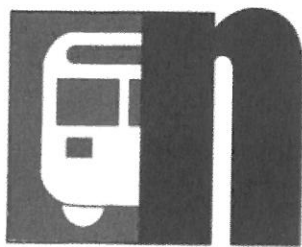


NATIONAL



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 22980

FAX ■ Home Office (540) 337-4619

VA - (540) 943-3430 ■ Cell - (540) 256-3246

Regional Representative – Andrew W. Clawson

aclawson@nationalbussales.com

BVH410

**2014 Goshen Coach GCII
Original**



ANDREW W. CLAWSON

Regional Area Representative

Commercial Bus Division

07/30/13 08:25:23 AM

West Virginia Purchasing Division



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

Solicitation

NUMBER
BVH419

PAGE
1

ADDRESS CORRESPONDENCE TO ATTENTION OF
TARA LYLE 304-558-2544

V
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*724144045 800-282-7981
NATIONAL BUS SALES & LEASING I
PO BOX 6549

MARIETTA GA 30065

S
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WEST VIRGINIA VETERANS HOME

512 WATER STREET
BARBOURSVILLE, WV
25504 736-1027

DATE PRINTED
07/02/2013

BID OPENING DATE: 07/30/2013

BID OPENING TIME 01:30PM

LINE	QUANTITY	UCP	CAT NO.	ITEM NUMBER	UNIT PRICE	AMOUNT
0001	1	EA		070-93	\$64,887.00	\$64,887.00
13 PASSENGER CUTAWAY BUS						
THE WEST VIRGINIA PURCHASING DIVISION FOR THE AGENCY, WV VETERANS HOME, IS SOLICITING BIDS TO PROVIDE A 176" WHEELBASE - 13 PASSENGER CUTAWAY BUS WITH THREE (3) WHEELCHAIR SECUREMENTS AND LIFT, PER THE ATTACHED SPECIFICATIONS.						
ATTACHMENTS INCLUDE:						
1. INSTRUCTIONS TO VENDORS SUBMITTING BIDS						
2. GENERAL TERMS AND CONDITIONS						
3. BVH419 SPECIFICATIONS						
4. CERTIFICATION AND SIGNATURE PAGE						
5. PURCHASING AFFIDAVIT						
6. RESIDENT VENDOR PREFERENCE (RVP) FORM						
***** THIS IS THE END OF RFQ					BVH419 ***** TOTAL:	\$64,887

SIGNATURE	TELEPHONE 540-256-3246	DATE 7/29/13
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'

REQUEST FOR QUOTATION
BVH419 176" Wheelbase 13 Passenger Cutaway Bus

000059

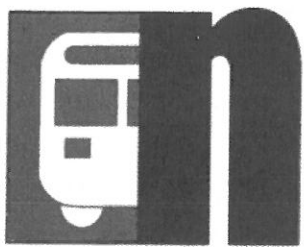
Exhibit A

Pricing Page

RFQ: BVH419

	Item Description	Unit Price	Quantity	Extended Price
	Base Vehicle Bid with 3 wheelchair spaces		1	\$ 64,887.00
Option	Item Description	Unit Price	Quantity	Extended Price
A	Cloth Seats		1	\$ 675.00
B	Flip Up Arm Rests for Passenger Seats		1	\$ 820.00
C	Security Camera		1	\$ 2,742.00
D	Security Camera Playback System		1	\$ 2,694.00
E	Full Bus Body Paint		1	\$ 2,994.00
F	3/4 Body Paint with Expanded Graphics		1	\$ 2,551.00
G	Vehicle Skirt Painting		1	\$ 994.00
Total Cost:				\$ 78,297.00

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 23322

FAX ■ Home Office (540) 337-4619

VA - (540) 943-3430 ■ Cell - (540) 256-3246

Regional Representative – Andrew Clawson

July 29, 2013

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

Ref: BVH419

Dear Ms. Tara Lyle:

National Bus Sales and Leasing, Inc. appreciates this opportunity to submit a bid for a transit vehicle to the State of West Virginia. Our offering, a Goshen GC II, meets the intent and letter of your specifications with the following documentation, clarifications and explanations per your Required Documentation Checklist:

Section

Required Documentation

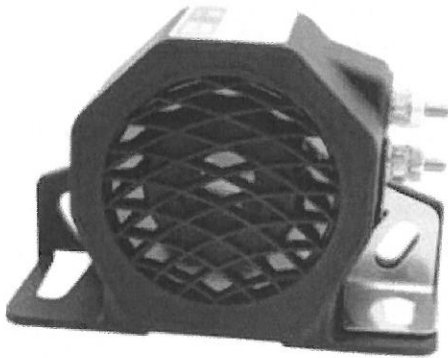
- 3.1 National Bus Sales certifies that each vehicle will be delivered with the documentation required per 3.1.1-3.1.7.
- 6.1.1 Bid offering – Current model year Ford E450 chassis with Goshen Coach GC II bus body. Major components include a 6.8 L V10 gasoline engine, a ACT dual compressor air conditioning system and a Braun NHTSA compliant Millennium wheelchair lift. See enclosed GC II literature at Enclosure A and a list of equipment for the 3WC Unit Enclosure B.
- 6.1.2 Please see Enclosure C for the interior floorplan.
- 6.1.3 Curb weight – See Cert of Origin for GVWR at Enclosure C and shipping weight at enclosure C.
- 6.1.4 Please see Enclosure D for available Paint and Vinyl Charts.

- 3.1 Base bid is a Ford Gasoline Engine, 6.8L V10 Warranty is by Ford Motor Corporation – 3yr/36,000 miles. See Ford 2012 Shuttle Bus Overview at Enclosure E for additional information.
- 3.1.6 Cooling system - Gasoline Engine equipped with large capacity radiator and viscous thermostatically activated cooling fan Warranty – 3yr/36,000 miles. See Enclosure E for additional information.
- 3.1.7 High idle system – Gasoline engines are equipped with Goshen installed Intermotive Gateway High Lock idle controller. See enclosure F. This system is integrated with an ADA compliant wheelchair interlock required by FMVSS 403/404. Minimum warranty – 1 year / 12,000 miles falls under Goshen Add-on equipment.
- 3.1.8 Engine oil cooler – Ford OEM oil cooler is standard on base bid. It is a full- flow, cylindrical tube type with an external cooling fin bundle. See enclosure E for additional information. Warranty – 3yr/36,000 miles Ford.
- 3.2 See Enclosure E for Ford OEM 5R110W transmission details. Warranty – 3yr/36,000 miles Ford.
- 3.2.4 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. See enclosure E for additional details
- 4.1 Heavy-duty brakes – 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. See enclosure E for additional details
- 4.3 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 shocksWarranty – 3yr/36,000 miles. See enclosure E for additional details
- 4.3.1 See enclosed Mor-Ryde documentation at Encl G Warranty 3yr/70,000 miles.
- 4.4.1 Ford OEM Tires - LT245/75R 16E BSW All Season Tire - Brand TBD. Warranty is limited to manufacturing defect and covered under Ford warranty umbrella. See enclosure E for additional details.
- 5.0 Ford OEM 12V Electrical system is integrated with a solenoid triggered body electrical system, all 12V circuits with circuit breaker and fuse interface. See Bussmann Series 3000 VEC electrical center at Enclosure H. See Enclosure B – As Built wire schematics are ordered for each bus.
- 5.1 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.
- 5.2 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. Note: Only one of the two batteries can be relocated to the slide out battery tray required in the specification due to restrictions by the Ford Quality Vehicle Modifier (QVM) Program. One will be relocated to the battery box with stainless steel tray. Warranty 3yr/36,000 miles. See enclosure E for additional details
- 5.3.4 LED 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 1yr /12,000 miles on connector and up to lifetime on diodes. See Enclosure I

- 5.4.1 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 1yr /12,000 miles on connector harness from Goshen and up to lifetime warranty from Optronics on diodes. See Enclosure J.
- 5.6.2 Currently offered back-up alarm is by Ecco. Activates when vehicle is shifted into reverse to warn those near-by that vehicle is moving backwards. See info below. Minimum warranty coverage is 1 year / 12,000 miles, Goshen Add-on

Ecco 520 Back Up Alarm Self Grounded 12-24V 97dB

Back Up Alarm, Self Grounded, Width 4 In., Height 2.6 In., Dia. 1.6 In., Color Black, Voltage 12 Decibels 97 Db, Meets Osha, Bureau Of Mines, Gsa K-spec, And All State Regulations. Standards, Includes Universal Mounting Bracket



- 5.6.4 Intelligent Audible Alarm – No longer required by specifications.
- 5.7 Back-up camera system is now required in place of 5.6.4
Goshen will provide a Rear view safety camera system. See Enclosure K
- 6.1.1 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. See Enclosure E for additional information.
- 6.1.2 Stepwell heater – Goshen will install for this bid an electric pad style heater on the bottom step. The heater is thermostatically controlled. It will only operate when the ignition is in the on position. The heater works by radiating heat to the underside of the bottom step most prone to icing. See Enclosure L. Minimum warranty is 1 year/12,000 miles, Add-on.
- 6.1.3 Auxiliary heater is a Goshen installed Pro- AIR model # 435. It is a floor mounted heater that is controlled independently from the dash heater. Features include a plastic encased hot water radiator with a two-speed fan remotely controlled from the driver's area. Two are installed. See Enclosure M. Minimum warranty is 1 year / 12,000 miles, Add-on.
- 6.2 Air conditioning 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 auxillary compressor in addition to a stand-alone Ford OEM compressor. An ACT ceiling mounted evaporator and a two 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. See enclosure N.
- 6.3 See enclosed Transpec literature at enclosure . Minimum warranty 1 year / 12,000 miles, Add-on. See enclouser O.

- 8.1.1 Body Construction – See enclosure P for Goshen Coach Body construction. Structural Warranty is 6yr/60,000 miles.
- 8.1.8 Goshen water test procedures at Enclosure Q.
- 8.2.1 Goshen's standard construction for roof panels is currently a one-piece lamination. See Enclosure A back side of literature or Enclosure P paragraph 5.2 D.
- 8.2.2 Insulation – Goshen installed insulation is 1.5" thick rigid polystyrene thermal insulation with an R value of 4.6 per inch. See Enclosure R for MSDS showing fire retardant properties and non-toxicity.
- 8.4.2 Floor information at enclosure S. Minimum warranty - 1 year / 12,000 mile Add-on.
- 8.5 Help Bumper- SMI Energy Absorbing Bumper Information at Enclosure T. Minimum warranty- 1 year/12,000 mile Add-on.
- 9.2.3 Electric Operated Door – A&M fabricated header serves as mounting plate for assembly of gearing, electric actuated motor and door control rods. Control switch is remotely controlled from the driver's area. Minimum warranty - 1 year /12,000 miles, Add-on. See Enclosure U for detailed description and schematic of door control circuit.
- 10.1 Lift – Goshen Coach will install a Braun NHTSA compliant Millenium lift. See documentation at enclosure V. Goshen will install the Millenium **NL917FIB3751-2** The millennium lift are NHTSA Compliant with a Usable Platform: 37" x 51".
- 10.2.7 Interlock documentation is combined Highlock system by Intermotive at Enclosure F.
- 11.1 Passenger Seating – All literature has been downloaded from the Freedman website - www.freedmanseating.com . See Enclosure W for literature and FMVSS 210 certification.
- 11.2 Driver's Seat – A Freedman Shield Sport 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. See Enclosure X. Minimum warranty - 1 year /12,000 miles, Add-on.
- 11.3 Mobility Aid system – See enclosed Q'Straint literature at Enclosure Y. Warranty- 2 year limited warranty from Q'Straint. System is -#A1 with fully retractable shoulder belt
- 13.1 Rosco M715 series mirrors with option for electric remote controlled and heated included . Covered by minimum 1 year /12,000 mile add-on warranty. See enclosure Z.
- 16.0 Radio/CD – Goshen is back to using the Panasonic brand of radios. See below:

Home > Products > Mobile Audio > CQCM130U

Panasonic CQ-CM130U MP3/CD/PA Ready

Panasonic
ideas for life

CQ-CM130U PA Ready - MP3 CD Radio

- 200 Watts
- PA Ready - requires additional PA kit available from MITO Corporation
- SQ Presets for Rock, Pop, or Vocal
- Auto Preset Memory
- Digital Clock
- LED Lighting
- Supports CD-R/RW Disc Playback
- Plays MP3 Format



Includes CD with clock and is installed in the dash space reserved for radios. The above model is the current offering but may be succeeded at any time by a new equivalent model #. Covered by minimum 1 year /12,000 mile add-on warranty.

19.1 Interior Color Schemes :

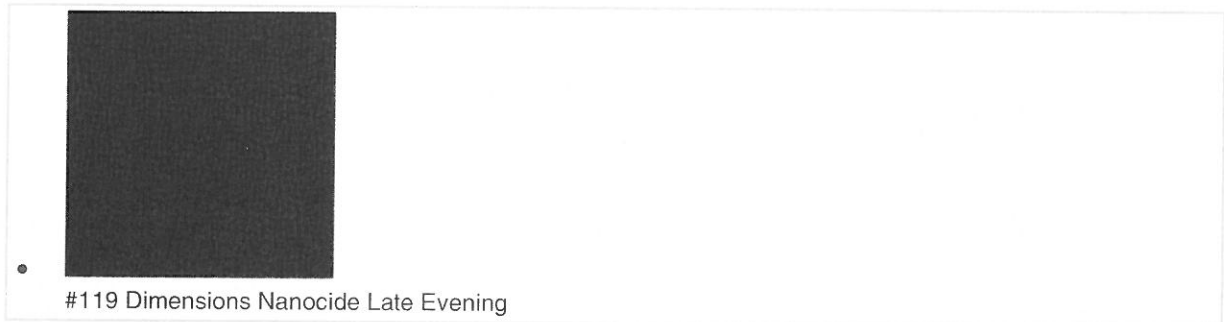
- A. Sidewalls – Grey FRP
- B. Pads – Grey Vinyl to match cab
- C. Flooring – Blue rubber per RCA enclosure
- D. Ceiling – Grey FRP
- E. Cab – Grey vinyl

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.

19.2.2 Paint scheme – See enclosure D for color choices for graphics.

19.4 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. See enclosure 1.

20.0 Option A Cloth passenger seats in Level 4 solid Repel fabric. See insert below from www.freedmanseating.com. Covered by minimum 1 year /12,000 mile, add-on warranty.



SPECIFICATIONS CMI has developed the Dimensions line of coated fabrics with Nanocide for use in public transportation that uses a patent pending process of permanently embedding nanoscale silver particles, from an EPA registered Oeko-Tex approved source in our product during the manufacturing process. Silver is a natural antimicrobial. Microbes and fungi cannot survive in the presence of silver ions. The smaller the silver particles, the more silver ions they emit and the more unwanted microbes are eliminated. Silver enhanced antimicrobial products actively inhibit bacterial growth and show a 99.9% reduction in test microbes and common bacteria.*

- 20.0 Option B Flip –up arm rests by U.S. Arm. See enclosure 2 from www.freedmanseating.com . Covered by minimum 1 year /12,000 mile, add-on warranty
 - 20.0 Option C Security Camera System by REI . Model # R40001 while supplies last. Model #SD40 later this year. Both will be priced the same. See Enclosure 3 for literature and details.
 - 20.0 Option D Security Camera Playback system will be a desk top standalone PC with 17" flat screen monitor and Bus-Watch software installed. PC brand and specifications to be determined at time of purchase. See enclosure 4 for software item number.
 - 20.0 Options E,F,G Full Body Paint Painting- See provided Paint Color Samples at Enclosure D
- 2..2.1 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 | Chenoweth 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

2.3.1 Warranty on completed vehicle follows:

Chassis: 3 year or 36,000 miles

Bus Conversion: 1 year or 12,000 miles.

Braun Lift: 2 year parts and labor, 3 additional years parts only

Supplemental AC system: 2 years, unlimited miles

Add-on components: Minimum 1 year or 12,000 miles unless stated above

Warranty on basic vehicle structure

Bus Structure: 6 year or 60,000 miles
Undercoating: 5 year limited

8.5.5 Warranty Locations – National Bus Sales & Leasing, Inc. is responsible to coordinate all warranty repairs through our Customer Service Center at 1-800-282-7981 29 or at our website, www.nationalbussales.com. See table above for compliance 2.2.1

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

Sincerely,

A handwritten signature in black ink, appearing to read "Andrew W. Clawson".

Andrew W. Clawson
Regional Representative
aclawson@nationalbussales.com

GCI

GOSHEN COACH

Thor Industries Commercial Bus Division

Shown with
optional graphics
package and
reflective tape.

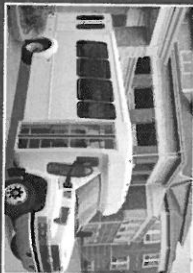


Committed to moving people ahead >

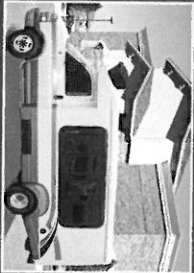
- Up to 25 passengers
- Flexible wheel chair positions
- Spacious interior
- Fully welded steel cage for safety
- Available on Ford or Chevy chassis
- Altoona tested (7 years/200,000 miles)



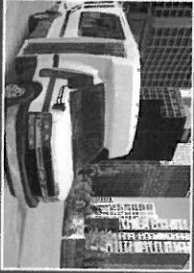
Parking Shuttle



Assisted Living



Church



Public Transit



Higher Education



Touring

CHASSIS

Chevy G3500 & G4500:

- 12,300 & 14,200 LBS GVWR
- 6.0L Gas or 6.6L Diesel Engine
- OEM Driver's Seat, High-back, Reclining, Bucket, Cloth w/Headrest & Right Arm
- Electronic 4-speed Automatic Transmission

- OEM Dash A/C, Heater & Defroster
- Dual Battery
- Power Steering/ABS Brakes/Tilt Wheel/Cruise

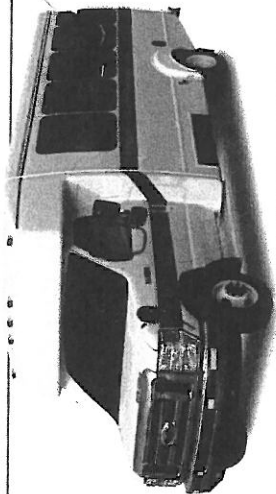
- Daytime Running Lights
- OEM Alternator (dual diesel)
- Chrome Front Bumper
- Driver Air Bag
- Engine Block Heater (diesel)
- Dual Rear Wheels
- All Wheels Painted White
- Power Outlets

Ford E-350 & E-450

- 11,500, 12,500 or 14,500 LBS GVWR
- 5.4L & 6.8L Gas or 6.0L Diesel Engine
- Electronic 5-speed Automatic Transmission
- OEM Dash A/C, Heater & Defroster
- Dual Battery*
- Power Steering/ABS Brakes/Tilt Wheel/Cruise

- OEM Alternator (dual diesel)
- Chrome Front Bumper
- Driver Air Bag
- Driver Side Sun Visor
- Engine Block Heater (gas & diesel)
- Dual Rear Wheels
- All Wheels Painted White
- Power Outlets

* Diesel engines include battery box with slide out tray



Seating plans can be configured based on customer needs or specifications

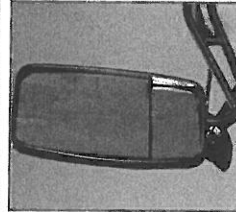
24 Passenger

21 Passenger & Rear Luggage

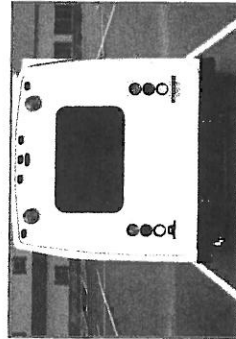
STANDARD FEATURES

- Up to 26 Feet Long and 25 Passengers
- 91" Interior Width for Double Seating on Both Sides of Center Aisle
- Interior Height 79" at Aisle (75" with flat floor option)
- Fully Welded, Unitized Steel Cage Construction
- One Piece High Gloss, FRP Exterior Sidewalls
- Large Upper T-slider Windows w/Dark Tint
- FRP Interior Walls
- 5/8" Exterior Plywood Sub-floor with Black Rubber Flooring & Carpeting Under Seats
- 6 Dome Lights and 2 Stepwell Lights
- Rear Mud Flaps
- Vacuum Laminated and Fully Insulated Walls and Roof
- Emergency Side and Rear Egress Windows
- One Piece Roof
- Manual Exterior Breakaway Mirrors w/Convex
- Altoona Tested - 7 Years/200,000 Miles

Due to constant product improvements, specifications, component parts and optional equipment are subject to change without notice or obligation. See your dealer for details. Photos may show optional equipment.



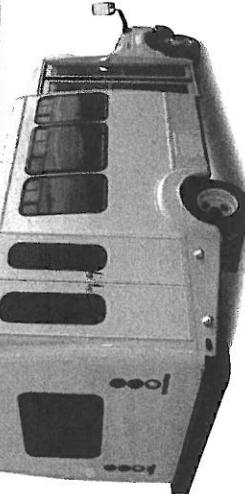
Breakaway Convex Mirrors



Rear Window (shown with optional light package)



High Gloss Exterior Fiberglass



16 Passenger, 2 W/C

12 Passenger, 2 W/C

Optional Equipment:

- Choice of Exterior Skin (Aluminum or Fiberglass)
- Choice of Rear Suspension Systems
- Audio/Visual Packages
- Luggage, Dedicated Rear and/or Overhead Rubber or Altro Flooring
- Choice of Interiors (Cloth, Vinyl, Carpet)
- Choice of Seat Material (Vinyl, Cloth, Leather)
- ADA Packages Available
- Custom Paint & Graphics Packages



Overhead Luggage



Flip-down TV



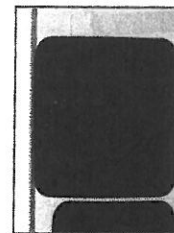
Rooftop Mounted AC



Perimeter Seating



Rear Wheel Chair Lift



Destination Sign



GOSHEN COACH

Thor Industries Commercial Bus Division



25161 Leer Drive Elkhart, IN 46514 USA
(phone) 574.970.6300 • (fax) 574.266.5866
(e-mail) sales@goshencoach.com
(web) www.goshencoach.com

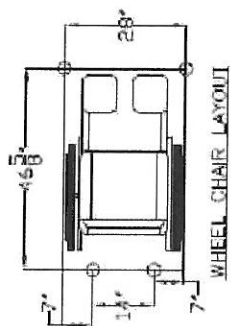
24.5' MODEL

1	GCII 176"WB/292" Ford 6.8L Gas, GVWR 12,500 E-350
1	ALIGNMENT W/CASTOR & CAMBER KIT-FORD & CHEVY
1	EXHAUST-ROUTE TO STREETSIDE-GAS ENGINES (STD ON CHEVY 139" WB CHASSIS) (N/A ON 159" WB / 263" OAL G4500 DUE TO FUEL TANK LOCATION)
0.5	MUD FLAPS-FRONT (REAR MUD FLAPS ARE STANDARD)
1	RUNNING BOARD DRIVER SIDE DIAMOND PLATE (N/A ON LOW FLOOR)
1	BATTERY BOX WITH STAINLESS STEEL SLIDE OUT TRAY
1	TIRE-SPARE & WHEEL GCII & PII
1	EXTENSION-VALVES FOR TWO INNER DUAL WHEEL
1	BUMPER-REAR SMI ENERGY ABSORBING BUMPER, GCII & G-FORCE
1	MOR/RIDE-REAR E-450
1	FLOOR-UNDERBELLY ALUMINUM
1	YELLOW STEP NOSING
1	RUBBER-COLORED ON ENTIRE FLOOR, 18" AISLE
1	STANDEE LINE-YELLOW, w/ 2" SIGN "NO STANDING FORWARD OF YELLOW LINE"
1	FRP ON CEILING
1	DOOR HOLD OPEN, CAM-OVER SPRING STYLE, EACH
1	ENTRY DOOR-36" ELECTRIC IPO MANUAL (N/A ON LOW FLOOR)
1	KEY SWITCH (EXTERIOR)-FOR ELECTRIC ENTRY DOOR
1	REAR DOOR-36" W/2 WINDOWS W/DOOR AJAR BUZZER & LIGHT ON DASH
1	STAINLESS STEEL-STEPWELL & ENTRY DOOR SURROUND
1	WINDOW-EGRESS IPO STD , EACH (NOTE: ADD 2 ADDITIONAL EGRESS WINDOWS IF PASSENGER LOAD IS GREATER THAN 19)
1	WINDOW-REAR TWIN (N/A WITH REAR LUGGAGE ROOM)
1	FAN-CIRCULATING
1	ROOF HATCH-TRANSPEC LOW PROFILE STANDARD SAFETY VENT #1975
1	HEATER, REAR-35000 BTU
1	HEATER, REAR-35000 BTU W/CIRCULATING PUMP
1	STEPWELL-FRONT HEATED (ELECTRIC) W/THERMOSTAT - PER STEP
1	ACT-913/21, EZ-91 EVAP, CS-3 COND, DUAL COMPRESSORS (TM21)-97000 BTU FORD GAS
0.25	INTERIOR ADVERTISING BRACKETS, FULL-LENGTH, BOTH SIDES. REPLACES TRANSITION PADS BETWEEN WALLS AND CEILING. INCLUDES DOME LIGHTS AND SPEAKERS (IF ORDERED). (N/A WITH OVERHEAD LUGGAGE OPTIONS)
1	ALARM-BACK UP
1	SCHEMATIC-LAMINATED ELECTRIC LEGEND ON ELEC. DOOR
1	SCHEMATICS-WIRING AS BUILT
1	RADIO-DELUXE AM/FM/CD W/4 SPEAKERS (INCLUDES CLOCK)
0.5	SPEAKER, 2 ADD'L
1	BACKUP CAMERA, COLOR, 7" MONITOR
1	LIGHTS-LED STEPWELL LIGHTS IN LIEU OF STANDARD (2)

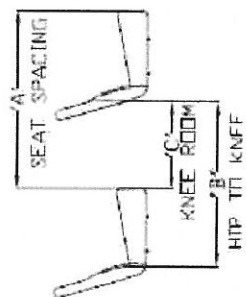
LOCATION:

1	LIGHTS-INTERIOR DOME LIGHTS LED IN LIEU OF INCANDESCENT (TOTAL 6)
2	LIGHT-INTERIOR DOME, (1) ADD'L - LED
1	BRAKE LIGHT-REAR CENTER MOUNTED LED
1	EXTERIOR LIGHT-HOODED AT ENTRANCE DOOR LED
1	MIDSHIP TURN SIGNAL / MARKER LIGHT COMBINATION (ARMORED) - LED
1	OVERHEAD STORAGE IN FRONT CAP (N/A W/FRONT DESTINATION SIGN)
1	GRAB RAILS-ENTRANCE PARALLEL TO STEPS, BOTH SIDES (STD ON LOW FLOOR)
1	GRAB RAILS-CEILING (BOTH SIDES OF AISLE)
1	STANCHION-ADDITIONAL-EACH
4	STANCHION-PADDING 40"-EACH
1	MODESTY PANEL-DRIVER W/ STAINLESS STEEL STANCHIONS
1	MODESTY PANEL-PLEXIGLASS TOP (TINTED)
1	FIRE EXTINGUISHER-5 LB
1	FIRST AID-16 UNIT
1	FIRST AID-BODY FLUID CLEAN-UP KIT
1	TRIANGLES-EMERGENCY IN BOX
1	REFLECTORS-BOTH SIDES OF BUS (RED REAR/AMBER FRONT)
1	MIRRORS-EXTERIOR, M715, REMOTE CONTROL, HEATED, FORD, ROSCO
1	MIRRORS-INTERIOR FLAT 6"X16"
1	LENS-WIDE ANGLE 11"X14" (ADHERES TO REAR WINDOW)
1	DECAL-"ALL PASSENGERS ARE REQUIRED TO WEAR SEAT BELTS . . ."
1	DECAL-"CAUTION FREQUENT STOPS" BLACK ON YELLOW
1	DECAL-"EMERGENCY EQUIPMENT" RED ON WHITE
1	DECAL-"NO SMOKING" RED ON WHITE
2	DECAL-"PRIORITY SEATING WC AREA" (ADA REQUIRED)
1	DECAL-"VEHICLE HEIGHT"
1	DECAL-"WATCH YOUR STEP" MOUNT ON TOP RISER
1	DECAL-INTERNATIONAL WHEELCHAIR SYMBOL-12"X12"
1	DECAL-"EMERGENCY TELEPHONE NOS" RED ON WHITE
1	EXTERIOR DECAL-"CAUTION PASSENGERS LOADING AND UNLOADING" MOUNT ON REAR, BLACK ON YELLOW
1	EXTERIOR DECAL-"THIS VEHICLE STOPS AT ALL RAILROAD CROSSINGS" MOUNT ON REAR, BLACK ON YELLOW
65	EXTERIOR DECAL-REFLECTIVE 2" 3M TAPE, PRICE PER FT
1	INTERMOTIVE HIGHLOCK FAST IDLE & INTERLOCK SYSTEM W/ DOOR AJAR LED PANEL, FORD E-SERIES
1	WC DR, DBL, 2 WIND, INT LITE, AJAR PKG, EXT LITE, EXTRA SPRING
1	UPGRADE DOOR FRAME TO STAINLESS STEEL - DOUBLE W/C DOOR (REQUIRES DBL W/C DOOR OPTION)
3	STORAGE POUCH FOR TIE-DOWN BELTS (GOSHEN COACH LOGO)
1	Q'STRAIT WEB CUTTER P/N Q5-7590
3	Q'STRAIT, "QRT" DELUXE SYSTEM WITH L-TRACK Q-8100-A1-L
12	Q'STRAIT WEBBING LOOP Q5-7580 (EACH)

3	QSTRAINT SCOOPED END CAPS FOR L-TRACK, PER WC POSITION (4 PIECES)
1	SEAT, DRIVER, FREEDMAN SPORT SHIELD RECLINER, RH ARM REST, ADJ LUMBAR, MAP POCKET, FORD & CHEVY
1	ADNIK POWER SEAT BASE, FORD & CHEVY (REQ'S FREEDMAN SHIELD RECLINER SEAT, FSC ECONO SEAT, SPORT SEAT, OR G2E. ALSO COMPATIBLE WITH CHEVY PEDESTAL OPTION 4602)
5	SEAT, MID-HIGH, RIGID, DBL, FEATHERWEIGHT (N/A AS AISLE FACING SEAT)
1	SEAT, BV FOLD AWAY, NOTCH BACK, DBL, 3-STEP, FREEDMAN
1	SEAT, FABRIC UPGRADE TO LEVEL 3, (1) DRIVER SEAT
12	SEAT, FABRIC UPGRADE TO LEVEL 3.5 (1) PASS SEAT
12	GRAB HANDLE, TOP MOUNT, ANTIVANDAL, BLACK (N/A ON HIGH BACK SEATS)
2	CRS-225 CHILD SEAT LATCH FOR FEATHERWEIGHT SEATS, PER PERSON (FITS RIGID OR RECLINERS. N/A ON ANY ICS OR FLIP SEATS)
12	SEAT BELT, RETRACTABLE, LAP
2	SEAT BELT, EXTENSION, 24" (N/A ON 3-PT SEATS)
12	SEAT BACK, ABS, MID-HIGH, (N/A ON ICS SEATS)
1	PARTS MANUAL
2	HOODSCOOP-PERKO VENT ON HOOD (1 EA)
3	RCA TALON STEP TREADS, 1-PIECE, YELLOW
1	STANCHION BEHIND DRIVER TO BE PRE-WIRED FOR FAREBOX
1	WEST VIRGINIA STARS & STRIPES VINYL GRAPHICS
1	BRAUN MILLENNIUM NL917FIB3751-2 WHEELCHAIR LIFT WITH OPTIONAL SAFETY BELT
1	SPECIAL RUB RAIL (WITHOUT SNAP-IN RUBBER)
2	SILVER MYLAR SAFETY BLANKET FROM CERTIFIED SAFETY MANUFACTURING.
1	QUANTITY OF TWO (2) DOCUMENT HOLDERS ON FRONT BULKHEAD FOR SINGLE 8.5" X 11" PAPER
1	UPGRADE BATTERY BOX TO STAINLESS STEEL
1	EXTRA ROLL BAR IN ROOF STRUCTURE (2 TOTAL)
1	all exterior screws and bolts to be stainless steel
1	entry door aluminum trim to have seam sealed
1	3 EGRESS WINDOWS TOTAL, 2 ON SS, 1 ON CS
1	CAM OVER OPTION FOR REAR DOOR
1	EXTRA SPEAKER FOR DRIVER DOOR OR DASHBOARD
1	MOUNT FRESNEL LENS ON LOWER EDGE OF UPPER REAR DOOR WINDOW
1	INSTALL MASTER POWER SWITCH ON DASH FOR W/C LIFT
1	EXHAUST TAIL PIPE TO EXTEND APPROX 2" BEYOND BODY
1	EXTRA STANCHION AT FRONT ENTRY TO BE ATTACHED TO FRONT BULKHEAD
1	SPARE TIRE MUST BE FORD OEM THAT CAME WITH CHASSIS



SEAT STYLE	SEAT SPACING 'A'	HIP-TO-KNEE 'B'	KNEE ROOM 'C'
MID-HI	32"	28"	9-3/4"
MID-LI	36"	36"	13-3/4"





Thor Industries Commercial Bus Division

WEIGHT ANALYSIS WORKSHEET

ESTIMATED

F/P NO:	REF NO:	UNIT NO:
0130927	29547	10207
UNIT SERIES NO's:		DATE:
		5/2/2012

VEHICLE DESCRIPTION:			MODEL NO:	MODEL YR:	# SEATING POSITIONS
GCII 292" FORD -- 18P			GCF292-E476	2012	19 (INC. DRIVER SEAT)
CHASSIS DESCRIPTION:	ENGINE:	WHEELBASE:	TIRE SIZE:	FUEL TANK:	FUEL LEVEL:
Ford E450 176"WB, 6.8L Gas, 14,500 GVWR	6.8L (425CID) EFI V10	176	LT225/75R16E	55 Gal. Rear Tank @ 196"	1/16

VEHICLE LOAD DISTRIBUTION

(L)	(K)	(J)	(I)	(H)	(G)	(F)	(E)	(D)	(C)	(B)	(A)	"STREETSIDE"
		300	300				300	300	300		150	PASSENGER & LUGGAGE LOAD
		230	195				160	125	90		45	SEAT WEIGHT
												DISTANCE

2432
(3)

176
WHEEL BASE

2458
(4)

VEHICLE WEIGHT DATA:
(See attached weight ticket)

1786
(1)

1782
(2)

(FROM CENTERLINE OF FRONT AXLE)

FRONT>>>

(X)	(W)	(V)	(U)	(T)	(S)	(R)	(Q)	(P)	(O)	(N)	(M)	"CURBSIDE"
					300	300	300	0	300			PASSENGER & LUGGAGE LOAD
					230	190	150	131	110			SEAT WEIGHT
												DISTANCE (FROM CENTERLINE OF FRONT AXLE)

VEHICLE WEIGHT DATA:	FRONT WEIGHTS			REAR WEIGHTS			TOTAL	NOTES:
	LEFT	RIGHT	TOTAL	LEFT	RIGHT	TOTAL		
Actual Completed Weight Of Vehicle	1786	1782	3568	2432	2458	4890	8458	
FUEL LOAD ADJUSTMENT:	-18	-18	-36	176	176	352	316	
VEHICLE CONFIGURATION ADJUSTMENTS:	-26	-22	-48	-14	-34	-48	-96	
UNLOADED VEHICLE WEIGHT:	1742	1742	3484	2594	2600	5194	8678	
WEIGHT OF THE OCCUPANTS & LUGGAGE:	248	41	289	1402	1159	2561	2850	
LOADED VEHICLE WEIGHT:	1990	1783	3773	3996	3759	7755	11528	
AVAILABLE EXCESS CARGO CAPACITY:	690	897	1227	944	1181	1845	2972	
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: RP

DATE: 5/2/2012

CERTIFICATE OF ORIGIN FOR A VEHICLE

GOSHEN COACH, INC.
a THOR company

DATE
MARCH 14, 2012

INVOICE NO.
59955

VEHICLE IDENTIFICATION NO.
1FDFE4FS8BDB37562

YEAR
2011

MAKE
GOSHEN COACH

BODY TYPE
BUS

SHIPPING WEIGHT
8958 lbs

H.P. (S.A.E.)

G.V.W.R.
14,500

NO. CYLS.
10

SERIES OR MODEL
GC II

I, the undersigned authorized representative of the company, firm or corporation named below, hereby certify that the new vehicle described above is the property of the said company, firm or corporation and is transferred on the above date and under the invoice Number indicated to the following distributor or dealer.

NAME OF DISTRIBUTOR, DEALER, ETC.

NATIONAL BUS SALES & LEASING, INC.
800 PICKENS DRIVE EXT
MARIETTA, GA 30065-0549

It is further certified that this was the first transfer of such new vehicle in ordinary trade and commerce.

GOSHEN COACH, INC.
a THOR company

BY:

(SIGNATURE OF AUTHORIZED REPRESENTATIVE)

(AGENT)

GC 0008938

ELKHART, INDIANA 46514

CITY - STATE

FLEX-TRANSCUENTS

2400 WHITE

2401 IVORY

2402 LIGHT RED

2409 RED

2410 BURGUNDY

2414 MANGO

2406 YELLOW

2404 ORANGE

2407 ROYAL BLUE

2413 BRIGHT BLUE

2403 OLYMPIC BLUE

2408 FOREST GREEN

2412 GREEN

2416 TEAL

2415 BLACK

2411 DURANODIC

FLEX-POLYESTER

2451 CHROME MIRROR

2452 CHROME BRUSH

2453 GOLD BRUSH

2454 DOUBLE GOLD MIRROR

FLEX-PEARLESCENT

2700 PEARL

2701 CORAL

2702 VIOLET

2703 PASSION

2704 TEALITE

2705 PATINA

2706 MARINE BLUE

2707 GALAXY BLUE

FLEX-REFLECTIVE

2500 WHITE

2501 RED

2506 DARK RED

2503 YELLOW

2505 GOLD

2508 BLACK

2504 GREEN

2507 ORANGE

2502 BLUE

2509 LT. BLUE

FLEX-ETCH

2600 ETCHMARK

FLEX-FLUORESCENT

2550 RED

2551 PINK

2552 ORANGE

2553 YELLOW

2554 GREEN

2555 BLUE

FLEX-STENCIL MASK

2455 WHITE

2456 YELLOW

FLEX-LUSTER

2800 SPANISH GREEN

2801 GARNET

2802 EMPIRE BLUE

2803 RUBY

2804 IMPERIAL PURPLE

2805 AQUAMARINE

2806 TEA ROSE

FLEXCAL

1000 WHITE

1001 MATTE WHITE

1002 BLACK

1003 MATTE BLACK

1004 MATTE CLEAR

1005 SLATE GRAY

1006 NAVY

1007 MEDIUM BLUE

1008 SAPPHIRE BLUE

1009 OLYMPIC BLUE

1010 LIGHT BLUE

1011 REAL TEAL

1012 DARK TEAL

1013 GREEN

1014 FOREST GREEN

FLEXCAL

1015 SUNFLOWER YELLOW

1016 MEDIUM YELLOW

1017 CANARY YELLOW

1018 MATTE YELLOW

1019 BROWN

1020 BURGUNDY

1021 CARDINAL RED

1022 RED

1023 TOMATO RED

1024 BLOSSOM

1025 PINK

1026 ORANGE

1027 LIGHT PURPLE

1028 PURPLE

1029 DEEP PURPLE

1030 GOLD

1031 SILVER

1032 ALMOND

BLACK & WHITE	STANDARD COLORS	STANDARD COLORS	STANDARD METALLICS	STANDARD METALLICS	SUPER METALLICS
2001 BLACK	2044 VIBRANT GREEN	2039 REGAL PURPLE	2328 SILVER	2316 MAUVE METALLIC	2332 SILVER
2002 MATTE BLACK	2033 MINT GREEN	2025 LAVENDER BLUE	2323 PEWTER	2325 RED METALLIC	2333 GOLD
2003 WHITE	2012 CALYPSO	2037 PEACOCK BLUE	2306 CHARCOAL	2320 BURGUNDY MET.	2334 COOL BLUE
2004 MATTE WHITE	2070 EMERALD GREEN	2054 OLYMPIC BLUE	2308 DARK CHARCOAL	2309 DK. MAPLE MET.	2335 COBALT
2005 CLEAR	2053 FOREST GREEN	2023 INTENSE BLUE	2327 SEAFOAM GREEN	2330 VIOLET BLUE MET.	2336 WINTERMINT
	2051 DEEP GREEN	2057 VIVID BLUE	2324 PINK GREEN MET.	2331 VIOLET MIST MET.	2337 GUSTY GRAPE
STANDARD COLORS	2046 BURGUNDY	2055 SAPPHIRE BLUE	2315 LIGHT COPPER MET.	2305 BRIGHT PURPLE MET.	2338 FROSTY MELOH
2003 AQUA	2056 TOMATO RED	2029 LIGHT NAVY	2310 DARK MESA MET.	2321 MIST BLUE	2339 FIRE OPAL
2016 DK. AQUA	2047 CARMINAL RED	2048 DK. BLUE	2314 LIGHT ANTELOPE MET.	2317 MED. BLUE MET.	2340 BLACK
2017 DK. IVY	2018 DARK RED	2006 ALMOND	2301 AUTUMN GOLD	2311 DENIM BLUE MET.	
2049 DK. YELLOW	2045 WINEBERRY	2009 BEIGE	2302 BAY GOLD MET.	2318 BLUE METALLIC	
2026 LEMON YELLOW	2028 LIGHT MAGENTA	2013 CAMEL	2300 ANTIQUE BRONZE MET.	2312 ELECTRIC BLUE	
2014 CANARY YELLOW	2020 FIESTA	2041 SANDSTONE	2304 BRIGHT GOLD	2326 ROYAL BLUE	
2022 IMITATION GOLD	2021 GERANIUM	2010 BUCKSKIN	2313 GOLD	2322 NAVY BLUE MET.	
2007 APRICOT	2035 ORCHID	2015 COCOA	2307 COPPER	2329 TEAL BLUE MET.	
2034 ORANGE	2038 RASPBERRY	2019 DOVE GRAY	2319 BROWN METALLIC		
2042 TANGERINE	2030 MAGENTA	2027 LIGHT ASH GRAY			
2043 TURQUOISE	2036 PLUM	2031 MARINE GRAY			
	2040 ROYAL WINE	2032 MED. MARINE GRAY			
	2024 LAVENDER				

E-Series Van/Cutaway

What's Important

2012

New for 2012

Model Lineup

- No new models for 2012

Performance/Handling

- Dual 78-amp heavy-duty batteries available

Quality/Reliability/Durability

- No feature changes for 2012

Flexibility

- SYNC AppLink included with SYNC
- Ash cup/coilholder available, no longer standard equipment
- Navigation System has late availability (Winter 2012)
- Color added:
 - Steel Blue Metallic (UN) available on all models
- Color deleted:
 - Royal Red Metallic
- Multi-Function School Activity Bus (MFSAB) Prep Package available on E-350/E-450 Cutaways

Capability

- No feature changes for 2012

Package Changes

- School Bus Prep Package available with 10,050 lb. Gross Vehicle Weight Rating (GVWR)

Options Deleted

- Auxiliary battery is no longer available
- In-dash computer no longer available
- Tool Link™ by DEWALT® no longer available

Options Added

- Auxiliary audio input jack included with base AM/FM stereo radio
- Keys — 2 additional (4 total) available on all vans

E-Series Van/Cutaway

Model Lineup

2012

Recreational Van — All Commercial Van content, plus:



Flexibility

- Audio — single-CD/MP3/6 speakers/audio jack
- Bumpers — chrome, front and rear contour

- Cruise control
- Dash sound absorber
- Glass — solar w/fixed side rear cargo door
- Grille — chrome
- Headlamps — dual sealed-beam fixed lens
- Instrument panel — color-keyed with tachometer
- Insulation Package
- Lighting — courtesy light
- Mirror — interior day/night rearview mirror, INCLUDED on all Recreational Vans
- Mirrors — aerotype, LH/RH (RH convex) power adjust flat glass mirror with integrated spotter mirror
- Modified Vehicle Wiring Kit and System
- Power door locks/windows
- Remote keyless entry — w/panic alarm and illuminated entry
- Safety belts — color-keyed with height-adjustable D-ring
- Seats — manual pedestal without seats
- Sun visors — untrimmed, LH/RH mirror visor kit (incl. in dunnage box)
- Trim
 - Color-keyed cowl trim panels
 - Color-keyed plastic door trim panels with map compartment
 - No headliner
 - No floor covering

Cutaway



Performance/Handling

- Axle
 - Front, twin I-beam
 - Rear, full-float (DRW)
 - Rear, semi-float (SRW)
- Brakes — 4-wheel disc brakes
- Handling Package — Includes front stabilizer bar and heavy-duty front and rear shocks

Quality/Reliability/Durability

- Fuel tank
 - 33-gallon midship (E-250/E-350 SRW)
 - 40-gallon aft-of-axle (E-350)

Flexibility

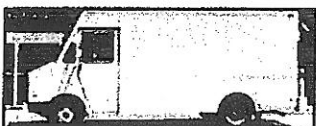
- Air conditioning — front only
- Audio — electronic AM/FM stereo/digital clock/2 speakers
- Auxiliary fuel port
- Bumper — black painted, front with lower black plastic valance
- Console, slim line engine cover — color-keyed with dual-bin stowage and 3 cup holders
- Courtesy light switch — front door
- Dash sound absorber
- Floor covering — front, black vinyl
- Ford oval on grille
- Front dome light
- Glass — solar
- Glove box with auxiliary powerpoint
- Headlamps — dual sealed beam
- Horn — dual note
- Instrument panel — Medium Flint

- Key In Ignition warning chime
- Light and Convenience Group
- Mirror — interior day/night rearview mirror — NOT INCLUDED
- Mirrors — NOT INCLUDED
- Modified Vehicle Wiring Kit and System
- Powerpoint — double 12V powerpoint in instrument panel
- Safety
 - Airbags — driver and front passenger
 - Anti-lock Braking System (ABS)
 - Safety belts — Medium Flint with height-adjustable D-ring
 - Tire Pressure Monitoring System (TPMS) (SRW only)
- Seats — dual bucket seats w/vinyl trim and inboard armrests
- Spare tire and wheel — NOT INCLUDED
- Steel valve stems (Std. on DRW)
- Steering gear — heavy-duty
- Steering wheel — tilt
- Sun visors — color-keyed vinyl
- Tachometer
- Trim
 - A-pillar grab handle
 - B-pillar, Flint only
 - LH/RH black cowl trim panels
 - LH/RH color-keyed cowl grab handles
 - Medium Flint w/single stowage area door trim panels
 - Molded vinyl-faced front headliner
- Wheel trim — NOT INCLUDED
- White steel wheels — DRW
- Windshield wipers — Interval

Capability

- Alternator — 120-amp
- Auxiliary transmission oil cooler
- Battery — heavy-duty

Stripped Chassis



Performance/Handling

- Brakes — 4-wheel disc brakes
- Handling Package — Includes front stabilizer bar and heavy-duty front and rear shocks

Quality/Reliability/Durability

- For Stripped Chassis only:
 - Warranty Facts Book
 - Incomplete Vehicle Manual
 - Vehicle Identification Kit
 - Fuel filler vent hose
 - Headlamp assembly
 - Headlamp switch
 - Instrument cluster
 - Wiring assemblies
 - Wrench — wheel nut

Flexibility

- Auxiliary fuel port
- Daytime running lights
- Front bumper delete
- Horn — dual note
- Mirror — interior day/night rearview mirror — NOT INCLUDED
- Mirrors — NOT INCLUDED
- Modified Vehicle Wiring Kit and System

- Radio — NOT INCLUDED
- Steering wheel — tilt
- Wheel trim — NOT INCLUDED
- Windshield wipers — Interval

NOTE: The above information is an excerpt from pages 2–3 of the 6/1/11 E-Series Van Dealer Ordering Guide and page 2–3 of the 6/1/11 E-Series Cutaway/Stripped Chassis Dealer Ordering Guide. For the latest Dealer Ordering Guide, go to fmcdealer.com.

May 2011

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E-Series Van/Cutaway

2012

E-Series Van/Cutaway

Model Lineup

Optional Equipment

	Commercial Van	Recreational Van	Cutaway	Stripped Chassis
Performance/Handling				
5.4L V8/4-speed automatic transmission FFV capable	O ^(1,2)	O ^(1,2)	O/S	—
5.4L V8/5-speed automatic transmission FFV capable (NOTE: Non-FFV capable with Ambulance Prep Package)	—	—	S	S
6.8L V10/5-speed automatic transmission (Incl. Tow/Haul Mode) (Opt. on E-350 Van and Cutaway)	O ⁽³⁾	O ⁽³⁾	O ^(3,4)	O
AdvanceTrac with RSC (Roll Stability Control)	S	S	—	—
Clean Fuel Fleet Option — 50-State	O	O	O	O
CNG/LPG Gaseous Engine Prep Package (5.4L V8 and 6.8L V10 only; not available with Ambulance Prep Package or School Bus Prep Package)	O	O	O	O
Quality/Reliability/Durability				
40.0-gallon fuel tank (Incl. with School Bus Prep Package)	—	—	S ⁽¹⁾ O ⁽⁴⁾	S ⁽¹⁾ O ⁽⁴⁾
55.0-gallon available on E-350 DRW Cutaway and Stripped Chassis with 158" WB with 11,500-lb. or 12,500-lb. GVWR (NA with School Bus Prep Package)	—	—	O ⁽¹⁾ S ⁽⁴⁾	O ⁽¹⁾ S ⁽⁴⁾
Battery — heavy-duty (78-amp/hr. battery) (Replaces 72-amp/hr. battery)	O	O	O	O
Dual Batteries — heavy-duty (78-amp/hr.) NA with E-350 with 4-speed transmission	O	O	O	—
Pucks — frame (isolators) Incl. 12 body mounts (Included with Ambulance Prep, Motorhome Prep, School Bus Prep, Shuttle Bus Prep and Motorhome Prep Packages)	—	—	O ^(3,4)	—
Spacers:				
Alternate lateral frame (6 lateral all WB. Incl. frame pucks) (NA on E-250 Cutaway; School Bus Prep Package)	—	—	O ^(3,4)	—
Standard pattern frame (4 long/2 lateral w/138" & 158" WB. 4 lateral/2 long w/176" WB. Incl. 559 frame pucks) (NA with School Bus Prep Package)	—	—	O ^(3,4)	—
Flexibility				
A/C Prep Package	—	—	—	O
Air conditioning — high-capacity front/rear (Incl. aux. heater. NA w/Ambulance Prep or Recreational Van with RV Plus Package. Package Stand-alone unit mounted over left rear wheelhouse cover. Does not Incl. headliner, overhead vents or ducts)	O	O	—	—
Air conditioning — high-capacity front/rear (Incl. auxiliary heater. Stand-alone unit mounted over left rear wheelhouse cover. Does not include overhead vents or ducts.) Requires RV Plus Package. Replaces Auxiliary Heater-A/C Connector Package (with rear controls)	—	O	—	—
Air conditioning delete (front) — front heat only	O	—	O	S
Airbag delete — passenger side (reqs. captain's chair — driver side only, passenger seat delete, Seat Prep Package — manual/power)	—	—	P	—
Alternator:				
Extra Heavy-Duty Alternator — 225-amp (NA with 4.6L engine)	O ⁽³⁾	O ⁽³⁾	O ^(3,4)	O
Heavy-Duty 155-amp. (avail. with 5.4L and 6.8L gasoline engines only, included with School Bus Prep and Shuttle Bus Prep Package)	O	O	O ^(3,4)	O
Ambulance Prep Package	O ⁽²⁾	—	O ^(3,4)	—
Ambulance Prep Package, not required (req. on all orders NOT destined for ambulance use)	O ^(2,3)	O	O ^(1,3)	—
Ash cup/coincubator with lid (fits in front cup holder)	O	O	O	—
Audio:				
AM/FM stereo/clock/CD/MP3 (Incl. single-CD player/aux. jack w/2 speakers on Cutaway, 4 speakers on Commercial Vans or 6 speakers on Recreational Vans)	O	S	O	—
AM/FM stereo/clock/CD/MP3 player with 2 speakers (avail. only with E-Guard Cargo Protection System)	O	—	—	—
Radio Delete (NA with SiriusXM satellite radio)	O	O	O	S
Radio Prep Package (Incl. antenna, 2 speakers, grilles and wiring normally provided)	O	—	O	—
Radio Prep Package (Incl. antenna, 4 speakers, grilles and wiring normally provided) (NA with E-Guard)	O	—	O	—
Radio Prep Package (Incl. antenna, 6 speakers, grilles and wiring normally provided)	—	O	—	—
Speaker Upgrade Package — 4 speakers (Incl. 2 installed and 2 boxed speakers)	—	—	O	—
Auxiliary fuel port (NA w/4.6L engine)	O	O	S	S
Auxiliary heater — A/C Connector Package (w/rear A/C controls)	P ⁽³⁾	O	O ^(3,4)	—
Auxiliary heater — A/C Connector Package (w/o rear A/C controls)	P ⁽³⁾	O	O ^(3,4)	—
B-pillar trim kit. Includes full LH/RH B-pillar trim. NA with right hand-door delete or Medium Pebble Interior	—	—	O	—

S = Standard O = Optional P = Package — = Not available (1) E-150 only. (2) E-250 only. (3) E-350 only. (4) E-450 only.

NOTE: The above information is an excerpt from pages 5–8 of the 6/1/11 E-Series Van Dealer Ordering Guide and pages 5–9 of the 6/1/11 E-Series Cutaway/Stripped Chassis Dealer Ordering Guide. For the latest Dealer Ordering Guide, go to fmcdealer.com.

E-Series Van/Cutaway

Model Lineup

2012

Optional Equipment cont'd

	Commercial Van	Recreational Van	Cutaway	Stripped Chassis
Flexibility (cont'd)				
Bumper:				
Front/rear contour — Chrome (incl. and only avail. with High-Series Exterior Upgrade Package)	P	S	—	—
Front, Chrome with black lower fascia (incl. with High-Series Exterior Upgrade Package, Motorhome Prep and Shuttle Bus Prep Package)	—	—	P	—
Rear step — Chrome (avail. with High-Series Exterior Upgrade Package only. Incl. Trailer Tow Package) (NA with Ambulance Package)	O	O	—	—
Rear step — Black (NA with High-Series Exterior Upgrade Package Incl. Trailer Tow Package with 4-pin trailer tow wire) (NA with Ambulance Package)	O	—	—	—
Painted white	—	—	O	—
Commercial Cargo Van Package	O	—	—	—
Cruise control (req'd with SYNC)	O	S	O	—
Crew Van Package	O	—	—	—
Dome/Cargo Light Kit — 3 additional cargo lights (NA with Insulation Package, Interior Upgrade Package, Premium Van Group, Ambulance Prep Package, Crew Van Package or EconoCargo Package)	O	—	—	—
Door:				
Right-hand door delete (deletes RH door, A-pillar grab handle, RH seat and safety belt, passenger side airbag, under seat stowage and ext. mirrors, NA with Interior Upgrade Package, Ambulance Prep Package, Motorhome Prep Package and Power Windows and Locks Group)	—	—	O ^(3A)	—
EconoCargo System	O	—	—	—
EconoCargo Upgrade — General Delivery Package	O	—	—	—
E-Guard Cargo Protection Syst (NA with sliding side door, Interior Upgrade Package or Premium Van Group, audio systems with 4 or 6 speakers)	O	—	—	—
Engine block heater (recommended when minimum temperature is -10° F or below, 750-watt)	O	O	O	O
Floor covering — vinyl rear (may substitute for carpet when Interior Upgrade Package is selected)	O	—	—	—
Ford Work Solutions:				
Crew Chief Telematics powered by Telogis [®]	O	O	O	—
Glass:				
Fixed rear cargo door glass (incl. inside rearview mirror)	O	—	—	—
Fixed side/rear cargo door glass (includes back door fixed glass, 60/40 side cargo door fixed glass, inside rearview mirror, NA with sliding side cargo door)	O	S	—	—
Glass windows, all-around — Window Van (incl. swing-out side/fixed rear door glass inside rearview mirror)	O	O	—	—
Privacy glass (incl. tinted windshield and front door glass. Reqs. swing-out side, fixed rear door glass or windows all-around)	O	O	—	—
Swing-out side/fixed rear cargo door glass (incl. fixed rear door glass, 40% side cargo door fixed glass/60% flip-out glass on sliding cargo door, inside rearview mirror, NA with sliding side cargo door)	O	O	—	—
Swing-out side/fixed rear cargo door glass (incl. fixed rear door glass and flip-out side window with sliding cargo door and inside rearview mirror)	O	P	—	—
High-Series Exterior Upgrade Package	O	—	O	—
Instrument Panel Message Center (req. with Reverse Sensing System or Trailer Brake Controller)	O	O	O	—
Insulation Package	O	S	O	—
Interior Upgrade Package	O	—	O	—
Keys — 2 additional (4 total); NA with SecurLock Passive Anti-theft System (late availability)	O	O	—	—
License plate bracket (req. and generated in states issuing two license plates)	O	O	O	—
Mid-Series Exterior Upgrade Package	O	—	O	—

S = Standard O = Optional P = Package — = Not available (1) E-150 only. (2) E-250 only. (3) E-350 only. (4) E-450 only.

E-Series Van/Cutaway

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E-Series Van/Cutaway

Model Lineup

Optional Equipment cont'd

	Commercial Van	Recreational Van	Cutaway	Stripped Chassis
Flexibility (cont'd)				
Mirrors:				
Aerotype exterior — LH/RH manual flat glass with manual convex spotter (available on Cutaway with select GVWR: 8600 lbs., 9600 lbs. and 9900 lbs. only)	O	—	O	—
Aerotype exterior — LH/RH power (incl. and only avail. w/Power Group, incl. LH/RH [RH convex] power flat glass mirror w/manual convex spotter) (incl. and available only with Power Group)	P	S	—	—
Day/Night interior rear view	S	S	O	—
Telescopic Trailer Tow Mirrors, manual (incl. with Ambulance Prep Package — Cutaway; NA with Motorhome Prep Package, Shuttle Bus Prep Package, right-hand door delete, Power Group, Remote Keyless Entry or Interior Upgrade Package)	S	—	O/P	—
Telescopic Trailer Tow (Power) (req. Power Group, incl. LH/RH power adjust flat glass lens and manual adjust convex spotter lens; NA with Shuttle Bus Prep Package or right-hand door delete)	O	O	O	—
Modified Vehicle Wiring System and Kit	O/P	S	S	S
Modified Vehicle Wiring System (no kit); NA with Ambulance Prep Package	O	—	—	—
Navigation System with SiriusXM Traffic, SiriusXM Travel Link and HD Radio™ — AM/FM stereo/single-CD/DVD/SiriusXM satellite radio capability (incl. 6 months SiriusXM satellite radio service) Reqs. SYNC voice-activated communication and entertainment system; Power Group on Commercial Van and Power Windows and Locks Group on Cutaway	O	O	O	—
Passenger airbag cutoff switch (NA with Crew Van Package, passenger side airbag delete, right-hand door delete or seats delete)	O	—	O	—
Power Group	O	—	—	—
Power Windows and Locks Group (incl. one-touch-down power driver window)	—	—	O	—
Premium Van Group	O	—	—	—
QuietFlex™ Racks and Bins Package	O	—	—	—
Racks and Bins Ladder Rack Upgrade Package #1	O	—	—	—
Racks and Bins Electrical/Appliance Repair Upgrade Package #2	O	—	—	—
Racks and Bins Plumbing/HVAC Service Package #3	O	—	—	—
Rear View Camera — camera in rear license plate bracket, video display in electrochromic rearview mirror on units without Navigation System (NA with base stereo or radio delete)	O	O	—	—
Remote Keyless Entry (req. power windows and locks)	P	S	O	—
Reverse Sensing System — (req. rear step or contour bumpers and Message Center)	O	O	—	—
Running boards — LH/RH door length	—	—	O	—
Running boards — Door length on driver side, full length on passenger side	O	—	—	—
RV Plus Package (NA on Extended Length Van)	—	O ^(1,2)	—	—
Seats:				
Driver seat — 6-way power (incl. LH manual lumbar)	O	O	O	—
Seats, NOT INCLUDED — Power pedestal (driver seat pedestal is prepared for power seat. Incl. throwaway driver seat. Pool accounts only for E-150 and E-250, deletes floor covering)	—	O	—	—
Dual captain's chairs without trim, avail. with power driver seat	—	O	—	—
Dual captain's chairs (incl. with Interior Upgrade Package avail. w/power driver seat)	O/P	—	—	—
Dual captain's chairs with 3-passenger rear seat (avail. with Crew Van Package only)	P	—	—	—
Dual high-back cloth captain's chairs without trim (NA on E-250 Cutaway)	—	—	O	—
Dual high-back cloth captain's chairs (incl. with Interior Upgrade Package)	—	—	O	—
Captain's chair — driver side without trim (includes passenger airbag delete; available only with Shuttle Bus Prep Package with right-hand door delete; NA on E-250 Cutaway)	—	—	O ^(3,4)	—
Captain's chair — driver side only, Mid-Series Cloth — (NA with Interior Upgrade Package or Ambulance Prep Packages, includes passenger airbag delete and only available with right-hand door delete)	—	—	O ^(3,4)	—
Manual pedestal with 2-way adjuster (provides manual pedestal, pretensioning restraint system and unique front seat tracks for driver side only. Temporary seat provided. NA with Interior Upgrade Package or Ambulance Prep Package)	—	—	P ^(3,4)	—
Power Seat Prep Package — driver seat pedestal is prepared for power seat. (available only with Motorhome Prep or Shuttle Bus Prep Package)	—	—	O ^(3,4)	—
Passenger seat delete (deletes passenger seat, airbag and harness restraint system) incl. with School Bus Prep Package and right-hand door delete; NA with Ambulance Prep Package or Interior Upgrade Package	—	—	O	—
Seat Prep Package — Manual with 2-way adjuster (provides manual pedestal, pretensioning restraint system and unique seat tracks for driver side only. Temporary driver seat provided) (available with Shuttle Bus Prep Package only) NA with Interior Upgrade Package	—	—	O ^(1,2)	—

S = Standard O = Optional P = Package — = Not available (1) E-150 only. (2) E-250 only. (3) E-350 only. (4) E-450 only.

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E-Series Van/Cutaway

Model Lineup

2012

Optional Equipment cont'd

	Commercial Van	Recreational Van	Cutaway	Stripped Chassis
Flexibility (cont'd)				
Seats cont'd				
Seat Prep Package — Power (provides manual pedestal, pretensioning restraint system and unique seat tracks for driver side only. Temporary driver seat provided [NA on E-250 Cutaway] available only with Shuttle Bus Prep Package and right-hand door delete)	—	—	O ^(1,3)	—
SecuriLock Passive Anti-theft Ignition System (SRW Cutaways only)	O	O	O ^(2,3)	—
SiriusXM satellite radio with 6-month prepaid subscription (48 contiguous states). Service not available in Alaska or Hawaii. NA with base AM/FM radio, or radio delete, incl. with Navigation System	O	O	O	P
Sliding side cargo door — 60/40 hinged side cargo door is std., available with no glass, fixed rear cargo glass, swing-out/fixed rear door glass or windows all around (NA with fixed side/rear door glass)	O	O	—	—
Steel Racks and Bins Package	O	—	—	—
SYNC — reqs. cruise control, NA with base radio, required with Navigation System, incl. electrochromic inside mirror	O	O	O	—
Tires:				
LT225/75R16E all-season DRW	—	—	O ⁽³⁾ S ⁽⁴⁾	O ⁽³⁾ S ⁽⁴⁾
LT225/75R16 OWL all-season	—	P ⁽¹⁾	—	—
User-defined switches — four upfitter switches on the instrument panel (NA w/4.6L, reqs. 155-amp alternator or 225-amp. alternator)	O	O	O	—
Wheels:				
Spare tire and wheel — NOT INCLUDED	O ^(2,3)	—	S	S
Spare tire and wheel (E-250/E-350 SRW incl. 2-ton mechanical jack; E-350 DRW incl. 4-ton mechanical jack; no jack with E-450)	—	—	O	O
16" Sport wheel covers, NA with white steel or aluminum wheels (SRW only)	S	S	O ^(2,3)	O ⁽³⁾
16"x 7" painted white steel wheels (SRW only)	O	—	O ^(2,3)	O ⁽³⁾
16" x 7" aluminum (may be ordered w/Exterior Upgrade Package) (SRW only)	O	O	O	—
Capability				
Aerial Bucket Truck Suspension Package	O ⁽³⁾	—	—	—
Motorhome Prep Package	—	—	O ^(3,4)	—
School Bus Prep Package	—	—	O ^(3,4)	—
Shuttle Bus Prep Package	—	—	O ^(3,4)	—
Traction control	—	—	O	O
Trailer brake controller (reqs. Trailer Tow Prep Package II/III/IV, Message Center) [NA on Cutaway with 5.4L V8 and 4-speed transmission]	O	O	O ^(3,4)	—
Trailer Towing Package (Class I) (reqs. rear step bumper; black painted or chrome)	P	P	O	—
Trailer Towing Package (Class II/III/IV)	O	O	—	—
Fleet Only Options				
Auxiliary Heater Connection Package with rear fan controls (available with Motorhome, School Bus and Shuttle Bus Prep Packages)	—	—	O ^(3,4)	—
Daytime running lamps	O	O	O	S
Engine cover console delete (deletes standard console, engine cover is retained)	O	—	O	S
GAWR, Max. Front — up to 4600 lbs. (incl. with Ambulance Package and Aerial Bucket Truck Suspension Package)	O ^{(1)/P}	—	—	—
GAWR, Max. Front — up to 5000 lbs. (incl. with Ambulance Prep Package on E-350/E-450 Cutaway, Motorhome Prep Package on E-450 Cutaway). Available on E-450 Cutaway and Stripped Chassis with 14,050-lb. GVWR; E-350 Stripped Chassis reqs. Business Center approval; NA on E-350 Stripped Chassis with 10,000-lb. GVWR	—	—	O/P	O
Mirror delete — exterior	O	—	—	—
Painted white bumper (NA with rear step bumper or High Series Exterior Upgrade Package)	O	—	—	—
Seats delete — bucket (deletes passenger seat, airbag and restraint system). Available with cloth or vinyl trim; NA with Ambulance Package, Interior Upgrade Package or Premium Van Group	O ^(2,3)	—	—	—
Seats delete — captain's chair (deletes passenger seat, airbag and restraint system). Req. Medium Flint trim; NA with Ambulance Package, Interior Upgrade Package or Premium Van Group; available with power driver seat	O ^(2,3)	—	—	—
Speed limitation — 65 mph governed speed (4.6L only)	O ^(1,2)	—	O	O
Speed limitation — 75 mph governed speed (4.6L only)	O ^(1,2)	—	O	O

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4-511-1011-10000-0000

E-Series Van/Cutaway

2012

E-Series Van/Cutaway

Performance/Handling

Key Messages

- E-Series appeals to a wide range of customers
- With 2 available V8s and an available V10 coupled with a 4- or 5-speed automatic overdrive transmission, E-Series has the power to perform many different tasks
- Equipped with a standard four-wheel disc Anti-lock Braking System (ABS) and auxiliary engine oil cooler, E-Series can haul the load, whether it's people or payload
- E85 Flex Fuel compatibility on all 4.6L and 5.4L V8 engines
- CNG/LPG Gaseous Engine Prep Package on 5.4L V8 and 6.8L V10 engines

Engines

Modular Engine Family

- Includes 4.6L V8, 5.4L V8 and 6.8L V10 engines
- One camshaft in each cylinder head eliminates the need for pushrods
- Single Overhead Cam (SOHC) design provides an advanced level of valve control
- Deep-skirt engine block design and low-friction components enhance reliability and fuel economy
- Silent-design chain cam drive contributes to reduced noise
- Electronic throttle control delivers seamless and consistent engine response and transmission shifts
- **Fall-safe cooling system**

Flex Fuel (E85) Capability

- 4.6L and 5.4L V8 engines are Flex Fuel (E85) capable
 - 5.4L V8 is not Flex Fuel capable when included in the Ambulance Prep Package
- E85 is 85 percent ethanol and 15 percent gasoline
- Flex Fuel engines can run on E85, 100 percent gasoline or any combination of the two fuels
- A sensor detects when the vehicle is refueled, and the vehicle automatically determines what mix of fuel is being used and adjusts the air/fuel mix accordingly
- Using E85 does not reduce the power output of the engine
- Using E85 burns more cleanly than gasoline and helps reduce our dependency on imported oil
- Ethanol is derived from renewable resources
- Flex Fuel engines have special upgrades to avoid corrosion and wear:
 - Fuel tank has a special coating
 - Fuel lines are nylon 6 or stainless steel
 - Fuel injectors are alcohol tolerant
 - Valves and seats are hardened
 - Head gaskets are more robust



MAKE THE POINT:

Flex Fuel (E85) Capability

The E-Series Van equipped with either the 4.6L or 5.4L V8 offers Flexible Fuel (E85) capability. This allows the engine to operate on E85 fuel — a blend of 85 percent ethanol fuel and 15 percent unleaded gasoline. These V8s can run on E85 fuel, regular unleaded gasoline or any combination of the two. It's important to note that while operating on E85, the power output of these engines is unchanged but fuel economy will be noticeably reduced. This is normal, since E85 has less energy as a fuel, it takes more E85 to make the same power as unleaded gasoline. The primary benefits of E85 fuel are that it's made from renewable resources to help reduce our dependence on imported oil and lower greenhouse gas emissions.

CNG/LPG Gaseous Engine Prep Package

- Available on both the 5.4L V8 and 6.8L V10 gasoline engines (except with Ambulance Prep and School Bus Prep Packages)
- Includes hardened intake and exhaust valve seat faces as well as hardened valve seats designed to compensate for the lack of lubrication normally provided to the valve/seal interface by gasoline or E85 liquid fuels
 - Compressed Natural Gas (CNG) or Liquefied Petroleum Gas (LPG) cannot provide the same level of lubrication
 - Hardened valves/seats must be used to maintain engine durability and the normal engine operating life-span
- This package does not include fuel tanks, lines or other hardware required to make the vehicle CNG/LPG compatible
- Vehicle is shipped from the factory with standard fuel system
- Any additional required equipment must be sourced through a qualified aftermarket upfitter experienced in gaseous fuel system upfits

E-Series Van/Cutaway

Performance/Handling

2012

Engines cont'd

Engine Oil Cooler

- All E-Series models are equipped with an auxiliary engine oil cooler
- Mounted at the front of the vehicle behind the grille
- Helps the engine oil maintain proper operating temperature, preventing oxidation and increasing the oil's lubricating and protecting properties
- Contributes to longer engine life

Fail-safe Cooling System

- Helps protect E-Series gasoline engines from damage due to coolant loss

Transmissions

4-speed Wide-ratio Automatic (4R75E)

- Fully electronic shift control provides a wide range of smooth shifts for optimum performance
- Drive gear and friction materials are designed and engineered to handle the output of the V8 engines
- Torque converter provides impressive launch performance and increased efficiency
- Overdrive lowers engine rpm at highway speeds, contributing to improved fuel economy
- "Smart" fully electronic shift scheduling calculates torque in the next gear and regulates shift points based on the vehicle's projected performance in the next gear
- Adaptive pressure control maintains consistent shift response and feel over time

TorqShift 5-speed Automatic (5R110W)

- All electrohydraulic shifts are optimized with pure electronic shift controls for more responsiveness
- Torque converter designed to maximize low-speed torque capability
- Large pump provides significant lubrication and cooling capacity
- Drive gear and friction material provide long-term durability
- Internally mounted transmission oil filter; maintenance interval increased to 36 months or 60,000 miles under normal operating conditions
- Selectable Tow/Haul Mode helps eliminate unwanted gear search on steep uphill grades and allows engine braking to maintain vehicle speed and control on downhill grades (Tow/Haul feature included on 5.4L- and 6.8L-equipped models)

Powertrain Combinations

Powertrain (Engine/Transmission)	Horsepower (SAE net @ rpm)	Torque (lb.-ft. @ rpm)	Standard Availability	Optional Availability
4.6L V8/Flex Fuel capable/ 4-Speed Automatic	225 @ 4800	286 @ 3500	E-150 Van/E-250 Van and Cutaway	—
5.4L V8/Flex Fuel capable/ 4-Speed Automatic	255 @ 4500	350 @ 2500	E-350 Van, E-350 SRW Cutaway	E-150/E-250 Vans, E-350 Cutaway
5.4L V8/Flex Fuel capable/ TorqShift 5-Speed Automatic	255 @ 4500	350 @ 2500	E-350/E-450 Cutaway/ Stripped Chassis	—
6.8L V10/TorqShift 5-Speed Automatic	305 @ 4250	420 @ 3250	—	E-350 Van/E-350 Cutaway/Stripped Chassis/E-350 DRW Cutaway/Stripped Chassis/E-450 Cutaway/ Stripped Chassis

NOTE: See the latest Dealer Ordering Guide for transmission availability.

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E-Series Van/Cutaway

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E-Series Van/Cutaway

Performance/Handling

Fuel Economy — Vans Only

2011 EPA-estimated Fuel Economy ⁽¹⁾			
Model	Engine/Transmission	City mpg	Highway mpg
E-150	4.6L V8 (gas)/4-speed automatic	13	17
	4.6L V8 (E85)/4-speed automatic	10	12
	5.4L V8 (gas)/4-speed automatic	12	16
	5.4L V8 (E85)/4-speed automatic	9	12
E-250	5.4L V8 (gas)/4-speed automatic	12	16
	5.4L V8 (E85)/4-speed automatic	9	12
E-350	5.4L V8 (gas)/4-speed automatic	12	15
	5.4L V8 (E85)/4-speed automatic	9	12
	6.8L V10 (gas)/5-speed automatic	10	14

Chassis

Four-wheel Disc Brakes

- Feature large rotors, calipers, pistons and specially formulated pad material to help improve stopping distances, handle high GVWRs and lengthen brake life by reducing operating temperatures
- Disc brakes help resist fade better than drum brakes

Independent Front Suspension

- Tuned shock absorbers help improve ride quality
- Each wheel reacts to road irregularities with minimal effect on the opposite wheel to help deliver a smooth, controlled ride

Handling Package

- Provides a higher level of ride smoothness with less body lean when cornering
- Handling Package includes:
 - Front stabilizer bar
 - Heavy-duty front and rear shock absorbers

Power Steering

- Provides overall responsive handling and solid, on-center feel
- Provides low steering efforts

Spare Tire and Wheel (51A)

- Optional on E-350/E-450 Cutaway
- Includes:
 - 2-ton mechanical jack (E-250/E-350 SRW)
 - 4-ton hydraulic jack (E-350 DRW)
 - No jack (E-450)

Turning Diameter

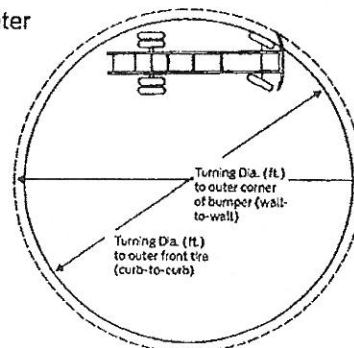
- The ability to maneuver through crowded streets, narrow back alleys and squeezed-in loading docks saves time and money for a commercial driver. In fact, over the course of a year, the added savings can be substantial.

A CLOSER LOOK: Turning Diameter

Turning diameter is defined as the diameter of the outside track made by the outside front tire during the shortest turn. The diagram shows the diameter made by the outside edge of the bumper during the shortest turn.

NOTE: When comparing competitive truck specifications, note whether they spec a diameter or radius dimension.

E-Series Model	Wheelbase	Turning Diameter (ft.) ⁽²⁾	
		Curb-to-Curb	Wall-to-Wall
E-150/E-250 SD	138	48.6	50.1
E-350 SD SRW/DRW	138	48.6	50.0/50.1 ⁽³⁾
E-350 SD SRW	158	54.9	56.2 ⁽³⁾
E-350 SD DRW/E-450	158	54.8	56.2 ⁽³⁾
E-350 SD DRW/E-450	176	60.3	61.8 ⁽³⁾



(1) 2012 fuel economy estimates will be made available prior to production release. Stay tuned to eSourceBook for updates.
 (2) Average of left and right turns with standard tires.

(3) Van and Cutaway only.

E-Series Van/Cutaway

Quality/Reliability/Durability

2012

Key Messages

- For over 50 years, buyers have relied on the quality and durability of E-Series
- With features like a full-perimeter frame, 97,500-mile spark plug replacement interval, fail-safe cooling and a double-wall cargo area, E-Series has the quality and durability needed to perform well as a people or cargo hauler

Reliability

Fail-safe Cooling System

- **Standard on all engines**
- **Designed to help protect the engine from potential damage due to loss of coolant**
- **If the engine overheats, the engine will switch from normal all-cylinder operation to alternating cylinder operation. The non-powered cylinders act as air pumps to help cool the powered cylinders**
- **The vehicle will continue to operate, but with limited engine power. This allows the driver to travel a short distance to obtain service or reach a service facility**
- **Driving distance is limited by a number of factors including vehicle load, outside temperature and road conditions**

24-Hour Roadside Assistance

- Toll-free number (1-800-241-FORD) operational 24 hours a day, every day
- Customers can request services to change flat tire, jump-start battery, unlock vehicle, deliver fuel or tow vehicle
- Available for 5 years or 60,000 miles, whichever comes first

Durability

Structural

- E-coated primer on the frame helps resist corrosion
- Body-on-frame construction is more durable and heavy-duty compared to unibody construction
- Double-wall cargo area helps protect the outer layer of sheet metal from shifting cargo
- Steel-reinforced rear license plate housing is especially beneficial on models with the available E-Guard Cargo Protection System
 - Rear door lock is mounted through the housing to resist tampering or prying

Powertrain

- Coil-on-plug Ignition eliminates traditional spark plug wires and distributor to improve high-mileage durability
- Additional electrical system charging capacity is available on the 5.4L V8 and 6.8L V10 engines with available 155- and 225-amp alternators

Durability Testing

- Simulates 150,000 miles of real-world use into a 50,000-mile test
- Testing is based on E-Series owner habits

Revised September 2011

Easy Maintenance

Yellow-coded Service Points

- Combined with the out-front engine placement, enable technicians to readily identify key components during routine maintenance
- Allow service to be accomplished quickly and efficiently

Extended Maintenance Intervals

- 6-month/7500-mile oil change interval under normal driving conditions
- 97,500-mile spark plug replacement interval under normal driving conditions
- 36-month or 60,000-mile replacement interval for the internally mounted TorqShift transmission filter

Maintenance-free Battery

- Standard on all E-Series Vans, Cutaways and Stripped Chassis models
- Reduces long-term maintenance costs

Common Parts Strategy

- Common parts throughout the E-Series lineup helps minimize part inventories and stocking costs
- Having the correct parts in stock helps save customers time and money

Warranties

New Vehicle Limited Warranties

- 3-year/36,000-mile Bumper-to-Bumper; no deductible
- 5-year/60,000-mile Powertrain Limited Warranty
- 5-year/unlimited-mileage Corrosion Perforation
- 5-year/60,000-mile Safety Restraint

5-year/60,000-mile Powertrain Limited Warranty

- Powertrain Limited Warranty for Ford vehicles is 5 years or 60,000 miles, whichever comes first
- That's an additional 2 years/24,000 miles of coverage for components such as the engine, transmission and front- and rear-wheel-drive parts beyond the vehicle's 3-year/36,000-mile Bumper-to-Bumper Limited Warranty
- Refer to the vehicle Warranty Guide for a complete list of all of the parts covered

NOTE: See www.motorcraftservice.com for a link to a printable PDF of the Warranty Guide.

2012

E-Series Van/Cutaway

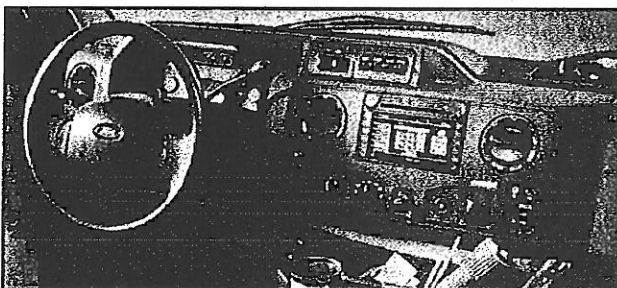
Flexibility

Key Messages

- E-Series is all about flexibility — for carrying people or cargo, for personal or commercial use
- Seats and head restraints are designed to comply with the latest safety standards
- Navigation System with SiriusXM Travel Link includes a single CD/DVD with HD Radio™ and SiriusXM satellite radio capability
- Rear View Camera helps drivers see what's behind them when backing up

Interior Convenience

Instrument Panel



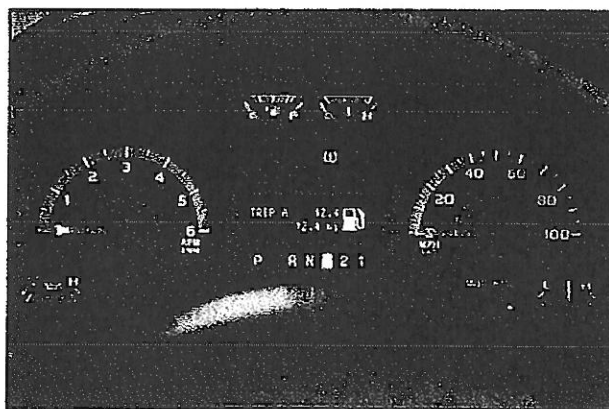
Designed to be functional and user friendly with these key features:

- Prominent center stack houses all switches into one, easy-to-access central area
- Glove box with powerpoint
- Passenger-side airbag cover
- Optional passenger airbag cutoff switch
- Storage tray above the passenger airbag
- Storage bin at the top of the center stack
- Auxiliary audio input jack on models equipped with a CD-capable radio



Instrument Cluster

- Features a logical, easy-to-read gauge layout
- Optional 2-line Message Center displays important vehicle information by constantly monitoring a number of vehicle operating systems
- Electronic transmission gearshift indicator has no mechanical connection between the transmission and the instrument cluster



Dome/Cargo Light Kit (43D)

- Three additional cargo lights on Commercial Vans

2012

E-Series Van/Cutaway

Flexibility

Groups/Packages cont'd

Premium Van Group (18M)

- Optional on Commercial Van
- Dual captain's chairs
- AM/FM stereo single-CD player with 4 speakers
- High-Series Exterior Upgrade Package
- Power Group
- Cruise control
- Insulation Package
- Requires rear door glass and aero mirrors (not required if telescoping trailer tow mirrors are selected)

RV Plus Package (43V)

- Optional on regular-length E-150 Recreational Van and E-250 Recreational Van
- LT225/75R16 OWL all-season tires and aluminum wheels with hubcap (E-150)
- LT245/75R16 BSW all-season tires and 16" Sport wheel covers over steel wheels (E-250)
- Leather-wrapped steering wheel
- Swing-out side/fixed rear door glass
- Auxiliary Heater-A/C Connector Package (with rear A/C controls)
- AM/FM stereo single-CD player
- Back-door lock switch
- SYNC voice-activated communications and entertainment system
- Auto-dimming inside rear view mirror with microphone

School Bus Body Builder Prep Package (47S)

- Select E-Series Cutaway models. Includes:
 - 40-gallon fuel tank
 - Banded front door glass (tinted)
 - High-back driver seat only
 - Frame pucks
 - Heavy-duty 155-amp alternator
- Deletes:
 - Right-hand seat, seat pedestal and attaching hardware
 - Right-hand safety belt system
 - Right-hand B-pillar trim and scuff plate
 - Passenger side airbag (right-hand, front)
 - Front headliner
- Requires:
 - School Bus Yellow paint (BY)

Shuttle Bus Prep Package (47B)

- E-350 and E-450 Cutaway only
- Includes:
 - High-Series Exterior Upgrade Package
 - Manual pedestals, seats not included
 - Power windows and locks group (not available with right-hand door delete)
 - Driver and front passenger airbags
 - Front maximum GAWR on E-450 (with 14,050 lb. GVWR)
 - Engine block heater
 - Frame pucks (isolators — included when spacers not ordered)
 - Front license plate bracket
 - Exterior mirror delete
 - Heavy-duty 155-amp alternator
- Deletes:
 - Front headliner
 - Front dome lamp
 - Front vinyl floor covering

Trailer Towing Package — Class I (534)

- Optional, included with chrome or step rear bumper
- Includes trailer wire harness

Trailer Towing Package — Heavy-Duty Class II/III/IV (536)

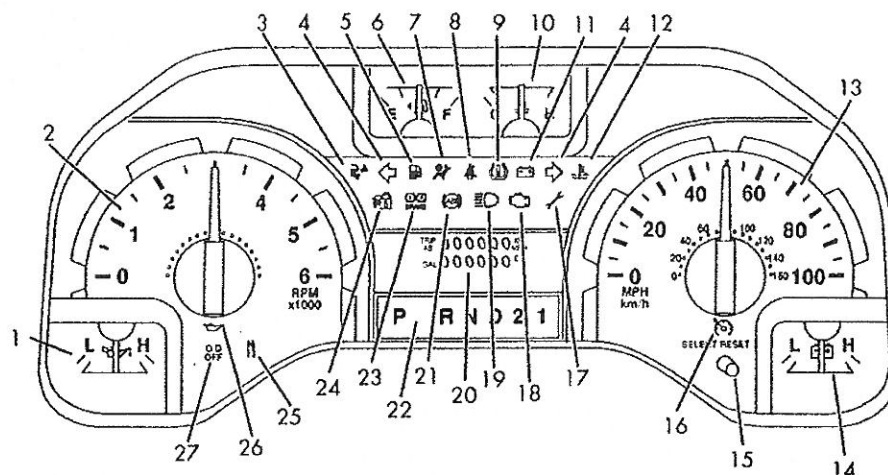
- Optional on Commercial and Recreational Vans
- Includes:
 - Electric brake controller tap-in capability
 - Frame-mounted hitch receiver
 - Relay system for backup/B+/running lights
 - Trailer Towing Package — Class I
 - Trailer wiring harness (blade-style female connector) with bumper bracket

E-Series Van/Cutaway

Instrument Cluster

2012

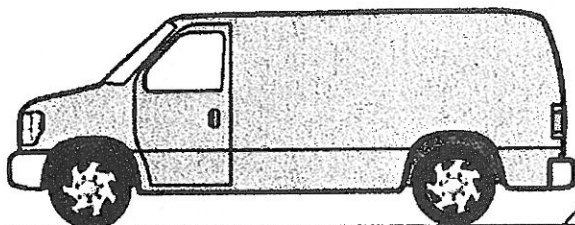
Instrument Cluster



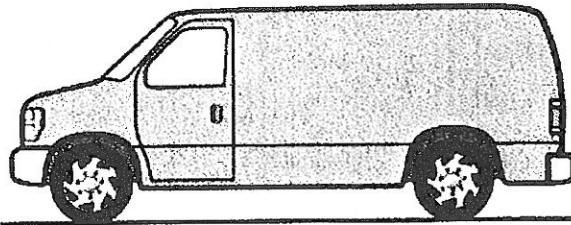
- | | | |
|--------------------------------------|---|--|
| 1. Engine oil pressure gauge | 12. Engine coolant temperature warning light | 20. Odometer/trip odometer/Message Center |
| 2. Tachometer | 13. Speedometer | 21. Anti-lock Braking System (ABS) warning light |
| 3. Check fuel cap warning light | 14. Battery voltage gauge | 22. Transmission gearshift indicator |
| 4. Turn signal Indicators | 15. Odometer/trip odometer select/reset switch | 23. Brake system warning/parking brake applied light |
| 5. Low fuel warning light | 16. Cruise control activated light | 24. SecurILock system active indicator |
| 6. Fuel gauge | 17. Electronic Throttle Control (ETC) warning light | 25. AdvanceTrac with RSC (Roll Stability Control) active light |
| 7. Airbag readiness warning light | 18. Service engine soon warning light | 26. Oil pressure warning light |
| 8. Fasten safety belt warning light | 19. High-beams-on light | 27. Transmission overdrive off light |
| 9. Low tire pressure warning light | | |
| 10. Engine coolant temperature gauge | | |
| 11. Charging system warning light | | |

2012

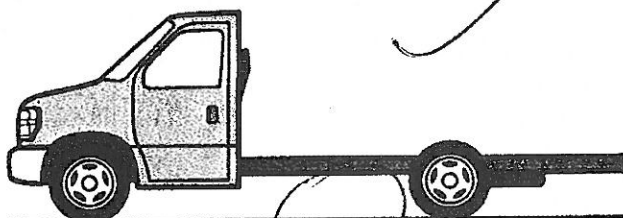
E-Series Van/Cutaway Configurations



Van: 138.0" wheelbase/216.7" overall length



Extended Van: 138.0" wheelbase/
236.4" overall length



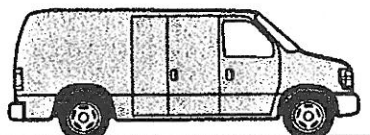
Cutaway: Choice of 138.0", 158.0" or 176.0" wheelbases



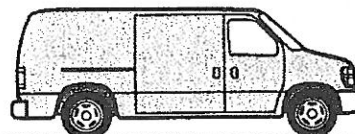
Stripped Chassis: Choice of 138.0", 158.0" or
176.0" wheelbases

Style	Model	Wheelbase (in.)	Trim Level	
			Commercial	Recreational
Van	E-150	138.0	X	X
	E-150 Extended	138.0	X	X
	E-250	138.0	X	X
	E-250 Extended	138.0	X	X
	E-350	138.0	X	X
	E-350 Extended	138.0	X	X
Cutaway	E-250	138.0	—	—
	E-350 SRW	138.0	—	—
	E-350 DRW	138.0	—	—
		158.0	—	—
		176.0	—	—
	E-450 DRW	158.0 176.0	— —	— —
Stripped Chassis	E-350	138.0 SRW/DRW	—	—
		158.0 SRW/DRW	—	—
		176.0 DRW	—	—
	E-450 DRW	158.0	—	—
		176.0	—	—

X = Available — = Not available



Standard 60/40 swing-out side doors

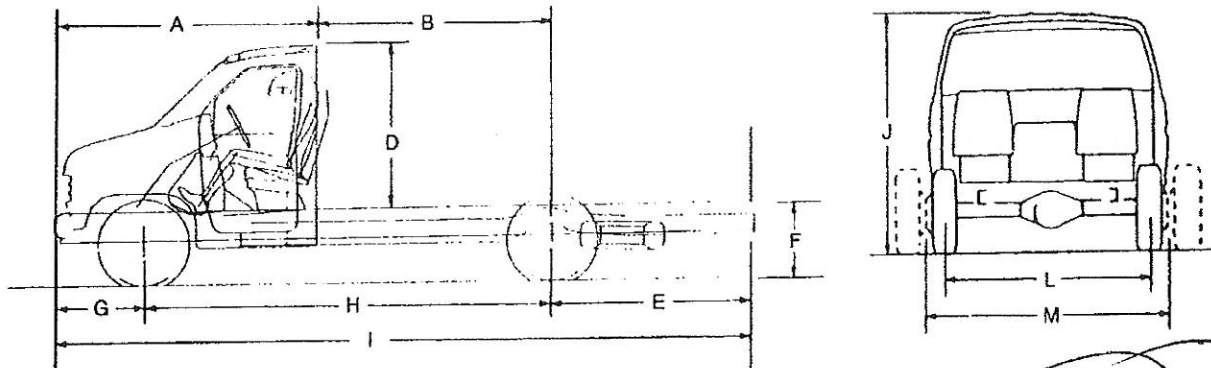


Sliding side cargo door (no-cost option)

E-Series Van/Cutaway

Body Dimensions cont'd

2012



BODY DIMENSIONS (in inches) – E-250/E-350/E-450 Cutaway

Series	Model	E-250 Super Duty		E-350 Super Duty		E-450 Super Duty	
		Cutaway		Cutaway		Cutaway	
		SRW	SRW/DRW	DRW	DRW	DRW	DRW
Code	Description						
A	Cab Length	92.5	92.5	92.5	92.5	92.5	92.5
B	Cab Rear to Rear Axle	80.0	80.0	100.0	118.0	100.0	118.0
D	Top of Frame to Top of Cab	54.4	54.4	54.4	54.4	58.4	58.4
E	Rear Overhang	68.5	68.5	68.5	50.5	68.5	50.5
F	Load Height — (Loaded)	25.9	25.9/26.2	26.2	26.2	26.0	26.0
G	Front Overhang	34.6	34.6	34.6	34.6	34.6	34.6
H	Wheelbase	138.0	138.0	158.0	176.0	158.0	176.0
I	Overall Length	241.1	241.1	261.1	261.1	261.1	261.1
J	Cab Height — (Curb)	80.3	80.4/80.3	80.2	80.1	80.0	80.0
L	Front Track	69.4	69.4	69.4	69.4	69.4	69.4
M	Rear Track Dual — Rear	66.6	72.1/75.4	75.4	75.4	77.7	77.7

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

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

E-Series Van/Cutaway

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E-Series Van/Cutaway

Weight Ratings cont'd

GVWR/Payload/OPT & ARC/Spring & GAWR (Front Computer-selected)/with the exception of DRW E-350/E-450 Cutaway & Stripped Chassis/Base Curb Weight cont'd

Model	WB (in.)	Engine/ Trans.	Maximum GVWR (lbs.)	Maximum Payload	OPT/ ARC Weight (lbs.) ⁽¹⁾	Spring/GAWR (lbs.) ⁽²⁾		Base Curb Weight (lbs.)		
						Front Range Min.-Max.	Rear	Front	Rear	Total
E-350 Cutaway	158 DRW	5.4L/4R75E	10,000	4967	3467	3900	7800	2871	2162	5033
		5.4L/5R110	10,000	4876	3376	3900	7800	2941	2183	5124
		6.8L/5R110	10,000	4765	3265	4050	7800	3034	2201	5235
		5.4L/4R75E	10,050	5017	3467	3900	7800	2871	2162	5033
		5.4L/5R110	11,500	6376	3376	4050-4600	7800	2941	2183	5124
		6.8L/5R110	11,500	6265	3265	4200-4600	7800	3034	2201	5235
		5.4L/5R110	12,500	7376	3376	4600-5000	8500	2941	2183	5124
		6.8L/5R110	12,500	7265	3265	4600-5000	8500	3034	2201	5235
	176 DRW	5.4L/4R75E	10,000	4957	3457	3900	7800	2936	2107	5043
		5.4L/5R110	10,000	4866	3366	3900	7800	3006	2128	5134
		6.8L/5R110	10,000	4755	3255	4050	7800	3100	2145	5245
		5.4L/4R75E	10,050	5007	3457	3900	7800	2936	2107	5043
		5.4L/5R110	12,500	7366	3366	4600-5000	8500	3006	2128	5134
		6.8L/5R110	12,500	7255	3255	4600-5000	8500	3100	2145	5245
E-350 Stripped	138 SRW	5.4L/5R110	9000	4853	4553	3800	6084	2238	1909	4147
		138 DRW	5.4L/5R110	10,000	5586	4286	3900	7800	2246	2168
	6.8L/5R110		10,000	5427	4127	4050	7800	2373	2200	4573
	5.4L/5R110		11,500	7086	4286	4200-4600	7800	2246	2168	4414
	6.8L/5R110		11,500	6927	4127	4400-4600	7800	2373	2200	4573
	158 SRW	5.4L/5R110	9600	5368	4468	3800-4200	6084	2350	1882	4232
		158 DRW	5.4L/5R110	10,000	5526	4226	3900	7800	2309	2165
	6.8L/5R110		10,000	5374	4074	4050	7800	2432	2194	4626
	5.4L/5R110		12,500	8026	4226	4600-5000	8500	2309	2165	4474
	6.8L/5R110		12,500	7874	4074	4600-5000	8500	2432	2194	4626
	176 DRW	5.4L/5R110	10,000	5467	4167	3900	7800	2365	2168	4533
		6.8L/5R110	10,000	5320	4020	4050	7800	2487	2193	4680
		5.4L/5R110	12,500	7967	4167	4600-5000	8500	2365	2168	4533
		6.8L/5R110	12,500	7820	4020	4600-5000	8500	2487	2193	4680
E-450 Cutaway	158 DRW	5.4L/5R110	14,050	8696	4146	4600-5000	9600	2935	2419	5354
		6.8L/5R110	14,500	9040	4040	5000	9600	3030	2430	5460
	176 DRW	5.4L/5R110	14,050	8687	4137	4600-5000	9600	3022	2341	5363
		6.8L/5R110	14,500	9033	4033	5000	9600	3113	2354	5467
E-450 Stripped Chassis	158 DRW	5.4L/5R110	14,050	9447	4897	4600-5000	9600	2359	2244	4603
		6.8L/5R110	14,500	9747	4747	5000	9600	2483	2270	4753
	176 DRW	5.4L/5R110	14,050	9395	4845	4600-5000	9600	2393	2262	4655
		6.8L/5R110	14,500	9694	4694	5000	9600	2518	2288	4806

(1) OPT/ARC Weight is the maximum allowable weight for regular production options (OPT) and aftermarket equipment (Accessory Reserve Capacity) for models with standard equipment and the engine/transmission combination indicated.

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

NOTE: Refer to pages 45-52 for Standard Powertrain/Chassis Equipment Specifications. Refer to the Accessory Reserve Capacity (ARC) Calculation/Worksheet on pages 4-15-4-17 of the Truck Payload section in the Source Book Appendices or on eSourceBook for optional equipment weights.

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E-Series Van/Cutaway

Standard Powertrain/Chassis

Equipment Specifications cont'd

E-450 Cutaway

DUAL REAR WHEELS:

WHEELBASE (In.):

158

176

POWERTRAIN:

Engine	— Application	Refer to Dealer Ordering Guide For Application Information
	— Type	6.8L SEFI V10
Transmission	— Type	5-speed Auto OD (TorqShift)

AXLES:

Front Axle	— Type	Twin I-beam IFS
	— Capacity (Rating @ Ground)	4600 lbs.
Rear Axle	— Type	Full-floating, Dana 10.75" HD
	— Capacity (Rating @ Ground)	9600 lbs.

BRAKES:

Front Disc	— Type	Dual Piston Caliper (2.36" Diameter Piston)
	— Size (In.)	13.58 Diameter Rotor
Rear Disc	— Type	Dual Piston Caliper (2.12" Diameter Piston)
	— Size (In.)	13.58 Diameter Rotor
Power-Assist Unit	— Boost Ratio	Hydro-Boost, 6.76:1
Anti-lock System		4-wheel
Parking Brake	— Transmission-mounted Drum	Foot-operated, Push to Apply/Pull Release Lever to Disengage

ELECTRICAL:

Alternator	— Rating	6G135 — 120 Amperes, 1620 Watt ⁽¹⁾
		SC2 — 155 Amperes, 2090 Watt ⁽¹⁾ — optional
		SC6 — 225 Amperes, 3035 Watt (optional — 5.4L and 6.8L only)
Battery	— Type	Maintenance-free
	— Rating	72 Amp.-Hr., 650 CCA
Kit		Modified Vehicle Wiring

FUEL TANK: — Capacity⁽²⁾

55-gallon Aft-of-rear-axle

STEERING:

— Type	Power, Ford XR-50 H.D. Gear
— Ratio	17.0:1

SUSPENSION:

Frame	— Type	Single-channel, 6 Crossmembers, 36,000 psi Steel
	— Section Modulus	6.40 cu. in.
Springs, Front	— Type	Coil
	— Rating @ Ground (min.)	4600 lbs.
Springs, Rear	— Type	Multi-leaf, Single-stage
	— Rating @ Ground (min.)	9600 lbs.
Shock Absorbers	— Gas-type	35mm
Stabilizer Bar	— Front — Diameter	23mm
	— Rear — Diameter (DRW only)	28.6mm

TIRES:

— Type	Six Truck-type Steel-belted Radial, All-season
— Size	LT225/75R16E

WHEELS:

— Type & Size	Six, 8-hole Disc, 16" x 6.0" K Steel
---------------	--------------------------------------

(1) Rated current (@ 6000 rpm) per ISO 8854: 1988 (E) and SAE J56 JUN1999. Actual output is temperature and application dependent.

(2) Also includes 7.5-gallon plastic transit fuel tank (may be deleted), Auxiliary Fuel Port and Fuel System Conversion Kit.

NOTE: Refer to the latest Dealer Ordering Guide for feature/product availability.

E-Series Van/Cutaway

Technical Specifications

2012

Axles

FRONT AXLE SPECIFICATIONS

Model/Series	E-150/E-250/E-350/E-450	
Max. Rating @ Ground (lbs.)	5000	
Type	Twin-I-beam Spindle with Ball Joints	
Axle	Material	Nodular Cast Iron
	Spring Centers (in.)	47.0
Radius Arms	No.	2
	Material	High-strength Low-alloy Steel
Ball Joint	Lubed-for-life Ball Joints	
Spindle	Material	Nodular Cast Iron Body with Forged Steel Stem
Wheel Bearings	Type	Tapered Roller

REAR AXLE SPECIFICATIONS

Model/Series	E-150	E-250	E-350	E-350 Extended	E-450
Make	Dana 9.75"		Dana 9.75" HD	Dana 10.5"	Dana 10.75" HD
Rating @ Ground (lbs.)	5520		6340	7800/8500	9600
Type	Semi-floating			Full-floating	
Driveline Attachment, Circular Flange	4.25"			4.75"	
Housing	Cast Center				
	Cover Attachment Bolted				
Section	Tube Diameter (in.) 3.50			4.00	
	Thickness (in.) 0.33			0.39/0.56 0.625	
Lubricant Capacity (pt.)	6.25			6.6 8.25	
Spring Centers (in.)	48.92				
Wheel Bearings	Type Straight Roller			Tapered Roller, 2 Opposed	
Gears	Type Hypoid				
	Material Alloy Steel				
Ring Gear	Pitch Diameter (in.) 9.75			10.50 10.75	
	Mounting Overhung				
Differential	Type 2-pinion			2-pinion ⁽¹⁾	
	L/S Type Traction-Lok			Traction-Lok Traction-Lok	
Axle Shaft	Spline — Minor Dia. (in.) 1.36			1.268 1.268	
	Spline — Major Dia. (in.) 1.45			1.375 1.375	
	Number Of Splines 35			32 35	

(1) 4-pinion for limited-slip.

HYDRAULIC BRAKE EQUIPMENT SPECIFICATIONS — FRONT/REAR

Type	Model/Series	Rotor Dia (in.)		Brake Lining Segment	Area (sq. in.)/ Width (in.)/ Thickness (in.)	Caliper Piston Dia. (in.)	Gross Lining Area Per Axle (sq. in.)	Total Swept Area Per Axle (sq. in.)
Disc	All (Front)	13.58	9.06	Outboard	7.16/2.34/0.489	2.36	49.60	270.40
				Inboard	—			
	E-450 (Rear)	13.58	8.07	Outboard	6.65/2.33/0.512	2.12	65.40	299.00
				Inboard	—			
	E-350 (Rear)	13.58	8.07	Outboard	6.65/2.33/0.346	1.89	65.40	299.00
				Inboard	5.31/2.03/0.413			

2012

E-Series Van/Cutaway

Technical Specifications cont'd

Brakes cont'd

BRAKE MASTER CYLINDER SPECIFICATIONS

Type	Model/Series	Bore Diameter (in.)
Dual System, Dash-mounted	E-150/E-250/E-350 SRW	1.3125
	E-350/E-450 DRW	1.375

POWER BRAKES VACUUM BOOSTER SPECIFICATIONS

Type	Model/Series	Ratio	Diaphragm Type
Bendix, Dash-mounted	E-150/E-250/E-350 (SRW)	7.5:1	Dual

POWER BRAKES HYDRAULIC BOOSTER SPECIFICATIONS

Type	Model/Series	Ratio
Hydro-Boost	E-350 DRW/E-450	6.76:1

Cooling Systems

COOLING SYSTEM SPECIFICATION

Engine	Cooling	Trans. Usage	Frontal Area (sq. in.)	Core Size (in.)			Rows of Tubes	Fins Per Inch	Cooling System Capacity (approx. quarts)	Fan Specifications		
				Height	Width	Thick.				Type	No. of Blades	Blade Dia. (in.)
4.6L SEFI V8	All	Auto.	708	23.6	30.0	1	1	15.2	23.8	Plastic	10	19.4
5.4L SEFI V8	All	Auto.	708	23.6	30.0	1	1	15.2	28.3	Plastic	10	19.4
6.8L SEFI V10	All	Auto.	708	23.6	30.0	1.4	1	16.5	30.4	Plastic	8	20.0

AUXILIARY AUTOMATIC TRANSMISSION OIL COOLER APPLICATIONS

Model/Series	Engine	Transmission	Standard No. of Plates	Air Conditioning No. of Plates	Trailer Towing No. of Plates
E-150/250	4.6L SEFI V8	4R75E	20 - 5/16" Ports	20 - 5/16" Ports	20 - 5/16" Ports
	5.4L SEFI V8	4R75E	20 - 1/2" Ports	20 - 1/2" Ports	20 - 1/2" Ports
E-250/350/450 SD	5.4L SEFI V8	TorqShift	20 - 1/2" Ports	20 - 1/2" Ports	24 - 1/2" Ports
	6.8L SEFI V10	TorqShift	20 - 1/2" Ports	20 - 1/2" Ports	24 - 1/2" Ports

E-Series Van/Cutaway

Technical Specifications cont'd

2012

Fuel System

FUEL SYSTEM DATA

Electronic Fuel Injection	4.6L SEFI V8	Sequential Multiport Fuel Injection
	5.4L SEFI V8	Sequential Multiport Fuel Injection
	6.8L SEFI V10	Sequential Multiport Fuel Injection
Fuel Pump	All Gasoline Engines	Electric-In-Tank High Pressure
Fuel Filter	All Gasoline Engines	In-line Large Capacity (One)
Air Cleaner	All Engines	Dry Element, Replaceable

Steering

STEERING SPECIFICATIONS

Model/Series	Wheelbase (in.)	Power Steering ⁽¹⁾		Turning Diameter (ft.) ⁽²⁾	
		Gear Ratio	Overall Ratio	Curb-to-Curb	Wall-to-Wall
E-150	138	17:1	21.2:1	48.6	50.1
E-250	138	17:1	21.2:1	48.6	50.1
E-350 SRW	138	17:1	21.2:1	48.6	50.0/50.0 ⁽³⁾
E-350 DRW	138	17:1	21.2:1	48.6	50.0/50.1 ⁽³⁾
E-350 SRW	158	17:1	21.2:1	54.9	56.2 ⁽³⁾
E-350 DRW/	158	17:1	21.2:1	54.8	56.2 ⁽³⁾
E-450	176	17:1	21.2:1	60.3	61.8 ⁽³⁾

(1) 15-1/2" diameter steering wheel. E-350 SD Van with 6.8L SEFI V10 and Cutaway and Stripped Chassis models include HD Steering gear.

(2) Average of left and right turns with standard tires.

(3) Van and Cutaway only.

Suspension

FRAME SPECIFICATIONS

Model/Series	Wheelbase (in.)	Maximum Side Rail Section (in.)	Section Modulus (cu. in.)	Yield Strength (psi)
E-150	138	6.16 x 3.18 x 0.181	3.30	36,000
E-250	138	6.16 x 3.18 x 0.181	3.30	36,000
E-350 Van	138	7.69 x 3.18 x 0.212	5.44	36,000
E-350/E-450 Cutaway/Stripped Chassis	138, 158, 176	7.69 x 3.18 x 0.228	5.73	36,000
E-450 Cutaway	158, 176	7.69 x 3.18 x 0.248	6.40	36,000

SHOCK ABSORBER SPECIFICATIONS

Model/Series	Usage	Number	Front & Rear Piston Diameter	Type
			(mm)	
E-150	Standard	4	35mm	Gas pressurized
E-250	Standard	4	35mm	Gas pressurized
E-350 SD/E-450	Standard	4	35mm	Gas pressurized

2012

E-Series Van/Cutaway

Technical Specifications cont'd

Suspension cont'd

SPRING SPECIFICATIONS — FRONT COIL

Model/Series	GVWR (lbs.)	Combined Rating @ Ground (lbs.)	Normal Working Height of Spring (in.)	Wire Diameter (in.)	Deflection Rate @ Ground (lbs. per in. each)	Inside Diameter (in.)	Rating Each @ Pad (lbs. per spring)
E-150 Van	8520/8600	3550	12.0	0.744	304	4.0	2020
		3700	12.0	0.756	318	4.0	2101
		3800	12.0	0.764	328	4.0	2165
		3900	12.0	0.775	341	4.0	2229
		4050	12.0	0.780	354	4.0	2318
E-250 Regular and Extended Van/Crew	8900/9000	3550	12.0	0.744	304	4.0	2020
		3700	12.0	0.756	318	4.0	2101
		3800	12.0	0.764	328	4.0	2165
		3900	12.0	0.775	341	4.0	2229
		4050	12.0	0.780	354	4.0	2318
E-250 Cutaway	8600 SRW	3800	12.0	0.764	328	4.0	2165
E-350 Van/Crew	9500	3700	12.0	0.756	318	4.0	2101
		3800	12.0	0.764	328	4.0	2165
		3900	12.0	0.775	341	4.0	2229
		4050	12.0	0.780	354	4.0	2318
		4200	12.0	0.780	354	4.0	2414
		4400	12.0	0.783	366	4.0	2542
		4600	12.0	0.803	366	4.0	2670
E-350 Extended Van/Crew	9500	3700	12.0	0.756	318	4.0	2101
		3800	12.0	0.764	328	4.0	2165
		3900	12.0	0.775	341	4.0	2229
		4050	12.0	0.780	354	4.0	2318
		4200	12.0	0.780	354	4.0	2414
		4400	12.0	0.782	366	4.0	2542
		4600	12.0	0.803	366	4.0	2670
E-350 Cutaway	9600, 9900, 10,000, 11,500, 12,500	3800	12.0	0.764	328	4.0	2165
		3900	12.0	0.775	341	4.0	2224
		4050	12.0	0.780	354	4.0	2318
		4200	12.0	0.780	354	4.0	2414
		4400	12.0	0.783	366	4.0	2542
		4600	12.0	0.803	366	4.0	2670
		5000	12.0	0.803	418	4.0	2900
		5000	12.0	0.803	418	4.0	2900
E-350 Commercial Stripped Chassis	9000, 9600, 9900, 10,000, 11,500, 12,500	3800	12.0	0.764	328	4.0	2165
		3900	12.0	0.775	341	4.0	2229
		4050	12.0	0.720	354	4.0	2318
		4200	12.0	0.780	354	4.0	2414
		4400	12.0	0.783	366	4.0	2542
		4600	12.0	0.803	366	4.0	2670
		5000	12.0	0.803	418	4.0	2900
E-450 Cutaway/ Commercial Stripped Chassis	14,050	4600	12.0	0.802	366	4.0	2670
	14,500	5000	12.0	0.803	418	4.0	2900

E-Series Van/Cutaway

Technical Specifications cont'd

2012

Suspension cont'd

SPRING SPECIFICATIONS — REAR MAIN LEAF

Model/Series	Combined Rating @ Ground (lbs.)	Number of Leaves	Total Thickness @ Pad (in.)	Length (in.)	Width (in.)	Deflection Rear (lbs. per in. per spring) ⁽¹⁾	Rating Each @ Pad (lbs. per spring)
E-150 Van	5120	4	1.94	55.0	3.00	378.5/564.5	2230
E-150 Extended Van	5545	4	1.94	55.0	3.00	350.0/649.0	2447
E-250 Van/Extended Van	5545	4	1.94	55.0	3.00	350.0/649.0	2447
E-250 Cutaway	5545	4	1.94	55.0	3.00	350.0/649.0	2447
E-350 Super Duty Van/Extended Van/Extended Cutaway	6195	4	1.99	55.0	3.00	373.0/699.0	2772
E-350 Cutaway/Commercial Stripped Chassis SRW	7310	9	3.59	55.0	3.00	924.7	3296
E-350 Cutaway/Commercial Stripped Chassis DRW	8500	9	3.79	58.5	3.00	1030	3790
E-450 Cutaway/Commercial Stripped Chassis	9600	11	4.66	58.5	3.00	1138	4596

(1) Dual numbers indicate two-stage spring.

Tires and Wheels

TIRE SPECIFICATIONS

Type/Size	Rim Width (in.)	Section Width (in.)	Ply Rating	Load Rating	Maximum Inflation Pressure (psi)	Load Limits @ Maximum Inflation Pressure (lbs.)	Static Loaded Radius (in.)	Revolutions per Mile @ 45 mph
LT225/75R16	6.0/7.0	9.50	8	D	60	2335	13.95	708
		9.60	10	E	80	2680	14.60	709
LT245/75R16	7.0	10.20	10	E	80	3042	14.10	677

WHEEL SPECIFICATIONS

Wheel Type	Wheel Size	Nominal Offset (mm.)	No. of Studs	Bolt Circle (in.)	Max Wheel Capacity Load (lbs. @ ground)
Steel	16" x 7.0" K	0.25	8	6.5	2300 Front/ 3045 Rear
	16" x 6.0" K (Dual)	5.15	8	6.5	2300 Front/ 2365 Rear
Aluminum	16" x 7.0" J	0.25	8	6.5	3045

2012

E-Series Van/Cutaway

Technical Specifications cont'd

Transmissions

AUTOMATIC TRANSMISSION SPECIFICATIONS

Make/Type	Ford 4-Speed Automatic Overdrive (4R75E)	Ford 5-Speed Automatic Overdrive (TorqShift)
Engine	4.6L SEFI V8/5.4L SEFI V8	6.8L SEFI V10/6.0L V8 Turbo Diesel
Ratios (to 1)		
1st	2.84	3.11
2nd	1.55	2.11
3rd	1.00	1.55
4th — OD	0.70	1.00
5th — OD	—	0.71
Reverse	2.32	2.88
Converter Size & Type	12" 145K (L370 Bypass Clutch)	12" PCM Controlled Clutch Apply
Converter Stall Ratio	2.33	—
Converter Torque Ratio @ WOT Stall	—	2.2 (5.4L), 1.86 (6.8L)
Lubricant Capacity (pt.)	13.2 (E Lifetime Fluid)	18.2 (5.4L), 19.0 (6.8L)
Gear Set	Helical	Spur
Oil Cooler	Water	Oil to Air and In-Tank

Special Applications

Trailer Towing Information

NOTE: For additional towing information, refer to the RV & Trailer Towing Guide, available as a printable PDF on eSourceBook, or the vehicle Owner Guide.

Snowplow Information

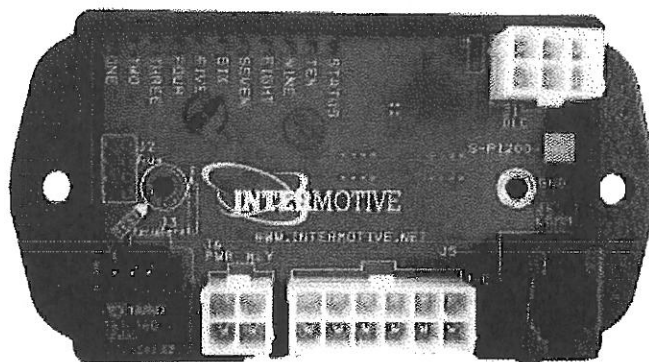
NOTE: Not recommended for Snowplow Applications.

HIGHLOCK

High Idle & Lift Interlock With Electrical Load Control

FEATURES & BENEFITS

- ♦ Fully compliant FMVSS 403/404 wheelchair lift interlock
- ♦ Dynamic Load Response (DLR) technology— monitors engine RPM & maintains speed at all load conditions
- ♦ Charge protect on gas & diesel engines
- ♦ Prevents shifting vehicle out of Park with Lift Door open or Park Brake applied—avoiding possible accidents or vehicle damage
- ♦ Dash-mounted control panel has LEDs to display current system status
- ♦ Simple, single-point "Plug & Play" connection.. Super fast installation & No cutting of factory wires
- ♦ Solid state microprocessor controller.. No additional solenoids, cables, or brackets
- ♦ Intermittent Fault Filter (IFF)® technology filters out all erroneous changes in sensor signals
- ♦ A High idle & a fully compliant Lift Interlock all in one, easy to install module!



HIGHLOCK MODULE

WHY HIGHLOCK?

HighLock is a fully Compliant FMVSS 403/404 wheelchair interlock & fast idle system all in one, easy to install module!

- ♦ Fast Idle— Monitors OEM sensor inputs from transmission, engine, charging system, air conditioner, ambient air temperature, & vehicle speed to determine if high idle is needed. Automatically maintained when loads are added or removed such as A/C or wheelchair lift. Active whenever the vehicle is in "Park", with or without the park brake set.
- ♦ Lift Interlock— Controls transmission shift lock by processing signals from transmission, Parking Brake and lift door to electronically lock down the vehicles ability to move when the lift is deployed.

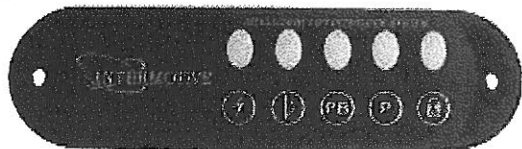


An ISO 9001:2008 Registered Manufacturer
www.InterMotive.net 800-969-6080



Rev. C

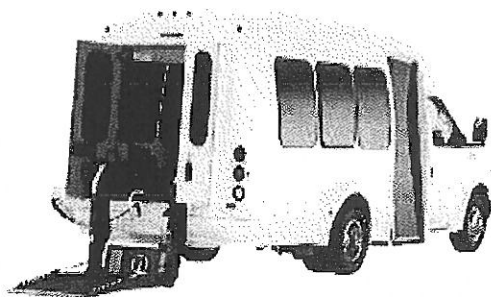
HIGHLOCK



Standard HighLock LED Panel



Optional HighLock Door Ajar LED Panel



SPECIFICATIONS

Physical Specifications:

Dimensions: 2.0"W x 4.0"L x 0.9"H
Weight: .14 lbs
Operating Temperature: 40°C to 85°C

Electrical Specifications

Power Input: +8 to 16 Vdc @ 1 amps for module control
+8 to 16 Vdc @ 8 amps for lift enable
Lift Enable: +12v @ 8 amps

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

OTHER GREAT INTERMOTIVE PRODUCTS

- ♦ Gateway^{AI}
 - ♦ Gateway^{AI} is InterMotive's top of the line fast idle/lift interlock system. It is a fully automatic system that can be configured to provide the customer with "real-time" chassis data for various monitors or functions. When combined with other InterMotive components, it becomes a very powerful control system.
- ♦ Gateway with BrakeMax Controller
 - ♦ All of the features of the Gateway/ILIS plus a controller for Ford & GM vehicles with Tow/Haul mode. This controller engages the Tow/Haul mode on start-up of the vehicle thereby providing the fleet with maximum "Tow/Haul" mode benefits without having the driver think about it.
- ♦ Gateway with DuraTrans
 - ♦ All of the features of the Gateway/ILIS plus a controller for Ford & GM vehicles with an Overdrive button. Overdrive is disabled until the vehicle speed reaches 55 MPH. Overdrive will not be disabled until the vehicle speed drops below 30MPH



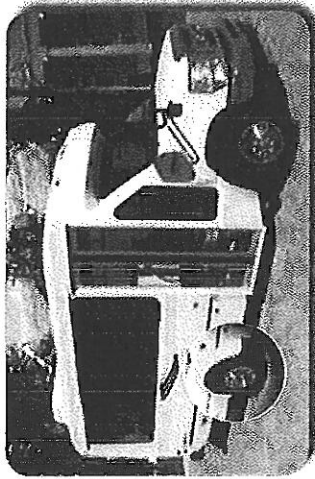
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BECAUSE YOUR BUS DOESN'T
HAVE TO RIDE LIKE A TRUCK!

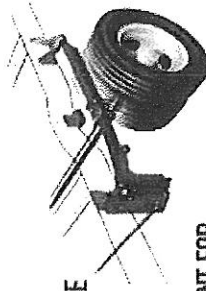
SMOOTHING OUT THE ROUGH SPOTS



"MOR/ryde really solved a problem for us. Previously we were faced with an expensive upgrade to improve the ride. MOR/ryde's system is less costly, easy to install and requires minimal maintenance."

- R. Streiff / Senior Analyst, Access Services

RUBBER SHEAR SPRINGS ISOLATE AND ABSORB ROAD SHOCK TO PROVIDE A SOFTER, MORE COMFORTABLE RIDE FOR ALL OF YOUR PASSENGERS.



BETTER PROTECTION FOR THE VEHICLE FROM DAMAGING ROAD SHOCK.

EASILY ADJUSTABLE TO ACCOUNT FOR WHEEL CHAIR LIFT.

ALSO AVAILABLE ON TRUCKS, AMBULANCES, AND MOTOR HOMES.



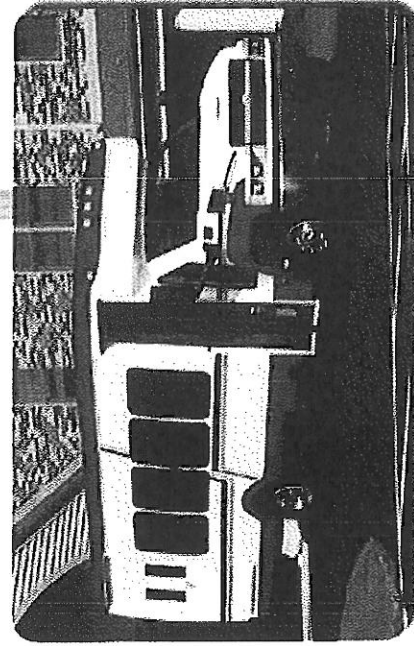
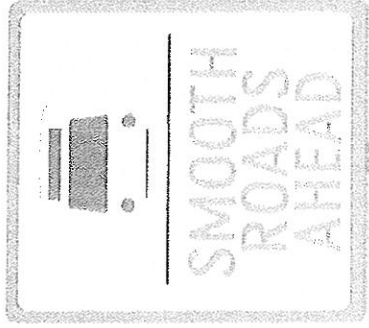
WWW.MORRYDE.COM

TODAY'S ROADS ARE ROUGHER THAN EVER

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

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

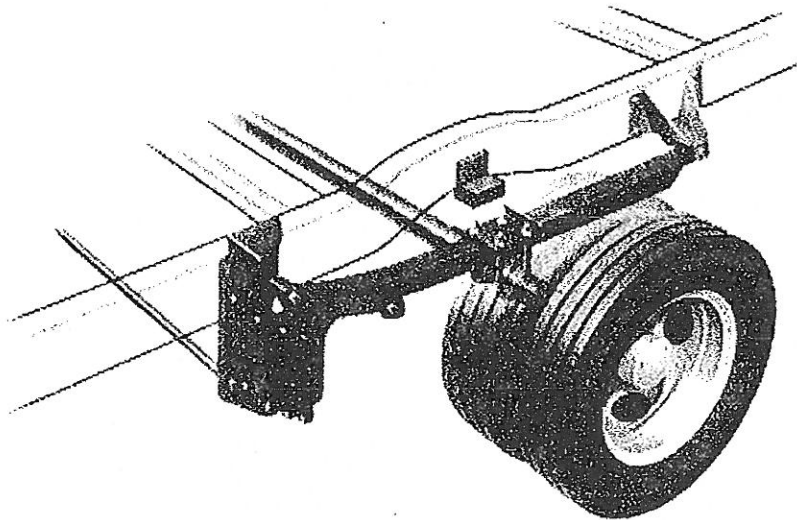
The MOR/ryde system can be ordered on new buses from the manufacturer or installed aftermarket on busses equipped with leaf springs in a very cost effective manner. Each system comes with a 3 year/ 70,000 mile warranty and requires minimal maintenance to sustain optimal performance.





RL RUBBER LEAF SUSPENSION SYSTEM

OWNER'S MANUAL



RL153-002 REV.

DESCRIPTION

Congratulations on your purchase of the Mor/ryde "RL" Suspension System*. The system installed on your vehicle utilizes rubber shear springs that work in conjunction with the chassis drive axle steel leaf springs. These double-eye leaf springs may be either multi style, or taper style (Fig. 1). The RL system has replaced the leaf spring hanger and shackle with a Mor/ryde hanger, spring carrier and rubber shear springs. (Fig. 2) The rubber shear springs isolate and absorb road shock and increase the dynamic axle travel. This provides you with:

- A much smoother ride
- Improved handling and drivability
- Better protection of the vehicle from damaging road shock
- Less vibration

The Mor/ryde RL system is available for a wide variety of vehicle applications including:

Pickup trucks
Medium duty buses
Limo buses

Motorhomes
Paratransit Vehicles
Specialty vehicles

Each RL system is designed specifically for the chassis of the vehicle that it is installed on. Maintenance to the RL system is very limited. This manual will outline general inspection and troubleshooting guidelines. Service manuals and instructions are provided with replacement parts in the unlikely event that service is required.

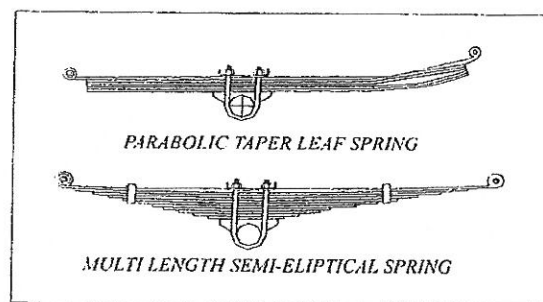


Fig. 1

* Made in the U.S.A. Patent Number 6,176,478

Replacement parts

Replacement parts are available direct from MOR/ryde. To help ensure the correct parts are sent, the following information is necessary:

Chassis VIN # _____ Make of Vehicle _____
Model _____ Year _____ Builder _____

Is your vehicle equipped with wheelchair lift? _____

Spring Type: (See Fig. 1)

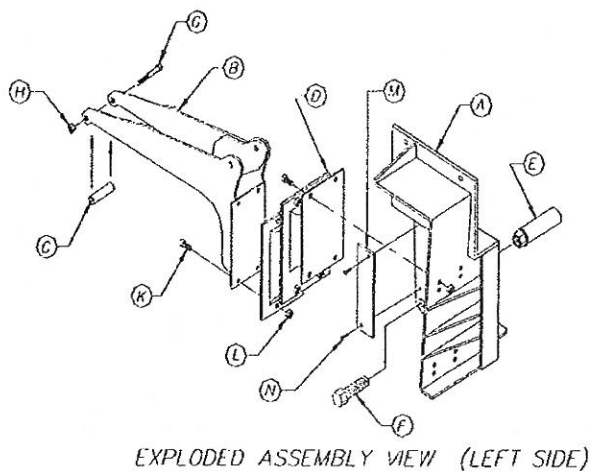
Multi _____ Taper _____

Part numbers are also etched on the steel components (e.g. RL24-001 etc) and the rubber springs have a number molded into the rubber. (e.g. 2, 3, 6, 10). If it is possible, provide us with these identifying numbers (See Fig. 2).

For ordering information, call us at 574-293-1581 and ask for the Parts Department.

Parts listing

Following is a breakdown of the components in a typical MOR/ryde RL Suspension System. individual systems may vary. Not all systems have the parts shown.



TYPICAL SUSPENSION COMPONENTS			
ITEM	PART #	DESCRIPTION	QTY
A	RL11-	FRAME HANGER ASSEMBLY (LH)	1
	RL11-	FRAME HANGER ASSEMBLY (RH)	1
B	RL24-	SPRING CARRIER ASSEMBLY (LH)	1
	RL24-	SPRING CARRIER ASSEMBLY (RH)	1
C	RL131-011	3625" SPACER SLEEVE	2
D	MD25-	RUBBER SPRING ASSEMBLY	2
E	RL32-012	27.75" X-MEMBER TUBE ASSEMBLY	2
F	UD115-021	BOLT - .75-10 x 1.5 FHCB GR5	4
G	UD115-056	BOLT - .50-13 x .50 FHCB GR5	2
H	UD116-001	NUT - .50-13 HEX LK GR2	2
I	UD115-143	BOLT - .44-14 x 1.5 FLHCB GR8	4
J	UD116-039	NUT - .44-14 FL LK GR8	4
K	UD115-011	BOLT - .38-16 x .089 FHCB GR8	16
L	UD116-002	NUT - .38-16 HEX LK GR2	16
M	RL131-039L/R	GLIDE PAD	2
N	UD115-138	BOLT - .31-18 x 1.00 SHCS GR2	4
O	UD116-004	NUT - .31-18 HEX LK GR2	4
P	RL131-038	SCRUB PAD	2
Q	UD115-138	BOLT - .31-18 x 1.00 SHCS GR2	4
R	UD116-004	NUT - .31-18 HEX LK GR2	4

* - PARTS ARE INSTALLED ON FRAME HANGER ASSEMBLY
** - PARTS ARE INSTALLED ON SPRING CARRIER ASSEMBLY

Fig. 2

TROUBLE-SHOOTING/MAINTENANCE CHECKS

Rubber Shear Spring Inspection

The rubber springs (Fig. 3) should be periodically inspected for any tears or cracks. If a rubber spring exhibits a 3" long and $\frac{3}{4}$ " deep crack or tear, the rubber spring should be replaced. This can be checked by using a flat tool such as a putty knife. The putty knife can be used to probe the rubber spring in the affected area. If the knife can be inserted $\frac{3}{4}$ " deep, by at least 3" long, the spring rate of the spring is affected and should be replaced. *Note: It is normal to see rubber spring weather checking, which is small surface cracks in the rubber. Weather checking does not require a rubber spring to be replaced.*

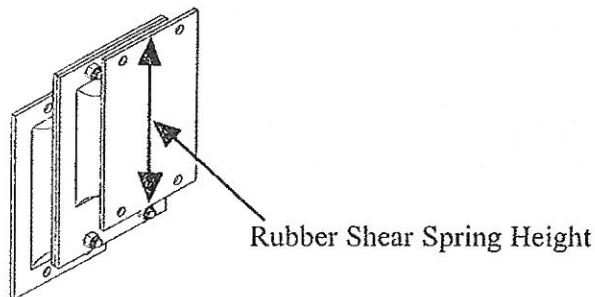


Fig. 3

Height Adjustments

The MOR/ryde RL suspension system offers vehicle height adjustment. A series of holes is offered on the frame hanger assembly (Fig. 4). Depending upon your system, there may be 2, 3, or 4 sets of mounting holes positioned at one inch increments. As the rubber springs are re-indexed to a lower set of mounting holes, the rear of the vehicle will be raised. This feature may be useful to level a vehicle as it is permissible to have the rubber springs positioned in different holes from side to side.

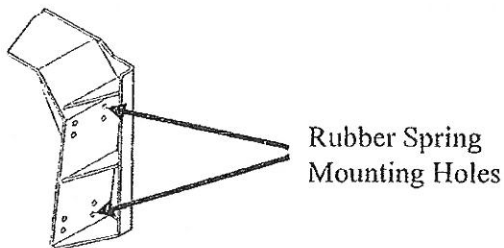


Fig. 4

Measuring Rubber Spring Deflection

Park the vehicle on level ground. Measure Dimension A, ground to bottom edge of the rubber spring at the hanger (Fig. 5). Measure Dimension B, ground to bottom edge the rubber spring at the spring carrier. Use the following formula to determine rubber spring deflection:

Step 1: Dim. A - Dim. B = C

Step 2: a) Rubber Spring Deflection = 5 - C

b) Rubber Spring Deflection = 4 - C

Note: For step 2 use equation (a) if the rubber shear spring is 10 inches tall. Use (b) if the rubber shear spring is 8 inches tall. (see Fig. 3)

*Nominal rubber spring deflection should be 2-3 inches.

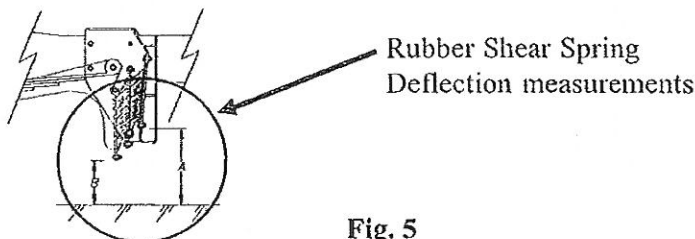


Fig. 5

Measuring Spring Carrier Travel

The spring carrier travel is defined as the vertical travel the spring carrier can move before the carrier strikes the top (limiter) of the hanger assembly at the rear spring eye. (See Fig. 6 Spring Carrier Travel- SCT). Under normal or maximum axle loading, a minimum of 2.5 inches should be observed for adequate suspension performance.

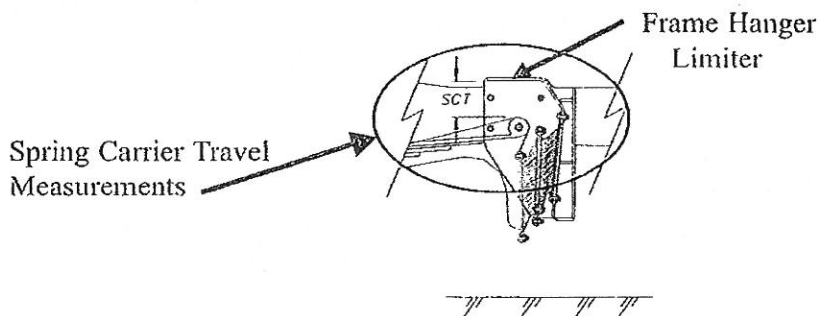
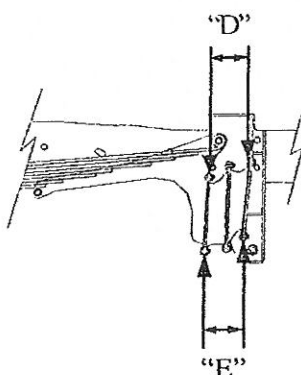


Fig. 6

Checking Rubber Shear Spring Stability

Measure the distance "D" and "E" (fig. 7). The Rubber Shear Spring Assembly measures 4.75 inches under no load (i.e. not installed on the vehicle) Under load dimensions "D" and "E" should be between 4.5" and 5.25"



Basic Trouble-shooting

Problem/Sympton	Cause	Correction
<i>Spring Carrier/Spring Eye Bottoming on Frame Hanger Limiter (see fig. 6)</i>	a. Torn rubber shear spring b. Rubber shear spring over deflected (fig. 5) c. Not enough spring carrier travel (fig. 6)	a. Replace rubber shear spring b. Replace rubber shear spring c. Re-index rubber shear spring to a lower hole setting in the frame hanger
Vehicle Leaning to One Side <i>Note: Your MOR/ryde RL Suspension has built-in leveling adjustments to compensate for uneven loading. It is not always possible for the built-in adjustment to level the vehicle. Occasionally additional steel leaf springs are required, or a spacer block must be added to the axle. (See Correction Step d)</i>	a. Torn rubber shear spring b. Rubber shear spring over deflected (fig. 5) c. Uneven loading	a. Replace rubber shear spring b. Replace rubber shear spring w/ stiffer durometer spring c. Re-index rubber shear spring to a different hole setting in the frame hanger d. Add a spacer block or additional steel leaf spring.
Vehicle has excessive noise.	a. The white plastic lateral control is worn down to the bolts or frame.	a. Replace lateral control parts.

**MOR/ryde RL Suspension System
LIMITED WARRANTY
Suspensions Used for Commercial Application**

Summary of Warranty

We, MOR/ryde, Inc., 1966 Moyer Avenue, P.O. Box 579, Elkhart, Indiana 46515 ("MOR/ryde"), warrant to you, the original first purchaser of new MOR/ryde rubber suspension system ("Product"), for a period of three (3) years from the date of original first purchase, or use or operation for a distance of seventy thousand (70,000) miles, whichever occurs first ("Warranty Period"), that the Product is free of defects in material or workmanship under normal use and service and will meet or exceed all of our advertised written specifications, excepting items and uses excluded from this Warranty. Labor charges will be covered for 12 months from the date of the original purchase.

Please direct all correspondence to:

**Mor/ryde International
1966 Moyer Ave
Elkhart, IN 46516
Phone (574) 293-1581
Fax (574) 294-4936
www.morryde.com
e-mail – service@morryde.com**



Series 3000 VEC

The Series 3000 VEC is a state of the art electrical distribution module for DC powered vehicles.

The VEC utilizes a patented programmable 3-D matrix technology which can easily be modified to accommodate changes in your electrical systems.

The module has been designed to accept automotive components having 2.8MM wide terminals on 8.1MM centerline spacing.

The Series 3000's compact size, only 4" x 4", provides the ultimate in component density. These dimensions match many commonly available devices (mini fuses, relays, circuit breakers, etc.) which are installed as plug-in components into the housing.

The internal design consists of multi-layer metal grids, each which can be readily customized to accommodate a wide range of circuit options. Layer spacing is designed to allow for direct plug-in of input and output connectors on any of three sides of the panel. Up to two 800 Series (2 position) input connectors can be provided, and up to four 280 Series (8 position) input/output connectors can be selected.

Harness designs can be simplified and cost reduced because jumpers and splices in the harness are eliminated by internally programming them into the grid matrix.

The Series 3000 is ideal for distributed power and auxiliary "add-on" applications. Larger distribution designs can be accommodated with multiple VEC's.

Current VEC applications include: Class 3-8 trucks, buses, RV's, CON-AG equipment and automotive power distribution systems.

The Series 3000 VEC detailed specifications and performance test results are available upon request.

Part numbers and custom labels are assigned by the Bussmann Engineering Department as each design is customer specific.

VEC options include covers (sealed or unsealed), outboard mounting bases, and input/output connectors (see page 6).

Reduce

- Tooling Costs & Lead Times*
- Number of External Splices.*
- Need for jumper wires.*

Allows for internal bussing to relays.

Low Profile Mounting.

Electrical Ratings, Amperage:

VEC Housing and Connector Material: Black, UL rated 94VO Thermoplastic, -40°C to 125°C

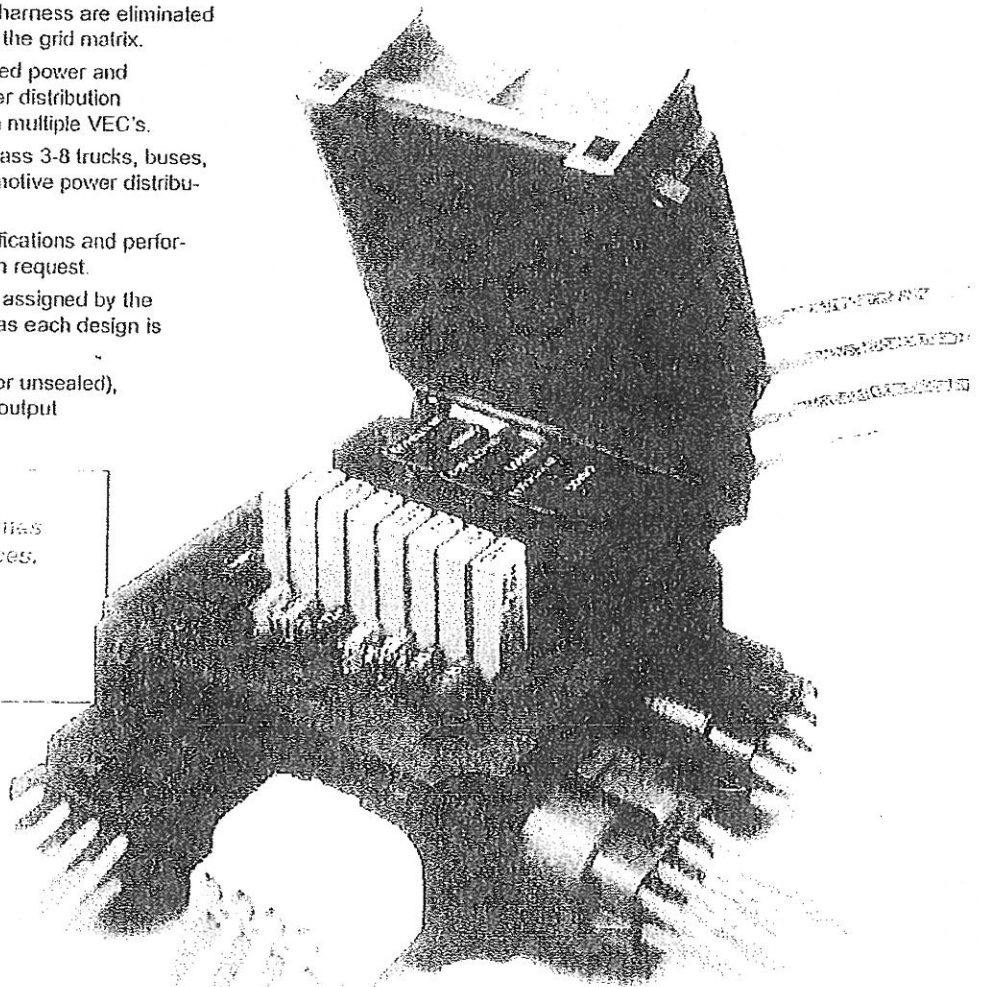
Input Capacity For All Circuits: 200 Amps maximum

Input Terminal Rating: Accepts industry standard 8.0mm blade terminals; 60 Amps per terminal max.

Output Terminal Rating: Accepts industry standard 2.8mm blade terminals; 30 Amps per terminal max.

Recommended Wire Size: Input Wires (unsealed) — #8-18; Input Wires (sealed) — #8; Output Wires (sealed and unsealed) — #10-22

Top Level Plug-in Components: 30 Amps max. device rating.



optronics LED



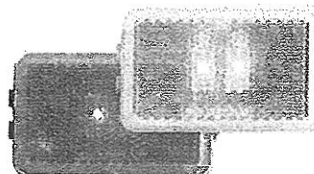
AL-90 Series

Single diode mini
marker/clearance light
AL-90AB Amber, bulk
AL-90RB Red, bulk
AL-90AS Amber, clam
AL-90RS Red, clam
MCL-83RB ID light bar, bulk
MCL-83RK ID light bar, clam



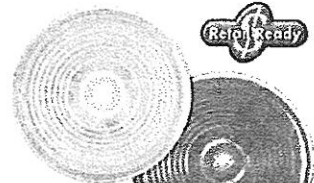
MCL-61 Series

Two diode thinline marker/
clearance lights
MCL-61AB Amber, bulk
MCL-61RB Red, bulk
MCL-61AS Amber, clam
MCL-61RS Red, clam
MCL-61ARB Amber/red
fender light, bulk



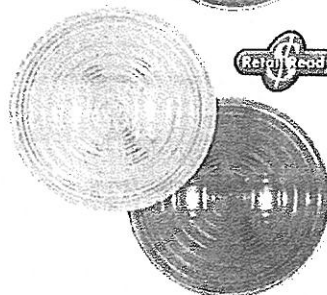
MCL-41 Series

Two diode square marker/
clearance lights with reflex
MCL-41AB Amber, bulk
MCL-41RB Red, bulk
A-41GB Grommet, black



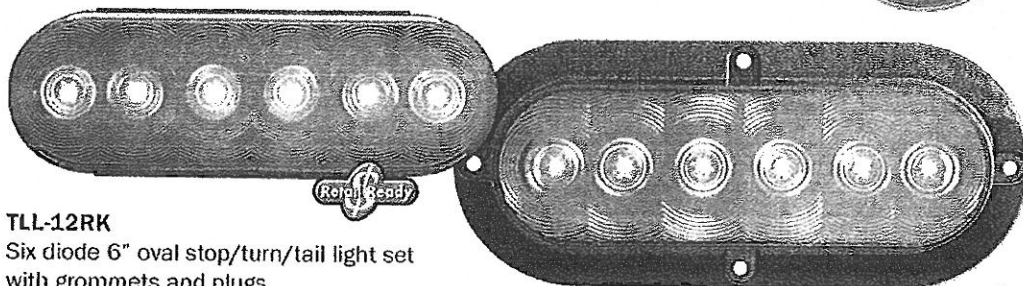
MCL-56 Series

Single diode 2" round
marker/clearance lights
MCL-56AB Amber, bulk
MCL-56RB Red, bulk
MCL-56AS Amber, clam
MCL-56RS Red, clam



MCL-527 Series

Two diode 2.5" round
marker/clearance lights
MCL-527AB Amber, bulk
MCL-527RB Red, bulk
MCL-527AS Amber, clam
MCL-527RS Red, clam

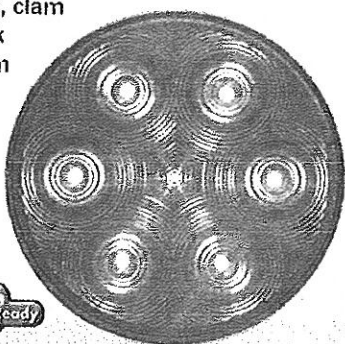


TLL-12RK

Six diode 6" oval stop/turn/tail light set
with grommets and plugs
TLL-12RK Trailer light set, clam
STL-12RB Light only, bulk
STL-12RS Light only, clam
STL-12RK Light kit, clam

STL-13 Series

Seven diode 4" round
stop/turn/tail light
STL-13RB Bulk
STL-13RS Clam
STL-13RK Kit, Clam



STL-73 Series

Six diode 6" oval flange
mount stop/turn/tail light
STL-73RB Light only, bulk



**No Bulbs to Replace...
EVER!**

- LED's are brighter than conventional lights
- LED's consume 90% less energy
- 100% Maintenance Free

LIFETIME LED WARRANTY



LED lighting uses energy more efficiently and
creates less waste than conventional lighting

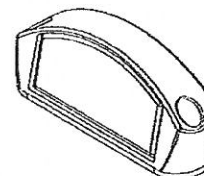
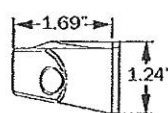
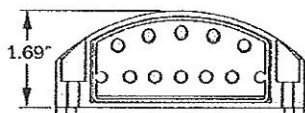
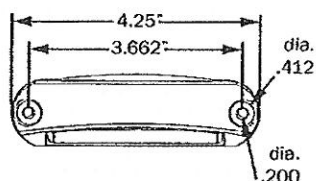
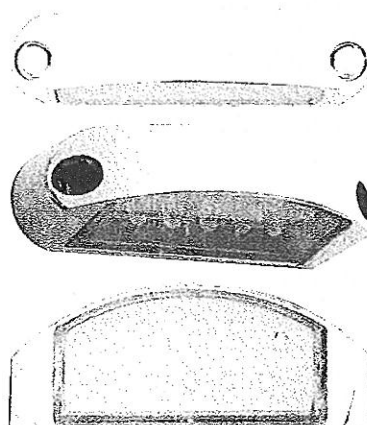


NEW PRODUCTS

ILL-85CB

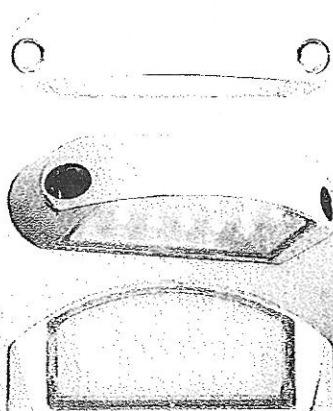
LED Step/Area Light

Compact, surface mount LED area light for buses illuminates step wells or pavement at base of steps or ramps; also suitable for use in RV's, enclosed trailers and boats. 10-LED design provides bright light output while conserving power. Diodes produce little heat and last up to 100,000 hours—no bulbs to replace. Corrosion proof, armored plastic housing with polished chrome finish; durable polycarbonate lens—same material as bullet proof glass. Operating voltage 8-30VDC. Hard wired design includes both lead and ground wires for mounting to all surfaces. Mounting centers 3.662". Closed cell foam mounting gasket included.



Specifications

Model No.	Description	Diodes	Amp Draw at 12.8V	Pack	Qty.
ILL-85CB	LED step/area light	10	0.107A	Bulk	10



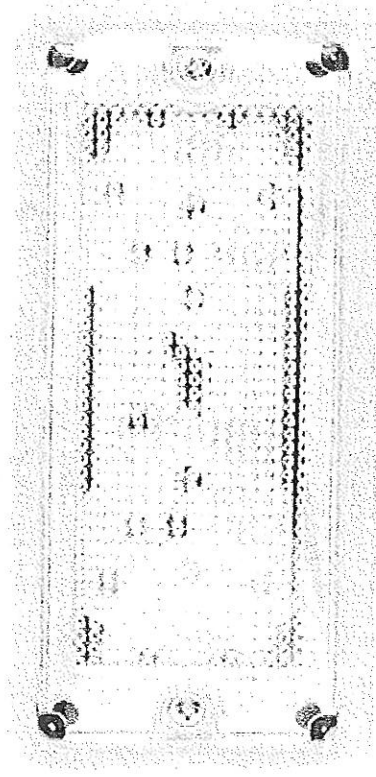
- LED's are Brighter than Conventional Lights
- No Bulbs to Replace—Ever!
- Use 90% Less Energy
- Safe, Dependable Service
- 100% Maintenance Free

Optronics, Inc LED Dome Light

ILL-31CB
LED Interior Light

Low profile LED interior light for semi-recess mount. 10-diode design with dimpled plastic lens for bright, even light output. Design includes both lead wire and ground wires. White housing.

Part No.	Description	Diodes	Amp Draw at
ILL-31CB	LED interior light	10	12.8V .107A





INCANDESCENT 3-YEAR LIMITED WARRANTY

Optronics' incandescent 12-volt lighting products are warranted for a period of three years from defects in workmanship and/or materials only. Optronics, Inc. will replace the product to the original purchaser or refund the purchase price if the product fails because of defect due to workmanship and/or materials within the limited warranty period from the date or lot code printed on the product. If warrantor is unable to provide replacement and repair is not commercially practicable or cannot be timely made, then warrantor will refund the purchase price. This offer does not constitute in any way a product guarantee and Optronics, Inc. does not assume any obligations beyond replacement of the product. This warranty is not transferable and applies to the original installation of the product.

LED LIFETIME LIMITED WARRANTY

Optronics' LED 12-volt lighting products are warranted for the lifetime of original purchaser from defects in workmanship and/or materials only. Optronics, Inc. will replace the product to the original purchaser or refund the purchase price if the product fails because of defect due to workmanship and/or materials. This limited lifetime warranty covers every and all diodes within each unit. Connector failure is covered by our three year limited warranty. The LED Lifetime Warranty does not apply to severe applications such as construction or off-road use and does not cover damage resulting from accident, misuse, or abuse. If warrantor is unable to provide replacement and repair is not commercially practicable or cannot be timely made, then warrantor will refund the purchase price. This offer does not constitute in any way a product guarantee and Optronics, Inc. does not assume any obligations beyond replacement of the product. This warranty is not transferable and applies to the original installation of the product.

PRODUCT REPLACEMENT PROCEDURES

To be eligible for Limited Warranty consideration, please contact your local authorized distributor/dealer or Optronics' customer service. Optronics' authorized distributor/dealer has full authority to issue an upfront warranty replacement/credit. If the product is found to be out of warranty at a later date, Optronics' customer service will rebill the customer for the replacement/credit. Customer service will determine if the failed product requires a return to Optronics, Inc. If return is required, a RETURN GOODS AUTHORIZATION NUMBER (RGA) will be issued.

THESE WARRANTIES DO NOT COVER DAMAGE RESULTING FROM ACCIDENT, MISUSE, OR ABUSE. CONSEQUENTIAL DAMAGES ARE EXCLUDED UNDER THIS WARRANTY AND ANY IMPLIED WARRANTY, EXCEPT FOR PERSONAL INJURY. THIS WARRANTY IS OFFERED IN LIEU OF ALL OTHER WARRANTIES. HOWEVER, MODIFICATION, LIMITATIONS OR EXCLUSIONS ON IMPLIED WARRANTIES MAY BE UNENFORCEABLE IN SOME STATES. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS AND YOU ALSO HAVE OTHER RIGHTS THAT VARY FROM STATE TO STATE. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES SO THE ABOVE LIMITATIONS OR EXCLUSIONS MAY NOT APPLY TO YOU.

OKLAHOMA

401 South 41st Street East
Muskogee OK 74403

Warranty Contact – Leslie Cook
Phone – 800-364-5483 ext. 228
Fax – 918-683-9517

INDIANA

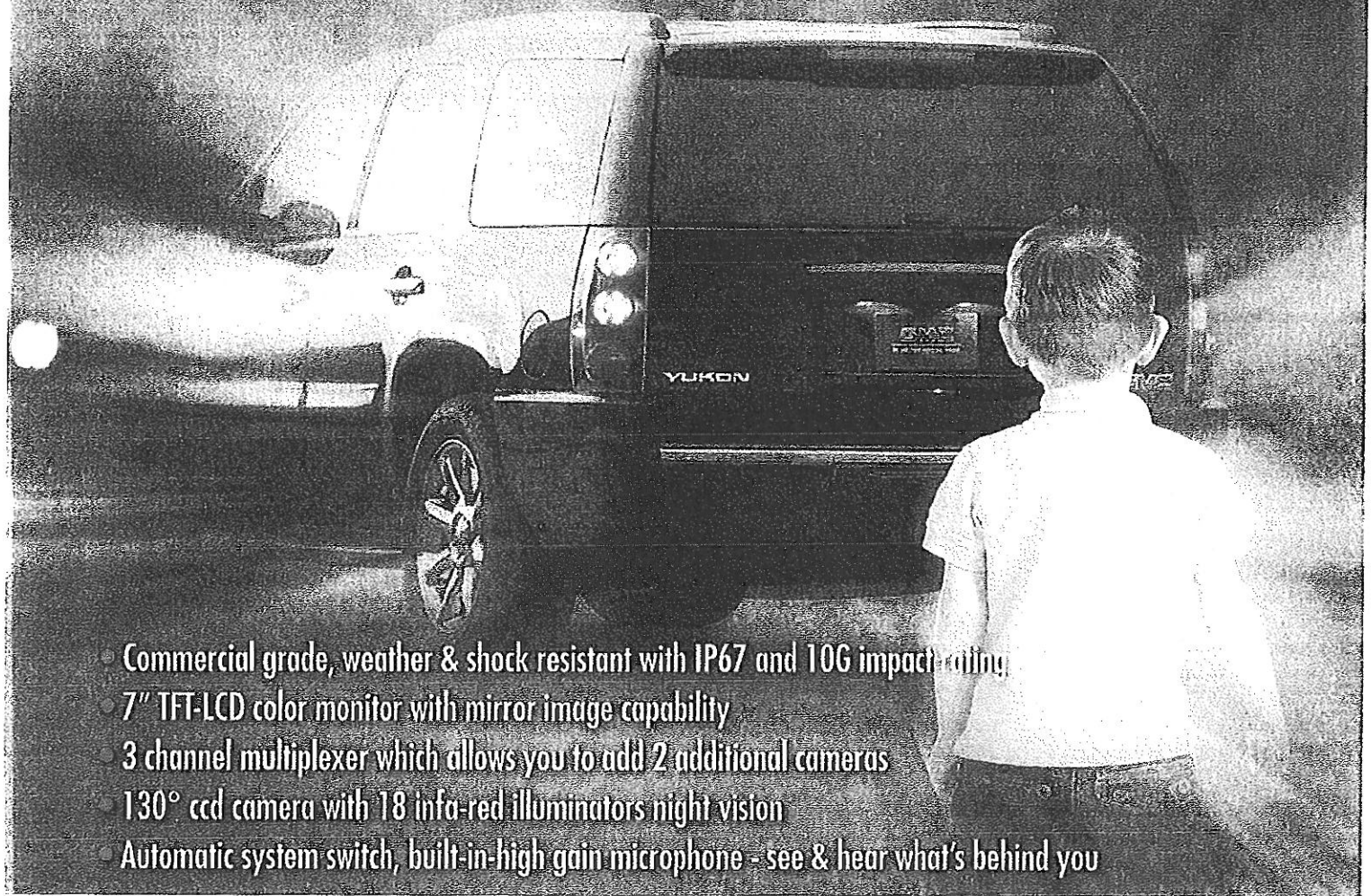
420 Roske Drive
Elkhart IN 46516

Warranty Contact – Kate Wine
Phone – 800-826-5483 ext. 219
Fax – 574-389-0041

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- Commercial grade, weather & shock resistant with IP67 and 10G impact rating
- 7" TFT-LCD color monitor with mirror image capability
- 3 channel multiplexer which allows you to add 2 additional cameras
- 130° ccd camera with 18 infra-red illuminators night vision
- Automatic system switch, built-in-high gain microphone - see & hear what's behind you



SCHOOL BUSES



BOATS



TRANSIT/COACH



CARGO/COMMERCIAL



MOTOR HOME/RV



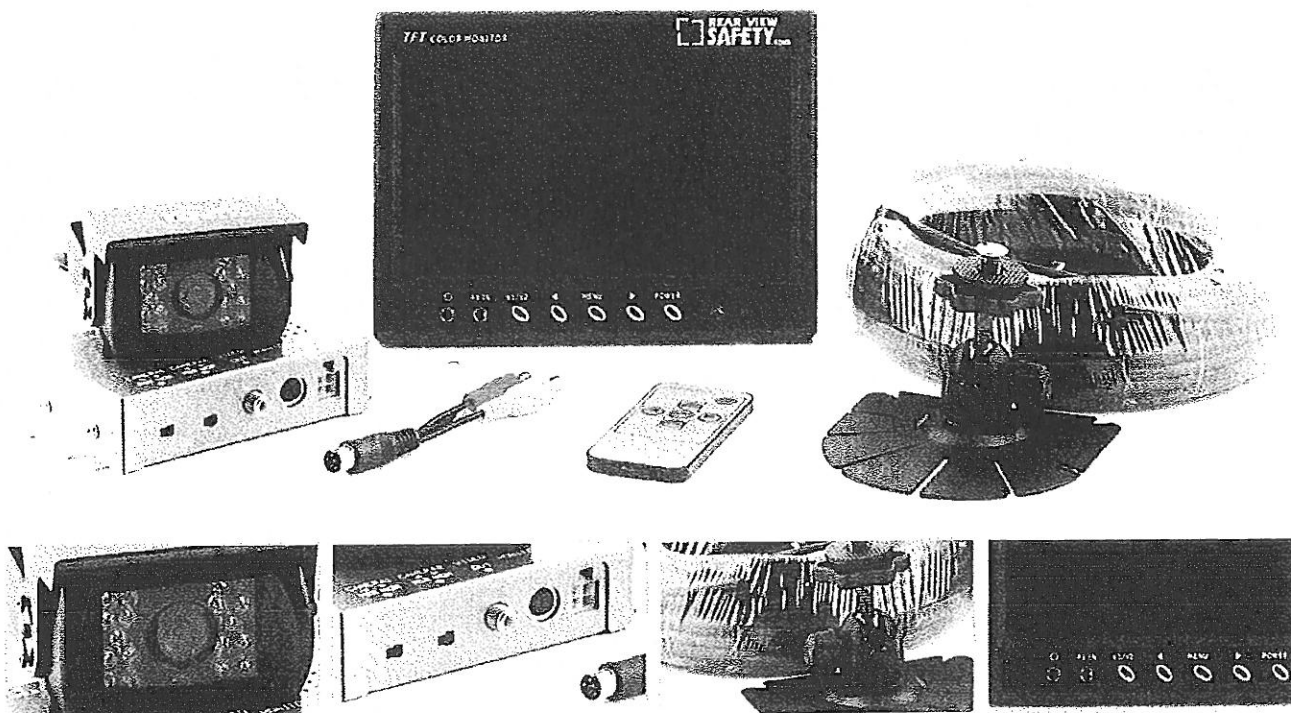
EMERGENCY



INDUSTRIAL

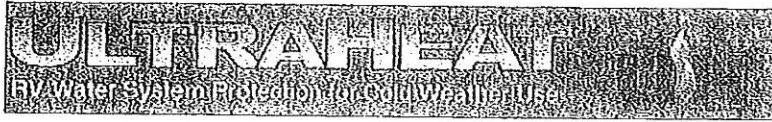
www.RearViewSafety.com

1650 Eastern Parkway, #207 • Brooklyn, New York 11233
1-800-764-1028 • fax: 646-755-3705 • sales@rearviewsafety.com



RVS-770613

Screen Type	TFT LCD Monitor	Camera	1/4 Sharp Color CCD
Screen Size	7"	Picture Elements	250,000 pixels
Dot Resolution	1440(H)x234(V)	Gamma Correction	$r=0.45$ to 1.0
Display Format	16:9	Image Sensor	• 420TV lines
Display Brightness	300		• PAL:500(H)*582(V)
Viewing Angle	90° Min		• NTSC:510(H)*492(V)
Video Input	2 channel	Lens	2.1mm
Video Source	1Vp-p, 75Ω	View Angle	130°
Power Supply	DC 12V (DC 24) (+/-10%)	Sync System	Internal Synchronization
Power Consumption	5W	Infra-red distance	50 Feet (18 Infrared LED)
Operating Temperature	-10°C ~ +65° C	Usable Illumination	0 Lux (LED On)
Video System	Auto NTSC/PAL	Power Source	DC 12V (+/- 10%)
Overall Dimensions	200 (L) x 115 (H) x 29 (T)	S/N Ratio	More than 48dB
Weight	400G	Electronic Iris	1/50, 160-1/100,000sec
Impact Rating	5G	Video Output	1Vp.p 75ohm
Active Area	154.08(H) x 86.58 (V)	IR Switch Control	CDS Automatic Control
Sync System	Internal	Impact Rating	10G
		Operating Temperature	-30°C - 50°C / RH 95% Max
		Storage Temperature	-30°C - 60°C / RH 95% Max



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STEP WARMERS

PROTECT PASSENGERS AND EMPLOYEES WITH ULTRAHEAT™ STEP WARMERS...

Keeps Steps from Icing up in Winter in...

- Transport Buses
- School Buses
- Cargo Vans
- Fire Trucks
- Ambulances

WHY PROTECT YOUR STEPS FROM FREEZING?

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

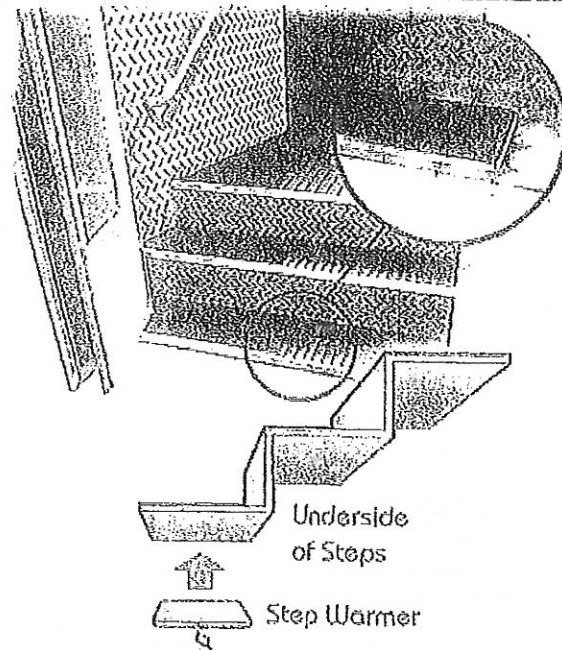
The UltraHeat™ Step Warmers will protect your passengers (and employees) from slippery ice build-ups. The Step Warmers safely heat the steps so that when they are wet with slush and water, they WILL NOT FREEZE. Using UltraHeat™ Step Warmers can greatly reduce the likelihood of winter-time injuries to your passengers or employees, helping avoid employee time-off or possible legal actions due to injury.

ULTRAHEAT IS YOUR FIRST STEP TO SAFETY!

[Installation Instructions](#)

[Specifications](#)

[How to Operate](#)



WARRANTY †

Register Your Warranty
What is the Warranty?
What is the Extended Warranty?

COMPANY INFO †

Profile
Why UltraHeat?
Contact Us
Dealer Registration

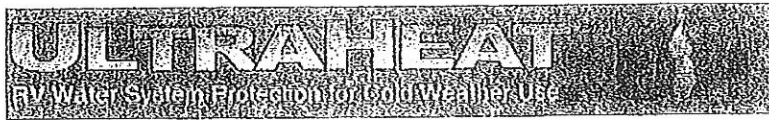
RV PRODUCTS †

Tank Heaters
Pipe Heaters
Elbow Heaters

FOR OTHER INDUSTRIES †

Transportation Safety
Personal Heaters
Medical - I.V. Warmer

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ARE YOU PROTECTED?

BEFORE YOU BUY AN RV

FAQS

EASY TO RETROFIT

DUCTED VS ULTRAHEAT

INSTALLATION INSTRUCTIONS:: STEP WARMER

Detailed Installation Instructions for UltraHeat™ Step Warmers

Please read the entire installation instructions before attempting to install the UltraHeat™ Step Warmers.

1. Prepare the Surface.

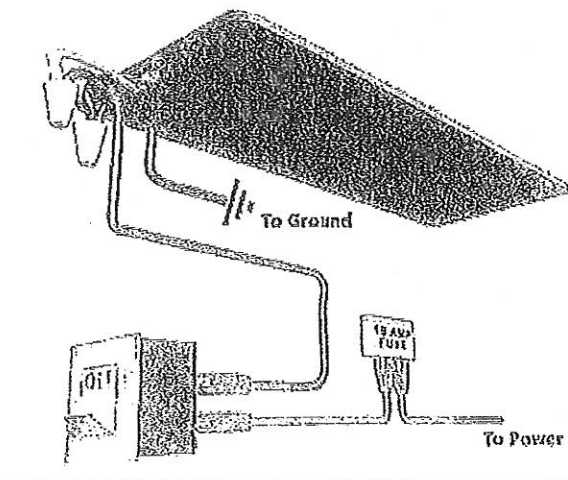
- The SH-267 Step Warmer is installed on the bottom side of the entrance step (quick 'n easy "peel 'n stick" application). The surface must be clean and dry prior to installation of the heater. Clean the surface where the heater is to be placed with ISOPROPYL ALCOHOL just before application of the heater. (Do not use solvent-based cleaners!) Make sure to allow the alcohol to dry completely before placing the heater on the step.

2. Put the Step Warmer onto the Surface.

- Peel the release paper from the back of the heater and place it (adhesive side up) in the center of the bottom side of the step(s) to be heated. Make sure that all parts of the heater contact the surface of the step.

3. Electrical Installation

- Wire leads should be connected to a 13.5 Volt power source with crimp type connectors. The heater's power circuit must have an in-line fuse or circuit breaker. UltraHeat recommends the use of an "On/Off" switch with the use of the SH-267 Step Warmer. Automotive undercoating can be put on the SH-267 after installation without any adverse effects.



• [Specifications](#)

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RV PRODUCTS †

Tank Heaters
Pipe Heaters
Elbow Heaters

FOR OTHER INDUSTRIES †

Transportation Safety
Personal Heaters
Medical - I.V. Warmer

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ULTRAHEAT[®]



Ultra Heat, Inc.
Elkhart IN 46516

Date : 04 April 08

O.E.M. Specification for StepWarmers[™]

Entry Step Heaters	Heater Size	Voltage	Current Draw	Power Consumed	Heat Output	Active Heater Area	Step Heater Sizes
Step Htr SH-267	7.25" x 26"	13.5 vdc	8 Amps	108 Watts	368.28 BTU/h	96.25 sq in	Bus Size Steps
Step Htr SH-267A	7.25" x 26"	13.5 vdc	8 Amps	108 Watts	368.28 BTU/h	96.25 sq in	Bus Size Steps
Step Htr SH-267B	7.25" x 26"	13.5 vdc	8 Amps	108 Watts	368.28 BTU/h	96.25 sq in	Bus Size Steps



NEW PRODUCT BULLETIN

NEW for 2009 ProAir's lineup of Low Profile Heaters!

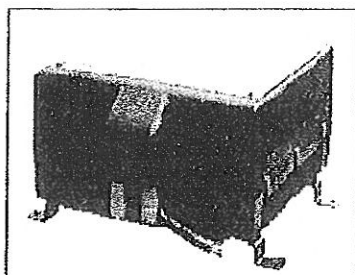
New Features:

- 3 inches lower in height
- 40% Lighter in weight!
- Plug-in waterproof wire connections
- 3-YEAR WARRANTY!
- Long life motor
- Rust free legs
- Filter option available

Model 436 LP 38,000 BTU

LOW PROFILE FLOOR HEATER

Part # 43600-200

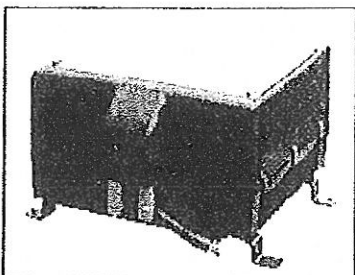


- 313 Cubic Feet Per Minute Airflow (CFM)
- Dimensions: 10.5" L x 9.5"W x 7.5"H
- 4.7 Amps @ 13.5 volts
- Weight: 4.8 lbs
- 3-Speed Fan

Model 446 LP 45,000 BTU

LOW PROFILE FLOOR HEATER

Part # 44600-200

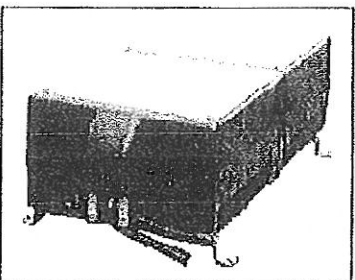


- 313 Cubic Feet Per Minute Airflow (CFM)
- Dimensions: 10.5" L x 9.5"W x 7.5"H
- 4.7 Amps @ 13.5 volts
- Weight: 5.2 lbs
- 3-Speed Fan

Model 466 LP 65,000 BTU

LOW PROFILE FLOOR HEATER

Part # 46600-200



- 640 Cubic Feet Per Minute Airflow (CFM)
- Dimensions: 21.5" L x 10.25" W x 7.5"H
- 9 Amps @ 13.5 volts
- Weight: 9.3 lbs
- 3-Speed Fan

High Performance Universal Recirculating Heaters, Perfect for Underseat use in Buses and Specialty Vehicles. Available for 12 & 24 Volt Applications

Call today for more information - Phone 574-264-5494

www.proairllc.com

Option Number:

ACT-913 /21

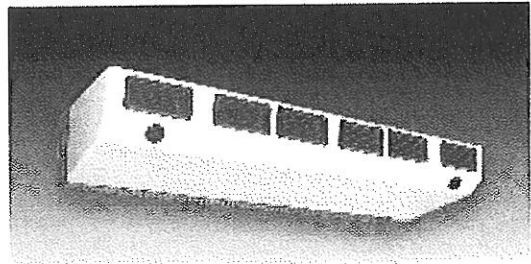
System Information:

The ACT EZ-91 free blow evaporator when combined with the ACT CS-3 skirt mounted condenser and TM-21 compressor combines to make the ACT-913/21. The system is BTU rated at 97,000 when combined with the OEM rating of 15,000 Btu.

COMPONENT SPECIFICATIONS

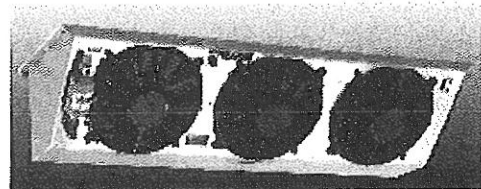
EZ-91 Evaporator

BTU'S:	93,000 Btu/hr IMACA Cooling Capacity
AIR MOVEMENT:	2400 CFM @ 0 static Pressure
VOLTAGE:	12 Volts DC
AMPERAGE:	27 Amps @ 13.5 Volts
SIZE:	W 59.25"x H 9.75"x D 22.125
WEIGHT:	95 Lbs.



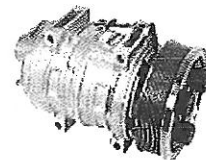
CS-3 CONDENSER

BTU'S:	82,000 Btu/hr IMACA Cooling Capacity
AIR MOVEMENT:	3690 CFM @ 0 static Pressure
VOLTAGE:	12 Volts DC
AMPERAGE:	32 Amps @ 13.5 Volts
SIZE:	W 49.5" x H 10.375" x D 13.750"
WEIGHT:	54 Lbs.



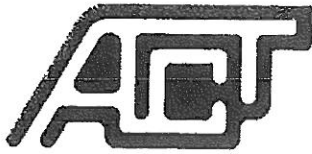
TM-21 COMPRESSOR DATA

PERMISSIBLE SPEED:	700-6000 RPM
DISPLACEMENT:	13 CUBIC INCH
REPORTED BTU CAPACITY:	65,000 BTU IMACA
REFRIGERANT:	R-134a



WARRANTY

ACT Systems by ProAir are covered by an industry-leading two-year warranty. Complete terms are outlined in our Warranty Statement, Consult ACT for detailed information.



American Cooling Technology, Inc.

715 Willow Spring Lane

York, PA 17406

Phone (717) 767-2775 / (877) 228-4247

Fax 717 767-3658

**AMERICAN COOLING TECHNOLOGY, INC.
SYSTEM LIMITED WARRANTY**

American Cooling Technology, Inc. (ACT) warranty on systems manufactured new from ACT is two (2) years unlimited mileage from date of system installation. ACT warrants against defect in materials under normal use and operation for a two-year period from date of system installation. ACT will warrant repair and labor only if prior authorization is given from ACT.

To file a warranty claim you must contact ACT warranty department at (717) 767-2775 or the source where the system was purchased or installed within thirty (30) days of the defect. Please have the following information available:

American Cooling Technology, Inc. serial number of part (required)

Description of system

ACT Part number

Sales order number

Nature of the defect

You must have prior written authorization from ACT in order to file a warranty claim or to return any item.

This warranty does not apply to components outside the continental U.S.A., Hawaii, or Alaska.

The warranty set forth above is exclusive, and no other warranty, whether written or oral, is expressed or implied. Act specifically disclaims the warranties of merchantability and fitness for a purpose.

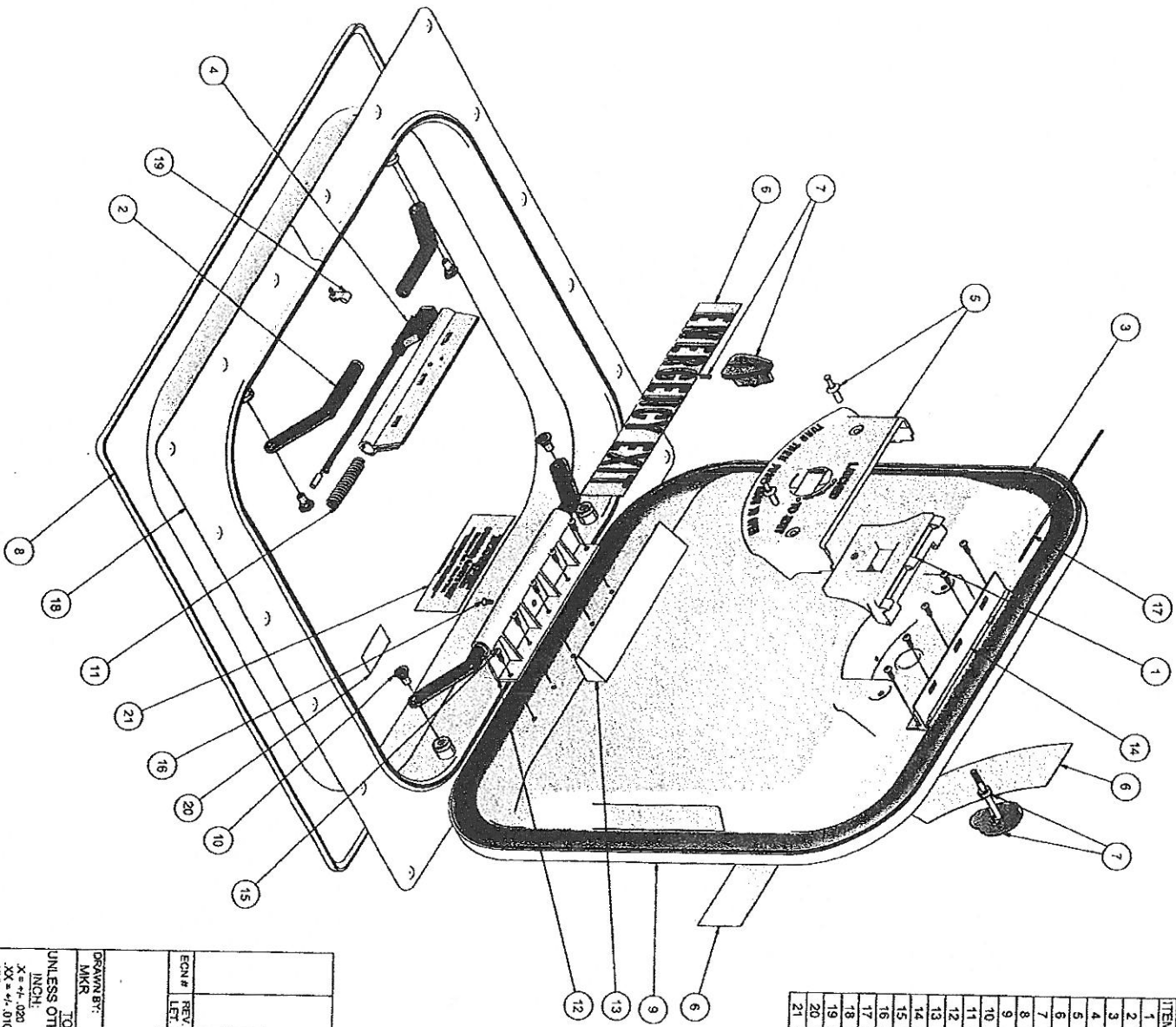
Limitations Of Liability

ACT will not warrant against improper installation, negligence, accident, lack of maintenance, or transportation. Incidental, consequential damages, or commercial losses from any cause are not the liability of ACT under any circumstances. Any alteration or repair to a component without prior written authorization from ACT will not be covered under the above warranty. ACT is not liable for towing, equipment rental, loss of time, or any other expenses or damages while the equipment is not operational.

During the warranty period, ACT will, at its option, either repair or replace the component that proves to be defective.

ITEM	QTY	PART NUMBER	DESCRIPTION	LID ONLY
1	1	1000-003	RELEASE HANDLE ASSEMBLY (WHITE)	X
2	4	1000-005	LINK AND PLUNGER	X
3	1	1000-017	GASKET KIT-STANDARD	X
4	1	1000-018	RELEASE HINGE WITH ALARM SWITCH	X
5	1	1975-015	RELEASE HINGE SHIELD W/ RIVETS (WHITE)	X
6	1	1976-006	DECAL KIT-4 (OSR)	X
7	1	1976-014	RELEASE KNOB ASSEMBLY	X
8	1	2220-28-001	#28 TRIM RING	X
9	1	1975	SS II COVER W/OSR (WHITE)	X
10	4	2030	BOLT-5/16-18 SPECIAL SHOULDER	X
11	4	2040	SPRING-COIL PLUNGER VENT	X
12	1	2050	FIXED HINGE (WHITE)	X
13	1	2055	HINGE COVER (WHITE)	X
14	1	2070	HANDLE BASE (WHITE)	X
15	11	2100	SPECIAL TORX HIL O SCREW SIS	X(11)
16	1	2105	SCREW #8 X 1/2 SIS PH FLAT HEAD	X
17	1	2140	PIN/HINGE STAINLESS STEEL	X
18	1	2247	MOUNTING FRAME #28 LOW PROFILE (WHITE) (PP)	X
19	1	2300	NILYON TUBE CLAMP	
20	1	2560	FRONT OF VEHICLE DECAL	
21	1	2568	DECAL-STANDARD SAFETY VENT	

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



ENG. #	REV.	DATE	BY	APVD
1	1	05/29/07		
MATERIAL:				
DRAWN BY: MKR				
DATE: 05/29/07				
TOLERANCE:				
UNLESS OTHERWISE SPECIFIED				
INCH: X = +.020				
METRIC: X = +.5 MM				
XX = +.010				
XXX = +.005				
XX = +.25 MM				
XXX = +.125 MM				
ANGLE: ±.1 DEG				
PVDI				
SCALE: NONE				
PRODUCT: VENTS				
DWG NO: 1975-02				
<div style="text-align: center;"> TRANSPEC WORLDWIDE </div>				
TITLE: STANDARD SAFETY VENT II W/#28				
MTG, OSR, ARM, & ENG DECALS				
(WHITE)				

Enclosure - Body, General Construction

The body structure is built as an integral steel-cage unit. All joints and corners where stress concentration may occur are adequately reinforced to carry required loads and withstand road shock. The bus body is certified by an independent testing agency to meet the requirements of Federal Motor Vehicle Safety Standard Number 220 (School Bus Rollover Protection.)

5.2. Body Structural Framing

- A. The vehicle body structure incorporates an integral, fixture-welded, steel body frame for floor, front, rear, sidewalls and roof, essentially forming a steel cage around the passenger cabin. Welding is used to fasten the floor to sidewalls, and roof to sidewalls, creating a steel structure as the primary load-bearing mechanism.
- B. The sidewall structure is made of 1" x 2" 16 GA custom formed steel studs welded vertically on approximately 26" centers, with 1" x 1" 16 GA steel tube running laterally at the top and bottom of the wall and at the window frames. Steel gussets are welded into the corners of the window frames for added support.
- C. The roof structural support members are made of 16 GA steel capped hat section roof bows, 1-1/2" high by 3-1/2" wide, spaced on approximately 24" centers. At least one (1) roll bar of 7 GA steel is installed, approximately in the middle of the roof structure. The roof bows are welded at the ends to 1" x 1" 16 GA steel tubes running the entire length of the roof. 1" x 3-1/2" 12 GA steel channels are welded to the roof bows where the rear air conditioner evaporator will be attached (when so equipped). Additional steel plates are added for attachment of stanchions, ceiling grab rails, etc. The roof is welded to the sidewalls.
- D. The exterior sidewalls are seamless fiberglass reinforced plastic (FRP) panels vacuum laminated to structural luan, which is vacuum laminated to the steel cage structure. (Optional aluminum is available.) The exterior roof panel is a seamless piece of FRP (aluminum optional) vacuum laminated to structural luan, which is vacuum laminated to the steel cage structure. The sidewalls and roof are welded together at the roof gutter above the windows. Side panels below the floor line are aluminum (FRP optional) and easily removable for service and repair.
- E. The steel mounting tracks for the passenger seats are welded to the sidewall steel frame and to the steel sub-floor. Any other method of attaching the seat track to the bus body is not acceptable.
- F. Prior to the vacuum lamination process, the steel cage walls and roof sections are treated with an anti-corrosion primer and filled with appropriate thickness, two-pound, high-density expanded polystyrene to provide an insulated body structure with an R-value of at least R-6. Once the sections are welded together, the welds are ground smooth and treated again with the anti-corrosive primer.
- G. Prior to the vacuum lamination process, all body sections (roof, sidewalls and rear wall) are filled with appropriate thickness, two-pound, high-density expanded polystyrene to provide an insulated body structure with an R-value of at least R-6.
- H. The steel sub-floor is a fixture-welded structure of minimum 2" x 4.8" 12 GA steel G-channel cross-members and 1" x 3-1/2" 12 GA steel C-channel, treated for corrosion protection. The sub-floor is covered with 5/8" exterior grade plywood, attached with a high-strength exterior adhesive and self-tapping, countersunk screws. Prior to installation,

the edges of the plywood are sealed with an anti-wicking solution to seal out moisture. All seams in the plywood floor are filled with wood filler and sanded smooth before installation of floor covering material.

- I. The floor is designed so that all the steps required to enter the passenger cabin are integrated into the main passenger stepwell. There is no additional transition step beyond the main stepwell.
- J. The body is bolted through the sub-floor structure to the chassis frame and utilizes rubber isolating mount pads and Grade 8 7/16-14 UNC bolts torqued to 60-65 ft-lbs. No part of the body is welded directly to the chassis frame structure.
- K. A front cap constructed of fiberglass and reinforced with a steel frame structure to provide strength and prevent drumming encloses the front end of the body over the cab area.
- L. The exterior sidewalls of the bus are smooth with no exposed fasteners. All nuts, bolts, clips, washers, clamps and like fasteners are zinc or cadmium plated, or zinc chromate coated, or stainless steel to prevent corrosion.
- M. Wheel housings are of one-piece, steel construction, 14 GA minimum, and treated with an anti-corrosive primer. Wheel housings are constructed and adequately reinforced to prevent deflection. Ample clearance is provided for tires in their maximum jounce position according to the chassis manufacturer.



— 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



— a THOR company —

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



QUALITY ASSURANCE VERIFICATION



— a THOR company —

Page 12 of 17

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

Retest ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6
 Wheelchair ☐

Date	Unit #	Model	Water Pressure	Duration	Tested by	Pass

pass <input type="checkbox"/> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <div style="display: flex; justify-content: space-between;"><div>date</div><div> </div></div> <div>inspector</div> </div> <div style="display: flex; justify-content: space-between;"> <div>Street <input type="checkbox"/></div> <div>Curb <input type="checkbox"/></div> </div> <div style="display: flex; justify-content: space-between;"> <div>Window # <input type="checkbox"/></div> <div>External <input type="checkbox"/></div> </div> <div style="display: flex; justify-content: space-between;"> <div>Egress <input type="checkbox"/></div> <div> </div> </div>	pass <input type="checkbox"/> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <div style="display: flex; justify-content: space-between;"><div>date</div><div> </div></div> <div>inspector</div> </div> <div style="display: flex; justify-content: space-between;"> <div>Street <input type="checkbox"/></div> <div>Curb <input type="checkbox"/></div> </div> <div style="display: flex; justify-content: space-between;"> <div>Window # <input type="checkbox"/></div> <div>External <input type="checkbox"/></div> </div> <div style="display: flex; justify-content: space-between;"> <div>Egress <input type="checkbox"/></div> <div> </div> </div>	pass <input type="checkbox"/> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <div style="display: flex; justify-content: space-between;"><div>date</div><div> </div></div> <div>inspector</div> </div> <div style="display: flex; justify-content: space-between;"> <div>Street <input type="checkbox"/></div> <div>Curb <input type="checkbox"/></div> </div> <div style="display: flex; justify-content: space-between;"> <div>Window # <input type="checkbox"/></div> <div>External <input type="checkbox"/></div> </div> <div style="display: flex; justify-content: space-between;"> <div>Egress <input type="checkbox"/></div> <div> </div> </div>	pass <input type="checkbox"/> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <div style="display: flex; justify-content: space-between;"><div>date</div><div> </div></div> <div>inspector</div> </div> <div style="display: flex; justify-content: space-between;"> <div>Street <input type="checkbox"/></div> <div>Curb <input type="checkbox"/></div> </div> <div style="display: flex; justify-content: space-between;"> <div>Window # <input type="checkbox"/></div> <div>External <input type="checkbox"/></div> </div> <div style="display: flex; justify-content: space-between;"> <div>Egress <input type="checkbox"/></div> <div> </div> </div>
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Front

1
2
3
4
5
6
7

Street

Curb

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



— a **THOR** company —

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

cellofoam[®]

EPS INSULATION

TECHNICAL DATA

TYPICAL PHYSICAL PROPERTIES OF EPS INSULATION
Specification Reference: ASTM C476

Cellofoam EPS Insulation as manufactured by Cellofoam North America Inc is a modified expanded polystyrene. It is rigid, foamed plastic with resilient closed cells molded in a range of densities and sizes to meet your application specifications and requirements.

Cellofoam EPS provides all the characteristics required for long-term performance: permanent R value, inherent water resistance, excellent physical strength, and dimensional stability.

Cellofoam EPS provides a high R value at a comparatively low cost, making it the insulation choice for: Roof, Perimeter, Cold Storage, Exterior and Cavity Wall Insulation, Polysheild Fan-fold, Leveling Board and Non-Structural Sheathing.

Property	Units	ASTM Test	Type I	Type VIII	Type II	Type IX
Density (Maximum)	pcf		1.0	1.25	1.5	2.0
Density (Minimum)	pcf	C303 or D1622	0.90	1.15	1.35	1.80
Thermal Conductivity K Factor	at 40F at 75F BTU/(hr.) (sq. ft.)(F/in.)	C177 or C518	0.24 0.26	0.235 0.255	0.22 0.24	0.21 0.23
Thermal Resistance Values (R)*	at 40F at 75F per inch	— —	4.17 3.85	4.25 3.92	4.55 4.17	4.76 4.35
Strength Properties						
Compressive 10% Deformation	psi	D1621	10-14	13-18	15-21	25-33
Flexural	psi	C203	25-30	30-38	40-50	50-75
Tensile	psi	D1623	16-20	17-21	18-22	23-27
Shear	psi	D732	18-22	23-25	26-32	33-37
Shear Modulus	psi	—	280-320	370-410	460-500	600-640
Modulus of Elasticity	psi	—	180-220	250-310	320-360	460-500
Moisture Resistance						
WVT	perm. in.	E96	2.0-5.0	1.5-3.5	1.0-3.5	0.6-2.0
Absorption (vol.)	%	C272	less than 4.0	less than 3.0	less than 3.0	less than 2.0
Capillarity	—	—	none	none	none	none
Coefficient of Thermal Expansion						
	in./in.(F)	D696	0.000035	0.000035	0.000035	0.000035
Maximum Service Temperature						
Long-term	°F	—	167	167	167	167
Intermittent			180	180	180	180
Oxygen Index	Minimum %	D2863	24.0	24.0	24.0	24.0
Dimensional Stability						
	% Change	D2126	max. 2.0	max. 2.0	max. 2.0	max. 2.0
Bond Strength, lb/ft² shear						
with Portland Cement			830	830	830	830
with gypsum			510	510	510	510
Sound Absorption						
at 1000 cps		C423	0.36	0.36	0.36	0.36
at 2000 cps			0.54	0.54	0.54	0.54
at 4000 cps			0.38	0.38	0.38	0.38
Buoyancy, lb/ft ³			60	60	60	60
Toxicity		Laboratory Reports	Approximately the same as burning wood, paper or cardboard			
Fungus & Bacterial Resistance		F.H.A. Test Procedures	Will not support bacterial or fungus growth; no food value.			

*R' means resistance to heat flow. The higher the 'R' value, the greater the insulating power.

Advantages

- Available in a wide range of sizes
- Low material and insulation costs
- Can be obtained in various densities
- Easily stored, handled and installed
- Simple to cut and shape with common tools
- Clean, odorless, non-irritating skin
- Excellent bond with drywall and non-solvent type adhesives
- Provides an excellent surface for laminate base
- Perfect soil substitute in road construction

Characteristics

- Resists moisture penetration
- Effective over wide temperature range
- Low thermal conductivity
- High strength to weight ratio
- Reflective white color
- Does not support bacterial growth
- Mold resistant
- Resistant to most acids and alkalis

WARNING: This product is combustible and if exposed to a fire of sufficient heat and intensity may burn rapidly. It should not be left exposed or inadequately protected. Consult specific instructions for use accompanying this product.

The performance data herein reflects Cellofoam North America Inc's expectation based on tests conducted in accordance with recognized standard methods. The sale of these products shall be subject to the Terms and Conditions of Sale, INCLUDING those LIMITING WARRANTIES as set forth in Cellofoam North America Inc's Invoices. No agent, employee or representative of Cellofoam North America Inc or its subsidiary or affiliated companies is authorized to modify this disclaimer.

All EPS insulation products manufactured by Cellofoam North America Inc meet applicable standards including:

ICC ESR-1820

IBC

IRC

UBC

HUD/FHA Use of Material, Bulletin #71

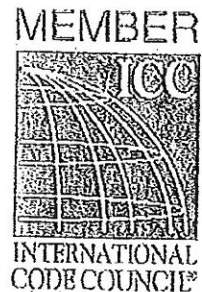
ASTM C578

Underwriters Laboratories

Military Spec. MILP-19644C

Military Spec. MILP-40619A

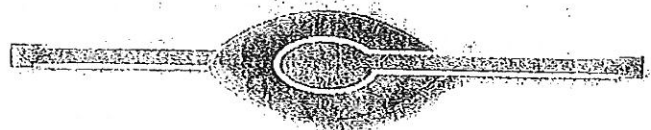
Factory Mutual



MEMBER OF



National Marine Manufacturers Association



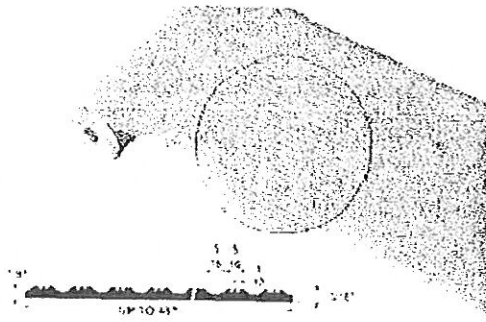
cellofoam®

P.O. Box 406
Conyers, Georgia 30012

800-241-3634
FAX 770-929-3608

Exclusive Transit-Flor® PGF Benefits

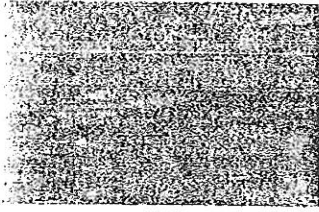
- **Homogeneous Composition** — The color and pattern of R.C.A.'s Transit-Flor® PGF penetrates throughout the entire thickness to ensure an attractive floor through years of demanding use.
- **Slip-Resistant** — Ribbed and textured surfaces keep passengers safe and help abate trips, slips and falls. Transit-Flor® meets or exceeds ADA guidelines.
- **Double groove rib design** facilitates water drainage eliminating the potential of puddling water.
- **Comfortable** — Soft underfoot, rubber is comfortable to walk on.
- **Easy to clean** — A simple labor - saving process keeps flooring looking great for years.
- **Dimensional stability** — Because rubber's coefficient of expansion is low, temperature changes don't affect it as with vinyl flooring. Dirt and moisture collection at seams because of expanding and contracting flooring, common with vinyl, is virtually eliminated.
- **Stands up to heavy traffic** — With a top-to-bottom wear surface, rubber flooring is not only long lasting, it will look good for years.
- **Bonding surface** — R.C.A. Rubber sands the underside of Transit-Flor® PGF during the finishing process to provide a strong bond to metal, wood and composite sub-floors.
- **Simplified installation** — Installation is a breeze. All R.C.A. Transit-Flor® PGF flooring can be cut to the specified lengths and widths needed for a total-floor system.
- **Broad color range** — Transit-Flor® PGF is available in a wide range of colors and patterns to compliment any interior décor.
- **Flame retardant** — Transit-Flor® flooring products exceed the minimum flame spread standards for school and heavy transit transportation vehicles for both FMVSS 302 and ASTM E648 test methods.
- **Warranty** — Transit-Flor® PGF premium-grade rubber flooring is warranted to be free from defects in workmanship or material for a period of twelve years from the date of delivery. Step treads are warranted for one year.



Transit-Flor Color Options

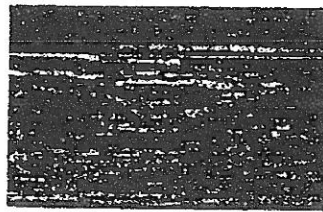
Transit-Flor® PGF flooring is available in a wide range of colors and patterns to compliment any transit interior décor — including the addition of four new bright colors:

Standard Marbleized



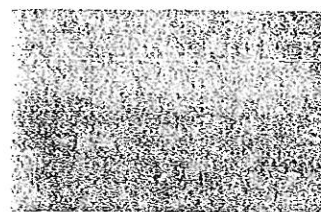
602

Terra Cotta with black and white



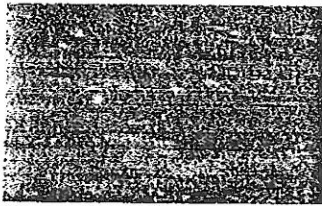
604

Black and White



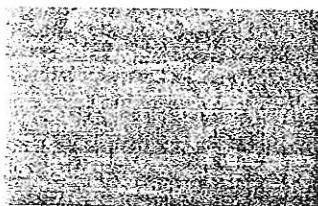
627

Walnut Brown with cream and coral



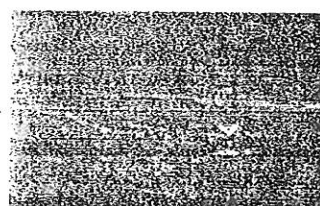
630

Mahogany with red and white



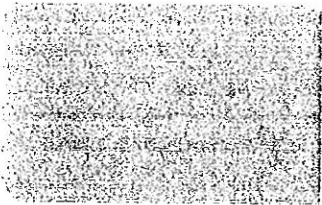
653

Soft Green with white



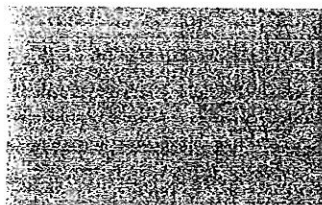
702

Medium Blue with white



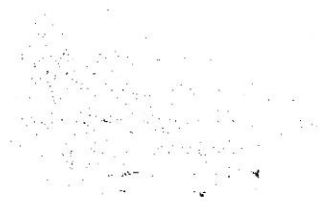
711

Medium Gray with ivory



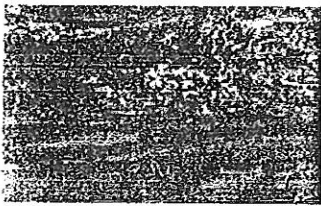
747

Medium Tan with brown and ivory



758

Soft White with fawn



766

Charcoal Gray with cream and black



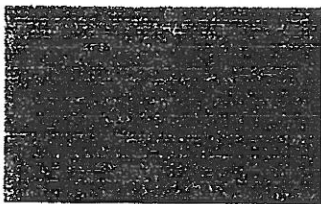
777

Fawn with ivory and brown



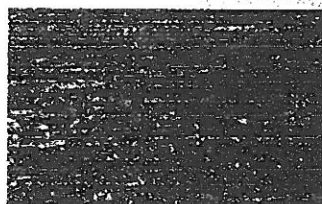
788

Gray with black and cream



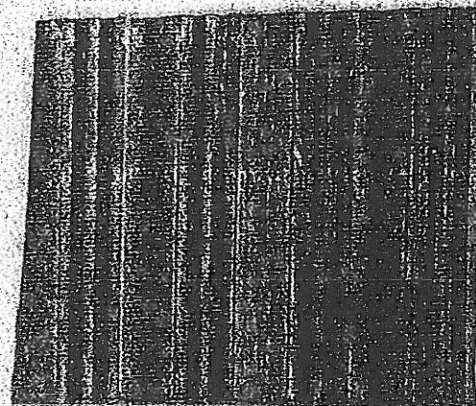
852

Royal Blue with light blue



855

Red with cream and burgundy

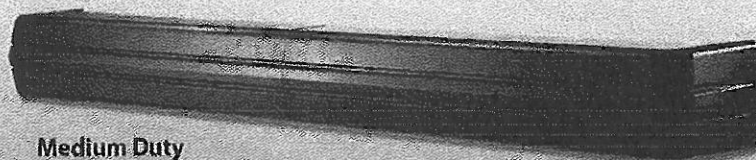
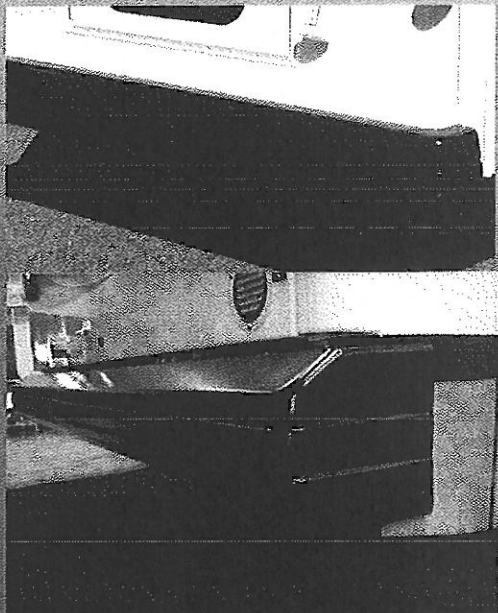


PRETORIA

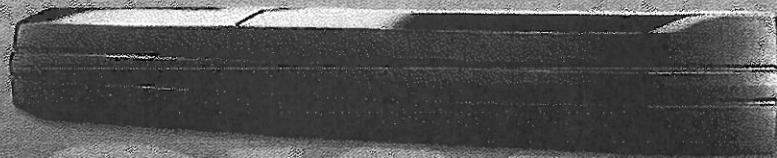
Energy Absorbing Bumpers for Today's Mid Size and Heavy Duty Buses

SMI Energy Absorbing Bumpers are made with an ultra, high strength "pultruded" back up structure. Corrosion resistant material ensures long life, even when subjected to harsh weather conditions and road salt.

Our energy absorbing bumper is interchangeable for the left or right side. Designed with fewer parts and less weight for improved performance and quick installation.

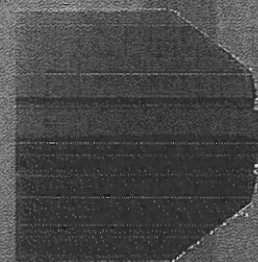


Medium Duty



Heavy Duty

**Two Piece Construction
Reduces Inventory Requirements and Cost
Lower Weight—Higher Fuel Efficiency
Durable Outer Skin Resist Tearing
Long Life Corrosion Resistance
Sleek, Modern Appearance
Range of Widths from 80" to 102"**



**SPECIALTY
MANUFACTURING**

TRANSPEC

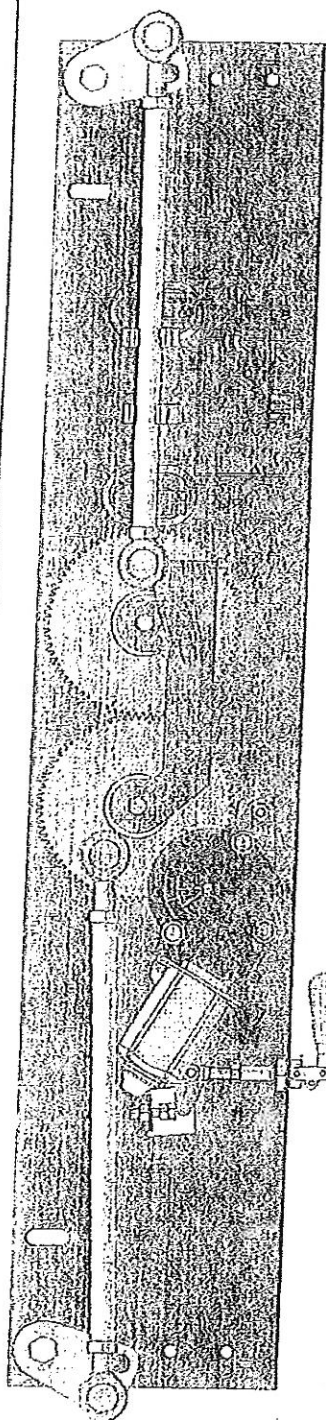


ISO 9001:2008

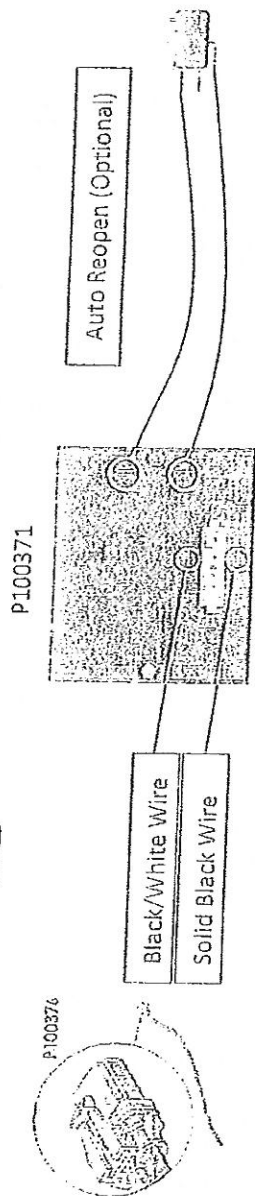
SpecFlor

Pretoria Transit Interiors
1975 Joe B. Jackson Pkwy
Murfreesboro, TN 37127
Phone: 615 867-8515
www.pretoriausa.com
www.smi-global.net

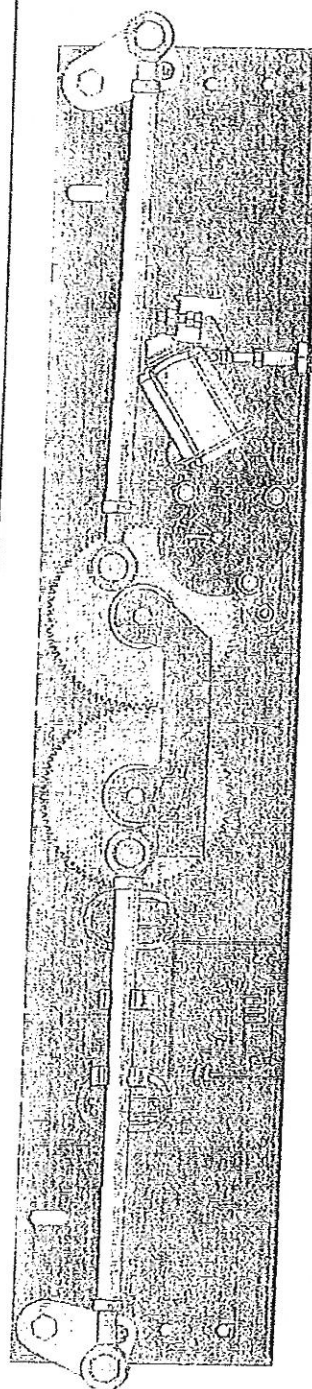
✓



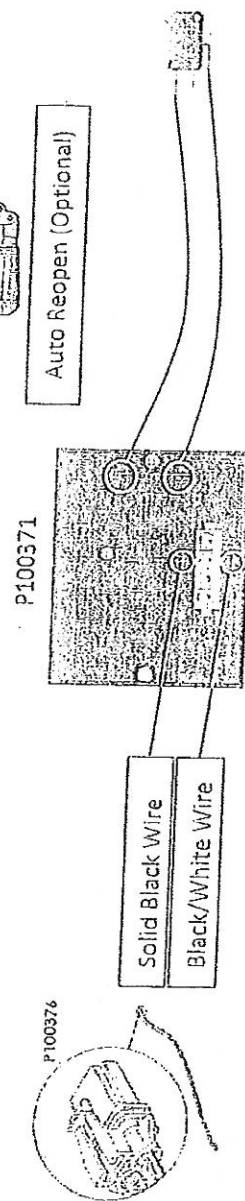
A



Black/White Wire
Solid Black Wire

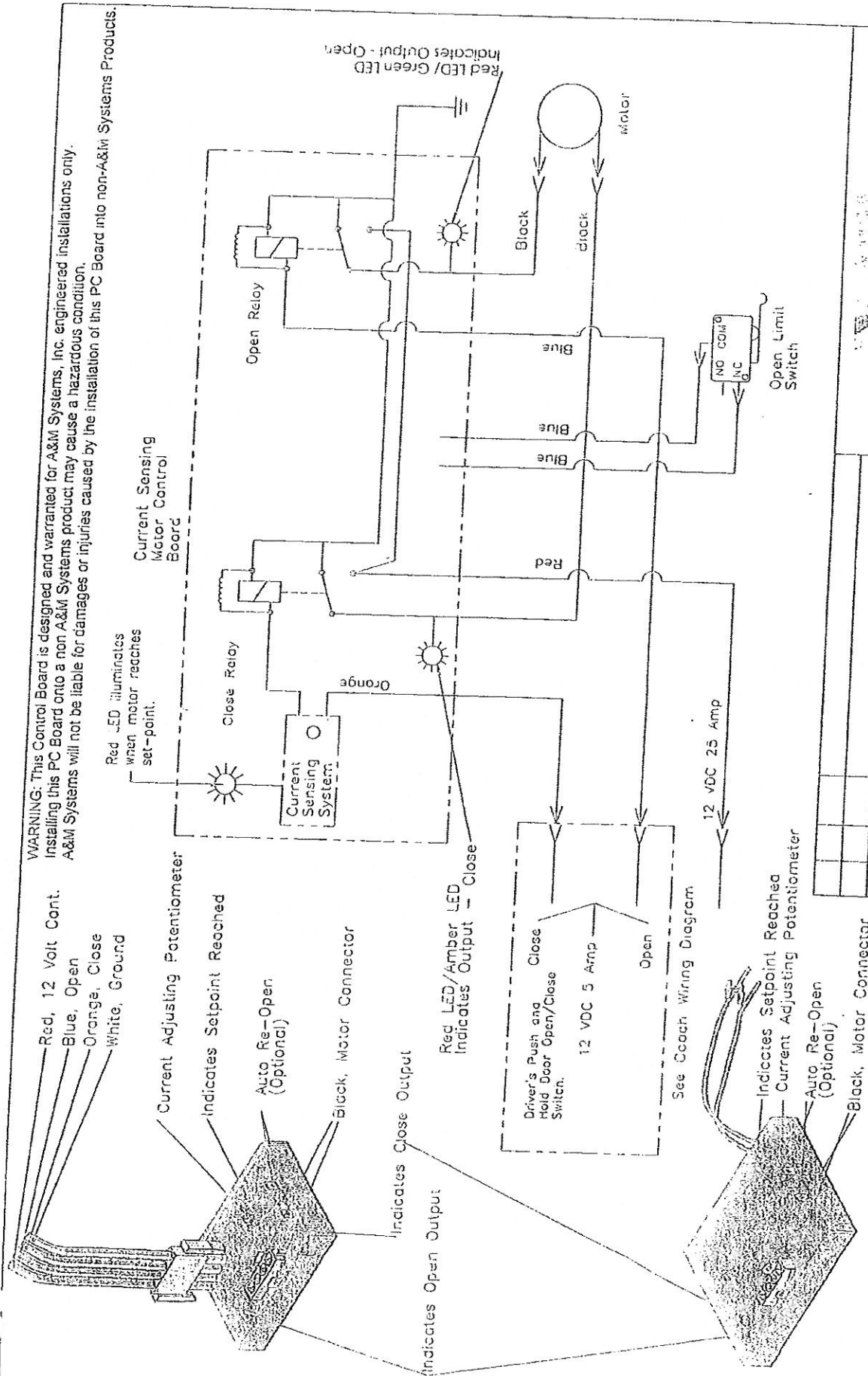


B



Solid Black Wire
Black/White Wire

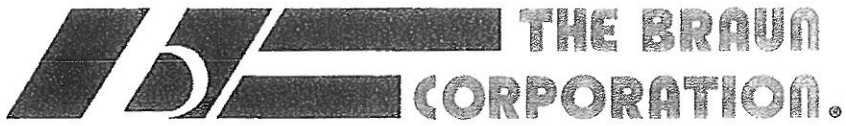
Red LED illumination



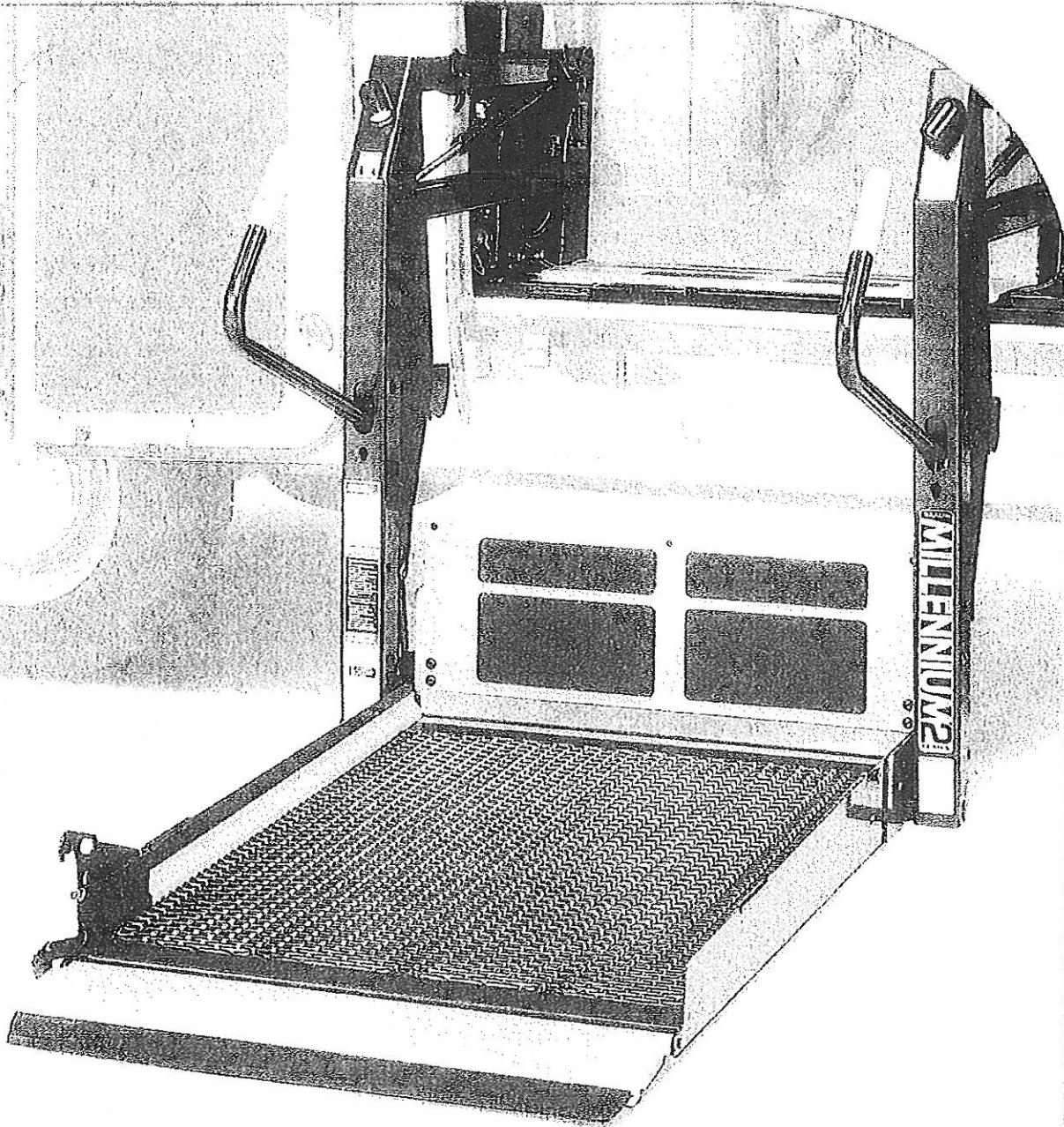
NEXT ASSY.:
SUPERSEDES:
DO NOT S

REV.		BY	DATE	RELEASE TO PRODUCTION	
TOLERANCE UNLESS SPECIFIED				DESCRIPTION	
Fractions: \pm - 1/32				DRAWING INFORMATION	
Decimals: .000 \pm - .005				DRAWING	SMILDER
Angles: \pm - 1 Deg				DATE	11/14/2011
				SCALE	1:12
				WT.	
THIS DRAWING IS THE PROPERTY OF A&M SYSTEMS, INC. AND IS NOT TO BE DUPLICATED OR USED IN ANY WAY DETRIMENTAL TO THEIR BEST INTEREST.					
				PC board and pigtail	
				MAT'L SPEC.	
				PART NUMBER	
				PAGE	

W

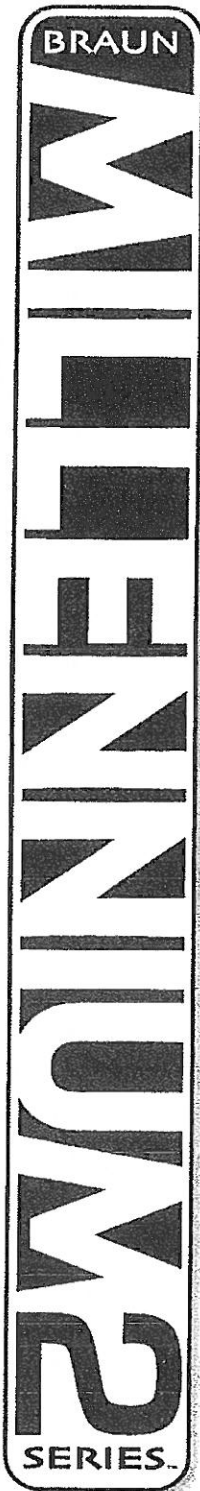


2010 Public Use Application Guide • Volume 11 • Issue 1 • 1-11-10



NL2 MILLENNIUM-2 SERIES™

NL2 Millennium-2 Series™ Features



- fully automatic NHTSA compliant lift, operated by an attendant
- loading position - either direction
- interfaces with OEM interlocks
- lift mounted lights - platform illuminated as it deploys
- hand control with illuminated functions
- locking mechanical Inboard Barrier (IB), powder coated yellow for safety and high visibility, prevents movement if occupied
- pump design prevents platform folding when occupied, quiet operation and low current draw
- durable redesigned baseplate reduces lift weight and allows for quicker and easier service of hose/wiring
- easily installed, step-by-step installation instructions, no peripheral hardware required
- visual and audible warning provides notification of unsafe conditions
- hydraulic outer barrier that will be in the fully up position before the platform leaves the ground, has durable rubber nose guard and is powder coated yellow for safety and high visibility
- parallel arms lift with hydraulic cylinders
- side or rear door application
- two platform widths available
- dual handrails for security and convenience
- bridging feature permits the wheelchair user to board the lift from sidewalks or inclines
- floor to ground travel is 48"
- lifting capacity is 800 lbs
- integrated back-up pump
- equipped with an adjustable anti-rattle feature to avoid unpleasant noise in the vehicle during transit
- durable high-gloss powder coated finish
- Lift-Tite system stows the lift platform securely while the vehicle is in transit
- pump module with removable cover offers easy access to all components

NL2 Millennium-2 Series™ Models

NL916IB-2 & NL916FIB-2

NHTSA Compliant Usable Platform: 30" x 51"

NL917IB-2 & NL917FIB-2

NHTSA Compliant Usable Platform: 33" x 51"

NL919IB-2 & NL919FIB-2

NHTSA Compliant Usable Platform: 34" x 51"

NL917IB3751-2 & NL917FIB3751-2

NHTSA Compliant Usable Platform: 37" x 51"

General Function: Electrohydraulic, power up/gravity down operation

Operation: Hydraulic pump with two lifting cylinders

Control: hand-held control box

Hydraulic: Pressure Max. 2,495 psi, Fluid is Univis HVI 26, oil reservoir is .33 gal

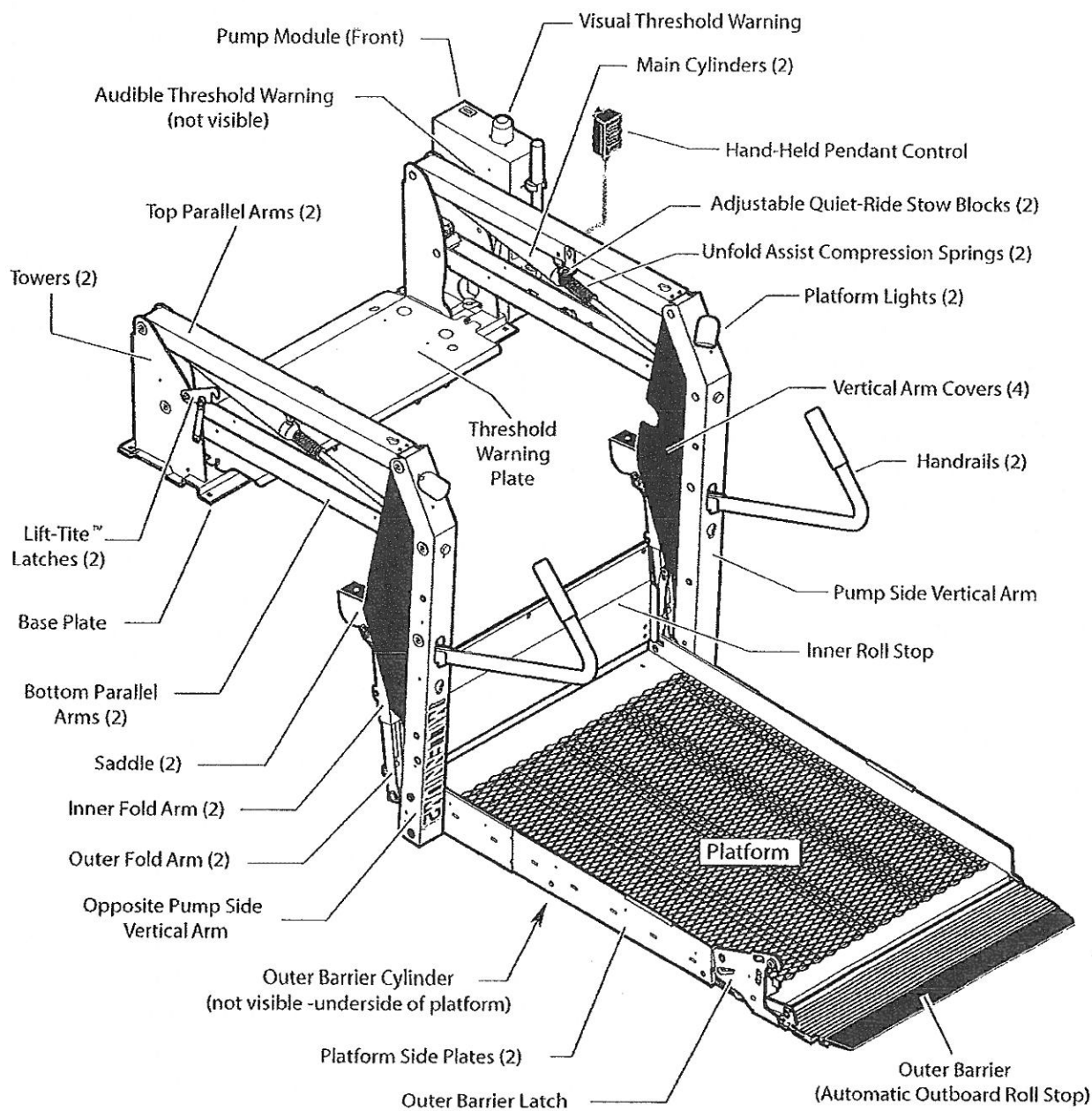
Construction: Steel structure with powder coat finish

Operating Temperature: 0°F to 140°F

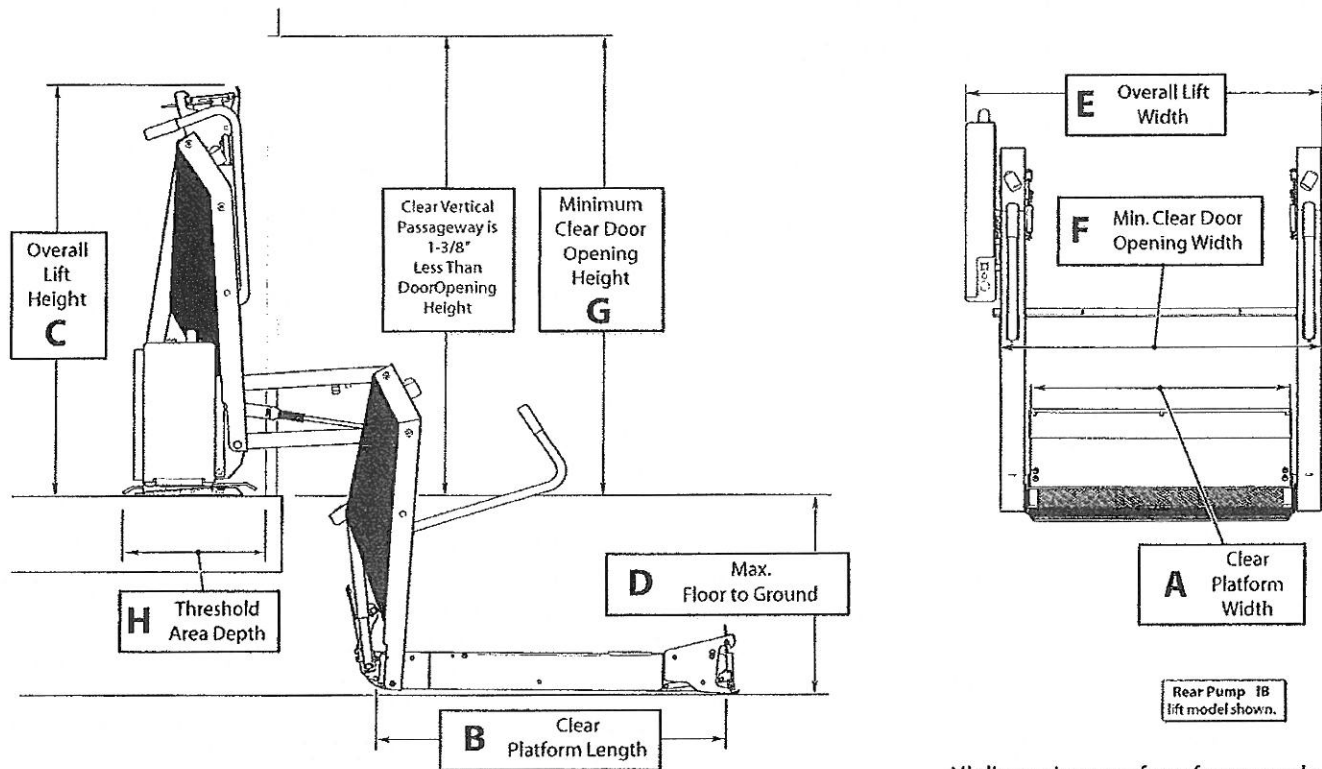
Power Supply: 12VDC

Current Consumption: Max. 70A (12V)

F = Front Pump IB = Inboard Barrier For a front-mounted pump assembly, add "F" to the model number when ordering (example: NL917FIB-2).



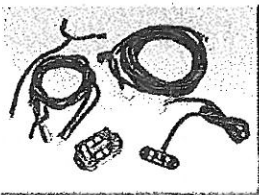
NL2 Millennium-2 Series™ Dimensions



All dimensions are for reference only.

NL2 • Millennium-2 Series*			A	B	C	D	E	F	G	H
Lift Model Number	Lift Weight lbs	Lifting Capacity lbs	Clear Platform Width	Clear Platform Length	Overall Lift Height	Max. Floor to Ground	Overall Lift Width	Min. Clear Door Opening Width	Min. Clear Door Opening Height	Threshold Area Depth
NL916IB-2 / NL916FIB-2	317	800	30"	51"	56.25"	48"	42.25"	39"	57.375"	18"
NL917IB-2 / NL917FIB-2	356	800	33"	51"	56.25"	48"	45.25"	42"	57.375"	18"
NL919IB-2 / NL919FIB-2	369	800	34"	51"	56.25"	48"	46.25"	43"	57.375"	18"
NL917IB3751-2 / NL917FIB3751-2	408	800	37"	51"	56.25"	48"	49.25"	46"	57.375"	18"

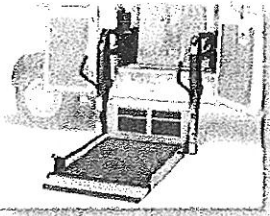
NHTSA Interlock Kit Options



* Plug & Play Kits are used in conjunction with Interlock Kits

34467	GM Public Use Interlock Kit - 2008 & Newer
32542	GM Public Use Interlock Kit - 2001 to 2007 Vans
32543	GM Plug & Play Kit* - 2001 & 2002 Vans
32539-09	Ford Public Use Interlock Kit - 2009 Vans
32539	Ford Public Use Interlock Kit - 2004 to 2008 Vans
32540	Ford Plug & Play Kit* - 2004-2008 with Trans Code A or F, 2004-2006 Code Q
33678	Ford Plug & Play Kit* - 2007 to 2008 with Trans Code Q
33303	Sprinter Public Use Interlock Kit - 2006 Only
32545	Universal Public Use Interlock Kit

NHTSA Installation Kits



	<u>Side Door</u>	<u>Std. Length Rear Door</u>	<u>Ext. Length Rear Door</u>
Ford	30956K	30957K	30970K
GM	30958K	30959K	30981K
Sprinter (up to 2006)	28763K	31407K	
Sprinter (2007 to 2008)	34474KS	34120KS	

Van Mounting Kits contain floor reinforcements for 403/404 compliance.
Use NL916-2 models only for 2006 and older Sprinter side door.

NL2 Millennium-2 Series™ Accessories



23708A913
"Full Curtain"
Lift Cover

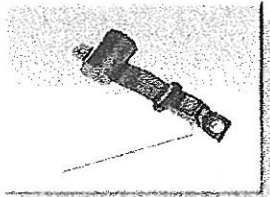


33673NK
Padding Kit
NL2 Series

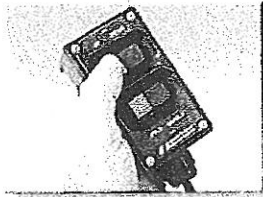


24882A
25977A
28757A
24882ARD

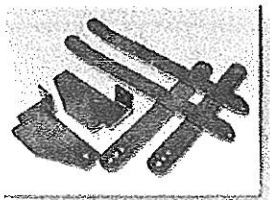
Reflective Tape Kit for Platform Sideplates
High-Conspicuity Reflective 3-M Tape Kit
3" Black & Yellow Reflective Tape Kit (FL)
Red & White Reflective Tape Kit (AL)



31579KS
Handrail
Restraint

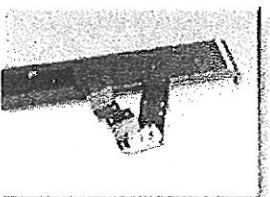


33659KS
Replacement
Hand-Held
Control



35295K

Upper Tower Support Kit - NL2 Series



CHEVY/GMC

19395A96

Rear Bumper Replacement Kit for 1996 & Up

DODGE

16327A

Rear Bumper Replacement Kit for 1994-1997

16327A98

Rear Bumper Replacement Kit for 1998 & Up

FORD

NOTE: When ordering 2001 and newer Ford Econoline and Club Wagon Chassis, use order code #762 to receive the painted rear bumper instead of the standard step bumper.

NL2 Millennium-2 Series™ Specifications

COMMERCIAL WHEELCHAIR LIFT SPECIFICATIONS - IN COMPLIANCE WITH United States Department of Transportation Rules and Regulations 49CFR, Part 38. FROM THE AMERICANS WITH DISABILITIES ACT OF 1990 and NHTSA Rule 403 (2004)

"Provided to make your spec writing easier."

The wheelchair lift is compliant with Federal Motor Vehicle Safety Standard 403 for platform lift systems for motor vehicles. The lift shall have been tested to a minimum static load of 2400#. The lift shall have 800# rated lifting capacity. The base plate shall be a corrugated designed member to provide rigidity to minimize lift deflection when placed under load.

The power supply shall be a 12 volt electro-hydraulic system operating two single-acting cylinders. The hydraulic power pack system shall be of modular design allowing for easy removal and field replacement, if needed. The operation of the unit shall provide a smooth, jerk-free ride in both up and down directions. The power operation of the hydraulic cylinders shall be of a pull-type design for smooth lifting operation and improved synchronous arm movement. The pivot pins in the trunnion (knuckle) of the pivot arms shall be of stationary design. The hydraulic system shall be regulated by two separate relief valves, one of which is designed to prevent accidental stowing when occupied.

The hand control for lift operation shall be of a one-hand operation design made of durable plastic. The hand control will provide user with illuminated functions. The hand control cable shall be coiled with quick-change connections for ease of maintenance or field change.

A manual back-up system shall be provided to ensure operation of the lift in case of electrical failure. The backup system shall provide a reliable means of manually raising and lowering the lift while occupied. The back-up system shall fold and unfold the platform. The back-up pump shall be integrated with the hydraulic power pack system such that no hydraulic lines or fittings are required.

The platform shall be of steel construction and the surface shall be of see-through grating allowing for improved visibility and safer use in inclement weather. The platform shall have a minimum usable wheelchair passageway width of 33 inches and a minimum usable length of 51 inches requiring a 57 inch vertical clear door opening. The sides of the platform shall be a minimum of 2-1/2 inches high.

The platform shall be automatically folded and unfolded and fully automatic in operation. The platform shall allow both inboard and outboard facing of wheelchair and mobility aid users. The platform entrance ramp shall be extruded aluminum for weight savings, have a rubber leading edge and raised ribs for traction. The outer barrier shall be hydraulically activated, and must be in the vertical (deployed) position prior to platform movement. The outer barrier must not raise if occupied with 25 lbs. The outer barrier shall be the sole outboard wheelchair retention device and shall be interlocked and comply with the FMVSS 403 requirements. Dual handrails shall be provided to add security and convenience. These handrails shall be 1-1/4 inch minimum diameter, minimum 30 inches in height, minimum of 8 inches in length, and withstand a 100# force in any direction (including vertical) without permanent deformation. The lift must have a fail safe system to prevent stowing if solenoid welds. The platform shall have "built in" lighting to meet 404 platform lighting requirements with no auxiliary lighting.

All lift components shall be finished with a baked-on powder coating, which will meet a salt spray test of 1000 hours, to provide corrosion resistance and a long service life. Braun Millennium 2 Series to include but not limited to the following model numbers:

• NL917IB-2, NL917FIB-2, NL919IB-2, NL919FIB-2, NL917IB3751-2, NL917FIB3751-2



www.braunlift.com

ISO 9001:2000

631 West 11th Street, Winamac, IN 46996, USA Phone: 574 946 6153 Fax: 574 946 4670

All illustrations, descriptions and specifications in this guide are based on the latest product information available at the time of publication. The Braun Corporation reserves the right to make changes at any time without notice.
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FEATHER WEIGHT

FOLDAWAY BV & AM STYLES

Freedman Seating gives you the largest selection of Foldaways in the industry. Whether you need space for luggage or wheel chairs, we have the right seat. Easy to install and easier to operate, our Foldaways will provide you with miles and miles of happy riders and drivers. Maybe we should say, "smiles and smiles". Freedman Seating, "Not just seats—seating solutions."



Not Just Seats

Seating Solutions™

THE FEATHER WEIGHT SERIES BY

FREEDMAN

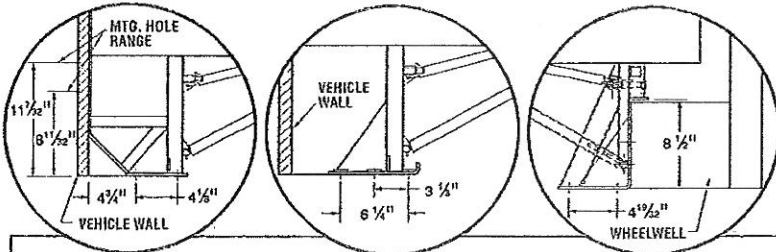
SEATING COMPANY

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High back, standard back and chair back are shown

FEATHER WEIGHT

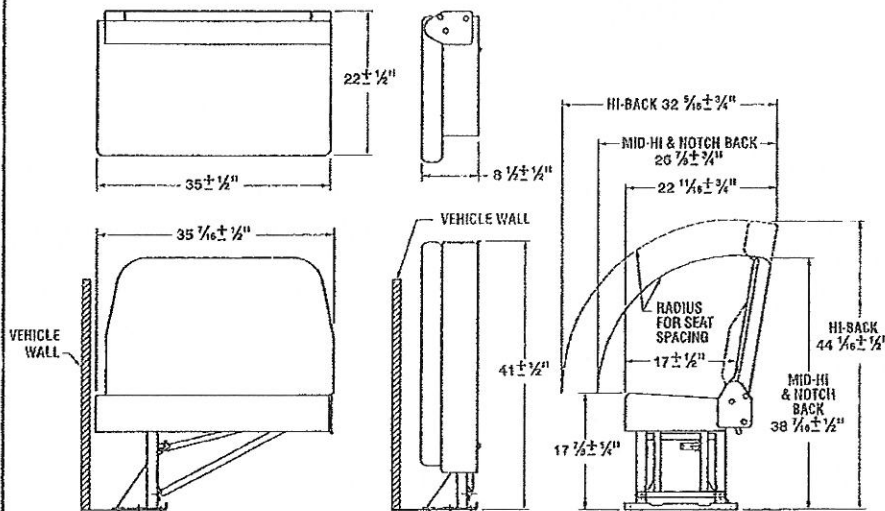
Foldaway BV & AM STYLES



AM2 Floor/Wall Mount

BV Floor Mount

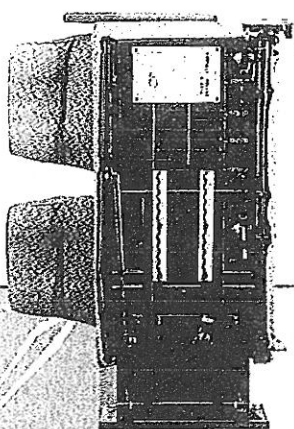
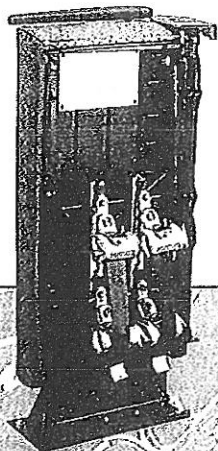
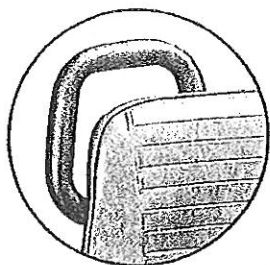
BVWW3 Floor Mount



Corner Grabs

TDSS with belts

TDSS without belts



belts not included

Standard Features:

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

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

Options:

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

Not Just Seats

THE FEATHER WEIGHT SERIES BY

FREEDMAN
SEATING COMPANY

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

We are constantly updating and improving our seats; therefore we reserve the right to change or modify specifications or materials without notice. All Freedman Seating Company seats meet or exceed FMVS standards.

Seating Solutions™

FEATHER WEIGHT

MID-HI SEAT "ROCK SOLID"



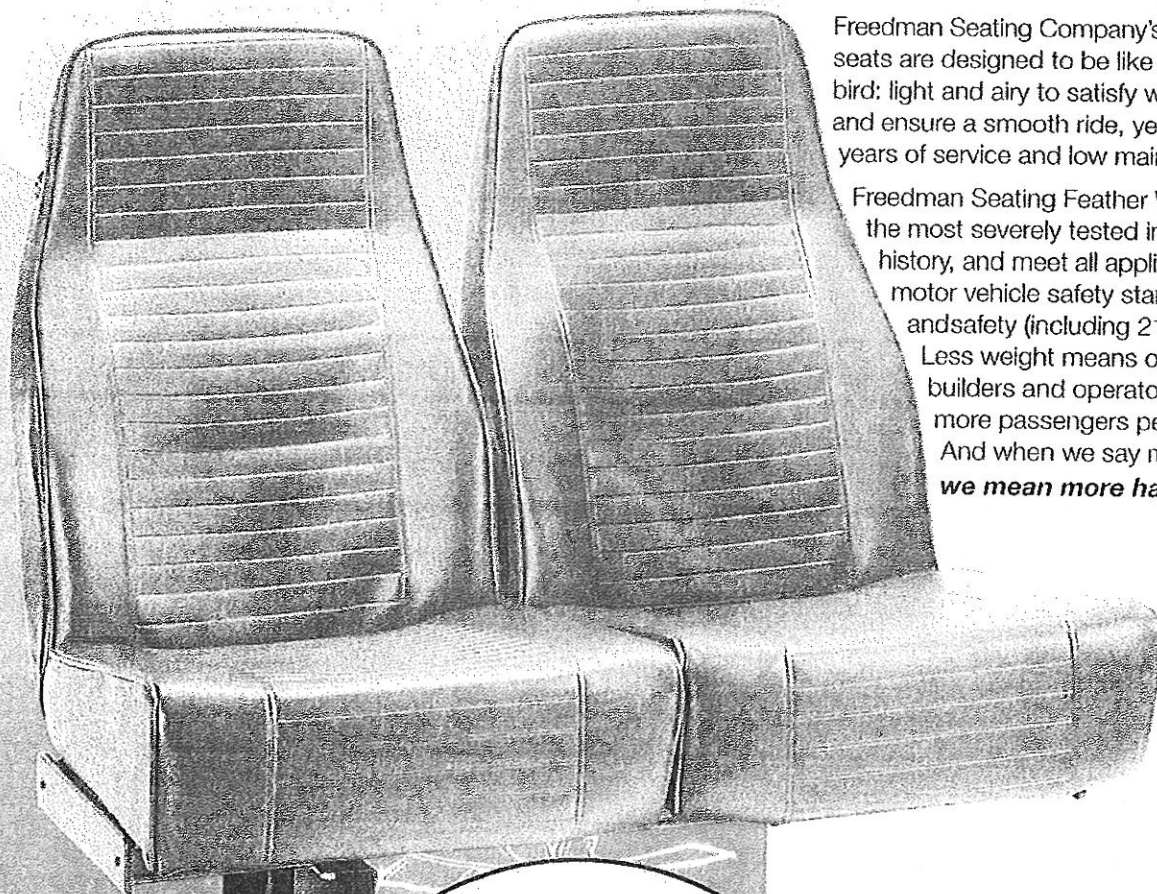
Sustainable Seating Solutions

Freedman Seating Company's Feather Weight seats are designed to be like feathers on a bird: light and airy to satisfy weight restrictions and ensure a smooth ride, yet durable for years of service and low maintenance.

Freedman Seating Feather Weight seats are the most severely tested in the company's history, and meet all applicable federal motor vehicle safety standards for strength and safety (including 210 for seat belts).

Less weight means one thing to bus builders and operators: they can get more passengers per bus.

And when we say more passengers, *we mean more happy passengers.*



Not Just Seats



Seating Solutions™

THE FEATHER WEIGHT SERIES BY

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FEATHER WEIGHT

MID-HI SEAT "ROCK SOLID"



Sustainable Seating Solutions

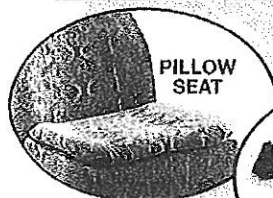
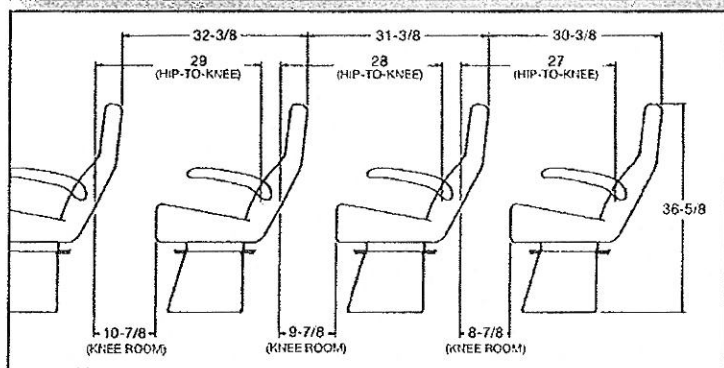
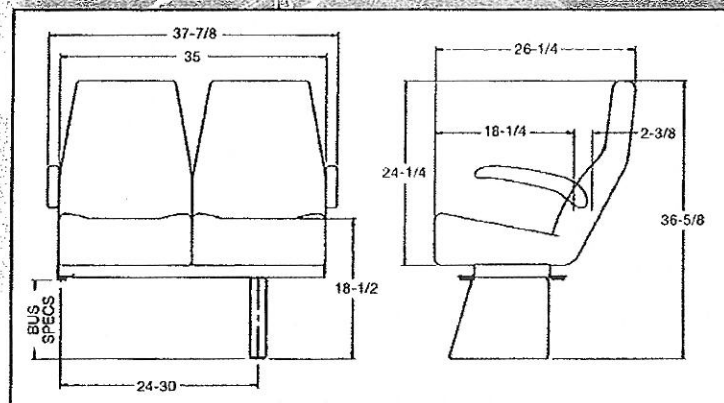
Whether your bus is for tour/charter, para-transit, or shuttle, Feather Weight Mid-Hi works for you. Optional adjustable headrests and reclining back-rests give you luxuries for long journeys, while grab rails and ABS plastic backs provide the function and safety required for shorter trips. The ultra-thin backrest gives outstanding support and creates more hip-to-knee room than any other seat in its class. The steel frame system meets or exceeds all applicable government standards for safety and durability. And, it's light as a feather!

Feather Weight Mid-Hi features include:

- An ultra-thin *Knee-Saver* type backrest for added hip-to-knee room and lumbar support
- Molded polyurethane seat and back cushions for comfort and long lasting support
- 17½" wide seat cushions
- 22½" back height off the seat cushion, 37" off the floor
- Wire mesh-grid seat springs for even support
- FMVSS 210 compliance—all *Feather Weight* seats are seat belt ready
- Transit style—rigid backrests (starting weight without options—43 lbs.)
- Touring style—reclining backrests (starting weight without options—47 lbs.)
- Covers that can be removed and replaced easily and without the use of special tools

Feather Weight Mid-Hi options include:

- Black molded U.S. Arms or upholstered flip-up armrests
- Adjustable headrests
- Black or yellow corner AV grab rails
- Black or yellow top AV grab rails
- ABS plastic backs
- Mesh map pockets
- Vertical stitching
- FTA foam
- Snack trays
- Aluminum folding footrests
- Pillow seat cushions
- Rear row quick disconnect
- Side sliders
- 16", 18" or 19" wide seats available
- Rigid or reclining backrests
- Seat belts
 - Non-retracting seat belts
 - Retracting seat belts
 - USR (Under Seat Retractors)
- S3 Bio-Cushions (Made with vegetable oil)
- A wide variety of cloths and vinyls
- S3 cloths (Made with recycled yarn)

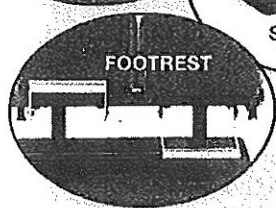


PILLOW SEAT

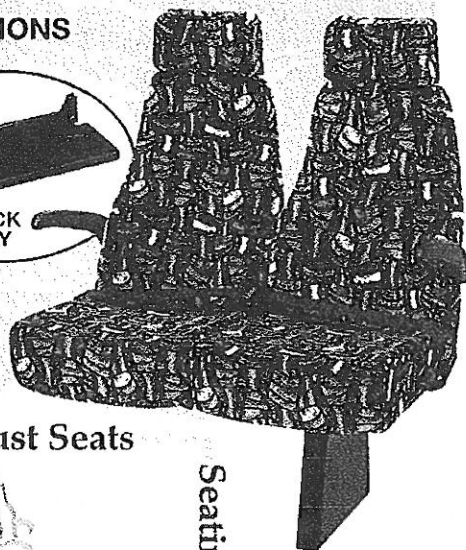
OPTIONS



SNACK TRAY



FOOTREST



Not Just Seats



Seating Solutions™




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(773) 524-2440 (800) 443-4540 Fax (773) 252-7450
e-mail: sales@freedmanseat.com
WWW.FREEDMANSEATING.COM

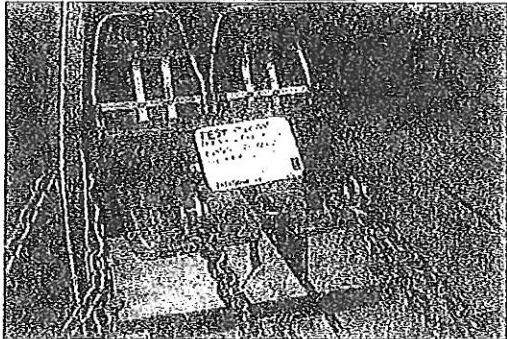

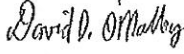
We are constantly updating and improving our seats; therefore we reserve the right to change or modify specifications or materials without notice. All Freedman Seating Company seats meet or exceed FMVSS standards.

ISO 9001:2000 registered

SINGLE RIGID SEAT

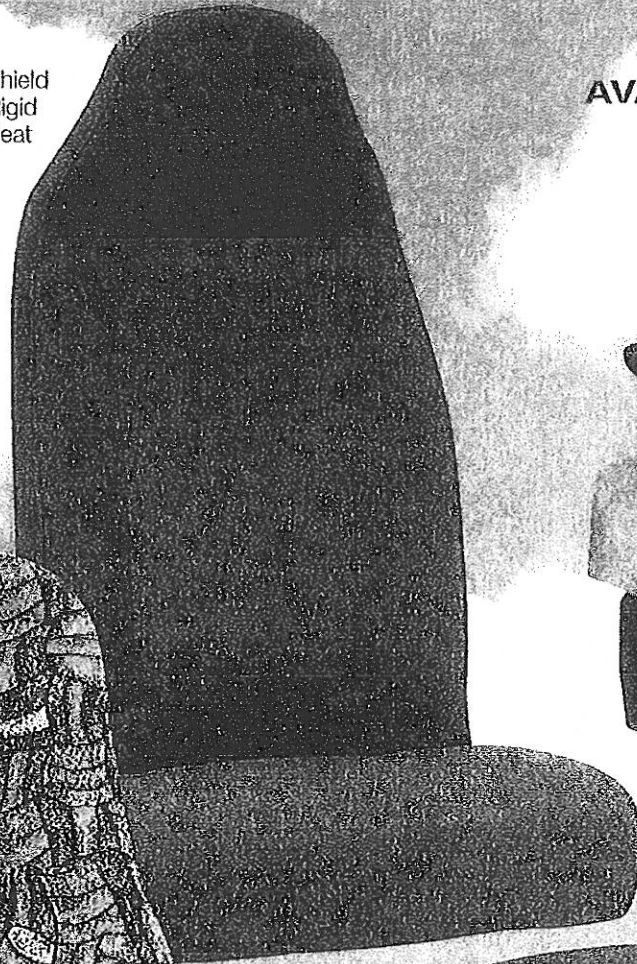
<u>Test / Work Order No.</u> 0703J	FSTL Final Test Report	<u>Test Facility:</u> FSTL 4646 W. Augusta Blvd. Chicago, IL 60661
<u>Test Date:</u> 3/14/2007	<u>Test Procedure:</u> FMVSS 207/210	
Description of Item Tested		
<p>All test items are obtained according to FSTL procedure LAI-011 unless otherwise noted. All items are tested for compliance with applicable standards, previously reviewed and approved by the party requesting this test, unless otherwise specifically noted:</p> <p>Goshen installed a FSC single, CS, forward facing, FW rigid seat [35598] with leg [35745] spaced 17 1/2" from the wall on baseframe [36878] in Goshen Buck-1 [0123806] in Pos-5. The seat had a shoulder belt with the d-ring tethered from the wall and anchored to the wall track with unistrut nut [500-125-138-1] with (1) 7/16"-20 x 1 1/2" gr.8 stud, 7/16" nut, and 7/16" high strength washer. The seat was secured to the test buck floor in the rear using unistrut nut [500-125-3-2] with (2) 7/16"-20 x 1 1/2" gr.8 studs, 7/16" nuts, and 7/16" high strength washers. The front of the leg used unistrut nut [500-125-138-1] with (1) 7/16"-20 x 1 1/2" gr.8 stud, 7/16" nut, and 7/16" high strength washer. The seat was secured to the test buck wall in the rear using unistrut nut [500-125-3-2] with (1) 7/16"-20 x 1 1/2" gr.8 stud, 7/16" nuts, and 7/16" high strength washers in the rear hole. The front of the baseframe used unistrut nut [500-125-138-1] with (1) 7/16"-20 x 1 1/2" gr.8 stud, 7/16" nut, and 7/16" high strength washer. All nuts torqued to 55 ft*lbs. Please see the attached photographs for details of the test set-up.</p>		
Description of Results		
		
<p>Summary of FMVSS Section 571.207.S4.2a & Section 571.210.S5.2</p> <p>A force of 3,000 lb shall be applied to each lap and shoulder belt at 10° ± 5° above the horizontal plane. In addition a force equal to 20 times the system mass (620 lb) was applied simultaneously through the CG of the seating system. The required forces must be reached within 30 seconds from the onset of the test then, when reached must be held for 10 seconds. The total of the forces applied during this test was 6,620 lb.</p> <p>Note: Full compliance with FMVSS and its Regulations, as set forth under 49 USC 301, et. seq., can only be achieved through proper in-vehicle testing. Freedman Seating Company, its agents, employees, affiliates and subsidiaries ("Freedman Seating") is not liable for damages resulting from the installation of any seat in a vehicle that has not been FMVSS tested or any installation of a seat that deviates from a FMVSS tested installation method. Freedman Seating has no responsibility for the design of any vehicle in which the subject seat may be placed, or any resulting damages. The results documented in this report relate only to the items tested, as described herein.</p>		
Test Opinions and Interpretations		
<p>Note: This Test Report is provided solely for the use of the party requesting the same identified below, and for no other person, entity or purpose. Reproduction of this document is strictly prohibited without the prior written permission of FSTL in each instance.</p> <p>The seat as tested complied to the above Test Procedures. (Please see chart and pictures for details)</p> <p>The test complied with the above Test Procedure: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>		
<u>Test Setup Approved by:</u>	 <small>Digitally signed by Miguel Flores DN: cn=Miguel Flores, o=US, ou=Freedman Seating, ou=FSTL Reason: I have reviewed this document Location: Chicago Date: 2007.04.04 10:15:51 -0500</small>	<u>Test Requested By:</u>
<u>Test Report Approved by:</u>	 <small>Digitally signed by David O'Malley DN: cn=David O'Malley, o=US, ou=Freedman Seating Test Lab, ou=FSTL Reason: I am approving this document Location: Chicago Date: 2007.04.04 10:19:49 -0500</small>	<u>Request Date:</u> 1/9/2007
<u>Test Setup Approved by:</u> <small>Digitally signed by Miguel Flores DN: cn=Miguel Flores, o=US, ou=Freedman Seating, ou=FSTL Reason: I have reviewed this document Location: Chicago Date: 2007.04.04 10:15:51 -0500</small>		

DOUBLE RIGID SEAT

Test / Work Order No. 0708W	FSTL Final Test Report		Test Facility: FSTL
Test Date: 10/16/2007	Test Procedure: FMVSS 207/210		4545 W. Augusta Blvd. Chicago, IL 60651
Description of Item Tested			
All test items are obtained according to FSTL procedure LAI-011 unless otherwise noted. All items are tested for compliance with applicable standards, previously reviewed and approved by the party requesting this test, unless otherwise specifically noted:			
Goshen installed a FSC double, CS, forward facing, FW rigid seat [35598] with leg [35745] spaced 26 1/2" from the wall on baseframe [35660] in Goshen Buck-6 [0124440] in Pos-4. The seat was secured to the test buck floor in the rear using unistrut nut [500-125-3-2] with (2) 7/16"-20 x 1 1/2" gr.8 studs, 7/16" nuts, and 7/16" high strength washers. The front of the leg used unistrut nut [500-125-138-1] with (1) 7/16"-20 x 1 1/2" gr.8 stud, 7/16" nut, and 7/16" high strength washer. The seat was secured to the test buck wall in the rear using unistrut nut [500-125-3-2] with (1) 7/16"-20 x 1 1/2" gr.8 stud, 7/16" nuts, and 7/16" high strength washers in the rear hole. The front of the baseframe used unistrut nut [500-125-138-1] with (1) 7/16"-20 x 1 1/2" gr.8 stud, 7/16" nut, and 7/16" high strength washer. All nuts torqued to 45 ft*lbs. Please see the attached photographs for details of the test set-up.			
Description of Results			
			
Summary of FMVSS Section 571.207.S4.2a & Section 571.210.S5.1			
A force of 5,000 lb shall be applied to each lap belt at 10° ± 5° above the horizontal plane [aisle]. In addition a force equal to 20 times the system mass (1,000 lb) was applied simultaneously through the CG of the seating system. The required forces must be reached within 30 seconds from the onset of the test then, when reached must be held for 10 seconds. The total of the forces applied during this test was 11,000 lb.			
Note: Full compliance with FMVSS and its Regulations, as set forth under 49 USC 301, et. seq., can only be achieved through proper in-vehicle testing. Freedman Seating Company, its agents, employees, affiliates and subsidiaries ("Freedman Seating") is not liable for damages resulting from the installation of any seat in a vehicle that has not been FMVSS tested or any installation of a seat that deviates from a FMVSS tested installation method. Freedman Seating has no responsibility for the design of any vehicle in which the subject seat may be placed, or any resulting damages. The results documented in this report relate only to the items tested, as described herein.			
Test Opinions and Interpretations			
Note: This Test Report is provided solely for the use of the party requesting the same identified below, and for no other person, entity or purpose. Reproduction of this document is strictly prohibited without the prior written permission of FSTL in each instance.			
The seat as tested did reach FMVSS within time. The floor track failed at about 40 seconds after the onset of the test. (Please see chart and pictures for details)			
The test complied with the above Test Procedure: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>			
Test Setup Approved by: 	Digitally signed by David O'Malley DN: CN = David O'Malley, O = US, O = Freedman Seat Test Lab, OU = FSTL Reason: I have reviewed this document. Location: Chicago Date: 2007.10.29 13:35:42 -0500		Test Requested By: Don Hasty Goshen Coach 25161 Leer Drive Elkhart, IN.
Test Report Approved by: 	Digitally signed by David O'Malley DN: CN = David O'Malley, O = US, O = Freedman Seat Test Lab, OU = FSTL Reason: I am approving this document. Location: Chicago Date: 2007.10.29 13:48:43 -0500		Request Date: 8/20/2007

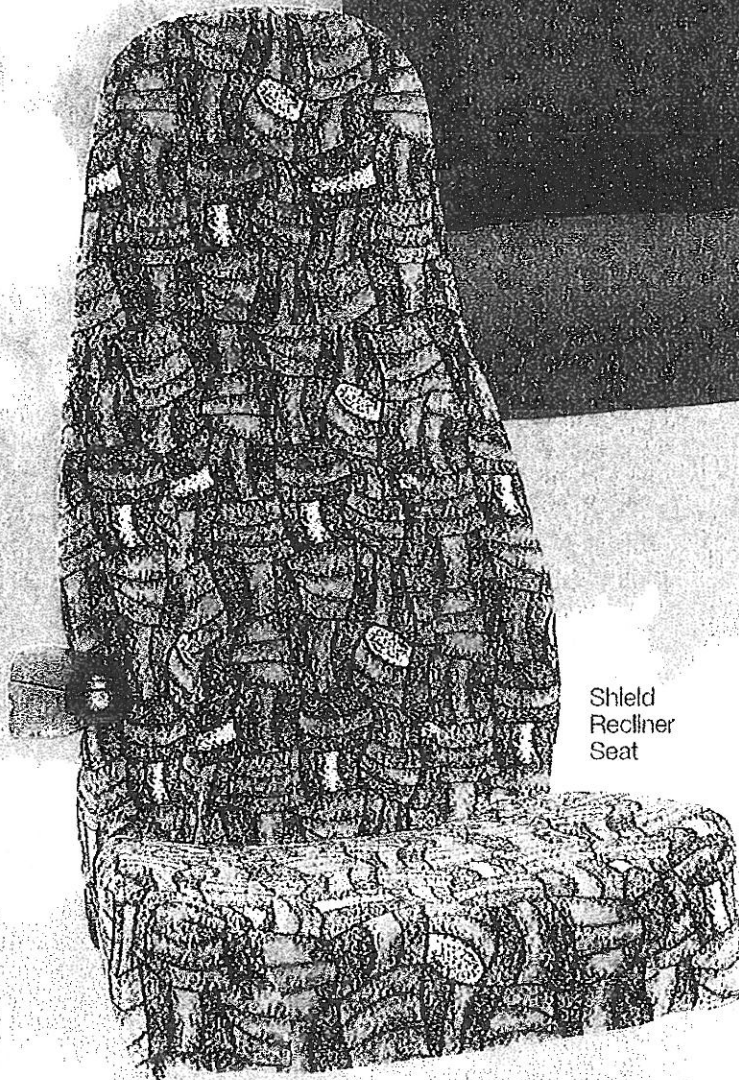
FREEDMAN SHIELD DRIVER SEATS

Shield
Rigid
Seat

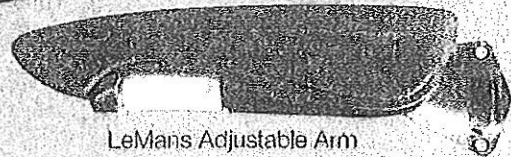


**NOW
AVAILABLE**

Sport Seat
Upgrade



Shield
Recliner
Seat



LeMans Adjustable Arm



Sustainable Seating Solutions
Freedman Seating Company

Not Just Seats

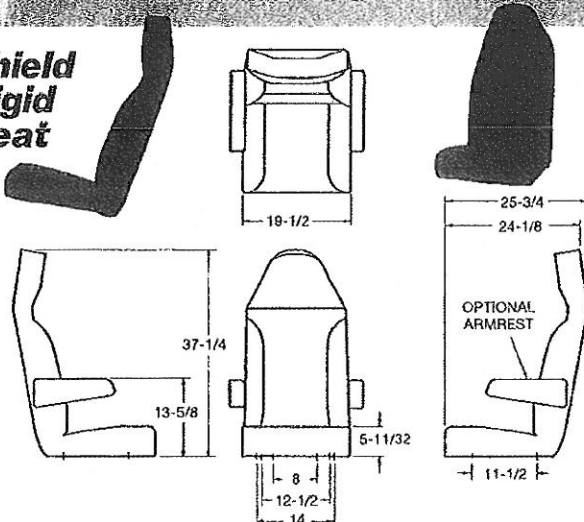


Seating Solutions™

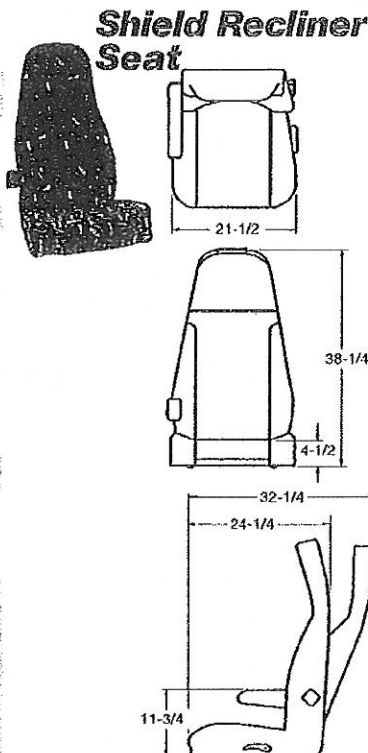
FREEDMAN
SEATING COMPANY

FREEDMAN SHIELD DRIVER SEATS

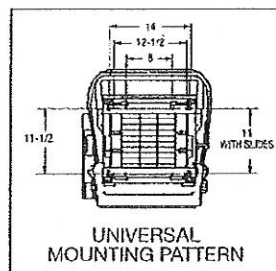
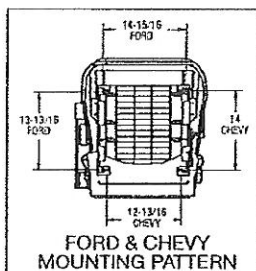
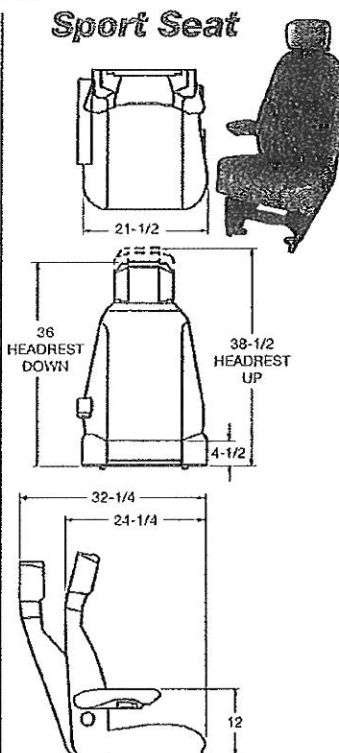
Shield Rigid Seat



Shield Recliner Seat



Sport Seat



MARKETS



We are constantly updating and improving our seats; therefore we reserve the right to change or modify specifications or materials without notice. All Freedman Seating Company seats meet or exceed FMVSS standards.

Shield Rigid Seat

Standard features:

- Designed and tested to comply with all applicable FMVSS requirements including 202A headrest standard
- Taller and wider headrest with decreased backset
- "Cushier" headrest for dynamic impact headrest absorption
- Automotive grade 4-spring seat flex-o-later for even load support and long life
- J-clip upholstery fastening for quick change out with no special tools
- High quality molded polyurethane seat and back cushions
- Universal mounting holes to fit Freedman Seating pedestals and most aftermarket bases

Rigid Seat optional features:

- Flip arms: US Arm, AMA upholstered or wide upholstered
- Mesh map pocket
- Vertical stitching
- Wide array of fabrics and vinyls
- 4-position adjustable lumbar support
- S3 Bio Cushions
- Fore/Aft slide tracks

Shield Recliner and Sport Seats

Standard features:

- Designed and tested to comply with all applicable FMVSS requirements including 202A headrest standard
- Taller and wider headrest with decreased backset
- "Cushier" headrest for dynamic impact headrest absorption
- Mesh map pocket
- Automotive grade 4-spring seat flex-o-later for even load support and long life
- J-clip upholstery fastening for quick change out with no special tools
- High quality molded polyurethane seat and back cushions

Recliner Seat additional standard features:

- 4-position adjustable lumbar-LH lever (RH lever on copilot)
- RH Shield arm
- Heavy duty recliner mechanism
- Mounting brackets to fit Ford E-Series and Chevy cutaway seat delete bases

Recliner Seat optional features:

- Vertical stitching (not for Sport)
- Wide array of fabrics and vinyls
- FTA foam
- S3 Bio Cushions
- Universal mounting kit to fit Freedman Seating pedestals and aftermarket bases
- Fore/Aft slide tracks (not for Ford or Chevy seats), required for universal mounting

Sport Seat additional standard features:

- Infinitely adjustable 4-way lumbar (up/down and in/out)
- RH LeMans arm



Sustainable Seating Solutions
Freedman Seating Company

Not Just Seats

Seating Solutions™

FREEDMAN
SEATING COMPANY

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

QRT DELUXE

The QRT Deluxe is a complete wheelchair and occupant securement system that will meet and exceed your expectations for speed, endurance, and ease of use.

The QRT Deluxe is the first ever securement that can self-lock & self-tension itself **automatically**. It is so easy to use that it takes only one hand to operate. The QRT Deluxe has been designed with a low profile to allow most types of wheelchairs to easily move into place without encountering obstructions.

One hand operation - Automatic

The unique automatic, self-locking & self-tensioning feature enables the retractor to be operated with one hand.

Durability - Dual Zinc Knobs

The securing retractors do not require the use of tensioning knobs. Knobs are made of zinc material.

No obstructions - Low Profile

This feature allows the wheelchair footrest to pass over the retractors.

Peace of Mind - Positive Lock Indicator (PLI)

The Red line indicator clearly identifies the fitting is in the locked position. This is a unique, patented feature that provides another degree of reliability.

No guesswork - Interchangeable Retractors

All retractable securements are the same in design, size and shape to avoid confusion in placement.

Warranty - 2 years

Testing and compliance:

Meets all ISO 10542, SAE J2249, FMVSS 209,302, 210,222, CMVSS 209, CSA Z605, AS2596 and ADA requirements. Manufactured under the ISO 9000 Quality System.

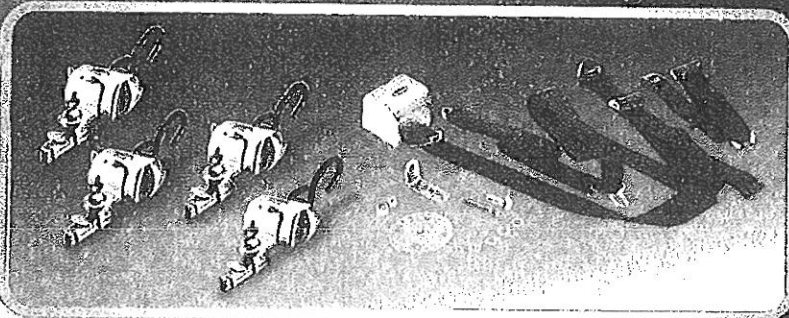
Testing documentation available upon request

Q'STRAIT

Q-8100-A1

QRT Deluxe System with retractable lap and shoulder belt combination.

- 4 QRT Deluxe retractors with pin connector and fittings (Q8-6200)
 - 1 Lap and shoulder belt combination with manual height adjuster, (emergency locking retractor) - (Q8-6326-A1)
- Serialized system with complete installation and driver operator instructions.



Q-8100-A1 Slide n' Click floor anchorage assembly included.
Retrofit for Q5-7560-5A available.



A-Track fitting anchorage,
order part number Q-8100-A1-A



L-Track, Positive Lock Fitting anchorage,
order part number Q-8100-A1-L

Q-8100-A

QRT Deluxe System with standard lap and standard shoulder belt.

- 4 QRT Deluxe retractors with pin connector and fittings (Q8-6200)
 - 1 Standard lap and standard shoulder belt (Q8-6325-A)
- Serialized system with complete installation and driver operator instructions.



Q-8100-A Slide n' Click floor anchorage assembly included.
Retrofit for Q5-7560-5A available.



A-Track fitting anchorage,
order part number Q-8100-A-A

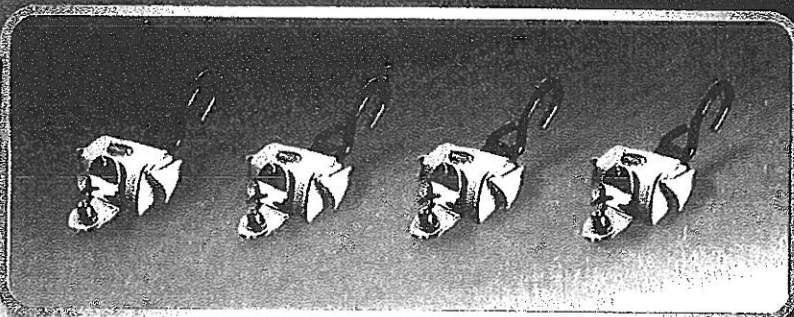


L-Track, Positive Lock Fitting anchorage,
order part number Q-8100-A-L

Q-8101

QRT Deluxe retractor series.

The Q-8101 Series consists of 4 QRT Deluxe retractors mounted to your preferred fittings.



Q-8101 Slide n' Click floor anchorage assembly included.
Retrofit for Q5-7560-5A available.



A-Track fitting anchorage,
order part number Q-8101-A



L-Track, Positive Lock Fitting anchorage,
order part number Q-8101-L

NEW! **Ford** **Fender Mount Mirror System**

FEATURING: Rosco's new passenger side Ford fender mount for all Rosco Accustyle and Eurostyle mirror heads, including hand adjustable, remote, heated, and LED signal light options.

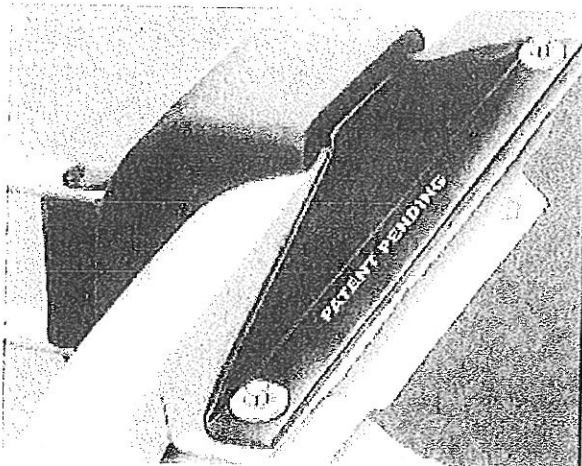
Traditional passenger side arm and brace systems were cumbersome, difficult to install, prone to damage, and down right unsightly. Newer, more simplified fender mounts often provided an improvement on aesthetics, but generally relied only on the thin fender wall for support. This resulted in mirror head vibration and loose fasteners.

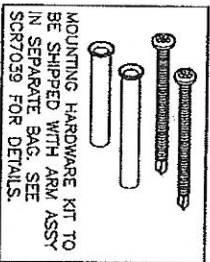
Now, through Rosco's innovative "Z-Bracket Technology" (bottom left), the stability and maintenance free durability of traditional fender mounts has been combined with the pleasing aesthetics and ease of installation of newer designs to create the industry's most sought after Ford fender solution.

The Ford System by Rosco consisting of the new fender mount, together with Rosco's patch mount driver side mirror (bottom right), is ready to be proposed to your company.



Please contact Rosco at 1-800-227-2095 for details and pricing.





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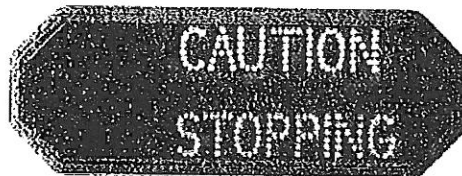
Driver Alert™ Model 7500

Dual safety messages alert traffic when school buses are stopping or stopped

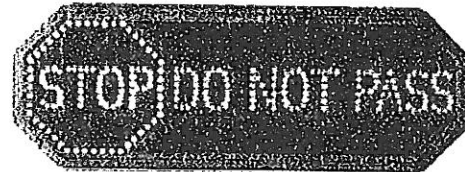
Transpec Worldwide proudly introduces the **DRIVER ALERT™** Model 7500. Built Transpec tough, our display unit flashes two distinct LED safety messages to alert drivers when a school bus is stopping or stopped.

- High Visibility LED Display
- Reduces Pass-by's
- Reduces Rear-end Collisions
- Improves Safety
- Easy to Install
- Low Maintenance
- Impact/Scratch Resistant
- Built Transpec Tough

"Caution" and "Stopping" flashes when amber lights or emergency flashers are activated.



"Stop" and "Do Not Pass" flashes when red lights and stop arm are deployed.



SENDS A CLEAR MESSAGE TO TRAFFIC

When amber lights or emergency flashers are activated, such as at a railroad crossing, the **DRIVER ALERT™** flashes its bright LED message of *Caution - Stopping*. When red lights and stop arm are deployed, the **DRIVER ALERT™** alternately flashes the message *Stop* with *Do Not Pass*. The result is improved bus safety by helping to reduce pass-by's and rear-end collisions.

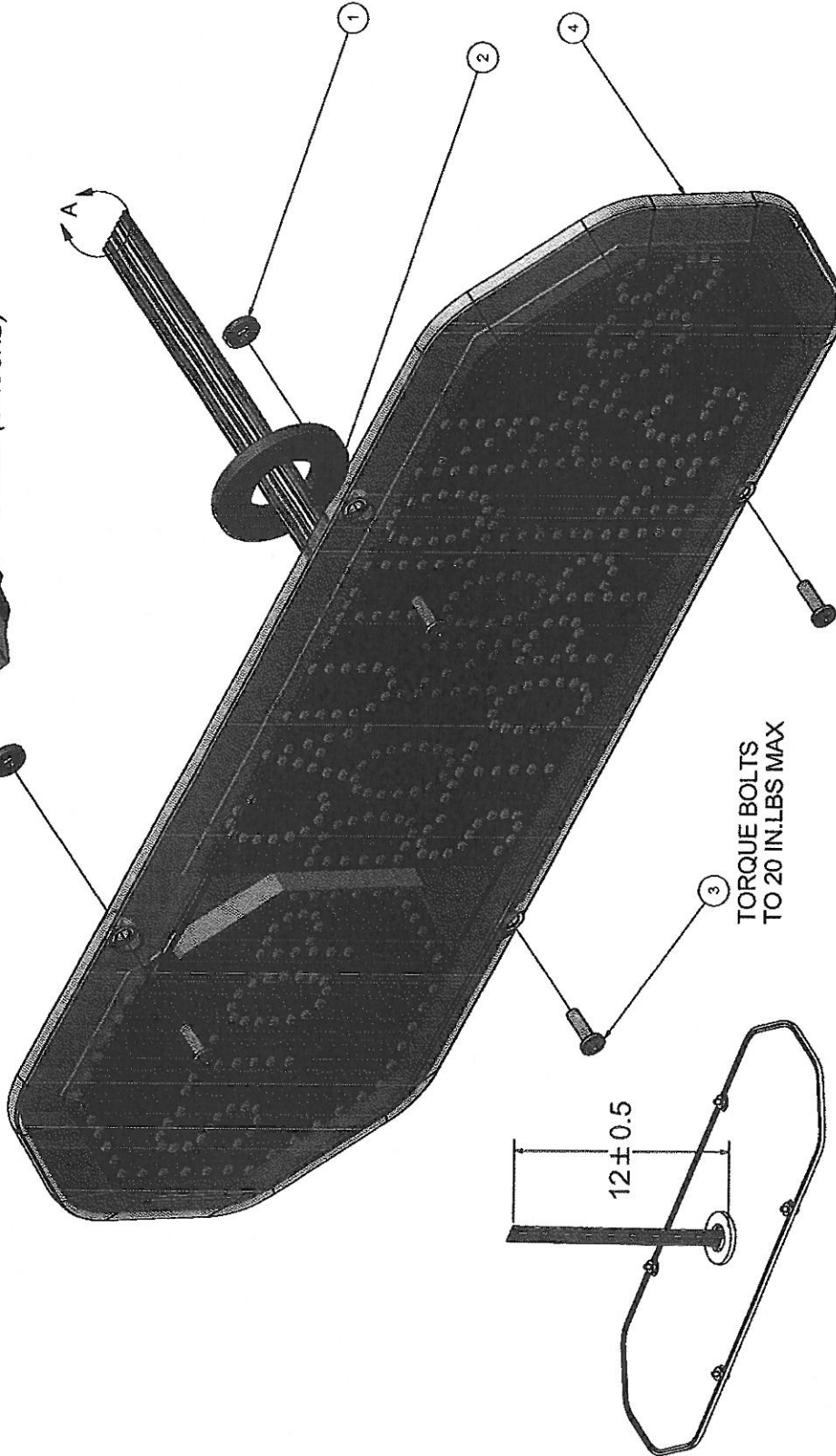
THE HIGHLY VISIBLE LED DISPLAY LETS YOU BE SEEN AND BE SAFER

The Transpec **DRIVER ALERT™** is simple to install. The intense LED display offers outstanding readability and long life with minimum maintenance. The **DRIVER ALERT™** is sealed to keep out all the elements and covered with a durable polycarbonate lens that resists impacts and scratches.

NOTE - WIRING CONNECTIONS:

- BLUE W/ WHITE STRIPE (STOPPING, RIGHT TURN SIGNAL)
- BLUE (CAUTION, LEFT TURN SIGNAL)
- ORANGE (CAUTION, BACK UP LIGHT)
- YELLOW W/ BLACK STRIPE (STOPPING, LEFT AMBER WARNING)
- YELLOW (CAUTION, RIGHT AMBER WARNING)
- RED W/ WHITE STRIPE (DO NOT PASS, RIGHT RED WARN)
- RED (STOP, LEFT RED WARNING)
- BLACK (GROUND)

DETAIL A
SCALE 3:1



TORQUE BOLTS
TO 20 IN.LBS MAX

12 ± 0.5

Parts List			DESCRIPTION
ITEM	QTY	PART NUM	
1	4	7524	Outer Gasket for Driver/Merge Alert
2	1	7527	Center Gasket for Driver/Merge Alert
3	4	7529	#12-24 X .75 Phillips Self Tapping Screw
4	1	7551	Driver Alert Sub-Assembly

MATERIAL SEE DETAIL DRAWINGS		DATE: 06/30/06	
DRAWN BY: KEVIN WOLF	TOLERANCE: UNLESS OTHERWISE SPECIFIED	INCH: METRIC:	
		X = +.020	X = +.5 MM
		XX = +.010	XX = +.3 MM
		XXX = +.005	XXX = +.3 MM
		ANGLES = ±.12 DEG.	
APPROVED BY: PAUL	SCALE: NONE	DATE: 06/30/06	REV. A
MANAGER VIDRI		BY: KLM	ECN #
REVISED DRAWING WITH NEW DRIVER ALERT SUB-ASSEMBLY		DATE: 06/30/06	REV. A
REVISION:		DATE: 06/30/06	REV. A
PRODUCT: DRIVER ALERT		DATE: 06/30/06	REV. A
REV: B		DATE: 06/30/06	REV. A
TITLE: Safety Stop "Driver Alert" w/ Gaskets & Screws (Rev: "B")		DATE: 06/30/06	REV. A
WORLDWIDE		DATE: 06/30/06	REV. A
TRANSPEC		DATE: 06/30/06	REV. A
DWG NO: 7500-000-000		DATE: 06/30/06	REV. A



Z TECHNOLOGIES CORPORATION
World Leaders in Corrosion Protection

03/4/2009

MB # -(0104UAMG1)

Z SHIELD™ 6001

GRAY, WATER BASED, ANTI CORROSION, FAST DRY PRIMER

A semi-gloss, hard, durable, water-based polymeric rust preventive coating, adaptable for spray application to sheet metal, hot rolled steel, castings, forgings, extruded metal, and cast aluminum. This coating is intended for chassis and axle components and is resistant to elevated temperatures. The 6000 GRAY is designed to protect metal substrates even when applied as a thin coating. The coating is fast drying and can be air dried, force dried or subjected to high temperature bake cycles. This formula was designed to coat "oily" steel and dirty surfaces. This formula does not contribute significantly to VOC emissions.

PHYSICAL PROPERTIES

Appearance	Gray Liquid
% NVM by WT.	56.0 ± 2.0
% NVM by VOL.	52.0 ± 2.0
Density	10.8 lb/gal
Viscosity (after reduction with water) per Brookfield RVT #5 Spindle	
20 RPM	500 ± 100 cps
100 RPM	300 ± 60 cps
Viscosity per #4 Zahn cup	26 ± 4 sec.
Mechanical Stability	Excellent
Heat Stability	Excellent
Freeze/Thaw Stability	Pass (5 cycles)
V.O.C.	0.07 lbs/gal
D.O.T. Flammability Rating	200° F
pH	8.5 ± 0.5
Cryptometer/#2 Wedge, ASTM D1212	15
60° Gloss	20

FILM PROPERTIES

Performance testing reflects coating on unpolished Q panels with four day air-dried films at 3.0 - 4.0 mils dry.

Dry to touch at R.T., ASTM D1640	10 ± 2 minutes
Dry-to-Handle at R.T., ASTM D1640	20 ± 5 minutes
Chemical Stability	Very good
Salt Spray, ASTM B117, 1000 hours	Field, scribe, edge clean; slight blistering

See Warranty/Caution on Back.

Z TECHNOLOGIES CORPORATION

World Leaders in Corrosion Protection

26500 Capital Avenue, Redford, Michigan 48239-2297
Telephone (313) 937-0710 • Fax (313) 937-1470

4

5 Year Limited Warranty
on
Undercoating produced by Z Technologies Corporation
for use by
Goshen Coach, Inc.

Subject to the terms, conditions and limitations in this Warranty, Z Technologies Corporation (the "Warrantor") hereby warrants to the original vehicle owner ("Owner") that the Z Technologies Undercoating used in the construction by Goshen Coach meets the specifications set forth in Z Technologies' current Product Profile, and when applied to new Goshen Coach products in the manner set forth in Z Technologies' application recommendations, will protect those products from damage by rust for a period of five (5) years from the date of the Owner's purchase.

In the event that refurbishing is required as a result of damage caused by rusting within five (5) years of the Purchase Date, Warrantor's entire liability to Owner, and Owner's sole and exclusive remedy, will be to provide replacement undercoating, to advise Owner on proper refurbishing methods and to reimburse the cost of refurbishing up to the original cost of installing the undercoating on the vehicle in question. Owner will be responsible for all other costs and expenses in connection with the refurbishing, including transportation. Warrantor will not, under any circumstances, be responsible for special (except as expressly stated in this paragraph), indirect, incidental, consequential or punitive damages.

If corrosion damage appears to have occurred while this Warranty is in effect, Owner shall notify Goshen Coach within 90 days after discovery of same. Goshen Coach will, in turn, notify Warrantor. All claims made under this Warranty must be made to Z Technologies within 63 months after the Purchase Date. This Warranty shall have no effect unless Owner authorizes Z Technologies to inspect the vehicle on site. Z Technologies will make the final determination as to whether or not repairs are authorized under this Warranty.

This Warranty does not apply to claims arising from damage due to:

- Misuse, alteration or negligence,
- Subsequent or additional coatings applied over or under the undercoating warranted,
- Dents, scratches, unusual contact, abrasion or fair wear and tear attributed to normal operating conditions,
- Failure to promptly repair damaged coating,
- Exposure to fire, heat, chemicals, explosion or any other natural causes.

The limited warranty provided herein is the sole and exclusive warranty with respect to Z Technologies undercoating. Any implied warranty, including any warranty of merchantability or warranty of fitness for a particular purpose, is limited in duration to the stated period of these written warranties. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

No dealer, salesman, representative or other person is authorized to make any warranties with respect to Undercoating, extend the warranty period or otherwise change modify or amend the provisions of this warranty.

This warranty is applicable only to the original Goshen Coach vehicle Owner and may not be transferred to any other person, firm or entity.

Goshen Coach Unit Serial No. _____
Z Technologies, the Originators of Ziebart Protective Coatings

FREEDMAN

SEATING COMPANY

US Armrest



CLICK TO VIEW LARGER IMAGES:



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4545 West Augusta Boulevard

Chicago, IL 60651

AN ISO 9001-2000 CERTIFIED COMPANY

PHONE: 800-443-4540

FAX: 773-252-7450

EMAIL: salesinfo@freedmanseat.com

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Our Products

[SCHOOL BUS](#)[TRANSIT](#)[MOTOR COACH](#)[SHUTTLE BUS](#)[AG/CONSTRUCTION](#)**Part No. 710292**

Mobile DVR, Digital BUS-WATCH® SD40 Four Channel

Features:

- Record up to 4 channels of audio/video - 60 fps at D1 resolution
- Lockable SD card slot utilizes professional grade 32GB REI SD card
- Easy-to-use RX Series viewing software
- H.264 advanced video compression
- Dual streaming Wi-Fi and 3G/4G compatible
- USB auto download
- Durable, compact & lightweight
- Quiet, clean fanless design
- Optional security caps

Environment:

- Power: 8 to 30 VDC
- Dimensions: 8" x 2.25" x 9"
- Weight: 3.11 lbs (1.5 kg) with mounting brackets
- Operating Current: 1 amp continuous/3 amps max (heater operating) @ 12 volts
- Standby Current: < 100 milliamps @ 12 volts
- Operation Temperature: -40°F to +158°F (-40°C to +70°C)
- Operating Humidity: 20% - 95%, non-condensing

[View Full Spec Page](#)

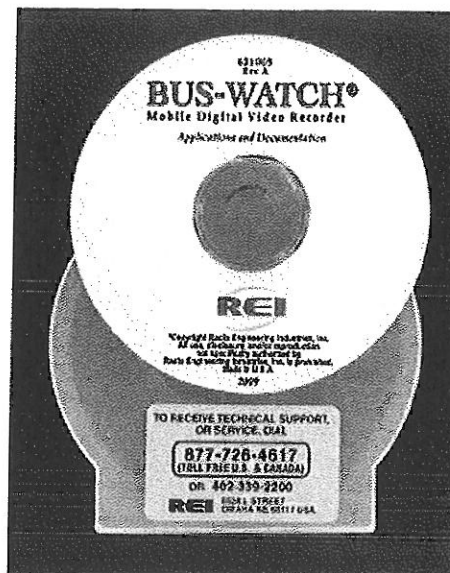
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OUR PRODUCTS →

Our Products

SCHOOL BUS
TRANSIT
MOTOR COACH
SHUTTLE BUS
AG/CONSTRUCTION



Part No. 622000

BUS-WATCH® Rx001 DVR LiveView & PlayBack Software, CD ROM

Features:

Allows users to watch video from a variety of sources:

LiveView:

- 802.11 Wireless Networks
- 3G Cell Phone Networks

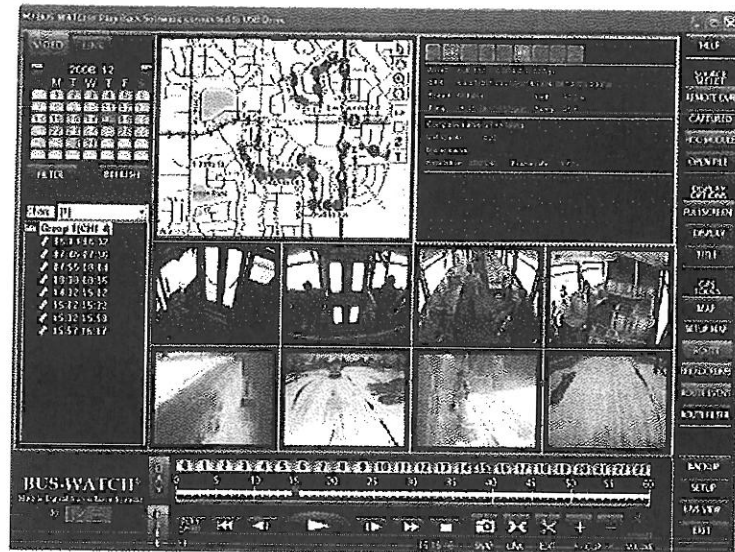
PlayBack:

- 802.11 Wireless Networks
- USB Connected Local HDD Module
- Local and Networked Archived Video Files

Metadata Information Display with Video:

- GPS Information (Text and optional Graphical Displays)
- Vehicle Sensors - Brakes, Turn Signals, Etc.
- Accelerometer (Text and Graphical Displays)

Edit, Save, and Convert Video Clips for Easy Sharing of Video



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)

7/29/13
(Date)