



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

Header 94

List View

General Information Contact Default Values Discount Document Information Clarification Request

Procurement Folder: 1395147

Procurement Type: Central Master Agreement

Vendor ID: VS0000011255

Legal Name: MODEL 1 COMMERCIAL VEHICLES INC

Alias/DBA:

Total Bid: \$26.00

Response Date: 05/30/2024

Response Time: 13:16

Responded By User ID: CreativeBus

First Name: Nick

Last Name: Corley

Email: biddepartment@model1.co

Phone: 8886338380

SO Doc Code: CRFQ

SO Dept: 0810

SO Doc ID: DMT2400000007

Published Date: 5/28/24

Close Date: 5/30/24

Close Time: 13:30

Status: Closed

Solicitation Description: Less than 30 Ft. Cutaway Bus

Total of Header Attachments: 94

Total of All Attachments: 94



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

State of West Virginia
Solicitation Response

Proc Folder: 1395147
Solicitation Description: Less than 30 Ft. Cutaway Bus
Proc Type: Central Master Agreement

Solicitation Closes	Solicitation Response	Version
2024-05-30 13:30	SR 0810 ESR05302400000007423	1

VENDOR
000000197591
SONNY MERRYMAN INC

Solicitation Number: CRFQ 0810 DMT2400000007
Total Bid: 0
Response Date: 2024-05-30
Response Time: 11:17:29
Comments:

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

Vendor Signature X	FEIN#	DATE
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All offers subject to all terms and conditions contained in this solicitation

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
1	Less than 30 ft. Cutaway Buses.	26.00000	EA	0.000000	0.00

Comm Code	Manufacturer	Specification	Model #
25101502			

Commodity Line Comments: Total cost for all classes is \$3,820,565.

Extended Description:

To establish an open ended contract for Less than 30 ft. Cutaway Buses. The vehicles will be utilized to assist public transportation throughout the state. The will be used in urban, sub-urban, and rural areas that includes hilly terrains and varying weather climates. These climates require vehicles that possess stop-start duty cycles.
Federal Terms and Conditions Apply



March 30, 2024

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

Dear Mr. Estep:

Thank you for the opportunity to submit this bid in response to your Request for Quotation CRFQ 0810 DMT2400000007. We are offering the Startrans Senator II. Should we receive an award for this solicitation, we will provide the material as outlined in the bid. The Startrans Senator II will be constructed in Goshen, Indiana. The lead time for delivery of the vehicles are 8-10 months ARO.

Also addressed and included in the proposal are curb weights, farebox provisions, and warranty locations to be used to maintain vehicles. We meet the warranty requirements specified within CRFQ 0810 DMT2400000007. We are in full understanding of the training requirements and will provide personnel to conduct training if we are the successful bidder. We have included "as-built" wiring schematics in our bid price.

Thank you again for this opportunity. Please call if you have questions.

Sincerely,

A handwritten signature in black ink that reads "Trey Myers". The signature is written in a cursive, flowing style.

Trey Myers
Commercial Vehicle Sales
Sonny Merryman Inc.
804-514-9289
trey@sonnymerryman.com



*To please our customers.
To serve our communities.
To drive people forward.*



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

State of West Virginia
Centralized Request for Quote
Vehicles

Proc Folder: 1395147			Reason for Modification:
Doc Description: Less than 30 Ft. Cutaway Bus			
Proc Type: Central Master Agreement			
Date Issued	Solicitation Closes	Solicitation No	Version
2024-04-18	2024-05-08 13:30	CRFQ 0810 DMT2400000007	1

BID RECEIVING LOCATION

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

VENDOR

Vendor Customer Code: 000000197591
Vendor Name : Sonny Merryman Inc.
Address : 5120 Wards Road Evington, Va 24550
Street : 5120 Wards Road
City : Evington
State : VA **Country :** USA **Zip :** 24550
Principal Contact : Trey Myers
Vendor Contact Phone: 804-514-9289 **Extension:**

FOR INFORMATION CONTACT THE BUYER

John W Estep
304-558-2566
john.w.estep@wv.gov

Vendor Signature X *Trey Myers* **FEIN#** 54-0806-176 **DATE** 05/28/2024

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

ADDITIONAL INFORMATION
REQUEST FOR QUOTATION: The West Virginia Purchasing Division is soliciting bids on behalf of the Division of Multimodal Transportation Facilities Division - Public Transit and any other state agency that desires to utilize this contract to establish an open-end contract for <30' cutaway transit vehicle(s) manufactured on a standard cutaway chassis with provision for stand-up entry, a wheelchair lift (in certain vehicle Classes) and tie downs, to provide transportation services in an urban and rural environment, including mountainous terrain and a severe winter climate. Per the Bid Requirements, Specifications, Terms and Conditions attached to this solicitation.

INVOICE TO	SHIP TO
PUBLIC TRANSIT DIVISION OF BLDG 5 RM 663 1900 KANAWHA BLVD E CHARLESTON WV US	PUBLIC TRANSIT DIVISION OF KANAWHA VALLEY REGIONAL TRANSPORTATION AUTHORITY 1550 FOURTH AVE CHARLESTON WV US

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
1	Less than 30 ft. Cutaway Buses.	26.00000	EA		

Comm Code	Manufacturer	Specification	Model #
25101502			

Extended Description:
To establish an open ended contract for Less than 30 ft. Cutaway Buses. The vehicles will be utilized to assist public transportation throughout the state. The will be used in urban, sub-urban, and rural areas that includes hilly terrains and varying weather climates. These climates require vehicles that possess stop-start duty cycles.

Federal Terms and Conditions Apply

SCHEDULE OF EVENTS		
<u>Line</u>	<u>Event</u>	<u>Event Date</u>
1	Tech Questions due by 10:00am	2024-04-26

	Document Phase	Document Description	Page 3
DMT2400000007	Final	Less than 30 Ft. Cutaway Bus	

ADDITIONAL TERMS AND CONDITIONS

See attached document(s) for additional Terms and Conditions

REQUEST FOR QUOTATION
<30' Length Cutaway Bus

BID FORM #3

**DISADVANTAGED BUSINESS ENTERPRISE
VENDORS/ MANUFACTURERS CERTIFICATION**

(Check appropriate statement)

☒ The Vendor, if a transit vehicle manufacturer, hereby certifies that it has complied with the requirements of 49 CFR Section 26.49 by submitting an annual DBE goal to the Federal Transit Administration (FTA). The goal has either been approved or not disapproved by FTA.

☐ The Vendor, if a non-manufacturing supplier, hereby certifies that the manufacturer of the transit vehicle to be supplied has complied with the above-referenced requirement of 49 CFR Section 26.49.

5/24/2024

Date

JACOB BLOOM

Authorized Signature

Government Bid Sales

Title

FOREST RIVER BUS, LLC

Company Name

REQUEST FOR QUOTATION
<30' Length Cutaway Bus

BID FORM #4

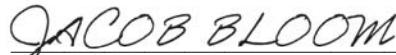
**BUY AMERICA CERTIFICATION
ROLLING STOCK**

Certificate of Compliance

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

5/24/2024

Date


Authorized Signature

FOREST RIVER BUS, LLC

Company Name

JACOB BLOOM

Name

Government Bid Sales

Title

Certificate for Non-Compliance

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

Date

Authorized Signature

Company Name

Name

Title

REQUEST FOR QUOTATION
<30' Length Cutaway Bus

BID FORM #5

**FEDERAL MOTOR VEHICLE
SAFETY STANDARDS CERTIFICATION**

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

5/24/2024

Date

JACOB BLOOM

Authorized Signature

Government Bid Sales

Title

FOREST RIVER BUS, LLC

Company Name

REQUEST FOR QUOTATION
<30' Length Cutaway Bus

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

FOREST RIVER BUS, LLC _____ hereby certifies that it

_____ **IS or**

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

5/24/2024

Date

JACOB BLOOM

Authorized Signature

Government Bid Sales

Title

FOREST RIVER BUS, LLC

Company Name

BID FORM #7

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

The Primary Participant (applicant for an FTA grant or cooperative agreement, or potential contractor for a major third-party contract),
FOREST RIVER BUS, LLC (COMPANY NAME) certifies to the best of its knowledge and belief, that it and its principals:

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

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

THE PRIMARY PARTICIPANT (APPLICANT FOR AN FTA GRANT OR COOPERATIVE AGREEMENT, OR POTENTIAL CONTRACTOR FOR A MAJOR THIRD-PARTY CONTRACT),
JACOB BLOOM, CERTIFIES OR AFFIRMS THE TRUTHFULNESS AND ACCURACY OF THE CONTENTS OF THE STATEMENTS SUBMITTED ON OR WITH THIS CERTIFICATION AND UNDERSTANDS THAT THE PROVISIONS OF 31 U.S.C. SECTIONS 3801 ET SEQ. ARE APPLICABLE THERETO.

JACOB BLOOM Government Bid Sales
Signature and Title of Authorized Official

REQUEST FOR QUOTATION
<30' Length Cutaway Bus

BID FORM #8

***VENDOR'S CERTIFICATION OF
UNDERSTANDING AND ACCEPTANCE***

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

5/24/2024

Date

JACOB BLOOM

Authorized Signature

Government Bid Sales

Title

FOREST RIVER BUS, LLC

Company Name

SPECIFICATION COMPLIANCE

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

_____ Bid proposal submitted meets and/or exceeds all specification requirements.

_____ Bid proposal submitted contains deviations from specification requirements. Detailed descriptions of these deviations have been provided with this bid proposal.

REQUEST FOR QUOTATION
<30' Length Cutaway Bus

BID FORM #9

CERTIFICATION OF RESTRICTIONS ON LOBBYING

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

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

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

The (Vendor, Contractor) FOREST RIVER BUS, LLC, certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the (Vendor, Contractor) understands and agrees that the provisions of 31 U.S.C. §§ 3801, et seq., apply to this certification and disclosure.

5/24/2024

Date

JACOB BLOOM

Authorized Signature

Government Bid Sales

Title

REQUEST FOR QUOTATION
<30' Length Cutaway Bus

18.2.2 Immediate cancellation of one or more release orders issued under this Contract.

18.2.3 Any other remedies available in law or equity.

20. MISCELLANEOUS:

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

Contract Manager: Trey Myers

Telephone Number: 804-514-9289

Fax Number: (434) 821-8203

Email Address: trey@sonnymerryman.com

19.4 NOTIFICATION OF FEDERAL PARTICIPATION

Federal funding for this project is being provided by the Federal Transit Administration through various CFDA grants for 80% of the project cost. CFDA grants will be specified after award.

REQUEST FOR QUOTATION
<30' Length Cutaway Bus

CRFQ - Exhibit A PRICING PAGE				
<30' Length Cutaway Bus Transit Vehicles				
VENDOR NAME:				
Manufacturer/ Brand:				
		Unit Price	Estimated	Extended
Class	Item Description	Per Vehicle	Quantity	Price
A	Bus; 450/4500 chassis - twelve passengers, two wheelchair spaces.	\$146,005	10	\$1,460,050
B	Bus; 450/4500 chassis - sixteen passenger, two wheelchair spaces	\$152,399	5	\$761,995
C	Bus; 450/4500 chassis - eighteen passengers, two wheelchair spaces	\$153,150	5	\$765,750
D	Bus, 450/4500 chassis - twenty to twenty-two passengers, no lift	\$136,995	3	\$410,985
E	Bus, 450/4500 chassis - twenty-three to twenty-five passengers, no lift	\$140,595	3	\$421,785
			TOTAL	\$3,820,565
<i>*Complete Form provided.</i>				
<i>*Please note these are only estimated quantities and do not reflect any guarantee of purchase.</i>				
<i>*The WV DMTF-PT may purchase more or less as needed.</i>				

REQUEST FOR QUOTATION
<30' Length Cutaway Bus

BID FORM #1

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

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

Name: Brady Childress _____

Address: 5120 Wards Road Evington, Va 24550 _____

Telephone: 434-821-1000 _____

Name: Tim George _____

Address: 5120 Wards Road Evington, Va 24550 _____

Telephone: 434-821-1000 _____

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

Name: Derek Shelton _____

Address: 5120 Wards Road Evington, Va 24550 _____

Telephone: 434-821-1000 _____

Name: _____

Address: _____

Telephone: _____

REQUEST FOR QUOTATION
<30' Length Cutaway Bus

BID FORM #2

CERTIFICATION FOR AIR & WATER POLLUTION

The Vendor certifies that the vehicles proposed:

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

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

05/28/2024

Date

Trey Myers

Authorized Signature

Commercial Sales Representative

Title

Sonny Merryman Inc.

Company Name

BID FORM #3

**DISADVANTAGED BUSINESS ENTERPRISE
VENDORS/ MANUFACTURERS CERTIFICATION**

(Check appropriate statement)

_____ The Vendor, if a transit vehicle manufacturer, hereby certifies that it has complied with the requirements of 49 CFR Section 26.49 by submitting an annual DBE goal to the Federal Transit Administration (FTA). The goal has either been approved or not disapproved by FTA.

☒ The Vendor, if a non-manufacturing supplier, hereby certifies that the manufacturer of the transit vehicle to be supplied has complied with the above-referenced requirement of 49 CFR Section 26.49.

05/28/2024

Date

Trey Myers

Authorized Signature

Commercial Sales Representative

Title

Sonny Merryman Inc.

Company Name

REQUEST FOR QUOTATION
<30' Length Cutaway Bus

BID FORM #4

**BUY AMERICA CERTIFICATION
ROLLING STOCK**

Certificate of Compliance

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

05/28/2024

Date

Trey Myers

Authorized Signature

Sonny Merryman Inc.

Company Name

Trey Myers

Name

Commercial Sales Representative

Title

Certificate for Non-Compliance

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

Date

Authorized Signature

Company Name

Name

Title

REQUEST FOR QUOTATION
<30' Length Cutaway Bus

BID FORM #5

**FEDERAL MOTOR VEHICLE
SAFETY STANDARDS CERTIFICATION**

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

05/28/2024

Date

Trey Myers

Authorized Signature

Commercial Sales Representative

Title

Sonny Merryman Inc.

Company Name

REQUEST FOR QUOTATION
<30' Length Cutaway Bus

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

Trey Myers - Sonny Merryman Inc. _____ hereby certifies that it

_____ **IS or**

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

05/28/2024

Date

Trey Myers

Authorized Signature

Commercial Sales Representative

Title

Sonny Merryman Inc.

Company Name

BID FORM #7

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

The Primary Participant (applicant for an FTA grant or cooperative agreement, or potential contractor for a major third-party contract),
Sonny Merryman Inc. _____ (COMPANY NAME) certifies to the best
of its knowledge and belief, that it and its principals:

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

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

THE PRIMARY PARTICIPANT (APPLICANT FOR AN FTA GRANT OR COOPERATIVE AGREEMENT, OR POTENTIAL CONTRACTOR FOR A MAJOR THIRD-PARTY CONTRACT),
Sonny Merryman Inc. _____, CERTIFIES OR AFFIRMS THE
TRUTHFULNESS AND ACCURACY OF THE CONTENTS OF THE STATEMENTS SUBMITTED
ON OR WITH THIS CERTIFICATION AND UNDERSTANDS THAT THE PROVISIONS OF 31
U.S.C. SECTIONS 3801 ET SEQ. ARE APPLICABLE THERETO.

Trey Myers Commercial Sales Representative
Signature and Title of Authorized Official

REQUEST FOR QUOTATION
<30' Length Cutaway Bus

BID FORM #8

***VENDOR'S CERTIFICATION OF
UNDERSTANDING AND ACCEPTANCE***

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

05/28/2024

Date

Trey Myers

Authorized Signature

Commercial Sales Representative

Title

Sonny Merryman Inc.

Company Name

SPECIFICATION COMPLIANCE

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

☒

_____ Bid proposal submitted meets and/or exceeds all specification requirements.

☐

_____ Bid proposal submitted contains deviations from specification requirements. Detailed descriptions of these deviations have been provided with this bid proposal.

REQUEST FOR QUOTATION
<30' Length Cutaway Bus

BID FORM #9

CERTIFICATION OF RESTRICTIONS ON LOBBYING

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

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

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

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

05/28/2024

Date

Trey Myers

Authorized Signature

Commercial Sales Representative

Title

REQUEST FOR QUOTATION
<30' Length Cutaway Bus

BID FORM #10

REQUIRED BID DOCUMENTATION CHECKLIST

Model Year: 2025 Model: Startrans

Bid Forms

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

REQUEST FOR QUOTATION
<30' Length Cutaway Bus

Documentation – to be submitted with bid:

Referenced

- ☒ 3.2 Engine: gasoline minimum 6.6L, maximum 7.3L V-8: provide product description, Warranty information and product literature.
- ☒ 3.2.8 High Idle System: provide product description, warranty information and product literature.
- ☒ 3.4 Transmission (separate cooling system): provide product description, warranty information and product literature.
- ☒ 3.5.4 Back Up Camera System: provide product description, warranty information and product literature.
- ☒ 3.10 Tires: provide product description, warranty information and product literature.
- ☒ 3.15.5 Alternator: provide product description, warranty information and product literature.
- ☒ 3.1.11 Water Testing: provide details of water testing procedures.
- ☒ 3.14 f. Exterior Vinyl Colors: provide samples/chart of available colors.
- ☒ 3.15 Undercoating and Rustproofing: provide product description, warranty information and literature.
- ☒ 3.16.2 Ambulatory Passenger Entrance/Exit: provide location, size, door operating details.
- ☒ 3.16.8 Stepwell Heater: provide product description, warranty information and product literature.
- ☒ 3.22 Floor Covering: provide samples of floor covering and colors to be provided.
- ☒ 3.27 Seating: provide product description, warranty information, product literature and color charts for all of the seating products to be utilized. **Proposed floor plans.**
- ☒ 3.27.11 Driver's Seat: provide description of product.
- ☒ 3.27.1 Exterior Mirrors: provide product description, warranty information and product literature.
- ☒ 3.19 Dual Purpose Safety Vent: provide product description, warranty information and product literature.
- ☒ 3.30 Wheelchair Securement System: provide product description, warranty information and product literature.
- ☒ 3.37 Strap/Buckle Storage: provide description and location of product.

REQUEST FOR QUOTATION
<30' Length Cutaway Bus

- ☒ 3.31 Wheelchair Occupant Restraint System: provide product description, warranty information and product literature.
- ☒ 3.32 Wheelchair Lift: provide Make, Model #, product description, warranty information and product literature.
- ☒ 3.34 AM/FM Radio/CD: provide product description, warranty information and product literature.
- ☒ 3.39 Training: submit letter of understanding to the terms in this Section.
- ☒ 3.38.4 Fare box Provisions: provide description of proposed location.
- ☒ 3.38.1 Destination Signs: provide product description, warranty information and product literature.
- ☒ 3.38.5 PA System: provide product description and product literature.
- ☒ 3.21.15 Strobe Light: provide product description and product literature.
- ☒ 3.28.11 Security Cameras Only: provide product description, warranty information and product literature.
- ☒ 4.10 Security Camera System Including Playback: provide product description, warranty information and product literature.
- ☒ 4.15 Warranty on complete vehicle.
- ☒ 4.16 Warranty on Basic Vehicle Structure.
- ☒ 4.17.1 Warranty: warranties to be provided on subsystems and components.
- ☒ 6.1.2 Complete two (2) bids in binder form – one (1) marked for DPT.
- ☒ 10.2 A. Complete mechanical description of vehicle, its construction and equipment including manufacturer's model name and /or number. Include description of front and rear air conditioning and heat systems.
- ☒ 21 Proposed interior floor plans, showing detailed dimensions including the location of the wheelchair securement system and stanchions.
- ☒ 10.2 C. Curb weight (empty weight) and gross vehicle weight rating (GVWR) of vehicle.
- ☒ 10.2 D. Samples or paint charts of available exterior paint colors and vinyl.
- ☒ 10.2 H. Identification of the conversion location of the van.

REQUEST FOR QUOTATION
<30' Length Cutaway Bus

- ✓ 10.2 I. A list of five (5) users names, addresses, emails, and telephone numbers who have been provided similar equipment by the Vendor.
- ✓ No Debt Affidavit
- ✓ Addendum Acknowledgement

DESIGNATED CONTACT: Vendor appoints the individual identified in this Section as the Contract Administrator and the initial point of contact for matters relating to this Contract.

(Printed Name and Title) Trey Myers - Commercial Sales Representative

(Address) 5120 Wards Road Evington, Va 24550

(Phone Number) / (Fax Number) 804-514-9289/434-821-8203

(email address) trey@sonnymerryman.com

CERTIFICATION AND SIGNATURE: By signing below, or submitting documentation through wvOASIS, I certify that: I have reviewed this Solicitation/Contract in its entirety; that I understand the requirements, terms and conditions, and other information contained herein; that this bid, offer or proposal constitutes an offer to the State that cannot be unilaterally withdrawn; that the product or service proposed meets the mandatory requirements contained in the Solicitation/Contract for that product or service, unless otherwise stated herein; that the Vendor accepts the terms and conditions contained in the Solicitation, unless otherwise stated herein; that I am submitting this bid, offer or proposal for review and consideration; that this bid or offer was made without prior understanding, agreement, or connection with any entity submitting a bid or offer for the same material, supplies, equipment or services; that this bid or offer is in all respects fair and without collusion or fraud; that this Contract is accepted or entered into without any prior understanding, agreement, or connection to any other entity that could be considered a violation of law; that I am authorized by the Vendor to execute and submit this bid, offer, or proposal, or any documents related thereto on Vendor's behalf; that I am authorized to bind the vendor in a contractual relationship; and that to the best of my knowledge, the vendor has properly registered with any State agency that may require registration.

By signing below, I further certify that I understand this Contract is subject to the provisions of West Virginia Code § 5A-3-62, which automatically voids certain contract clauses that violate State law; and that pursuant to W. Va. Code 5A-3-63, the entity entering into this contract is prohibited from engaging in a boycott against Israel.

Sonny Merryman Inc.

(Company)

Trey Myers

(Signature of Authorized Representative)

Trey Myers/Commercial Sales Representative

(Printed Name and Title of Authorized Representative) (Date)

804-514-9289/434-821-8203

(Phone Number) (Fax Number)

trey@sonnymerryman.com

(Email Address)

STATE OF WEST VIRGINIA

Purchasing Division

PURCHASING AFFIDAVIT

CONSTRUCTION CONTRACTS: Under W. Va. Code § 5-22-1(i), the contracting public entity shall not award a construction contract to any bidder that is known to be in default on any monetary obligation owed to the state or a political subdivision of the state, including, but not limited to, obligations related to payroll taxes, property taxes, sales and use taxes, fire service fees, or other fines or fees.

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

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

DEFINITIONS:

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

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

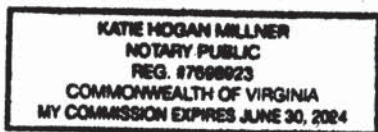
"Related party" means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership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

AFFIRMATION: By signing this form, the vendor's authorized signer affirms and acknowledges under penalty of law for false swearing (W. Va. Code §61-5-3) that: (1) for construction contracts, the vendor is not in default on any monetary obligation owed to the state or a political subdivision of the state, and (2) for all other contracts, that neither vendor nor any related party owe a debt as defined above and that neither vendor nor any related party are in employer default as defined above, unless the debt or employer default is permitted under the exception above.

WITNESS THE FOLLOWING SIGNATURE:Vendor's Name: Sonny Merryman Inc.Authorized Signature: Trey Myers Date: 05/02/2024State of VirginiaCounty of Campbell, to-wit:Taken, subscribed, and sworn to before me this 2nd day of May, 2024.My Commission expires June 30, 2024.

AFFIX SEAL HERE

NOTARY PUBLIC

Katie Millner

NATIONAL ACADEMY OF SCIENCES
 NATIONAL ACADEMY OF ARTS AND LETTERS
 NATIONAL ACADEMY OF MEDICAL SCIENCES
 NATIONAL ACADEMY OF POLITICAL SCIENCES
 NATIONAL ACADEMY OF SOCIAL SCIENCES
 NATIONAL ACADEMY OF TECHNICAL SCIENCES
 NATIONAL ACADEMY OF HUMANITIES
 NATIONAL ACADEMY OF EDUCATION
 NATIONAL ACADEMY OF ECONOMICS
 NATIONAL ACADEMY OF ENVIRONMENTAL SCIENCES
 NATIONAL ACADEMY OF AGRICULTURAL SCIENCES
 NATIONAL ACADEMY OF FORESTRY
 NATIONAL ACADEMY OF FISHERIES
 NATIONAL ACADEMY OF MINING
 NATIONAL ACADEMY OF METALLURGY
 NATIONAL ACADEMY OF CHEMISTRY
 NATIONAL ACADEMY OF PHYSICS
 NATIONAL ACADEMY OF MATHEMATICS
 NATIONAL ACADEMY OF BIOLOGY
 NATIONAL ACADEMY OF MEDICINE
 NATIONAL ACADEMY OF DENTISTRY
 NATIONAL ACADEMY OF VETERINARY MEDICINE
 NATIONAL ACADEMY OF NURSING
 NATIONAL ACADEMY OF PHARMACY
 NATIONAL ACADEMY OF OPTICS
 NATIONAL ACADEMY OF ACOUSTICS
 NATIONAL ACADEMY OF ELECTRICITY
 NATIONAL ACADEMY OF MECHANICS
 NATIONAL ACADEMY OF CIVIL ENGINEERING
 NATIONAL ACADEMY OF CHEMICAL ENGINEERING
 NATIONAL ACADEMY OF METALLURGICAL ENGINEERING
 NATIONAL ACADEMY OF MINING ENGINEERING
 NATIONAL ACADEMY OF AERONAUTICS
 NATIONAL ACADEMY OF SPACE SCIENCE
 NATIONAL ACADEMY OF ASTRONOMY
 NATIONAL ACADEMY OF COSMOLOGY
 NATIONAL ACADEMY OF PHYSICS
 NATIONAL ACADEMY OF MATHEMATICS
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 NATIONAL ACADEMY OF MINING ENGINEERING
 NATIONAL ACADEMY OF AERONAUTICS
 NATIONAL ACADEMY OF SPACE SCIENCE
 NATIONAL ACADEMY OF ASTRONOMY
 NATIONAL ACADEMY OF COSMOLOGY

References

- 1. Customer:** Metropolitan Washington Council of Governments (MWCOG)
Contact: Dan Sheehan (Transportation Program Operations Manager)
Phone: (202)-962-3287
Email: dsheehan@mwkog.org
Address: 777 North Capitol Street NE, Suite 300, Washington, DC. 20002
Goods Provided: Body on Chassis & Minivans
Dates of Service: 2016 - Present
Estimated Sales Volume: \$1,300,000.00
- 2. Customer:** Virginia Department of Rail and Public Transportation (DRPT)
Contact: Avery Daugherty (Statewide Program Manager)
Phone: (804)-786-6796
Email: avery.daugherty@drpt.virginia.gov
Address: 600 E Main Street, Richmond, VA 23219
Goods Provided: Paratransit Vehicles
Dates of Service: 1992 - Present
Estimated Sales Volume: \$100,000,000.00
- 3. Customer:** U.S. General Services Administration (GSA) / Federal Acquisition Service
Contact: Craig Yokum (Contracting Officer)
Phone: (703)-605-9291
Email: craig.yokum@gsa.gov
Address: 1800 F Street, NW, 3rd Floor, Hub 3200, Washington, DC 20405
Goods Provided: Light/Medium Duty Shuttle Buses
Dates of Service: 2014 - Present
Estimated Sales Volume: \$8,000,000.00
- 4. Customer:** Maryland Department of Transportation
Contact: Jason Keppel
Phone: 410-767-7330
Email: jkeppel@mta.maryland.gov
Address: 7201 Corporate Center Drive, Hanover, MD 21076
Goods Provided: Paratransit Vehicles
- 5. Customer:** Anne Arundel County
Contact: Sam Snead
Phone: 410-222-7440
Address: 26644 Riva Road – 3rd Floor, Annapolis, MD 21401
Goods Provided: Paratransit Vehicles



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

State of West Virginia
Centralized Request for Quote
Vehicles

Proc Folder: 1395147

Doc Description: Less than 30 Ft. Cutaway Bus

Reason for Modification:

ADDENDUM NO_1
Vendor Question and Response

Proc Type: Central Master Agreement

Date Issued	Solicitation Closes	Solicitation No	Version
2024-04-23	2024-05-08 13:30	CRFQ 0810 DMT2400000007	2

BID RECEIVING LOCATION

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

VENDOR

Vendor Customer Code: 000000197591

Vendor Name : Sonny Merryman Inc.

Address : 5120 Wards Road Evington, Va 24550

Street : 5120 Wards Road

City : Evington

State : VA

Country : USA

Zip : 24550

Principal Contact : Trey Myers

Vendor Contact Phone: 804-514-9289

Extension:

FOR INFORMATION CONTACT THE BUYER

John W Estep
304-558-2566
john.w.estep@wv.gov

Vendor
Signature X *Trey Myers*

FEIN# 54-0806-176

DATE 05/28/2024

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

ADDITIONAL INFORMATION

ADDENDUM NO_1

Addendum No_1 issued to publish and distribute the attached information to the Vendor Community.

REQUEST FOR QUOTATION:

The West Virginia Purchasing Division is soliciting bids on behalf of the Division of Multimodal Transportation Facilities Division - Public Transit and any other state agency that desires to utilize this contract to establish an open-end contract for <30' cutaway transit vehicle(s) manufactured on a standard cutaway chassis with provision for stand-up entry, a wheelchair lift (in certain vehicle Classes) and tie downs, to provide transportation services in an urban and rural environment, including mountainous terrain and a severe winter climate. Per the Bid Requirements, Specifications, Terms and Conditions attached to this solicitation.

INVOICE TO	SHIP TO
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PUBLIC TRANSIT DIVISION OF BLDG 5 RM 663 1900 KANAWHA BLVD E CHARLESTON WV US	PUBLIC TRANSIT DIVISION OF KANAWHA VALLEY REGIONAL TRANSPORTATION AUTHORITY 1550 FOURTH AVE CHARLESTON WV US
--	--

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
1	Less than 30 ft. Cutaway Buses.	26.00000	EA		

Comm Code	Manufacturer	Specification	Model #
25101502			

Extended Description:

To establish an open ended contract for Less than 30 ft. Cutaway Buses. The vehicles will be utilized to assist public transportation throughout the state. The will be used in urban, sub-urban, and rural areas that includes hilly terrains and varying weather climates. These climates require vehicles that possess stop-start duty cycles.

Federal Terms and Conditions Apply

SCHEDULE OF EVENTS

<u>Line</u>	<u>Event</u>	<u>Event Date</u>
1	Tech Questions due by 10:00am	2024-04-26

SOLICITATION NUMBER: CRFQ DMT2400000007

Addendum Number: 1

The purpose of this addendum is to modify the solicitation identified as CRFQ DMT2400000007 ("Solicitation") to reflect the change(s) identified and described below.

Applicable Addendum Category:

- ☐ Modify bid opening date and time
- ☐ Modify specifications of product or service being sought
- ☒ Attachment of vendor questions and responses
- ☐ Attachment of pre-bid sign-in sheet
- ☐ Correction of error
- ☐ Other

Additional Documentation:

Bid Opening remains 05/08/2024 at 1:30pm

Terms and Conditions:

1. All provisions of the Solicitation and other addenda not modified herein shall remain in full force and effect.
2. Vendor should acknowledge receipt of all addenda issued for this Solicitation by completing an Addendum Acknowledgment, a copy of which is included herewith. Failure to acknowledge addenda may result in bid disqualification. The addendum acknowledgement should be submitted with the bid to expedite document processing.

CRFQ DOT2400000007
ADDENDUM NO. 1

Questions:

Q1: Approved equals request for Gerflor Flooring ?

A1: Will Accept.

Instructions: Please acknowledge receipt of all addenda issued with this solicitation by completing this addendum acknowledgment form. Check the box next to each addendum received and sign below. Failure to acknowledge addenda may result in bid disqualification.

Acknowledgment: I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specification, etc.

Addendum Numbers Received:

(Check the box next to each addendum received)

<input checked="" type="checkbox"/> Addendum No. 1	<input type="checkbox"/> Addendum No. 6
<input type="checkbox"/> Addendum No. 2	<input type="checkbox"/> Addendum No. 7
<input type="checkbox"/> Addendum No. 3	<input type="checkbox"/> Addendum No. 8
<input type="checkbox"/> Addendum No. 4	<input type="checkbox"/> Addendum No. 9
<input type="checkbox"/> Addendum No. 5	<input type="checkbox"/> Addendum No. 10

I understand that failure to confirm the receipt of addenda may be cause for rejection of this bid. I further understand that that any verbal representation made or assumed to be made during any oral discussion held between Vendor's representatives and any state personnel is not binding. Only the information issued in writing and added to the specifications by an official addendum is binding.

Sonny Merryman Inc.

Company

Trey Myers

Authorized Signature

05/28/2024

Date

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



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

State of West Virginia
Centralized Request for Quote
Vehicles

Proc Folder: 1395147

Doc Description: Less than 30 Ft. Cutaway Bus

Reason for Modification:

ADDENDUM NO_2
Vendor Questions and Responses

Proc Type: Central Master Agreement

Date Issued	Solicitation Closes	Solicitation No	Version
2024-04-24	2024-05-08 13:30	CRFQ 0810 DMT2400000007	3

BID RECEIVING LOCATION

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

VENDOR

Vendor Customer Code: 000000197591

Vendor Name : Sonny Merryman Inc.

Address : 5120 Wards Road Evington, Va 24550

Street : 5120 Wards Road

City : Evington

State : VA

Country : USA

Zip : 24550

Principal Contact : Trey Myers

Vendor Contact Phone: 804-514-9289

Extension:

FOR INFORMATION CONTACT THE BUYER

John W Estep
304-558-2566
john.w.estep@wv.gov

Vendor
Signature X *Trey Myers*

FEIN# 54-0806-176

DATE 05/28/2024

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

ADDITIONAL INFORMATION**ADDENDUM NO_2**

Addendum No_2 issued to publish and distribute the attached information to the Vendor Community.

REQUEST FOR QUOTATION:

The West Virginia Purchasing Division is soliciting bids on behalf of the Division of Multimodal Transportation Facilities Division - Public Transit and any other state agency that desires to utilize this contract to establish an open-end contract for <30' cutaway transit vehicle(s) manufactured on a standard cutaway chassis with provision for stand-up entry, a wheelchair lift (in certain vehicle Classes) and tie downs, to provide transportation services in an urban and rural environment, including mountainous terrain and a severe winter climate. Per the Bid Requirements, Specifications, Terms and Conditions attached to this solicitation.

INVOICE TO

PUBLIC TRANSIT DIVISION
OF
BLDG 5 RM 663

1900 KANAWHA BLVD E
CHARLESTON WV
US

SHIP TO

PUBLIC TRANSIT DIVISION
OF

KANAWHA VALLEY
REGIONAL
TRANSPORTATION
AUTHORITY

1550 FOURTH AVE
CHARLESTON WV
US

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
1	Less than 30 ft. Cutaway Buses.	26.00000	EA		

Comm Code	Manufacturer	Specification	Model #
25101502			

Extended Description:

To establish an open ended contract for Less than 30 ft. Cutaway Buses. The vehicles will be utilized to assist public transportation throughout the state. The will be used in urban, sub-urban, and rural areas that includes hilly terrains and varying weather climates. These climates require vehicles that possess stop-start duty cycles.

Federal Terms and Conditions Apply

SCHEDULE OF EVENTS

Line	Event	Event Date
1	Tech Questions due by 10:00am	2024-04-26

SOLICITATION NUMBER: CRFQ DMT2400000007

Addendum Number: 2

The purpose of this addendum is to modify the solicitation identified as CRFQ DMT2400000007 (“Solicitation”) to reflect the change(s) identified and described below.

Applicable Addendum Category:

- ☐ Modify bid opening date and time
- ☐ Modify specifications of product or service being sought
- ☒ Attachment of vendor questions and responses
- ☐ Attachment of pre-bid sign-in sheet
- ☐ Correction of error
- ☐ Other

Additional Documentation:

Bid Opening remains 05/08/2024 at 1:30pm

Terms and Conditions:

1. All provisions of the Solicitation and other addenda not modified herein shall remain in full force and effect.
2. Vendor should acknowledge receipt of all addenda issued for this Solicitation by completing an Addendum Acknowledgment, a copy of which is included herewith. Failure to acknowledge addenda may result in bid disqualification. The addendum acknowledgement should be submitted with the bid to expedite document processing.

CRFQ DMT2400000007
ADDENDUM NO. 2

Questions:

Q1: Please approve the use of DOCKET 90 Vinyl for this solicitation.

A1: We will allow but not require the use of DOCKET 90 Vinyl for the vehicle contracts.

ADDENDUM ACKNOWLEDGEMENT FORM
SOLICITATION NO.: CRFQ DMT2400000007

Instructions: Please acknowledge receipt of all addenda issued with this solicitation by completing this addendum acknowledgment form. Check the box next to each addendum received and sign below. Failure to acknowledge addenda may result in bid disqualification.

Acknowledgment: I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specification, etc.

Addendum Numbers Received:

(Check the box next to each addendum received)

<input type="checkbox"/> Addendum No. 1	<input type="checkbox"/> Addendum No. 6
<input checked="" type="checkbox"/> Addendum No. 2	<input type="checkbox"/> Addendum No. 7
<input type="checkbox"/> Addendum No. 3	<input type="checkbox"/> Addendum No. 8
<input type="checkbox"/> Addendum No. 4	<input type="checkbox"/> Addendum No. 9
<input type="checkbox"/> Addendum No. 5	<input type="checkbox"/> Addendum No. 10

I understand that failure to confirm the receipt of addenda may be cause for rejection of this bid. I further understand that that any verbal representation made or assumed to be made during any oral discussion held between Vendor's representatives and any state personnel is not binding. Only the information issued in writing and added to the specifications by an official addendum is binding.

Sonny Merryman Inc.

Company

Trey Myers

Authorized Signature

05/28/2024

Date

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



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

State of West Virginia
Centralized Request for Quote
Vehicles

Proc Folder: 1395147

Doc Description: Less than 30 Ft. Cutaway Bus

Reason for Modification:

addendum no_3
Bid Opening moves to 05/30/2024

Proc Type: Central Master Agreement

Date Issued	Solicitation Closes	Solicitation No	Version
2024-04-25	2024-05-30 13:30	CRFQ 0810 DMT2400000007	4

BID RECEIVING LOCATION

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

VENDOR

Vendor Customer Code: 000000197591

Vendor Name : Sonny Merryman Inc.

Address : 5120 Wards Road Evington, Va 24550

Street : 5120 Wards Road

City : Evington

State : VA

Country : USA

Zip : 24550

Principal Contact : Trey Myers

Vendor Contact Phone: 804-514-9289

Extension:

FOR INFORMATION CONTACT THE BUYER

John W Estep
304-558-2566
john.w.estep@wv.gov

Vendor
Signature X *Trey Myers*

FEIN# 54-0806-176

DATE 05/28/2024

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

ADDITIONAL INFORMATION

<p>ADDENDUM NO_3</p> <p>Addendum No_3 issued to publish and distribute the attached information to the Vendor Community.</p> <p>REQUEST FOR QUOTATION:</p> <p>The West Virginia Purchasing Division is soliciting bids on behalf of the Division of Multimodal Transportation Facilities Division - Public Transit and any other state agency that desires to utilize this contract to establish an open-end contract for <30' cutaway transit vehicle(s) manufactured on a standard cutaway chassis with provision for stand-up entry, a wheelchair lift (in certain vehicle Classes) and tie downs, to provide transportation services in an urban and rural environment, including mountainous terrain and a severe winter climate. Per the Bid Requirements, Specifications, Terms and Conditions attached to this solicitation.</p>

INVOICE TO			SHIP TO		
PUBLIC TRANSIT DIVISION OF BLDG 5 RM 663 1900 KANAWHA BLVD E CHARLESTON WV US			PUBLIC TRANSIT DIVISION OF KANAWHA VALLEY REGIONAL TRANSPORTATION AUTHORITY 1550 FOURTH AVE CHARLESTON WV US		

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
1	Less than 30 ft. Cutaway Buses.	26.00000	EA		

Comm Code	Manufacturer	Specification	Model #
25101502			

Extended Description:
To establish an open ended contract for Less than 30 ft. Cutaway Buses. The vehicles will be utilized to assist public transportation throughout the state. The will be used in urban, sub-urban, and rural areas that includes hilly terrains and varying weather climates. These climates require vehicles that possess stop-start duty cycles.

Federal Terms and Conditions Apply

SCHEDULE OF EVENTS

<u>Line</u>	<u>Event</u>	<u>Event Date</u>
1	Tech Questions due by 10:00am	2024-04-26

SOLICITATION NUMBER: CRFQ DOT2400000007

Addendum Number: 3

The purpose of this addendum is to modify the solicitation identified as CRFQ DOT2400000007 ("Solicitation") to reflect the change(s) identified and described below.

Applicable Addendum Category:

- ☐ Modify bid opening date and time
- ☐ Modify specifications of product or service being sought
- ☒ Attachment of vendor questions and responses
- ☐ Attachment of pre-bid sign-in sheet
- ☐ Correction of error
- ☐ Other

Additional Documentation:

Bid Opening Moves to 05/30/2024 at 1:30pm

Terms and Conditions:

1. All provisions of the Solicitation and other addenda not modified herein shall remain in full force and effect.
2. Vendor should acknowledge receipt of all addenda issued for this Solicitation by completing an Addendum Acknowledgment, a copy of which is included herewith. Failure to acknowledge addenda may result in bid disqualification. The addendum acknowledgement should be submitted with the bid to expedite document processing.

ADDENDUM ACKNOWLEDGEMENT FORM
SOLICITATION NO.: CRFQ DOT2400000007

Instructions: Please acknowledge receipt of all addenda issued with this solicitation by completing this addendum acknowledgment form. Check the box next to each addendum received and sign below. Failure to acknowledge addenda may result in bid disqualification.

Acknowledgment: I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specification, etc.

Addendum Numbers Received:

(Check the box next to each addendum received)

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<input type="checkbox"/> Addendum No. 2	<input type="checkbox"/> Addendum No. 7
<input checked="" type="checkbox"/> Addendum No. 3	<input type="checkbox"/> Addendum No. 8
<input type="checkbox"/> Addendum No. 4	<input type="checkbox"/> Addendum No. 9
<input type="checkbox"/> Addendum No. 5	<input type="checkbox"/> Addendum No. 10

I understand that failure to confirm the receipt of addenda may be cause for rejection of this bid. I further understand that that any verbal representation made or assumed to be made during any oral discussion held between Vendor's representatives and any state personnel is not binding. Only the information issued in writing and added to the specifications by an official addendum is binding.

Sonny Merryman Inc.

Company

Trey Myers

Authorized Signature

05/28/2024

Date

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



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

State of West Virginia
Centralized Request for Quote
Vehicles

Proc Folder: 1395147	Reason for Modification:
Doc Description: Less than 30 Ft. Cutaway Bus	Addendum No. 4

Proc Type: Central Master Agreement

Date Issued	Solicitation Closes	Solicitation No	Version
2024-05-09	2024-05-30 13:30	CRFQ 0810 DMT2400000007	5

BID RECEIVING LOCATION

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

VENDOR

Vendor Customer Code: 000000197591
Vendor Name : Sonny Merryman Inc.
Address : 5120 Wards Road Evington, VA 24550
Street : 5120 Wards Road
City : Evington
State : VA **Country :** USA **Zip :** 24550
Principal Contact : Trey Myers
Vendor Contact Phone: 804-514-9289 **Extension:**

FOR INFORMATION CONTACT THE BUYER

John W Estep
304-558-2566
john.w.estep@wv.gov

Vendor Signature X *Trey Myers*

FEIN# 54-0806-176

DATE 05/28/2024

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

ADDITIONAL INFORMATION
ADDENDUM NO. 4
1.To correct errors to specifications, see attached.
2.To provide responses to vendor technical questions, see attached.
3.To modify specifications, see attached.
4.Bid opening date and time remains May 30, 2024, at 1:30 pm., est.
5.No other changes.

INVOICE TO	SHIP TO
PUBLIC TRANSIT DIVISION OF BLDG 5 RM 663 1900 KANAWHA BLVD E CHARLESTON WV US	PUBLIC TRANSIT DIVISION OF KANAWHA VALLEY REGIONAL TRANSPORTATION AUTHORITY 1550 FOURTH AVE CHARLESTON WV US

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
1	Less than 30 ft. Cutaway Buses.	26.00000	EA		

Comm Code	Manufacturer	Specification	Model #
25101502			

Extended Description:
To establish an open ended contract for Less than 30 ft. Cutaway Buses. The vehicles will be utilized to assist public transportation throughout the state. The will be used in urban, sub-urban, and rural areas that includes hilly terrains and varying weather climates. These climates require vehicles that possess stop-start duty cycles.

Federal Terms and Conditions Apply

SCHEDULE OF EVENTS		
<u>Line</u>	<u>Event</u>	<u>Event Date</u>
1	Tech Questions due by 10:00am	2024-04-26

SOLICITATION NUMBER: CRFQ DMT2400000007

Addendum Number: 4

The purpose of this addendum is to modify the solicitation identified as (“DMT2400000007”) to reflect the change(s) identified and described below.

Applicable Addendum Category:

- ☐ Modify bid opening date and time.
- ☒ Modify specifications of product or service being sought.
- ☒ Attachment of vendor questions and responses.
- ☐ Attachment of pre-bid sign-in sheet.
- ☒ Correction of error.
- ☐ Other.

Description of Modification to Solicitation:

1. To correct errors to specifications, see attached.
2. To provide responses to vendor technical questions, see attached.
3. To modify specifications, see attached.
4. Bid opening date and time remains May 30, 2024, at 1:30 pm., est.
5. No other changes.

Additional Documentation: Documentation related to this Addendum (if any) has been included herewith as Attachment A and is specifically incorporated herein by reference.

Terms and Conditions:

1. All provisions of the Solicitation and other addenda not modified herein shall remain in full force and effect.
2. Vendor should acknowledge receipt of all addenda issued for this Solicitation by completing an Addendum Acknowledgment, a copy of which is included herewith. Failure to acknowledge addenda may result in bid disqualification. The addendum acknowledgement should be submitted with the bid to expedite document processing.

CRFQ DMT24*07 Vendor Questions and Responses

1. **Section 3.1.3** – One of the floorplans can be built on a 23-foot body. Will you accept a minimum vehicle length of 23 feet?

Yes

2. **Section 3.1.4** – One of the floorplans can be built on a 158in wheelbase. Will you accept a minimum wheelbase of 158 inches?

Yes

3. **Section 3.2.1** – The Ford 7.3L gas engine is 325 horsepower. Will you accept this modification?

Yes

4. **Section 3.5.2** – This option is not available. Both the Chevy and Ford Chassis' have a manual parking brake option. Will you approve the manual parking brake option?

Yes

5. **Section 3.5.5** – This section calls for an F450 chassis. Can you clarify whether you are looking for an E-series or F-series chassis?

E-Series

6. **Section 3.8.7** – Can you clarify if you would like the position of the switches to be located overhead or on a doghouse next to the driver's seat?

Either

7. **Section 3.8.7 (Rear Suspension)** – Will you accept the OEM rear suspension? Can you clarify if you are looking or an upgraded rear suspension such as MORRYDE or if the OEM is suspension is approved?

MORRYDE

8. **Section 3.9.1** – Will you accept 16in wheels as this is standard on both Ford and Chevy chassis’?

Yes

9. **Section 3.10.5** – Will you accept an aftermarket spare tire that is the same size as the standard wheel and tire?

Yes

10. **Section 3.11.2** – For the rear bumper, will you accept the standard rear bumper, or do you require an energy absorbing/help rear bumper?

Yes

11. **Section 3.14.3** – The manufacturer does not offer a galvanized steel cage option. The steel body cage will be aluminized steel with a T-140 coating. Will you accept this modification?

Yes

12. **Section 3.15.2** – Is there a size requirement for the interior decals?

No

13. **Section 3.16.1** – Do you require the bus to be painted white? The bus comes standard OEM white and all exterior parts are finished to match the OEM cab.

White is Preferred.

14. **Section 3.16.2 and Section 3.16.6** – Can you provide additional information as to what you are looking for with regards to paint schemes and graphics? Section 3.16.5 mentions “exhibit C,” however, I do not see an exhibit C attached. Can you share pictures/diagrams of the paint schemes and graphics you need?

Graphics will be agency Specific

15. **Section 3.16.5** – Should the cost of the paint/graphics be included in the vehicle cost for each class of vehicle? Or will this be negotiated with the transit agency directly?

YES, Should be included

16. **Section 3.18.2** – Can you clarify if the ambulatory passenger door should be manually or electrically operated? Section 3.18.6 calls for electric entry door while section 3.18.2 calls for manually operated entry door.

Either is acceptable

17. **Section 3.18.8** – Can you clarify if you want the riser height to be 9inches or 9.25inches? Section 3.18.2 calls for 9.25in while section 3.18.8 calls for 9in riser.

Either is acceptable

18. **Section 3.18.9** – Will you accept the following steel gauges as an approved equal? The header will be 16-gauge steel. The Sides upper and lower will be 14-gauge steel. The steps will be 11-gauge steel.

Yes

19. **Section 3.19.1** – The OEM windshield is glued in place which is standard on the Ford and Chevy chassis. Will you accept this modification?

Yes

20. **Section 3.19.7** – Both the Ford and Chevy chassis have a single piece window that is roll up/roll down style. Will you accept this modification?

Yes

21. **Section 3.20.3** “A screen is to be installed under the defrost vent holes to prevent foreign objects from falling into defroster fan” – This modification would require the OEM dash to be pulled and will void the warranty of the OEM HVAC system. We do not have the ability to remove and replace the OEM dash. Will you accept deletion of this section?

Yes

22. **Section 3.20.5** – Will you accept the TransAir system TA7722 as an approved equal (see attached brochure)?

Yes

23. **Section 3.21.1** – Do you require TWO roof/escape hatches? Or will you accept 1 escape/roof hatch?

No, 1 plus Window

24. **Section 3.23.16** – Will you accept the PTI-LUXX strobe light as an approved equal? (see attached brochure)

Yes

25. **Section 3.23.17** – Will you accept the Maxxima fog lights as an approved equal? (see attached brochure)

Yes

26. **Section 3.24.2** – Do you require a 2-tone flooring for stepwell and walkways?

Yes, easily Visible demarcation.

27. **Section 3.24.11** – Do you require energy absorbing or HELP bumpers (i.e. Romeo Rim or equal) for the rear bumper? Section 3.11.2 calls for the manufacturer standard bumper. Which do you require?

NO

28. Section 3.25.5 – Can you clarify/explain in more detail the locations that you require vertical stanchions?

Behind drivers seat but doesn't interfere with driver seat maneuverability.

29. Section 3.27 – This section states the minimum seating capacity of 23 passengers and 2 wheelchairs. This conflicts with the attached floorplans. Can this be changed/updated to the correct minimum desired amount?

Yes

30. Section 3.27.10 – Can you clarify the location of the ICS seats? Should the two ICS seats be located on the same row?

Specifics for location not required.

31. Section 3.27.11 – Is there a specific driver seat required?

NO

32. Section 3.29.1 – The ROSCO mirror is 8" X 15" standard. Will you accept this approved equal? (see attached brochure)

Yes

33. Section 3.29.4 – Will the driver dome light location in the attached picture work for this? (see attached picture)

Yes

34 Section 3.31.8 – Can you clarify what brand of wheelchair tie downs are required? The spec calls out several brands, however, the "LOCKED" indicator only comes on the Sur-Lok brand.

Brand not required

35 Section 3.38.2 – The Transign Destinator Series comes in the following dimensions: 12

X 112 (front) and 12 X 80 (side). Will you accept this modification?

Yes

36 Section 3.38.7 – The manufacturer standard location for the license plate is built into the rear cap, not the rear bumper. Will you accept this modification? (see attached picture)

Yes

37 Section 4.1 – “Lower Step to Ground Not More than 12in.” Section 3.18.2 states a 14in ground to first step height. Can you clarify which is required?

Should be less than 14 inch.

38 Class A Floorplan – Are foldable seats required for wheelchair positions in Class? If so, how many are required?

Yes 1

39 Class B Floorplan – Are foldable seats required in the wheelchair area for class B? If so, how many are required?

Yes 1

40 Class C Floorplan – Are foldable seats required in the wheelchair area for class C? Is so, how many are required?

Yes 1

41 Class C Floorplan – Is a luggage area a requirement for class C?

NO

42 Class D Floorplan – Is a luggage area a requirement for class D?

NO

43. Class E Floorplan – Is a luggage area a requirement for class E?

NO

44. Page 5, Chassis 3.1.3. Will you accept a body length 23'-29.5"

Yes.

45. Page 5, Chassis 3.1.4. With above body length, wheelbase to be a minimum of 158" to 212"-

Yes.

46. Page 9. Request on E-450 Chassis Approved equal - Wheels 3.9.1 16" x 6.5 bolt pattern, 8 lug, tire size 275 x 16.-

Yes

47. Page 13, Body 3.14.3. Please provide clarification that Galvanized steel cage does not need anti corrosion treatment.-

It does not need anti corrosion treatment.

48. Page 14. Body 3.14.7. Approved equal: Interior and Exterior panels are fastened to a steel cage using a high strength automotive adhesive material. The industry has moved away from welding or riveted exterior and interior panels.-

That is acceptable.

49. Page 14. Body 3.14.12. Bidder is requesting that the requirement for skirts be eliminated. Our OEM side exterior side wall does not include a skirt.-

Page 18. Doors 3.18.2.

a) Bidder is requesting 36" entry door with 33" clear opening.

b) Door will be an electric gear driven as in 3.18.6.

c) Door height to be minimum 78".

d) Riser height 9.5"

That is acceptable.

50. Page 20. Heating and AC. 3.20.3. Will a driver's fan pointed toward the right side driver's compartment window for defrosting proposes be acceptable?-

Yes.

51. 3.1.3 CHASSIS PLEASE ACCEPT THAT THE CLASS A VEHICLE CAN BE BUILT ON A 23.5' LONG BUS-

We Accept.

52. 3.1.4 CHASSIS PLEASE APPROVE A MINIMUM WHEELBASE RANGE OF 158". THIS IS A STANDARD FORD WHEELBASE FOR BUSES <30' AND REQUIRED FOR FLOOR PLAN CLASS

We accept.

53. 3.2.1 ENGINE PLEASE ACCEPT THAT THE FORD 7.3L ENGINE HAS A HORSEPOWER OF 325-

We accept.

54. 3.5.2 TRANSMISSION PLEASE DELETE THE REQUIREMENT THAT THE PARKING BRAKE AUTOMATICALLY ENGAGE WHEN THE TRANSMISSION IS PLACED IN PARK. THIS IS NOT AVAILABLE ON FORD E SERIES CHASSIS AND CHEVY 4500 CHASSIS AND THERE IS NO AFTERMARKET OPTION AVAILABLE-

We will delete that requirement.

55. 3.5.5 TRANSMISSION, ALSO 4.1 AND 4.1.1 THESE ITEMS REFERS TO THE F450 CHASSIS. PLEASE CLARIFY THAT THEY SHOULD REFER TO AN E450 CHASSIS TO MEET THE REMAINDER OF THE CHASSIS SPECIFICATIONS-

Yes, it should refer to a E450 Chasis.

- 56 3.9.1 WHEELS PLEASE DELETE THE REQUIREMENT FOR 19.5" WHEELS AS THEY ARE NOT AVAILABLE ON THE FORD E SERIES CHASSIS AND CHEVY 4500 CHASSIS WHICH ONLY HAVE 16".-

We will delete that requirement.

- 57 3.12.1 ELECTRICAL Please accept that all wiring schematic on a flash drive, in lieu of paper copies, as an approved equal.-

We accept.

58. 3.14 BODY PLEASE APPROVE THE BODY CONSTRUCTION METHODS AND MATERIALS OUTLINED IN THE PROVIDED DOCUMENT TITLED 3.14 BODY CONSTRUCTION WHICH UTILIZED ALUMINIZED STEEL CAGE. THE CONSTRUCTION DETAILED IN THE SPECIFICATIONS ARE PROPRIATARY TO ONE MANUFACTURER AND WILL EXCLUDE ALL OTHER BIDDERS.-

We accept.

59. 3.16.1 EXTERIOR PAINT PLEASE ACCEPT THAT THE EXTERIOR OF THE BUS WILL NOT BE PAINTED WHITE UPON COMPLETION AS EACH COMPONENT ON THE EXTERIOR IS PRE-TREATED TO BE WHITE TO MATCH THE CHASSIS CAB-

We approve.

60. 3.16.2 EXTERIOR PAINT IT IS UNCLEAR WHAT, IF ANY, PAINT AND GRAPHICS ARE TO BE INCLUDED IN THE PRICE FOR EACH CLASS OF BUS. AND ADD THAT TO THE PRICE FOR EACH BUS? THAT DOES NOT APPEAR TO BE TO THE STATE'S ADVANTAGE FINANCIALLY. SINCE THE SPECIFICATION DESCRIBE THREE DIFFERENT SCENARIOS, WE SUGGEST YOU CLARIFY THAT THE BASE BUS DOES NOT INCLUDE ANY PAINT OR GRAPHICS AND ADD TWO OPTIONS TO EXHIBIT A PRICING PAGE. (1) TO INCLUDE LOGOS AND A MID BODY VINYL STRIPE ON BOTH SIDEWALLS AS WELL AS PAINTED SKIRTS. (2) TO INCLUDE 3/4 EXPANDED GRAPHICS OR FULL PAINT PACKAGE. SEE ATTACHED EXAMPLE OF REVISED EXHIBIT A PRICING PAGE.-

We only want the vehicles painted white. We will delete the graphics option from the pricing sheet.

61. 3.16.5 EXTERIOR PAINT SPECIFICATION REFERS TO EXHIBIT C FOR EXAMPLES OF PAINT INFORMATION AVAILABLE FOR PAINT AND GRAPHICS SCHEMES. –

We only want white.

62. 3.16.7 DECALS PLEASE ACCEPT THAT ALL DECALS WILL NOT BE 1.25" TALL LETTERS AND -

We only want white vehicles.

63. 3.18.2 AND 3.18.6 DOOR PLEASE CLARIFY IF AMBULATORY ENTRY DOOR IS TO BE MANUAL OR ELECTRIC OPERATED. SPEC CALLS OUT BOTH-

We want electric operated.

64. 3.18.2 DOOR PLEASE ACCEPT AN OVERALL CLEAR WIDTH OF 29-30 INCHES FOR THE ENTRY DOOR. THIS IS WHAT IS SHOWN ON THE FLOOR PLAN EXAMPLES INCLUDED IN YOUR SPECIFICATIONS-

We accept.

65. 3.18.9 DOORS PLEASE ACCEPT THE MANUFACTURER'S STANDARD DOOR CONSTRUCTION WHICH IS:

Header 16ga steel.

Sides upper and lower 14ga steel.

Steps 11ga steel.

We accept.

66. 3.19.1 WINDOWS/GLAZING PLEASE ACCEPT THE OEM STANDARD WINDSHIELD WHICH IS ONE PIECES AND IS GLUED IN PLACE. THIS IS THE ONLY WINDSHIELD AVAILABLE-

We accept.

67. 3.20.3 HEATING AND AIR CONDITIONING PLEASE ACCEPT THAT THE OEM DASH DOES NOT HAVE A SCREEN BELOW THE VENTS AND THE BUS MANUFACTURER CAN'T ADD A SCREEN WITHOUT REMOVING THE OEM DASH WHICH THEY ARE NOT PERMITTED TO DO BY FORD-

We accept.

68. 3.20.5 HEATING AND AIR CONDITIONING PLEASE ACCEPT TRANS AIR A/C SYSTEM AS AN APPROVED EQUAL TO THE BRAND NAME CALLED OUT IN THE SPEC. DETAILS OF THE PROPOSED SYSTEM ARE PROVIDED IN THE DOCUMENT TITLED 3.20.5 AIR CONDITIONING-

We accept.

69. 3.23.18 EXTERIOR LIGHTING PLEASE REMOVE THE REQUIREMENT TO USE TRUCK-LITE EXTERIOR LIGHT FIXTURE EXCLUSIVELY AS THIS WILL LIMIT THE COMPETITIVE BIDDING. MOST BUS MANUFACTURERS USE MORE THAN ONE BRAND NAME FOR EXTERIOR LIGHTS DEPENDING ON WHICH ONES ARE BEST SUITED FOR EACH PURPOSE-

We remove the requirement.

70. 3.24.2 FLOOR AND FLOOR COVERING PLEASE ACCEPT THE FOLLOWING FLOOR COVERING. ENTIRE FLOOR INCLUDING STEP TREADS, STEP RISERS, VESTIBULE, AISLE AND UNDER SEATS WILL BE BLUE GERFLOR NON-SKID COVERING. STEP TREADS AND STANDEE LINE WILL BE YELLOW.-

We accept the floor covering.

71. 3.24.2 FLOOR AND FLOOR COVERING PLEASE ACCEPT THE MANUFACTURER'S STANDARD FLOOR COVERING WHICH IS GERFLOR BLACK. THIS WILL CONTRAST WELL WITH A LIGHT GRAY SEAT COLOR.—

We accept the floor covering.

72. 3.11.2 AND 3.24.11 BUMPER SPECIFICATION CALLS FOR BOTH THE OEM REAR BUMPER AND A ROMEO RIM TYPE AFTERMARKET REAR BUMPER. WHICH ONE IS CORRECT?

The OEM rear bumper.

73. 3.27 SEATING THE FIRST ITEM IN THIS SECTION CALLS A MINIMUM OF 23 SEATS. THIS IS NOT WHAT THE SAMPLE FLOOR PLANS SHOW. PLEASE REMOVE THIS PORTION OF THE SPEC IF IT IS NOT CORRECT-

22 is acceptable.

3.27.10 SEATING DOES THIS SECTION CALL FOR DOUBLE SEAT WITH ONE CHILD RESTRAINT POSITION OR A DOUBLE SEAT WITH TWO CHILD RESTRAINT POSITIONS-

2 child restraint positions.

3.38.7 FIXED ROUTE PACKAGE PLEASE ACCEPT THAT ON THE TYPE OF BUS BEING PURCHASED, THE LICENSE PLATE BRACKET IS ON THE REAR WALL, NOT ON THE BUMPER. BRACKET WILL BE PROVIDED-

We accept that type.

Section 3.1.3 – One of the floorplans can be built on a 23-foot body. Will you accept a minimum vehicle length of 23 feet?

Yes.

2. Section 3.1.4 – One of the floorplans can be built on a 158in wheelbase. Will you accept a minimum wheelbase of 158 inches?

Yes.

3. Section 3.2.1 – The Ford 7.3L gas engine is 325 horsepower. Will you accept this modification?

Yes.

4. Section 3.5.2 – This option is not available. Both the Chevy and Ford Chassis' have a manual parking brake option. Will you approve the manual parking brake option?

Yes.

5. Section 3.5.5 – This section calls for an F450 chassis. Can you clarify whether you are looking for an E-series or F-series chassis?

E-Series.

6. Section 3.8.7 – Can you clarify if you would like the position of the switches to be located overhead or on a doghouse next to the driver's seat?-

Either is acceptable.

7. Section 3.8.7 (Rear Suspension) – Will you accept the OEM rear suspension? Can you clarify if you are looking for an upgraded rear suspension such as MORRYDE or if the OEM suspension is approved?-

MORRYDE.

8. Section 3.9.1 – Will you accept 16in wheels as this is standard on both Ford and Chevy chassis?-

Yes.

9. Section 3.10.5 – Will you accept an aftermarket spare tire that is the same size as the standard wheel and tire?-

Yes.

10. Section 3.11.2 – For the rear bumper, will you accept the standard rear bumper, or do you require an energy absorbing/rear bumper?

Yes.

11. Section 3.14.3 – The manufacturer does not offer a galvanized steel cage option. The steel body cage will be aluminized steel with a T-140 coating. Will you accept this modification?

Yes.

12. Section 3.15.2 – Is there a size requirement for the interior decals?

No. We want the vehicles painted white.

13. Section 3.16.1 – Do you require the bus to be painted white? The bus comes standard OEM white and all exterior parts are finished to match the OEM cab.-

Standard OEM White is acceptable.

14. Section 3.16.2 and Section 3.16.6 – Can you provide additional information as to what you are looking for with regards to paint schemes and graphics? Section 3.16.5 mentions “exhibit C,” however, I do not see an exhibit C attached. Can you share pictures/diagrams of the paint schemes and graphics you need?

We only want the vehicles painted white.

15. Section 3.16.5 – Should the cost of the paint/graphics be included in the vehicle cost for each class of vehicle? Or will this be negotiated with the transit agency directly?

The vehicles will only be painted white.

16. Section 3.18.2 – Can you clarify if the ambulatory passenger door should be manually or electrically operated? Section 3.18.6 calls for electric entry door while section 3.18.2 calls for manually operated entry door.-

Either is acceptable.

17. Section 3.18.8 – Can you clarify if you want the riser height to be 9inches or 9.25inches? Section 3.18.2 calls for 9.25in while section 3.18.8 calls for 9in riser.-

Either is acceptable.

18. Section 3.18.9 – Will you accept the following steel gauges as an approved equal? The header will be 16-gauge steel. The Sides upper and lower will be 14-gauge steel. The steps will be 11-gauge steel.-

Yes.

19. Section 3.19.1 – The OEM windshield is glued in place which is standard on the Ford and Chevy chassis. Will you accept this modification?

Yes.

20. Section 3.19.7 – Both the Ford and Chevy chassis have a single piece window that is roll up/roll down style. Will you accept this modification?

Yes.

21. Section 3.20.3 “A screen is to be installed under the defrost vent holes to prevent foreign objects from falling into defroster fan” – This modification would require the OEM dash to be pulled and will void the warranty of the OEM HVAC system. We do not have the ability to remove and replace the OEM dash. Will you accept deletion of this section?

Yes.

22. Section 3.20.5 – Will you accept the TransAir system TA7722 as an approved equal (see attached brochure)?

Yes.

23. Section 3.21.1 – Do you require TWO roof/escape hatches? Or will you accept 1 escape/roof hatch?

No, one plus the window.

24. Section 3.23.16 – Will you accept the PTI-LUXX strobe light as an approved equal? (see attached brochure)

Yes.

25. Section 3.23.17

– Will you accept the Maxxima fog lights as an approved equal? (see attached brochure) **Yes.**

26. Section 3.24.2 – Do you require a 2-tone flooring for stepwell and walkways?-

Yes this provides easily visible demarcation.

27. Section 3.24.11 – Do you require energy absorbing or HELP bumpers (i.e. Romeo Rim or equal) for the rear bumper? Section 3.11.2 calls for the manufacturer standard bumper. Which do you require?

No.

28. Section 3.25.5 – Can you clarify/explain in more detail the locations that you require vertical stanchions?-

Behind the driver's seat but it should not interfere with drive seat maneuverability.

29. Section 3.27 – This section states the minimum seating capacity of 23 passengers and 2 wheelchairs. This conflicts with the attached floorplans. Can this be changed/updated to the correct minimum desired amount?-

Yes.

30. Section 3.27.10 – Can you clarify the location of the ICS seats? Should the two ICS seats be located on the same row?-

Specifics for location are not required.

31. Section 3.27.11 – Is there a specific driver seat required?

No.

32. Section 3.29.1 – The ROSCO mirror is 8" X 15" standard. Will you accept this approved equal? (see attached brochure)-

Yes.

33. Section 3.29.4 – Will the driver dome light location in the attached picture work for this?
(see attached picture)-

Yes.

34. Section 3.31.8 – Can you clarify what brand of wheelchair tie downs are required? The spec calls out several brands, however, the “LOCKED” indicator only comes on the Sur-Lok brand.

Brand not required.

35. Section 3.38.2 – The Transign Destinator Series comes in the following dimensions: 12 X 112 (front) and 12 X 80 (side). Will you accept this modification?

Yes.

36. Section 3.38.7 – The manufacturer standard location for the license plate is built into the rear cap, not the rear bumper. Will you accept this modification? (see attached picture)

Yes.

37. Section 4.1 – “Lower Step to Ground Not More than 12in.” Section 3.18.2 states a 14in ground to first step height. Can you clarify which is required?

Should be less than 14 inches.

38. Class A Floorplan – Are foldable seats required for wheelchair positions in Class? If so, how many are required?

Yes, 1.

39. Class B Floorplan – Are foldable seats required in the wheelchair area for class B? If so, how many are required?

Yes, 1.

40. Class C Floorplan – Are foldable seats required in the wheelchair area for class C? Is so, how many are required?-

Yes, 1.

41. Class C Floorplan – Is a luggage area a requirement for class C?

No.

42. Class D Floorplan – Is a luggage area a requirement for class D?

No.

43. Class E Floorplan – Is a luggage area a requirement for class E?

No.

For Class A, Vehicle will require CDL to operate. If Division wants none CDL, recommend deleting both foldaway seats over the wheelchair.

Alternate floorplan available if needed.

Class A-Please provide the floorplan,

We will review the floorplan and add it if necessary.

For Class C, the luggage area is very small. Recommend increasing by 6” and changing lift position to forward just behind entrance steps.

Alternate floorplan available if needed.

Class C-Yes, it may be 6" longer.

For both Class D and E, none of the floorplans meet American’s with Disabilities Act
Just want the Division to know for FTA reimbursement reasons.

Class D and E Comment-We know it is not ADA compliant, but we would like to have that option regardless.

1. Please require the use of Docket 90 for the vinyl upholstery and have the polyurethane foam completely encapsulated by the vinyl. The correct test is FAR 25.853 not ASTM 162 and there is a smoke test ASTM E-662 to support lower smoke emissions.

We allow but do not require the usage of Docket 90.

2. Please approve the use of DOCKET 90 Vinyl (Attached) for this solicitation.

We approve the usage of Docket 90 Vinyl.

3.24 Floor and Floor Covering-3.24.4-All flooring shall be non-skid RCA Transit Flooring, Altro, or equal. Floor covering to be BLUE and shall contrast with seat cover colors. Vendor shall supply samples of flooring with bid.

Please accept Gerflor Tarabus as an approved equal to the specified RCA and Altro flooring. RCA rubber has been discontinued and is no longer produced. Gerflor's Tarabus flooring was designed and first introduced into the heavy-duty bus market with our 2.25mm thickness. The 2.25 mm, with its 100% pure PVC wear layer, has proven over the years to be very durable in the heavy-duty market. With the success in the heavy-duty market, this has carried over to the shuttle bus market with the 2.25 mm proving to be more than durable enough to last throughout the life cycle of a light and medium duty bus and the 12-year warranty on the Tarabus product line is longer than the average life cycle of a light/medium duty bus. See attached information. –

We accept this as an approved equal.

ADDENDUM ACKNOWLEDGEMENT FORM
SOLICITATION NO.: CRFQ ADJ2400000015

Instructions: Please acknowledge receipt of all addenda issued with this solicitation by completing this addendum acknowledgment form. Check the box next to each addendum received and sign below. Failure to acknowledge addenda may result in bid disqualification.

Acknowledgment: I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specification, etc.

Addendum Numbers Received:

(Check the box next to each addendum received)

- | | |
|--|--|
| <input checked="" type="checkbox"/> Addendum No. 1 | <input type="checkbox"/> Addendum No. 6 |
| <input checked="" type="checkbox"/> Addendum No. 2 | <input type="checkbox"/> Addendum No. 7 |
| <input checked="" type="checkbox"/> Addendum No. 3 | <input type="checkbox"/> Addendum No. 8 |
| <input checked="" type="checkbox"/> Addendum No. 4 | <input type="checkbox"/> Addendum No. 9 |
| <input type="checkbox"/> Addendum No. 5 | <input type="checkbox"/> Addendum No. 10 |

I understand that failure to confirm the receipt of addenda may be cause for rejection of this bid. I further understand that that any verbal representation made or assumed to be made during any oral discussion held between Vendor's representatives and any state personnel is not binding. Only the information issued in writing and added to the specifications by an official addendum is binding.

Sonny Merryman Inc.

Company

Trey Myers

Authorized Signature

05/28/2024

Date

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



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

State of West Virginia
Centralized Request for Quote
Vehicles

Proc Folder: 1395147

Doc Description: Less than 30 Ft. Cutaway Bus

Reason for Modification:

ADDENDUM NO_5
Vendor Questions and responses

Proc Type: Central Master Agreement

Date Issued	Solicitation Closes	Solicitation No	Version
2024-05-28	2024-05-30 13:30	CRFQ 0810 DMT2400000007	6

BID RECEIVING LOCATION

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

VENDOR

Vendor Customer Code: 000000197591

Vendor Name : Sonny Merryman Inc.

Address : 5120 Wards Road Evington, VA 24550

Street : 5120 Wards Road

City : Evington

State : VA

Country : USA

Zip : 24550

Principal Contact : Trey Myers

Vendor Contact Phone: 804-514-9289

Extension:

FOR INFORMATION CONTACT THE BUYER

John W Estep
304-558-2566
john.w.estep@wv.gov

Vendor
Signature X *Trey Myers*

FEIN# 54-0806-176

DATE 05/28/2024

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

ADDITIONAL INFORMATION

ADDENDUM NO. 5

Addendum No_5 issued to publish and distribute the attached information to the Vendor Community

INVOICE TO	SHIP TO
-------------------	----------------

PUBLIC TRANSIT DIVISION OF BLDG 5 RM 663		PUBLIC TRANSIT DIVISION OF KANAWHA VALLEY REGIONAL TRANSPORTATION AUTHORITY	
1900 KANAWHA BLVD E		1550 FOURTH AVE	
CHARLESTON	WV	CHARLESTON	WV
US		US	

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
1	Less than 30 ft. Cutaway Buses.	26.00000	EA		

Comm Code	Manufacturer	Specification	Model #
25101502			

Extended Description:

To establish an open ended contract for Less than 30 ft. Cutaway Buses. The vehicles will be utilized to assist public transportation throughout the state. The will be used in urban, sub-urban, and rural areas that includes hilly terrains and varying weather climates. These climates require vehicles that possess stop-start duty cycles.

Federal Terms and Conditions Apply

SCHEDULE OF EVENTS

<u>Line</u>	<u>Event</u>	<u>Event Date</u>
1	Tech Questions due by 10:00am	2024-04-26

SOLICITATION NUMBER: CRFQ DMT2400000007

Addendum Number: 5

The purpose of this addendum is to modify the solicitation identified as CRFQ DMT2400000007 ("Solicitation") to reflect the change(s) identified and described below.

Applicable Addendum Category:

- ☐ Modify bid opening date and time
- ☐ Modify specifications of product or service being sought
- ☒ Attachment of vendor questions and responses
- ☐ Attachment of pre-bid sign-in sheet
- ☐ Correction of error
- ☐ Other

Additional Documentation:

Bid Opening remains 05/30/2024 at 1:30pm

Terms and Conditions:

1. All provisions of the Solicitation and other addenda not modified herein shall remain in full force and effect.
2. Vendor should acknowledge receipt of all addenda issued for this Solicitation by completing an Addendum Acknowledgment, a copy of which is included herewith. Failure to acknowledge addenda may result in bid disqualification. The addendum acknowledgement should be submitted with the bid to expedite document processing.

1. In reading the specifications and addendum #4 which includes the states responses to the first round of questions, we noticed many irregularities and confusing responses which will prevent all bidders from being on an even playing field. Since the bid will be award to the participant with the lowest price, it is crucial that all bidders understand exactly what the state demands for each Class of vehicle. Also, we think it is in the state's best interest to clearly describe each vehicle Class so that a bidder or bidders cannot take advantage of the irregularities to give themselves a price advantage by leaving items off their quotes.
 - Without being aware of the specific irregularities that are being identified, the Division of Public Transit cannot provide a response. The RFQ has been reviewed by DOT Purchasing personnel and the State of West Virginia's Department of Purchasing personnel and has been deemed acceptable to be posted for the bidding process.
2. The floor plans provided and the text describing the floor plans confuse the issue even further regarding what is and is not required for each bus Class.
 - As quoted from our RFQ, floor plans are for illustrative purposes only, and they are not exact descriptions of the configurations.
3. Bidders still do not have enough information to properly quote the optional paint and vinyl graphics.
 - We want the vehicles painted an approved version of white.
4. Items were left out of the specifications that we feel the state actually wants on their cutaway buses such as a driver running board and passenger seat belt extensions, etc.
 - We would like to have an OEM, industry standard driver running boards and OEM seat belt extensions added to the buses.

Please consider moving the opening date for the bid out so that you can schedule a due date in the near future for a second round of questions and clarifications so that these matters can be addressed.

- We do not want to delay the process further, we plan to keep to the same due date, May 30th.

I have reviewed the responses to the questions submitted, however, I am requesting some clarification with regards to the graphics and paint schemes for the bid. The response to the question below reads that the vendor is responsible for the graphics and paint schemes on the vehicles and this cost should be included in the cost of the vehicle.

However, later in the document the response to a similar question state that the vehicles “only be painted white.”

- Can you please clarify if the vendors are responsible for completing the specific agencies graphics/paint scheme OR should the vehicle remain white? If we are to complete the paint scheme/graphics, should we include this cost into the vehicle price for each class?
 - We only want the vehicles painted an approved color of white.
- Can you please clarify if you would like for us to have the exterior decals listed in section 3.16.7 installed on the vehicle? The response to the question below reads that you do not need the exterior decals.
 - We would like the vehicles painted white; we do not need the exterior decals installed on the vehicles.
- Can you please clarify if the two-tone flooring in section 3.24.2 is required? One question in addendum 4 states that two-tone flooring is required while another question accepts solid blue or black flooring.
 - We only need the two-tone flooring on the steps for safety purposes. The other sections of the buses do not need to have two tones.
- Can you clarify if a rear emergency door is required for Classes A, B,C,D and E? The bid mentions a rear emergency door (section 3.23.7) and is shown in the floorplans.
 - Yes, we would like to have emergency rear doors installed on the buses for safety purposes.

In reference to

CRFQ 0810 DMT2400000007

A few questions and request for equals:

Page 5, Chassis 3.1.3. Will you accept body length 23'-29.5"-

- Yes this is acceptable.

Page 5, Chassis 3.1.4. With above body length, wheelbase to be a minimum of 158" to 212"-

- Yes this is acceptable.

Page 9. Request for E-450 Chassis Approved equal - Wheels 3.9.1 16" x 6.5 bolt patten, 8 lug, tire size 275 x 16.-

- Yes this is acceptable.

Page 13, Body 3.14.3. Please provide clarification that Galvanized steel in cage does not need anticorrosion treatment. –

- It does not need anticorrosion treatment.

Page 14. Body 3.14.7. Approved equal: Interior and Exterior panels are fastened to steel cage using a high strength automotive adhesive material.

The industry has moved away from welding or riveted exterior and interior panels.

- Yes, this is acceptable.

Page 14. Body 3.14.12. The bidder is requesting that the requirement for skirts is eliminated. Our OEM side exterior side wall does not include a skirt. –

- This is acceptable.

Page 18. Doors 3.18.2. a) Bidder is requesting 36" entry door with 33" clear opening. - This is acceptable.

b) Door will be an electric gear driven as in 3.18.6.-

- This is acceptable.

c) Door height to be minimum 78". –

- This is acceptable.

d) Riser height 9.5". –

- This is acceptable.

Page 20. Heating and AC. 3.20.3. Will a driver's fan pointing toward right side driver's compartment window for defrosting purposes be acceptable? –

- Yes this is acceptable, as long as the compartment window is defrosted in a reasonable time frame.

ADDENDUM ACKNOWLEDGEMENT FORM
SOLICITATION NO.: CRFQ DMT2400000007

Instructions: Please acknowledge receipt of all addenda issued with this solicitation by completing this addendum acknowledgment form. Check the box next to each addendum received and sign below. Failure to acknowledge addenda may result in bid disqualification.

Acknowledgment: I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specification, etc.

Addendum Numbers Received:

(Check the box next to each addendum received)

<input type="checkbox"/> Addendum No. 1	<input type="checkbox"/> Addendum No. 6
<input type="checkbox"/> Addendum No. 2	<input type="checkbox"/> Addendum No. 7
<input type="checkbox"/> Addendum No. 3	<input type="checkbox"/> Addendum No. 8
<input type="checkbox"/> Addendum No. 4	<input type="checkbox"/> Addendum No. 9
<input checked="" type="checkbox"/> Addendum No. 5	<input type="checkbox"/> Addendum No. 10

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Sonny Merryman Inc.

Company

Trey Myers

Authorized Signature

05/28/2024

Date

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

StarTrans Bus

Pre-Award BUY AMERICA CERTIFICATION

This certifies compliance with FTA Buy America Regulations set forth in 49 C.F.R. § 661.11 for each component that more than 70% of the subcomponents, by cost, are of U.S. origin/manufacture and is manufactured in the U.S. Manufacturer attests that the U.S. content of subcomponents, by cost is as indicated below.

CHASSIS DESCRIPTION	MANUFACTURER NAME		% U.S. CONTENT	%FOREIGN CONTENT
Senator II 22 158" WB E-450	StarTrans Bus		<u>72.47%</u>	<u>27.53%</u>
COMPONENT NAME	MANUFACTURER NAME	MFG LOCATION	% OF TOTAL	
Chassis	Ford Motor Co.	U.S.	40.73%	
Destination Signs	Transign	U.S.	3.67%	
Exterior Mirrors	ROSCO	U.S.	0.44%	
A/C System	Trans Air	U.S.	6.95%	
Wheelchair/Rear Door(s)	Challenger Door	U.S.	1.08%	
Wheelchair Lift	Braun	U.S.	4.55%	
Seating	Freedman	U.S.	8.22%	
DVR/NVR	ANGELTRAX	U.S.	3.24%	
Roof Hatch	Transpec	U.S.	0.21%	
Entry Door Header/Door Panels	A&M Systems	U.S.	0.71%	
Windows	Lippert Components Inc	U.S.	0.66%	
Intermotive Gateway	LGS Group	U.S.	0.89%	
Fiberglass Caps/Transitions	Sampson Fiberglass	U.S.	1.11%	

MAJOR ACTIVITIES UNDERTAKEN AT THE FINAL ASSEMBLY LOCATION

All purchasing of raw and assembled materials including the chassis, fabrication and welding of the frame, prime paint, installation of all wood, fabric, FRP, aluminum and/or other body panel and/or trim materials, installation of doors and windows, HVAC components and systems, electrical systems, installation of any required options such as wheel chair lifts, tie down kits, seats, radios and optional electronic items, if any, complete undercoat, exterior paint and/or graphics if ordered, full road test, rain booth test and all other final quality functions as needed to ensure compliance with the contract.

FINAL ASSEMBLY LOCATION: 2367 CENTURY DRIVE, GOSHEN, IN 46528

BODY V.I.N. OF UNITS DELIVERED UNDER POST DELIVERY BUY AMERICA:

TBD

FINAL ASSEMBLY % OF TOTAL COST NOT INCLUDED IN THE MATERIAL COSTS ABOVE:

3.32%

FINAL ASSEMBLY \$\$ NOT INCLUDED IN THE COSTS ABOVE

\$1,508.59



AUTHORIZED SIGNATURE

Government Bid Assistant

TITLE

5/29/2024

DATE

Luke Akins
PRINT NAME

StarTrans Bus

Pre-Award BUY AMERICA CERTIFICATION

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CHASSIS DESCRIPTION	MANUFACTURER NAME		% U.S. CONTENT	%FOREIGN CONTENT
Senator II 25 176" WB E-450	StarTrans Bus		<u>71.64%</u>	<u>28.36%</u>
COMPONENT NAME	MANUFACTURER NAME	MFG LOCATION	% OF TOTAL	
Chassis	Ford Motor Co.	U.S.	39.31%	
Destination Signs	Transign	U.S.	3.54%	
Exterior Mirrors	ROSCO	U.S.	0.42%	
A/C System	Trans Air	U.S.	6.71%	
Wheelchair/Rear Door(s)	Challenger Door	U.S.	1.04%	
Wheelchair Lift	Braun	U.S.	4.40%	
Seating	Freedman	U.S.	9.64%	
DVR/NVR	ANGELTRAX	U.S.	3.13%	
Roof Hatch	Transpec	U.S.	0.20%	
Entry Door Header/Door Panels	A&M Systems	U.S.	0.68%	
Windows	Lippert Components Inc	U.S.	0.64%	
Intermotive Gateway	LGS Group	U.S.	0.86%	
Fiberglass Caps/Transitions	Sampson Fiberglass	U.S.	1.07%	

MAJOR ACTIVITIES UNDERTAKEN AT THE FINAL ASSEMBLY LOCATION

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BODY V.I.N. OF UNITS DELIVERED UNDER POST DELIVERY BUY AMERICA:

TBD

FINAL ASSEMBLY % OF TOTAL COST NOT INCLUDED IN THE MATERIAL COSTS ABOVE:

3.21%

FINAL ASSEMBLY \$\$ NOT INCLUDED IN THE COSTS ABOVE

\$1,508.59



AUTHORIZED SIGNATURE

Government Bid Assistant

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CHASSIS DESCRIPTION	MANUFACTURER NAME		% U.S. CONTENT	%FOREIGN CONTENT
Senator II 25 190" WB E-450	StarTrans Bus		<u>71.67%</u>	<u>28.33%</u>
COMPONENT NAME	MANUFACTURER NAME	MFG LOCATION	% OF TOTAL	
Chassis	Ford Motor Co.	U.S.	38.87%	
Destination Signs	Transign	U.S.	3.50%	
Exterior Mirrors	ROSCO	U.S.	0.42%	
A/C System	Trans Air	U.S.	6.63%	
Wheelchair/Rear Door(s)	Challenger Door	U.S.	1.03%	
Wheelchair Lift	Braun	U.S.	4.35%	
Seating	Freedman	U.S.	10.37%	
DVR/NVR	ANGELTRAX	U.S.	3.09%	
Roof Hatch	Transpec	U.S.	0.20%	
Entry Door Header/Door Panels	A&M Systems	U.S.	0.68%	
Windows	Lippert Components Inc	U.S.	0.63%	
Intermotive Gateway	LGS Group	U.S.	0.85%	
Fiberglass Caps/Transitions	Sampson Fiberglass	U.S.	1.06%	

MAJOR ACTIVITIES UNDERTAKEN AT THE FINAL ASSEMBLY LOCATION

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BODY V.I.N. OF UNITS DELIVERED UNDER POST DELIVERY BUY AMERICA:

TBD

FINAL ASSEMBLY % OF TOTAL COST NOT INCLUDED IN THE MATERIAL COSTS ABOVE:

3.18%

FINAL ASSEMBLY \$\$ NOT INCLUDED IN THE COSTS ABOVE

\$1,508.59



AUTHORIZED SIGNATURE

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TITLE

5/29/2024

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StarTrans Bus

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CHASSIS DESCRIPTION	MANUFACTURER NAME		% U.S. CONTENT	%FOREIGN CONTENT
Senator II 25 176" WB E-450	StarTrans Bus		<u>72.03%</u>	<u>27.97%</u>
COMPONENT NAME	MANUFACTURER NAME	MFG LOCATION	% OF TOTAL	
Chassis	Ford Motor Co.	U.S.	42.30%	
Destination Signs	Transign	U.S.	3.81%	
Exterior Mirrors	ROSCO	U.S.	0.46%	
A/C System	Trans Air	U.S.	7.22%	
Wheelchair/Rear Door(s)	Challenger Door	U.S.	0.50%	
Seating	Freedman	U.S.	10.67%	
DVR/NVR	ANGELTRAX	U.S.	3.37%	
Roof Hatch	Transpec	U.S.	0.22%	
Entry Door Header/Door Panels	A&M Systems	U.S.	0.74%	
Windows	Lippert Components Inc	U.S.	0.69%	
Intermotive Gateway	LGS Group	U.S.	0.92%	
Fiberglass Caps/Transitions	Sampson Fiberglass	U.S.	1.15%	

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BODY V.I.N. OF UNITS DELIVERED UNDER POST DELIVERY BUY AMERICA:

TBD

FINAL ASSEMBLY % OF TOTAL COST NOT INCLUDED IN THE MATERIAL COSTS ABOVE:

3.45%

FINAL ASSEMBLY \$\$ NOT INCLUDED IN THE COSTS ABOVE

\$1,508.59

Luke Akins

AUTHORIZED SIGNATURE

Government Bid Assistant

TITLE

5/29/2024

DATE

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StarTrans Bus

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CHASSIS DESCRIPTION	MANUFACTURER NAME		% U.S. CONTENT	%FOREIGN CONTENT
Senator II 25 190" WB E-450	StarTrans Bus		<u>72.16%</u>	<u>27.84%</u>
COMPONENT NAME	MANUFACTURER NAME	MFG LOCATION	% OF TOTAL	
Chassis	Ford Motor Co.	U.S.	41.32%	
Destination Signs	Transign	U.S.	3.72%	
Exterior Mirrors	ROSCO	U.S.	0.45%	
A/C System	Trans Air	U.S.	7.05%	
Wheelchair/Rear Door(s)	Challenger Door	U.S.	0.49%	
Seating	Freedman	U.S.	12.21%	
DVR/NVR	ANGELTRAX	U.S.	3.29%	
Roof Hatch	Transpec	U.S.	0.21%	
Entry Door Header/Door Panels	A&M Systems	U.S.	0.72%	
Windows	Lippert Components Inc	U.S.	0.67%	
Intermotive Gateway	LGS Group	U.S.	0.90%	
Fiberglass Caps/Transitions	Sampson Fiberglass	U.S.	1.12%	

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FINAL ASSEMBLY LOCATION: 2367 CENTURY DRIVE, GOSHEN, IN 46528

BODY V.I.N. OF UNITS DELIVERED UNDER POST DELIVERY BUY AMERICA:

TBD

FINAL ASSEMBLY % OF TOTAL COST NOT INCLUDED IN THE MATERIAL COSTS ABOVE:

3.37%

FINAL ASSEMBLY \$\$ NOT INCLUDED IN THE COSTS ABOVE

\$1,508.59



AUTHORIZED SIGNATURE

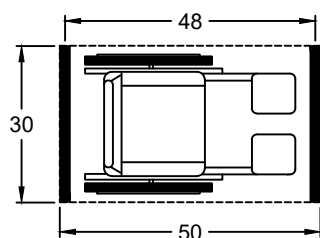
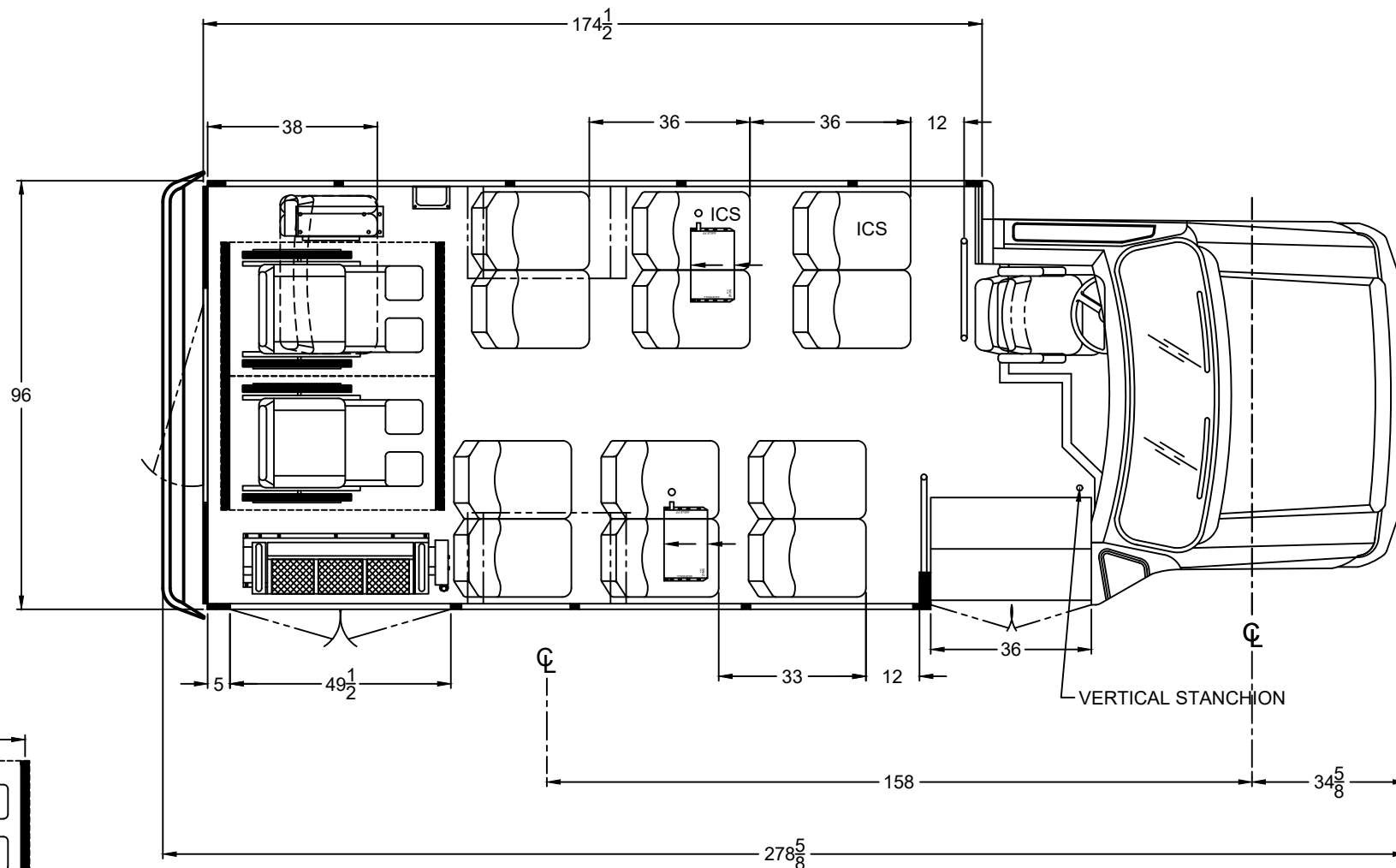
Government Bid Assistant

TITLE

5/29/2024

DATE

Luke Akins
PRINT NAME



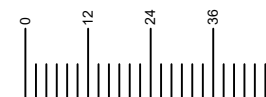
DEALER APPROVAL

☐ APPROVED

CUSTOMER SIGNATURE

NOTE: SHOWN WITH MID HI FREEDMAN SEATS
E-450 14,500 GVWR
THIS FLOOR PLAN IS FOR ILLUSTRATION PURPOSES ONLY.
A WEIGHT ANALYSIS HAS NOT YET BEEN PERFORMED.
FINAL APPROVAL WITH A WEIGHT ANALYSIS IS REQUIRED UPON RECEIPT OF A
COMPLETED ORDER WITH ALL OPTIONS SHOWN.
OPTIONAL EQUIPMENT MAY BE SHOWN.
THE SALES ORDER PLACED DICTATES ACTUAL OPTION CONTENT.

SCALE
IN INCHES



THIS DRAWING AND THE INFORMATION THEREON ARE THE EXCLUSIVE PROPERTY OF FOREST RIVER BUS, A DIVISION OF FOREST RIVER. IT SHALL NOT BE COPIED OR DUPLICATED IN ANY MANNER, NOR SHALL IT BE SUBMITTED TO OUTSIDE PARTIES FOR EXAMINATION WITHOUT OUR WRITTEN CONSENT. IT IS LOANED FOR USE WITH REFERENCE TO WORK UNDER CONTRACT WITH, OR PROPOSALS SUBMITTED TO FOREST RIVER BUS, A DIVISION OF FOREST RIVER.

REV.	DESCRIPTION OF CHANGE	BY	CHK	DATE	ECN No.
LET.					

TOLERANCE UNLESS
OTHERWISE SPECIFIED

WOOD	OTHER
+ 1/8"	+ 1/16"
+ 1"	+ 1/2"



FOREST RIVER BUS

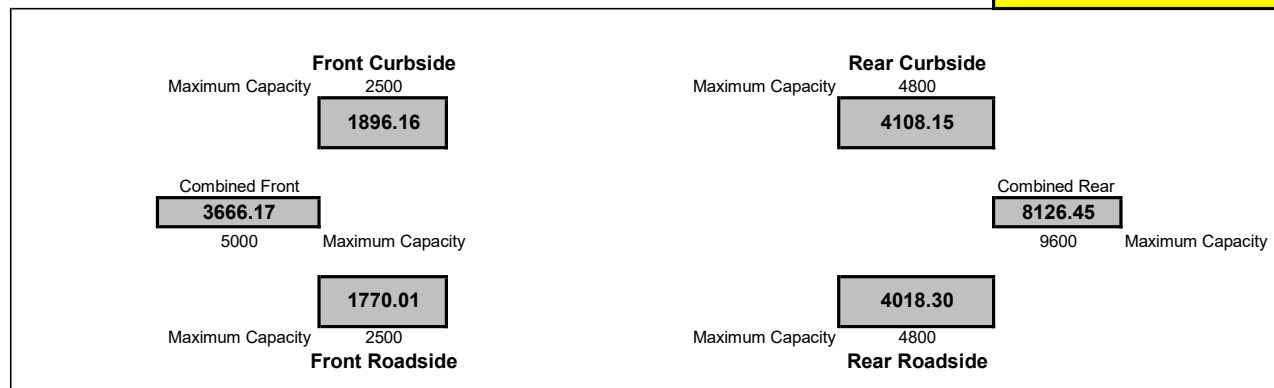
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MODEL 22'

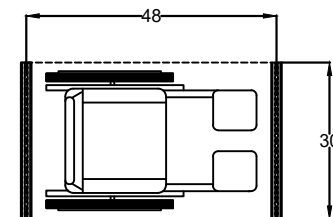
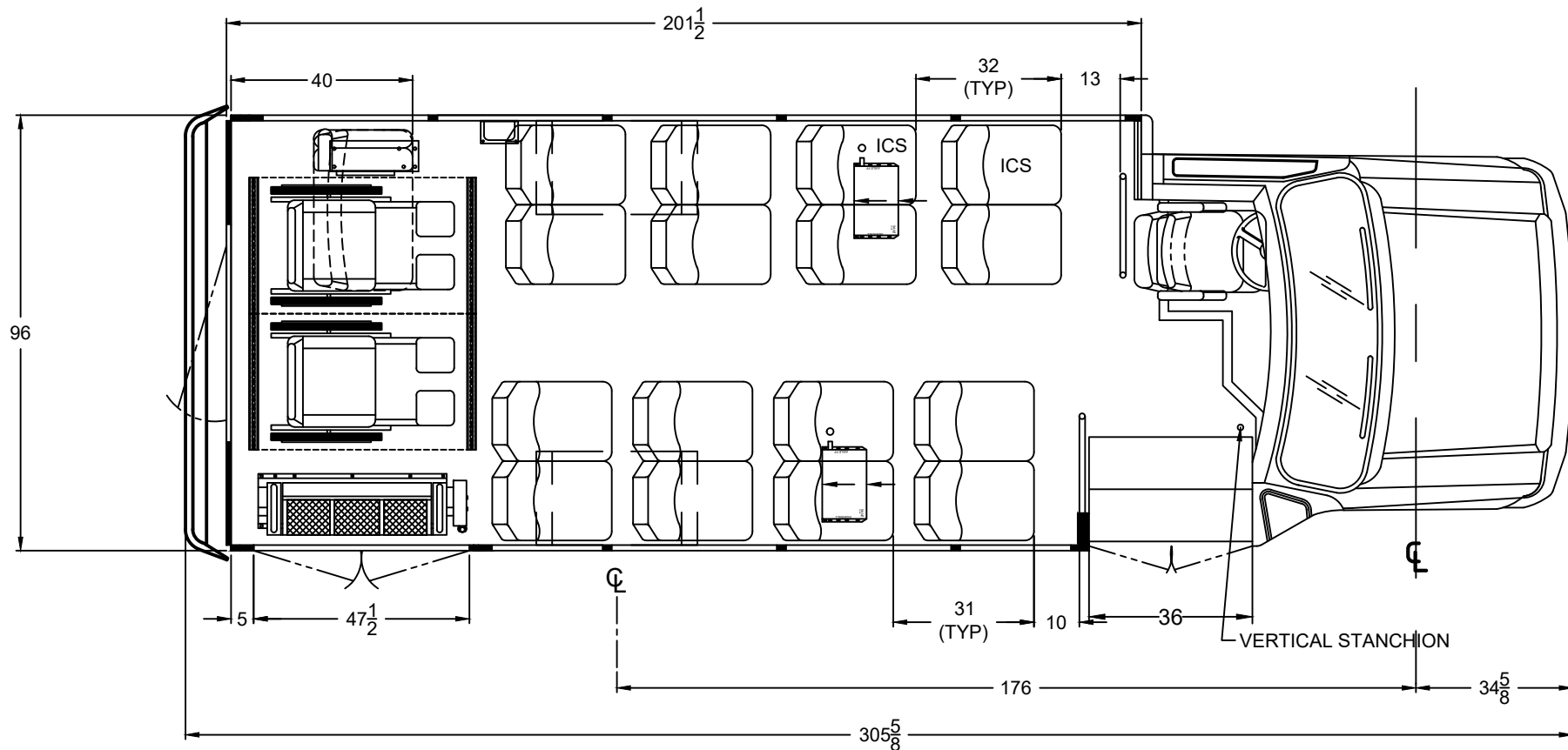
NAME: CRANS

DATE: 05/23/24

DWG. No. 12 2 WC 1 DB FOLD 158 163-31 FRB

5/24/2024 12 2 WC 1 DB FOLD 158 163-31 FRB WA

[illegible]



DEALER APPROVAL

☐ APPROVED

CUSTOMER SIGNATURE

NOTE: SHOWN WITH MID HI FREEDMAN SEATS
E-450 14,500 GVWR
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OPTIONAL EQUIPMENT MAY BE SHOWN.
THE SALES ORDER PLACED DICTATES ACTUAL OPTION CONTENT.

SCALE
IN INCHES



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REV.	DESCRIPTION OF CHANGE	BY	CHK	DATE	ECN No.
LET.					

TOLERANCE UNLESS
OTHERWISE SPECIFIED

WOOD	OTHER
+ 1/8"	+ 1/16"
+ 1"	+ 1/2"



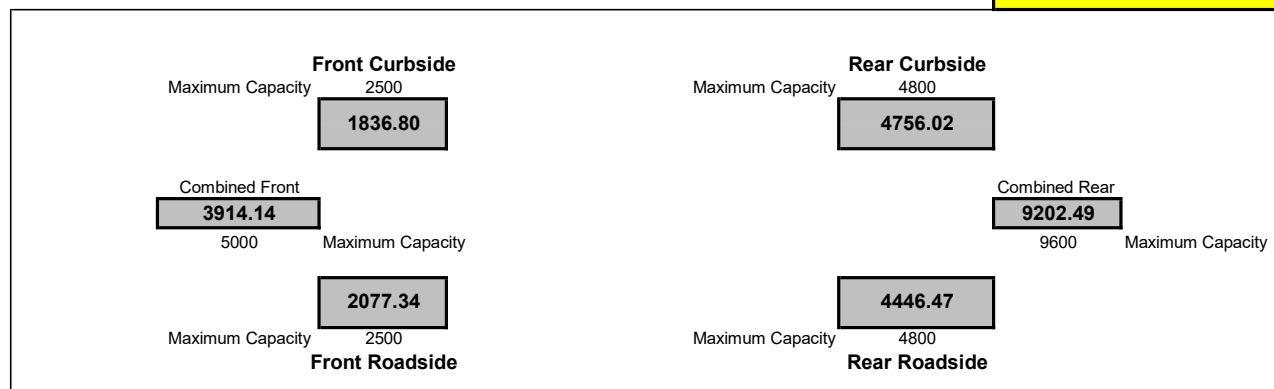
FOREST RIVER BUS

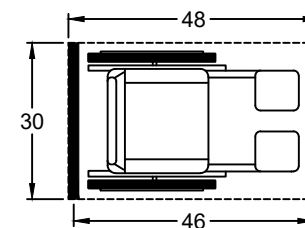
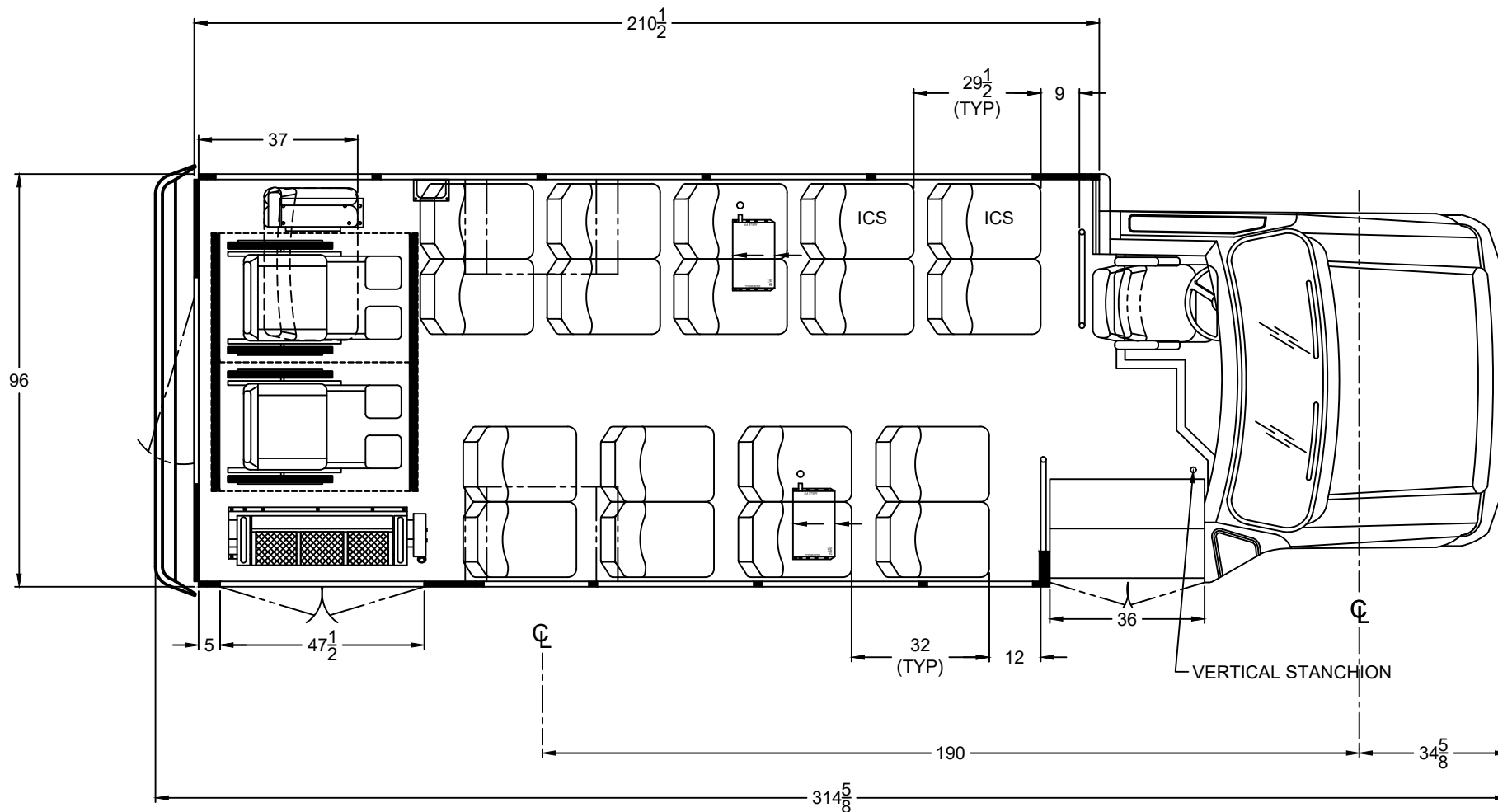
TITLE:
16 2 WC PASS
MODEL 25

NAME: CRANS DATE: 05/23/24

DWG. No. 16 2 WC 1 DB FOLD 176 190-11 FRB

5/24/2024 16 2 WC 1 DB FOLD 176 190-11 FRB WA

[illegible]



NOTE: SHOWN WITH MID HI FREEDMAN SEATS
 E-450 14,500 GVWR
 THIS FLOOR PLAN IS FOR ILLUSTRATION PURPOSES ONLY.
 A WEIGHT ANALYSIS HAS NOT YET BEEN PERFORMED.
 FINAL APPROVAL WITH A WEIGHT ANALYSIS IS REQUIRED UPON RECEIPT OF A
 COMPLETED ORDER WITH ALL OPTIONS SHOWN.
 OPTIONAL EQUIPMENT MAY BE SHOWN.
 THE SALES ORDER PLACED DICTATES ACTUAL OPTION CONTENT.

DEALER APPROVAL

☐ APPROVED

CUSTOMER SIGNATURE

SCALE
IN INCHES



FOREST RIVER BUS

TITLE:
18 2 WC PASS. 190" WB
MODEL 25

NAME: CRANS DATE: 05/23/24

DWG. No. 18 2 WC 1 DB FOLD 190 199-1 FRB

THIS DRAWING AND THE INFORMATION THEREON ARE THE EXCLUSIVE PROPERTY OF FOREST RIVER BUS, A DIVISION OF FOREST RIVER. IT SHALL NOT BE COPIED OR DUPLICATED IN ANY MANNER, NOR SHALL IT BE SUBMITTED TO OUTSIDE PARTIES FOR EXAMINATION WITHOUT OUR WRITTEN CONSENT. IT IS LOANED FOR USE WITH REFERENCE TO WORK UNDER CONTRACT WITH, OR PROPOSALS SUBMITTED TO FOREST RIVER BUS, A DIVISION OF FOREST RIVER.

REV.
LET.

DESCRIPTION OF CHANGE

BY

CHK

DATE

ECN No.

TOLERANCE UNLESS
OTHERWISE SPECIFIED

WOOD

OTHER

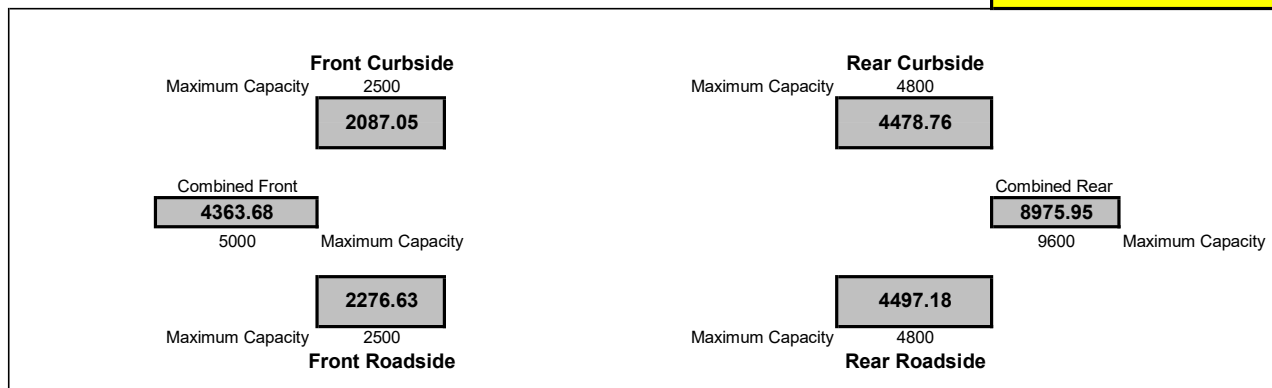
+ 1/8"

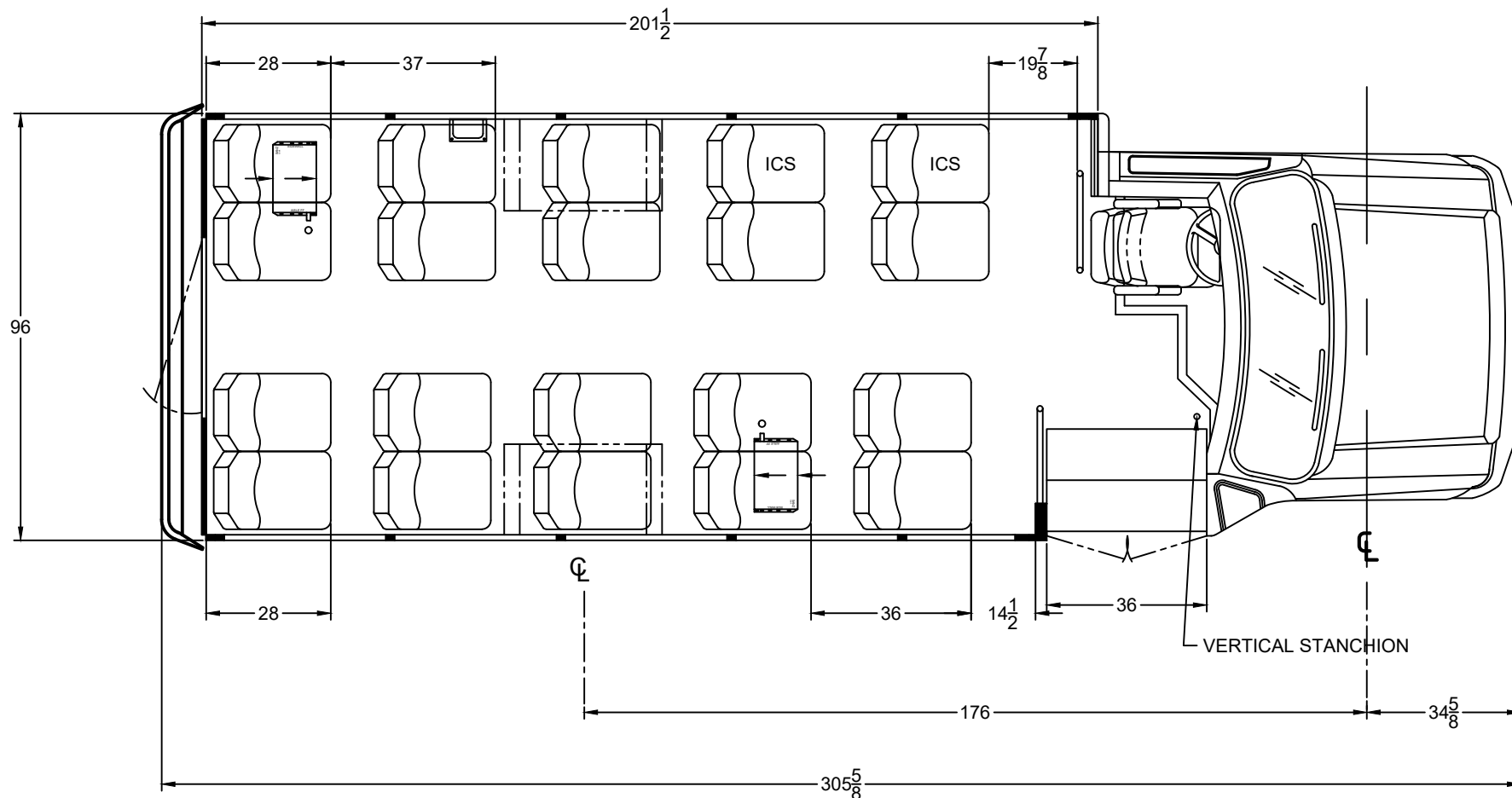
+ 1/16"

+ 1"

+ 1/2"

5/24/2024 18 2 WC 1 DB FOLD 190 199-1 FRB WA

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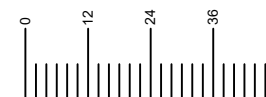
DEALER APPROVAL

☐ APPROVED

CUSTOMER SIGNATURE

NOTE: SHOWN WITH MID HI FREEDMAN SEATS
E-450 14,500 GVWR
THIS FLOOR PLAN IS FOR ILLUSTRATION PURPOSES ONLY.
A WEIGHT ANALYSIS HAS NOT YET BEEN PERFORMED.
FINAL APPROVAL WITH A WEIGHT ANALYSIS IS REQUIRED UPON RECEIPT OF A
COMPLETED ORDER WITH ALL OPTIONS SHOWN.
OPTIONAL EQUIPMENT MAY BE SHOWN.
THE SALES ORDER PLACED DICTATES ACTUAL OPTION CONTENT.

SCALE
IN INCHES



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REV.	DESCRIPTION OF CHANGE	BY	CHK	DATE	ECN No.
LET.					

TOLERANCE UNLESS
OTHERWISE SPECIFIED

WOOD	OTHER
+ 1/8"	+ 1/16"
+ 1"	+ 1/2"



FOREST RIVER BUS

TITLE:

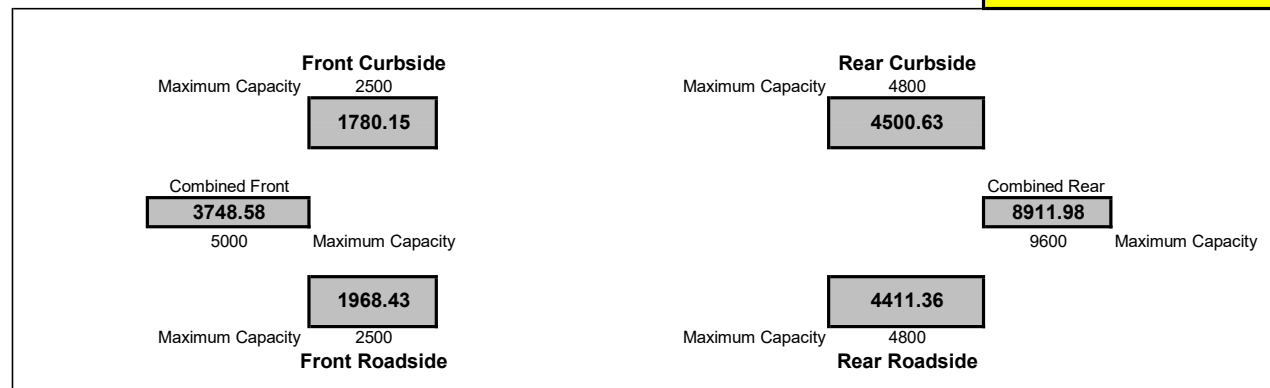
20 PASS. 176" WB
MODEL 25

NAME: CRANS

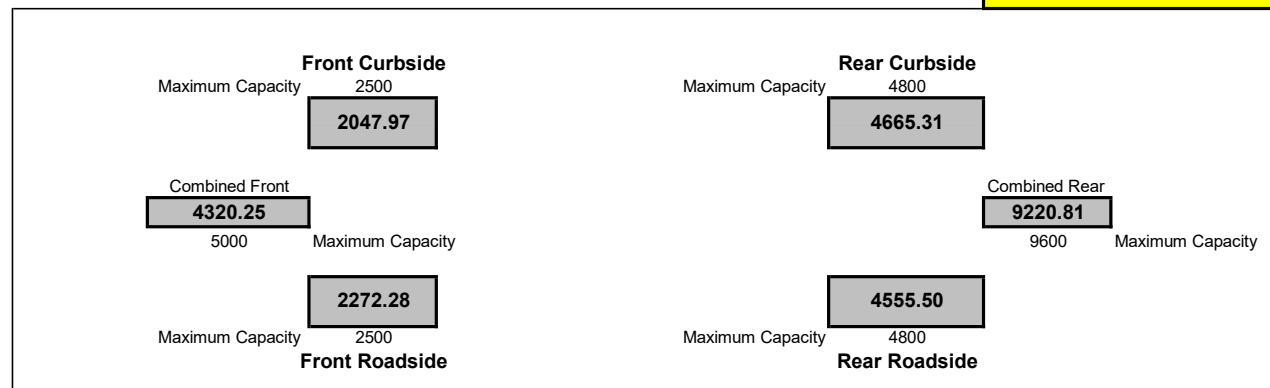
DATE: 03/16/23

DWG. No. 20 PASS 176 190-8 FRB

5/29/2024 20 PASS 176 190-8 FRB WA

[illegible]

5/29/2024 24 PASS 190 199-14 FRB WA

[illegible]

2025 Model Year **Ford Warranty Guide**

(Except F-600/F-650/F-750/F-53/F-59
Over 19,500 lbs. GVWR and Electric Vehicles)



owner.ford.com



ford.ca

January 2024
First Printing
Litho in U.S.A.



SW7J19T201 AA



This booklet explains the New Vehicle Limited Warranty coverages that apply to your Ford vehicle. Your satisfaction is our goal. If you are not satisfied with Ford's performance under the warranty, Ford participates in an informal warranty dispute settlement mechanism through the Better Business Bureau, which you can contact as follows: BBB AUTOLINE
1676 International Drive, Suite 550, McLean, VA 22102.

You may use the BBB Autoline without charge. An application is available from BBB (800-955-5100) or Ford (800-392-3673).

You must resort to the BBB Autoline mechanism before exercising rights or seeking remedies created by the Magnuson-Moss Warranty Act. If you choose to seek redress by pursuing rights and remedies not created by the Magnuson-Moss Warranty Act, resort to the BBB Autoline Mechanism is not required by any provision of the Magnuson-Moss Warranty Act. Your state may require that you first resort to the BBB Autoline before exercising rights or seeking remedies created by your state's laws.

Further information on the BBB Autoline can be found on page 47.

ALL IMPLIED WARRANTIES, INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE ARE LIMITED, TO THE EXTENT ALLOWED BY LAW, TO THE DURATION OF THE NEW VEHICLE LIMITED WARRANTY BUMPER TO BUMPER COVERAGE. Further information on implied warranties can be found on page 6.

ANY PUNITIVE, EXEMPLARY, INCIDENTAL, CONSEQUENTIAL OR ANY OTHER DAMAGES CAUSED BY DELAY, OR LOSS OF USE MAY NOT BE RECOVERED AND ARE DISCLAIMED AND EXCLUDED UNLESS APPLICABLE LAW PROHIBITS THEIR DISCLAIMER OR EXCLUSION. Further information on the disclaimers and exclusions can be found on page 6.



Your satisfaction is our #1 goal. If you have any questions or concerns, or are unsatisfied with the service you are receiving, follow these steps:

1. Contact your Sales Representative or Service Advisor at your selling/servicing dealership.
2. If your inquiry or concern remains unresolved, contact the Sales Manager, Service Manager or Customer Relations Manager.
3. If you require assistance or clarification on Ford Motor Company policies or procedures, please contact the Ford Customer Relationship Center.

In the United States	In Canada
<p>Ford Motor Company Customer Relationship Center P.O. Box 6248 Dearborn, MI 48121 1-800-392-3673 (FORD) For the hearing- or speech-impaired: Please contact the Telecommunication Relay Service by dialing 711 www.owner.ford.com</p>	<p>Customer Relationship Centre Ford Motor Company of Canada, Limited P.O. Box 2000 Oakville, Ontario L6J 5E4 1-800-565-3673 (FORD) For the hearing- or speech-impaired: Please contact the Telecommunication Relay Service by dialing 711 M-F 8:30 AM - 8:00 PM (ET) www.ford.ca</p>
In Asia-Pacific Region, Sub-Saharan Africa, U.S. Virgin Islands, Central America, the Caribbean, and Israel:	In Puerto Rico
<p>Ford Motor Company Ford Export Operations Attention: Customer Relations 1555 Fairlane Drive Fairlane Business Park #3 Allen Park, MI 48101 Telephone: (313) 594-4857 For customers in Guam, the Commonwealth of the Northern Mariana Islands (CNMI), America Samoa, and the U.S. Virgin Islands, please feel free to call our Toll-Free Number: (800) 841-FORD (3673) Fax: (313) 390-0804 E-mail: expcac@ford.com</p>	<p>Ford International Business Development, Inc. P.O. Box 11957 Caparra Heights Station San Juan, PR 00922-1957 Telephone: (800) 841- FORD (3673) Fax: (313) 390-0804 E-mail: prcac@ford.com www.ford.com.pr</p>
In Middle East	
<p>Customer Relationship Center P.O. Box 21470 Dubai, United Arab Emirates Telephone: 971-4-3326084 Toll-free Number for the Kingdom of Saudi Arabia: 800 8971409 Local Telephone Number for Kuwait: 24810575 Fax: 971-4-3327299 E-mail: menacac@ford.com www.me.ford.com</p>	

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1. Introduction

Ford Motor Company and your selling dealer thank you for selecting one of our quality products. Our commitment to you and your vehicle begins with quality protection and service.

When you need warranty repairs, your selling dealer would like you to return to it for that service, but you may also take your vehicle to another Ford Motor Company dealership authorized for warranty repairs. Certain warranty repairs require special training though, so not all dealers are authorized to perform all warranty repairs. That means that, depending on the warranty repair needed, the vehicle may need to be taken to another dealer. If a particular dealership cannot assist you, then contact the Customer Relationship Center at 1-800-392-3673.

This booklet explains in detail the warranty coverages that apply to your 2025-model car or light truck. If you bought a previously owned 2025-model vehicle, you are eligible for any remaining warranty coverages.

Ford Motor Company provides the **Emissions Defect Warranties** and **Emissions Performance Warranties** which cover your emissions control systems, and **Noise Emissions Warranty** which applies only to medium/heavy duty trucks over 10,000 pounds Gross Vehicle Weight Rating (pages 24-45).

2. Important information you should know

IF YOU NEED CUSTOMER ASSISTANCE

Your Ford Motor Company dealer is available to assist you with all your automotive needs. Please follow the procedures outlined on the front page of this booklet.

In addition, if you are an eligible U.S. owner, you may use - at no cost - the services of the BBB AUTO LINE program. For details, see Better Business Bureau (BBB) AUTO LINE program, page 47 or call 1-800-955-5100.

KNOW WHEN YOUR WARRANTY BEGINS

Your Warranty Start Date is the day you take delivery of your new vehicle or the day it is first put into service (for example, as a dealer demonstrator), whichever occurs first.

NOTE: For new retail sales on or after July 1st, 2023 sold from a California retailer and/or to a California resident, the Warranty Start Date and mileage will start no earlier than when the goods are delivered to the customer.

CHECK YOUR VEHICLE

We try to check vehicles carefully at the assembly plant and the dealership, and we usually correct any damage to paint, sheet metal, upholstery, or other appearance items. But occasionally something may slip past us, and a customer may find that a vehicle was damaged before he or she took delivery. If you see any damage when you receive your vehicle, notify your dealership within one week.

MAINTAIN YOUR VEHICLE PROPERLY

Your glove compartment contains an **Owner's Manual** which indicates the scheduled maintenance required for your vehicle. Proper maintenance guards against major repair expenses resulting from neglect or inadequate maintenance, may help

increase the value you receive when you sell or trade your vehicle, and is important in allowing your vehicle to comply with applicable emissions standards.

It is your responsibility to make sure that all of the scheduled maintenance is performed and that the materials used meet Ford engineering specifications. Failure to perform scheduled maintenance as specified in the Owner's Manual will invalidate warranty coverage on parts affected by the lack of maintenance. Make sure that receipts for completed maintenance work are retained with the vehicle.

Your Ford or Lincoln dealership, or Ford or Lincoln Quality Care Service Center, has factory-trained technicians who can perform the required maintenance using genuine Ford parts. The dealership looks forward to meeting your every service need to maximize your satisfaction with your vehicle.

WHO PAYS FOR WARRANTY REPAIRS?

You will not be charged for repairs covered by any applicable warranty during the stated coverage periods, unless specifically stated elsewhere in this guide.

Some states have mandated alternate time coverage periods for parts of your vehicle (e.g. seatbelts).

Some states and/or local governments may require a tax on a portion of warranty repairs. Where applicable law allows, the tax must be paid by you, the owner of the vehicle.

During the Bumper to Bumper Warranty period, dealers may receive instructions to provide no-cost, service-type improvements - not originally included in your Owner's Manual -intended to increase your overall satisfaction with your vehicle.

Sometimes Ford may offer a special adjustment program to pay all or part of the cost of certain repairs beyond the terms of the applicable warranty. Check with your dealer or call 1-800-392-3673 to learn whether any adjustment program is applicable to your vehicle. Please have your vehicle identification number available.

DO WARRANTIES APPLY IN OTHER COUNTRIES?

Warranty Service Outside of the United States, U.S. Territories or Canada

A. In a Foreign Country Outside of the United States, U.S. Territories or Canada

If you are traveling in a foreign country outside of the United States, U.S. Territories or Canada and your vehicle remains registered in the United States, your Ford Warranty still applies if your vehicle model is sold or serviceable by an authorized Ford Distributor/Dealer in the country in which you are traveling:

- Service may be requested at any authorized Ford dealership.
- It may be necessary for the vehicle owner to pay the servicing dealer and then present the paid repair order/invoice along with the vehicle to a United States/Canada Ford dealer for a refund under the United States/Canada warranty.
- Reimbursement will not be considered if the vehicle does not return to the United States/Canada.

B. If you move outside of the United States, U.S. Territories, or Canada to another country you must contact the local Ford Customer Relations Center (CRC) to verify if your vehicle model is sold or serviceable in the destination country.

- If your vehicle model is sold or serviceable by an authorized Ford Distributor/Dealer in the destination country, you will continue to have warranty coverage that may be less than or equal to the original country's coverage.
- If your vehicle model is not sold or serviceable by an authorized Ford Distributor/Dealer in the destination country, you will not receive warranty service.
- You should contact the Customs department of the destination country before you move. Vehicle importation rules vary considerably from country to country.

Notes to A&B:

- Repairs due to the use of improper or dirty fuels and lubricants are not covered by the manufacturer's warranty.
- Vehicles shipped out of the United States, U.S. Territories or Canada to foreign countries specifically for the purpose of resale in that foreign country are not covered.
- The United States warranty does not apply if a vehicle is purchased from an authorized dealer in the United States or U.S. Territories, and the vehicle is not registered/licensed/titled in the United States, U.S. Territories or Canada.
- Vehicles that were originally purchased through the Ford Export Operations Military Sales Program will continue to have the United States coverage as long as the vehicle is serviceable in the destination country.
- Serviceability and destination warranty coverage is at the sole discretion of Ford Motor Company.

Please refer to owner's manual under customer assistance if you have any questions or go to www.Ford.com.

You should contact the U.S. CRC to verify destination country warranty and serviceability.

3. The New Vehicle Limited Warranty for your 2025-model vehicle

LIMITATIONS AND DISCLAIMERS

All of the warranties in this booklet are subject to the following limitations and disclaimers:

The warranties in this booklet are the only express warranties applicable to your vehicle. Ford does not assume or authorize anyone to assume for it any other obligation or liability in connection with your vehicle or these warranties. No person, including Ford employees or dealers, may modify or waive any part of these warranties.

Ford and its dealers reserve the right to make changes in or additions to vehicles built or sold by them at any time without incurring any obligation to make the same or similar changes or additions to vehicles previously built or sold.

Ford and its dealers also reserve the right to provide post-warranty repairs, conduct recalls, or extend the warranty coverage period for certain vehicles or vehicle populations, at the sole discretion of Ford. The fact that Ford has provided such measures to a particular vehicle or vehicle population in no way obligates Ford to provide similar accommodations to other owners of similar vehicles.

As a condition of these warranties, you are responsible for properly using, maintaining, and caring for your vehicle as outlined in your Owner's Manual. Ford recommends that you maintain copies of all maintenance records and receipts for review by Ford.

Ford and your dealer are not responsible for any time or income that you lose, any inconvenience you might be caused, the loss of your transportation or use of your vehicle, the cost of rental vehicles, fuel, telephone, travel, meals, or lodging, the loss of personal or commercial property, the loss of revenue, or for any other incidental or consequential damages you may have.

Punitive, exemplary, or multiple damages may not be recovered unless applicable law prohibits their disclaimer.

You may not bring any warranty-related claim as a class representative, a private attorney general, a member of a class of claimants or in any other representative capacity.

Ford shall not be liable for any damages caused by delay in delivery or furnishing of any products and/or services.

You may have some implied warranties. For example, you may have an implied warranty of merchantability (that the car or light truck is reasonably fit for the general purpose for which it was sold) or an implied warranty of fitness for a particular purpose (that the car or light truck is suitable for your special purposes), if a special purpose was specifically disclosed to Ford itself not merely to the dealer before your purchase, and Ford itself not just the dealer told you the vehicle would be suitable for that purpose.

These implied warranties are limited, to the extent allowed by law, to the time period covered by the written warranties, or to the applicable time period provided by state law, whichever period is shorter.

DISCLAIMER OF IMPLIED WARRANTIES FOR BUSINESS AND RACING USE

***** Ford disclaims all implied warranties if the vehicle is used for business or commercial purposes. *****

***** Ford disclaims the implied warranty of fitness for a particular purpose if your vehicle is used for racing, even if the vehicle is equipped for racing. *****

The warranties contained in this booklet and all questions regarding their enforceability and interpretation are governed by the law of the state in which you purchased your Ford vehicle. Some states do not allow Ford to limit how long an implied warranty lasts or to exclude or limit incidental or consequential damages, so the limitation and exclusions described above may not apply to you.

APPLICABILITY OF LIMITATIONS OF IMPLIED WARRANTY TO NEW VEHICLE LIMITED WARRANTY AND EMISSIONS WARRANTY

***** This information about the limitation of implied warranties and the exclusion of incidental and consequential damages under the NEW VEHICLE LIMITED WARRANTY also applies to the EMISSIONS WARRANTIES described on pages 24-45. *****

Ford participates in the BBB AUTO LINE warranty dispute resolution program. You may contact BBB AUTO LINE by calling 800-955-5100.

You are required to submit your warranty dispute to the BBB AUTO LINE before exercising rights or seeking remedies under the Federal Magnuson-Moss Warranty Act, 15 U.S.C. § 2301 et seq. To the extent permitted by the applicable state “Lemon Law”, you are also required to submit your warranty dispute to the BBB AUTO LINE before exercising any rights or seeking remedies under the “Lemon Law”.

If you choose to seek remedies that are not created by the Magnuson-Moss Warranty Act or the applicable state “Lemon Law,” you are not required to first use BBB AUTO LINE to resolve your dispute – although the program is still available to you.

For more information regarding the BBB AUTO LINE program, see page 47 of this booklet.

QUICK REFERENCE: WARRANTY COVERAGE

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

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

- years in service
- miles driven

Your New Vehicle Limited Warranty	
TYPE OF COVERAGE	YEARS IN SERVICE/MILES DRIVEN
BUMPER TO BUMPER	3/36,000
POWERTRAIN	5/60,000
SAFETY RESTRAINT SYSTEM	5/60,000
CORROSION (Perforation only)	5/UNLIMITED
DIESEL ENGINE	5/100,000
HYBRID/ELECTRIC UNIQUE COMPONENT	8/100,000

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

For more details on coverage, see:

- What is Covered? (pages 10-16)
- What is Not Covered? (pages 16-21)

WHAT IS COVERED?

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

- your Ford vehicle is properly operated and maintained, and
- was taken to a Ford dealership for a warranted repair during the warranty period,

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

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

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

Conditions that are not covered by the New Vehicle Limited Warranty are described on pages 16-21. When making warranty repairs on your vehicle, the dealer will use Ford or Motorcraft parts or remanufactured or other parts that are authorized by Ford, at the discretion of Ford or the Ford dealership.

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

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

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

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

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

The tire manufacturer also provides you with a separate tire warranty that may extend beyond the New Vehicle Limited Warranty coverage.

The tire manufacturer's tire warranty information is available through the manufacture's websites .

Tire Manufacturer	Website	Toll-Free Number
BFGoodrich	www.bfgoodrichtires.com	1-877-788-8899
Bridgestone /Firestone	www.bridgestonetire.com www.firestonetire.com	U.S.: 1-800-356-4644 Canada: 1-800-267-1318
Continental/General	www.continentaltire.com www.generaltire.com	U.S.: 1-800-847-3349 Canada: 1-855-453-1962
Goodyear/Dunlop	www.goodyear.com	U.S.: 1-800-321-2136 Canada: 1-855-453-1962
Hankook	U.S.: www.hankooktire.com/us Canada: www.hankook.com/ca-en	U.S.: 1-800-426-5665 Canada: 1-800-843-7709
Linglong	www.linglongtire.com	1-844-692-8527
Maxxis	www.maxxis.com	1-866-509-7067
Michelin	www.michelinman.com	1-866-866-6605
Nitto	www.nittotire.com	1-888-529-8200
Pirelli	U.S.: www.pirelli.com/tires/en-us/car/tire-use-guide-warranty/tirewarranty Canada: www.pirelli.com/tires/en-ca/car/tire-warranty	1-800-747-3554 (English) 1-800-363-0583 (French)
Toyo	www.toyotires.com	1-800-442-8696
Sumitomo/Falken	www.falkentire.com	1-800-723-2553

You have the option of having a tire warranty repair performed by the tire manufacturer's authorized service center. If you go to a tire service center for a repair covered by the New Vehicle Limited Warranty, you may be charged a prorated amount for wear or other charges. If so, you should present your paid invoice detailing the nature of the charges to any Ford Motor Company dealership for refund consideration. When making warranty repairs on your vehicle, the dealer will use Ford or Motorcraft parts or remanufactured or other parts that are authorized by Ford. In

certain instances, Ford may authorize repairs at other than Ford dealer facilities. Tire replacements under warranty will be made with the same brand and model as originally equipped with the vehicle unless the same brand and model is no longer available, in which case a tire of the same brand, size, load, speed and tread type will be used. In some circumstances, Ford may authorize another brand and/or model to substitute for the original brand and model, even if still available.

Normal tire wear or damage is not reimbursable. See page 20 for details of what is not covered.

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

(1) Your vehicle's Powertrain components are covered for five years or 60,000 miles, whichever occurs first. The extended coverage applies to the Engine: all internal lubricated parts, cylinder block, cylinder heads, electrical fuel pump, powertrain control module, engine mounts, flywheel, injection pump, manifold (exhaust and intake), manifold bolts, oil pan, oil pump, seals and gaskets, engine thermostat, engine thermostat housing, timing chain cover, timing chain (gears or belt), turbocharger/supercharger unit, valve covers, water pump; **Transmission:** all internal parts, clutch cover, seals and gaskets, torque converter, transfer case (including all internal parts), transmission case, transmission mounts (front and rear); **Front-Wheel Drive:** axle shafts, support bracket, front bearings, seals and gaskets, universal and constant velocity joints; **Rear-Wheel Drive:** axle shafts, rear bearings, center support bearing, drive axle housing (including all internal parts), drive shaft, retainers, supports, seals and gaskets, universal and constant velocity joints. **Four-Wheel/All-Wheel Drive:** axle shafts, support bracket, bearings (front and rear), center support bearing, drive shafts, final drive housing (including all internal parts), hubs-automatic front locking (four-wheel drive), locking rings (four-wheel drive), seals and gaskets, universal and constant velocity joints.

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

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

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

(5) The electrical drivetrain system of your vehicle is covered by the Hybrid & Electric Vehicle Unique Component coverage for eight years or 100,000 miles, whichever comes first. The components in the electrical drivetrain system of your vehicle will vary, depending on whether your vehicle is a hybrid, plug-in hybrid, but you can rest assured knowing that your vehicle's electrical drivetrain system is covered by this comprehensive warranty. Depending on your vehicle, electrical drivetrain system components covered by this warranty may include, and are not limited to: high-voltage battery, high-voltage battery connector, battery energy control module (BECM), on-board charger, inverter system controller (ISC), DC/DC converter, hybrid continuously variable transmission or electric driveline motor and transmission range sensor. If an electrical drivetrain system component requires replacement under warranty, it may be replaced with a new, factory remanufactured, or factory refurbished component, at Ford's discretion. Refurbished battery components selected for your vehicle will align with your vehicle's age and mileage, and meet Ford's stringent requirements and standards. (see "NOTE: High-Voltage Battery Gradual Capacity Loss" below).

NOTE: High Voltage Battery Gradual Capacity Loss

The high voltage battery will experience gradual capacity loss with time and use, similar to all batteries, which is considered normal wear and tear. Loss of battery capacity due to or resulting from gradual capacity loss is NOT covered under the New Vehicle Limited Warranty. See your Owner's Manual for important tips on how to maximize the life and capacity of the high voltage battery.

NOTE: Some components may also be covered by the Emissions Warranties. For more information, see pages 24-45.

If you own or lease a 2025-model Next Generation Police Interceptor Vehicle (NGPI), refer to the Warranty Addendum Card that was given to you when you took delivery of your vehicle for further explanation of Amendments to the New Vehicle Limited Warranty. The Warranty Addendum applies only the NGPI vehicles delivered in the State of Florida and New York.

(6) Certain Commercial customers with a Valid Fleet Identification Number (FIN Code) are eligible for a five year / 100,00 mile limited powertrain warranty extension on the following vehicles: F-150 (Excluding Raptor), Super Duty (F-250 through F600) pickup, chassis cabs (F53/F59), Transit, Transit Connect and E-Series. Vehicle must be reported as a sales type “fleet” at original time of sale. To become a U.S. Ford Fleet Account, for vehicles which are owned and operated in the United States, you must register for a U.S. Fleet Identification Number (FIN Code). You will also be asked to provide proof of eligibility documentation for the vehicles in your fleet. To see if you qualify, please see the eligibility restrictions at www.fleet.ford.com/get-started.

This warranty extension will stay with the vehicle even if it is subsequently sold to a non-fleet customer before the expiration. This extension applies to both gas and diesel powertrains.

Ford Power-Up software updates

During the warranty coverage period, Ford Motor Company warrants that:

- you will not be charged for diagnosis, repair, replacement, or adjustment of components that are damaged or inoperable due to a defect caused by a Ford Power-Up software update.

WHAT IS NOT COVERED?

Damage Caused By:

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

(Plug-In Vehicles only) - The New Vehicle Limited Warranty does not cover: damage to the 120V convenience cord caused by misuse of the cord. Always use the convenience cord in a manner that conforms to the directions found in the Owner's Manual.

Damage Caused by Alteration or Modification

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

- alterations or modifications of the vehicle, including the body, chassis, electronics or their components, after the vehicle leaves the control of Ford Motor Company
- tampering with the vehicle, tampering with the emissions systems or with the other parts that affect these systems (for example, but not limited to exhaust and intake systems)
- the installation or use of a non-Ford Motor Company part or software (other than a certified emissions part or software) or any part or software (Ford or non-Ford) designed for off-road use only installed after the vehicle leaves the control of Ford Motor Company if the installed part fails or causes a Ford part to fail. Examples include, but are not limited to lift kits, oversized tires, roll bars, cellular phones, alarm systems, automatic starting systems and performance-enhancing powertrain components or software and performance "chips". Your vehicle may allow, enable or facilitate the use of certain non-Ford Motor Company software. Ford is not responsible for the functionality of such software. Ford may disallow, discontinue or modify your ability to use such software at any time without prior notification or incurring any warranty or other obligation. Non-Ford Motor Company software may be governed by End User License Agreement or warranty provided by the software provider. For Ford Motor Company software see End User License Agreement found in the Owner Manual.

Damage Caused by Use and/or the Environment

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

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

Maintenance/Wear

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

- | | |
|----------------------------------|--|
| • oil changes | • clutch linings |
| • oils, lubricants, other fluids | • wiper blades |
| • oil/air filters | • wheel alignments and tire balancing* |
| • tire rotation/inflation | • brake pad/lining* |
| • cleaning/polishing | |

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

- Wheel alignments and tire balancing will be provided during the first 12 months or 12,000 miles in service, whichever occurs first. Wheel alignment and steering wheel adjustments on incomplete vehicles (i.e. Chassis Cabs/Cutaway/box delete) are not reimbursable after the Second Unit body is added unless related to a Ford warranty repair for the incomplete vehicle.
- Brake pad/lining replacements will be provided during the first 12 months or 18,000 miles in service, whichever occurs first.

SYNC Hands-Free Communications and Entertainment System

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

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

- the defective function or obsolescence of your cellular phone or digital media device (for example, inadequate signal reception by the external antenna, viruses or other software problems)

Tire Wear or Damage

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

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

Other Items or Conditions Not Covered

The New Vehicle Limited Warranty does not cover:

- vehicles that have had the odometer disconnected, altered, or inoperative for an extended period of time with the result that the actual mileage cannot be determined
- vehicles that have ever been labeled or branded as dismantled, fire, flood, junk, rebuilt, reconstructed, or salvaged; this will void the New Vehicle Limited Warranty
- vehicles that have been determined to be a total loss by an insurance company; this will void the New Vehicle Limited Warranty
- converted ambulances that are not equipped with the Ford Ambulance Prep Package, see important information about ambulance conversions (page 50)
- aftermarket parts or components, sometimes installed by Ford Motor Company or an authorized Ford dealership, may not be covered by the New Vehicle Limited Warranty. Any damage caused to Ford components due to the failure of aftermarket parts (other than a certified emissions part) is not covered.

- high-voltage battery replacement due to improper vehicle storage. Refer to the Owner's Manual for the proper ways your vehicle's battery must be maintained in the event the vehicle is not driven or is stored for an extended period of time. The Lithium-ion battery (EV battery) will experience gradual capacity loss with time and use (similar to all lithium-ion batteries), which is considered normal wear and tear. Loss of battery capacity due to or resulting from gradual capacity loss is NOT covered under the New Vehicle Limited Warranty. See your Owner's Manual for important tips on how to maximize the life and capacity of the Lithium-ion battery.
- if the component that caused the failure is beyond coverage and damages a component with remaining coverage, the entire repair is NOT reimbursable.

4. In addition ...

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

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

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

The Roadside Assistance Program is separate from the New Vehicle Limited Warranty. It begins at the warranty start date and lasts for five years or 60,000 miles (whichever occurs first). If you need towing beyond the five years or 60,000 miles (whichever occurs first) period, Ford can arrange roadside assistance and charge your credit card. If the reason for the vehicle disablement is later found to be covered by a Ford or Lincoln Protect extended service plan, you may seek reimbursement for a tow charge under that plan.

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

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

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

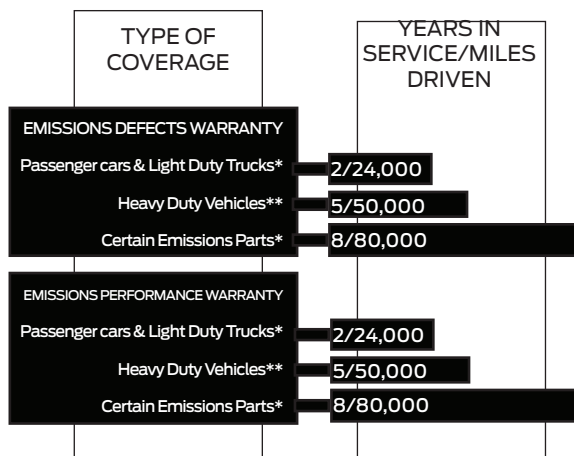
5. Federal requirements for emissions warranties

QUICK REFERENCE: EMISSIONS WARRANTY COVERAGE

This chart shows your warranty coverage under two emissions warranties that Ford Motor Company provides, in compliance with Federal requirements. The warranties are:

- Emissions Defects Warranty
- Emissions Performance Warranty

Emissions Warranties for Your Vehicle



* Applies to vehicles up through 8,500 pounds gross vehicle weight rating (GVWR)

** Applies to trucks over 8,500 pounds GVWR up through 19,500 pounds GVWR.

Vocational vehicle tires covered for 2/24,000 for defects that affect compliance with greenhouse gas requirements.

For full details on emissions control coverage, see:

- Emissions Defect Warranty (pages 25-26)
- Emissions Performance Warranty (pages 26-27)
- What is Covered? (pages 28-30)
- What is Not Covered? (page 30)

NOTE: Fully-electric vehicles are not eligible for any emissions warranties described in this booklet.

EMISSIONS DEFECT WARRANTY COVERAGE

During the warranty coverage period, Ford Motor Company warrants that:

- your vehicle or engine is designed, built, and equipped to meet
- at the time it is sold - the emissions regulations of the U.S. Environmental Protection Agency (EPA).
- your vehicle or engine is free from emission-related defects in factory-supplied materials or workmanship, which are defects that could prevent the vehicle or engine from conforming with applicable EPA regulations.
- you will not be charged for diagnosis, repair, replacement, or adjustment of parts containing an emissions-related defect. A list of emission-related parts can be found in **What is Covered?** on pages 28-30.

The warranty coverage period for:

- The emissions defects warranty coverage period for passenger cars and light duty trucks (applies to vehicles up through 8,500 pounds GVWR) is as follows:
 - 8 years or 80,000 miles (whichever occurs first) for catalytic converters, electronic emissions control unit, and onboard emissions diagnostic devices, including the battery energy control module (BECM), and emission-related reprogramming of modules.
 - 2 years or 24,000 miles (whichever occurs first) for all other covered parts. (Note: Ford's 3-year, 36,000-mile bumper-to-bumper coverage, as described above, surpasses this mandatory federal coverage.)

- Heavy duty vehicles (applies to trucks over 8,500 pounds GVWR up through 19,500 pounds GVWR)
 - The emissions warranty coverage period for heavy duty vehicles (HDVs) is 5 years or 50,000 miles (whichever comes first) for all parts covered by your emissions warranty. The 5 year or 50,000 mile warranty includes coverage of components whose failure would increase the vehicle's emissions of air conditioning refrigerants.
 - Only for HDVs designated as “vocational vehicles” on the underhood “VEHICLE EMISSION CONTROL INFORMATION” label: Tire defects that affect compliance with greenhouse gas requirements are covered for 2 years or 24,000 miles, whichever comes first.

EMISSIONS PERFORMANCE WARRANTY COVERAGE

Under Emissions Performance Warranty Coverage, Ford Motor Company will repair, replace, or adjust - with no charge for labor, diagnosis, or parts - any emissions control device or system, if you meet all of the following conditions:

- You have maintained and operated your vehicle according to the instructions on proper care in the Owner's Manual and this booklet.
- Your vehicle fails to conform, during the warranty coverage period, to the applicable national EPA standards, as determined by an EPA approved inspection and maintenance program.
- You are subject to a penalty or sanction under local, state, or federal law because your vehicle has failed to conform to the emissions standards. (A penalty or sanction can include being denied the right to use your vehicle.)
- Your vehicle has not been tampered with, misused, or abused.

The warranty coverage period for:

- Passenger cars and light duty trucks (applies to vehicles up through 8,500 pounds GVWR) is as follows:
 - 8 years or 80,000 miles (whichever occurs first) for catalytic converters, electronic emissions control unit, and onboard emissions diagnostic devices, including the battery energy control module (BECM), and emission-related reprogramming of modules.
 - 2 years or 24,000 miles (whichever occurs first) for all other covered parts.
- Heavy duty vehicles (applies to trucks over 8,500 pounds GVWR up through 19,500 pounds GVWR)
 - 5 years or 50,000 miles (whichever occurs first) for all covered parts.

See **WHAT IS COVERED?** below for list of covered parts.

Note that the warranty period begins on the **Warranty Start Date** as specified on page 2 of this booklet.

WHAT IS COVERED?

If the parts on the following list contain an emissions-related defect, they are covered by the Defects Warranties.

- Aftertreatment Sensors
- Air Flow Sensor
- Air/Fuel Feedback Control System and Sensors
- Air Induction System
- Anti-lock Brake System Module (Hybrid and Plug-in Hybrid vehicles only except Explorer hybrid)
- Battery Energy Control Module (BECM)
- Belt Integrated Starter Generator (Hybrid and Plug-in Hybrid vehicles only)
- Brake Hydraulic/Electric Control Assembly (Plug-in Hybrid vehicles only)
- Brake Vacuum Pump (Plug-in Hybrid vehicles only)
- Catalytic Converters (including Selective Catalytic Reduction and Diesel Oxidation Catalysts)
- Charger and Bracket Assembly High Voltage Battery (Hybrid and Plug-in Hybrid vehicles only)
- Cold Start Enrichment System (diesel only)
- Controls for Deceleration (diesel only)
- Converter and Bracket Assembly High Voltage to Low Voltage (Hybrid and Plug-in Hybrid vehicles only)
- Diesel Exhaust Fluid System
- Diesel Particulate Filter
- Electronic Ignition System (diesel only)
- Electronic Engine Control Sensors and Switches
- Powertrain Control Module (PCM)/ Engine Control Module (ECM)*
- Evaporative Emission Control System
- Exhaust Gas Recirculation (EGR) System
- Exhaust Manifold
- Exhaust Pipe (Manifold to Catalyst)
- Fuel Filler Door Sensor (Hybrid and Plug-in Hybrid vehicles only)
- Fuel Filler Tube and Seal (non-diesel only)
- Fuel Injection System
- Fuel Injector Supply Manifold
- Fuel Tank (non-diesel only)
- Fuel Tank Pressure Control valve

- Glow Plugs (diesel only)
- High Voltage Battery (Hybrid and Plug-in Hybrid vehicles only)
- HVAC Controller (Plug-in Hybrid vehicles only)
- Ignition Coil and/or Control Module
- Intake Manifold
- Intercooler Assembly-Engine Charger
- Inverter System Controller (Plug-in Hybrid vehicles only)
- Jumper Assembly Charge Inlet to Charger (Hybrid and Plug-in Hybrid vehicles only)
- Jumper Assembly DC/DC Converter to High Voltage Panel (Hybrid and Plug-in Hybrid vehicles only)
- Malfunction Indicator Lamp (MIL)/On-Board Diagnostic (OBD) System
- Module and Bracket Assembly Transmission Inverter Control (Hybrid and Plug-in Hybrid vehicles only)
- Motor Electronics Coolant Pump (Plug-in Hybrid vehicles only)
- PCV system and Oil Filler Cap
- Onboard Charger (Plug-in Hybrid vehicles only)
- Secondary Air Injection System
- Spark Control Components
- Spark Plugs and Ignition Wires
- Thermostat
- Throttle Body Assembly (MFI)
- Transmission Assembly (Plug-in Hybrid vehicles only)
- Transmission Auxiliary Oil Pump (Plug-in Hybrid vehicles only)
- Transmission Fluid Temperature Sensor (Plug-in Hybrid vehicles only)
- Transmission Control Module (TCM) and Solenoids
- Turbocharger Assembly
- Vacuum Distribution System

* Includes hardware and emissions related software changes only

Important Information About List of Parts

Also covered by the two emissions warranties are all emissions-related bulbs, hoses, clamps, brackets, tubes, gaskets, seals, belts, connectors, non-diesel fuel lines, sensors, and wiring harnesses that are used with components on the list of parts, above.

Concerning parts that should be replaced on a certain maintenance schedule: these parts remain under warranty until : (a) the first replacement time that is specified in your **Owner's Manual**; or (b) the time or mileage limits of the Federal Defect and Performance Warranties (whichever occurs first). Your Ford Motor Company dealer maintains a complete list of parts covered by the emissions performance warranty. For questions about emission-related parts, contact your dealer.

WHAT IS NOT COVERED?

Ford Motor Company may deny you emissions warranty coverage due to abuse, neglect, improper maintenance, or unapproved modifications.

If you need more information about getting service under the **Federal Emissions Performance Warranty**, or if you want to report what you believe to be violations of the terms of this warranty, you may contact:

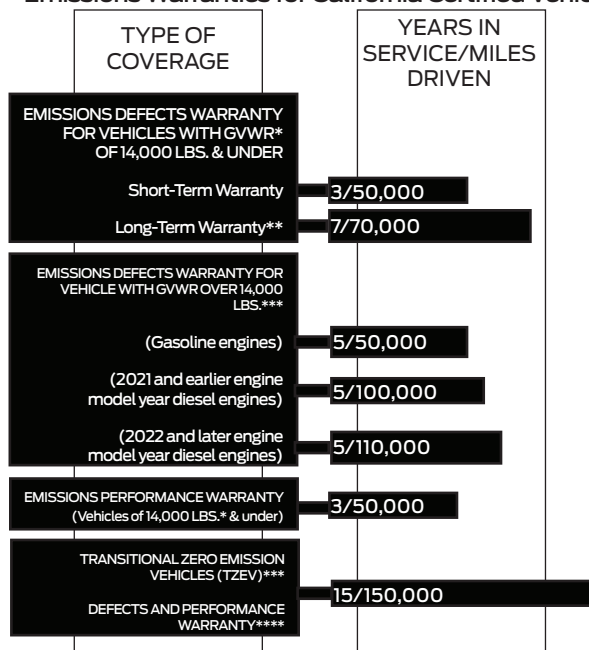
**U.S. Environmental Protection
Agency Office of Transportation
and Air Quality Compliance
Division, Light-Duty Vehicle Group
Attn: Warranty Complaints
2000 Traverwood Drive
Ann Arbor, MI 48105
Email: complianceinfo@epa.gov**

6. California requirements for emissions warranties

QUICK REFERENCE: EMISSIONS WARRANTY COVERAGE

This chart shows the emission warranty that Ford Motor Company provides for your vehicle under the emissions control warranty in accordance with the regulations of the California Air Resources Board. This coverage is in addition to Federal Emission warranties page 24.

Emissions Warranties for California Certified Vehicles



* Gross Vehicle Weight Rating

** These specific parts were selected on the basis of their estimated replacement cost at the time the California Air Resources Board certified your vehicle for sale in California (up through 14,000 pounds GVWR).

*** Refer to your Vehicle Emission Control Information and Important Engine Information (if applicable) label for emissions certification information.

**** Except for the high voltage battery, which is covered for 10 years or 150,000 miles (whichever occurs first).

NOTE: Fully-electric vehicles are not eligible for any emissions warranties described in this booklet.

Vehicles Eligible for California Emission Warranty Coverage

California emission warranty coverage applies if your vehicle meets the following two requirements:

- Your vehicle is registered in a state¹ that has adopted and is enforcing California emission warranty regulations applicable for your vehicle at the time of repair, and
- Your vehicle is certified for sale in California as indicated on the vehicle emission control information label.

¹ Subject to change, the following states have adopted and are enforcing California emission warranty regulations:

- **Passenger Car & Light-duty Trucks** (up through 8,500 pounds GVWR) - California, Colorado, Connecticut, Delaware, Maine, Maryland, Massachusetts, New Jersey, New York, Oregon, Pennsylvania, Rhode Island, Vermont and Washington
- **Medium-Duty Passenger Vehicles** (up through 10,000 pounds GVWR designed primarily for the transportation of persons. Excludes incomplete trucks, trucks with a seating capacity either over twelve persons total or over nine persons rearward of the driver's seat, or trucks with an open cargo area of at least six feet of interior length): California, Colorado, Connecticut, Delaware, Maine, Maryland, Massachusetts, New York, Oregon, Rhode Island, Vermont and Washington
- **Medium-Duty Vehicles** (over 8,500 pounds GVWR up through 14,000 pounds GVWR) - California, Colorado, Connecticut, Delaware, Maine, Maryland, Massachusetts, New York, Oregon, Rhode Island, and Vermont.
- **Light Heavy-Duty Diesel Engine Vehicles** (over 14,000 pounds GVWR up through 19,500 pounds GVWR) - California, Maine and Pennsylvania.

Vehicles Eligible for California Transitional Zero Emission Vehicle (TZEV) Emission Warranty Coverage

California Transitional Zero Emissions Vehicle (TZEV) extended emission warranty coverage applies if your vehicle meets the following two requirements:

- Your vehicle is registered in a state** that has adopted and is enforcing California TZEV emissions warranty regulations applicable to your vehicle at the time of repair, and
- Your vehicle is certified as a TZEV in California as indicated on the vehicle emission control information label.

**Subject to change, the following states have adopted and are enforcing California TZEV emission warranty regulations: California, Colorado, Connecticut, Maine, Maryland, Massachusetts, New Jersey, New York, Rhode Island, and Vermont (NOTE: Delaware, Pennsylvania and Washington did not adopt the California TZEV emission warranty; standard California emission warranty coverage applies to all emission components. Oregon adopted high voltage battery TZEV warranty requirements only.)

For full details about coverage under California requirements for emissions control, see:

- Defects Warranties (pages 34-41)
- Performance Warranty (pages 34-37)
- What Is Covered? (pages 38-41)
- What Is Not Covered? (page 41)

EXPLANATION OF CALIFORNIA EMISSIONS WARRANTIES

CALIFORNIA EMISSION CONTROL WARRANTY STATEMENT

Your Warranty Rights and Obligations

The California Air Resources Board and Ford Motor Company are pleased to explain the emission control system warranty on your 2025-model vehicle. In California, new motor vehicles must be designed, built, and equipped to meet the State's stringent anti-smog standards. Ford must warrant the emission control system on your vehicle for the periods of time listed on pages 34-37, provided there has been no abuse, neglect, or improper maintenance of your vehicle.

Your emission control system may include parts such as the fuel injection system, the ignition system, catalytic converter, and the engine computer. Also included may be hoses, belts, connectors, and other emissions-related assemblies.

Where a warrantable condition exists, Ford Motor Company will repair your vehicle at no cost to you including diagnosis, parts, and labor.

Manufacturer's Warranty Coverage

For Vehicles Eligible for California Emission Warranty Coverage

If Gross Vehicle Weight Rating is 14,000 lbs. or less:

For 3 years or 50,000 miles (whichever occurs first):

1. If your vehicle fails a Smog Check inspection, all necessary repairs and adjustments will be made by Ford to ensure that your vehicle passes the inspection. This is your emission control system **PERFORMANCE WARRANTY**.
2. If any emissions-related part on your vehicle is defective, the part will be repaired or replaced by Ford. This is your short-term emission control system **DEFECTS WARRANTY**.

For 7 years or 70,000 miles (whichever occurs first):

If an emissions-related part listed in this warranty booklet specially noted with coverage for 7 years or 70,000 miles is defective, the part will be repaired or replaced by Ford. This is your long-term emission control system DEFECTS WARRANTY.

For a list of the high-priced emission-related parts that are covered for 7 years or 70,000 miles, go to www.owner.ford.com/OwnerManuals.

Select the list that corresponds to the model and the model year of your vehicle. **NOTE:** This list is vehicle specific and may not be the same for all vehicles. It is based on the replacement cost of each specific part, which can vary between vehicle lines.

If Gross Vehicle Weight Rating is 8,501 lbs. through 14,000 lbs.:

- For 5 years or 50,000 miles (whichever occurs first) for components whose failure would increase the vehicle's emissions of air conditioning refrigerants.
- **Only for HDVs designated as “vocational vehicles” on the underhood “VEHICLE EMISSION CONTROL INFORMATION” label:** Tire defects that affect compliance with greenhouse gas requirements are covered for 2 years or 24,000 miles, whichever comes first.

If Gross Vehicle Weight Rating is over 14,000 lbs.:

For 5 years or 50,000 miles (gasoline engines), 5 years or 100,000 miles (2021 and earlier engine model year diesel engines), and 5 years or 110,000 miles (2022 and later engine model year diesel engines) (whichever occurs first). Warranty coverage of 5 years or 50,000 miles (whichever occurs first) applies for components whose failure would increase the vehicle's emissions of air conditioning refrigerants. **Only for HDVs designated as “vocational vehicles” on the underhood “VEHICLE EMISSION CONTROL INFORMATION” label:** Tire defects that affect compliance with greenhouse gas requirements are covered for 2 years or 24,000 miles, whichever comes first.

For Vehicles Eligible for California TZEV Emission Warranty Coverage

Except as noted below, for 15 years or 150,000 miles (whichever first occurs):

1. If your vehicle fails a Smog Check inspection, all necessary repairs and adjustments will be made by Ford to ensure that your vehicle passes the inspection. This is your emission control system PERFORMANCE WARRANTY.

2. If any emissions-related part on your vehicle is defective, the part will be repaired or replaced by Ford. This is your short-term emission control system DEFECTS WARRANTY.

NOTE: The TZEV warranty period for the high-voltage battery is 10 years or 150,000 miles (whichever first occurs).

Owner's Warranty Responsibilities

As the vehicle owner, you are responsible for the performance of the required maintenance listed in your owner's manual. Ford Motor Company recommends that you retain all receipts covering maintenance on your vehicle, but Ford cannot deny warranty coverage solely for the lack of receipts or for your failure to ensure the performance of all scheduled maintenance.

You are responsible for presenting your vehicle to a Ford Motor Company dealer as soon as a problem exists. The warranty repairs should be completed in a reasonable amount of time, not to exceed 30 days.

As the vehicle owner, you should also be aware that Ford Motor Company may deny you warranty coverage if your vehicle or a part has failed due to abuse, neglect, improper maintenance, or unapproved modifications.

If you have any questions regarding your warranty rights and responsibilities, or if you want to report what you believe to be violations of the terms of this warranty, you may contact the Ford Customer Relationship Center at 1-800-392-3673 (FORD) or the California Air Resources Board at:

**California Air Resources Board
4001 Iowa Avenue
Riverside, California 92507**

WHAT IS COVERED?

If the parts on the following list contain an emissions-related defect, they are covered by the Defects Warranties.

- Aftertreatment Sensors
- Air Flow Sensor
- Air/Fuel Feedback Control System and Sensors
- Air Induction System
- Anti-lock Brake System Module (Hybrid and Plug-in Hybrid vehicles only except Explorer hybrid)
- Battery Energy Control Module (BECM)
- Belt Integrated Starter Generator (Hybrid and Plug-in Hybrid vehicles only)
- Brake Hydraulic/Electric Control Assembly (Plug-in Hybrid vehicles only)
- Brake Vacuum Pump (Plug-in Hybrid vehicles only)
- Camshaft**
- Catalytic Converters (including Selective Catalytic Reduction and Diesel Oxidation Catalysts)
- Charger and Bracket Assembly High Voltage Battery (Hybrid and Plug-in Hybrid vehicles only)
- Cold Start Enrichment System (diesel only)
- Controls for Deceleration (diesel only)
- Converter and Bracket Assembly High Voltage to Low Voltage (Hybrid and Plug-in Hybrid vehicles only)
- Cylinder head**
- Diesel Exhaust Fluid System
- Diesel Particulate Filter
- Electronic Ignition System (diesel only)
- Electronic Engine Control Sensors and Switches
- Powertrain Control Module (PCM)/ Engine Control Module (ECM)*
- Evaporative Emission Control System
- Exhaust Gas Recirculation (EGR) System
- Exhaust Manifold
- Exhaust Pipe (Manifold to Catalyst)
- Exhaust Valve**
- Fuel Filler Door Sensor (Hybrid and Plug-in Hybrid vehicles only)
- Fuel Filler Tube and Seal (non-diesel only)
- Fuel Injection System

- Fuel Injector Supply Manifold
- Fuel Tank (non-diesel only)
- Fuel Tank Pressure Control valve
- Glow Plugs (diesel only)
- High Voltage Battery (Hybrid and Plug-in Hybrid vehicles only)
- HVAC Controller (Plug-in Hybrid vehicles only)
- Ignition Coil and/or Control Module
- Intake Manifold
- Intake Valve**
- Intercooler Assembly-Engine Charger
- Inverter System Controller (Plug-in Hybrid vehicles only)
- Jumper Assembly Charge Inlet to Charger (Hybrid and Plug-in Hybrid vehicles only)
- Jumper Assembly DC/DC Converter to High Voltage Panel (Hybrid and Plug-in Hybrid vehicles only)
- Malfunction Indicator Lamp (MIL)/On-Board Diagnostic (OBD) System
- Module and Bracket Assembly Transmission Inverter Control (Hybrid and Plug-in Hybrid vehicles only)
- Motor Electronics Coolant Pump (Plug-in Hybrid vehicles only)
- PCV system and Oil Filler Cap
- Piston**
- Onboard Charger (Plug-in Hybrid vehicles only)
- Secondary Air Injection System
- Spark Control Components
- Spark Plugs and Ignition Wires
- Thermostat
- Throttle Body Assembly (MFI)
- Transmission Assembly (Plug-in Hybrid vehicles only)
- Transmission Auxiliary Oil Pump (Plug-in Hybrid vehicles only)
- Transmission Fluid Temperature Sensor (Plug-in Hybrid vehicles only)
- Transmission Control Module (TCM) and Solenoids
- Turbocharger Assembly
- Vacuum Distribution System
- Valve Spring**

* Includes hardware and emissions related software changes only

** Heavy-Duty Diesel only

COVERAGE FOR 2025 MODEL VEHICLES (GVWR OF 14,000 LBS. OR LESS) UNDER LONG TERM DEFECTS WARRANTY
 APPLICABLE ONLY TO CALIFORNIA-CERTIFIED VEHICLES REGISTERED IN A STATE THAT HAS ADOPTED AND IS ENFORCING
 CALIFORNIA EMISSION WARRANTY REGULATIONS
 (Coverage for up to 7 years/70,000 miles, whichever first occurs)

Part Description	17/3L Econoline
Instrument Cluster (2)	X
Powertrain Control Module (PCM) / Engine Control Module	X
Fuel Sender Wiring Assembly (4)	X
Main Body Wiring Harness (4)	X
Main Jumper Wiring Assembly (4)	X
Molded Lead Frame Wiring Harness (4)	X
Power Steering Wiring Assembly (4)	X
Catalyst Inlet Pipe	X
Catalytic Converter	X
Camshaft Timing Assembly	X
Adjuster Assembly - Valve Lifter (4)	X
Arm Assembly - Valve Rocker (4)	X
Valve Rocker Cover Assembly (RH, LH)	X
Oil Pump Assembly (4)	X
Camcover Gasket	X
Engine Variable Camshaft Timing Solenoid	X
Gasket for Turbo Oil Tube	X
Transmission Control Assembly (4)	X
Transmission Internal MLF Wiring Harness (4)	X
Transmission Range Sensor / Detent Assembly	X
Fuel Tank	X
High Pressure Fuel Pump	X
Intake Manifold	X
Exhaust Manifold (Right Hand)	X
Exhaust Manifold (Left Hand)	X
Intake Manifold Gasket	X
Fuel Tank Pressure Sensor	X
Carbon Canister and Bracket Assembly	X
Fuel Distrib	X
Fuel Delivery Module	X
Fuel Tube Supply	X
Tank Assembly (without straps)	X
Fuel Tube Assembly	X

- (1) For Plug-in Hybrid Vehicles Only
 (2) For Service Engine Soon/Malfunction Indicator Lamp
 (MIL) Functionality Concerns Only

- (3) For EcoBoost Engine Only
 (4) For MIL Illumination Only
 (5) For Non-EcoBoost Engine Only

Important Information about List of Parts

There may be additional coverage for these parts through the Bumper to Bumper, Powertrain, or Diesel Engine limited warranties. In any case, the warranty with the broadest coverage applies.

Ford will cover damages to other vehicle components proximately caused by a failure under warranty of any warranted part.

Also covered by this warranty are all emissions-related bulbs, hoses, clamps, brackets, tubes, gaskets, seals, belts, connectors, non diesel fuel lines, and wiring harnesses that are used with components on the list of parts above.

Concerning parts that should be replaced on a certain maintenance schedule: these parts remain under warranty until the first required replacement time that is specified in your **Owner's Manual**.

NOTE: If the diagnosis does not reveal a defect, the Defects Warranty does not apply.

Your Ford Motor Company dealer maintains a complete list of covered parts. For more details about the specific parts that are covered by the Defects Warranty, contact your dealer.

WHAT IS NOT COVERED?

Ford Motor Company may deny you emissions warranty coverage due to abuse, neglect, improper maintenance, or unapproved modifications.

7. Additional information about your emissions warranty coverage, under Federal and California requirements

HOW DO I GET WARRANTY SERVICE?

To get service under your emissions warranties, take your vehicle to any Ford Motor Company dealer as soon as possible after illumination of the Malfunction Indicator Light or it has failed an EPA-approved test or a California Smog Check inspection. Be sure to show the dealer the document that says your vehicle has failed the test.

Your dealer will determine whether the repair is covered by the warranty. If the dealer has a question about Emissions Performance Warranty coverage, it will forward the question to Ford Motor Company, which must make a final decision within 30 days after you bring your vehicle in for repair. (The decision will be made within a shorter time if state, local, or federal law requires you to have the vehicle repaired more quickly in order to avoid additional penalties.) The deadline for a determination about Emissions Performance Warranty Coverage does not need to be met if you request a delay, agree to a delay in writing, or if the delay is caused by an event for which neither Ford nor your dealer is responsible. If a question about Emissions Performance Warranty coverage is referred to Ford Motor Company, you will be notified by Ford Motor Company in writing if your claim for warranty coverage is denied. The notice will explain the basis for denying your claim. If you fail to receive this notice within a timely manner, as determined above, Ford will perform the warranty repair for you free of charge.

HOW DO I HANDLE EMERGENCY REPAIRS?

If your vehicle needs an emergency warrantable repair and a Ford Motor Company dealer is not available, or if a Ford Motor Company dealer cannot perform warrantable repair(s) within 30 days of you bringing your vehicle to the dealer, repairs may be performed at any service establishment or by you using Ford equivalent replacement parts.

Ford will reimburse you for the cost of these warranty repairs including diagnosis, if you take the part(s) that are replaced and the repair receipt(s) to a Ford Motor Company dealer. The reimbursement shall not exceed Ford's suggested retail price for the warranted parts that are replaced and labor charges based on Ford's recommended time allowance for the warranty repair and the geographically appropriate hourly rate.

WHAT REPLACEMENT PARTS SHOULD I USE?

Ford Motor Company recommends that you use genuine Ford replacement parts. However, when you are having non-warranty work done on your vehicle, you may choose to use non-Ford parts. If you decide to use non-Ford parts, be sure they are equivalent to Ford parts in performance, quality, and durability. If you use replacement parts that are not equivalent to Ford parts, your vehicle's emissions control systems may not work as effectively, and you may jeopardize your emissions warranty coverage.

Under the Federal and California emissions warranties, Ford will repair or replace covered parts if they are properly installed Ford parts or the equivalent, or non-Ford parts that have been certified by the U.S. EPA or the California Air Resources Board (CARB). Ford is not responsible for the cost of repairing or replacing non-Ford parts that are not equivalent to Ford parts or that have not been certified by EPA or CARB.

The maintenance, replacement, or repair of emissions control devices or systems can be performed by any automotive repair establishment or individual using Ford replacement parts or the equivalent, or EPA- or CARB-certified parts, without voiding your emissions warranty coverage for future repairs during the applicable warranty period.

PROPER MAINTENANCE PRESERVES YOUR WARRANTY

If you do not maintain your vehicle properly, Ford may have the right to deny you warranty coverage.

To have repairs made under this warranty, you may have to show that you have followed Ford's instructions on properly maintaining and using your vehicle. You will find these instructions in your **Owner's Manual**. Be sure to save your service receipts and to keep accurate records of all maintenance work.

CUSTOMER ASSISTANCE

If you are not satisfied with the handling of a warranty matter, see **Customer Assistance**, on the inside front cover, and **Better Business Bureau (BBB) AUTO LINE** program, page 47.

8. Noise emissions warranty

NOISE EMISSIONS WARRANTY FOR CERTAIN LIGHT TRUCKS

Ford Motor Company warrants to the first person who purchases this vehicle for purposes other than resale and to each subsequent purchaser that this vehicle as manufactured by Ford, was designed, built and equipped to conform at the time it left Ford's control with all applicable U.S. EPA Noise Control Regulations.

This warranty covers this vehicle as designed, built and equipped by Ford Motor Company, and is not limited to any particular part, component or system of the vehicle as manufactured by Ford. Defects in design, assembly or in any part, component or system of the vehicle as manufactured by Ford, which, at the time it left Ford's control, caused noise emissions to exceed Federal standards, are covered by this warranty for the life of the vehicle.

THE NOISE EMISSIONS WARRANTY OBLIGATIONS DO NOT APPLY TO:

- loss of time, inconvenience, loss of use of the vehicle, commercial loss or other consequential damages.
- any vehicle which is not covered by the U.S. EPA Medium and Heavy Trucks Noise Emission Standards (40 C.F.R. Part 205, Subpart B). Among the non-covered vehicles are those lacking a partially or fully enclosed operator's compartment, such as a basic stripped chassis, those having a Gross Vehicle Weight Rating of 10,000 pounds or less, and those sold outside the United States and its territories. To the extent permitted by law, THIS WARRANTY IS EXPRESSLY INSTEAD of any express or implied warranty, condition, or guarantee, agreement, or representation, by any person with respect to conformity of this vehicle with the U.S. EPA Noise Control Regulations, including ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS.

9. Ford Protect Extended Service Plan

MORE PROTECTION FOR YOUR VEHICLE

You can get more protection for your new car or light truck by purchasing a Ford Protect. Ford Protect service contracts are backed by Ford Motor Company or Ford Motor Service Company. Ford Protect plans provide up to 8 years and 150,000 miles of coverage.

They provide:

- benefits during the warranty period, depending on the plan you purchase can be: reimbursement for a rental vehicle, protecting against tire and wheel road hazard damage, coverage for certain maintenance and wear items, lost key replacement, other plans are available;
- protection against covered repair costs and continuing Roadside Service Assistance benefits after your Bumper to Bumper Warranty expires.

You may purchase Ford Protect from any Ford Motor Company dealer or see our website at fordprotect.ford.com. There are several Ford Protect plans available in various time, distance and deductible combinations. Each plan is tailored to fit your own driving and vehicle ownership needs, including reimbursement for towing and rental.

When you purchase Ford Protect, you receive peace-of-mind protection throughout the United States, Canada and Mexico, provided by a network of more than 3,200 Ford Motor Company dealers.

NOTE: Repairs performed outside the United States, Canada, Mexico, Guam or Puerto Rico, Virgin Islands, American Samoa and District of Columbia are not eligible for Ford Protect coverage.

This information is subject to change. Ask your dealer for complete details about Ford Protect coverage.

10. The Better Business Bureau (BBB) AUTO LINE Program (U.S. Only)

Your satisfaction is important to Ford Motor Company and your dealer. If you are not satisfied with the resolution of a warranty concern, we recommend you follow the three-step resolution procedure outlined in this Warranty Guide. You may also be eligible to participate in the BBB AUTO LINE program whether or not you follow this three-step procedure.

The BBB AUTO LINE program consists of two parts — mediation and arbitration. During mediation, a representative of the BBB will contact both you and Ford Motor Company to explore options for settlement of the claim. If an agreement is not reached during mediation and your claim is eligible, you may participate in the arbitration process. An arbitration hearing will be scheduled so that you can present your case in an informal setting before an impartial person. The arbitrator will consider the testimony provided and make a decision after the hearing.

You are not bound by the decision, but should you choose to accept the BBB AUTO LINE decision, Ford must abide by the accepted decision as well. Disputes submitted to the BBB AUTO LINE program are usually decided within forty days after you file your claim with the BBB.

BBB AUTO LINE Application: Using the information provided below, please call or write to request a program application. You will be asked for your name and address, general information about your new vehicle, information about your warranty concerns, and any steps you have already taken to try to resolve them. A Customer Claim Form will be mailed that will need to be completed, signed, and returned to the BBB along with proof of ownership. Upon request, the BBB will review the claim for eligibility under the Program Summary Guidelines.

You can get more information by calling BBB AUTO LINE at 1-800-955-5100, or writing to:

BBB AUTO LINE
1676 International Drive, Suite 550
McLean, VA 22102

BBB AUTO LINE applications can also be requested by calling the Ford Motor Company Customer Relationship Center at 1-800-392-3673.

NOTE: Ford Motor Company reserves the right to change eligibility limitations, modify procedures, or to discontinue this process at any time without notice and without obligation.

11. State warranty enforcement laws

These state laws - sometimes called “lemon laws” - allow owners to receive a replacement vehicle or a refund of the purchase price, under certain circumstances. The laws vary from state to state.

To the extent your state law allows, Ford Motor Company requires that you first send us a written notification of any defects or non-conformities that you have experienced with your vehicle. (This will give us the opportunity to make any needed repairs before you pursue the remedies provided by your state's law.)

In all other states where not specifically required by state law, Ford Motor Company requests that you give us the written notice. Send your written notification to:

Ford Motor Company
Customer Relationship Center
P.O. Box 6248
Dearborn, MI 48126

12. Important information about ambulance conversions

Ford vehicles are suitable for producing ambulances only if equipped with the **Ford Ambulance Prep Package**. In addition, Ford urges ambulance manufacturers to follow the recommendations of the Ford Incomplete Vehicle Manual and the Ford Truck Body Builders Layout Book (and pertinent supplements).

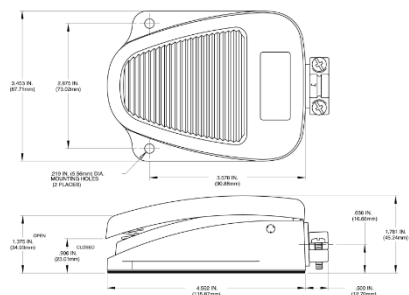
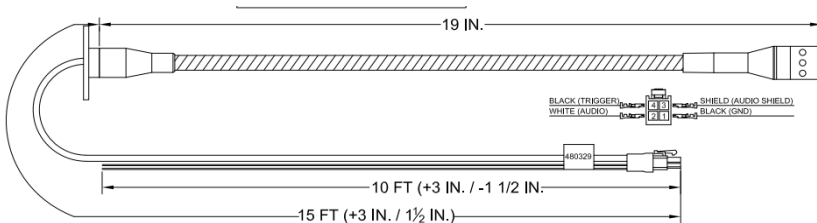
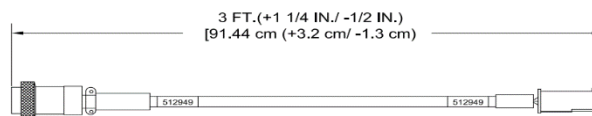
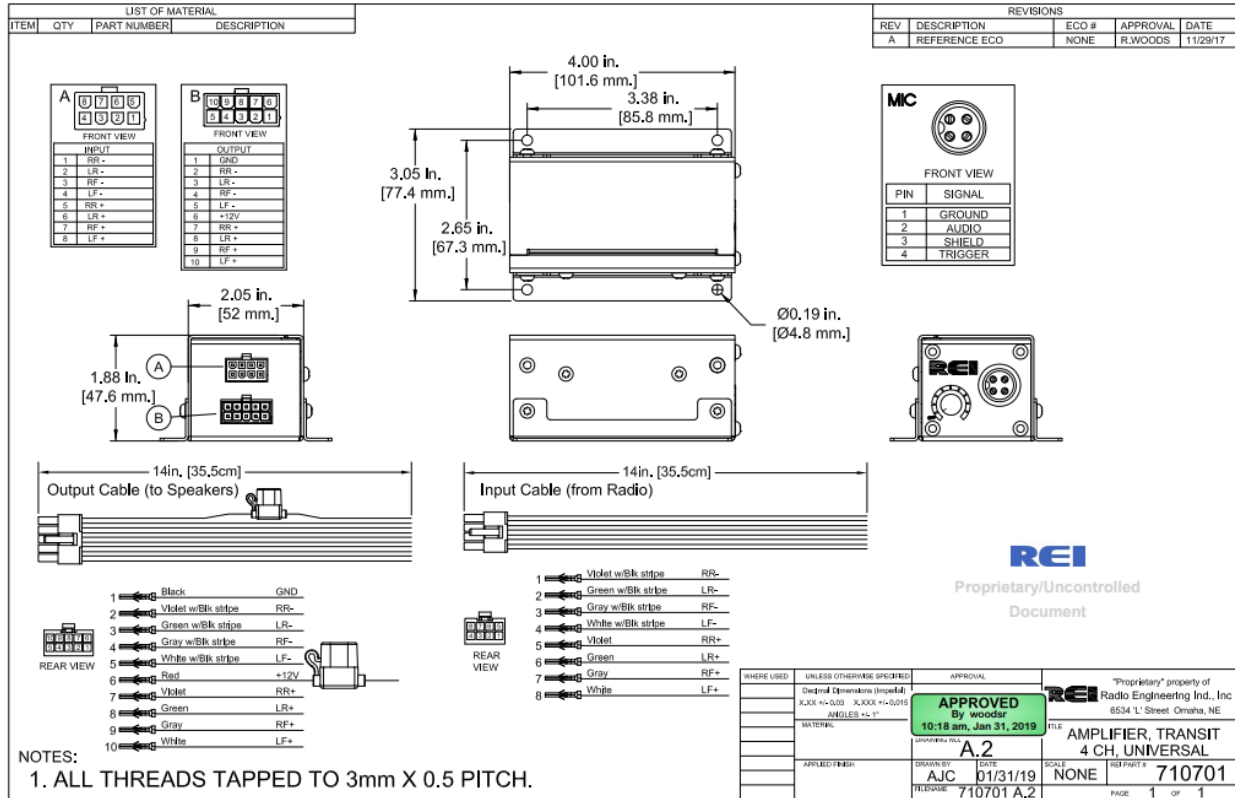
Using a Ford vehicle without the **Ford Ambulance Prep Package** to produce an ambulance could result in elevated underbody temperatures, fuel over pressurization, and the risk of fuel expulsion and fires. Such use also voids the Ford Bumper to Bumper Warranty and may void the Emissions Warranties.

You may determine whether the vehicle is equipped with the **Ford Ambulance Prep Package** by inspecting the information plate on the driver's rear door pillar.

You may determine whether the ambulance manufacturer has followed Ford's recommendations by contacting the ambulance manufacturer of your vehicle.

710701 STAND ALONE PA TO VR BOOM MIC W/FOOTSWITCH

PLUG 512949 TO FRONT MIC CONNECTION ON 710701
 PLUG 480329 TO MINFIT ON 512949
 CONNECT WIRE(S) FROM 480329 TO 290078 FOOTSWITCH



WHERE USED	UNLESS OTHERWISE SPECIFIED	APPROVAL	REI	PROPRIETARY
750249	Default Dimensions (Imperial) X.XXX +/- 0.03 X.XXX +/- 0.015 ANGLES +/- 1°	APPROVED By woods 10-18 am, Jan 31, 2019	6534 L Street Omaha, NE	PROPERTY
N/A	MATERIAL	A.2	AMPLIFIER, TRANSIT 4 CH. UNIVERSAL	
	APPLIED FINISH	DESIGN BY AJC	SCALE NONE	
		DATE 01/31/19	REV PART # 710701	
		TELEPHONE 710701 A.2	PAGE 1 OF 1	



AccuStyle® &
EuroStyle®
Series
**Rearview
Mirror
Systems**



A Century of Automotive Vision Safety

The following pages demonstrate all the advantages of Rosco’s dual-lens remote mirrors for the school bus industry. Two distinct sizes and models cover all the needs of a multitude of applications. A list of some major features is shown at bottom right. A variety of heavy-duty breakaway mounting arms are available to satisfy every requirement and budget. (pls see pgs. 13,15)

The AccuStyle® Story

The AccuStyle® Series mirrors combine the functionality of the EuroStyle® Series with the unique engineering capability to also be retrofitted to old or new “Loop” style arms. The AccuStyle® mirrors can be mounted on two-point, upright or overhang arms. Although employing light weight materials and construction principles, the heavy duty “spine” structure isolates the mirror from vibrations. In addition, the sleek, aerodynamic shape and light texture lowers wind drag which can lead to cost savings through greater fuel efficiency.



Smooth aerodynamic shape with full rear cover for connector and clamp access



Available in two-point mount configuration



Heavy duty spine structure

The EuroStyle® Story

These masterpieces of design engineering, combine a traditional yet elegant design in an extremely functional and feature-rich package. Advantages range from hidden wiring and fasteners to vibration resistance. Space-age resins and attractive heavy texture finish, combined with stainless steel internal components make these mirrors durable and corrosion proof.



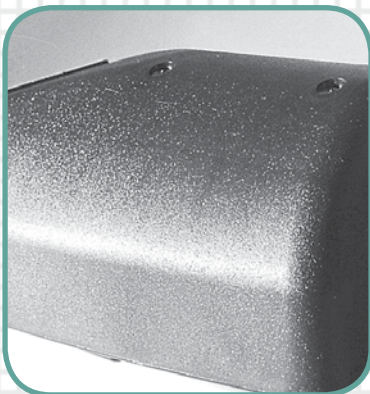
Easy access to connectors



Mirror-Lok system holds mirror glass tightly while allowing for easy replacement



Heavy-duty spine structure



Textured finish hides scratches and fingerprints

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Advanced Features for AccuStyle® and EuroStyle®

- Heavy-duty A.S.A. resin injection-molded housing.
- Aerodynamic styling with no obvious wires or fasteners.
- Available in different sizes with a variety of mounting options.
- Easily replaceable glass. No need for velcro.
- Both flat and convex mirrors separately motorized and heated. Each 4 way adjustable.
- Internal lens or exterior LED turn directionals.
- Available in manual version with fingertip adjustable glass.
- Packaged as components or as complete systems.
- Custom wire harnessing available with many styles of connectors and switches.
- Internal harnessing fed through arm to eliminate unsightly wire ties and protect wiring.
- Available in 12 or 24 volt, heated or unheated.
- Spring-loaded breakaway mechanism on mounts allows for easy return to detent position.
- Patented Spring-Break® Breakaway arm system, dampens vibration.

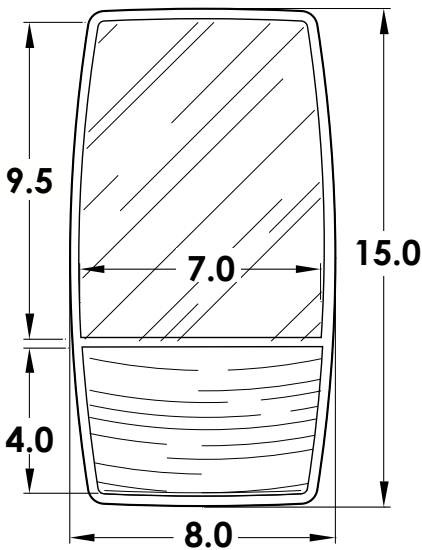
Features and Benefits

- Lightweight, vibration reducing design.
- Certified by OEMs to meet FMVSS-111 requirements.
- Same model can be mounted as upright, overhang or two point mount.
- Reduces inventory of replacement parts.
- Aerodynamic, wind tunnel tested profile has lower drag coefficient for increased fuel economy.
- Available motorized or hand adjustable.
- Available with heated and LED turn signal options
- Each motorized mirror lens is four way adjustable.
- Hidden wire and connectors.
- Black or chrome finish is available.
- Full height rear entry cap allows for simple installation and ease of maintenance, including access to all wires and harnesses.



Model 815U
Shown with E-Z Bracket
combination assembly

Rearview Mirror System



REPLACEMENT PARTS

PART NO.	DESCRIPTION
815/1	7" x 9.5" flat mirror glass
815D/1	7" x 4" convex mirror glass
815/4	7" x 9.5" flat mirror carrier and motor assembly
815D/4	7" x 4" convex mirror carrier and motor assembly
M815/4	7" x 9.5" flat mirror carrier and hand swivel assembly
M815D/4	7" x 4" convex mirror carrier and hand swivel assembly
CAP1042	Rear access cover for 815 mirror head, two point mount
CAP1056	Rear access cover for 815 mirror head, overhang or upright mt
CAP1034	Grommet, rubber, for 1" tube, no harness hole
CAP1058	Grommet, rubber, for 3/4" tube, no harness hole
CAP1044	Grommet, rubber, for 1" tube, harness hole
CAP1045	Grommet, rubber, for 3/4" tube, harness hole
815/SHELL	815 two point mount housing (includes internal spine/clamps)
815OGU/SHELL	815 overhang/upright housing (includes internal spine/clamps)
815SL/1	7" x 9.5" flat mirror glass with Left signal LEDs
815SR/1	7" x 9.5" flat mirror glass with Right signal LEDs

For Heated Mirrors, Add "H" to the End of All Part Numbers Without a "/"
or Add "H" in Front of the "/" When Present.

AccuStyle® 815 series 8"x15" Dual Mirrors

PART NO.	DESCRIPTION
815	8" x 15" dual mirror, two point mount, motorized, 12 volt
815ELU / 815ERU	8" x 15" dual mirror, upright mount, motorized 12 volt with Left or Right external signal LEDs
815OG	8" x 15" dual mirror, overhang mount, motorized, 12 volt
815SL / 815SR	8" x 15" dual mirror, two point mount, motorized 12 volt with Left or Right mirror lens signal LEDs
815SLU / 815SRU	8" x 15" dual mirror, upright mount, motorized 12 volt with Left or Right mirror lens signal LEDs
815SLOG / 815ROG	8" x 15" dual mirror, overhang mount, motorized 12 volt with Left or Right mirror lens signal LEDs
815U	8" x 15" dual mirror, upright mount, motorized, 12 volt
CBL815U	8" x 15" dual mirror, upright mount, motorized 12 volt with Left or Right integrated camera
CBR815U	8" x 15" dual mirror, upright mount, motorized 12 volt with Left or Right integrated camera
M815	8" x 15" dual mirror, two point mount, hand adjustable
M815OG	8" x 15" dual mirror, overhang mount, hand adjustable
M815U	8" x 15" dual mirror, upright mount, hand adjustable

For Heated Mirrors, Add "H" to the End of All Part Numbers Without a "/"
or Add "H" in Front of the "/" When Present.



Model 815



AccuStyle® 818 Series

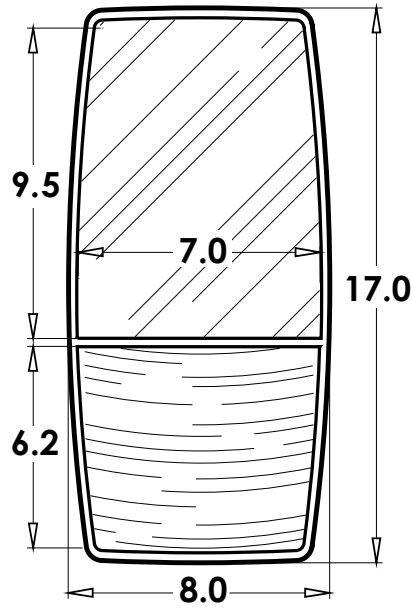
Features and Benefits

- Lightweight,vibration reducing design.
- Certified by OEMs to meet FMVSS-111 requirements.
- Same model can be mounted as upright, overhang or two point mount.
- Reduces inventory of replacement parts.
- Aerodynamic, wind tunnel tested profile has lower drag coefficient for increased fuel economy.
- Oversized 8" x 17" housing provides additional mirror surface.
- Used on all large school and commercial bus types, including conventional and transit style platforms.
- Available motorized or hand adjustable.
- Available heated and with LED turn signal options.
- Each motorized mirror lens is four way adjustable.
- Full height rear entry cap allows for simple installation and ease of maintenance, including access to all wires and harnesses.
- Black or chrome finish is available.



Model 818 with
Stainless Steel Arm

Rearview Mirror System



REPLACEMENT PARTS

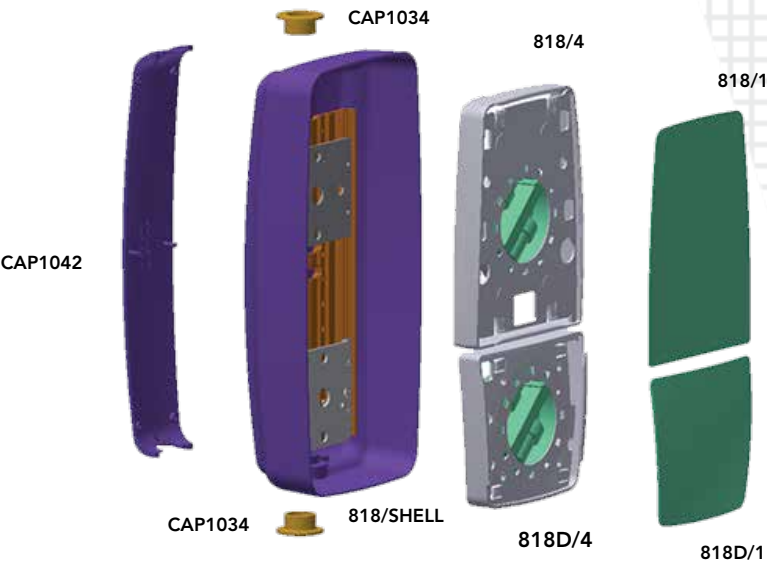
PART NO.	DESCRIPTION
818/1	7" x 9.5" flat mirror glass
818D/1	7" x 6" convex mirror glass
818/4	7" x 9.5" flat mirror carrier and motor assembly
818D/4	7" x 6" convex mirror carrier and motor assembly
M818/4	7" x 9.5" flat mirror carrier and hand swivel assembly
M818D/4	7" x 6" convex mirror carrier and hand swivel assembly
CAP1057	Rear access cover for 818 mirror head, two point mount
CAP1071	Rear access cover for 818 mirror head, overhang or upright mount
CAP1034	Grommet, rubber, for 1" tube, no harness hole
CAP1058	Grommet, rubber, for 3/4" tube, no harness hole
CAP1044	Grommet, rubber, for 1" tube, with harness hole
CAP1045	Grommet, rubber, for 3/4" tube, with harness hole
818/SHELL	818 two point mount housing (includes internal spine/clamps)
818OGU/SHELL	818 overhang/upright housing (includes internal spine/clamps)
818SL/1	7" x 9.5" flat mirror glass with Left signal LEDs
818SR/1	7" x 9.5" flat mirror glass with Right signal LEDs

For Heated Mirrors, Add "H" to the End of All Part Numbers Without a "/" or Add "H" in Front of the "/" When Present.

AccuStyle® 818 series 8"x17" Dual Mirrors

PART NO.	DESCRIPTION
818	8" x 17" dual mirror, two point mount, motorized, 12 volt
818OG	8" x 17" dual mirror, overhang mount, motorized, 12 volt
818SLU / 818SRU	8" x 17" dual mirror, upright mount, motorized 12 volt with Left or Right signal LEDs
818SLOG / 818SROG	8" x 17" dual mirror, overhang mount, motorized 12 volt with Left or Right signal LEDs
818U	8" x 17" dual mirror, upright mount, motorized, 12 volt
M818	8" x 17" dual mirror, two point mount, hand adjustable
M818OG	8" x 17" dual mirror, overhang mount, hand adjustable
M818U	8" x 17" dual mirror, upright mount, hand adjustable

For Heated Mirrors, Add "H" to the End of All Part Numbers Without a "/" or Add "H" in Front of the "/" When Present.



Features and Benefits

- Certified by OEM's to meet FMVSS-111 requirements.
- Compact 8" x 15" housing reduces forward blind spots.
- Available in upright and overhang configurations.
- Used on all large school and commercial bus types, including conventional and transit style platforms.
- Available motorized or hand adjustable.
- Available heated and with LED turn signal options.
- Hidden wiring and connectors.
- 4-way adjustable motors.
- Available in black textured finish to help conceal surface blemishes such as scratches and road grime.

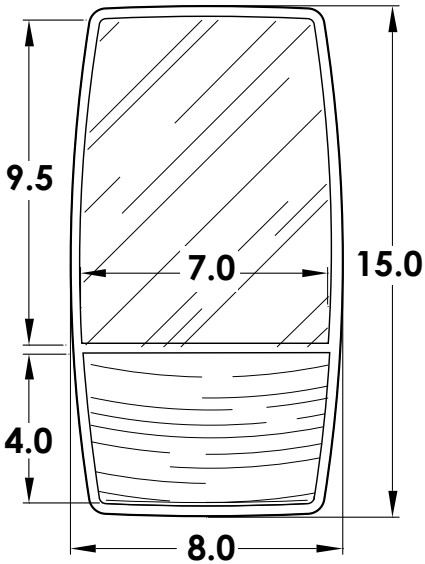


Model 715
shown with upright
Spring-Break®
mounting arm



Model 715SR

Rearview Mirror System



REPLACEMENT PARTS

PART NO.	DESCRIPTION
715/1	7" x 9.5" flat mirror glass
715D/1	7" x 4" convex mirror glass
715/4	7" x 9.5" flat mirror carrier and hand swivel assembly
M715/4	7" x 9.5" convex mirror carrier and hand swivel assembly
M715D/4	7" x 4" convex mirror carrier and hand swivel assembly
CAP	Connector access panel available with various company logos
CAP1001	Rubber grommet for 715 & 717 series mirrors
715/SHELL	Shell for 715 mirrors
715SL/1	7" x 9.5" flat mirror glass with left signal LEDs
715SR/1	7" x 9.5" flat mirror glass with right signal LEDs

For Heated Mirrors, Add "H" to the End of All Part Numbers Without a "/"
or Add "H" in Front of the "/" When Present.

EuroStyle® 715 series 8"x15" Dual Mirrors

PART NO.	DESCRIPTION
715	8" x 15" dual mirror, upright mount, 12 volt motorized
715I	8" x 15" dual mirror, upright mount, 12 volt motorized, wired for International switch
715OG	8" x 15" dual mirror, overhang mount, 12 volt motorized
715IOG	8" x 15" dual mirror, overhang mount, 12 volt motorized, wired for International switch
715SL / 715SR	8" x 15" dual mirror, upright mount, motorized 12 volt with Left or Right signal LEDs
715SLOG / 715SROG	8" x 15" dual mirror, overhang mount, motorized 12 volt with Left or Right signal LEDs
715T	8" x 15" dual mirror, two point mount, 12 volt motorized
M715	8" x 15" dual mirror, upright mount, hand adjustable
M715OG	8" x 15" dual mirror, overhang mount, hand adjustable
M715T	8" x 15" dual mirror, two point mount, hand adjustable

For Heated Mirrors, Add "H" to the End of All Part Numbers Without a "/"
or Add "H" in Front of the "/" When Present.

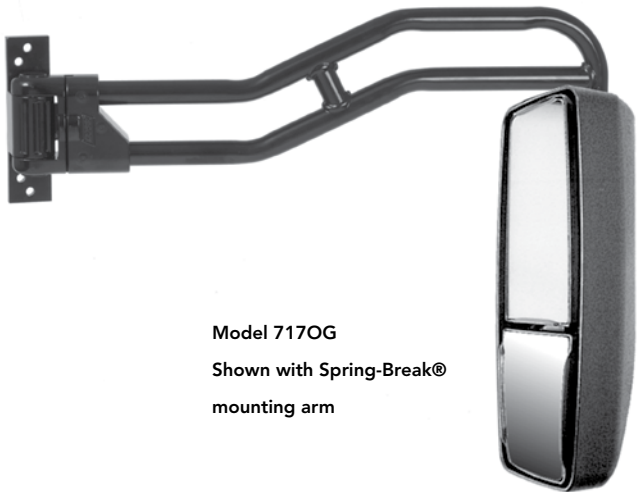


Model 715OG



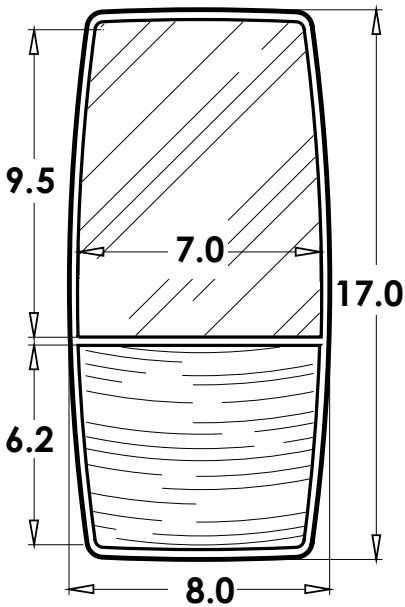
Features and Benefits

- Certified by OEMs to meet FMVSS-111 requirements.
- Oversized 8" x 17" housing provides additional mirror surface.
- Available in upright and overhang configurations.
- Used on all large school and commercial bus types, including conventional and transit style platforms.
- Available motorized or hand adjustable.
- Available heated and with LED turn signal options.
- Hidden wiring and connectors.
- 4-way adjustable motors.
- Available in black textured finish to help conceal surface blemishes such as scratches and road grime.



Model 717OG
Shown with Spring-Break®
mounting arm

Rearview Mirror System



REPLACEMENT PARTS

PART NO.	DESCRIPTION
717/1	7" x 9.5" flat mirror glass
717D/1	7" x 6" convex mirror glass
717/4	7" x 9.5" flat mirror carrier and motor assembly
717D/4	7" x 6" convex mirror carrier and motor assembly
717SL/1	7" x 9.5" flat mirror glass with Left signal LEDs
717SR/1	7" x 9.5" flat mirror glass with Right signal LEDs
M717/4	7" x 9.5" flat mirror carrier and hand swivel assembly
M717D/4	7" x 6" convex mirror carrier and hand swivel assembly
CAP	Connector access panel available with various company logos
CAP1001	Rubber grommet for 715 & 717 series mirrors
717/SHELL	Shell for 717 mirrors

For Heated Mirrors, Add "H" to the End of All Part Numbers Without a "/"
or Add "H" in Front of the "/" When Present.

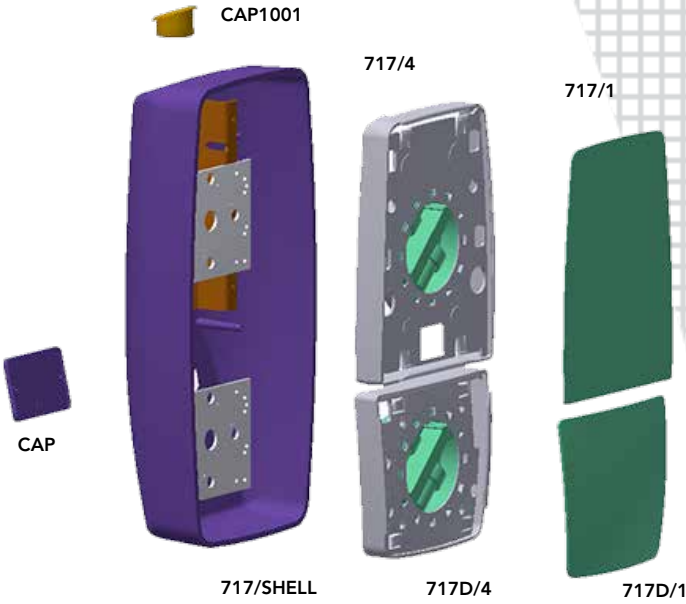
EuroStyle® 717 series 8"x17" Dual Mirrors

PART NO.	DESCRIPTION
717OG	8" x 17" dual mirror, overhang mount, 12 volt motorized
717IOG	8" x 17" dual mirror, overhang mount, 12 volt motorized, wired for International switch
717U	8" x 17" dual mirror, upright mount, 12 volt motorized
717IU	8" x 17" dual mirror, upright mount, 12 volt motorized, wired for International switch
717SLU / 717SRU	8" x 17" dual mirror, upright mount, motorized 12 volt with Left or Right signal LEDs
717SLOG / 717SROG	8" x 17" dual mirror, overhang mount, motorized 12 volt with Left or Right signal LEDs
M717OG	8" x 17" dual mirror, overhang mount, hand adjustable
M717U	8" x 17" dual mirror, upright mount, hand adjustable

For Heated Mirrors, Add "H" to the End of All Part Numbers Without a "/"
or Add "H" in Front of the "/" When Present.



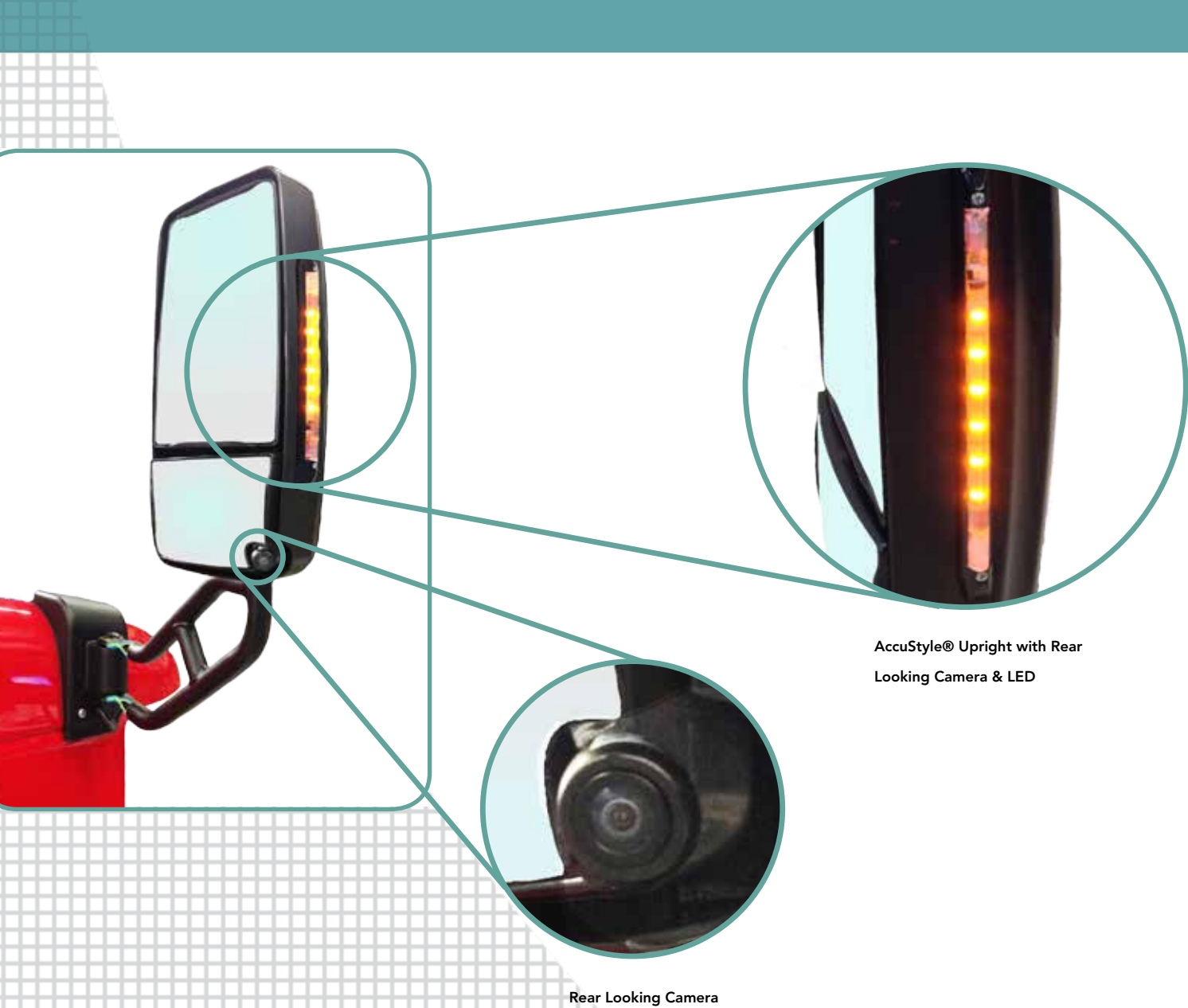
Model 717SRU



Advanced Options for AccuStyle® Mirror Heads

AccuStyle® with Rear Looking Camera

& External Signal LED



External Signal LED

Add Rosco LED side marker lights for omni-directional vehicle alerts to other drivers and pedestrians.

Rear Looking Camera

Add Rosco blind spot/wide angle viewing cameras to help driver visibility. The industry's only integrated mirror camera that adjusts positions with the convex mirror lens adjustment (both manual and remote control).

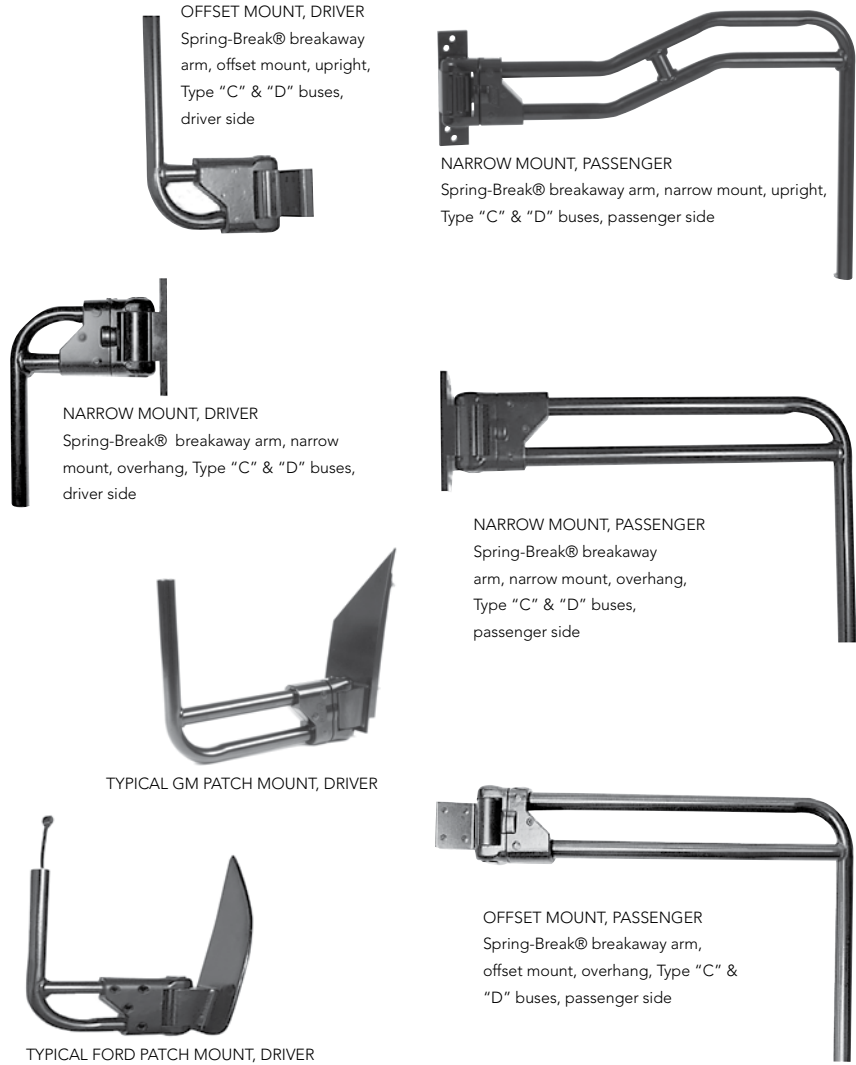
Spring-Break® and Swivel Arm Breakaway Systems

This line of mounting arms has a unique spring loaded detent mechanism that dampens vibration and keeps the arm locked in position. Heavy-duty aluminum castings sandwich a dual tubular arm for maximum hold with no maintenance requirements.

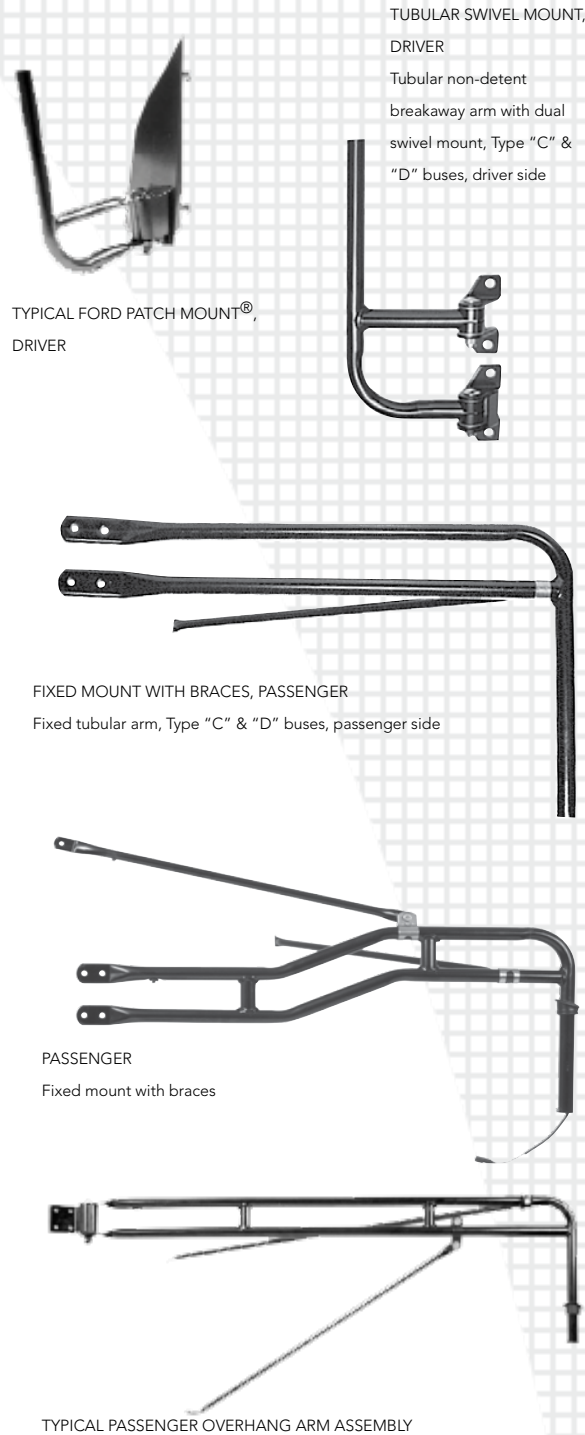
Tubular arm construction keeps things economical. The arm is concealed inside the AccuStyle® or EuroStyle® mirror housing with concealed fasteners.

Economy models offer breakaway swivel arms, or fixed arms. Fender mount systems are available for Ford, GM, and other cutaway buses.

Spring-Break® Detent



Swivel and Fixed Mount Arms



E-Z Bracket®

Combination Rearview and Cross View Arm Assemblies

Rearview Fender Mount with Spring-Break® Detent

Features and Benefits

- Simple and Fast Installation: Rosco's patented E-Z Bracket® System makes installation of a Type "A" school bus mirror system easier than ever before (Patent No. 7,055,973).
- The under-the-fender mount utilizes existing fender mounting bolts to secure the mount below the hood.
- Rosco's unique ferrule system transfers the strength of the inner heavy-gage wall to the exterior of the vehicle.
- Installation is completed with three holes instead of as many as twelve.
- Eliminates the large arms and two braces commonly used on passenger side mirrors until now.
- Massive cast aluminum mounting base provides a stable mount for vibration resistance and durability.
- Low-profile construction is aerodynamic and aesthetically appealing.
- Contoured profile matches the fender perfectly for a solid mount that looks great on the vehicle.
- Available for both Ford and GM vehicles.



Ford E-Z Bracket® Installation with Model 815U AccuStyle® and Hawk-Eye® Cross View Combo Assembly

Rosco's Unique Mounting and Arm Options

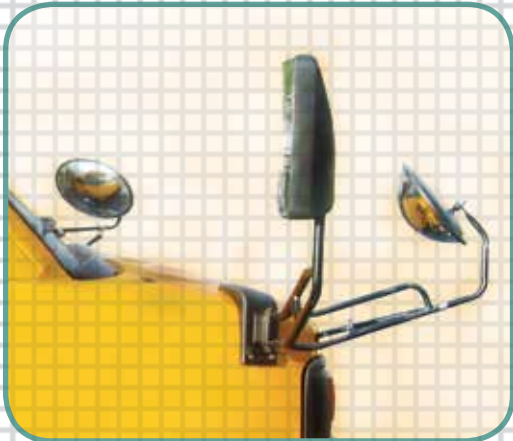
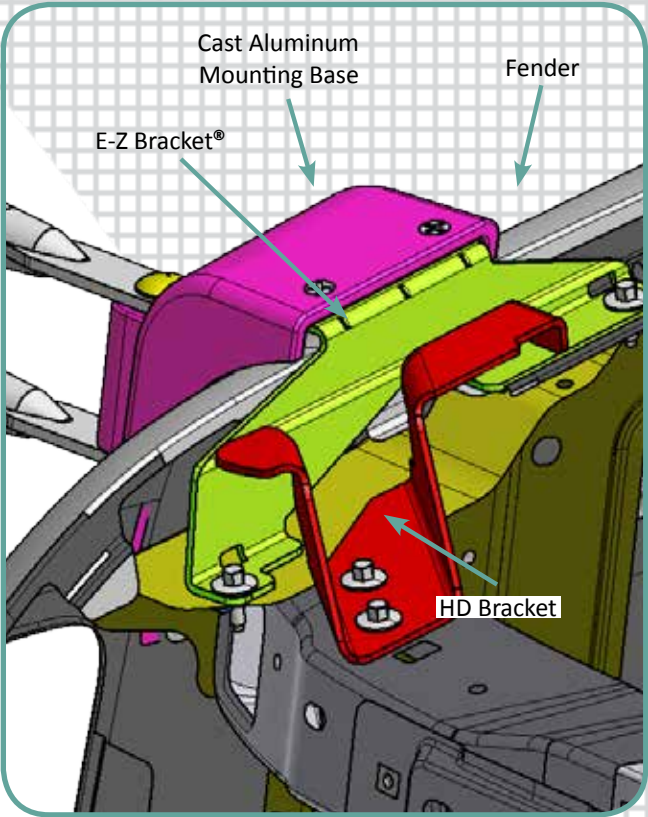
HD E-Z Bracket®

Dual-Wall Breakaway Swivel Arm



HD E-Z Bracket® Installation

Rosco's HD E-Z Bracket® maximizes holding force with OEM inner hood components to simplify installation and minimize vibration.



GM E-Z Bracket® Installation with Model 715 EuroStyle® and Hawk-Eye® Cross View Combo Assembly

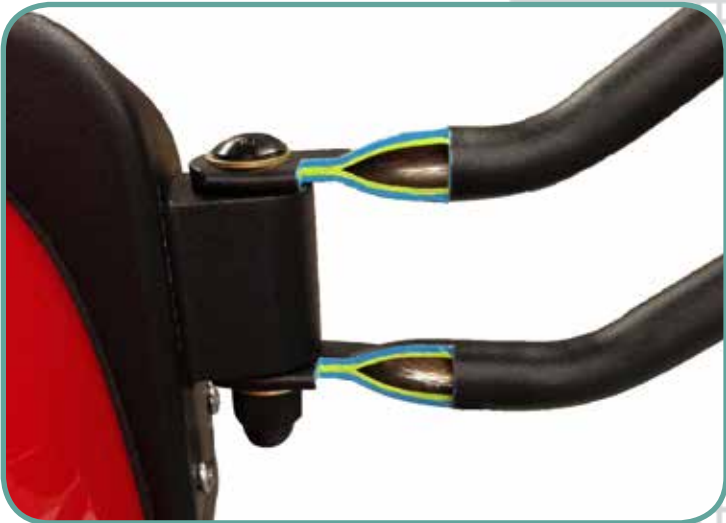


Fender Mount Rearview Mirror Assembly with Spring-Break® Detent (Non Combination Assembly)



GM E-Z Bracket® with Model 815 AccuStyle® and Eye-Max® LP Cross View Combo Assembly

Rosco's Dual-Wall breakaway swivel arms allow for unlimited adjustment and positioning of the mirror while rigidifying the connection to the mounting base. The result is a mirror arm that virtually eliminates vibration.



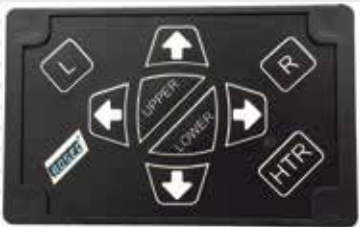
Control Switches & Custom Wire Harnessing

A variety of switches, including heater controls and timers, are available to suit all requirements. Wire harnesses are available from stock or in custom lengths, with many different standard and weatherproof connectors.

- A variety of mirror control switches in various sizes to meet every need.
- Heater control switches available in two types with optional heater timer.
- Illuminated membrane switches with combination heater and remote control for up to four lenses.

Switches and Components

PART NO	DESCRIPTION
SW-1	Remote mirror control switch, 12V lighted, 1.330"x 1.330", 12" harness
SW-3	Remote mirror control switch, 12V, 1.4" diameter, 12" harness
SW-4	Mirror heater toggle switch, 1"x 0.5"
SW-5	Mirror heater momentary switch, 1"x 0.5"
SW-5-HT	Mirror heater momentary switch, with 10 minute heater timer relay
SW-6	Mirror heater toggle switch, 1/2" diameter
HAR5012	Switch Plate Assembly, 2 remote switches and 1 momentary heater switch w/ 10 minute heater timer relay, w/ 10 pin connectors for LED turn signal
HAR5013	Switch Plate Assembly, 2 remote switches and 1 momentary heater switch w/ 10 minute heater timer relay



SWI1011

Rosco's family of remote control/heater membrane switches consolidates the function of two "knob" style switches and one heater with auto shut-off switch. The membrane switch combines the switches into a small solid package with illumination, circuit protection and unmatched durability.

Ford E - Series Driver Door Mounted Switches

PART NO	DESCRIPTION
HAR5020	Switch Pod w/toggle heater switch, red illuminated & 2 remote switches
HAR5024	Switch Pod w/toggle heater switch, green illuminated
HAR5029	Switch Pod w/momentary heater switch (red), timer, 2 remote switches
HAR5032	Switch Pod w/momentary heater switch (red), timer, 2 remote switches, 10 pin connectors for LED mirror turn

Heater Switches for Ford Switch Pod



Green Illuminated
SWI3003
Toggle



Red Illuminated
SWI2005
Momentary
w/ Shut Off Timer



Custom Wire Harnessing

- Harnesses can have custom lengths.
- Conductors available in various gauges.
- Durable connection systems for superior harnessing between mirror, arm and switch.
- Weather proof connectors are available and grommets pre-installed on harnesses.
- Connectors from various companies, including: Tyco/AMP, ITT Canon, Delphi Packard and Deutsch, as well as others.
- In house high speed termination equipment provides fast turnaround.
- UL certified wire.
- Miniature connectors allow smaller holes in vehicle body.
- Multi-conductor cabling available in 2-lead for heating only, 4-lead for single motor control and 8-lead for dual motor control and heating.

Harness Types

1. Arm Harness- Concealed inside arm. Can be made very short to plug into a flush mount connector on the exterior of the vehicle or to pass just inside the vehicle skin. Can be made longer to be run all the way to the control switch.
2. Intermediate Harness- Joins the arm harness to the switch harness. Advantageous because it can be run before installation of the arm on the vehicle assembly line. Also allows arm to be removed from bus by disconnecting a connector instead of cutting a longer wire. More commonly used on passenger side.
3. Switch Harness- Attached to control switch. Often integrates heater control switch. Has leads for power and mirror heater circuits. Usually very short in length.

Mirror Systems Testing For Compliance to FMVSS-111

Our AccuStyle® and EuroStyle® rearview mirror systems and front cross view mirror systems (Eye-Max® LP, HD®, Hawk-Eye®), have been certified for compliance to FMVSS-111 by all the major school bus body builders. Companies including IC Corporation, Thomas Built Buses, Blue-Bird, Collins and Girardin, have shown time and again that Rosco mirrors not only meet, but exceed the requirements of FMVSS-111. However, we continue to test and improve our mirrors to make sure that they cover areas around the bus, beyond the requirements of FMVSS-111. We can not rest in this regard, because we know that the safety of our children depends on it.



Proper School Bus Mirror Adjustment

You know your buses are being manufactured with FMVSS-111 compliant mirrors, but how do you know that your mirrors are being properly adjusted? Can you be sure that your drivers are seeing the blind areas around the bus? Are there blind areas around the bus beyond the FMVSS-111 mandated coverage? If these questions are bothering you, then you need to see "Field of Vision", the first video which teaches you how to keep your mirrors properly adjusted at all times. This free video guideline is a perfect addition to your driver training program. It not only shows how to keep your mirrors adjusted in compliance with FMVSS-111, but also how to see blind areas beyond FMVSS-111 regulations.

Email us for your free copy: info@roscomirrors.com



FIELD OF VISION
A video guide to proper school bus mirror adjustment in accordance with FMVSS-111

OTHER INNOVATIVE ROSCO

Fleet Safety Management Continuous Video & Event Recording,

Rosco's Dual-Vision™ XC is the only windshield based camera that offers all the benefits of event based recording with the added benefit of continuous recording. With Dual-Vision™ XC in your fleet has the ability to reduce your liability and insurance premiums. Some Dual-Vision™ XC features include:

Some Dual-Vision™ XC features include:

- No Monthly Fees
- Up to 160 hours of continuous video on a 32GB SD card
- Tamper proof
- G-Force recognition
- Vehicle speed
- Integrated post route GPS tracking
- Driver panic button
- 24 hour surveillance timer audio, night vision
- Up to 6 camera views
- Wi-Fi download capability and much, much more.

Dual-Vision™ XC 2 + 1



DV231



Maximize your data's potential with our DV-Pro® fleet database management system. This software was developed specifically for organizing information captured by Dual-Vision™ XC recording devices. DV-Pro® makes it fast and easy to view or transfer footage, archive or discard content and compile reports or email files. DV-Pro® driver tools give greater control of information generated by high capacity Dual-Vision™ XC recorders. You can conduct searches based on detailed criteria and quickly make note of key events such as speed overages.

VISION PRODUCTS

Backup Safety Products, Cameras & Monitors

Safety Starts With a Rearview Camera

We cover all the safety angles so your vehicle can backup safely. Replace a standard rearview mirror with one that displays an LCD monitor as soon as the vehicle is shifted into reverse. Or install a rearview mirror backup camera that delivers an unobstructed view of what's behind the vehicle even when it's dark outside. Reduce the risks of moving in reverse. Drivers will be able to maneuver easily in reverse with one of our backup camera kits.



STSK7965
COMPLETE CAMERA KIT



MOR-Vision Mirror/Monitor Backup Camera Kits



Rosco Vision Systems introduces a revolutionary new backup camera system (STSK6630) for large school buses and vehicles. This new system utilizes an interior 6" x 30" rearview mirror (STSM630) to display a 7" LCD monitor when the vehicle is in reverse operation. This monitor allows the driver to see behind the vehicle, and once the vehicle is shifted to all other modes of operation a normal full mirror view reappears.

The MOR-Vision series also includes our STSK5530 kit and STSK1030 kit for small and large buses. Buses equipped with MOR-Vision have options for multiple cameras and automatic monitor view changes based on operational conditions of the school bus. With two camera inputs, the MOR-Vision systems allow for a second camera to be installed for increased visibility and security. Upgrade the MOR-Vision Mirror/Monitor Backup Camera System with a second interior or exterior camera.



STSK1030 Mirror/Monitor 10" x 30" Backup Camera Kit
STSM1030 Monitor, STSC109B Camera, and STSH341 Harness



STSK6630 Mirror/Monitor 6" x 30" Backup Camera Kit
STSM630 Monitor, STSC109B Camera, and STSH341 Harness



STSK5530 Mirror/Monitor 6" x 16" Backup Camera Kit
STSM530 Monitor, STSC109B Camera, and STSH341 Harness



STSK4530 Mirror/Monitor 6" x 16" Backup Camera Kit
STSM230 Monitor, STSC130 Camera, and STSH330 Harness



Rosco was established in 1907. For over a century, our goals have remained the same: We are committed to producing the highest quality automotive products and providing the superior service our customers have grown to expect.

Today, we supply our products to every school bus manufacturer in North America. Our products are designed and built in the USA. Our staff has grown to over two hundred people in facilities totaling over one hundred thousand square feet.

As we move forward we have set our goals even higher. We are now certified to ISO-9001:2008. Our focus on Total Quality Management and continuous improvement will keep our product quality at levels our customers demand.

We will strive to improve our customer service through online and other electronic resources. We will continue to develop newer and better products to serve the ever-changing needs of the marketplace of tomorrow.



A Century of Automotive Vision Safety

90-21 144th Place, Jamaica, New York 11435

TEL (800) 227-2095 • FAX (718) 297-0323

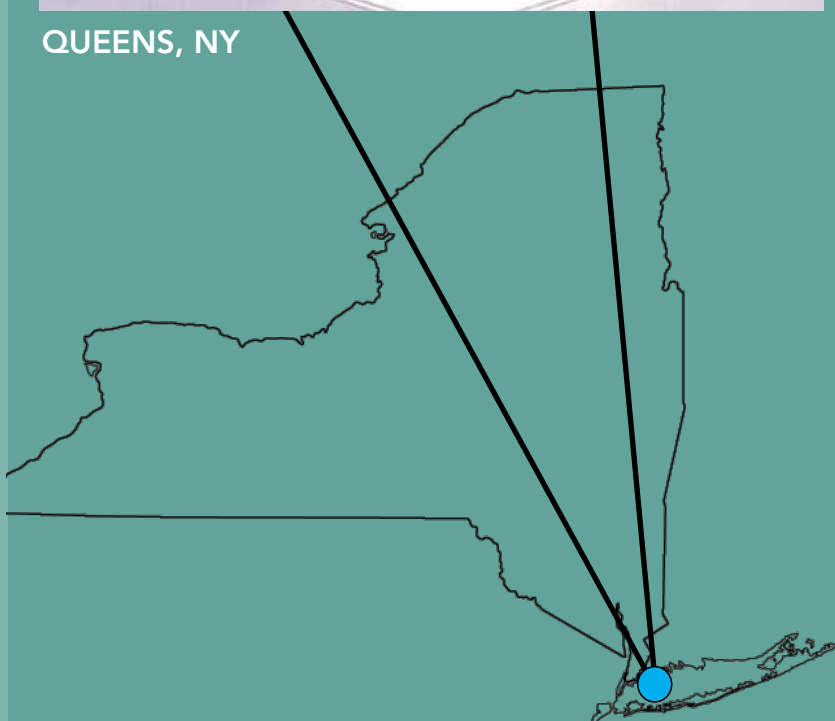
Info@Roscomirrors.com

www.roscomirrors.com www.roscovision.com

Cat. No. 081414



QUEENS, NY



NEW YORK SINCE 1907

Limited Warranty

IVS, Inc. dba AngelTrax, warrants its product to be free from manufacturer's defects in material and workmanship under normal use and service for the designated warranty period, as listed below, from the date of purchase. "Normal use" means the product was used for intended purposes, maintained properly and protected from deliberate damage. The following products are covered by the limited warranty for the following periods of time:

- **Five (5) years from date of purchase parts and labor on the Vulcan Series VX4AI™, V5SD™, V5™, V5X3™, VX5AI™, V6X3™, VX7AI™, V862HC™, V8X3™, V12™, V16-35™ and V24™ MDVRs**
- **Five (5) years from date of purchase parts and labor on the Vulcan Series Hybrid Component V1284HC MDVR™, V8HCNVR™, V12HCNVR™, V1202HC MNVR™, V16HCNVR™ and V20HC MNVR™**
- **Five (5) years from date of purchase parts and labor on the Vulcan Series V32™ Commercial NVR**
- **Five (5) years from date of purchase parts and labor on the Hybrid Component Series Hybrid Quest™, Hybrid Quest Edge™, Hybrid Quest Edge Plus™ and Hybrid Vault™ MDVRs**
- **Five (5) years from date of purchase parts and labor on the HDX Hybrid™ MDVR**
- **Three (3) years from date of purchase parts and labor on the HDX™ and SDX™ MDVRs**
- **Three (3) years from date of purchase parts and labor on the CoPilot™, CoPilot-WA™ and CoPilot-RFID™ MDVRs**
- **Five (5) years from date of purchase full replacement on all solid-state hard drives**
- **Five (5) years from date of purchase parts and labor on all SD cards**
- **Three (3) years from date of purchase parts and labor on 3.5-inch SATA hard drives with storage capacities of 1TB through 8TB**
- **Five (5) years from date of purchase parts and labor on 3.5-inch SATA hard drives with storage capacities of 10TB and more**
- **Three (3) years from date of purchase parts and labor on all 2.5-inch SATA hard drives**
- **Three (3) years from date of purchase parts and labor on the Vulcan Series IP and HD Cameras**
- **Three (3) years from date of purchase parts and labor on the HD Quality Lens Cameras**
- **Three (3) years from date of purchase parts and labor on the WM Series and Student Transit PeriOptic Lens Cameras**
- **Three (3) years from date of purchase parts and labor on the CoPilot™ Camera**
- **Three (3) years from date of purchase parts and labor on the Virtual Synchronized Mapping™ internal and external units**
- **Three (3) years from date of purchase parts and labor on the GDA-7012 Kit and GDA-7012 Monitor**
- **Three (3) years from date of purchase parts and labor on the WLAN and AP Router**
- **One (1) year from date of purchase parts and labor on the MON7AT installation monitor, all wireless access points (WAPs) and all accessories not listed above**

This warranty gives the user specific rights, and those rights may vary from state to state. The terms and conditions of said warranty are as follows:

1. When the product is installed by, or purchased from an authorized AngelTrax dealer, IVS, Inc. will either repair, or replace at no charge to the original purchaser, any product that IVS, Inc. determines to be defective and under the warranty provided. The defect(s) must be reported within five (5) years from the date of purchase. This warranty is valid only with the original purchaser, and is non-transferable. The warranty does not cover removal or reinstallation of the product(s).
2. The date of purchase and proof of an authorized AngelTrax dealer installation must be established by the original sales receipt, which should accompany the product(s) that are returned for warranty services.
3. The warranty shall not apply to any product that has been altered in any way, or used for any unintended purpose.
4. IVS, Inc. does not authorize any other person to assume liability in connection with its products. This warranty is the only expressed warranty made by IVS, Inc. to its products. Any implied warranty of merchantability or fitness for a particular purpose applicable to IVS, Inc. products, is limited to the duration of this limited warranty. Some states or provinces do not allow the exclusion or limitation of incidental or consequential damages, or limitation on how long an implied warranty lasts. Therefore, the above limitations may not apply.
5. If in the unlikely event warranty service becomes necessary, contact us directly and request a Return Merchandise Authorization (RMA) from the technical service department. Please call 1-800-673-1788 and ask for the technical service department to obtain a return merchandise authorization (RMA) number. Be sure to have the model number, serial number and the nature of the problem available for the technical service representative. Upon verification of a defect, IVS, Inc. will send a new or refurbished replacement unit via express shipping at no cost to the customer. The customer will receive a copy of the RMA and a Call Tag with their replacement unit. Once the customer has received the replacement unit, they have 30 days to ship the defective product back to IVS, Inc. or the customer will be charged for the replacement product. Once the unit is exchanged, the returned product shall become the property of IVS, Inc. The Call Tag included with the replacement unit allows the customer to ship the defective product back to IVS, Inc. at no cost.
6. Products must be returned to the factory in their original carton, or equivalent, and in original packaging conditions. Items shipped to IVS, Inc. without a clearly identified RMA number on the exterior of the packaging may be refused. If the product is received with the serial number removed or defaced, the warranty is void. The product will not be repaired under warranty and returned to the owner freight collect.

Send product to:
IVS, Inc. (AngelTrax)
Warranty Service Department
119 South Woodburn Drive
Dothan, Alabama 36305

NCL1000-2 Century Series™

Commercial Wheelchair Lifts



1,000 lb
Lifting Capacity

Larger Platform
Now Available in 37" Width

 **BraunAbility**
Life is a Moving Experience®

NCL1000-2 Century Series™

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

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

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

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

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

NCL1000IB3751HB-2 (37" wide x 51" long platform - with handrail belt)

NCL1000IB3754HB-2 (37" wide x 54" long platform - with handrail belt)

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

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



All illustrations, descriptions and specifications in this brochure are based on the latest product information at the time of publication. BraunAbility reserves the right to make changes at any time without notice. © 2017 BraunAbility 400636



Integrated dual handrails provide added security for wheelchair users and standees



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



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



 **BraunAbility**
Life is a Moving Experience®

631 West 11th Street • Winamac, IN 46996

(574) 946-6153 • 1-800-THE-LIFT

www.braunability.com/commercial

Braun® Limited Warranty

WARRANTY COVERAGE AND WARRANTY COVERAGE TIME PERIODS

The Braun Corporation ("Braun") warranty covers certain parts of this wheelchair lift for three (3) years or 10,000 cycles and the cost of labor to repair or replace those parts for one (1) year or 3,000 cycles. If The Braun Corporation receives the warranty registration card within 20 days after the lift is put into service, the warranty labor coverage will increase from one (1) year or 3,000 cycles to three (3) years or 10,000 cycles. In addition, providing the warranty registration card is returned as noted above, the following lift's power train parts are warrantied for five (5) years or 15,000 cycles: Cable, Cylinder, Flow Control, Gear Box, Motor, Pump, Hydraulic Hose and Fittings. This limited warranty covers substantial defects in materials and workmanship of the lift, provided that the lift is operated and maintained properly and in conformity with the owner's manual. The warranty period begins on the date that the product is delivered to the first retail purchaser by an independent, authorized dealer of Braun, or, if the dealer places the product into any type of service prior to retail sale, on the date the dealer first places the product in such service. This limited warranty applies only to the first purchaser. It may not be transferred.

WHAT BRAUN WILL DO TO CORRECT PROBLEMS

In the event that a substantial defect in material or workmanship, attributable to Braun, is found to exist during the first year of warranty coverage, it will be repaired or replaced, at Braun's option, without charge for parts or labor to the owner, in accordance with the terms, conditions and limitations of this limited warranty. If the substantial defect in material or workmanship, attributable to Braun, is found to exist during the second or third year of warranty coverage, it will be repaired or replaced, at Braun's option, without charge to the owner for parts, only, in accordance with the terms, conditions and limitations of this limited warranty. Providing the warranty card is returned within 20 days as outlined above, the labor warranty period will be extended by two years of coverage in accordance with the terms, conditions, and limitations of this limited warranty. In addition, if a substantial defect in material or workmanship, attributable to Braun, is found to exist during the fourth or fifth year of warranty coverage to the following lift's power train parts: Cable, Cylinder, Flow Control, Gear Box, Motor, Pump, Hydraulic Hose and Fittings, it will be repaired or replaced, at Braun's option, without charge to the owner for parts, only, in accordance with the terms, conditions and limitations of this limited warranty. The cost of labor for repair or replacement at any time after the warranty coverage detailed above is the sole responsibility of the owner.

Braun's obligation to repair or replace defective materials or workmanship is the sole obligation of Braun under this limited warranty. Braun reserves the right to use new or remanufactured parts of similar quality to complete any work, and to make parts and design changes from time to time without notice to anyone. Braun reserves the right to make changes in the design or material of its products without incurring any obligation to incorporate such changes in any previously manufactured product. Braun makes no warranty as to the future performance of this product, and this limited warranty is not intended to extend to the future performance of the product. In addition, the owner's obligation to notify Braun, or one of its authorized, independent dealers, of a claimed defect does not modify any obligation placed on the owner to contact Braun directly when attempting to pursue remedies under state or federal law.

LIMITATIONS, EXCLUSIONS AND DISCLAIMER OF IMPLIED WARRANTIES

ANY IMPLIED WARRANTY THAT IS FOUND TO ARISE BY WAY OF STATE OR FEDERAL LAW, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR ANY IMPLIED WARRANTY OF FITNESS, IS LIMITED IN DURATION TO THE TERMS OF THIS LIMITED WARRANTY AND IS LIMITED IN SCOPE OF COVERAGE TO THE SCOPE OF COVERAGE OF THIS LIMITED WARRANTY. Braun disclaims any express or implied warranty, including any implied warranty of fitness or merchantability, on items excluded from coverage as set forth in this limited warranty. Braun makes no warranty of any nature beyond that contained in this limited warranty. No one has authority to enlarge, amend or modify this limited warranty, and Braun does not authorize anyone to create any other obligation for it regarding this product. Braun is not responsible for any representation, promise or warranty made by any independent dealer or other person beyond what is expressly stated in this limited warranty. Any selling or servicing dealer is not Braun's agent, but an independent entity.

Braun® Limited Warranty

BRAUN SHALL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES THAT MAY RESULT FROM BREACH OF THIS LIMITED WARRANTY OR ANY IMPLIED WARRANTY. THIS EXCLUSION OF CONSEQUENTIAL AND INCIDENTAL DAMAGES SHALL BE INDEPENDENT OF ANY FAILURE OF THE ESSENTIAL PURPOSE OF ANY WARRANTY, AND THIS EXCLUSION SHALL SURVIVE ANY DETERMINATION THAT THIS LIMITED WARRANTY OR ANY IMPLIED WARRANTY HAS FAILED OF ITS ESSENTIAL PURPOSE. This warranty does not cover, and in no event shall Braun be liable for towing charges, travel, lodging, or any other expense incurred due to the loss of use of the product or other reason.

Some states do not allow limitations on how long an implied warranty lasts, or the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you.

HOW TO GET SERVICE

To obtain warranty service the owner must do all of the following:

1. Notify an authorized service center, of the claimed defect attributable to Braun, within the warranty coverage period designated above
2. Provide the notification mentioned in (1), above, within ten (10) days of when the owner discovered, or should have discovered, the claimed defect
3. Promptly schedule an appointment with and take the product to an authorized service center for service.
4. Pay any transportation costs and all expenses associated with obtaining warranty service.

Since Braun does not control the scheduling of service work at the independent dealerships you may encounter some delay in scheduling or completion of work. If you need assistance you may contact Braun, at 631 West 11th Street, Winamac, Indiana 46996; 1-800-THE-LIFT, (843-5438).

If two (2) or more service attempts have been made to correct any covered defect that you believe impairs the value, use or safety of the product, or if it has taken longer than thirty (30) days for repairs to be completed, you must, to the extent permitted by law, notify Braun directly, in writing, at the above address, of the unsuccessful repair(s) of the alleged defect(s) so that Braun can become directly involved in providing service pursuant to the terms of this limited warranty.

WHAT IS NOT COVERED

This Limited Warranty does not cover any of the following: defects in materials, components or parts of the product not attributable to Braun, any material, component or part of the product that is warranted by another entity (Note: the written warranty provided by the manufacturer of the material, component or part is the direct responsibility of that manufacturer); items that are added or changed after the product leaves Braun's possession; additional items installed at any dealership, or other place of business, or by any other party, other than Braun; normal wear, tear, usage, maintenance, service, periodic adjustments, the effects of condensation or moisture from condensation; mold or any damage caused by mold; imperfections that do not affect the product for its intended purpose; items that are working as designed but that you are unhappy with; problems related to mis-operation, misuse, mishandling, neglect or abuse, including failure to maintain the product in accordance with the owner's manual, or other routine maintenance such as inspections, lubricating, adjustments, tightening of screws, sealing, wheel alignments or rotating tires; damage due to accident or collision, including any acts of weather or damage or corrosion due to the environment; theft, vandalism, fire, or other intervening acts not attributable to Braun; damage resulting from tire wear or tire failure; defacing, scratches, dents or chips on any interior or exterior surface of the product, including those caused by rocks or other road hazards, damage caused by off road use, overloading or alteration of the product, or any of its components or parts.

Defects and/or damage to interior and exterior surfaces and other appearance items may occur at the factory or when the product is in transit. These items are usually detected and corrected at the factory or by

Braun® Limited Warranty

a dealer prior to delivery to the purchaser. You must inspect the product for this type of damage when you take delivery. If you find any such defect or damage you must notify the selling dealer, or Braun, at the time of delivery to have these items covered by this limited warranty and to have work performed on the items at no cost to you as provided by this limited warranty.

EVENTS DISCHARGING BRAUN FROM OBLIGATION UNDER WARRANTY

The following shall completely discharge Braun from any express or implied warranty obligation to repair or replace anything and void this warranty: misuse, neglect, collision, accidents, failure to provide routine maintenance (See Owner's Manual), unauthorized alteration, off road use, Acts of Nature, damage from weather or the environment, theft, vandalism, tampering, fire, explosions, overloading the product and odometer tampering.

LEGAL REMEDIES

Any action to enforce any portion of this limited warranty, or any implied warranty, must be commenced within six (6) months after expiration of the warranty coverage period designated above or the action will be barred because of the passage of time. Any performance of repairs shall not suspend this limitation period from expiring. Any performance of repairs after the warranty coverage period has expired, or performance of repairs regarding any thing excluded from coverage under this limited warranty shall be considered "good will" repairs, and they will not alter the terms of this limited warranty, or extend the warranty coverage period or the filing limitation period in this paragraph. In addition, since it is reasonable to expect that the product will need some service during the warranty period; this warranty does not extend to future performance. It only sets forth what Braun will do and does not guarantee anything about the product for any time period. Nothing in this warranty, or any action of Braun, or any agent of Braun, shall be interpreted as an extension of any warranty period or the filing limitation period in this paragraph. Some states do not allow a reduction in the statute of limitations, so this reduction may not apply to you.

WARRANTY REGISTRATION and MISCELLANEOUS

Your warranty registration records should be completed and delivered to the appropriate companies, including the Braun Delivery Checklist & Warranty form. That form must be returned to Braun within twenty (20) days of purchase. The Braun warranty will not be registered unless this warranty registration is completed and received by Braun. Failure to file this warranty registration with Braun will not affect your rights under this limited warranty as long as you can present proof of purchase, but it can cause delays in obtaining the benefits of this limited warranty, and it changes the start date of the warranty to the date of final assembly of the product by Braun.

Braun agrees to repair or replace any of its factory installed parts found to have substantial defects within the appropriate warranty period designated above, provided that the repair is authorized by Braun and carried out by an authorized service center (a Braun labor schedule determines the cost allowance for repairs). Braun will not honor any warranty claim for repairs or replacement of parts unless the claim is submitted with the appropriate paperwork, and the work is completed by an independent, factory authorized service center. The appropriate paperwork can be obtained by written or phone contact with Braun at the contact information in this warranty.

Braun reserves the right to designate where any warranty work can be performed. Braun also reserves the right to examine any defective workmanship or part prior to giving any authorization for warranty work. Braun's return authorization procedure must be adhered to in order to process any warranty claims.

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS. YOU MAY ALSO HAVE OTHER RIGHTS THAT VARY FROM STATE TO STATE.

Expanded Polystyrene (EPS) Thermal Insulation Performance Requirements

PROPERTY	UNITS	ASTM TEST	TYPE I	TYPE VIII	TYPE II	TYPE IX	TYPE XIV
Density	pcf, minimum	C303	0.90	1.15	1.35	1.80	2.40
Thermal Resistance Values (R)	Per inch thickness At 75°F (23.9°C)	C518	3.60	3.80	4.00	4.20	4.20
Compressive Resistance 10% Deformation	psi, minimum	D1621	10	13	15	25	40
Flexural Strength	psi, minimum	C203	25	30	35	50	60
Water Vapor Permeability	perm-in; maximum	E96	5.0	3.5	3.5	2.0	2.5
Water Absorption By Total Immersion	% by Vol Max	C272	4.0	3.0	3.0	2.0	2.0

EPS insulation may be manufactured to meet or exceed the requirements of ASTM C578 Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation and applicable building codes. For more information about [ASTM C578-04](#) or other standards visit www.astm.org.



1298 Cronson Blvd., Suite 201
Crofton, MD 21114
(800) 607-3772
www.epsmolders.org

Freedman In-Stock Upholstery Program

As of November 7, 2023

	FSC PN	All	Combo
LEVEL 1			Oxen Vinyl
	62000001	001	Black
	62000641	641	Dark Brown
	62000642	642	Dark Blue
	62000643	643	Crimson Red
	62000644	644	Saddle Tan
	62000672	672	Gray
			Newport Vinyl
	62000624	624	Regatta Blue
	62000685	685	Burgundy
LEVEL 2	62000686	686	Ash Gray
	62000688	688	Cadet Blue
	62000691	691	Sea Green
			Olefin Fabric
	61000055	055	Blueberry
	61000056	056	Sand
	61000057	057	Charcoal Gray
	61000058	058	Wine
			Predictions Vinyl
	62000588	588	Ivy Green
LEVEL 3	62000595	595	Silversurf Gray
	62000600	600	Clipper Blue
	62000607	607	Claret
	62000610	610	Misty Bay Gray
	62000612	612	Indigo Blue
			Regions Fabric
	61136023	409	Pacific Rosa
	51318001-Q8	400	Pacific Gray
	51318001-Q4	401	Pacific Green
	51318001-Q5	402	Pacific Navy
LEVEL 4	51318001-Q6	403	Pacific Dark Blue
	51318001-Q7	404	Pacific Black
	51318001-Q9	405	Midwest Merlot
	51318001-Q0	406	Midwest Pippin
	51318001-QA	407	Midwest Bluette
	51318001-QB	408	Midwest Blackberry
			Sierra Leathermate Vinyl
	62000206	206	Raven Black
	62000207	207	Adriatic Blue
	62000208	208	Light Gray
LEVEL 5	62000209	209	Garnet
			BusTextil Plush L4*
	61108017	110	Chance Black
	61108302	123	Incense Blue
	61108078	021	Incense Rainbow
	61000152	152	Orbit Blue
	61000154	154	Pennant Blue
	61000157	157	Flags Gray
	61000159	159	Orbit Gray
	61136021	275	Majestic Blue (A)
LEVEL 6	61136022	277	Majestic Ruby (A)
	61136002	340	Boomer Blue (A)
	61136008	341	Boomer Gray (A)
	61136000	342	Polaris Blue (A)
	61136009	343	Hermes Navy Blue (A)
	61000156	156 823	Blue Bolster
	61108051	151 824	Gray Bolster
	61108045	830 825	Black Bolster
			Ion Vinyl
	62108089	119	Late Evening Blue
LEVEL 7	82008025	120	Charcoal
			Morbern Vinyl
	51318001-E4	006	Arc Dragonfly
	51318001-4Y	007	Arc Nightingale
	61113004	004	Wave Freestyle Blue
	51318001-R4	005	Wave Rocket
	51318001-S6	003	Priority Vinyl English/Spanish
	51318001-F1	010	Priority Vinyl English/French
			Camira Polyester
	61111282	013	Fireworks Blue
LEVEL 8	61111283	015	Circuit Board Blue
	61111284	031	Wallpaper Bubbles Blue
	61111285		Dots Blue
	61111286	033	Fireworks Gray
	61111287	049	Circuit Board Gray
	61111288	054	Wallpaper Bubbles Gray
	61111289		Dots Gray
			Milano Vinyl*
	62108077	815 816	Pewter
	62108079	817 818	Papyrus
LEVEL 9	62108078	819 820	Black
	62108080	821 822	Chianti
			NPF Fabric**
	61108081	022 039	River
	61108082	023 040	Tumbler
			Tower 4000 Plush
	61108075	024 025	Blue
	61108076	026 027	Rainbow
	61108077	028 029	Green
			D-90 Vinyl
LEVEL 10	62108000	114	Gray
	62108008	115	Mushroom
	62108042	116	Blue
	62108043	117	Wine
			BT Docket 90 Vinyl
	62142000		Embossed Blue
	62142001		Embossed Gray
	62142002		Smooth Gray
	62142003		Smooth Blue
			BusTextil Plush L6
LEVEL 11	61108079	035 036	Southbeach Blue
	61108080	037 038	Twilight Gray
			Morbern Hidden Creek
	62113008	410	Marsh
			Level 4
	61136028	045 050	Rock Gray
	61136029	046 051	Rock Red
	61136030	047 052	Rock Blue
			Level 5
			Combines Rock & Gem
LEVEL 12			Level 6
	61136025	070 050	Gem Gray
	61136027	071 051	Gem Red
	61136026	072 052	Gem Blue
			Level 6
	61108083	043	Vanes Blue w/D-90 trim
	61108084	044	Vanes Gray w/D-90 trim
			Level 7
	61108083	041	Vanes Blue
	61108084	042	Vanes Gray
LEVEL 13			Level 5
	62116006	264	PreVail Standard Gray
	62116007	265	PreVail Standard Blue
			Level 6
	62116004	262	Prevail AK KEVLAR Gray
	62116005	263	Prevail AK KEVLAR Blue
	62000318	268	FR Blok 2000 PermaGuard Gray
			Other
	64000064		Gray Carpet
	51318001-V5		Black Carpet

Use All Over or Combo Number when ordering seats.

Use FSC PN when ordering upholstery only.

(A) Amaya Fabric Program

Refer to cell *comments* for *combo* details. This info also available at www.freedmanseating.com.



FREEDMAN®

SEATING COMPANY

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freedmanseating.com | info@freedmanseating.com

FEATHER WEIGHT

FOLDAWAY BV & AM STYLES

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



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

Not Just Seats



THE FEATHER WEIGHT SERIES BY

FREEDMAN

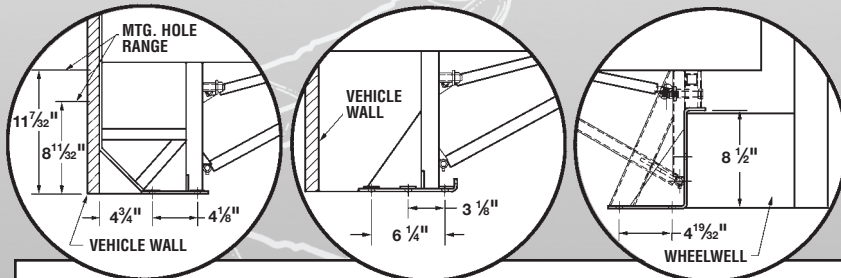
SEATING COMPANY

an ISO 9001:2000 certified company

Seating Solutions™

FEATHER WEIGHT

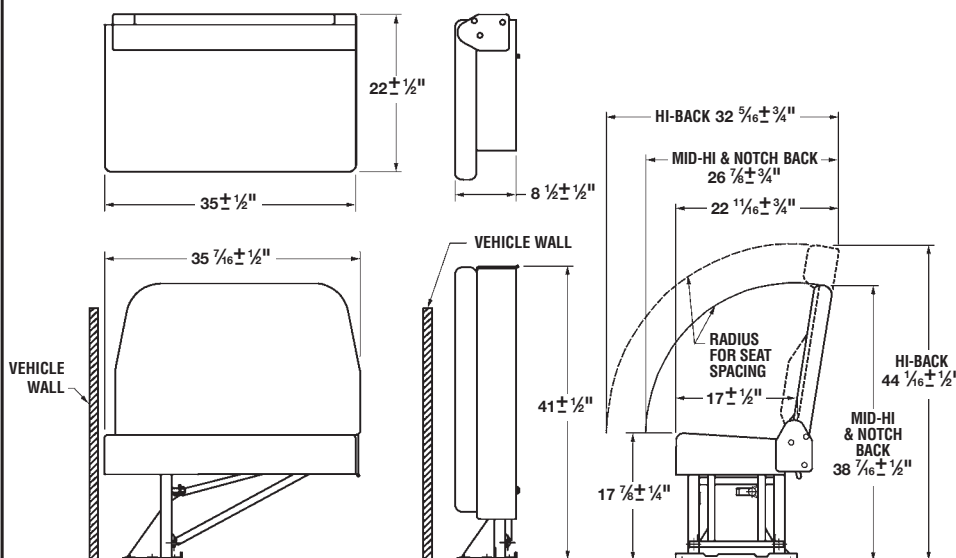
Foldaway BV & AM STYLES



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

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WWW.FREEDMANSEATING.COM
e-mail: sales@freedmanseat.com

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

Seating Solutions™

FEATHER WEIGHT

**MID-HI SEAT
"ROCK SOLID"**



Sustainable Seating Solutions

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

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

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

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



Not Just Seats



Seating Solutions™

THE FEATHER WEIGHT SERIES BY

FREEDMAN
SEATING COMPANY

an ISO 9001:2000 certified company

FEATHER WEIGHT

MID-HI SEAT "ROCK SOLID"



Sustainable Seating Solutions

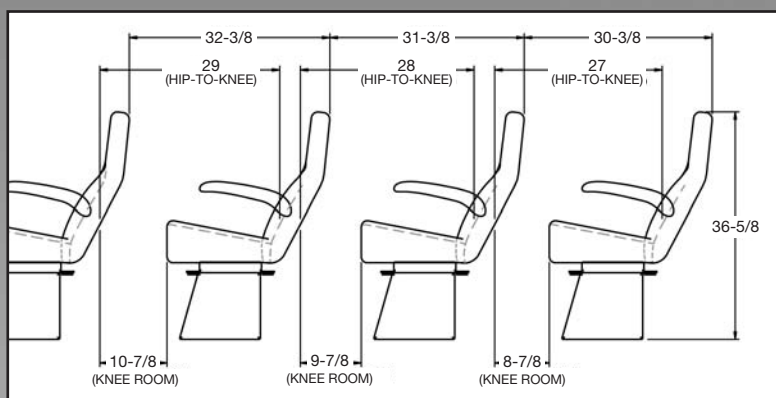
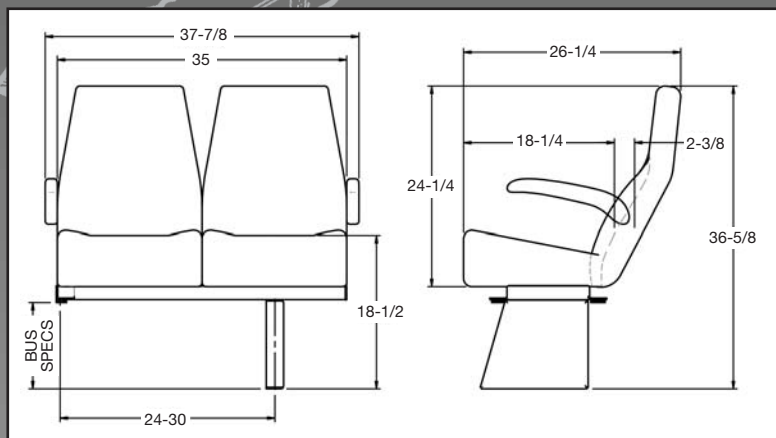
Whether your bus is for tour/charter, para-transit, or shuttle, Feather Weight Mid-Hi works for you. Optional adjustable headrests and reclining back-rests give you luxuries for long journeys, while grab rails and ABS plastic backs provide the function and safety required for shorter trips. The ultra-thin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

Feather Weight Mid-Hi features include:

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

Feather Weight Mid-Hi options include:

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



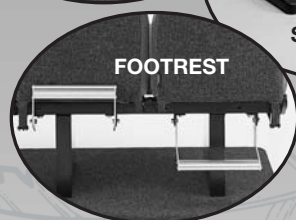
OPTIONS



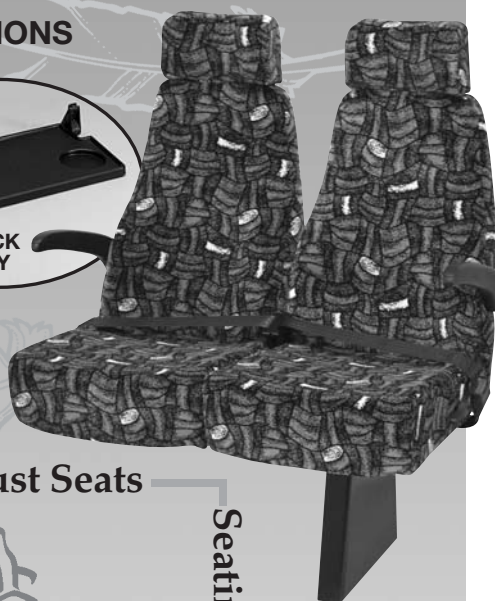
PILLOW SEAT



SNACK TRAY



FOOTREST



Not Just Seats



Seating Solutions™

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WWW.FREEDMANSEATING.COM

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ISO 9001:2000 registered

Gateway

High Idle and Shift Interlock System

Overview

- All-in-one wheelchair interlock and high idle system to ensure full functionality of the vehicle's systems while using the lift
- Provides battery charge protection and improves air conditioning performance
- System is fully compliant with FMVSS 403/404 and the Americans with Disabilities Act (ADA) for wheelchair lift interlocks
- Simple plug and play connection to the OEM chassis

Features

- Prevents vehicle movement while the lift is in use by locking the shifter in Park
- Monitors OEM sensor inputs from the transmission, engine, charging system and ambient air temperature
- Programmable RPM for high idle
- Prevents driving with the park brake set
- Can provide real-time chassis data
- Diagnostic trouble codes available
- Uses Intermittent Fault Filter™ (IFF) technology to eliminate erroneous lift door signals

*Some features vary by chassis.
See instructions for complete details.*

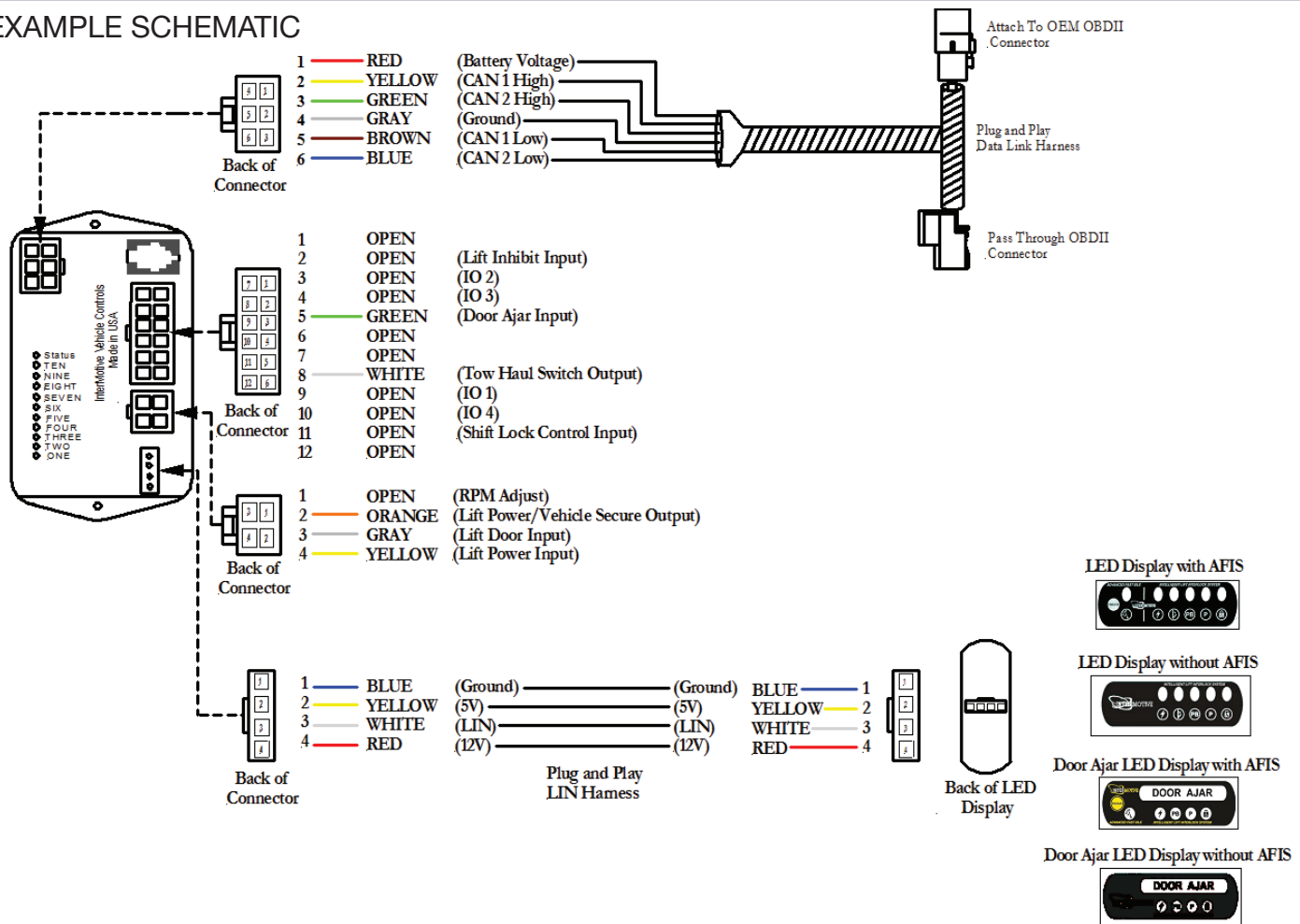
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(775) 831-2002

Details

EXAMPLE SCHEMATIC



SPECIFICATIONS

Number of Inputs	Five inputs (lift inhibit, door ajar, shift lock, lift door and RPM adjust)
Number of Outputs	Four configurable outputs, plus one lift power/vehicle secure output and one tow haul switch output
Current Draw	~120 mA
Quiescent Draw	~2 mA (sleep current)
CAN Speed	High and medium speed
Temperature Range	-40°C to 80°C
Dimensions	4" L x 2" W x 1" H

IdleLock

INTERMOTIVE

**VEHICLE
CONTROLS**

An ISO 9001:2008 Registered Company

IdleLock™

Secure Idling with Key Removed

Overview

- Anti-theft system that allows the vehicle to idle with the key removed from the ignition and the transmission locked in Park
- Activated by pressing an enable switch and removing the key; inserting the key and turning it to run restores normal operation
- Simple plug and play connections
- Easy to install; no cutting of factory wires

Features

- **SAFE:** Walk away from your idling vehicle with confidence that everything is safely locked
- **FULL FUNCTIONALITY:** All lights, equipment and HVAC is still fully functional while engaged
- **SECURE:** The engine shuts off if an unauthorized person tries to shift out of Park without the key in the ignition
- Also provides a shift lock that can be used as an interlock for the rear door, or to secure the trunk or gun rack for police vehicles



Ignition switch "T" harness shown

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

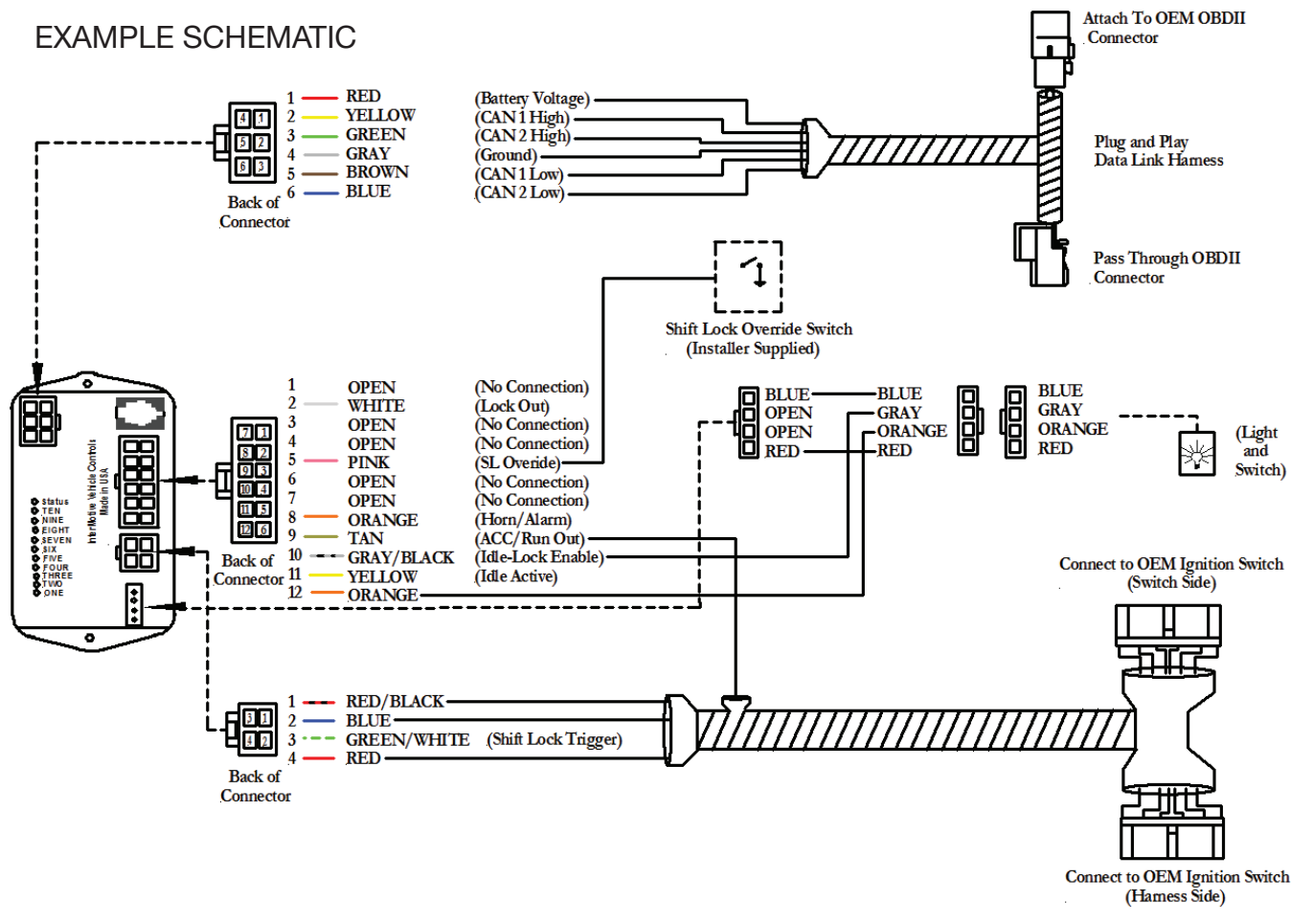
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Details

EXAMPLE SCHEMATIC



SPECIFICATIONS

Number of Inputs Three active inputs (one high, two low)

Number of Outputs Three active outputs (two high, one low)

Current Draw 120 mA

Quiescent Draw < 2 mA (sleep current)

Temperature Range -40°C to 80°C

Dimensions 3" L x 2" W x 1" H

2025 FORD E-SERIES Owner's Manual



The information contained in this publication was correct at the time of release. In the interest of continuous development, we reserve the right to change specifications, design or equipment at any time without notice or obligation. No part of this publication may be reproduced, transmitted, stored in a retrieval system or translated into any language in any form by any means without our written permission. Errors and omissions excepted.

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Part Number: -202310-20231026212109

California Proposition 65



WARNING: Operating, servicing and maintaining a passenger vehicle or off-highway motor vehicle can expose you to chemicals including engine exhaust, carbon monoxide, phthalates, and lead, which are known to the State of California to cause cancer and birth defects or other reproductive harm. To minimize exposure, avoid breathing exhaust, do not idle the engine except as necessary, service your vehicle in a well-ventilated area and wear gloves or wash your hands frequently when servicing your vehicle. For more information go to www.P65Warnings.ca.gov/passenger-vehicle.



WARNING: Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm.
Wash your hands after handling.

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Introduction

ABOUT THIS MANUAL

Thank you for choosing Ford. We recommend that you take some time to get to know your vehicle by reading this manual. The more that you know about your vehicle, the greater the safety and pleasure you will get from driving it.



WARNING: Driving while distracted can result in loss of vehicle control, crash and injury. We strongly recommend that you use extreme caution when using any device that may take your focus off the road. Your primary responsibility is the safe operation of your vehicle. We recommend against the use of any hand-held device while driving and encourage the use of voice-operated systems when possible. Make sure you are aware of all applicable local laws that may affect the use of electronic devices while driving.

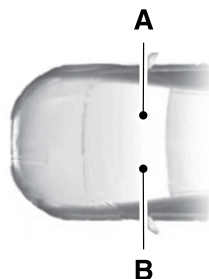
Note: *This manual describes product features and options available throughout the range of available models, sometimes even before they are generally available. It may describe options not fitted to the vehicle you have purchased.*

Note: *Some of the illustrations in this manual may show features as used in different models, so may appear different to you on your vehicle.*

Note: *Always use and operate your vehicle in line with all applicable laws and regulations.*

Note: *Pass on this manual when selling your vehicle. It is an integral part of your vehicle.*

This manual may qualify the location of a component as left-hand side or right-hand side. The side is determined when facing forward in the seat.



- A Right-hand side.
B Left-hand side.

PERCHLORATE

Certain components in your vehicle such as airbag modules, seatbelt pretensioners and remote control batteries may contain perchlorate material. Special handling may apply for service or vehicle end of life disposal.

For more information visit:

Web Address
www.dtsc.ca.gov/hazardouswaste/perchlorate

FORD CREDIT

US Only

Ford Credit/Ford Pro FinSimple offers a full range of financing and lease plans to help you acquire our vehicle. If you have financed or leased your vehicle through Ford Credit/Ford Pro FinSimple, thank you for your business.

Introduction

For assistance:

- Call 1-800-727-7000.
- For more information about Ford Credit and access to the online Account Manager tool, visit www.ford.com/finance.
- For more information about Ford Pro FinSimple, visit <https://fordpro.com/en-us/financing/>.

REPLACEMENT PARTS RECOMMENDATION

We have built your vehicle to the highest standards using quality parts. We recommend that you demand the use of genuine Ford and Motorcraft parts whenever your vehicle requires scheduled maintenance or repair. You can clearly identify genuine Ford and Motorcraft parts by looking for the Ford, FoMoCo or Motorcraft branding on the parts or their packaging.

Scheduled Maintenance and Mechanical Repairs

One of the best ways for you to make sure that your vehicle provides years of service is to have it maintained in line with our recommendations using parts that conform to the specifications detailed in this Owner's Manual.

Genuine Ford and Motorcraft parts meet or exceed these specifications.

Collision Repairs

We hope that you never experience a collision, but accidents happen sometimes.

Genuine Ford replacement collision parts meet our stringent requirements for fit, finish, structural integrity, corrosion protection and dent resistance. During vehicle development we validate that these parts deliver the intended level of protection as a whole system. A great way to know for sure you are getting this level of protection is to use genuine Ford replacement collision parts.

Warranty on Replacement Parts

Genuine Ford and Motorcraft replacement parts are the only replacement parts that benefit from a Ford Warranty.

The Ford Warranty may not cover damage caused to your vehicle as a result of failed non-Ford parts.

For additional information, refer to the terms and conditions of the Ford Warranty.

SPECIAL NOTICES

New Vehicle Limited Warranty

For a detailed description of what is covered by your New Vehicle Limited Warranty, see your warranty guide that is available online. For more information, refer to our website and download your copy of the warranty guide.

Special Instructions

For your added safety, your vehicle is fitted with sophisticated electronic controls.



WARNING: You risk death, fire, or serious injury to yourself and others if you do not follow the instruction highlighted by the warning symbol.



WARNING: Never place front seat mounted rear-facing child or infant seats in front of an active passenger airbag.

Introduction

Fleet Telematics Modem (If Equipped)

The onboard modem provides access to data to support telematics services such as location, speed, idle time, fuel, vehicle diagnostics and maintenance alerts. To explore data, telematics services, third party service provider support and to manage existing telematics accounts, refer to www.commercialsolutions.ford.com or call 833-FCS-FORD.

Note: *This is not available with FordPass Connect.*

FordPass Connect (If Equipped)

With a FordPass Connect-equipped vehicle, you can use FordPass to track your vehicle's location and remotely access vehicle features such as start, lock and unlock and vehicle status including fuel level and approximate mileage. Message and data rates may apply. Services may be limited by mobile phone network coverage area. For additional information, refer to www.fordpass.com.

On Board Diagnostics Data Link Connector



WARNING: Do not connect wireless plug-in devices to the data link connector. Unauthorized third parties could gain access to vehicle data and impair the performance of safety related systems. Only allow repair facilities that follow our service and repair instructions to connect their equipment to the data link connector.

Your vehicle has an OBD Data Link Connector (DLC) that is used in conjunction with a diagnostic scan tool for vehicle diagnostics, repairs and reprogramming services. Installing an aftermarket device that uses the DLC during normal driving for purposes such as

remote insurance company monitoring, transmission of vehicle data to other devices or entities, or altering the performance of the vehicle, may cause interference with or even damage to vehicle systems. We do not recommend or endorse the use of aftermarket plug-in devices unless approved by Ford. The vehicle Warranty will not cover damage caused by an aftermarket plug-in device.

Notice to Owners of Pickup Trucks and Utility Type Vehicles



WARNING: Utility vehicles have a significantly higher rollover rate than other types of vehicles.



WARNING: Vehicles with a higher center of gravity (utility and four-wheel drive vehicles) handle differently than vehicles with a lower center of gravity (passenger cars). Avoid sharp turns, excessive speed and abrupt steering in these vehicles. Failure to drive cautiously increases the risk of losing control of your vehicle, vehicle rollover, personal injury and death.

Before you drive your vehicle, please read this Owner's Manual carefully. Your vehicle is not a passenger car. As with other vehicles of this type, failure to operate this vehicle correctly may result in loss of vehicle control, vehicle rollover, personal injury or death.

Using your Vehicle as an Ambulance

If your light truck has the Ford Ambulance Preparation Package, it may be utilized as an ambulance. Ford urges ambulance manufacturers to follow the recommendations of the Ford Incomplete Vehicle Manual, Ford Truck Body Builder's Layout Book and the Qualified Builder

Introduction

Modifiers (QVM) Guidelines as well as pertinent supplements. For additional information, please contact the Truck Body Builders Advisory Service at <http://www.fleet.ford.com/truckbbas/> and then by selecting Contact Us or by phone at 1-877-840-4338.

Use of your Ford light truck as an ambulance, without the Ford Ambulance Preparation Package voids the Ford New Vehicle Limited Warranty and may void the emissions warranties. In addition, ambulance usage without the preparation package could cause high underbody temperatures, over-pressurized fuel and a risk of spraying fuel, which could lead to fires.

If your vehicle has the Ford Ambulance Preparation Package, it will be indicated on the Safety Compliance Certification Label. The label is on the driver side door pillar or on the rear edge of the driver door. You can determine whether the ambulance manufacturer followed Ford's recommendations by directly contacting that manufacturer.

hand-held device while driving and encourage the use of voice-operated systems when possible. Make sure you are aware of all applicable local laws that may affect the use of electronic devices while driving.

Using mobile communications equipment is becoming increasingly important in the conduct of business and personal affairs. However, you must not compromise your own or others' safety when using such equipment. Mobile communications can enhance personal safety and security when appropriately used, particularly in emergency situations. Safety must be paramount when using mobile communications equipment to avoid negating these benefits. Mobile communication equipment includes, but is not limited to, cellular phones, pagers, portable email devices, text messaging devices and portable two-way radios.

MOBILE COMMUNICATIONS EQUIPMENT



WARNING: Driving while distracted can result in loss of vehicle control, crash and injury. We strongly recommend that you use extreme caution when using any device that may take your focus off the road. Your primary responsibility is the safe operation of your vehicle. We recommend against the use of any

Symbols Glossary

SYMBOLS USED ON YOUR VEHICLE

These are some of the symbols you may see on your vehicle.



Airbag



Air conditioning system



Air conditioning system lubricant type



Anti-lock braking system



Avoid smoking, flames or sparks



Battery



Battery acid



Blower motor



Brake fluid - non petroleum based



Brake system



Brake system



Cabin air filter



Check fuel cap



Child safety door lock or unlock



Child seat lower anchor



Child seat tether anchor



Cruise control



Do not open when hot



Electric Parking brake



Engine air filter



Engine coolant



Engine coolant temperature



Engine oil



Explosive gas



Fan warning



Fasten seatbelt



Flammable



Front fog lamps

Symbols Glossary



Fuel pump reset



Fuse compartment



Hazard flashers



Headlamp high beams



Headlamps on



Heated rear window



Hill descent control



Horn control



Interior luggage compartment release



Jack



Keep out of reach of children



Lighting control



Low fuel level



Low tire pressure warning



Maintain correct fluid level



Malfunction Indicator Lamp (MIL)



Note operating instructions



Panic alarm



Parking aid



Parking lamps



Passenger airbag activated



Passenger airbag deactivated



Power steering fluid



Power windows front/rear



Power window lockout



Requires registered technician



Safety alert



See Owner's Manual



See Service Manual



Side airbag

Symbols Glossary



Shield the eyes



Stability control



Stability control off



Trail control



Turn Signal



Windshield defrosting system



Windshield wiping system



Windshield wash and wipe

Data Privacy



WARNING: Do not connect wireless plug-in devices to the data link connector. Unauthorized third parties could gain access to vehicle data and impair the performance of safety related systems. Only allow repair facilities that follow our service and repair instructions to connect their equipment to the data link connector.

We respect your privacy and are committed to protecting it. The information contained in this publication was correct at the time of release, but as technology rapidly changes, we recommend that you visit the local Ford website for the latest information.

Your vehicle has electronic control units that have data recording functionality and the ability to permanently or temporarily store data. This data could include information on the condition and status of your vehicle, vehicle maintenance requirements, events and malfunctions. The types of data that can be recorded are described in this section. Some of the data recorded is stored in event logs or error logs.

Note: *Error logs are reset following a service or repair.*

Note: *We may provide information in response to requests from law enforcement, other government authorities and third parties acting with lawful authority or through a legal process. Such information could be used by them in legal proceedings.*

Data recorded includes, for example:

- Operating states of system components, for example fuel level, tire pressure and battery charge level.
- Vehicle and component status, for example wheel speed, deceleration, lateral acceleration and seatbelt status.

- Events or errors in essential systems, for example headlamps and brakes.
- System responses to driving situations, for example airbag deployment and stability control.
- Environmental conditions, for example temperature.

Some of this data, when used in combination with other information, for example an accident report, damage to a vehicle or eyewitness statements, could be associated with a specific person.

Services That We Provide

If you use our services, we collect and use data, for example account information, vehicle location and driving characteristics, that could identify you. We transmit this data through a dedicated, protected connection. We only collect and use data to enable your use of our services to which you have subscribed, with your consent or where permitted by law. For additional information, see the terms and conditions of the services to which you have subscribed.

For additional information about our privacy policy, refer to the local Ford website.

Services That Third Parties Provide

We recommend that you review the terms and conditions and data privacy information for any services equipped with your vehicle or to which you subscribe. We take no responsibility for services that third parties provide.

Data Privacy

SERVICE DATA

Service data recorders in your vehicle are capable of collecting and storing diagnostic information about your vehicle. This potentially includes information about the performance or status of various systems and modules in the vehicle, such as engine, throttle, steering or brake systems. In order to properly diagnose and service your vehicle, Ford Motor Company (Ford of Canada in Canada), and service and repair facilities may access or share among them vehicle diagnostic information received through a direct connection to your vehicle when diagnosing or servicing your vehicle. Additionally, Ford Motor Company (Ford of Canada, in Canada) may, where permitted by law, use vehicle diagnostic information for vehicle improvement or with other information we may have about you, for example, your contact information, to offer you products or services that may interest you. Data may be provided to our service providers such as part suppliers that may help diagnose malfunctions, and who are similarly obligated to protect data. We retain this data only as long as necessary to perform these functions or to comply with law. We may provide information where required in response to official requests to law enforcement or other government authorities or third parties acting with lawful authority or court order, and such information may be used in legal proceedings. For U.S. only (if equipped), if you choose to use connected apps and services, you consent that certain diagnostic information may also be accessed electronically by Ford Motor Company and Ford authorized service facilities, and that the diagnostic information may be used to provide services to you, personalizing your experience, troubleshooting, and to improve products and services and offer you products and services that may interest

you, where permitted by law. For Canada only, for more information, please review the Ford of Canada privacy policy at www.ford.ca, including our U.S. data storage and use of service providers in other jurisdictions who may be subject to legal requirements in Canada, the United States and other countries applicable to them, for example, lawful requirements to disclose personal information to governmental authorities in those countries.

EVENT DATA

This vehicle is equipped with an event data recorder. The main purpose of an event data recorder is to record, in certain crash or near crash-like situations, such as an airbag deployment or hitting a road obstacle; this data will assist in understanding how a vehicle's systems performed. The event data recorder is designed to record data related to vehicle dynamics and safety systems for a short period of time, typically 30 seconds or less.

The event data recorder in this vehicle is designed to record such data as:

- How various systems in your vehicle were operating.
- Whether or not the driver and passenger seatbelts were buckled/fastened.
- How far (if at all) the driver was depressing the accelerator and/or the brake pedal.
- How fast the vehicle was traveling.
- Where the driver was positioning the steering wheel.

This data can help provide a better understanding of the circumstances in which crashes and injuries occur.

Data Privacy

Note: *Event data recorder data is recorded by your vehicle only if a non-trivial crash situation occurs; no data is recorded by the event data recorder under normal driving conditions and no personal data or information (for example name, gender, age, and crash location) is recorded. However, parties, such as law enforcement, could combine the event data recorder data with the type of personally identifying data routinely acquired during a crash investigation.*

To read data recorded by an event data recorder, special equipment is required, and access to the vehicle or the event data recorder is needed. In addition to the vehicle manufacturer, other parties, such as law enforcement, that have such special equipment, can read the information if they have access to the vehicle or the event data recorder.

SETTINGS DATA

Your vehicle has electronic control units that have the ability to store data based on your personalized settings. The data is stored locally in the vehicle or on devices that you connect to it, for example, a USB drive or digital music player. You can delete some of this data and also choose whether to share it through the services to which you subscribe.

Comfort and Convenience Data

Data recorded includes, for example:

- Seat and steering wheel position.
- Climate control settings.
- Radio presets.

Entertainment Data

Data recorded includes, for example:

- Music, videos or album art.
- Contacts and corresponding address book entries.
- Navigation destinations.

CONNECTED VEHICLE DATA



The modem has a SIM. The modem was enabled when your vehicle was built and periodically sends messages to stay connected to the cell phone network, receive automatic software updates and send vehicle-related information to us, for example diagnostic information. These messages could include information that identifies your vehicle, the SIM and the electronic serial number of the modem. Cell phone network service providers could have access to additional information, for example cell phone network tower identification. For additional information about our privacy policy, visit www.FordConnected.com or refer to your local Ford website.

Note: *The modem continues to send this information unless you disable the modem or stop the modem from sharing vehicle data by changing the modem settings. See **Connected Vehicle** (page 238).*

Note: *The service can be unavailable or interrupted for a number of reasons, for example environmental or topographical conditions and data plan coverage.*

Note: *To find out if your vehicle has a modem, visit www.FordConnected.com.*

EMERGENCY CALL SYSTEM DATA (IF EQUIPPED)

When the emergency call system is active, it may disclose to emergency services that your vehicle has been in a crash involving the deployment of an airbag or activation of the fuel pump shut-off. Certain versions or updates to the emergency call system may also be capable of electronically or verbally disclosing to emergency services operators your vehicle location or other details about your vehicle or crash to assist emergency services operators to provide the most appropriate emergency services. If you do not want to disclose this information, do not activate the emergency call system.

Note: *You cannot deactivate emergency call systems that are required by law.*

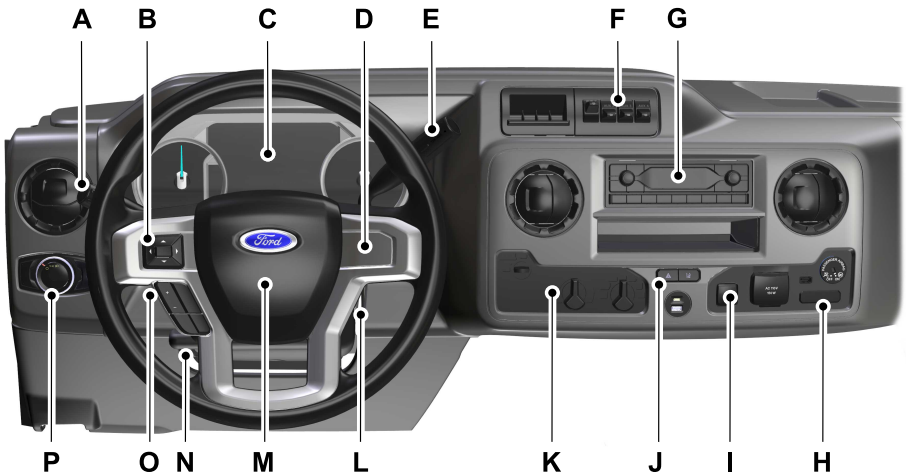
PROTECTING THE ENVIRONMENT

Sustainability is a priority at Ford. We are constantly looking for ways to reduce our impact on the planet while providing customers with great products and delivering a strong business. You should play your part in protecting the environment. Correct vehicle usage and the authorized disposal of waste, cleaning and lubrication materials are significant steps toward this aim.

For additional information about our sustainability progress and initiatives, visit www.sustainability.ford.com.

At a Glance

INSTRUMENT PANEL



- A Direction indicators. See **Direction Indicators** (page 54). Wiper lever. See **Windshield Wipers** (page 51).
- B Information display control. See **Information Display Control** (page 50).
- C Instrument cluster. See **General Information** (page 65).
- D Audio control.
- E Gearshift lever. See **Automatic Transmission** (page 94).
- F Auxiliary switches. See **Auxiliary Switches** (page 245).
- G Audio unit. See **Audio Unit** (page 239).
- H Passenger airbag deactivation indicator. See **Driver and Passenger Airbags** (page 37).
- I Traction control switch. See **Using Traction Control** (page 101).
- J Hazard flasher switch. See **Hazard Flashers** (page 139).
- K Climate control. See **Manual Climate Control** (page 74).
- L Ignition. See **Ignition Switch** (page 82).
- M Horn.
- N Steering wheel adjustment. See **Adjusting the Steering Wheel** (page 49).

At a Glance

- O Cruise control. See **Cruise Control** (page 105).
- P Lighting control. See **Lighting Control** (page 52).

Child Safety

GENERAL INFORMATION

See the following sections for directions on how to properly use safety restraints for children.



WARNING: Always make sure your child is secured properly in a device that is appropriate for their height, age and weight. Child safety restraints must be bought separately from your vehicle. Failure to follow these instructions and guidelines may result in an increased risk of serious injury or death to your child.



WARNING: All children are shaped differently. The National Highway Traffic Safety Administration and other safety organizations, base their recommendations for child restraints on probable child height, age and weight thresholds, or on the minimum requirements of the law. We recommend that you check with a NHTSA Certified Child Passenger Safety Technician

(CPST) to make sure that you properly install the child restraint in your vehicle and that you consult your pediatrician to make sure you have a child restraint appropriate for your child. To locate a child restraint fitting station and CPST, contact NHTSA toll free at 1-888-327-4236 or go to www.nhtsa.dot.gov. In Canada, contact Transport Canada toll free at 1-800-333-0371 or go to www.tc.gc.ca to find a Child Car Seat Clinic in your area. Failure to properly restrain children in child restraints made especially for their height, age and weight, may result in an increased risk of serious injury or death to your child.



WARNING: On hot days, the temperature inside the vehicle can rise very quickly. Exposure of people or animals to these high temperatures for even a short time can cause death or serious heat related injuries, including brain damage. Small children are particularly at risk.

Child Safety

Recommendations for Safety Restraints for Children

Child	Child Size, Height, Weight, or Age	Recommended Restraint Type
Infants or toddlers	Children weighing 40 lb (18 kg) or less (generally age four or younger).	Use a child restraint (sometimes called an infant carrier, convertible seat, or toddler seat).
Small children	Children who have outgrown or no longer properly fit in a child restraint (generally children who are less than 57 in (1.45 m) tall, are greater than age four and less than age 12, and between 40 lb (18 kg) and 80 lb (36 kg) and upward to 100 lb (45 kg) if recommended by your child restraint manufacturer).	Use a belt-positioning booster seat.
Larger children	Children who have outgrown or no longer properly fit in a belt-positioning booster seat (generally children who are at least 57 in (1.45 m) tall or greater than 80 lb (36 kg) or 100 lb (45 kg) if recommended by child restraint manufacturer).	Use a vehicle seatbelt having the lap belt snug and low across the hips, shoulder belt centered across the shoulder and chest, and seat backrest upright.

- You are required by law to properly use child restraints for infants and toddlers in the United States and Canada.
- Many states and provinces require that small children use approved booster seats until they reach age eight, a height of 57 in (1.45 m) tall, or 80 lb (36 kg). Check your local and state or provincial laws for specific requirements about the safety of children in your vehicle.
- When possible, always properly restrain children 12 years of age and under in a rear seating position of your vehicle. Accident statistics suggest that children are safer when properly restrained in the rear seating positions than in a front seating position.
- When installing a rear facing child restraint, adjust the vehicle seats to avoid interference between the child restraint and the vehicle seat in front of the child restraint.

Child Safety

INSTALLING CHILD RESTRAINTS

Child Seats



E142594

Use a child restraint (sometimes called an infant carrier, convertible seat, or toddler seat) for infants, toddlers, or children weighing 40 lb (18 kg) or less (generally age four or younger).

Using Lap and Shoulder Belts



WARNING: Do not place a rearward facing child restraint in front of an active airbag. Failure to follow this instruction could result in personal injury or death.



WARNING: Properly secure children 12 years old and under in a rear seating position whenever possible. If you are unable to properly secure all children in a rear seating position, properly secure the largest child on the front seat. If you must use a forward facing child restraint on the front seat, move the seat as far back as possible. Failure to follow these instructions could result in personal injury or death.



WARNING: Depending on where you secure a child restraint, and depending on the child restraint design, you may block access to certain seatbelt buckle assemblies and LATCH lower anchors, rendering those features potentially unusable. To avoid risk of injury, make sure occupants only use seating positions where they are able to be properly restrained.

When installing a child restraint with combination lap and shoulder belts:

- Use the correct seatbelt buckle for that seating position.
- Insert the belt tongue into the proper buckle until you hear a snap and feel it latch. Make sure the tongue is securely fastened in the buckle.
- Keep the buckle release button pointing up and away from the child restraint, with the tongue between the child restraint and the release button, to prevent accidental unbuckling.
- Place the vehicle seat in the upright position before you install the child restraint.
- Put the seatbelt in the automatic locking mode. See Step 5. This vehicle does not require the use of a locking clip.

Perform the following steps when installing the child restraint with combination lap and shoulder belts:

Note: *Although the child restraint illustrated is a forward facing child restraint, the steps are the same for installing a rear facing child restraint.*

Child Safety



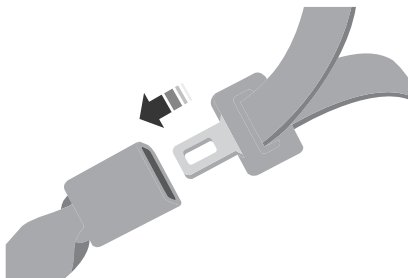
1. Position the child restraint in a seat with a combination lap and shoulder belt.



2. Pull down on the shoulder belt and then grasp the shoulder belt and lap belt together.



3. While holding the shoulder and lap belt portions together, route the tongue through the child restraint according to the child restraint manufacturer's instructions. Make sure that you did not twist the belt webbing.



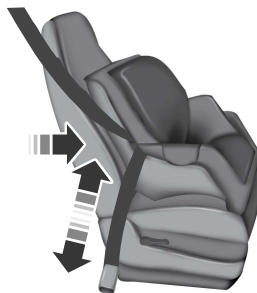
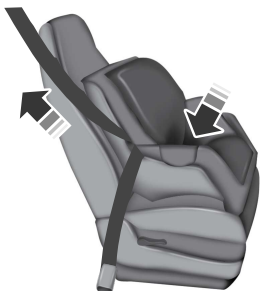
4. Insert the belt tongue into the proper buckle (the buckle closest to the direction the tongue is coming from) for that seating position until you hear a snap and feel the latch engage. Make sure the tongue is latched securely by pulling on it.



5. To put the retractor in the automatic locking mode, grasp the shoulder portion of the belt and pull downward until you pull all of the belt out.

Child Safety

6. Allow the belt to retract to remove slack. The belt clicks as it retracts to indicate it is in the automatic locking mode.
7. Try to pull the belt out of the retractor to make sure the retractor is in the automatic locking mode. You should not be able to pull more belt out. If the retractor is not locked, unbuckle the belt and repeat Steps 5 and 6.



10. Before placing the child in the seat, forcibly move the seat forward and back to make sure the seat is securely held in place.

To check this, grab the seat at the belt path and attempt to move it side to side and forward and back. There should be no more than 1 in (2.5 cm) of movement for proper installation.

8. Remove remaining slack from the belt. Force the seat down with extra weight, for example, by pressing down or kneeling on the child restraint while pulling up on the shoulder belt in order to force slack from the belt. This is necessary to remove the remaining slack that exists once you add the extra weight of the child to the child restraint. It also helps to achieve the proper snugness of the child restraint to your vehicle. Sometimes, a slight lean toward the buckle will help to remove remaining slack from the belt.
9. If the child restraint has a tether strap, attach it.

We recommend checking with a NHTSA Certified Child Passenger Safety Technician to make certain the child restraint is properly installed. In Canada, check with Transport Canada for referral to a Child Car Seat Clinic.

Using Tether Straps

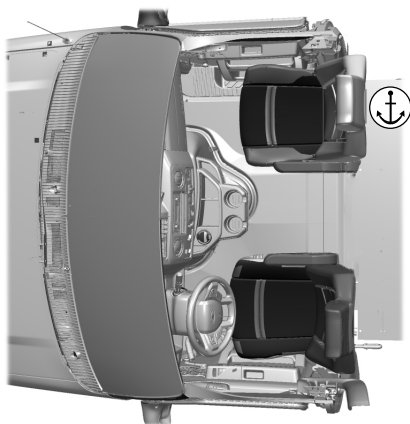
Many forward-facing child restraints include a tether strap which extends from the back of the child restraint and hooks to an anchoring point called the top tether anchor. Tether straps are available as an accessory for many older child restraints. Contact the manufacturer of your child restraint for information about ordering a tether strap, or to obtain a longer tether strap if the tether strap on your child restraint does not reach the appropriate top tether anchor in the vehicle.

Attach the tether strap only to the tether anchor as shown. The tether strap may not work properly if attached somewhere other than the correct tether anchor.

Child Safety

Note: Do not tighten the tether strap enough to lift the child restraint off the vehicle seat cushion when the child is seated in it. Keep the tether strap just snug without lifting the front of the child restraint. Keeping the child restraint just touching the vehicle seat gives the best protection in a severe crash.

Perform the following steps to install a child restraint with tether anchors:



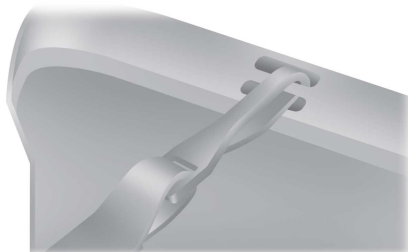
You can attach the tether directly to the rear of the front seat.

1. Adjust the front passenger seat fully forward.



E190810

2. Route the child restraint tether strap over the back of the front passenger seat as shown.



E190811

3. Clip the tether strap hook to the seat pedestal at the location shown. If the tether strap is clipped incorrectly, the child restraint may not be retained properly in the event of a crash.
4. Adjust the front passenger seat to the full rearward position.
5. Tighten the child restraint tether strap according to the manufacturer's instructions.

If you do not properly anchor the child restraint, the risk of a child being injured in a crash greatly increases.

Child Safety

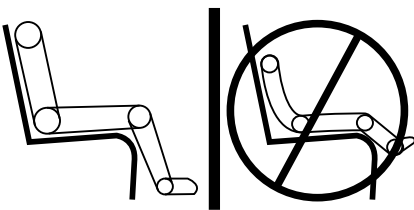
BOOSTER SEATS



WARNING: Do not put the shoulder section of the seatbelt or allow the child to put the shoulder section of the seatbelt under their arm or behind their back. Failure to follow this instruction could reduce the effectiveness of the seatbelt and increase the risk of injury or death in a crash.

Use a belt-positioning booster seat for children who have outgrown or no longer properly fit in a child safety restraint (generally children who are less than 57 in (1.45 m) tall, are greater than age 4 and less than age 12, and between 40 lb (18 kg) and 80 lb (36 kg) and upward to 100 lb (45 kg) if recommended by your child restraint manufacturer). Many state and provincial laws require that children use approved booster seats until they reach age eight, a height of 57 in (1.45 m) tall, or 80 lb (36 kg).

Booster seats should be used until you can answer YES to ALL of these questions when seated without a booster seat:



- Can the child sit all the way back against their vehicle seat backrest with knees bent comfortably at the edge of the seat cushion?
- Can the child sit without slouching?

- Does the lap belt rest low across the hips?
- Is the shoulder belt centered on the shoulder and chest?
- Can the child stay seated like this for the whole trip?

Always use booster seats in conjunction with your vehicle lap and shoulder belt.

Types of Booster Seats



- Backless booster seats

If your backless booster seat has a removable shield, remove the shield. If a vehicle seating position has a low seat backrest or no head restraint, a backless booster seat may place your child's head (as measured at the tops of the ears) above the top of the seat. In this case, move the backless booster to another seating position with a higher seat backrest or head restraint and lap and shoulder belts, or consider using a high back booster seat.

Child Safety



If, with a backless booster seat, you cannot find a seating position that adequately supports your child's head, a high back booster seat would be a better choice.

Children and booster seats vary in size and shape. Choose a booster that keeps the lap belt low and snug across the hips, never up across the stomach, and lets you adjust the shoulder belt to cross the chest and rest snugly near the center of the shoulder. The following drawings compare the ideal fit (center) to a shoulder belt uncomfortably close to the neck and a shoulder belt that could slip off the shoulder. The drawings also show how the lap belt should be low and snug across the child's hips.

- High back booster seats



Child Safety

If the booster seat slides on the vehicle seat upon which it is being used, placing a rubberized mesh sold as shelf or carpet liner under the booster seat may improve this condition. Do not introduce any item thicker than this under the booster seat. Check with the booster seat manufacturer's instructions.

CHILD RESTRAINT POSITIONING



WARNING: Do not place a rearward facing child restraint in front of an active airbag. Failure to follow this instruction could result in personal injury or death.



WARNING: Properly secure children 12 years old and under in a rear seating position whenever possible. If you are unable to properly secure all children in a rear seating position, properly secure the largest child on the front seat. If you must use a forward facing child restraint on the front seat, move the seat as far back as possible. Failure to follow these instructions could result in personal injury or death.



WARNING: Always carefully follow the instructions and warnings provided by the manufacturer of any child restraint to determine if the restraint device is appropriate for your child's size, height, weight, or age. Follow the child restraint manufacturer's instructions and warnings provided for installation and use in conjunction with the instructions

and warnings provided by your vehicle manufacturer. A safety seat that is improperly installed or utilized, is inappropriate for your child's height, age, or weight or does not properly fit the child may increase the risk of serious injury or death.



WARNING: Do not allow a passenger to hold a child on their lap when your vehicle is moving. Failure to follow this instruction could result in personal injury or death in the event of a sudden stop or crash.



WARNING: Do not use pillows, books or towels to boost your child's height. Failure to follow this instruction could result in personal injury or death.



WARNING: Properly secure child restraints or booster seats when they are not in use. They could become projectiles in a sudden stop or crash. Failure to follow this instruction could result in personal injury or death.



WARNING: Do not put the shoulder section of the seatbelt or allow the child to put the shoulder section of the seatbelt under their arm or behind their back. Failure to follow this instruction could reduce the effectiveness of the seatbelt and increase the risk of injury or death in a crash.



WARNING: Do not leave children or pets unattended in your vehicle. Failure to follow this instruction could result in personal injury or death.

Child Safety

Recommendations for Attaching Child Restraints

Restraint Type	Use Any Attachment Method as Indicated Below by X.		
	Combined Weight of Child and Child Restraint	Seatbelt and Top Tether Anchor	Seatbelt Only
Rear-facing child restraint	Up to 65 lb (29.5 kg)		X
Rear-facing child restraint	Over 65 lb (29.5 kg)		X
Forward-facing child restraint	Up to 65 lb (29.5 kg)	X	X ¹
Forward-facing child restraint	Over 65 lb (29.5 kg)	X	X ¹

¹ We recommend using a top tether if the child restraint has one, and the child restraint manufacturer recommends its use.

Note: *The child restraint must rest tightly against the vehicle seat upon which it is installed. It may be necessary to lift or remove the head restraint. See **Head Restraints** (page 77).*

Seatbelts

PRINCIPLE OF OPERATION



WARNING: Always drive and ride with the seat backrest upright and the lap belt snug and low across the hips.



WARNING: To reduce the risk of injury, make sure children sit where they can be properly restrained.



WARNING: Never let a passenger hold a child on his or her lap while your vehicle is moving. The passenger cannot protect the child from injury in a crash which may result in serious injury or death.



WARNING: All occupants of the vehicle, including the driver, should always properly wear their safety belts, even when an airbag supplemental restraint system is provided. Failure to properly wear your safety belt could seriously increase the risk of injury or death.



WARNING: It is extremely dangerous to ride in a cargo area, inside or outside of a vehicle. In a crash, people riding in these areas are more likely to be seriously injured or killed. Do not allow people to ride in any area of your vehicle that is not equipped with seats and safety belts. Be sure everyone in your vehicle is in a seat and using a safety belt properly.



WARNING: In a rollover crash, an unbelted person is significantly more likely to die than a person wearing a safety belt.



WARNING: Each seating position in your vehicle has a specific safety belt assembly which is made up of one buckle and one tongue that are designed to be used as a pair. 1) Use the shoulder belt on the outside shoulder only. Never wear the shoulder belt under the arm. 2) Never swing the safety belt around your neck over the inside shoulder. 3) Never use a single belt for more than one person.



WARNING: When possible, all children 12 years old and under should be properly restrained in a rear seating position. Failure to follow this could seriously increase the risk of injury or death.



WARNING: Safety belts and seats can become hot in a vehicle that has been closed up in sunny weather; they could burn a small child. Check seat covers and buckles before you place a child anywhere near them.



WARNING: Front and rear seat occupants, including pregnant women, should wear safety belts for optimum protection in an accident.

All seating positions in this vehicle have lap and shoulder safety belts. All occupants of the vehicle should always properly wear their safety belts, even when an airbag supplemental restraint system is provided.

The safety belt system consists of:

- Lap and shoulder safety belts.
- Shoulder safety belt with automatic locking mode, (except driver safety belt).

Seatbelts

- Height adjuster at the front outboard seating positions.
- Safety belt pretensioner at the front outboard seating positions.



- Safety belt warning light and chime.

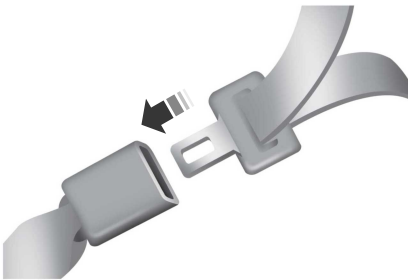


- Crash sensors and monitoring system with readiness indicator.

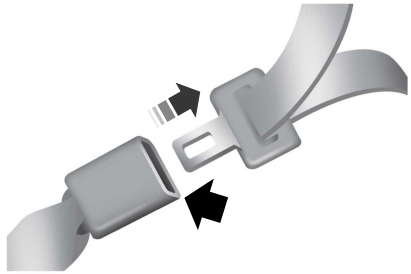
The safety belt pretensioners at the front seating positions are designed to tighten the safety belts when activated. In frontal and near-frontal crashes, the safety belt pretensioners may be activated alone or, if the crash is of sufficient severity, together with the front airbags.

FASTENING THE SEATBELTS

The front outboard safety restraints in the vehicle are combination lap and shoulder belts.



1. Insert the belt tongue into the proper buckle (the buckle closest to the direction the tongue is coming from) until you hear a snap and feel it latch. Make sure the tongue is securely fastened in the buckle.

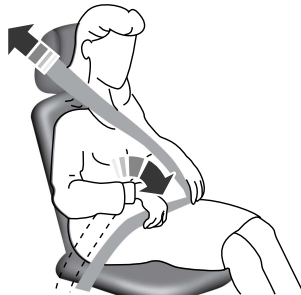


2. To unfasten, press the release button and remove the tongue from the buckle.

Using Seatbelts During Pregnancy



WARNING: Always ride and drive with your seatback upright and properly fasten your seatbelt. Fit the lap portion of the seatbelt snugly and low across the hips. Position the shoulder portion of the seatbelt across your chest. Pregnant women must follow this practice. See the following figure.



Seatbelts

Pregnant women should always wear their seatbelt. Position the lap belt portion of a combination lap and shoulder belt low across the hips below the belly and worn as tight as comfort allows. Position the shoulder belt to cross the middle of the shoulder and the center of the chest.

Seatbelt Locking Modes



WARNING: If your vehicle is involved in a crash, have the seatbelts and associated components inspected as soon as possible. Failure to follow this instruction could result in personal injury or death.

All safety restraints in the vehicle are combination lap and shoulder belts. The driver seatbelt has the first type of locking mode. The front outboard passenger seatbelt has both types of locking modes described as follows:

Vehicle Sensitive Mode

This is the normal retractor mode, which allows free shoulder belt length adjustment to your movements and locking in response to vehicle movement. For example, if the driver brakes suddenly or turns a corner sharply, or the vehicle receives an impact of about 5 mph (8 km/h) or more, the combination seatbelts lock to help reduce forward movement of the driver and passengers.

In addition, the retractor is designed to lock if you pull the webbing out too quickly. If the seatbelt retractor locks, slowly lower the height adjuster to allow the seatbelt to retract. If the retractor does not unlock, pull the seatbelt out slowly then feed a

small length of webbing back toward the stowed position. For rear seatbelts, recline the rear seat backrest or push the seat backrest cushion away from the seatbelt. Feed a small length of webbing back toward the stowed position.

Automatic Locking Mode

In this mode, the shoulder belt automatically pre-locks. The belt will still retract to remove any slack in the shoulder belt. The automatic locking mode is not available on the driver seatbelt.

When to Use the Automatic Locking Mode

Use this mode any time a child safety seat, except a booster, is installed in the passenger front seating position. See **Child Safety** (page 21).

How to Use the Automatic Locking Mode



1. Buckle the combination lap and shoulder belt.
2. Grasp the shoulder portion and pull downward until the entire belt is pulled out.
3. Allow the belt to retract. As the belt retracts, you will hear a clicking sound. This indicates the seatbelt is now in the automatic locking mode.

Seatbelts

How to Disengage the Automatic Locking Mode

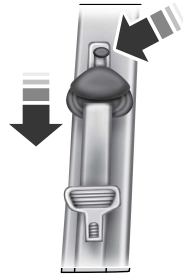
Unbuckle the combination lap and shoulder belt and allow it to retract completely to disengage the automatic locking mode and activate the vehicle sensitive (emergency) locking mode.

SEATBELT HEIGHT ADJUSTMENT



WARNING: Position the safety belt height adjuster so that the belt rests across the middle of your shoulder. Failure to adjust the safety belt properly could reduce the effectiveness of the safety belt and increase the risk of injury in a crash.

Adjust the height of the shoulder belt so the belt rests across the middle of your shoulder.



E190812

To adjust the shoulder belt height:

1. Press the button and slide the height adjuster up or down.
2. Release the button and pull down on the height adjuster to make sure it is locked in place.

SEATBELT WARNING LAMP AND INDICATOR CHIME



This lamp illuminates and an indicator chime will sound if the driver seatbelt has not been fastened when the vehicle's ignition is turned on.

Conditions of operation

If	Then
The driver seatbelt is not buckled before the ignition switch is turned to the on position...	The seatbelt warning lamp illuminates and the indicator chime sounds for a few seconds.
The driver seatbelt is buckled while the warning lamp is illuminated and the indicator chime is sounding...	The seatbelt warning lamp and indicator chime turn off.
The driver seatbelt is buckled before the ignition switch is turned to the on position...	The seatbelt warning lamp and indicator chime remain off.

Seatbelts

CHILD RESTRAINT AND SEATBELT MAINTENANCE

Inspect the vehicle seatbelts and child restraint systems periodically to make sure they work properly and are not damaged. Inspect the vehicle seatbelts to make sure there are no nicks, tears or cuts. Replace if necessary. All vehicle seatbelt assemblies, including retractors, buckles, front seatbelt buckle assemblies, buckle support assemblies (slide bar-if equipped), shoulder belt height adjusters (if equipped), shoulder belt guide on seatback (if equipped), rear inflatable seatbelts (if equipped), child restraint LATCH and tether anchors, and attaching hardware, should be inspected after a crash. Read the child restraint manufacturer's instructions for additional inspection and maintenance information specific to the child restraint.

We recommend that all seatbelt assemblies in use in vehicles involved in a crash be replaced. However, if the crash was minor and an authorized dealer finds that the belts do not show damage and continue to operate properly, they do not need to be replaced. Seatbelt assemblies not in use during a crash should also be inspected and replaced if either damage or improper operation is noted.

Properly care for seatbelts. See **Cleaning the Interior** (page 185).

SEATBELT EXTENSIONS



WARNING: Persons who fit into the vehicle's seatbelt should not use an extension. Unnecessary use could result in serious personal injury in the event of a crash.



WARNING: Only use extensions provided free of charge by our dealers. The dealer will provide an extension designed specifically for this vehicle, model year and seating position. The use of an extension intended for another vehicle, model year or seating position may not offer you the full protection of your vehicle's seatbelt restraint system.



WARNING: Never use seatbelt extensions to install child restraints.





WARNING: Do not use extensions to change the way the seatbelt fits across the torso, over the lap or to make the seatbelt buckle easier to reach.


If, because of body size or driving position, it is not possible to properly fasten the seatbelt over your lap and shoulder, an extension that is compatible with the seatbelts is available free of charge from our dealers. Only use our seatbelt extensions made by the original equipment seatbelt manufacturer with our seatbelts. Ask your authorized dealer if your extension is compatible with your vehicle restraint system.


Supplementary Restraints System


PRINCIPLE OF OPERATION


 **WARNING:** Airbags do not inflate slowly or gently, and the risk of injury from a deploying airbag is the greatest close to the trim covering the airbag module.


 **WARNING:** All occupants of your vehicle, including the driver, should always properly wear their seatbelts, even when an airbag supplemental restraint system is provided. Failure to properly wear your seatbelt could seriously increase the risk of injury or death.


 **WARNING:** Properly secure children 12 years old and under in a rear seating position whenever possible. If you are unable to properly secure all children in a rear seating position, properly secure the largest child on the front seat. If you must use a forward facing child restraint on the front seat, move the seat as far back as possible. Failure to follow these instructions could result in personal injury or death.

 **WARNING:** Do not place your arms on the airbag cover or through the steering wheel. Failure to follow this instruction could result in personal injury.

 **WARNING:** Do not place a rearward facing child restraint in front of an active airbag. Failure to follow this instruction could result in personal injury or death.

 **WARNING:** Do not attempt to service, repair, or modify the supplementary restraint system or associated components. Failure to follow this instruction could result in personal injury or death.

 **WARNING:** Several airbag system components get hot after inflation. To reduce the risk of injury, do not touch them after inflation.

 **WARNING:** If a supplementary restraint system component has deployed, it will not function again. Have the system and associated components inspected as soon as possible. Failure to follow this instruction could result in personal injury or death.

The airbags are a supplemental restraint system and are designed to work with the seatbelts to help protect the driver and right front passenger from certain upper body injuries. Airbags do not inflate slowly; there is a risk of injury from a deploying airbag.

Note: *You will hear a loud bang and see a cloud of harmless powdery residue if an airbag deploys. This is normal.*

The airbags inflate and deflate rapidly upon activation. After airbag deployment, it is normal to notice a smoke-like, powdery residue or smell the burnt propellant. This may consist of cornstarch, talcum powder (to lubricate the bag) or sodium compounds (for example, baking soda) that result from the combustion process that inflates the airbag. Small amounts of sodium hydroxide may be present which may irritate the skin and eyes, but none of the residue is toxic.

While the system is designed to help reduce serious injuries, contact with a deploying airbag may also cause abrasions or swelling. Temporary hearing loss is also a possibility as a result of the noise associated with a deploying airbag. Because airbags must inflate rapidly and with considerable force, there is the risk of death or serious injuries such as fractures, facial and eye injuries or internal injuries,

Supplementary Restraints System

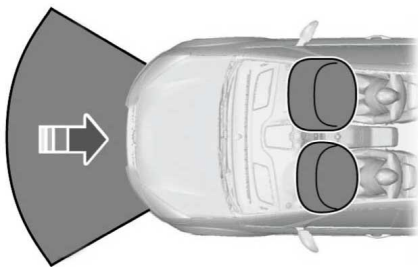
particularly to occupants who are not properly restrained or are otherwise out of position at the time of airbag deployment. Thus, it is extremely important that occupants be properly restrained as far away from the airbag module as possible while maintaining vehicle control.

Routine maintenance of the airbags is not required.

DRIVER AND PASSENGER AIRBAGS

WARNING: Do not place your arms on the airbag cover or through the steering wheel. Failure to follow this instruction could result in personal injury.

WARNING: Do not place a rearward facing child restraint in front of an active airbag. Failure to follow this instruction could result in personal injury or death.



The driver and front passenger airbags deploy during significant frontal and near frontal crashes.

The driver and passenger front airbag system consists of:

- Driver and passenger airbag modules.



• Crash sensors and monitoring system with readiness indicator. See **Crash Sensors and Airbag Indicator** (page 41).

Passenger Airbag On and Off Switch (If Equipped)

WARNING: Your vehicle may have an airbag deactivation switch. Before driving, always look at the switch to make sure it is in the appropriate position. Failure to put the switch in the proper position can increase the risk of serious injury or death in a crash.

Note: *The passenger airbag on and off switch may be on vehicles with no rear seats.*

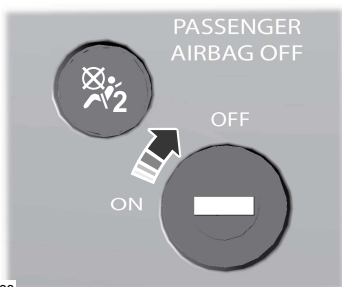
Switching the Passenger Airbag Off

WARNING: If the light does not illuminate when the passenger airbag switch is off and you switch the ignition on, have the passenger airbag switch serviced immediately by a qualified technician.

WARNING: To avoid switching on the airbag, always remove the ignition key with the switch in the off position.

WARNING: NEVER use a rearward facing child restraint on a seat protected by an ACTIVE AIRBAG in front of it, DEATH or SERIOUS INJURY to the CHILD can occur.

Supplementary Restraints System



E224283

1. Insert the ignition key into the passenger airbag on and off switch, turn the switch to off and hold it in off while removing the key.
2. When you switch the ignition on and the passenger airbag switch is in the off position, the off light illuminates briefly, momentarily shuts off and then turns back on. This indicates that the passenger airbag is deactivated.

Switching the Passenger Airbag Back On



WARNING: The seatbelts for the driver and right front passenger seating positions are specifically designed to operate together with the airbags in certain types of crashes. When you switch off your airbag, you not only lose the protection of the airbag, you also may reduce the effectiveness of your seatbelt system. If the passenger does not meet the requirements stated in the National Highway Traffic Safety Administration or Transport Canada deactivation criteria, switching off the airbag can increase the risk of serious injury or death in a crash.

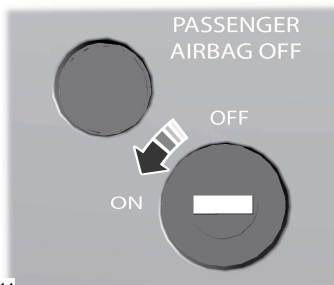


WARNING: If your vehicle has rear seats, always transport children who are 12 and younger in the rear seat. Always use seatbelts and child restraints properly. Do not place a child in a rear facing infant seat in the front seat unless your vehicle is equipped with an airbag on and off switch and the passenger airbag is turned off. This is because the back of the infant seat is too close to the inflating airbag and the risk of a fatal injury to the infant when the airbag inflates is substantial.



WARNING: If the passenger airbag off light is illuminated when the passenger airbag switch is on and the ignition is on, have the passenger airbag switch serviced immediately by a qualified technician.

The passenger airbag remains off until you switch it back on.



E190814

1. Insert the ignition key into the passenger airbag on and off switch and turn the switch to on.
2. The off light briefly illuminates when you switch the ignition on. This indicates that the passenger airbag is operational.

Supplementary Restraints System

The passenger side airbag should always be on (the airbag off light should not be illuminated) unless the passenger is a person who meets the requirements stated either in Category 1, 2 or 3 of the National Highway Traffic Safety Administration/Transport Canada deactivation criteria which follows.

The vast majority of drivers and passengers are much safer with an airbag than without. To do their job and reduce the risk of life threatening injuries, airbags must open with great force, and this force can pose a potentially deadly risk in some situations, particularly when a front seat occupant is not properly buckled up. The most effective way to reduce the risk of unnecessary airbag injuries without reducing the overall safety of the vehicle is to make sure all occupants are properly restrained in the vehicle, especially in the front seat. This provides the protection of seatbelts and permits the airbags to provide the additional protection they were designed to provide. If you choose to deactivate your airbag, you are losing the very significant risk reducing benefits of the airbag and you are also reducing the effectiveness of the seatbelts, because seatbelts in modern vehicles are designed to work as a safety system with the airbags.

National Highway Traffic Safety Administration Deactivation Criteria (Excluding Canada)



WARNING: This vehicle has special energy management seatbelts for the driver and right front passenger. These particular seatbelts are specifically designed to work with airbags to help reduce the risk of injury in a crash. The energy management seatbelt gives or releases additional seatbelt webbing in some accidents to reduce the

concentration of force on an occupant's chest and to reduce the risk of certain bone fractures and injuries to underlying organs. In a crash, if the airbag is off, this energy management seatbelt might permit the passenger wearing the seatbelt to move forward enough to have a serious or fatal injury. The more severe the crash, and the heavier the occupant, the greater the risk. Make sure the airbag is on for any passenger who does not qualify under the National Highway Traffic Safety Administration deactivation criteria.

1. Infant. An infant (less than 1 year old) must ride in the front seat because:

- The vehicle has no rear seat.
- The vehicle has a rear seat too small to accommodate a rear-facing infant seat.
- The infant has a medical condition which, according to the infant's physician, makes it necessary for the infant to ride in the front so that the driver can constantly monitor the child's condition.

2. Child age 1 to 12. A child age 1 to 12 must ride in the front seat because:

- The vehicle has no rear seat.
- Although children ages 1 to 12 ride in the rear seat(s) whenever possible, children ages 1 to 12 sometimes must ride in the front because no space is available in the rear seat(s) of the vehicle.
- The child has a medical condition which, according to the child's physician, makes it necessary for the child to ride in the front seat so that the driver can constantly monitor the child's condition.

Supplementary Restraints System

3. Medical condition. A passenger has a medical condition which, according to his or her physician:

- Causes the passenger airbag to pose a special risk for the passenger.
- Makes the potential harm from the passenger airbag in a crash greater than the potential harm from turning off the airbag and allowing the passenger, even if belted, to hit the dashboard or windshield in a crash.

Transport Canada Deactivation Criteria (Canada Only)



WARNING: This vehicle has special energy management seatbelts for the driver and right front passenger. These particular seatbelts are specifically designed to work with airbags to help reduce the risk of injury in a crash. The energy management seatbelt gives or releases additional seatbelt webbing in some accidents to reduce the concentration of force on an occupant's chest and to reduce the risk of certain bone fractures and injuries to underlying organs. In a crash, if the airbag is off, this energy management seatbelt might permit the passenger wearing the seatbelt to move forward enough to have a serious or fatal injury. The more severe the crash, and the heavier the occupant, the greater the risk. Make sure the airbag is on for any passenger who does not qualify under the Transport Canada deactivation criteria.

1. Infant: An infant (less than 1 year old) must ride in the front seat because:

- My vehicle has no rear seat.
- The rear seat in my vehicle cannot accommodate a rear-facing infant seat.
- The infant has a medical condition which, according to the infant's physician, makes it necessary for the infant to ride in the front seat so that the driver can monitor the infant's condition.

2. Child age 12 or under: A child age 12 or under must ride in the front seat because:

- My vehicle has no rear seat.
- Although children age 12 and under ride in the rear seat whenever possible, children age 12 and under have no option but to sometimes ride in the front seat because rear seat space is insufficient.
- The child has a medical condition that, according to the child's physician, makes it necessary for the child to ride in the front seat so that the driver can monitor the child's condition.

3. Medical condition: A passenger has a medical condition that, according to his or her physician:

- Poses a special risk for the passenger if the airbag deploys.
- Makes the potential harm from the passenger airbag deployment greater than the potential harm from turning off the airbag and experiencing a crash without the protection offered by the airbag.

Supplementary Restraints System

Proper Driver and Front Passenger Seating Adjustment



WARNING: National Highway Traffic Safety Administration (NHTSA) recommends a minimum distance of at least 10 in (25 cm) between an occupant's chest and the driver airbag module.

To properly position yourself away from the airbag:

- Move your seat to the rear as far as you can while still reaching the pedals comfortably.
- Recline the seat slightly (one or two degrees) from the upright position.

After all occupants have adjusted their seats and put on seatbelts, it is very important that they continue to sit properly. Properly seated occupants sit upright, lean against the seat back, and center themselves on the seat cushion, with their feet comfortably extended on the floor. Sitting improperly can increase the chance of injury in a crash event. For example, if an occupant slouches, lies down, turns sideways, sits forward, leans forward or sideways, or puts one or both feet up, the chance of injury during a crash is greatly increased.

Children and Airbags



WARNING: Do not place a rearward facing child restraint in front of an active airbag. Failure to follow this instruction could result in personal injury or death.



Children must always be properly restrained. Accident statistics suggest that children are safer when properly restrained in the rear seating positions than in the front seating position. Failure to follow these instructions may increase the risk of injury in a crash.

CRASH SENSORS AND AIRBAG INDICATOR



WARNING: Modifying or adding equipment to the front of your vehicle could affect the performance of the airbag system, increasing the risk of injury. This includes the hood, bumper system, frame, front body structure, tow hooks, hood pins, push bar and snowplows.

Your vehicle has a collection of crash and occupant sensors which provide information to the restraints control module. The restraints control module deploys (activates) the front seatbelt pretensioners, driver airbag and passenger airbag. Based on the type of accident, the restraints control module deploys the appropriate safety devices.

Supplementary Restraints System

The restraints control module also monitors the readiness of the above safety devices plus the crash sensors. The readiness of the safety system is indicated by a warning indicator light in the instrument cluster or by a backup tone if the warning light is not working. See **Instrument Cluster** (page 59). Routine maintenance of the airbag is not required.

A difficulty with the system is indicated by one or more of the following:



The readiness light will not illuminate immediately after you switch the ignition on.

- The readiness light either flashes or stays lit.
- You hear a series of five tones. The tone pattern repeats periodically until the problem, the light or both are repaired.

If any of these things happen, even intermittently, have the supplemental restraint system serviced at an authorized dealer immediately. Unless serviced, the system may not function properly in the event of a crash.

The seatbelt pretensioners and the airbag supplemental restraint system are designed to activate when the vehicle sustains frontal deceleration sufficient to cause the restraints control module to deploy a safety device.

The fact that the seatbelt pretensioners or airbags did not activate in a crash does not mean that something is wrong with the system. Rather, it means the restraints control module determined the accident conditions (such as crash severity, belt usage) were not appropriate to activate these safety devices.

- The design of the front airbags is to activate only in frontal and near-frontal crashes (not rollovers, side impacts or rear impacts) unless the crash causes sufficient frontal deceleration.
- The design of the seatbelt pretensioners is to activate in frontal or near-frontal crashes and deploy in rollovers.

AIRBAG DISPOSAL

Contact your authorized dealer as soon as possible. Airbags must be disposed of by qualified personnel.

Keys and Remote Controls

GENERAL INFORMATION ON RADIO FREQUENCIES

This device complies with Part 15 of the FCC Rules and with Licence exempt RSS Standards of Industry Canada. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.



WARNING: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. The term "IC:" before the radio certification number only signifies that Industry Canada technical specifications were met.

The typical operating range for your transmitter is approximately 33 ft (10 m). Vehicles with the remote start feature will have a greater range. One of the following could cause a decrease in operating range:

- Weather conditions.
- Nearby radio towers.
- Structures around the vehicle.
- Other vehicles parked next to your vehicle.

Other short distance radio transmissions, for example amateur radios, medical equipment, wireless headphones, remote controls and alarm systems can also use the radio frequency used by your remote control. If the frequencies are jammed, you will not be able to use your remote control. You can lock and unlock the doors with the key.

Note: Make sure to lock your vehicle before leaving it unattended.

Note: If you are in range, the remote control will operate if you press any button unintentionally.

Note: The remote control contains sensitive electrical components. Exposure to moisture or impact may cause permanent damage.

REMOTE CONTROL (IF EQUIPPED)



E195660

Note: If there are problems with the remote entry system, make sure to take all remote entry transmitters with you to an authorized dealer in order to aid in troubleshooting the problem.

Note: If your vehicle is fitted with the E-Guard Cargo Protection System™, the remote transmitter unlock command only unlocks the front doors. The side or rear cargo doors can only be unlocked from outside your vehicle using the key.

Keys and Remote Controls

Changing the Remote Control Battery



WARNING: Keep batteries away from children to prevent ingestion. Failure to follow this instruction could result in personal injury or death. If ingested, immediately seek medical attention.



WARNING: If the battery compartment does not securely close, stop using the remote control and replace it as soon as possible. In the meantime, keep the remote control away from children. Failure to follow this instruction could result in personal injury or death.

The remote control uses one coin-type three-volt lithium battery CR2032 or equivalent.



Make sure that you dispose of old batteries in an environmentally friendly way.

Seek advice from your local authority about recycling old batteries.



E195662

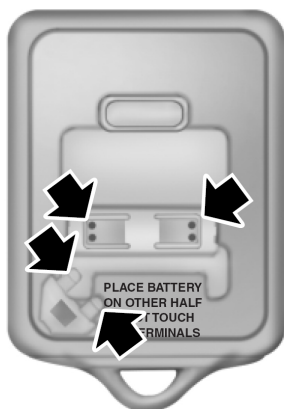
1. Twist a thin coin in the slot of the transmitter near the key ring to remove the battery cover.

Note: Do not remove the rubber cover and circuit board from the front housing of the remote entry transmitter.

Note: Do not wipe off any grease on the battery terminals or on the back surface of the circuit board.

2. Remove the old battery.

Keys and Remote Controls



Note: The panic alarm operates regardless of the ignition position.

REPLACING A LOST KEY OR REMOTE CONTROL

Replacement keys or remote controls can be purchased from an authorized dealer. Authorized dealers can program remote controls for your vehicle.

E195661

3. Insert the new battery. Refer to the symbols inside the transmitter for the correct orientation of the battery. Press the battery down to make sure it is fully engaged in the housing.
4. Reinstall the battery housing cover onto the transmitter.

Note: Replacing the battery does not erase the programmed key from your vehicle. The transmitter should operate normally.

Car Finder



Press the button twice within three seconds. The horn sounds and the direction indicators flash. We recommend you use this method to locate your vehicle, rather than using the panic alarm.

Sounding the Panic Alarm



Press the button to sound the panic alarm. Press the button again or switch the ignition on to turn it off.

Doors and Locks

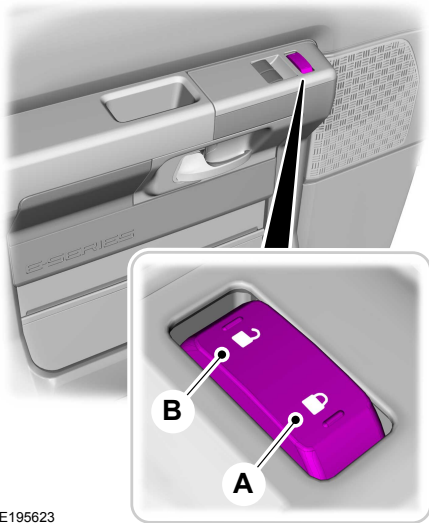
LOCKING AND UNLOCKING

You can use the power door lock control or the remote control to lock and unlock your vehicle.

Note: Do not use the door latch assembly to attach any accessory, such as handles or steps, as this can cause damage to your vehicle.

Power Door Locks (If Equipped)

The power door lock control is on the driver and front passenger door panels.



E195623

- A Lock.
- B Unlock.

Remote Control (If Equipped)

You can use the remote control at any time when the ignition is off.

Unlocking the Doors (Two-Stage Unlock)



Press the button to unlock the driver door.

Press the button again within three seconds to unlock all doors. The direction indicators flash.

Note: The driver door can be unlocked with the key if the remote control is not functioning.

Note: When you leave your vehicle unattended for several weeks, the remote control turns off. Your vehicle must be unlocked and started. Unlocking and starting your vehicle once enables the remote control.

Reprogramming the Unlocking Function

Note: When you press the unlock button, either all the doors are unlocked or only the driver door is unlocked. Pressing the unlock button again unlocks all the doors.

You can reprogram the unlocking function so that only the driver door is unlocked.

Press and hold the unlock and lock buttons on the remote control simultaneously for at least four seconds with the ignition off. The direction indicators flash twice to confirm the change.

To return to the original unlocking function, repeat the process.

Locking the Doors



Press the button to lock all doors. The direction indicators flash.

Press the button again within three seconds to confirm that all the doors are closed. The doors lock again, the horn sounds and the direction indicators flash if all the doors are closed.

Doors and Locks

Note: If any door is open, the horn sounds twice and the direction indicators do not flash.

Autolock

Autolock locks all the doors when all of the following occur:

- All doors are closed.
- The ignition is on.
- The vehicle reaches a speed greater than 12 mph (20 km/h).

Autolock repeats when:

- The vehicle is stopped.
- Any door opens and closes while the ignition is on.
- The vehicle reaches a speed greater than 12 mph (20 km/h).

Autounlock

Autounlock unlocks all the doors when all of the following occur:

- All the doors are closed and your vehicle is moving at a speed greater than 12 mph (20 km/h).
- Your vehicle comes to a stop.
- You open the driver door within 10 minutes of switching the ignition off or to the accessory position.

Note: If you open the driver door after 10 minutes, autounlock does not unlock all other doors.

Enabling or Disabling Autounlock

(If Equipped)

You can enable or disable the autounlock feature in the instrument cluster display or an authorized dealer can do it for you.

To enable or disable autounlock, do the following:

1. Switch the ignition on.

2. Press the power door unlock control three times.
3. Switch the ignition off.
4. Press the power door unlock control three times.
5. Switch the ignition on. The horn sounds indicating your vehicle is in programming mode.
6. Press the power door lock control and within five seconds, press the power door unlock control. The horn sounds once if disabled or twice if enabled.
7. Switch the ignition off. The horn sounds indicating programming is complete.

Note: You can also switch this feature on or off using the instrument cluster display. See **Information Displays** (page 65).

Illuminated Entry

The interior lamps and some exterior lamps illuminate when you unlock the doors with the remote control.

The lamps turn off if:

- The ignition is on.
- You press the lock button on the remote control.
- 25 seconds have elapsed.

The lamps do not turn off if:

- You switch them on with the lighting control.
- Any door is open.

PASSIVE ANTI-THEFT SYSTEM

Note: *The system is not compatible with non-Ford aftermarket remote start systems. Use of these systems could result in engine starting problems and a loss of security protection.*

Note: *Prevent these objects from touching the coded key when starting your vehicle. Metallic objects, electronic devices or a second coded key on the same key chain could result in vehicle starting problems, especially if they are too close to the key when starting your vehicle. Switch the ignition off, move all objects on the key chain away from the coded key and restart your vehicle if a problem occurs.*

Note: *Do not leave a duplicate coded key in your vehicle. Always take your keys and lock all doors when leaving your vehicle.*

SecuriLock®

The system helps prevent the engine from starting unless you use a coded key programmed to your vehicle. Using the wrong key may prevent your vehicle from starting. A message may appear in the information display.

If you are unable to start your vehicle with a coded key, it is not operating correctly. A message may appear in the information display.

Automatic Arming

The system arms when you switch the ignition off.

Automatic Disarming

The system disarms when you switch the ignition on with a coded key.

Replacement Keys

Your vehicle may have two integrated keyhead transmitters.

The integrated keyhead transmitter functions as a programmed ignition key that starts your vehicle.

If your programmed transmitters or standard SecuriLock coded keys become lost or stolen and you do not have an extra coded key, you need to have your vehicle towed to an authorized dealer. You need to erase the key codes from your vehicle and program new coded keys.

Store an extra programmed key away from your vehicle in a safe place. To purchase additional spare or replacement keys, contact an authorized dealer.

If you have a spare key, you need to program it. See **Replacing a Lost Key or Remote Control** (page 45).

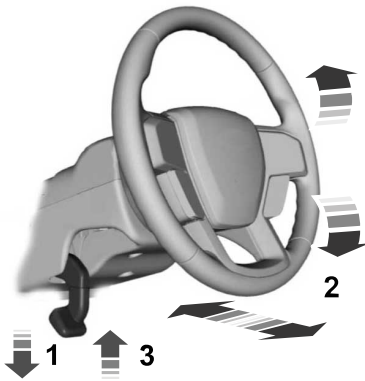
Steering Wheel

ADJUSTING THE STEERING WHEEL



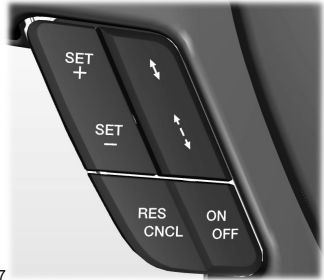
WARNING: Do not adjust the steering wheel when your vehicle is moving.

Note: Make sure that you are sitting in the correct position. See **Sitting in the Correct Position** (page 77).



1. Unlock the steering column.
2. Adjust the steering wheel to the position you prefer.
3. Lock the steering column.

CRUISE CONTROL - VEHICLES WITH: ADAPTIVE CRUISE CONTROL



E191337

See **Using Adaptive Cruise Control** (page 106).

CRUISE CONTROL - VEHICLES WITH: CRUISE CONTROL



E191329

See **What Is Cruise Control** (page 105).

Steering Wheel

INFORMATION DISPLAY CONTROL



E191336

See **Information Displays** (page 65).

HORN



Wipers and Washers

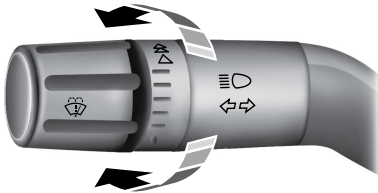
WINDSHIELD WIPERS

Note: Fully defrost the windshield before you switch the windshield wipers on.

Note: Make sure you switch the windshield wipers off before entering a car wash.

Note: If streaks or smears appear on the windshield, clean the windshield and the wiper blades. If that does not resolve the issue, install new wiper blades.

Note: Do not operate the wipers on a dry windshield. This may scratch the glass, damage the wiper blades or cause the wiper motor to burn out. Always use the windshield washers before wiping a dry windshield.



E172816

- Rotate away from you for a long wipe interval.
- Rotate toward you for a short wipe interval.

Speed Dependent Wipers

When your vehicle speed increases, the interval between wipes decreases.

WINDSHIELD WASHERS



E172818

- A brief press causes a single wipe without washer fluid.
- A brief press and hold causes the wipers to swipe three times with washer fluid.
- A long press and hold turns on the wipers and washer fluid for up to 10 seconds.

A wipe occurs a few seconds after washing to clear any remaining washer fluid. You can switch this feature on or off in the information display. See **Information Displays** (page 65).

Note: Do not operate the washers when the washer reservoir is empty. This could cause the washer pump to overheat.

Lighting

GENERAL INFORMATION

Condensation in the Exterior Front Lamps and Rear Lamps

Exterior front lamps and rear lamps have vents to accommodate normal changes in air pressure.

Condensation can be a natural by-product of this design. When moist air enters the lamp assembly through the vents, there is a possibility that condensation can occur when the temperature is cold. When normal condensation occurs, a fine mist can form on the interior of the lens. The fine mist eventually clears and exits through the vents during normal operation.

Clearing time may take as long as 48 hours under dry weather conditions.

Examples of acceptable condensation are:

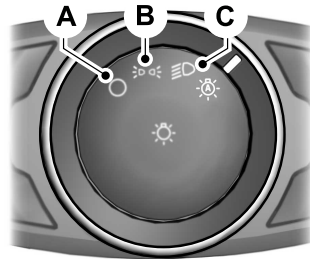
- The presence of a fine mist (no streaks, drip marks or large droplets).
- A fine mist covers less than 50% of the lens.

Examples of unacceptable condensation are:

- A water puddle inside the lamp.
- Streaks, drip marks or large droplets present on the interior of the lens.

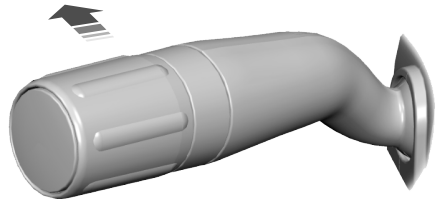
If you see any unacceptable condensation, have your vehicle checked by an authorized dealer.

LIGHTING CONTROL



- A Lamps off.
- B Parking lamps, instrument panel lamps, license plate lamps and rear lamps.
- C Headlamps.

Headlamp High Beam

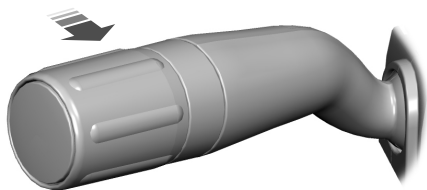


Push the lever away from you to switch the high beam on.

Push the lever forward again or pull the lever toward you to switch the high beams off.

Lighting

Flashing the Headlamp High Beam



Slightly pull the lever toward you and release it to flash the headlamps.

AUTOLAMPS



WARNING: The system does not relieve you of your responsibility to drive with due care and attention. You may need to override the system if it does not turn the headlamps on in low visibility conditions, for example daytime fog.

Autolamps turn the headlamps on in low light situations or when the wipers operate.



Switch the lighting control to the autolamps position.

The headlamps remain on for a period of time after you switch the ignition off. Use the information display controls to adjust the period of time that the headlamps remain on.

Note: If you switch the autolamps on, you cannot switch the high beams on until the system turns the low beams on.

Windshield Wiper Activated Headlamps

When you switch the autolamps on, the headlamps turn on within 10 seconds of switching the wipers on. They turn off approximately 60 seconds after you switch the windshield wipers off.

The headlamps do not turn on with the wipers:

- During a single wipe.
- When using the windshield washers.
- If the wipers are in intermittent mode.

Note: If you switch the autolamps and the autowipers on, the headlamps turn on when the windshield wipers continuously operate.

INSTRUMENT LIGHTING DIMMER

The instrument lighting dimmer buttons are on the lighting control.



Repeatedly press one of the buttons to adjust the brightness.



DAYTIME RUNNING LAMPS - VEHICLES WITH: CONFIGURABLE DAYTIME RUNNING LAMPS



WARNING: The daytime running lamps system does not activate the rear lamps and may not provide adequate lighting during low visibility driving conditions. Make sure you switch the headlamps on, as appropriate, during all low visibility conditions. Failure to do so may result in a crash.

Lighting

Switch the daytime running lamps on or off using the touchscreen:

1. Select **Settings**.
2. Select **Vehicle**.
3. Select **Lighting**.

The daytime running lamps turn on when:

1. The lamps are on in the information display.
2. You switch the ignition on.
3. The transmission is not in park (P) for vehicles with automatic transmissions or you release the parking brake for vehicles with manual transmissions.
4. The lighting control is in the autolamps position.
5. The headlamps are off.

The other lighting control switch positions do not turn on the daytime running lamps.

If the daytime running lamps are off in the information display, the lamps stay off in all switch positions.

DAYTIME RUNNING LAMPS - VEHICLES WITH: DAYTIME RUNNING LAMPS (DRL)

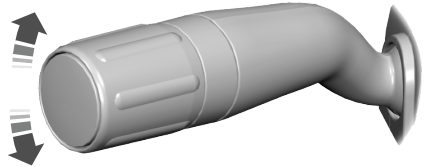


WARNING: The daytime running lamps system does not activate the rear lamps and may not provide adequate lighting during low visibility driving conditions. Make sure you switch the headlamps on, as appropriate, during all low visibility conditions. Failure to do so may result in a crash.

The system turns the lamps on in daylight conditions.

To switch the system on, switch the lighting control to any position except headlamps.

DIRECTION INDICATORS



Push the lever up or down to use the direction indicators.

Note: Tap the lever up or down to make the direction indicators flash three times.

Automatic High Beam Control (If Equipped)

WHAT IS AUTOMATIC HIGH BEAM CONTROL

The system turns on high beams if it is dark enough and no other traffic is present. If it detects an approaching vehicle's headlamps or tail lamps, or street lighting ahead, the system turns the high beams off. Low beams remain on.

A camera sensor, centrally mounted behind the windshield of your vehicle, continuously monitors conditions to turn the high beams on and off.

SWITCHING AUTOMATIC HIGH BEAM CONTROL ON AND OFF

Switch the system on or off using the information display. See **General Information** (page 65).

Activating the Automatic High Beam Control



Switch the lighting control to the autolamps position to activate. See **Autolamps** (page 53).

Note: Automatic high beams are not available when you do not turn on autolamps.

When active, the high beams turn on if all of the following occur:

- The ambient light level is low enough.
- There is no traffic in front of your vehicle.
- The vehicle speed is greater than approximately 32 mph (52 km/h).

When active, the high beams turn off if any of the following occur:

- The ambient light level is high enough that it does not require high beams.
- The system detects an approaching vehicle's headlamps or tail lamps.

- The system detects severe rain, snow or fog.
- The camera is blocked.
- The vehicle speed falls below approximately 27 mph (44 km/h).

Note: The deactivation speed is lower on curves.

Note: There could be a delay in high beam reactivation in certain curvy road situations.

Note: If you have a blocked sensor, the system may not operate properly. Keep the windshield free from obstruction or damage.

Note: The system may not operate properly in cold or inclement conditions. You can switch on the high beams by overriding the system.

Note: If the system detects a blockage, for example bird droppings, bug splatter, snow or ice, the system goes into low beam mode until you clear the blockage. If you have a blocked camera, a message may appear in the information display.

Note: Using much larger tires or equipping vehicle accessories such as snowplows can modify your vehicle's ride height and degrade automatic high beam control performance.

AUTOMATIC HIGH BEAM CONTROL INDICATORS



The indicator illuminates to confirm when the system is ready to assist.

Automatic High Beam Control (If Equipped)

OVERRIDING AUTOMATIC HIGH BEAM CONTROL



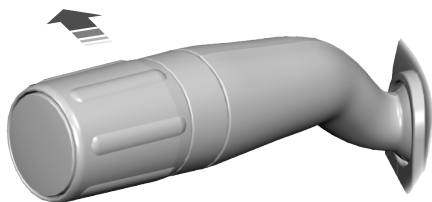
WARNING: The system does not relieve you of your responsibility to drive with due care and attention. You may need to override the system if it does not turn the high beams on or off.



WARNING: You may need to override the system when approaching other road users.



WARNING: You may need to override the system during inclement weather.



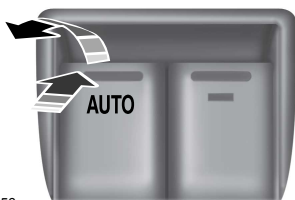
Push the lever away from you to switch between high beam and low beam.

Windows and Mirrors

POWER WINDOWS (IF EQUIPPED)

WARNING: Do not leave children unattended in your vehicle and do not let them play with the power windows. Failure to follow this instruction could result in personal injury.

WARNING: When closing the power windows, verify they are free of obstruction and make sure that children and pets are not in the proximity of the window openings.



E163056

Note: You may hear a pulsing noise when just one of the windows is open. Lower the opposite window slightly to reduce this noise.

Press the switch to open the window. Lift the switch to close the window.

One-Touch Down

Press the switch fully and release it. Press again or lift it to stop the window.

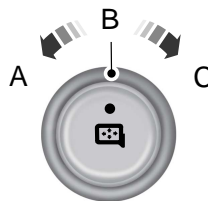
Accessory Delay

You can use the window switches for several minutes when you switch the ignition off or until you open either front door.

EXTERIOR MIRRORS (IF EQUIPPED)

Power Exterior Mirrors (If Equipped)

WARNING: Do not adjust the mirrors when your vehicle is moving.



E163059

- A Left mirror.
- B Off.
- C Right mirror.

To adjust your mirrors:

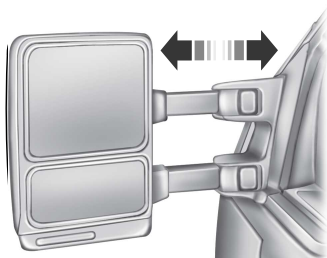
1. Select the mirror you want to adjust.
2. Move the control in the direction you want to tilt the mirror.
3. Return the control to the center position to lock the mirrors in place.

Fold-Away Exterior Mirrors

Push the mirror toward the door window glass. Make sure that you fully engage the mirror in its support when returning it to its original position.

Windows and Mirrors

Telescoping Mirrors (If Equipped)



E163061

This feature lets you extend the mirror about 3 in (75 mm). It is useful when towing a trailer. You can manually pull out or push in the mirrors to the desired position.

INTERIOR MIRROR (IF EQUIPPED)



WARNING: Do not adjust the mirrors when your vehicle is moving. This could result in the loss of control of your vehicle, serious personal injury or death.

Note: Do not clean the mirror housing or glass with harsh abrasives, fuel or other petroleum-based cleaning products.

You can adjust the interior mirror to your preference. Some mirrors also have a second pivot point. This lets you move the mirror head up or down and from side to side.

Manual Dimming Mirror

Pull the tab below the mirror toward you to reduce the effect of bright light from behind.

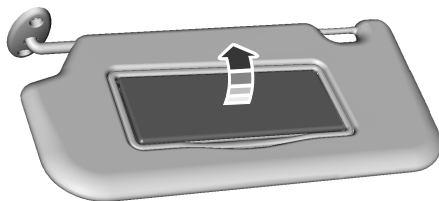
Automatic Dimming Mirror (If Equipped)

Note: Do not block the sensors on the front and back of the mirror. A rear center passenger or raised rear center head restraint may also block light from reaching the sensor.

The mirror dims to reduce the effect of bright light from behind. It returns to normal when the bright light from behind is no longer present or if you shift into reverse (R).

SUN VISORS (IF EQUIPPED)

Illuminated Vanity Mirror (If Equipped)



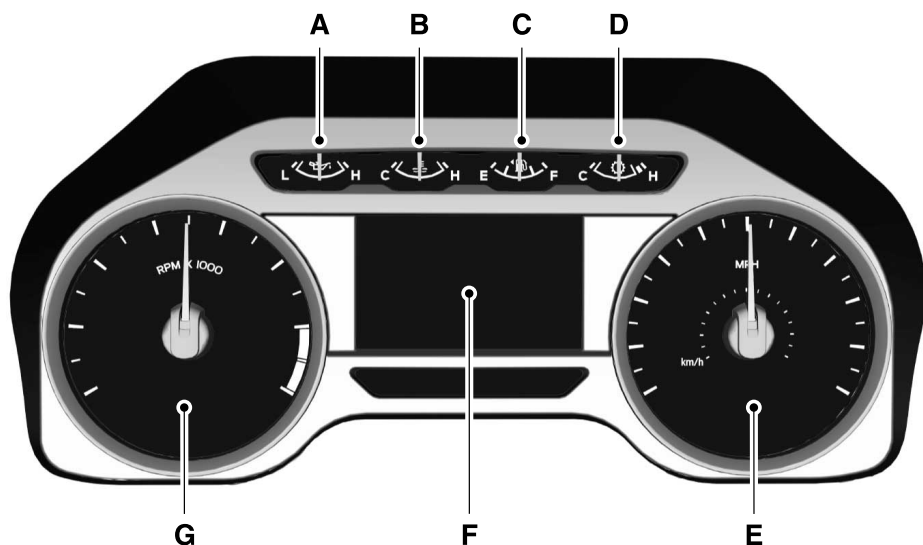
E162197

Lift the cover to switch the lamp on.

Instrument Cluster

GAUGES

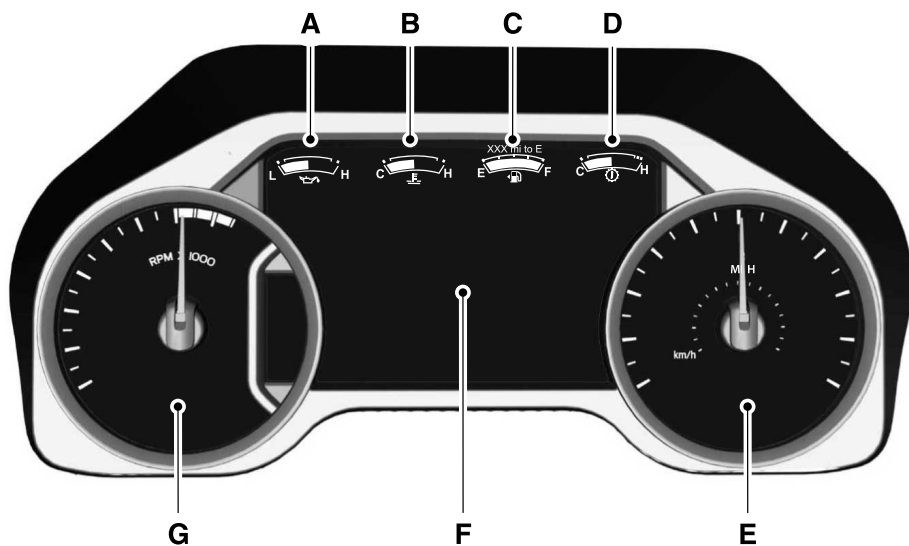
2.3 Inch Display



- A Engine oil pressure gauge.
- B Engine coolant temperature gauge.
- C Fuel gauge.
- D Transmission fluid temperature gauge.
- E Speedometer.
- F Information display. See **General Information** (page 65).
- G Tachometer.

Instrument Cluster

8 Inch Display



- A Engine oil pressure gauge.
- B Engine coolant temperature gauge.
- C Fuel gauge.
- D Transmission fluid temperature gauge.
- E Speedometer.
- F Information display. See **General Information** (page 65).
- G Tachometer.

Instrument Cluster

Engine Oil Pressure Gauge

Indicates engine oil pressure. At normal operating temperature, the level indicator is in the normal range. If the pressure gauge falls below the normal range, stop your vehicle, switch off the engine and check the engine oil level. Add oil if needed. If the oil level is correct, have your vehicle checked by an authorized dealer.

Engine Coolant Temperature Gauge



WARNING: Do not remove the coolant reservoir cap when the engine is on or the cooling system is hot. Wait 10 minutes for the cooling system to cool down. Cover the coolant reservoir cap with a thick cloth to prevent the possibility of scalding and slowly remove the cap. Failure to follow this instruction could result in personal injury.

Indicates engine coolant temperature. At normal operating temperature, the level indicator is in the normal range. If the engine coolant temperature exceeds the normal range, stop your vehicle as soon as possible, switch off the engine and let the engine cool.

Fuel Gauge

The fuel gauge indicates about how much fuel is in the fuel tank.

The arrow adjacent to the fuel pump symbol indicates on which side of your vehicle the fuel filler door is located.

Note: *The fuel gauge may vary slightly when your vehicle is moving or on a slope.*

Low Fuel Reminder

A low fuel level reminder displays and sounds when the distance to empty reaches 50 mi (80 km), 25 mi (40 km), 10 mi (20 km) and 0 mi (0 km) for all vehicle keys.

Note: *The low fuel reminder can appear at different fuel gauge positions depending on fuel economy conditions. This variation is normal.*

Distance to Empty

Indicates the approximate distance your vehicle can travel on the fuel remaining in the tank. Changes in driving pattern can cause the value to not only decrease but also increase or stay constant for periods of time.

Transmission Fluid Temperature Gauge

Indicates transmission fluid temperature. At normal operating temperature, the level indicator is in the normal range. If the transmission fluid temperature exceeds the normal range, stop your vehicle as soon as possible and verify the airflow is not restricted by snow or debris blocking airflow through the grille.

Special operating conditions such as snowplowing, towing, or off-road use may cause higher than normal operating temperatures. See **Special Operating Conditions Scheduled Maintenance** (page 255).

To lower the transmission temperature into the normal range, alter the severity of your driving conditions. Operating the transmission for extended periods with the gauge in the higher than normal area may cause internal transmission damage. If the gauge continues to show high temperatures, see an authorized dealer.

Instrument Cluster

WARNING LAMPS AND INDICATORS

The following warning lamps and indicators alert you to a vehicle condition that may become serious. Some lamps illuminate when you start your vehicle to make sure they work. If any lamps remain on after starting your vehicle, refer to the respective system warning lamp for further information.

Note: Some warning indicators appear in the information display and operate the same as a warning lamp but do not illuminate when you start your vehicle.

Airbag Warning Lamp



If it does not illuminate when you switch the ignition on, continues to flash or remains on when the engine is running, this indicates a malfunction. Have your vehicle checked as soon as possible.

Parking Lamps On



Illuminates when you switch the parking lamps on.

Anti-Lock Brake System Warning Lamp



If it illuminates when you are driving, this indicates a malfunction. Your vehicle continues to have normal braking without the anti-lock brake system function. Have your vehicle checked as soon as possible.

Battery



If it illuminates while driving, it indicates a malfunction. Switch off all unnecessary electrical equipment and have an authorized dealer check the system immediately.

Brake System Warning Lamp



WARNING: Driving your vehicle with the warning lamp on is dangerous. A significant decrease in braking performance may occur. It may take you longer to stop your vehicle. Have your vehicle checked as soon as possible. Driving extended distances with the parking brake engaged can cause brake failure and the risk of personal injury.

Note: Indicators vary depending on region.

This lamp is a dual function lamp and illuminates when:

- You apply the parking brake with the ignition on.
- Your vehicle has a brake fault or low brake fluid level, regardless of parking brake position.



If the lamp illuminates while you are moving, you may have the parking brake applied. Be sure that the parking brake is off. Have your vehicle checked as soon as possible if the lamp continues to illuminate.

Cruise Control Indicator (If Equipped)



It illuminates when you switch the system on.

See **What Is Cruise Control** (page 105).

Direction Indicator



Illuminates when you switch on the left or right direction indicator or the hazard warning flasher. If the indicators stay on or flash faster, check for a burned out bulb.

Instrument Cluster

Engine Coolant Temperature Warning Lamp



If it illuminates when your vehicle is moving, this indicates that the engine is overheating. Stop your vehicle as soon as it is safe to do so and switch the engine off. Have your vehicle checked as soon as possible.

Engine Oil



It illuminates when you switch the ignition on.

If it illuminates when the engine is running this indicates a malfunction. Stop your vehicle as soon as it is safe to do so and switch the engine off. Check the engine oil level. If the oil level is sufficient, this indicates a system malfunction. Have your vehicle checked as soon as possible.

See **Engine Oil Check** (page 164).

Fasten Seatbelt Warning Lamp



It illuminates and a tone sounds until you fasten the seatbelts.

Headlamp High Beam Indicator



It illuminates when you switch the headlamp high beam on.

Low Fuel Level Warning Lamp



If it illuminates when you are driving, refuel as soon as possible.

Low Tire Pressure Warning Lamp

(If Equipped)



It illuminates if the tire pressure in one or more tires is below the correct tire pressure.

It also illuminates momentarily when you switch the ignition on to confirm the lamp is functional. If it does not illuminate when you switch the ignition on, or begins to flash at any time, have the system checked by your authorized dealer.

Powertrain Malfunction/Electronic Throttle Control



It illuminates when the system detects a powertrain fault, have an authorized dealer check the system as soon as possible.

Service Engine Soon



If it illuminates when the engine is running this indicates a malfunction. The On Board Diagnostics system has detected a malfunction of the vehicle emission control system.

If it flashes, engine misfire may be occurring. Increased exhaust gas temperatures could damage the catalytic converter or other vehicle components. Avoid heavy acceleration and deceleration and have your vehicle serviced immediately.

It illuminates when you switch the ignition on prior to engine start to check the bulb and to indicate whether your vehicle is ready for Inspection and Maintenance (I/M) testing.

Normally, it illuminates until the engine is cranked and automatically turns off if no malfunctions are present. However, if after 15 seconds it flashes eight times, this indicates that your vehicle is not ready for Inspection and Maintenance (I/M) testing. See **Emission Law** (page 90).

Instrument Cluster

Traction Control Indicator



It flashes during a traction control event.

If it does not illuminate when you switch the ignition on, or remains on when the engine is running, this indicates a malfunction. Have your vehicle checked as soon as possible.

Traction Control System Off



Illuminates when the driver disables traction control.

Tow Haul Indicator



Illuminates when the driver activates the tow/haul feature. If the light flashes steadily, have an authorized dealer check the system immediately, damage to the transmission could occur.

AUDIBLE WARNINGS AND INDICATORS

Headlamps On Warning Chime

Sounds when you remove the key from the ignition and open the driver's door and you have left the headlamps or parking lamps on.

Key in Ignition Warning Chime

Sounds when you open the driver's door and you have left the key in the ignition.

Parking Brake On Warning Chime

Sounds when you have left the parking brake on and drive your vehicle. If the warning chime remains on after you have released the parking brake, have the system checked by your authorized dealer immediately.

Information Displays

GENERAL INFORMATION



WARNING: Driving while distracted can result in loss of vehicle control, crash and injury. We strongly recommend that you use extreme caution when using any device that may take your focus off the road. Your primary responsibility is the safe operation of your vehicle. We recommend against the use of any hand-held device while driving and encourage the use of voice-operated systems when possible. Make sure you are aware of all applicable local laws that may affect the use of electronic devices while driving.

Note: Trailer options are not available if your vehicle speed is greater than 3 mph (5 km/h).

Information Display Controls



- Press the up and down arrow buttons to scroll through and highlight the options within a menu.
- Press the right arrow button to enter a sub-menu.
- Press the left arrow button to exit a menu.
- Press the **OK** button to choose and confirm settings or messages.



This icon shows the features on or off status. A check in the box indicates the feature is on, and unchecked indicates the feature is off.

2.3 Inch Display Menu

Note: Some options could appear slightly different or not at all if the items are optional.

Main Menu
Trip 1
Trip 2
Fuel Economy
Driver Assist
Settings

Information Displays

Trip 1 or 2

Displays the following of an individual journey.

- Digital speed.
- Distance.
- Time.
- Distance to empty.
- Average fuel economy.

Note: Hold **OK** to reset fuel history and average fuel economy.

Fuel Economy

Displays the following:

- Instant fuel economy.
- Average fuel economy.
- Average speed.
- Distance to empty.

Note: Hold **OK** to reset fuel history and average fuel economy.

Driver Assist

Displays the following:

- Progressive range select.
- Engine hours.
- Maintenance monitor.

Settings

Settings		
Vehicle	Lighting	Select Your Setting
	Locks	
	FordPass	
	Windows	
	Wiper Controls	
Displ. Settings	Units	Select Your Setting
	Temperature	
	Language	

8 Inch Display Menu

Note: Some options could appear slightly different or not at all if the items are optional.

Information Displays

Main Menu
MyView
Trip/Fuel
Vehicle Info
Settings

MyView

MyView	
Trip 1	
Fuel Economy	
Configure MyView	For more options, press the OK button.

Trip/Fuel

Trip/Fuel
Trip 1
Trip 2
Fuel Economy
Fuel History

Trip 1 or 2

Displays the following of an individual journey.

- Trip timer.
- Distance to empty.
- Trip odometer.
- Average fuel economy.

Note: Hold **OK** to reset fuel history and average fuel economy.

Fuel Economy

Displays your instantaneous fuel usage as a bar graph and average mpg.

Fuel History

Displays your fuel usage based on time. The graph is updated each minute with the fuel economy that you achieved during 30 minutes of driving.

Information Displays

Vehicle Info

Vehicle Info
Gauge View
Digital Speedometer
Engine Information
Maintenance Monitor
Transmission Temp

- Engine Information - Shows engine hours, engine idle hours and engine oil temp and oil life.

Settings

Settings			
Driver Alert		Turn On or Off	
Pre-Collision		Select Your Setting	
Cruise Control		Select Your Setting	
Gauge Selection		Select Your Setting	
Advanced Settings	Vehicle	Lighting	Select Your Setting
		Locks	
		FordPass	
		Windows	
		Wiper Controls	
	Displ. Settings	Units	Select Your Setting
		Temperature	
		Tire Pressure	
		Language	

Information Displays

INFORMATION MESSAGES

Note: Depending on your vehicle options and instrument cluster type, not all messages display or are available. The instrument cluster display may shorten certain messages.

Press the **OK** button to acknowledge and remove some messages from the information display. The information display will automatically remove other messages after a short period of time.

You need to confirm certain messages before you can access the menus.



Battery and Charging System

Message	Action
Check Charging System	The charging system needs servicing. If the warning stays on or continues to come on, contact an authorized dealer as soon as possible.

Doors and Locks

Message	Action
Driver Door Ajar	The driver door is not completely closed.
Passenger Door Ajar	The passenger door is not completely closed.

Driver Alert

Message	Action
Driver Alert Warning Rest Now	Stop and rest as soon as it is safe to do so.
Driver Alert Warning Rest Suggested	Take a rest soon.

Information Displays

Engine

Message	Action
Power Reduced to Lower Engine Temp	The engine has reduced power to help reduce high engine temperature.

Fuel

Message	Action
Fuel Level Low	An early reminder of a low fuel condition.
Check Fuel Fill Inlet	The fuel fill inlet may not be properly closed.

Lane Departure Warning System

Message	Action
Front Camera Temporarily Not Available	The system detects a condition that causes the system to be temporarily unavailable.
Front Camera Low Visibility Clean Screen	The system detects a condition that requires you to clean the windshield in order for it to operate properly.
Front Camera Malfunction Service Required	Have the system checked as soon as possible.
Keep Hands on Steering Wheel	The system requests you to keep your hands on the steering wheel.

Maintenance

Message	Action
Low Engine Oil Pressure	Stop your vehicle as soon as safely possible and turn off the engine. Check the oil level. If the warning stays on or continues to come on with your engine running, contact an authorized dealer as soon as possible.
Change Engine Oil Soon	The engine oil life remaining is 10% or less.
Oil Change Required	The oil life left is at 0%.

Information Displays

Message	Action
Brake Fluid Level Low	The brake fluid level is low, inspect the brake system immediately. See Brake Fluid Check (page 173).
Check Brake System	The brake system needs servicing. Stop your vehicle in a safe place. Contact an authorized dealer.
Transport / Factory Mode Contact Dealer	Your vehicle is still in transport or factory mode. This may not allow some features to operate properly. See an authorized dealer.
See Manual	The powertrain needs service due to a powertrain malfunction.

Pre-Collision Assist

Message	Action
Pre-Collision Assist Not Available Sensor Blocked	You have a blocked sensor due to bad weather, ice, mud or water in front of the radar sensor. You can typically clean the sensor to resolve. If the message continues to appear, have the system checked as soon as possible.
Pre-Collision Assist Not Available	There is a condition preventing the system from being available. Have the system checked as soon as possible.

Power Steering

Message	Action
Steering Fault Service Now	The power steering system detects a condition that requires service. See an authorized dealer.
Steering Loss Stop Safely	The power steering system is not working. Stop your vehicle in a safe place. Contact an authorized dealer.
Steering Assist Fault Service Required	The power steering system detects a condition within the power steering system or passive entry or passive start system requires service. Contact an authorized dealer.
Steering Lock Malfunction Service Now	The steering lock system detects a condition that requires service. See an authorized dealer.

Information Displays

Traction Control

Message	Action
Traction Control Off	The status of the traction control system after you switched it off. See Using Traction Control (page 101).
Traction Control On	The status of the traction control system after you switched it on. See Using Traction Control (page 101).

Transmission

Message	Action
Shift to Park	You switched the engine off and shift select lever is in any position other than park (P).
Press Brake Pedal	Displays when the brake pedal needs to be pressed.
Transmission Over Temperature Stop Safely	The transmission is overheating and needs to cool. Stop in a safe place as soon as it is possible.
Transmission Service Required	See an authorized dealer.
Transmission Too Hot Press Brake	The transmission is overheating and needs to cool. Stop in a safe place as soon as it is possible.
Transmission Limited Function See Manual	The transmission has limited functionality. See an authorized dealer.
Transmission Not in Park	A reminder to shift into park (P). In addition, this message is typical after reconnecting or recharging the battery until you cycle the ignition to the on mode. See Changing the 12V Battery (page 174).
Transmission Fault Service Now	Have your vehicle checked as soon as possible.
Transmission Adjusted	Displays when the transmission has adjusted the shift strategy.
Transmission Adapt-Mode	Displays when the transmission is adjusting the shift strategy.
Transmission Warming Up Please Wait	Transmission is too cold. Wait for it to warm up before you drive.

Information Displays

Message	Action
Transmission Indicat- Mode Lockup On	Displays when the transmission shift lever is locked and unable to select gears.
Transmission Indicat- Mode Lockup Off	Displays when the transmission shift lever is unlocked and free to select gears.
Transmission Over- heating Stop Safely	The transmission is overheating and needs to cool. Stop in a safe place as soon as it is possible.

Climate Control

MANUAL CLIMATE CONTROL

Heater Only System (If Equipped)



Setting the Temperature

COOL

WARM

Turn the control to set the temperature.

Switching the Heater On and Off

OFF

Turn the control.

Manual Climate Control (If Equipped)

Note: Depending on your vehicle option package, the controls may look different from what you see here.

Directing the Air

Turn the control to direct the air.

VENT

Direct air to the instrument panel air vents.

FLR

Direct air to the footwell air vents.

MIX

Direct air to the instrument panel and footwell air vents.



Direct air to the windshield air vents. You can also use this setting to defog and clear the windshield of a thin covering of ice.

Setting the Blower Motor Speed



Turn the control to adjust the volume of air circulated in the vehicle.



Note: Depending on your vehicle option package, the controls may look different from what you see here.

Directing the Air

Turn the control to direct the air.

VENT

Direct air to the instrument panel air vents.

FLR

Direct air to the footwell air vents.

MIX

Direct air to the instrument panel and footwell air vents.

Climate Control



Direct air to the windshield air vents. You can also use this setting to defog and clear the windshield of a thin covering of ice.

Switching the Air Conditioning On and Off



Turn to switch the air conditioning on or off.

Switching Maximum Air Conditioning On and Off



Turn the control for maximum cooling.

Recirculated air flows through the instrument panel vents and air conditioning turns on.

Setting the Blower Motor Speed



Turn the control to adjust the volume of air circulated in the vehicle.

Setting the Temperature



Turn the control to set the temperature.

Switching the Climate Control On and Off



Turn the control.

HINTS ON CONTROLLING THE INTERIOR CLIMATE

General Hints

Note: Prolonged use of recirculated air may cause the windows to fog up.

Note: You may feel a small amount of air from the footwell air vents regardless of the air distribution setting.

Note: To reduce humidity build-up inside your vehicle, do not drive with the system switched off or with recirculated air always switched on.

Note: To reduce fogging of the windshield during humid weather, adjust the air distribution control to the windshield air vents position.

Note: Do not place objects under the front seats as this may interfere with the airflow to the rear seats.

Note: Remove any snow, ice or leaves from the air intake area at the base of the windshield.

Note: To improve the time to reach a comfortable temperature in hot weather, drive with the windows open until you feel cold air through the air vents.

Quickly Heating the Interior

1. Adjust the fan speed to the highest speed setting.
2. Adjust the temperature control to the full heat setting.
3. Direct air to the footwell air vents.

Recommended Settings for Heating

1. Adjust the fan speed to the center setting.
2. Adjust the temperature control to the midway point of the hot settings.

Climate Control

3. Direct air to the footwell air vents.

Quickly Cooling the Interior

1. Switch **MAX A/C** on.
2. Drive with the windows open until you feel cold air through the air vents.

Recommended Settings for Cooling

1. Adjust the fan speed to the center setting.
2. Adjust the temperature control to the midway point of the cold settings.
3. Direct air to the instrument panel air vents.

Vehicle Stationary for Extended Periods During Extreme High Ambient Temperatures

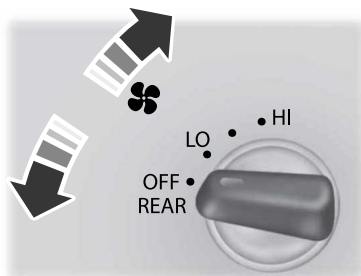
1. Apply the parking brake.
2. Place your vehicle in park (P) or neutral (N).
3. Switch **MAX A/C** on.
4. Adjust the fan speed to the lowest speed setting.

Defogging the Side Windows in Cold Weather

1. Direct air to the instrument panel and windshield vents.
2. Turn to **NORM A/C**.
3. Adjust the temperature control to the desired setting.
4. Adjust the fan speed to the highest setting.
5. Direct air toward the side windows.
6. Close the instrument panel vents.

REAR PASSENGER CLIMATE CONTROLS

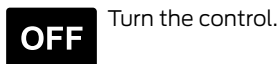
Setting the Blower Motor Speed



Turn the control to adjust the volume of air circulated in the vehicle.

Note: Depending on your vehicle option package, the controls may look different from what you see here.

Switching the Rear Climate Control On and Off



Seats

SITTING IN THE CORRECT POSITION



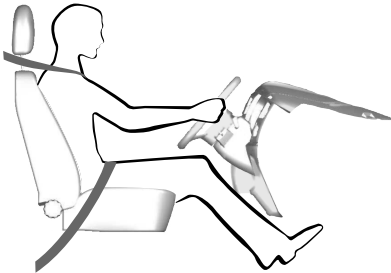
WARNING: Sitting improperly, out of position or with the seatback reclined too far can take weight off the seat cushion and affect the decision of the passenger sensing system, resulting in serious injury or death in the event of a crash. Always sit upright against your seat back, with your feet on the floor.



WARNING: Do not recline the seat backrest too far as this can cause the occupant to slide under the seatbelt, resulting in personal injury in the event of a crash.



WARNING: Do not place objects higher than the top of the seat backrest. Failure to follow this instruction could result in personal injury or death in the event of a sudden stop or crash.



When you use them properly, the seat, head restraint, seatbelt and airbags will provide optimum protection in the event of a crash.

We recommend that you follow these guidelines:

- Sit in an upright position with the base of your spine as far back as possible.
- Do not recline the seat backrest so that your torso is more than 30 degrees from the upright position.
- Adjust the head restraint so that the top of it is level with the top of your head and as far forward as possible. Make sure that you remain comfortable.
- Keep sufficient distance between yourself and the steering wheel. We recommend a minimum of 10 in (25 cm) between your breastbone and the airbag cover.
- Hold the steering wheel with your arms slightly bent.
- Bend your legs slightly so that you can press the pedals fully.
- Position the shoulder strap of the seatbelt over the center of your shoulder and position the lap strap tightly across your hips.

Make sure that your driving position is comfortable and that you can maintain full control of your vehicle.

HEAD RESTRAINTS



E190815

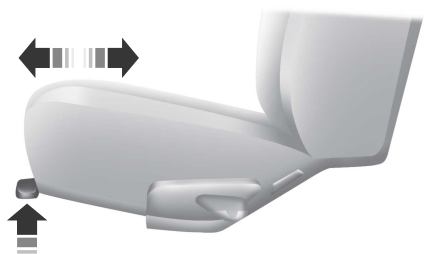
Seats

The front row outboard non-adjustable head restraints consist of a trimmed foam head covering over the upper structure of the seatback. Properly adjust the seatback to an upright driving or riding position, so that the head restraint is positioned as close as possible to the back of your head.

MANUAL SEATS (IF EQUIPPED)

WARNING: Make sure the seat fully locks into place by rocking it backward and forward. Not securing the seat into the locked position can be dangerous in a crash and could cause serious personal injury or death.

Moving the Seat Backward and Forward

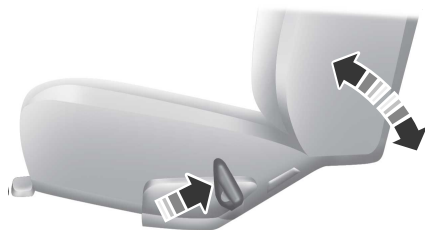


E190816

Recline Adjustment (If Equipped)

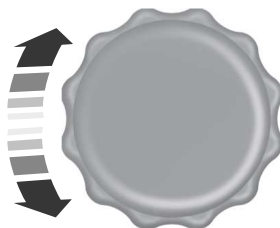
WARNING: Do not place cargo or any objects behind the seat backrest before returning it to the original position. Pull on the seat backrest to make sure that it has fully latched after returning the seat backrest to its original position. An unlatched seat may become dangerous if you stop suddenly or have a crash.

WARNING: Always drive and ride with your seatback upright and the lap belt snug and low across the hips.



E190817

Manual Lumbar (If Equipped)



E166702

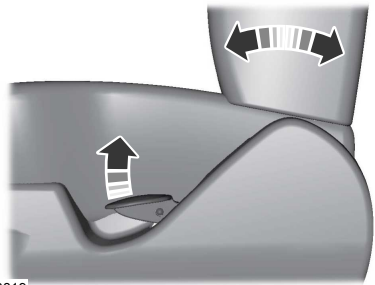
Seats

The lumbar control is on the inboard side of the driver seat. Turn the control to adjust your support.

POWER SEATS (IF EQUIPPED)

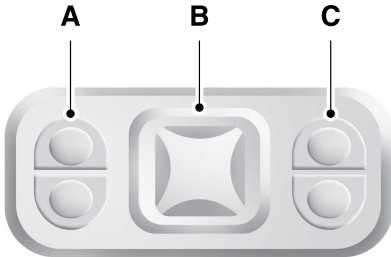


WARNING: Do not adjust the driver seat or seat backrest when your vehicle is moving. This may result in sudden seat movement, causing the loss of control of your vehicle.



E190819

The control is on the outermost side of the seat cushion.



E190818

- Press A to raise or lower the front portion of the seat cushion.
- Press B to move the seat forward, backward, up or down.
- Press C to raise or lower the rear portion of the seat cushion.

Recline Adjustment (If Equipped)



WARNING: Always drive and ride with your seatback upright and the lap belt snug and low across the hips.

Auxiliary Power Points

12 Volt DC Power Point



WARNING: Do not plug optional electrical accessories into the cigar lighter socket. Incorrect use of the cigar lighter can cause damage not covered by the vehicle warranty, and can result in fire or serious injury.

Note: When you switch the ignition on, you can use the socket to power 12 volt appliances with a maximum current rating of 15 amps.

Note: If the power supply does not work after you switch the ignition off, switch the ignition on.

Note: Do not hang any accessory from the accessory plug.

Note: Do not use the power point over the vehicle capacity of 12 volt DC 180 watts or a fuse may blow.

Note: Always keep the power point caps closed when not in use.

Do not insert objects other than an accessory plug into the power point. This damages the power point and may blow the fuse.

Run the vehicle for full capacity use of the power point.

To prevent the battery from running out of charge:

- Do not use the power point longer than necessary when the vehicle is not running.
- Do not leave devices plugged in overnight or when you park your vehicle for extended periods.

Locations

Power points could be in the following locations:

- On the instrument panel.
- Inside the glove box.
- Behind the driver's seat, upper trim panel.

110 Volt AC Power Point (If Equipped)



WARNING: Do not keep electrical devices plugged into the power outlet whenever the device is not in use. The outlet provides power when the vehicle is on. Failure to follow this instruction could result in personal injury.



WARNING: Do not use an extension cord or connect multiple devices to the power outlet. Doing so could result in overloading the power outlet. Failure to follow this instruction could result in fire, personal injury or property damage.

Note: The power point turns off when you switch the ignition off, or when the battery voltage drops below 11 volts.

You can use the power point for electric devices that require up to 150 watts. It is on the instrument panel.



E194174

Auxiliary Power Points

To gain access to the outlet contacts, press the plug against the outlet and rotate clockwise.

When the indicator light on the power point is:

- On: The power point is working, the ignition is on and a device is plugged in.
- Off: The power point is off, the ignition is off or no device is plugged in.
- Flashing: The power point is in fault mode.

The power outlet temporarily turns off power when in fault mode if the device exceeds the 150 watt limit. Unplug your device and switch the ignition off. Switch the ignition back on, but do not plug your device back in. Let the system cool off and switch the ignition off to reset the fault mode. Switch the ignition back on and make sure the indicator light remains on.

Do not use the power point for certain electric devices, including:

- Cathode-ray, tube-type televisions.
- Motor loads, such as vacuum cleaners, electric saws and other electric power tools or compressor-driven refrigerators.
- Measuring devices, which process precise data, such as medical equipment or measuring equipment.
- Other appliances requiring an extremely stable power supply such as microcomputer-controlled electric blankets or touch-sensor lamps.

Starting and Stopping the Engine

GENERAL INFORMATION



WARNING: Extended idling at high engine speeds can produce very high temperatures in the engine and exhaust system, creating the risk of fire or other damage.



WARNING: Do not park, idle or drive your vehicle on dry grass or other dry ground cover. The emission system heats up the engine compartment and exhaust system, creating the risk of fire.



WARNING: Do not start the engine in a closed garage or in other enclosed areas. Exhaust fumes are toxic. Always open the garage door before you start the engine. Failure to follow this instruction could result in personal injury or death.



WARNING: Exhaust leaks may result in entry of harmful and potentially lethal fumes into the passenger compartment. If you smell exhaust fumes inside your vehicle, have your vehicle inspected immediately. Do not drive if you smell exhaust fumes.

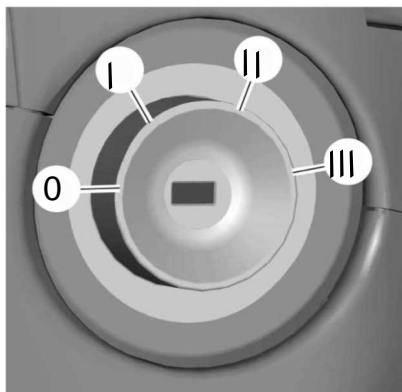
The powertrain control system meets all Canadian interference-causing equipment standard requirements regulating the impulse electrical field or radio noise.

Note: If you use your vehicle regularly above the altitude of 5,000 ft (1,524 m) and under the temperature of -4.0°F (-20°C), it is recommended to use the alternative engine oil. See **Capacities and Specifications** (page 226).

If you disconnect the battery, your vehicle may exhibit some unusual driving characteristics for approximately 6 mi (10 km) after you reconnect it. This is because the engine management system must realign itself with the engine. You can disregard any unusual driving characteristics during this period.

When you start the engine, avoid pressing the accelerator pedal before and during operation. Only use the accelerator pedal when you have difficulty starting the engine.

IGNITION SWITCH



0 (off) - The ignition is off.

Note: When you switch the ignition off and leave your vehicle, do not leave your key in the ignition. This could cause your vehicle battery to lose charge.

I (accessory) - Allows the electrical accessories, such as the radio, to operate while the engine is not running.

Starting and Stopping the Engine

Note: Do not leave the ignition key in this position for too long. This could cause your vehicle battery to lose charge.

II (on) - All electrical circuits are operational and the warning lamps and indicators illuminate.

III (start) - Cranks the engine.

STARTING A GASOLINE ENGINE

When you start the engine, the idle speed increases helping to warm up the engine. If the engine idle speed does not slow down, have your vehicle checked as soon as possible.

Before starting the engine check the following:

- Make sure all occupants fasten their seatbelts.
- Make sure the headlamps and electrical accessories are off.
- Make sure the parking brake is on.
- Make sure the transmission is in park (P) or neutral (N).
- Turn the ignition key to the on position.

Note: Do not press the accelerator pedal.

1. Fully press the brake pedal.
2. Turn the key to the start position to start the engine. Release the key when the engine starts.

Note: The engine may continue cranking for up to 15 seconds or until it starts.

Note: If you cannot start the engine on the first try, wait for a short period and try again.

Failure to Start

If you cannot start the engine after three attempts, wait 10 seconds and follow this procedure:

1. Fully press the brake pedal.

2. Shift into park (P).
3. Fully press and hold the accelerator pedal.
4. Attempt to start your vehicle and wait until the engine stops cranking.
5. Release the accelerator pedal.
6. Start the engine.

Stopping the Engine When Your Vehicle is Stationary

1. Shift into park (P) or neutral (N).
2. Turn the key to the off position.
3. Apply the parking brake.

Stopping the Engine When Your Vehicle is Moving



WARNING: Switching off the engine when your vehicle is still moving results in a significant decrease in braking assistance. Higher effort is required to apply the brakes and to stop your vehicle. A significant decrease in steering assistance could also occur. The steering does not lock, but higher effort could be required to steer your vehicle. When you switch the ignition off, some electrical circuits, for example airbags, also turn off. If you unintentionally switch the ignition off, shift into neutral (N) and restart the engine.

1. Switch the ignition off to stop the engine.
2. Put the transmission into neutral (N) and use the brakes to bring your vehicle to a safe stop.
3. When your vehicle has stopped, shift into park (P).
4. Apply the parking brake.

Starting and Stopping the Engine

Guarding Against Exhaust Fumes



WARNING: Exhaust leaks may result in entry of harmful and potentially lethal fumes into the passenger compartment. If you smell exhaust fumes inside your vehicle, have your vehicle inspected immediately. Do not drive if you smell exhaust fumes.

Important Ventilating Information

If you stop your vehicle and leave the engine idling for long periods of time, we recommend you either open the windows at least 1 in (3 cm) or set the climate control to outside air.

ENGINE BLOCK HEATER (IF EQUIPPED)



WARNING: Failure to follow engine block heater instructions could result in property damage or serious personal injury.



WARNING: Do not use your heater with ungrounded electrical systems or two-pronged adapters. There is a risk of electrical shock.



WARNING: Do not fully close the hood, or allow it to drop under its own weight when using the engine block heater. This could damage the power cable and may cause an electrical short resulting in fire, injury and property damage.

The heater acts as a starting aid by warming the engine coolant. This allows the climate control system to respond quickly. The equipment includes a heater element (installed in the engine block) and a wire harness. You can connect the system to a grounded 120-volt AC electrical source.

We recommend that you do the following for a safe and correct operation:

- Use a 16-gauge outdoor extension cord that is product certified by Underwriter's Laboratory (UL) or Canadian Standards Association (CSA). This extension cord must be suitable for use outdoors, in cold temperatures, and be clearly marked Suitable for Use with Outdoor Appliances. Do not use an indoor extension cord outdoors. This could result in an electric shock or become a fire hazard.
- Use as short an extension cord as possible.
- Do not use multiple extension cords.
- Make sure that when in operation, the extension cord plug and heater cord plug connections are free and clear of water. This could cause an electric shock or fire.
- Make sure your vehicle is parked in a clean area, clear of combustibles.
- Make sure the heater, heater cord and extension cord are firmly connected.
- Check for heat anywhere in the electrical hookup once the system has been operating for approximately 30 minutes.

Note: The engine block heater is most effective when outdoor temperatures are below 0°F (-18°C). We recommend the use of engine block heater to improve engine cold start performance.

Starting and Stopping the Engine

- Make sure the system is unplugged and properly stowed before starting and driving your vehicle. Make sure the protective cover seals the prongs of the block heater cord plug when not in use.
- Make sure the heater system is checked for proper operation before winter.

Using the Engine Block Heater

Make sure the receptacle terminals are clean and dry prior to use. Clean them with a dry cloth if necessary.

The heater uses 0.4 to 1.0 kilowatt-hours of energy per hour of use. The system does not have a thermostat. It achieves maximum temperature after approximately three hours of operation. Using the heater longer than three hours does not improve system performance and unnecessarily uses electricity.

Fuel and Refueling

SAFETY PRECAUTIONS



WARNING: Do not overfill the fuel tank. The pressure in an overfilled tank may cause leakage and lead to fuel spray and fire.



WARNING: The fuel system may be under pressure. If you hear a hissing sound near the fuel filler inlet, do not refuel until the sound stops. Otherwise, fuel may spray out, which could cause serious personal injury.



WARNING: Fuels can cause serious injury or death if misused or mishandled.



WARNING: Fuel may contain benzene, which is a cancer-causing agent.



WARNING: When refueling always shut the engine off and never allow sparks or open flames near the fuel tank filler valve. Never smoke or use a cell phone while refueling. Fuel vapor is extremely hazardous under certain conditions. Avoid inhaling excess fumes.

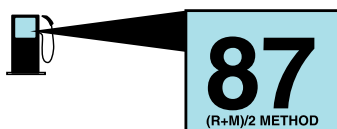
- Avoid inhaling fuel vapors. Inhaling fuel vapor can lead to eye and respiratory tract irritation. In severe cases, excessive or prolonged breathing of fuel vapor can cause serious illness and permanent injury.
- Avoid getting fuel in your eyes. If you splash fuel in your eyes, immediately remove contact lenses (if worn), flush with water for 15 minutes and seek medical attention. Failure to seek proper medical attention could lead to permanent injury.
- Fuels can be harmful if absorbed through the skin. If you splash fuel on your skin, clothing or both, promptly remove contaminated clothing and thoroughly wash your skin with soap and water. Repeated or prolonged skin contact causes skin irritation.
- Be particularly careful if you are taking Antabuse or other forms of Disulfiram for the treatment of alcoholism. Breathing fuel vapors could cause an adverse reaction, serious personal injury or sickness. Immediately call a physician if you experience any adverse reactions.

Follow these guidelines when refueling:

- Extinguish all smoking materials and any open flames before refueling your vehicle.
- Always switch the engine off before refueling.
- Automotive fuels can be harmful or fatal if swallowed. Fuel is highly toxic and if swallowed can cause death or permanent injury. If fuel is swallowed immediately call a physician, even if no symptoms are immediately apparent. The toxic effects of fuel may not be apparent for hours.

FUEL QUALITY - GASOLINE

Choosing the Right Fuel



Your vehicle is designed to operate on regular unleaded gasoline with a minimum pump (R+M)/2 octane rating of 87.

Fuel and Refueling

Some fuel stations, particularly those in high altitude areas, offer fuels posted as regular unleaded gasoline with an octane rating below 87. The use of these fuels could result in engine damage that will not be covered by the vehicle warranty.

For best overall vehicle and engine performance, premium fuel with an octane rating of 91 or higher is recommended. The performance gained by using premium fuel is most noticeable in hot weather as well as other conditions, for example when towing a trailer. See **Towing** (page 127).

Do not be concerned if the engine sometimes knocks lightly. However, if the engine knocks heavily while using fuel with the recommended octane rating, contact an authorized dealer to prevent any engine damage.

We recommend Top Tier detergent gasolines, where available to help minimize engine deposits and maintain optimal vehicle and engine performance. For additional information, refer to www.toptiergas.com.

Note: *Use of any fuel for which the vehicle was not designed can impair the emission control system, cause loss of vehicle performance, and cause damage to the engine which may not be covered by the vehicle Warranty.*

Do not use:

- Diesel fuel.
- Fuels containing kerosene or paraffin.
- Fuel containing more than 15% ethanol or E85 fuel.
- Fuels containing methanol.
- Fuels containing metallic-based additives, including manganese-based compounds.

- Fuels containing the octane booster additive, methylcyclopentadienyl manganese tricarbonyl (MMT).
- Leaded fuel, using leaded fuel is prohibited by law.

The use of fuels with metallic compounds such as methylcyclopentadienyl manganese tricarbonyl (commonly known as MMT), which is a manganese-based fuel additive, will impair engine performance and affect the emission control system.

RUNNING OUT OF FUEL

Avoid running out of fuel. Running out of fuel can cause damage not covered by the vehicle Warranty.

If your vehicle runs out of fuel:

- Normally, adding 1.3 gal (5 L) of fuel is enough to restart the engine. If your vehicle is on a steep grade, more fuel may be required.
- You may need to cycle the ignition from off to on several times after refueling to allow the fuel system to pump the fuel from the tank to the engine. On restarting, cranking time will take a few seconds longer than normal.

Filling a Portable Fuel Container




WARNING: Flow of fuel through a fuel pump nozzle can produce static electricity. This can cause a fire if you are filling an ungrounded fuel container.

Fuel and Refueling


Use the following guidelines to avoid electrostatic charge build-up, which can produce a spark, when filling an ungrounded fuel container:


- Only use an approved fuel container to transfer fuel to your vehicle. Place the container on the ground when filling.
- Do not fill a fuel container while it is inside your vehicle (including the cargo area).
- Keep the fuel pump nozzle in contact with the fuel container while filling.
- Do not use a device that holds the fuel pump nozzle lever in the fill position.

REFUELING


 **WARNING:** Fuel vapor burns violently and a fuel fire can cause severe injuries.


 **WARNING:** Read and follow all the instructions on the pump island.


 **WARNING:** When refueling always shut the engine off and never allow sparks or open flames near the fuel tank filler valve. Never smoke or use a cell phone while refueling. Fuel vapor is extremely hazardous under certain conditions. Avoid inhaling excess fumes.

 **WARNING:** Stay outside your vehicle and do not leave the fuel pump unattended when refueling your vehicle.

 **WARNING:** Keep children away from the fuel pump. Never let children pump fuel.

 **WARNING:** Wait at least five seconds before removing the fuel pump nozzle to allow any residual fuel to drain into the fuel tank.


 **WARNING:** Stop refueling after the fuel pump nozzle automatically shuts off for the second time. Failure to follow this will fill the expansion space in the fuel tank and could lead to fuel overflowing.

 **WARNING:** Do not remove the fuel pump nozzle from its fully inserted position when refueling.

Use the following guidelines to avoid electrostatic charge build-up when filling an ungrounded fuel container:

- Place approved fuel container on the ground.
- Do not fill a fuel container while it is in the vehicle (including the cargo area).
- Keep the fuel pump nozzle in contact with the fuel container while filling.
- Do not use a device that would hold the fuel pump handle in the fill position.

Fuel Filler Cap

 **WARNING:** The fuel system may be under pressure. If you hear a hissing sound near the fuel filler inlet, do not refuel until the sound stops. Otherwise, fuel may spray out, which could cause serious personal injury.

Note: *If you must replace the fuel filler cap, replace it with a fuel filler cap that is designed for your vehicle. The customer warranty may be void for any damage to the fuel tank or fuel system if the correct genuine Ford, Motorcraft or other certified fuel filler cap is not used.*

Your vehicle has a threaded fuel filler cap. When fueling your vehicle:

1. Put your vehicle in park (P).
2. Switch the engine off.

Fuel and Refueling

3. Carefully turn the fuel filler cap counterclockwise until it spins off.
4. Pull to remove the cap from the fuel filler pipe and place on the fuel door hanging hook if equipped.
5. When the nozzle shuts off, wait at least five seconds, then slightly raise the fuel pump nozzle and slowly remove it.
6. Install the fuel filler cap by rotating it clockwise until it clicks.

If the Check Fuel Cap light or a Check Fuel Cap message appears in the instrument cluster and stays on after you start the engine, you may not have installed the fuel filler properly.

If the fuel cap light remains on, at the next opportunity, safely pull off of the road, remove the fuel filler cap, align the cap properly and reinstall it. The check fuel cap light or Check fuel cap message may not reset immediately. It may take several driving cycles for the indicators to turn off. A driving cycle consists of an engine start-up (after four or more hours with the engine off) followed by normal city and highway driving.

FUEL CONSUMPTION

Advertised Capacity

The advertised capacity is the maximum amount of fuel that you can add to the fuel tank after running out of fuel. Included in the advertised capacity is an empty reserve. The empty reserve is an unspecified amount of fuel that remains in the fuel tank when the fuel gauge indicates empty.

Note: *The amount of fuel in the empty reserve varies and should not be relied upon to increase driving range.*

Fuel Economy

Your vehicle calculates fuel economy figures through the trip computer average fuel function. See **General Information** (page 65).

The first 1,000 mi (1,500 km) of driving is the break-in period of the engine. A more accurate measurement is obtained after 2,000 mi (3,000 km).

Impacting Fuel Economy

- Incorrect tire inflation pressures.
- Fully loading your vehicle.
- Carrying unnecessary weight.
- Adding certain accessories to your vehicle such as bug deflectors, rollbars or light bars, running boards and ski racks.
- Using fuel blended with alcohol. See **Fuel Quality** (page 86).
- Fuel economy may decrease with lower temperatures.
- Fuel economy may decrease when driving short distances.
- You may get better fuel economy when driving on flat terrain than when driving on hilly terrain.

Engine Emission Control

EMISSION LAW



WARNING: Do not remove or alter the original equipment floor covering or insulation between it and the metal floor of the vehicle. The floor covering and insulation protect occupants of the vehicle from the engine and exhaust system heat and noise. On vehicles with no original equipment floor covering insulation, do not carry passengers in a manner that permits prolonged skin contact with the metal floor. Failure to follow these instructions may result in fire or personal injury.

U.S. federal laws and certain state laws prohibit removing or rendering inoperative emission control system components. Similar federal or provincial laws may apply in Canada. We do not approve of any vehicle modification without first determining applicable laws.



Tampering with emissions control systems including related sensors or the Diesel Exhaust Fluid system can result in reduced engine power and the illumination of the service engine soon light.

Tampering With a Noise Control System

Federal laws prohibit the following acts:

- Removal or rendering inoperative by any person other than for purposes of maintenance.
- Repair or replacement of any device or element of the design incorporated into a new vehicle for the purpose of noise control prior to its sale or delivery to the ultimate purchaser or while it is in use.
- The use of the vehicle after any person removes or renders inoperative any device or element of the design.

The U.S. Environmental Protection Agency may presume to constitute tampering as follows:

- Removal of hood blanket, fender apron absorbers, fender apron barriers, underbody noise shields or acoustically absorptive material.
- Tampering or rendering inoperative the engine speed governor, to allow engine speed to exceed manufacturer specifications.

If the engine does not start, runs rough, experiences a decrease in engine performance, experiences excess fuel consumption or produces excessive exhaust smoke, check for the following:

- A plugged or disconnected air inlet system hose.
- A plugged engine air filter element.
- Water in the fuel filter and water separator.
- A clogged fuel filter.
- Contaminated fuel.
- Air in the fuel system, due to loose connections.
- An open or pinched sensor hose.
- Incorrect engine oil level.

Engine Emission Control

- Incorrect fuel for climatic conditions.
- Incorrect engine oil viscosity for climactic conditions.

Note: Some vehicles have a lifetime fuel filter that is integrated with the fuel tank. Regular maintenance or replacement is not needed.

Note: If these checks do not help you correct the concern, have your vehicle checked as soon as possible.

Noise Emissions Warranty, Prohibited Tampering Acts and Maintenance

On January 1, 1978, Federal regulation became effective governing the noise emission on trucks over 10,000 lb (4,536 kg) Gross Vehicle Weight Rating (GVWR). The preceding statements concerning prohibited tampering acts and maintenance, and the noise warranty found in the Warranty Guide, are applicable to complete chassis cabs over 10,000 lb (4,536 kg) GVWR.

CATALYTIC CONVERTER



WARNING: Do not park, idle or drive your vehicle on dry grass or other dry ground cover. The emission system heats up the engine compartment and exhaust system, creating the risk of fire.



WARNING: The normal operating temperature of the exhaust system is very high. Never work around or attempt to repair any part of the exhaust system until it has cooled. Use special care when working around the catalytic converter. The catalytic converter heats up to a very high temperature after only a short period of engine operation and stays hot after the engine is switched off.



WARNING: Exhaust leaks may result in entry of harmful and potentially lethal fumes into the passenger compartment. If you smell exhaust fumes inside your vehicle, have your vehicle inspected immediately. Do not drive if you smell exhaust fumes.

Your vehicle has various emission control components and a catalytic converter that enables it to comply with applicable exhaust emission standards.

To make sure that the catalytic converter and other emission control components continue to work properly:

- Do not crank the engine for more than 10 seconds at a time.
- Do not run the engine with a spark plug lead disconnected.
- Do not push-start or tow-start your vehicle. Use booster cables. See **Jump Starting the Vehicle** (page 139).
- Use only the specified fuel listed.
- Do not switch the ignition off when your vehicle is moving.
- Avoid running out of fuel.
- Have the items listed in scheduled maintenance information performed according to the specified schedule.

Note: Resulting component damage may not be covered by the vehicle Warranty.

The scheduled maintenance items listed in scheduled maintenance information are essential to the life and performance of your vehicle and to its emissions system.

If you use anything other than Ford, Motorcraft or Ford-authorized parts for maintenance replacements or for service of components affecting emission control, such non-Ford parts should be equivalent to genuine Ford Motor Company parts in performance and durability.

Engine Emission Control

Illumination of the service engine soon indicator, charging system warning light or the temperature warning light, fluid leaks, strange odors, smoke or loss of engine power could indicate that the emission control system is not working properly.

An improperly operating or damaged exhaust system may allow exhaust to enter the vehicle. Have a damaged or improperly operating exhaust system inspected and repaired immediately.

Do not make any unauthorized changes to your vehicle or engine. By law, vehicle owners and anyone who manufactures, repairs, services, sells, leases, trades vehicles, or supervises a fleet of vehicles are not permitted to intentionally remove an emission control device or prevent it from working. Information about your vehicle's emission system is on the Vehicle Emission Control Information Decal located on or near the engine. This decal also lists engine displacement.

Please consult your warranty information for complete details.

On-Board Diagnostics (OBD-II)

Your vehicle has a computer known as the on-board diagnostics system (OBD-II) that monitors the engine's emission control system. The system protects the environment by making sure that your vehicle continues to meet government emission standards. The OBD-II system also assists a service technician in properly servicing your vehicle.



When the service engine soon indicator illuminates, the OBD-II system has detected a malfunction. Temporary malfunctions may cause the service engine soon indicator to illuminate. Examples are:

1. Your vehicle has run out of fuel—the engine may misfire or run poorly.
2. Poor fuel quality or water in the fuel—the engine may misfire or run poorly.
3. The fuel fill inlet may not have closed properly. See **Refueling** (page 88).
4. Driving through deep water—the electrical system may be wet.

You can correct these temporary malfunctions by filling the fuel tank with good quality fuel, properly closing the fuel fill inlet or letting the electrical system dry out. After three driving cycles without these or any other temporary malfunctions present, the service engine soon indicator should stay off the next time you start the engine. A driving cycle consists of a cold engine startup followed by mixed city and highway driving. No additional vehicle service is required.

If the service engine soon indicator remains on, have your vehicle serviced at the first available opportunity. Although some malfunctions detected by the OBD-II may not have symptoms that are apparent, continued driving with the service engine soon indicator on can result in increased emissions, lower fuel economy, reduced engine and transmission smoothness and lead to more costly repairs.

Readiness for Inspection and Maintenance (I/M) Testing

Some state and provincial and local governments may have Inspection/Maintenance (I/M) programs to inspect the emission control equipment on your vehicle. Failure to pass this inspection could prevent you from getting a vehicle registration.



If the service engine soon indicator is on or the bulb does not work, your vehicle may need service. See On-Board Diagnostics.

Engine Emission Control

Your vehicle may not pass the I/M test if the service engine soon indicator is on or not working properly (bulb is burned out), or if the OBD-II system has determined that some of the emission control systems have not been properly checked. In this case, the vehicle is not ready for I/M testing.

If the vehicle's engine or transmission has just been serviced, or the battery has recently run down or been replaced, the OBD-II system may indicate that the vehicle is not ready for I/M testing. To determine if the vehicle is ready for I/M testing, turn the ignition key to the on position for 15 seconds without cranking the engine. If the service engine soon indicator blinks eight times, it means that the vehicle is not ready for I/M testing; if the service engine soon indicator stays on solid, it means that your vehicle is ready for I/M testing.

The OBD-II system checks the emission control system during normal driving. A complete check may take several days.

If the vehicle is not ready for I/M testing, you can perform the following driving cycle consisting of mixed city and highway driving:

1. 15 minutes of steady driving on an expressway or highway followed by 20 minutes of stop-and-go driving with at least four 30-second idle periods.
2. Allow your vehicle to sit for at least eight hours with the ignition off. Then, start the vehicle and complete the above driving cycle. The vehicle must warm up to its normal operating temperature. Once started, do not turn off the vehicle until the above driving cycle is complete.

If the vehicle is still not ready for I/M testing, you need to repeat the above driving cycle.

Transmission

AUTOMATIC TRANSMISSION



WARNING: Apply the parking brake, shift into park (P), switch the ignition off and remove the key before you leave your vehicle. Failure to follow this instruction could result in personal injury or death.

P R N D M 2 1

Putting your vehicle in or out of gear:

1. Fully press down the brake pedal.
2. Move the gearshift lever into the preferred gear.
3. When you finish driving, come to a complete stop.
4. Move the gearshift lever and securely latch it in park (P).
5. Release the brake pedal and the transmission remains in the selected gear.

Park (P)

This position locks the transmission and prevents the wheels from turning.

Reverse (R)

With the transmission in reverse (R), your vehicle moves backward. Always come to a complete stop before shifting into and out of reverse (R).

Neutral (N)

With the transmission in neutral (N), you can start your vehicle and it is free to roll. Hold the brake pedal down when in this position.

Drive (D)

Drive (D) is the normal driving position for the best fuel economy. The overdrive function allows automatic upshifts and downshifts through gears one through six.

Manual (M)

Moving the gearshift lever to the manual (M) position allows you to manually select the gear you prefer. Only the current gear displays. Use the buttons on the gearshift lever to manually select gears. Press the + button to upshift or the – button to downshift. Return the transmission to a different gearshift position to deactivate manual control.

Second (2)

Transmission operates in second (2) gear only. Use second (2) gear to start-up on slippery roads.

First (1)

- Transmission operates in first (1) gear only.
- Provides maximum engine braking.
- Allows upshifts by moving gearshift lever.
- Does not downshift into first (1) gear at high speeds; allows for first (1) gear when vehicle reaches slower speeds.

Forced downshifts

- Allowed in drive (D) with the tow/haul feature on or off.
- Press the accelerator to the floor.
- Allows transmission to select an appropriate gear.

Transmission

Tow/Haul Mode

TOW HAUL To activate tow/haul, press the button on the gearshift lever. The TOW HAUL indicator light illuminates in the instrument cluster.

The tow/haul feature:

- Delays upshifts to reduce the frequency of transmission shifting.
- Provides engine braking in all forward gears, which slows your vehicle and assists you in controlling your vehicle when descending a slope.
- Depending on driving conditions and load conditions, may downshift the transmission, slow your vehicle and control your vehicle speed when descending a hill, without pressing the accelerator pedal. The amount of downshift braking provided varies based upon the amount you press the brake pedal.

The tow/haul feature improves transmission operation when towing a trailer or a heavy load. All transmission gear ranges are available when using tow/haul.

To deactivate the tow/haul feature and return to normal driving mode, press the button on the gearshift lever again. The TOW HAUL light deactivates. Tow/haul also deactivates when you power down your vehicle.



WARNING: Do not use tow/haul when the road surface is slippery. Failure to follow this instruction could result in the loss of control of your vehicle.

Understanding Your SelectShift Automatic™ Transmission



Note: When pressing the button on the gearshift lever, you can cycle through the available drive modes.

Your vehicle has a SelectShift Automatic™ transmission gearshift lever. The SelectShift Automatic transmission gives you the ability to change gears up or down without a clutch.

To prevent the engine from running at too low an RPM, which may cause it to stall, SelectShift still makes some downshifts if it has determined that you have not downshifted in time. Although SelectShift makes some downshifts for you, it still allows you to downshift at any time if the SelectShift determines that damage to the engine does not occur from over-revving.

SelectShift does not upshift, even if the engine is approaching the RPM limit. Shift manually by pressing the + button.

Note: Engine damage may occur if you maintain excessive engine revving without shifting.

SelectShift does not automatically upshift, even if the engine is approaching the RPM limit. Shift manually by pressing the (+) paddle.

Transmission

Progressive Range Selection - PRS

(If Equipped)

Progressive Range Selection gives you the ability to lockout gears from the automatic shifting range. This may provide you with an improved driving experience. For example, in slippery conditions or when experiencing a steep grade.

With the gearshift lever in drive (D), press the – button to active PRS. The instrument cluster indicates the available and selected gears.

All available gears display with the current gear indicated. Press the – button again to lock out gears beginning with the highest gear. Example: press the – button twice to lock out 6th and 5th gears. Only the available gears display, and the transmission automatically shifts between the available gears. Press the + button to unlock gears to allow the transmission to shift to higher gears. The transmission shifts within the gear range you select.

Automatic Transmission Adaptive Learning

This feature may increase durability and provide consistent shift feel over the life of your vehicle. A new vehicle or transmission may have firm shifts, soft shifts, or both. This is normal and does not affect function or durability of the transmission. Over time, the adaptive learning process fully updates transmission operation.

Brake-Shift Interlock



WARNING: Do not drive your vehicle until you verify that the stoplamps are working.



WARNING: When doing this procedure, you need to take the transmission out of park (P) which means your vehicle can roll freely. To avoid unwanted vehicle movement, apply the parking brake prior to doing this procedure. Use wheel chocks if appropriate.



WARNING: If the parking brake is fully released, but the brake warning lamp remains illuminated, the brakes may not be working properly. Have your vehicle checked as soon as possible.

Your vehicle has a brake-shift interlock feature that prevents the gearshift lever from moving from park (P) when the ignition is in the 3 (on) position and the brake pedal is not pressed.

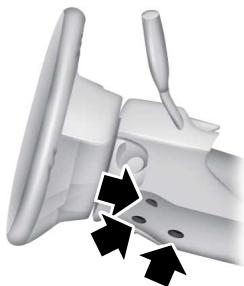
If you cannot move the gearshift lever out of park (P) position with the ignition in the 3 (on) position and the brake pedal pressed, a malfunction may have occurred. It is possible that a fuse has blown or your vehicle's brake lamps are not operating properly. See **Fuse Specification Chart** (page 151).

If the fuse is not blown and the brake lamps are working properly, the following procedure allows you to move the gearshift lever from park (P):

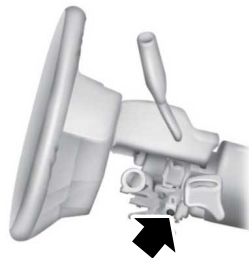
1. Apply the parking brake. Switch the ignition key to 1 (off), then remove the key.
2. Move the steering column to the full down and full rearward position, toward the driver seat.
3. Remove the gearshift lever boot.

Transmission

4. Place your fingers into the hole where you removed the gearshift lever boot and pull the top half of the shroud up and forward to separate it from the lower half of the shroud. There is a hinge at the forward edge of the top of the shroud. Roll the top half of the shroud upward on the hinge point, then pull straight rearward toward the driver seat to remove.
5. Remove the top half of the shroud.
6. Remove the three fasteners under the column that secure the lower shroud half to the column.



7. Pull the lock lever into the full unlocked position and remove the lower shroud cover by pulling the lever handle through the slot in the cover.
8. Apply the brake. Gently lift the override disk and move the gearshift lever into neutral (N).



9. Start your vehicle.

Perform Steps 4 through 8 in reverse order, making sure to engage the hinge pivots between the upper and lower halves of the shroud. Keep slight pressure in the forward direction as you rotate the halves together.

If Your Vehicle Gets Stuck in Mud or Snow

Note: Do not rock your vehicle if the engine is not at normal operating temperature or damage to the transmission may occur.

Note: Do not rock your vehicle for more than a minute or damage to the transmission and tires may occur, or the engine may overheat.

If your vehicle is stuck in mud or snow, you may rock it out by shifting between forward and reverse gears, stopping between shifts in a steady pattern. Press lightly on the accelerator in each gear.

Brakes

GENERAL INFORMATION

Note: *Occasional brake noise is normal. If a metal-to-metal, continuous grinding or continuous squeal sound is present, the brake linings may be worn-out, have the system checked. If the vehicle has continuous vibration or shudder in the steering wheel while braking, have the system checked as soon as possible.*

Note: *Brake dust may accumulate on the wheels, even under normal driving conditions. Some dust is inevitable as the brakes wear and does not contribute to brake noise. See **Cleaning the Wheels** (page 187).*

BRAKE See **Warning Lamps and Indicators** (page 62).



Wet brakes result in reduced braking efficiency. Gently press the brake pedal a few times when driving from a car wash or standing water to dry the brakes.

Brake Over Accelerator

In the event the accelerator pedal becomes stuck or entrapped, apply steady and firm pressure to the brake pedal to slow the vehicle and reduce engine power. If you experience this condition, apply the brakes and bring your vehicle to a safe stop. Move the transmission to park (P), switch the engine off and apply the parking brake. Inspect the accelerator pedal for any interference. If none are found and the condition persists, have the system checked.

Anti-lock Brake System

This system helps you maintain steering control during emergency stops by keeping the brakes from locking.



If it illuminates when you are driving, your vehicle requires service. Your vehicle continues to have normal braking without the anti-lock brake system function. Have your vehicle checked as soon as possible.

It also momentarily illuminates when you switch the ignition on to confirm the lamp is functional. If it does not illuminate when you switch the ignition on, or begins to flash at any time, have the system checked.



It illuminates when you engage the parking brake and the ignition is on.



If it illuminates when your vehicle is moving, make sure the parking brake is disengaged. If the parking brake is disengaged, this indicates low brake fluid level or a brake system fault. Have your vehicle checked as soon as possible.

It also momentarily illuminates when you switch the ignition on to confirm the lamp is functional. If it does not illuminate when you switch the ignition on, or begins to flash at any time, have the system checked.

Hydraulic brake booster system (Hydroboost or Hydromax)

The Hydroboost and Hydromax systems receive fluid pressure from the power steering pump to provide power assist during braking.

The Hydromax booster receives backup pressure from the reserve system electric pump whenever the fluid in the power steering system is not flowing. When the engine is off, the pump turns on if you apply the brake pedal, or if you switch the ignition to the on position.

Brakes

The sound of the pump operating may be heard by the driver. This is a normal characteristic of the system.

The reserve system provides reduced braking power, so the vehicle should be operated under these conditions with caution, and only to seek service repair and removal of the vehicle from the roadway.

Note: For vehicles with the Hydromax system operating under normal conditions, the noise of the fluid flowing through the booster may be heard whenever you apply the brake. This condition is normal. Vehicle service is not required.

If braking performance or pedal response becomes very poor, even when you strongly press the pedal, it may indicate the presence of air in the hydraulic system or leakage of fluid. Stop your vehicle as soon as it is safe to do so. Have the system checked as soon as possible.

HINTS ON DRIVING WITH ANTI-LOCK BRAKES

The anti-lock brake system does not eliminate the risks when:

- You drive too closely to the vehicle in front of you.
- Your vehicle is hydroplaning.
- You take corners too fast.
- The road surface is poor.

Note: If the system activates, the brake pedal could pulse and may travel further. Maintain pressure on the brake pedal. You may also hear a noise from the system. This is normal.

PARKING BRAKE



WARNING: Apply the parking brake, shift into park (P), switch the ignition off and remove the key before you leave your vehicle. Failure to follow this instruction could result in personal injury or death.

Apply the parking brake whenever you park your vehicle.

- For vehicles with a foot operated parking brake, press the pedal down.
- For vehicles with a hand operated parking brake, pull the parking brake lever up.

BRAKE



It illuminates when you switch the ignition on and apply the parking brake. It also illuminates momentarily when you switch the ignition on to confirm the lamp is functional. If it does not illuminate when you switch the ignition on or begins to flash at any time, have the system checked by an authorized dealer.

If it illuminates when your vehicle is moving, make sure you disengage the parking brake.

If the parking brake is disengaged, this indicates a low brake fluid level or a brake system fault. Have your vehicle checked as soon as possible.

To release the parking brake:

- For vehicles with a foot operated parking brake, pull the parking brake release lever.
- For vehicles with a hand operated parking brake, push the parking brake lever down.

Brakes

HILL START ASSIST



WARNING: The system does not replace the parking brake. When you leave your vehicle, always apply the parking brake.



WARNING: You must remain in your vehicle when the system turns on. At all times, you are responsible for controlling your vehicle, supervising the system and intervening, if required. Failure to take care may result in the loss of control of your vehicle, serious personal injury or death.



WARNING: The system will turn off if a malfunction is apparent or if you rev the engine excessively. Failure to take care may result in the loss of control of your vehicle, serious personal injury or death.

The system makes it easier to pull away when your vehicle is on a slope without the need to use the parking brake.

When the system is active, your vehicle remains stationary on the slope for two to three seconds after you release the brake pedal. This allows time to move your foot from the brake to the accelerator pedal. The system releases the brakes automatically once the engine has developed sufficient torque to prevent your vehicle from rolling down the slope. This is an advantage when pulling away on a slope, for example from a car park ramp, traffic lights or when reversing uphill into a parking space.

The system activates on any slope that causes your vehicle to roll.

Note: *There is no warning light to indicate the system is either on or off.*

Using Hill Start Assist

1. Press the brake pedal to bring your vehicle to a complete standstill. Keep the brake pedal pressed and shift into first gear when facing uphill or reverse (R) when facing downhill.
2. If the sensors detect that your vehicle is on a slope, the system activates automatically.
3. When you remove your foot from the brake pedal, your vehicle remains on the slope without rolling away for about two to three seconds. This hold time automatically extends if you are in the process of driving off.
4. Drive off in the normal manner. The system releases the brakes automatically.

Note: *When you remove your foot from the brake pedal and press the pedal again when the system is active, you will experience significantly reduced brake pedal travel. This is normal.*

Switching the System On and Off

Vehicles with Manual Transmission

You can switch this feature on or off in the information display. The system remembers the last setting when you start your vehicle.

Vehicles with Automatic Transmission

You cannot turn the system on or off. When you switch the ignition on, the system automatically turns on.

Traction Control

PRINCIPLE OF OPERATION

The traction control system helps avoid drive wheel spin and loss of traction.

If your vehicle begins to slide, the system applies the brakes to individual wheels and, when needed, reduces engine power at the same time. If the wheels spin when accelerating on slippery or loose surfaces, the system reduces engine power in order to increase traction.

USING TRACTION CONTROL



WARNING: Operating your vehicle with the traction control disabled could lead to an increased risk of loss of vehicle control, vehicle rollover, personal injury and death.

The system automatically turns on each time you switch the ignition on.

If your vehicle is stuck in mud or snow, switch traction control off to allow the wheels to spin.

Switching the System Off



The button for the traction control system is located on the instrument panel.

When you switch the system off, the TCS off lamp illuminates in the instrument cluster.

Use the switch again to return the traction control system to normal operation.

System Indicator Lights and Messages



The traction control light temporarily illuminates on engine start-up and flashes when a driving condition activates the system.



The traction control off light temporarily illuminates on engine start-up and stays on when the traction control system is switched off or a problem occurs in the system.

Stability Control

PRINCIPLE OF OPERATION



WARNING: Vehicle modifications involving braking system, aftermarket roof racks, suspension, steering system, tire construction and wheel and tire size may change the handling characteristics of your vehicle and may adversely affect the performance of the electronic stability control system. In addition, installing any stereo loudspeakers may interfere with and adversely affect the electronic stability control system. Install any aftermarket stereo loudspeaker as far as possible from the front center console, the tunnel, and the front seats in order to minimize the risk of interfering with the electronic stability control sensors. Reducing the effectiveness of the electronic stability control system could lead to an increased risk of loss of vehicle control, vehicle rollover, personal injury and death.



WARNING: Remember that even advanced technology cannot defy the laws of physics. It's always possible to lose control of a vehicle due to inappropriate driver input for the conditions. Aggressive driving on any road condition can cause you to lose control of your vehicle increasing the risk of personal injury or property damage. Activation of the electronic stability control system is an indication that at least some of the tires have exceeded their ability to grip the road; this could reduce the operator's ability to control the vehicle potentially resulting in a loss of vehicle control, vehicle rollover, personal injury and death. If your electronic stability control system activates, SLOW DOWN.

The system automatically turns on each time you switch the ignition on.

If a fault occurs in either the stability control or the traction control system, you may experience the following conditions:

- The stability and traction control light illuminates steadily.
- The stability control and traction control systems do not enhance your vehicle's ability to maintain traction of the wheels.

If a driving condition activates either the stability control or the traction control system you may experience the following conditions:

- The stability and traction control light flashes.
- Your vehicle slows down.
- Reduced engine power.
- A vibration in the brake pedal.
- The brake pedal is stiffer than usual.
- If the driving condition is severe and your foot is not on the brake, the brake pedal may move as the system applies higher brake force.

The stability control system has several features built into it to help you maintain control of your vehicle:

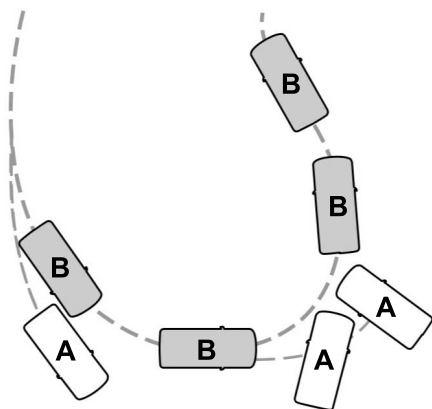
Electronic Stability Control

The system enhances your vehicle's ability to prevent skids or lateral slides by applying brakes to one or more of the wheels individually and, if necessary, reducing engine power.

Traction Control

The system enhances your vehicle's ability to maintain traction of the wheels by detecting and controlling wheel spin. See **Using Traction Control** (page 101).

Stability Control



- A Vehicle without stability control skidding off its intended route.
- B Vehicle with stability control maintaining control on a slippery surface.

USING STABILITY CONTROL

The system automatically turns on each time you switch the ignition on.

You cannot switch the stability control system off, but when you shift into reverse (R), the system deactivates.

You can switch the traction control system off or on. See **Using Traction Control** (page 101).

Parking Aids

REAR VIEW CAMERA (IF EQUIPPED)



WARNING: The rear view camera system is a reverse aid supplement device that still requires the driver to use it in conjunction with the interior and exterior mirrors for maximum coverage.



WARNING: Objects that are close to either corner of the bumper or under the bumper, might not be seen on the screen due to the limited coverage of the camera system.



WARNING: Use caution when the rear cargo door is ajar. If the rear cargo door is ajar, the camera will be out of position and the video image could be incorrect. All guide lines disappear when the rear cargo door is ajar. Failure to follow this instruction could result in personal injury.



WARNING: Reverse your vehicle slowly. Failure to follow this instruction could result in the loss of control of your vehicle, personal injury or death.



WARNING: Use caution when turning camera features on or off when the transmission is not in park (P). Make sure your vehicle is not moving.

The rear view camera system provides a video image of the area behind your vehicle.

Example



The camera is located on the rear of your vehicle.

Note: Camera location may vary depending on the configuration of your vehicle.

Using the Rear View Camera System

The rear view camera system displays what is behind your vehicle when you place the transmission in reverse (R).

Note: When towing, the camera only sees what you are towing behind your vehicle. This might not provide adequate coverage as it usually provides in normal operation and you might not see some objects.

The camera may not operate correctly under the following conditions:

- Mud, water or debris obstructs the camera's view. Clean the lens with a soft, lint-free cloth and non-abrasive cleaner.
- The camera is misaligned due to damage to the rear of your vehicle.

Cruise Control (If Equipped)

WHAT IS CRUISE CONTROL

Cruise control lets you maintain a set speed without keeping your foot on the accelerator pedal.

Requirements

Use cruise control when the vehicle speed is greater than 20 mph (30 km/h).

SWITCHING CRUISE CONTROL ON AND OFF



WARNING: Do not use cruise control on winding roads, in heavy traffic or when the road surface is slippery. This could result in loss of vehicle control, serious injury or death.

The cruise controls are on the steering wheel. See **Cruise Control** (page 49).

Switching Cruise Control On

ON

Press the button.

Switching Cruise Control Off

OFF

Press the button when the system is in standby mode.

The system also turns off when you switch the ignition off.

Note: The set speed erases when you switch the system off.

SETTING THE CRUISE CONTROL SPEED



WARNING: When you are going downhill, your vehicle speed could increase above the set speed. The system does not apply the brakes.

Drive to the speed you prefer.

SET+

Press either button to set the current speed.

SET-

Take your foot off the accelerator pedal.

Note: The indicator changes color in the information display.

Changing the Set Speed

SET+

Press and release the button to increase the set speed in small increments.

Press and hold the button to accelerate. Release the button when you reach your preferred speed.

SET-

Press and release the button to decrease the set speed in small increments.

Press and hold the button to decelerate. Release the button when you reach your preferred speed.

Note: If you accelerate by pressing the accelerator pedal, the set speed does not change. When you release the accelerator pedal, your vehicle returns to the speed that you previously set.

Cruise Control (If Equipped)

CANCELING THE SET SPEED



Press the button, or tap the brake pedal to cancel the set speed.

Note: The system remembers the set speed.

Note: The system cancels if the vehicle speed drops below 10 mph (16 km/h) under the set speed when driving uphill.

RESUMING THE SET SPEED



Press the button.

CRUISE CONTROL INDICATORS



Illuminates when you switch the system on.

USING ADAPTIVE CRUISE CONTROL



WARNING: You are responsible for controlling your vehicle at all times. The system is designed to be an aid and does not relieve you of your responsibility to drive with due care and attention. Failure to follow this instruction could result in the loss of control of your vehicle, personal injury or death.



WARNING: Do not use adaptive cruise control on winding roads, in heavy traffic or when the road surface is slippery. This could result in loss of vehicle control, serious injury or death.



WARNING: Pay close attention to changing road conditions such as entering or leaving a highway, on roads with intersections or roundabouts, roads without visible lanes of travel, roads that are unpaved, or steep slopes. Failure to follow this instruction could result in the loss of control of your vehicle, personal injury or death.



WARNING: In situations with poor visibility, such as fog, heavy rain or other inclement weather, you may need to override or completely switch off the system.



WARNING: Do not use the system when towing a trailer that has aftermarket electronic trailer brake controls. Failure to follow this instruction could result in the loss of control of your vehicle, personal injury or death.



WARNING: Do not use tire sizes other than those recommended because this can affect the normal operation of the system. Failure to do so may result in a loss of vehicle control, which could result in serious injury.



WARNING: The system may not detect stationary or slow moving vehicles below 6 mph (10 km/h).



WARNING: The system does not detect pedestrians or objects in the road.



WARNING: The system does not detect oncoming vehicles in the same lane.



WARNING: The system is not a crash warning or avoidance system.



WARNING: Do not use the system with a snow plow blade installed.

Cruise Control (If Equipped)

The system adjusts your vehicle speed to maintain the set gap between you and the vehicle in front of you in the same lane. You can select four gap settings.

The system uses a radar sensor that projects a beam directly in front of your vehicle.



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The adaptive cruise controls are on the steering wheel.

Switching Adaptive Cruise Control On

ON

Press and release the button.



The indicator, current gap setting and set speed appear in the information display.

Setting the Adaptive Cruise Speed

Drive to your preferred speed.

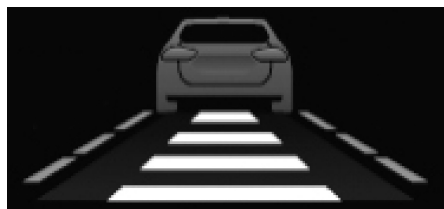
SET+

SET-

Press and release either button.

Take your foot off the accelerator pedal.

The indicator, current gap setting and set speed appear in the information display.



A vehicle graphic illuminates if there is a vehicle detected in front of you.

Note: When adaptive cruise control is active, the speedometer may vary slightly from the set speed displayed in the information display.

Following a Vehicle



WARNING: When following a vehicle that is braking, your vehicle does not always decelerate quickly enough to avoid a crash without driver intervention. Apply the brakes when necessary. Failure to follow this instruction could result in personal injury or death.



Cruise Control (If Equipped)



WARNING: The system only warns of vehicles detected by the radar sensor. In some cases there may be no warning or a delayed warning. Apply the brakes when necessary. Failure to follow this instruction could result in personal injury or death.

Note: When you are following a vehicle and you switch on a direction indicator, adaptive cruise control may provide a small temporary acceleration to help you pass.

Note: The brakes may emit noise when applied by the system.

When a vehicle ahead of you enters the same lane or a slower vehicle is ahead in the same lane, the vehicle speed adjusts to maintain a preset gap distance. A vehicle graphic illuminates in the instrument cluster.

Your vehicle maintains a consistent gap from the vehicle ahead until any of the following occur:

- The vehicle in front of you accelerates to a speed above the set speed.
- The vehicle in front of you moves out of the lane you are in.
- Your vehicle speed falls below 12 mph (20 km/h).
- You set a new gap distance.

The system applies the brakes to slow your vehicle to maintain a safe gap distance from the vehicle in front. The system only applies limited braking. You can override the system by applying the brakes.

If the system determines that its maximum braking level is not sufficient, an audible warning sounds, a message appears in the information display and an indicator flashes when the system continues to brake. Take immediate action.

Setting the Gap Distance

You can decrease or increase the distance between your vehicle and the vehicle in front by pressing the gap control.



Press and release to decrease the gap distance.



Press and release to increase the gap distance.



The selected gap appears in the information display as shown by the bars in the image.

Note: The gap setting is time dependent and therefore the distance adjusts with your vehicle speed.

Note: It is your responsibility to select a gap appropriate to the driving conditions.

Cruise Control (If Equipped)

Adaptive Cruise Control Gap Settings

Graphic Display, Bars Indicated Between Vehicles	Distance Gap	Dynamic Behavior
1	Closest.	Sport.
2	Close.	Normal.
3	Medium.	Normal.
4	Far.	Comfort.

Each time you switch the system on, it selects the last chosen gap setting.

Overriding the Set Speed



WARNING: If you override the system by pressing the accelerator pedal, it does not automatically apply the brakes to maintain a gap from any vehicle ahead.

When you press the accelerator pedal, you override the set speed and gap distance.



Use the accelerator pedal normally to intentionally exceed the set speed limit.

When you override the system, the green indicator light illuminates and the vehicle image does not appear in the information display.

The system resumes operation when you release the accelerator pedal. The vehicle speed decreases to the set speed, or a lower speed if following a slower vehicle.

Changing the Set Speed

SET+

Press and release to increase the set speed in small increments.

SET-

Press and release to decrease the set speed in small increments.

Press and hold either button to change the set speed in large increments. Release the button when the set speed has reached the desired speed.

The system may apply the brakes to slow the vehicle to the new set speed. The set speed displays continuously in the information display when the system is active.

Canceling the Set Speed

CNCL

Press and release the button or tap the brake pedal.

The set speed does not erase.

Resuming the Set Speed

RES

Press and release the button.

Your vehicle speed returns to the previously set speed and gap setting. The set speed displays continuously in the information display when the system is active.

Note: Only use resume if you are aware of the set speed and intend to return to it.

Automatic Cancellation

The system is not functional at vehicle speeds below 12 mph (20 km/h). An audible alarm sounds and the automatic braking releases if the vehicle drops below this speed.

Automatic cancellation can occur when the tires lose traction or you apply the parking brake.

Cruise Control (If Equipped)

Hilly Condition and Trailer Tow Usage

You should select a lower gear when the system is active in situations such as prolonged downhill driving on steep grades, for example in mountainous areas. The system needs additional engine braking in these situations to reduce the load on the vehicle's regular brake system to prevent it from overheating.

Note: An audible alarm sounds and the system shuts down if it applies the brakes for an extended period of time. This allows the brakes to cool. The system functions normally again after the brakes cool.

Note: When towing with adaptive cruise control, switch on Tow/Haul Mode.

Switching Adaptive Cruise Control Off

OFF

Press and release the button when the system is in standby mode, or switch the ignition off.

Note: The set speed is erased when you switch the system off.

Detection Issues



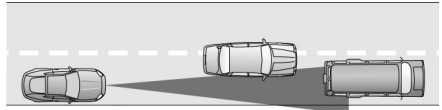
WARNING: On rare occasions, detection issues can occur due to the road infrastructures, for example bridges, tunnels and safety barriers. In these cases, the system may brake late or unexpectedly. At all times, you are responsible for controlling your vehicle, supervising the system and intervening, if required.



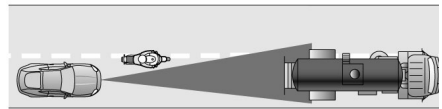
WARNING: If the system malfunctions, have your vehicle checked as soon as possible.

The radar sensor has a limited field of view. It may not detect vehicles at all or detect a vehicle later than expected in some situations. The lead vehicle graphic does not illuminate if the system does not detect a vehicle in front of you.

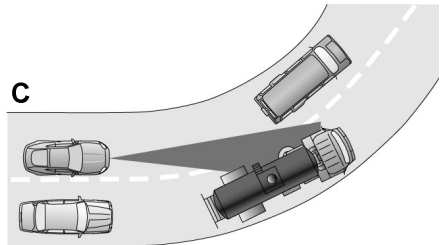
A



B



C



Detection issues can occur:

- A When driving on a different line than the vehicle in front.
- B With vehicles that edge into your lane. The system can only detect these vehicles once they move fully into your lane.
- C There may be issues with the detection of vehicles in front when driving into and coming out of a bend or curve in the road.

Cruise Control (If Equipped)

In these cases, the system may brake late or unexpectedly. You should stay alert and take action when necessary.

if something hits the front end of your vehicle or damage occurs, the radar-sensing zone may change. This could cause missed or false vehicle detection.

Optimal system performance requires a clear view of the road by the windshield-mounted camera.

Optimal performance may not occur if:

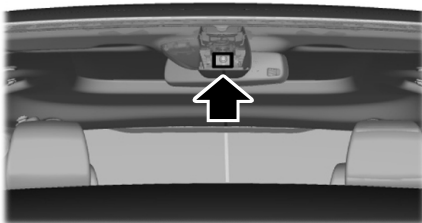
- The camera is blocked.
- There is poor visibility or lighting conditions.
- There are bad weather conditions.

System Not Available

Conditions that can cause the system to deactivate or prevent the system from activating when requested:

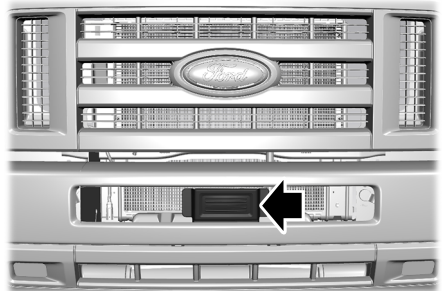
- A blocked sensor.
- High brake temperature.
- A failure in the system or a related system.

Blocked Sensor



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The camera is mounted on the windshield behind the interior mirror.



A message displays if something obstructs the radar signals from the sensor. The sensor is in the lower grille. The system cannot detect a vehicle ahead and does not function when something blocks the sensor.

Note: *You cannot see the sensor. It is behind a fascia panel.*

Keep the front of your vehicle free of dirt, metal badges or objects. Vehicle front protectors and aftermarket lights may also block the sensor.

Cruise Control (If Equipped)

Possible causes and actions for the blocked sensor message displaying:

Cause	Details
The surface of the radar is dirty or obstructed.	Clean the grille surface in front of the radar sensor or remove the object causing the obstruction.
The surface of the radar sensor is clean but the message remains in the display.	Wait a short time. It may take several minutes for the radar to detect that it is free from obstruction.
Heavy rain or snow is interfering with the radar signals.	Do not use the system in these conditions. It may not detect vehicles ahead.
Water, snow or ice on the road surface may interfere with the radar signals.	Do not use the system in these conditions. It may not detect vehicles ahead.
You are in a remote area with no other vehicles and no roadside objects.	Wait a short time or switch to normal cruise control.

Due to the nature of radar technology, it is possible to get a blocked sensor message without having an actual block. A false blocked condition either self-clears, or clears after you restart your vehicle.

Switching to Normal Cruise Control



WARNING: Normal cruise control will not brake when your vehicle is approaching slower vehicles. Always be aware of which mode you have selected and apply the brakes when necessary.



The cruise control indicator light replaces the adaptive cruise control indicator light if you select normal cruise control. The gap setting does not display, and the system does not respond to lead vehicles. Automatic braking remains active to maintain set speed.

You can change from adaptive cruise control to normal cruise control through the information display.

Driving Aids

DRIVER ALERT (IF EQUIPPED)



WARNING: You are responsible for controlling your vehicle at all times. The system is designed to be an aid and does not relieve you of your responsibility to drive with due care and attention. Failure to follow this instruction could result in the loss of control of your vehicle, personal injury or death.



WARNING: The system may not function if the sensor is blocked.



WARNING: Take regular rest breaks if you feel tired. Do not wait for the system to warn you.



WARNING: Certain driving styles may result in the system warning you even if you are not feeling tired.



WARNING: In cold and severe weather conditions the system may not function. Rain, snow and spray can all limit sensor performance.



WARNING: The system will not operate if the sensor cannot track the road lane markings.



WARNING: If damage occurs in the immediate area surrounding the sensor, have your vehicle checked as soon as possible.



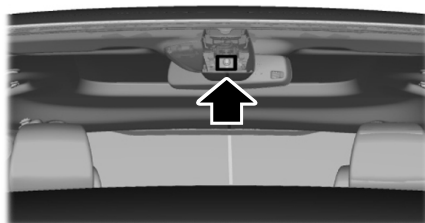
WARNING: The system may not correctly operate if your vehicle is fitted with a suspension kit not approved by us.

Note: Keep the windshield free from obstructions. For example, bird droppings, insects and snow or ice.

Note: If the camera is blocked or if the windshield is damaged, the system may not function.

Note: The system remembers the last setting when you start your vehicle, unless it detects a MyKey™.

Note: If enabled in the menu, the system activates at speeds above 40 mph (64 km/h).



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The system monitors your driving behavior using various inputs including the front camera sensor.

If the system detects reduced driving alertness below a certain threshold, the system alerts you using a tone and a message in the information display.

Using Driver Alert

Switching the system on and off

You may switch the system on or off through the information display by selecting Settings, Driver Assist and then Driver Alert in the menu. When activated, the system monitors your alertness level based upon your driving behavior in relation to the lane markings, and other factors.

System Warnings

Note: The system does not issue warnings below approximately 40 mph (64 km/h).

Driving Aids

The warning system uses two stages. At first the system issues a temporary warning that you need to take a rest. This message only appears for a short time. If the system detects further reduction in driving alertness, another warning could be issued which remains in the information display for a longer time. Press OK on the steering wheel control to clear the warning. When active the system runs in the background and only issues a warning if required.

Resetting the System

You can reset the system by either:

- Switching the ignition off and on.
- Stopping the vehicle and then opening and closing the driver door.

LANE KEEPING SYSTEM (IF EQUIPPED)



WARNING: You are responsible for controlling your vehicle at all times. The system is designed to be an aid and does not relieve you of your responsibility to drive with due care and attention. Failure to follow this instruction could result in the loss of control of your vehicle, personal injury or death.



WARNING: Always drive with due care and attention when using and operating the controls and features on your vehicle.



WARNING: In cold and severe weather conditions the system may not function. Rain, snow and spray can all limit sensor performance.



WARNING: The system will not operate if the sensor cannot track the road lane markings.



WARNING: The sensor may incorrectly track lane markings as other structures or objects. This can result in a false or missed warning.



WARNING: Large contrasts in outside lighting can limit sensor performance.



WARNING: The system may not operate properly if the sensor is blocked. Keep the windshield free from obstruction.



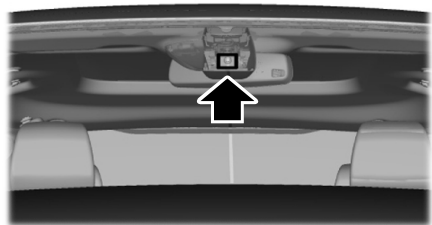
WARNING: If damage occurs in the immediate area surrounding the sensor, have your vehicle checked as soon as possible.



WARNING: The system may not correctly operate if your vehicle is fitted with a suspension kit not approved by us.

Note: The system works if the camera can detect one lane marking at a speed above 40 mph (64 km/h).

Note: The system may not function with a blocked camera, or if the windshield is damaged or dirty.



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Driving Aids

When you switch the lane keeping system on and the camera detects a drift out of the travel lane, the system alerts the driver by playing a chime.

Switching the System On and Off

Note: The system stores the on or off setting until you manually change it.

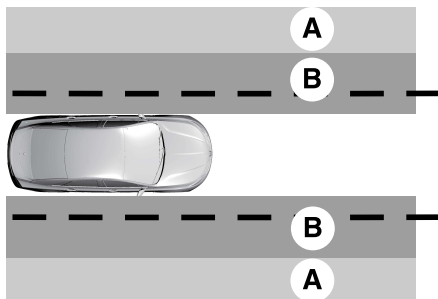


Press the button to switch the system on or off. The button is above the audio unit or on the center console.

System Settings

Adjust the system sensitivity and intensity through the display screen. See **General Information** (page 65). The system remembers the last selection. You do not need to readjust the setting each time you switch on your vehicle.

Sensitivity: This setting allows you to select where you would like to receive the alert within the lane. Increasing the sensitivity setting moves the warning zones in closer to your vehicle.



- A Normal
- B Increased

Note: The alert diagram illustrates general zone coverage. It does not provide exact zone parameters.

System Display



When you switch on the system, a graphic with lane markings appears in the display screen.

Note: The overhead vehicle graphic may still display if adaptive cruise control is enabled.

While the system is on, the color of the lane markings change to indicate the system status.

Gray: Indicates that the system is temporarily unable to provide a warning on the indicated side(s). This may be because:

- Your vehicle is below the activation speed.
- The direction indicator is active.
- Your vehicle is in a dynamic maneuver.
- The road has no or poor lane markings in the camera field-of-view.
- Certain conditions can prevent the camera from detecting the lane markings. These conditions can include any of the following: environmental, traffic, vehicle conditions, significant sun angles, shadows, snow, heavy rain or fog, following a large vehicle that is blocking or shadowing the lane, or poor headlamp illumination.

Driving Aids

See **Troubleshooting** for additional information.

Green: Indicates that the system is available or ready to provide a warning on the indicated side(s).

Red: Indicates that the system is providing or has just provided a lane keeping alert warning.

You can temporarily disable the system at any time by doing the following:

- Quick braking.
- Fast acceleration.
- Using your direction indicator.
- Evasive steering maneuver.
- Driving too close to the lane markings.

Troubleshooting

Why is the feature not available (line markings are gray) when I can see the lane markings on the road?
Your vehicle speed is outside the operational range of the feature.
The sun is shining directly into the camera lens.
A quick intentional lane change has occurred.
Your vehicle stays too close to the lane markings.
Driving at high speeds in curves.
The last feature activation occurred a short time ago.
Ambiguous lane markings, for example in construction zones.
Rapid transition from light to dark, or from dark to light.
Sudden offset in lane markings.
ABS or AdvanceTrac™ is active.
There is a camera blockage due to dirt, grime, fog, frost or water on the windshield.
You are driving too close to the vehicle in front of you.
Transitioning between no lane markings to lane markings or vice versa.
There is standing water on the road.
Faint lane markings, for example partial yellow lane markings on concrete roads.
Lane width is too narrow or too wide.
No one calibrated the camera after replacing the windshield.
Driving on tight roads or on uneven roads.
Vehicle accessories are blocking the camera, for example a snowplow.

Driving Aids

STEERING

Hydraulic Power Steering

To help prevent damage to the power steering system:

- Do not hold the steering wheel at its furthest turning points for more than three to five seconds when the engine is running.
- Avoid continuously steering back and forth with elevated engine RPM as this may overheat the system. If trying to free a stuck vehicle, pause between attempts to allow the power steering system to cool or seek assistance. Typical steering and driving maneuvers allow the system to cool.
- Do not operate the vehicle if the power steering pump fluid level is below the MIN mark on the reservoir.
- Some noise is normal during operation. If excessive, check for low power steering pump fluid level before seeking service by your dealer.
- Heavy or uneven efforts may be caused by low power steering fluid. Check for low power steering pump fluid level before seeking service by your dealer.
- Do not fill the power steering pump reservoir above the MAX mark on the reservoir, as this may result in leaks from the reservoir.

If the power steering system breaks down or if you switch the engine off, you can steer the vehicle manually, but it takes more effort.

If you have any steering components serviced or replaced, install new fasteners. Many fasteners have coatings with thread adhesive, or have prevailing torque features you cannot reuse. Do not reuse a bolt or nut. Torque fasteners to specifications.

Steering Tips

If the steering wanders or pulls, check for:

- An improperly inflated tire.
- Uneven tire wear.
- Loose or worn suspension components.
- Loose or worn steering components.
- Improper vehicle alignment.

Note: *A high crown in the road or high crosswinds may also make the steering seem to wander or pull.*

PRE-COLLISION ASSIST (IF EQUIPPED)



WARNING: You are responsible for controlling your vehicle at all times. The system is designed to be an aid and does not relieve you of your responsibility to drive with due care and attention. Failure to follow this instruction could result in the loss of control of your vehicle, personal injury or death.



WARNING: The system does not operate during hard acceleration or steering. Failure to take care may lead to a crash or personal injury.



WARNING: The system may operate with reduced function during cold and inclement weather conditions. Snow, ice, rain, spray and fog can adversely affect the system. Keep the front camera and radar free of snow and ice. Failure to follow this instruction may result in the loss of control of your vehicle, serious personal injury or death.

Driving Aids



WARNING: System performance could be reduced in situations where the vehicle camera has limited detection capability. These situations include but are not limited to direct or low sunlight, vehicles at night without tail lights, unconventional vehicle types, and pedestrians and cyclists with complex, partially obscured backgrounds. Failure to take care may result in the loss of control of your vehicle, personal injury or death.



WARNING: Take additional care if your vehicle is heavily loaded or you are towing a trailer. These conditions could result in reduced performance of this system. Failure to follow this instruction could result in the loss of control of your vehicle, personal injury or death.



WARNING: The system cannot help prevent all crashes. Do not rely on this system to replace driver judgment and the need to maintain a safe distance and speed.

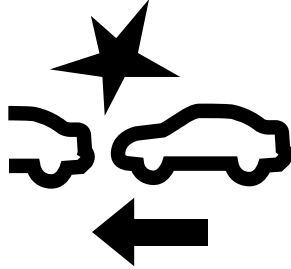
Using the Pre-Collision Assist System

The pre-collision assist system is active at speeds above 3 mph (5 km/h). Pedestrian detection functions at speeds up to 50 mph (80 km/h).



If your vehicle is rapidly approaching another stationary vehicle or a vehicle traveling in the same direction as yours, the system provides three levels of functionality:

- Alert.
- Brake support.
- Active braking.



Alert: When active, a flashing visual warning appears and an audible warning tone sounds.

Brake support: Helps reduce the impact speed by preparing the brakes for rapid braking. The system does not automatically apply the brakes. If you press the brake pedal, the system could apply additional braking up to maximum braking force, even if you lightly press the brake pedal.

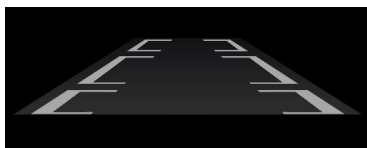
Active braking: May activate if the system determines that a collision is imminent. The system may help the driver reduce impact damage or completely avoid the crash.

Note: *If you perceive pre-collision assist alerts as being too frequent you can reduce the alert sensitivity, though the manufacturer recommends using the highest sensitivity setting where possible. Setting lower sensitivity would lead to fewer and later system warnings.*

Driving Aids

Distance Indication and Alert

Provides the driver with a graphical indication of the time gap to other preceding vehicles traveling in the same direction. The distance indication and alert screen in the instrument cluster display shows one of the following graphics.



If the time gap to a preceding vehicle is small, a red visual indication displays.

Note: Distance indication and alert deactivates and the graphics do not display when adaptive cruise control is active.

Adjusting the Pre-Collision Assist Settings

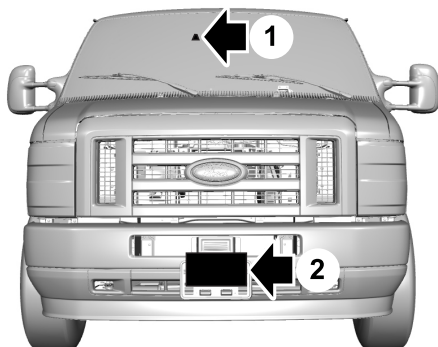
You can adjust the following settings by using the instrument cluster display controls. See **General Information** (page 65).

- You can change alert and distance alert sensitivity to one of three possible settings.
- You can switch distance indication and alert on or off.
- If required, you can switch active braking on or off.
- If required, you can switch the pre-collision assist feature on or off.

Note: Active braking turns on every time you switch the ignition on.

Note: Switch the system off if you install a snowplow or similar object in a way that it may block the radar sensor. Your vehicle remembers the selected setting across key cycles.

Blocked Sensors



- 1 Camera.
- 2 Radar sensor.

Driving Aids

If a message regarding a blocked sensor or camera appears in the instrument cluster display, the radar signals or camera images are obstructed. With a blocked sensor or camera, the pre-collision assist

system may not function, or performance may reduce. The following table lists possible causes and actions for when this message displays.

Camera Troubleshooting

Cause	Action
The windshield in front of the camera is dirty or obstructed in some way.	Clean the outside of the windshield in front of the camera.
The windshield in front of the camera is clean but the message remains in the display screen.	Wait a short time. It may take several minutes for the camera to detect that there is no obstruction.

Radar Troubleshooting

Cause	Action
The surface of the radar in the grille is dirty or obstructed in some way.	Clean the grille surface in front of the radar or remove the object causing the obstruction.
The surface of the radar in the grille is clean but the message remains in the display screen.	Wait a short time. It may take several minutes for the radar to detect that there is no obstruction.
Heavy rain, road spray, snow or fog is interfering with the radar signals.	The pre-collision assist system is temporarily disabled. Pre-collision assist automatically reactivates a short time after the weather conditions improve.
Swirling water or snow or ice on the surface of the road may interfere with the radar signals.	The pre-collision assist system is temporarily disabled. Pre-collision assist automatically reactivates a short time after the weather conditions improve.
Radar is out of alignment due to a front end impact.	Contact an authorized dealer to have the radar checked for proper coverage and operation.

Note: Proper system operation requires a clear view of the road. Repair any windshield damage in the area of the camera's field of view.

Driving Aids

Note: *If something hits the front end of your vehicle or damage occurs and your vehicle has a radar sensor, the radar sensing zone may change. This could cause missed or false vehicle detections. Contact an authorized dealer to have the radar checked for proper coverage and operation.*

Note: *If your vehicle detects excessive heat at the camera or a potential misalignment condition, a message may display in the instrument cluster display indicating the sensor is temporarily unavailable. When operational conditions are correct, the message deactivates. For example, when the ambient temperature around the sensor decreases or the sensor successfully recalibrates.*

Load Carrying

LOAD LIMIT

Vehicle Loading - with and without a Trailer

This section guides you in the proper loading of your vehicle, trailer, or both. Keep your loaded vehicle weight within its design rating capability, with or without a trailer. Properly loading your vehicle provides maximum return of vehicle design performance. Before you load your vehicle, become familiar with the following terms for determining your vehicle's weight rating, with or without a trailer, from the vehicle's Tire and Loading Information label or Safety Compliance Certification label.

Tire and Loading Label Information Example:



TIRE AND LOADING INFORMATION

SEATING CAPACITY TOTAL: 5 FRONT: 2 REAR: 3

The combined weight of occupants and cargo should never exceed: 385 kg or 850 lbs.

TIRE	SIZE	COLD TIRE PRESSURE
FRONT	235/45R18 94V	235 KPA, 34 PSI
REAR	235/45R18 94V	235 KPA, 34 PSI
SPARE	NONE	NONE

SEE OWNERS
MANUAL FOR
ADDITIONAL
INFORMATION



TIRE AND LOADING INFORMATION RENSEIGNEMENTS SUR LES PNEUS ET LE CHARGEMENT

SEATING CAPACITY NOMBRE DE PLACES TOTAL 5 FRONT AVANT 2 REAR ARRIERE 3

The combined weight of occupants and cargo should never exceed 396 kg or 875 lbs.
Le poids total des occupants et du chargement ne doit jamais dépasser

TIRE PNEU	SIZE DIMENSIONS	COLD TIRE PRESSURE PRESSION DES PNEUS A FROID
FRONT AVANT	235/40R19 96V	255 KPA, 37 PSI
REAR ARRIERE	235/40R19 96V	255 KPA, 37 PSI
SPARE DE SECOURS	T125/80R16 97M	415 KPA, 60 PSI

SEE OWNER'S
MANUAL FOR
ADDITIONAL
INFORMATION
VOIR LE MANUEL
DE L'USAGER
POUR PLUS DE
RENSEIGNEMENTS

Payload

Payload is the combined weight of cargo and passengers that your vehicle is carrying. The maximum payload for your vehicle appears on the Tire and Loading label. The label is either on the B-pillar or the edge of the driver door. Vehicles exported outside the US and Canada may not have a tire and loading label. Look for "The combined weight of occupants and cargo should never exceed XXX kg OR XXX lb" for maximum payload. The payload listed on the Tire and Loading Information label

Load Carrying

is the maximum payload for your vehicle as built by the assembly plant. If you install any additional equipment on your vehicle, you must determine the new payload. Subtract the weight of the equipment from the payload listed on the Tire and Loading label. When towing, trailer tongue weight or king pin weight is also part of payload.



WARNING: The appropriate loading capacity of your vehicle can be limited either by volume capacity (how much space is available) or by payload capacity (how much weight the vehicle should carry). Once you have reached the maximum payload of your vehicle, do not add more cargo, even if there is space available. Overloading or improperly loading your vehicle can contribute to loss of vehicle control and vehicle rollover.

GAWR (Gross Axle Weight Rating)

GAWR is the maximum allowable weight that a single axle (front or rear) can carry. These numbers are on the Safety Compliance Certification label. The label is located on the door hinge pillar, door-latch post, or the door edge that meets the door-latch post, next to the driver seating position.

The total load on each axle must never exceed its Gross Axle Weight Rating.

GVWR (Gross Vehicle Weight Rating)

GVWR is the maximum allowable weight of the fully loaded vehicle. This includes all options, equipment, passengers and cargo. It appears on the Safety Compliance Certification label. The label is located on the door hinge pillar, door-latch post, or the door edge that meets the door-latch post, next to the driver seating position.

The gross vehicle weight must never exceed the Gross Vehicle Weight Rating.

Safety Compliance Certification Label Example:

MFD. BY FORD MOTOR CO.		MFD. BY FORD MOTOR CO.	
DATE: XXXX	GVWR: XXXX LB	DATE: XXXX	GVWR: XXXX LB
FRONT GAWR: XXXX KG / XXXX LB	REAR GAWR: XXXX KG / XXXX LB	FRONT GAWR: XXXX KG / XXXX LB	REAR GAWR: XXXX KG / XXXX LB
XXX XXXX XXXX	XXX XXXX XXXX	XXX XXXX XXXX	XXX XXXX XXXX
AT XXXX kPa / XXX PSI COLD	AT XXXX kPa / XXX PSI COLD	AT XXXX kPa / XXX PSI COLD	AT XXXX kPa / XXX PSI COLD
THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR VEHICLE SAFETY AND THEFT PROTECTION STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.		THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR VEHICLE SAFETY AND THEFT PROTECTION STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.	
VIN: XXXXXXXXXXXXXXXXXX	VIN: XXXXXXXXXXXXXXXXXX	VIN: XXXXXXXXXXXXXXXXXX	VIN: XXXXXXXXXXXXXXXXXX
EXPIRY: XX/XX/XXXX	EXPIRY: XX/XX/XXXX	EXPIRY: XX/XX/XXXX	EXPIRY: XX/XX/XXXX
WB: XXX	WB: XXX	WB: XXX	WB: XXX
XXX	XXX	XXX	XXX

Load Carrying



WARNING: Exceeding the Safety Compliance Certification label vehicle weight limits can adversely affect the performance and handling of your vehicle, cause vehicle damage and can result in the loss of control of your vehicle, serious personal injury or death.

Maximum Loaded Trailer Weight

Maximum loaded trailer weight is the highest possible weight of a fully loaded trailer the vehicle can tow. Consult an authorized dealer (or the RV and Trailer Towing Guide available at an authorized dealer) for more detailed information.

GCWR (Gross Combined Weight Rating)

GCWR is the maximum allowable weight of the vehicle and the loaded trailer, including all cargo and passengers, that the vehicle can handle without risking damage. (Important: The towing vehicle's braking system is rated for operation at Gross Vehicle Weight Rating, not at Gross Combined Weight Rating.) Separate functional brakes should

be used for safe control of towed vehicles and for trailers where the Gross Combined Weight of the towing vehicle plus the trailer exceed the Gross Vehicle Weight Rating of the towing vehicle.

The gross combined weight must never exceed the Gross Combined Weight Rating.

Note: For trailer towing information refer to the *RV and Trailer Towing Guide* available at an authorized dealer.



WARNING: Do not exceed the GVWR or the GAWR specified on the certification label.



WARNING: Do not use replacement tires with lower load carrying capacities than the original tires because they may lower your vehicle's GVWR and GAWR limitations. Replacement tires with a higher limit than the original tires do not increase the GVWR and GAWR limitations.



WARNING: Exceeding any vehicle weight rating can adversely affect the performance and handling of your vehicle, cause vehicle damage and can result in the loss of control of your vehicle, serious personal injury or death.

Load Carrying

Steps for determining the correct load limit:

1. Locate the statement "The combined weight of occupants and cargo should never exceed XXX kg or XXX lb." on your vehicle's placard.
2. Determine the combined weight of the driver and passengers that will be riding in your vehicle.
3. Subtract the combined weight of the driver and passengers from XXX kg or XXX lb.
4. The resulting figure equals the available amount of cargo and luggage load capacity. For example, if the "XXX" amount equals 1,400 lb. and there will be five 150 lb. passengers in your vehicle, the amount of available cargo and luggage load capacity is 650 lb.
 $(1400 - (5 \times 150) = 1400 - 750 = 650 \text{ lb.})$
5. Determine the combined weight of luggage and cargo being loaded on the vehicle. That weight may not safely exceed the available cargo and luggage load capacity calculated in Step 4.
6. If your vehicle will be towing a trailer, load from your trailer will be transferred to your vehicle. Consult this manual to determine how this reduces the available cargo and luggage load capacity of your vehicle.

Helpful examples for calculating the available amount of cargo and luggage load capacity

Suppose your vehicle has a 1400-pound (635-kilogram) cargo and luggage capacity. You decide to go golfing. Is there enough load capacity to carry you, four of your friends and all the golf bags? You and four friends average 220 pounds (99 kilograms) each and the golf bags weigh approximately 30 pounds (13.5 kilograms) each. The calculation would be: $1400 - (5 \times 220) - (5 \times 30) = 1400 - 1100 - 150 = 150$ pounds. Yes, you have enough load capacity in your vehicle to transport four friends and your golf bags. In metric units, the calculation would be: $635 \text{ kilograms} - (5 \times 99 \text{ kilograms}) - (5 \times 13.5 \text{ kilograms}) = 635 - 495 - 67.5 = 72.5 \text{ kilograms}$.

Suppose your vehicle has a 1400-pound (635-kilogram) cargo and luggage capacity. You and one of your friends decide to pick up cement from the local home improvement store to finish that patio you have been planning for the past two years. Measuring the inside of the vehicle with the rear seat folded down, you have room for twelve 100-pound (45-kilogram) bags of cement. Do you have enough load capacity to transport the cement to your home? If you and your friend each weigh 220 pounds (99 kilograms), the calculation would be: $1400 - (2 \times 220) - (12 \times 100) = 1400 - 440$

Load Carrying

- 1200 = - 240 pounds. No, you do not have enough cargo capacity to carry that much weight. In metric units, the calculation would be: 635 kilograms - (2 x 99 kilograms) - (12 x 45 kilograms) = 635 - 198 - 540 = -103 kilograms. You will need to reduce the load weight by at least 240 pounds (104 kilograms). If you remove three 100-pound (45-kilogram) cement bags, then the load calculation would be: 1400 - (2 x 220) - (9 x 100) = 1400 - 440 - 900 = 60 pounds. Now you have the load capacity to transport the cement and your friend home. In metric units, the calculation would be: 635 kilograms - (2 x 99 kilograms) - (9 x 45 kilograms) = 635 - 198 - 405 = 32 kilograms.

The above calculations also assume that the loads are positioned in your vehicle in a manner that does not overload the front or the rear gross axle weight rating specified for your vehicle on the Safety Compliance Certification label.

Special Loading Instructions for Owners of Pick-up Trucks and Utility-type Vehicles



WARNING: When loading the roof racks, we recommend you evenly distribute the load, as well as maintain a low center of gravity. Loaded vehicles, with higher centers of gravity, may

handle differently than unloaded vehicles. Take extra precautions, such as slower speeds and increased stopping distance, when driving a heavily loaded vehicle.

Towing

TOWING A TRAILER



WARNING: Do not exceed the GVWR or the GAWR specified on the certification label.



WARNING: Towing trailers beyond the maximum recommended gross trailer weight exceeds the limit of your vehicle and could result in engine damage, transmission damage, structural damage, loss of vehicle control, vehicle rollover and personal injury.

Your vehicle may have electrical items, for example fuses or relays, related to towing. See **Fuses** (page 151).

Your vehicle's load capacity designation is by weight, not by volume, so you cannot necessarily use all available space when loading your vehicle.

Towing a trailer places an extra load on your vehicle's engine, transmission, axle, brakes, tires and suspension. Inspect these components periodically during, and after, any towing operation.

Load Placement

To help minimize how trailer movement affects your vehicle when driving:

- Load the heaviest items closest to the trailer floor.
- Load the heaviest items centered between the left and right side trailer tires.
- Load the heaviest items above the trailer axles or just slightly forward toward the trailer tongue. Do not allow the final trailer tongue weight to go above or below 10-15% of the loaded trailer weight.
- Select a draw bar with the correct rise or drop. When both the loaded vehicle and trailer are connected, the trailer frame should be level, or slightly angled down toward your vehicle, when viewed from the side.

When driving with a trailer or payload, a slight takeoff vibration or shudder may be present due to the increased payload weight. Additional information regarding correct trailer loading and setting your vehicle up for towing is located in another chapter of this Owner's Manual. See **Load Limit** (page 122). You can also find the information in the RV & Trailer Towing Guide. See an authorized dealer.

Towing

You can also find information in the **RV & Trailer Towing Guide**

available at your authorized dealer, or online.

RV & Trailer Towing Guide Online

Website	http://www.fleet.ford.com/towing-guides/
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RECOMMENDED TOWING WEIGHTS

Market	Website
United States of America	https://www.fordpro.com/en-us/fleet-vehicles/manuals-and-guides/
Canada	https://www.fordpro.com/en-us/fleet-vehicles/manuals-and-guides/

Towing

ESSENTIAL TOWING CHECKS

Follow these guidelines for safe towing:

- Do not tow a trailer until you drive your vehicle at least 1,000 mi (1,600 km).
- Consult your local motor vehicle laws for towing a trailer.
- See the instructions included with towing accessories for the proper installation and adjustment specifications.
- Service your vehicle more frequently if you tow a trailer. See your scheduled maintenance information. See **Scheduled Maintenance** (page 249).
- If you use a rental trailer, follow the instructions the rental agency gives you.

See **Load limits** in the Load Carrying chapter for load specification terms found on the tire label and Safety Compliance label and instructions on calculating your vehicle's load.

Remember to account for the trailer tongue weight as part of your vehicle load when calculating the total vehicle weight.

Trailer Towing Connector



When attaching the trailer wiring connector to your vehicle, only use a proper fitting connector that works with the vehicle and trailer functions. Some seven-position connectors may have the SAE J2863 logo, which confirms that it is the proper wiring connector and works correctly with your vehicle.

Color	Function
Yellow	Left turn signal and stop lamp
White	Ground (-)
Blue	Electric brakes
Green	Right turn signal and stop lamp
Orange	Battery (+)
Brown	Running lights
Grey	Reverse lights

Hitches

Do not use a hitch that either clamps onto the bumper or attaches to the axle. You must distribute the load in your trailer so that 10-15% of the total weight of the trailer is on the tongue.

Weight-distributing Hitches



WARNING: Do not adjust the spring bars so that your vehicle's rear bumper is higher than before attaching the trailer. Doing so will defeat the function of the weight-distributing hitch, which may cause unpredictable handling, and could result in serious personal injury.

When connecting a trailer using a weight-distributing hitch, always use the following procedure:

Towing

1. Park the loaded vehicle, without the trailer, on a level surface.
2. Measure the height to the top of your vehicle's front wheel opening on the fender. This is H1.
3. Attach the loaded trailer to your vehicle without the weight-distributing bars connected.
4. Measure the height to the top of your vehicle's front wheel opening on the fender a second time. This is H2.
5. Install and adjust the tension in the weight-distributing bars so that the height of your vehicle's front wheel opening on the fender is approximately halfway down from H2, toward H1.
6. Check that the trailer is level or slightly nose down toward your vehicle. If not, adjust the ball height accordingly and repeat Steps 2-6.

When the trailer is level or slightly nose down toward the vehicle:

- Lock the bar tension adjuster in place.
- Check that the trailer tongue securely attaches and locks onto the hitch.
- Install safety chains, lighting and trailer brake controls as required by law or the trailer manufacturer.

Safety Chains

Note: *Do not attach safety chains to the bumper.*

Always connect the safety chains to the frame or hook retainers of your vehicle hitch.

To connect the safety chains, cross the chains under the trailer tongue and allow enough slack for turning tight corners. Do not allow the chains to drag on the ground.

Trailer Brakes



WARNING: Do not connect a trailer's hydraulic brake system directly to your vehicle's brake system. Your vehicle may not have enough braking power and your chances of having a collision greatly increase.

Electric brakes and manual, automatic or surge-type trailer brakes are safe if you install them properly and adjust them to the manufacturer's specifications. The trailer brakes must meet local and federal regulations.

The rating for the tow vehicle's braking system operation is at the gross vehicle weight rating, not the gross combined weight rating.

Separate functioning brake systems are required for safe control of towed vehicles and trailers weighing more than 1500 lb (680 kg) when loaded.

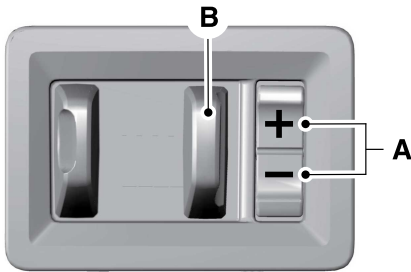
Integrated Trailer Brake Controller (If Equipped)



WARNING: Use the integrated trailer brake controller to properly adjust the trailer brakes and check all connections before towing a trailer. Failure to follow this instruction could result in the loss of control of your vehicle, personal injury or death.

Note: *The Ford trailer brake controller has been verified to be compatible with trailers having electric-actuated drum brakes (one to four axles) and electric-over-hydraulic surge-style trailer brakes. It is the responsibility of the customer to ensure that the trailer brakes are adjusted appropriately, functioning normally and all electric connections are properly made.*

Towing



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When used properly, the trailer brake controller assists in smooth and effective trailer braking by powering the trailer's electric or electric-over-hydraulic brakes with a proportional output based on the towing vehicle's brake pressure.

The controller user interface consists of the following:

A: + and - (Gain adjustment buttons): Pressing these buttons adjusts the controller's power output to the trailer brakes in 0.5 increments. You can increase the gain setting to 10.0 (maximum trailer braking) or decrease it to 0 (no trailer braking). The gain setting displays in the message center.

The controller shows gain setting, output bar graph, and trailer connectivity status in the information display. They appear in the information display as follows:

- **Trailer Brake Controller Gain** (without trailer connected): Shows the current gain setting during a given ignition cycle and when adjusting the gain. This also displays if you use the manual control lever or make gain adjustments with no trailer connected.
- **Trailer Brake Controller Gain Output:** Displays when you push your vehicle's brake pedal, or upon use of the manual control. Bar indicators illuminate in the information display to indicate the amount of power going to the trailer brakes relative to the brake pedal or manual control input. One bar indicates the least amount of output; six bars indicate maximum output.
- **Trailer Connected:** Displays when the system senses a correct trailer wiring connection (a trailer with electric trailer brakes) during a given ignition cycle.
- **Trailer Disconnected:** Displays, accompanied by a single audible tone, when the system senses a trailer connection and then a disconnection, either intentional or unintentional, during a given ignition cycle. It also displays if a truck or trailer-wiring fault occurs causing the trailer to appear disconnected. This message also displays if you use the manual control lever without a trailer connected.

B: Manual control lever: Slide the control lever to the left to switch on the trailer's electric brakes independent of the tow vehicle's. See **Procedure for Adjusting Gain** section for instructions on proper use of this feature. If you use the manual control while the brake is also applied, the greater of the two inputs determines the power sent to the trailer brakes.

Towing

- **Stoplamps:** Using the manual control lever illuminates both the trailer brake lamps and your vehicle brake lamps except the center high mounted stoplamp, if you make the proper electrical connection to the trailer. Pressing your vehicle brake pedal also illuminates both trailer and vehicle brake lamps.

Procedure for Adjusting Gain

Note: Only perform this procedure in a traffic-free environment at speeds of approximately 20-25 mph (30-40 km/h).

The gain setting sets the trailer brake controller for the specific towing condition. You should change the setting as towing conditions change. Changes to towing conditions include trailer load, vehicle load, road conditions and weather.

Set the gain to provide the maximum trailer braking assistance while making sure the trailer wheels do not lock when using the brakes. Locked trailer wheels may lead to trailer instability.

1. Make sure the trailer brakes are in good working condition, functioning normally and properly adjusted. See your trailer dealer if necessary.
2. Connect the trailer and make the electrical connections according to the trailer manufacturer's instructions.
3. When you plug in a trailer with electric or electric-over-hydraulic brakes, a message confirming connection appears in the information display.
4. Use the gain adjustment (+ and -) buttons to increase or decrease the gain setting to the desired starting point. A gain setting of 6.0 is a good starting point for heavier loads.

5. In a traffic-free environment, tow the trailer on a dry, level surface at a speed of 20-25 mph (30-40 km/h) and squeeze the manual control lever completely.
6. If the trailer wheels lock up, indicated by squealing tires, reduce the gain setting. If the trailer wheels turn freely, increase the gain setting. Repeat Steps 5 and 6 until the gain setting is at a point just below trailer wheel lock-up. If towing a heavier trailer, trailer wheel lock-up may not be attainable even with the maximum gain setting of 10.

Explanation of Information Display Warning Messages

Note: An authorized dealer can diagnose the trailer brake controller to determine exactly which trailer fault has occurred. However, your Ford warranty does not cover this diagnosis if the fault is with the trailer.

A message indicating a trailer brake module fault may display in response to faults sensed by the trailer brake controller, accompanied by a single tone. If this message appears, contact an authorized dealer as soon as possible for diagnosis and repair. The controller may still function, but performance may be degraded.

A message indicating a trailer wiring fault may display when there is a short circuit on the electric brake output wire. If this message displays, accompanied by a single tone, with no trailer connected, the problem is with your vehicle wiring between the trailer brake controller and the 7-pin connector at the bumper. If the message only displays with a trailer connected, the problem is with the trailer

Towing

wiring. Consult your trailer dealer for assistance. This can be a short to ground (such as a chafed wire), short to voltage (such as a pulled pin on trailer emergency breakaway battery) or the trailer brakes may be drawing too much current.

Points to Remember

Note: Do not attempt removal of the trailer brake controller without consulting the Workshop Manual. Damage to the unit may result.

- Adjust gain setting before using the trailer brake controller for the first time.
- Adjust gain setting, see **Procedure for Adjusting Gain**, whenever road, weather and trailer or vehicle loading conditions change from when the gain was initially set.
- Only use the manual control lever for proper adjustment of the gain during trailer setup. Misuse, such as application during trailer sway, could cause instability of trailer or tow vehicle.
- Avoid towing in adverse weather conditions. The trailer brake controller does not provide anti-lock control of the trailer wheels. Trailer wheels can lock up on slippery surfaces, resulting in reduced stability of trailer and tow vehicle.
- The trailer brake controller is equipped with a feature that reduces output at vehicle speeds below 11 mph (18 km/h) so trailer and vehicle braking is not jerky or harsh. This feature is only available when applying the brakes using your vehicle's brake pedal, not the controller.
- The controller interacts with the brake control system and powertrain control system of your vehicle to provide the best performance on different road conditions.
- Your vehicle's brake system and the trailer brake system work independently of each other. Changing the gain setting on the controller does not affect the operation of your vehicle's brakes whether you attach a trailer or not.
- When you switch the engine off, the controller output is disabled and the display and module shut down. The controller module and display turn on when you switch the ignition on.
- The trailer brake controller is only a factory-installed or dealer-installed item. Ford is not responsible for warranty or performance of the controller due to misuse or customer installation.

Trailer Lamps



WARNING: Never connect any trailer lamp wiring to the vehicle's tail lamp wiring; this may damage the electrical system resulting in fire. Contact your authorized dealer as soon as possible for assistance in proper trailer tow wiring installation. Additional electrical equipment may be required.

Trailer lamps are required on most towed vehicles. Make sure all running lights, brake lights, direction indicators and hazard lights are working.

Before Towing a Trailer

Practice turning, stopping and backing up to get the feel of your vehicle-trailer combination before starting on a trip. When turning, make wider turns so the trailer wheels clear curbs and other obstacles.

Towing

When Towing a Trailer

- Do not drive faster than 70 mph (113 km/h) during the first 500 mi (800 km).
 - Do not make full-throttle starts.
 - Check your hitch, electrical connections and trailer wheel lug nuts thoroughly after you have traveled 50 mi (80 km).
 - When stopped in congested or heavy traffic during hot weather, place the gearshift in park (P) to aid engine and transmission cooling and to help A/C performance.
 - Switch off the speed control with heavy loads or in hilly terrain. The speed control may turn off automatically when you are towing on long, steep grades.
 - Shift to a lower gear when driving down a long or steep hill. Do not apply the brakes continuously, as they may overheat and become less effective.
 - If your transmission is equipped with a Grade Assist or Tow/Haul feature, use this feature when towing. This provides engine braking and helps eliminate excessive transmission shifting for optimum fuel economy and transmission cooling.
 - If your vehicle is equipped with AdvanceTrac with roll stability control, this system may turn on during typical cornering maneuvers with a heavily loaded trailer. This is normal. Turning the corner at a slower speed while towing may reduce this tendency.
 - Allow more distance for stopping with a trailer attached. Anticipate stops and brake gradually.
 - Avoid parking on a grade. However, if you must park on a grade:
1. Turn the steering wheel to point your vehicle tires away from traffic flow.

2. Set your vehicle parking brake.
3. Place the automatic transmission in park (P).
4. Place wheel chocks in front and back of the trailer wheels. (Chocks not included with vehicle.)

Your vehicle may be equipped with a temporary or conventional spare tire. A temporary spare tire is different in size (diameter or width), tread-type (All-Season or All Terrain) or is from a different manufacturer than the road tires on your vehicle. Consult information on the tire label or Safety Compliance label for limitations when using.

Launching or Retrieving a Boat or Personal Watercraft (PWC)

Note: Disconnect the wiring to the trailer **before** backing the trailer into the water.

Note: Reconnect the wiring to the trailer **after** removing the trailer from the water.

When backing down a ramp during boat launching or retrieval:

- Do not allow the static water level to rise above the bottom edge of the rear bumper.
- Do not allow waves to break higher than 6 in (15 cm) above the bottom edge of the rear bumper.

Exceeding these limits may allow water to enter vehicle components:

- Causing internal damage to the components.
- Affecting driveability, emissions and reliability.

Replace the rear axle lubricant anytime the rear axle has been submerged in water. Water may have contaminated the rear axle lubricant, which is not normally checked or changed unless a leak is suspected or other axle repair is required.

TOWING THE VEHICLE ON FOUR WHEELS

Emergency Towing



WARNING: If your vehicle has a steering wheel lock make sure the ignition is in the accessory or on position when being towed.

You can flat-tow (all wheels on the ground, regardless of the powertrain or transmission configuration) your disabled vehicle (without access to wheel dollies or vehicle transport trailer) under the following conditions:

- Your vehicle is facing forward so you tow it in a forward direction.
- You shift into neutral (N). If you cannot shift into neutral (N), you may need to override the transmission. See **Transmission** (page 94).
- Maximum speed is 35 mph (56 km/h).
- Maximum distance is 50 mi (80 km).

Recreational Towing

Note: Put your climate control system in recirculated air mode to prevent exhaust fumes from entering the vehicle. See **Climate Control** (page 74).

Follow these guidelines if you have a need for recreational vehicle towing. An example of recreational towing would be towing your vehicle behind a motorhome. These guidelines are to make sure you do not damage the transmission during towing.

Do not tow your vehicle with any wheels on the ground, as vehicle or transmission damage may occur. It is recommended to tow your vehicle with all four wheels off the ground, for example when using a vehicle transport trailer. Otherwise, you cannot tow your vehicle.

Driving Hints

REDUCED ENGINE PERFORMANCE



WARNING: If you continue to drive your vehicle when the engine is overheating, the engine could stop without warning. Failure to follow this instruction could result in the loss of control of your vehicle.

If the engine coolant temperature gauge needle moves to the upper limit position, the engine is overheating. See **Gauges** (page 59).

You must only drive your vehicle for a short distance if the engine overheats. The distance you can travel depends on ambient temperature, vehicle load and terrain. The engine continues to operate with limited power for a short period of time.

If the engine temperature continues to rise, the fuel supply to the engine reduces. The air conditioning switches off and the engine cooling fan operates continually.

1. Gradually reduce your speed and stop your vehicle as soon as it is safe to do so.
2. Immediately switch the engine off to prevent severe engine damage.
3. Wait for the engine to cool down.
4. Check the coolant level. See **Engine Coolant Check** (page 167).
5. Have your vehicle checked as soon as possible.

ECONOMICAL DRIVING

Fuel economy is affected by several things such as how you drive, the conditions you drive under and how you maintain your vehicle.

There are some things to keep in mind that may improve fuel economy:

- Accelerate and slow down in a smooth, moderate fashion.
- Drive at reasonable and steady speeds.
- Anticipate stops.
- Minimize stop and go driving.
- Close the windows when driving at higher speed.
- Keep the tires properly inflated and use only the recommended size.
- Use the recommended engine oil.
- Perform all regularly scheduled maintenance.

Avoid these actions; they reduce fuel economy:

- Sudden or hard accelerations.
- Revving the engine before turning it off.
- Idle for periods longer than one minute.
- Warm up your vehicle on cold mornings.
- Using air conditioning.
- Using speed control in hilly terrain.
- Resting your foot on the brake pedal while driving.
- Driving with the wheels out of alignment.

Conditions:

- Adding certain accessories to your vehicle may reduce fuel economy. For example, bug deflectors, rollbars, light bars, running boards, ski racks or luggage racks.
- Using fuel blended with alcohol may lower fuel economy.
- Fuel economy may decrease with lower temperatures during the first 5–10 mi (12–16 km) of driving.

Driving Hints

- Driving on flat terrain offers improved fuel economy as compared to driving on hilly terrain.
- Transmissions give their best fuel economy when operated in the top cruise gear and with steady pressure on the gas pedal.

BREAKING-IN

You need to break in new tires for approximately 300 mi (480 km). During this time, your vehicle may exhibit some unusual driving characteristics.

Avoid driving too fast during the first 1,000 mi (1,600 km). Vary your speed frequently and change up through the gears early. Do not labor the engine.

Do not tow during the first 1,000 mi (1,600 km).

DRIVING THROUGH WATER

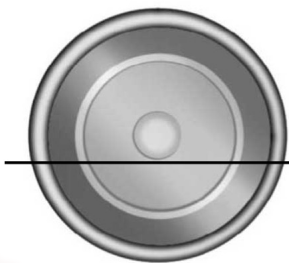


WARNING: Do not drive through flowing or deep water as you may lose control of your vehicle.

Note: *Driving through standing water can cause vehicle damage.*

Note: *Engine damage can occur if water enters the air filter.*

Before driving through standing water, check the depth. Never drive through water that is higher than the bottom of the wheel hubs.



When driving through standing water, drive very slowly and do not stop your vehicle. Your brake performance and traction may be limited. After driving through water and as soon as it is safe to do so:

- Lightly press the brake pedal to dry the brakes and to check that they work.
- Check that the horn works.
- Check that the exterior lights work.
- Turn the steering wheel to check that the steering power assist works.

FLOOR MATS



WARNING: Use a floor mat designed to fit the footwell of your vehicle that does not obstruct the pedal area. Failure to follow this instruction could result in the loss of control of your vehicle, personal injury or death.



WARNING: Pedals that cannot move freely can cause loss of vehicle control and increase the risk of serious personal injury.

Driving Hints



WARNING: Secure the floor mat to both retention devices so that it cannot slip out of position and interfere with the pedals. Failure to follow this instruction could result in the loss of control of your vehicle, personal injury or death.



WARNING: Do not place additional floor mats or any other covering on top of the original floor mats. This could result in the floor mat interfering with the operation of the pedals. Failure to follow this instruction could result in the loss of control of your vehicle, personal injury or death.



WARNING: Always make sure that objects cannot fall into the driver foot well while your vehicle is moving. Objects that are loose can become trapped under the pedals causing a loss of vehicle control.

Note: Regularly check the floor mats to make sure they are secure.



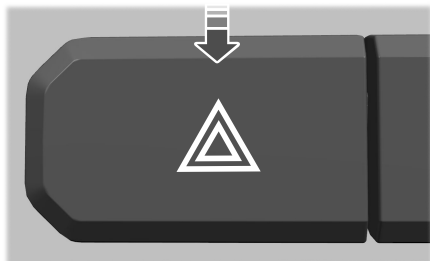
To install floor mats that have eyelets, position the floor mat eyelet over the retention post and press down to lock in position. Repeat for all eyelets on the floor mat.

To remove the floor mats, reverse the installation procedure.

Roadside Emergencies

HAZARD FLASHERS

Note: If used when the vehicle is not running, the battery loses charge. As a result, there may be insufficient power to restart your vehicle.



The hazard flasher control is located on the instrument panel. Use it when your vehicle is creating a safety hazard for other motorists.

- Press the flasher control and all front and rear direction indicators flash.
- Press the flasher control again to switch them off.

JUMP STARTING THE VEHICLE

WARNING: Batteries normally produce explosive gases which can cause personal injury. Therefore, do not allow flames, sparks or lighted substances to come near the battery. When working near the battery, always shield your face and protect your eyes. Always provide correct ventilation.

WARNING: Keep batteries out of reach of children. Batteries contain sulfuric acid. Avoid contact with skin, eyes or clothing. Shield your eyes when working near the battery to protect against possible splashing of acid solution. In case of acid contact with skin or eyes, flush immediately with water for a minimum of 15 minutes and get prompt medical attention. If acid is swallowed, call a physician immediately.

WARNING: Use only adequately sized cables with insulated clamps.

Preparing Your Vehicle

Do not attempt to push-start your automatic transmission vehicle.

Note: Attempting to push-start a vehicle with an automatic transmission may cause transmission damage.

Note: Use only a 12-volt supply to start your vehicle.

Note: Do not disconnect the battery of the disabled vehicle as this could damage the vehicle electrical system.

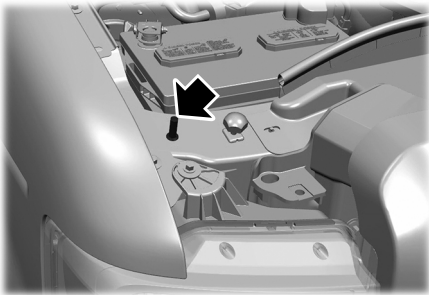
Park the booster vehicle close to the hood of the disabled vehicle, making sure the two vehicles do not touch.

Connecting the Jumper Cables

WARNING: Do not connect the negative jumper cable to any other part of your vehicle. Use the ground point.

WARNING: Make sure that the cables are clear of any moving parts and fuel delivery system parts.

Roadside Emergencies



Note: See the previous image for your vehicle's assigned ground connection point.

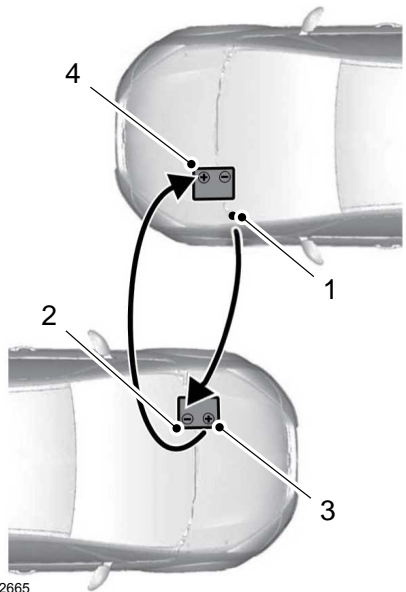
1. Connect the positive (+) jumper cable to the positive (+) terminal of the discharged battery.
2. Connect the other end of the positive (+) cable to the positive (+) terminal of the booster vehicle battery.
3. Connect the negative (-) cable to the negative (-) terminal of the booster vehicle battery.
4. Make the final connection of the negative (-) cable to the ground connection point.

Jump Starting

1. Start the engine of the booster vehicle and rev the engine moderately, or press the accelerator gently to keep your engine speed between 2000 and 3000 RPM, as shown in your tachometer.
2. Start the engine of the disabled vehicle.
3. Once the disabled vehicle has been started, run both vehicle engines for an additional three minutes before disconnecting the jumper cables.

Removing the Jumper Cables

Remove the jumper cables in the reverse order that they were connected.



E142665

1. Remove the negative (-) jumper cable from the disabled vehicle.
2. Remove the jumper cable from the negative (-) terminal of the booster vehicle battery.
3. Remove the jumper cable from the positive (+) terminal of the booster vehicle battery.
4. Remove the jumper cable from the positive (+) terminal of the disabled vehicle battery.
5. Allow the engine to idle for at least one minute.

TRANSPORTING THE VEHICLE



WARNING: Block the wheels to help prevent the vehicle from moving.

Roadside Emergencies



WARNING: Unexpected and possibly sudden vehicle movement may occur if you do not take these precautions.

If you need to have your vehicle towed, contact a professional towing service or, if you are a member of a roadside assistance program, your roadside assistance service provider.

We recommend the use of a wheel lift and dollies or flatbed equipment to tow your vehicle. Do not tow with a slingbelt. Ford Motor Company has not approved a slingbelt towing procedure. Vehicle damage may occur if towed incorrectly, or by any other means.

Ford Motor Company produces a towing manual for all authorized tow truck operators. Have your tow truck operator refer to this manual for proper hook-up and towing procedures for your vehicle.

It is acceptable to have your two-wheel drive vehicle towed with the front wheels on the ground without dollies and the rear wheels off the ground.

Crash and Breakdown Information

ROADSIDE ASSISTANCE

Vehicles Sold in the United States: Getting Roadside Assistance

If you have a vehicle concern, Ford Motor Company offers a complimentary roadside assistance program. This program is separate from the New Vehicle Limited Warranty.

The service is available:

- 24 hours a day, seven days a week.
- For the coverage period supplied with your vehicle.

Knowing your vehicle's VIN, mileage and your specific location allows help to get to you faster.

Roadside Assistance covers:

- A flat tire change with a good spare (except vehicles supplied with a tire inflation kit).
- Battery jump start.
- Lock-out assistance (key replacement cost is the customer's responsibility).
- Fuel delivery — independent service contractors, if not prohibited by state, local or municipal law, shall deliver up to 2 gal (8 L) of gasoline or 5 gal (20 L) of diesel fuel to a disabled vehicle. Roadside assistance limits fuel delivery service to two no-charge occurrences within a 12-month period.
- Winch out — available within 100 ft (30 m) of a paved or county maintained road, no recoveries.

- Towing — independent service contractors, if not prohibited by state, local or municipal law, shall tow Ford eligible vehicles to an authorized dealer within 50 mi (80 km) of the disablement location or to the nearest authorized dealer. If a member requests a tow to an authorized dealer that is more than 50 mi (80 km) from the disablement location, the member shall be responsible for any mileage costs in excess of 50 mi (80 km). Warranty towing, non-warranty towing and collision towing are available.
- Roadside Assistance includes up to \$200 for a towed trailer if the disabled eligible vehicle requires service at the nearest authorized dealer. If the towing vehicle is operational but the trailer is not, then the trailer does not qualify for any roadside services.

Vehicles Sold in the United States: Using Roadside Assistance

United States vehicle customers who require Roadside Assistance, call 1-800-241-3673.

If you need to arrange roadside assistance on your own, Ford Motor Company reimburses a reasonable amount for towing to the nearest dealership within 50 mi (80 km). To obtain reimbursement information, United States vehicle customers call 1-800-241-3673. Customers need to submit their original receipts.

Vehicles Sold in Canada: Getting Roadside Assistance

If you have a vehicle concern, Ford Motor Company of Canada, Limited offers a complimentary roadside assistance program. This program is eligible within Canada or the continental United States.

The service is available 24 hours a day, seven days a week.

Crash and Breakdown Information

This program is separate from the New Vehicle Limited Warranty, but the coverage is concurrent with the powertrain coverage period of your vehicle. Canadian roadside coverage and benefits may differ from the U.S. coverage. For complete details, see your Warranty Guide at www.ford.com/support/warranty/.

Download the Sykes4Ford Roadside Assistance App for access to your roadside assistance services. For more information, scan here:



If you require more information, please call us in Canada at 1-800-665-2006, or visit our website at www.ford.ca.

Ford Motor Company reserves the right to modify or discontinue Roadside Assistance at any time. Certain restrictions apply to Roadside Assistance benefits.

For further details, call
1-800-665-2006 (Canada)
1-800-241-3673 (United States)

POST-COLLISION BRAKING

How Does Post-Collision Braking Work

In the event of a moderate to severe crash, the braking system reduces the vehicle's speed to prevent or reduce the impact of a potential secondary crash.

Post-Collision Braking Limitations

Post-collision braking does not activate if any of the following occur:

- The anti-lock braking system is damaged during the collision.
- Electronic stability control is disabled.

Overriding Post-Collision Braking

You can override post-collision braking by pressing the brake or accelerator pedal.

Post-Collision Braking Indicators



It flashes when a post-collision braking event is occurring.

AUTOMATIC CRASH SHUTOFF

WHAT IS AUTOMATIC CRASH SHUTOFF

The automatic crash shutoff is designed to stop the fuel going to the engine in the event of a moderate or severe crash.

Note: *Not every impact causes a shutoff.*

AUTOMATIC CRASH SHUTOFF PRECAUTIONS



WARNING: If your vehicle has been involved in a crash, have the fuel system checked. Failure to follow this instruction could result in fire, personal injury or death.

RE-ENABLING YOUR VEHICLE

1. Switch the ignition off.
2. Attempt to start your vehicle.
3. Switch the ignition off.

Crash and Breakdown Information

4. Attempt to start your vehicle.

Note: *If your vehicle does not start after the third attempt, have your vehicle checked as soon as possible.*

Customer Assistance

GETTING THE SERVICES YOU NEED

Warranty repairs to your vehicle must be performed by an authorized dealer. While any authorized dealer handling your vehicle line will provide warranty service, we recommend you return to your selling authorized dealer who wants to ensure your continued satisfaction.

Please note that certain warranty repairs require special training and equipment, so not all authorized dealers are authorized to perform all warranty repairs. This means that, depending on the warranty repair needed, you may have to take your vehicle to another authorized dealer.

A reasonable time must be allowed to perform a repair after taking your vehicle to the authorized dealer. Repairs will be made using Ford or Motorcraft® parts, or remanufactured or other parts that are authorized by Ford.

Away From Home

If you are away from home when your vehicle needs service, contact the Ford Customer Relationship Center or use the online resources listed below to find the nearest authorized dealer.

In the United States:

Mailing address

Ford Motor Company
Customer Relationship Center
P.O. Box 6248
Dearborn, MI 48126

Telephone

1-800-392-3673 (FORD)
(TDD for the hearing impaired:
1-800-232-5952)
If your vehicle is configured as a
motorhome please call 1-800-444-3311
for support.

Additional information and resources are available online:

Website
www.owner.ford.com

These are some of the items that can be found online:

- U.S. dealer locator by Dealer Name, City/State or Zip Code.
- Owner Manuals.
- Maintenance Schedules.
- Recalls.
- Ford Extended Service Plans.
- Ford Genuine Accessories.
- Service specials and promotions.

In Canada:

Mailing address

Customer Relationship Centre
Ford Motor Company of Canada, Limited
P.O. Box 2000
Oakville, Ontario L6K 0C8

Telephone

1-800-565-3673 (FORD)
7-1-1 (Customer Service for Deaf and
Hard-of-Hearing Customers)

Website
www.ford.ca

Additional Assistance

If you have questions or concerns, or are unsatisfied with the service you are receiving, follow these steps:

1. Contact your Sales Representative or Service Advisor at your selling or servicing authorized dealer.

Customer Assistance

2. If your inquiry or concern remains unresolved, contact the Sales Manager, Service Manager or Customer Relations Manager.
3. If you require assistance or clarification on Ford Motor Company policies, please contact the Ford Customer Relationship Center.

In order to help us serve you better, please have the following information available when contacting a Customer Relationship Center:

- Vehicle Identification Number.
- Your telephone number (home and business).
- The name of the authorized dealer and city where located.
- The vehicle's current odometer reading.

In some states within the United States, you must directly notify Ford in writing before pursuing remedies under your state's warranty laws, and Ford is also allowed a final repair attempt.

Additionally, in some states within the United States, a consumer has the option of submitting a warranty dispute to the BBB Auto Line before taking action under the Magnuson-Moss Warranty Act, or to the extent allowed by state law, before pursuing replacement or repurchase remedies provided by certain state laws. This dispute handling procedure is not required prior to enforcing state created rights or other rights which are independent of the Magnuson-Moss Warranty Act or state replacement or repurchase laws.

IN CALIFORNIA (U.S. ONLY)

California Civil Code Section 1793.2(d) requires that, if a manufacturer or its representative is unable to repair a motor vehicle to conform to the vehicle's applicable express warranty after a reasonable number of attempts, the manufacturer shall be required to either replace the vehicle with one substantially identical or repurchase the vehicle and reimburse the buyer in an amount equal to the actual price paid or payable by the consumer (less a reasonable allowance for consumer use). The consumer has the right to choose whether to receive a refund or replacement vehicle.

California Civil Code Section 1793.22(b) presumes that the manufacturer has had a reasonable number of attempts to conform the vehicle to its applicable express warranties if, within the first 18 months of ownership of a new vehicle or the first 18,000 mi (29,000 km), whichever occurs first:

1. Two or more repair attempts are made on the same non-conformity likely to cause death or serious bodily injury OR
2. Four or more repair attempts are made on the same nonconformity (a defect or condition that substantially impairs the use, value or safety of the vehicle) OR
3. The vehicle is out of service for repair of nonconformities for a total of more than 30 calendar days (not necessarily all at one time).

In the case of 1 or 2 above, the consumer must also notify the manufacturer of the need for the repair of the nonconformity at the following address:

Ford Motor Company
16800 Executive Plaza Drive
Mail Drop 3NE-B
Dearborn, MI 48126

Customer Assistance

You are required to submit your warranty dispute to BBB AUTO LINE before asserting in court any rights or remedies conferred by California Civil Code Section 1793.22(b). You are also required to use BBB AUTO LINE before exercising rights or seeking remedies created by the Federal Magnuson-Moss Warranty Act, 15 U.S.C. sec. 2301 et seq. If you choose to seek redress by pursuing rights and remedies not created by California Civil Code Section 1793.22(b) or the Magnuson-Moss Warranty Act, resort to BBB AUTO LINE is not required by those statutes.

THE BETTER BUSINESS BUREAU (BBB) AUTO LINE PROGRAM (U.S. ONLY)

Your satisfaction is important to Ford Motor Company and to your dealer. If a warranty concern has not been resolved using the three-step procedure outlined earlier in this chapter in the Getting the Services you need section, you may be eligible to participate in the BBB AUTO LINE program.

The BBB AUTO LINE program consists of two parts – mediation and arbitration. During mediation, a representative of the BBB will contact both you and Ford Motor Company to explore options for settlement of the claim. If an agreement is not reached during mediation or you do not want to participate in mediation, and if your claim is eligible, you may participate in the arbitration process. An arbitration hearing will be scheduled so that you can present your case in an informal setting before an impartial person. The arbitrator considers the testimony provided and makes a decision after the hearing.

Disputes submitted to the BBB AUTO LINE program are usually decided within 40 days after you file your claim with the BBB. You are not bound by the decision, and may reject the decision and proceed to court where all findings of the BBB Auto Line dispute, and decision, are admissible in the court action. Should you choose to accept the BBB AUTO LINE decision, Ford is then bound by the decision, and must comply with the decision within 30 days of receipt of your acceptance letter.

BBB AUTO LINE Application: Using the information that follows, please call or write to request a program application. You will be asked for your name and address, general information about your new vehicle, information about your warranty concerns, and any steps you have already taken to try to resolve them. A Customer Claim Form will be mailed that needs to be completed, signed and returned to the BBB along with proof of ownership. Upon receipt, the BBB reviews the claim for eligibility under the Program Summary Guidelines.

You can get more information by calling BBB AUTO LINE at 1-800-955-5100, or writing to:

**BBB AUTO LINE a Division of BBB National Programs, Inc.
1676 International Drive, Suite 550
McLean, VA 22102**

BBB AUTO LINE applications can also be requested by calling the Ford Motor Company Customer Relationship Center at 1-800-392-3673.

For additional information, refer to the Better Business Bureau website.

Note: *Ford Motor Company reserves the right to change eligibility limitations, modify procedures, or to discontinue this process at any time without notice and without obligation.*

Customer Assistance

GETTING ASSISTANCE OUTSIDE THE U.S. AND CANADA

Before exporting your vehicle to a foreign country, contact the appropriate foreign embassy or consulate. These officials can inform you of local vehicle registration regulations and where to find unleaded fuel or petrol/gas engines or the proper sulfur fuel for diesel engines.

If you cannot find the proper fuel recommended for your vehicle, contact our Customer Relationship Center.

The use of improper fuels in your vehicle without proper conversion may damage the effectiveness of your emission control system and may cause engine knocking or serious engine damage. Ford Motor Company or Ford of Canada is not responsible for any damage caused by use of improper fuel. Using improper fuels may also result in difficulty importing your vehicle back into the United States.

If your vehicle must be serviced while you are traveling or living in Asia-Pacific Region, Sub-Saharan Africa, U.S. Virgin Islands and/or Puerto Rico, Central America, the Caribbean, and Israel and the Middle East, contact the nearest authorized dealer. If the authorized dealer cannot help you, contact the corresponding Ford Customer Assistance Center:

FORD MOTOR COMPANY Customer Relationship Centers in:

Customer Relation- ship Center	Phone	Fax	E-mail
Asia Pacific	N/A	N/A	apemcrc@ford.com
Caribbean and Central America	+1-800-841-3673	N/A	atnclien@ford.com
Middle East	Ford 80004443673	971 4 3327 266	menacac@ford.com
	Lincoln 80004441067		
	UAE 80004441066		
	Saudi Arabia 8008443673		
	Mobily and Zain cell phone users in Saudi 800850078		
	Kuwait 22280384		

Customer Assistance

Customer Relation- ship Center	Phone	Fax	E-mail
North Africa	N/A	N/A	nafcrc@ford.com
Puerto Rico and U.S. Virgin Islands	+1-800-841-3673	N/A	atnclien@ford.com
Sub-Saharan Africa	N/A	N/A	ssacrc@ford.com
South Korea	+82-02-1600-6003	N/A	infokr1@ford.com or infokr@lincoln.com

If you buy your vehicle in North America and then relocate to any of the above locations, register your vehicle identification number (VIN) and new address with Ford Global Trade Services by emailing, expcso@ford.com.

If you are in another foreign country, contact the nearest authorized dealer. In the event your inquiry is unresolved, communicate your concern with the dealership's Sales Manager, Service Manager or Customer Relations Manager. If you require additional assistance or clarification, please contact the respective Customer Relationship Center as previously listed.

Customers in the U.S. should call 1-800-392-3673.

ORDERING ADDITIONAL OWNER'S LITERATURE

To order the publications in this portfolio, contact Helm, LLC at:

HELM, LLC
47911 Halyard Drive, Suite 200
Plymouth, Michigan 48170
Attention: Customer Service

Or to order a free publication catalog, call toll free: 1-800-782-4356

Monday-Friday 8:00 a.m. - 6:00 p.m. EST

Helm, LLC can also be reached by their website:

www.helminc.com

(Items in this catalog may be purchased by credit card, check or money order.)

Obtaining a French Owner's Manual

French Owner's Manual can be obtained from your authorized dealer or by contacting Helm, LLC using the contact information listed previously in this section.

REPORTING SAFETY DEFECTS (U.S. ONLY)

If you believe that your vehicle has a defect which could cause a crash or could cause injury or death, you should immediately inform the National Highway Traffic Safety Administration (NHTSA) in addition to notifying Ford Motor Company.

Customer Assistance

If NHTSA receives similar complaints, it may open an investigation, and if it finds that a safety defect exists in a group of vehicles, it may order a recall and remedy campaign. However, NHTSA cannot become involved in individual problems between you, your dealer, or Ford Motor Company.

To contact NHTSA, you may call the Vehicle Safety Hotline toll-free at 1-888-327-4236 (TTY: 1-800-424-9153); go to www.safercar.gov; or write to:

Administrator

1200 New Jersey Avenue,
Southeast

Washington, D.C. 20590

You can also obtain other information about motor vehicle safety from www.safercar.gov.

REPORTING SAFETY DEFECTS (CANADA ONLY)

If you believe that your vehicle has a defect which could cause a crash or could cause injury or death, you should immediately inform Transport Canada and Ford of Canada.

Transport Canada Contact Information	
Website (English)	http://tc.canada.ca/recalls
Website (French)	http://tc.canada.ca/rappels
Phone	1-800-333-0510

Ford of Canada Contact Information	
Website	www.ford.ca
Phone	1-800-565-3673

Fuses

FUSE SPECIFICATION CHART

Engine Compartment Fuse Box



WARNING: Always disconnect the battery before servicing high current fuses.



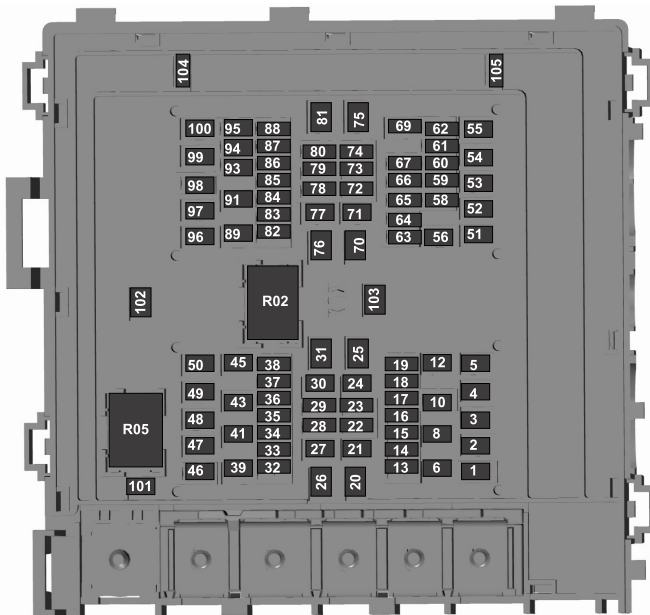
WARNING: To reduce risk of electrical shock, always replace the cover to the power distribution box before reconnecting the battery or refilling fluid reservoirs.

Note: If your vehicle has dual batteries, disconnecting the primary under hood battery does not remove power from all circuits.

The engine compartment fuse box is in the engine compartment. It has high-current fuses that protect your vehicle's main electrical systems from overloads.

If you disconnect and reconnect the battery, you need to reset some features. See **Changing the 12V Battery** (page 174).

Replace fuses with the same type and rating. See **Changing a Fuse** (page 160).



E251921

Fuses

Item	Rating	Protected Component
1	20 A	Horn.
2	50 A	Blower motor.
3	—	Not used.
4	30 A	Starter relay.
5	20 A	Power point 3.
6	20 A	Upfitter relay 4 (cutaway). Not used (spare) (stripped chassis).
8	—	Not used.
10	—	Not used.
12	20 A	Power point 4.
13	10 A	Yaw sensor (stripped chassis). Not used (spare) (cutaway).
14	10 A	Forward looking radar (cutaway). Not used (spare) (stripped chassis).
15	—	Not used.
16	—	Not used.
17	10 A	Powertrain control module run/start feed.
18	10 A	Anti-lock brake system run/start feed.
19	—	Not used.
20	30 A	Wiper power.
21	—	Not used.
22	10 A	Wiper module (stripped chassis). Not used (spare) (cutaway).
23	—	Not used.

Fuses

Item	Rating	Protected Component
24	40 A	Body control module - run power in feed 2.
25	50 A	Body control module - run power in feed 1.
26	—	Not used.
27	20 A	Body builder frame connector.
28	—	Not used.
29	10 A	B+ power 12 V(special order vehicle).
30	30 A	Power driver seat (cutaway). Not used (spare) (stripped chassis).
31	—	Not used.
32	20 A	Vehicle power 1 - Powertrain control module.
33	20 A	Vehicle power 2 - Heater exhaust gas oxygen sensor 11. Heater exhaust gas oxygen sensor 12. Heater exhaust gas oxygen sensor 21. Canister vent solenoid. Canister purge solenoid. Variable camshaft timing.
34	10 A	Vehicle power 3 - Variable oil pressure control. Fan clutch. A/C clutch relay.
35	20 A	Vehicle power 4 - Coil on plug.
36	—	Not used.
37	—	Not used.

Fuses

Item	Rating	Protected Component
38	10 A	Washer relay (stripped chassis). Not used (spare) (cutaway).
39	—	Not used.
41	30 A	Trailer brake control connector.
43	30 A	Instrument panel connector (stripped chassis). Not used (spare) (cutaway).
45	—	Not used.
46	10 A	A/C clutch.
47	40 A	Upfitter relay 1 (cutaway). Not used (spare) (stripped chassis).
48	—	Not used.
49	30 A	Pump electronics module.
50	15 A	Fuel injectors.
51	20 A	Power point 1.
52	50 A	Power at all times Auxiliary A/C prep on B-pillar vehicle connector (cutaway). Not used (spare) (stripped chassis).
53	30 A	Trailer tow park lamps.
54	40 A	Run/start feed on instrument panel connector.
55	20 A	Upfitter 3 relay (cutaway). Not used (spare) (stripped chassis).
56	20 A	Power point 2 prep B-pillar connector.
58	5 A	USB smart charger.

Fuses

Item	Rating	Protected Component
59	10 A	Parking lamps 1 (special order vehicle).
60	—	Not used.
61	—	Not used.
62	—	Not used.
63	—	Not used.
64	—	Not used.
65	—	Not used.
66	—	Not used.
67	—	Not used.
69	—	Not used.
70	40 A	Inverter.
71	30 A	Anti-lock brake system valves.
72	10 A	Brake on and off switch.
73	—	Not used.
74	—	Not used.
75	—	Not used.
76	60 A	Anti-lock brake system pump.
77	30 A	Voltage quality module power - body control module.
78	10 A	Trailer tow stoplamps.
79	—	Not used.
80	10 A	Trailer tow backup lamps.
81	—	Not used.
82	5 A	Upfitter switch (factory location for ignition power).

Fuses

Item	Rating	Protected Component
83	5 A	Upfitter switch (optional location for power at all times).
84	—	Not used.
85	—	Not used.
86	—	Not used.
87	—	Not used.
88	—	Not used.
89	—	Not used.
91	40 A	Hot at all times /B+ power on B-pillar connector (cutaway). Battery power on instrument panel connector (stripped chassis).
93	10 A	Parking lamps 3 (special order vehicle).
94	10 A	Parking lamps 2 (special order vehicle).
95	20 A	Stoplamp relay.
96	—	Not used.
97	50 A	Battery power to engine, B-pillar and instrument panel vehicle connectors.
98	30 A	Trailer tow battery charge.
99	40 A	Upfitter 2 relay (cutaway). Not used (spare) (stripped chassis).
100	—	Not used.
101	—	Not used.
102	—	Not used.
103	—	Not used.

Fuses

Item	Rating	Protected Component
104	—	Not used.
105	15 A	Trailer tow right-hand and left-hand stoplamp and direction indicator relay power.

Note: Spare fuse amperage may vary.

Passenger Compartment Fuse Box



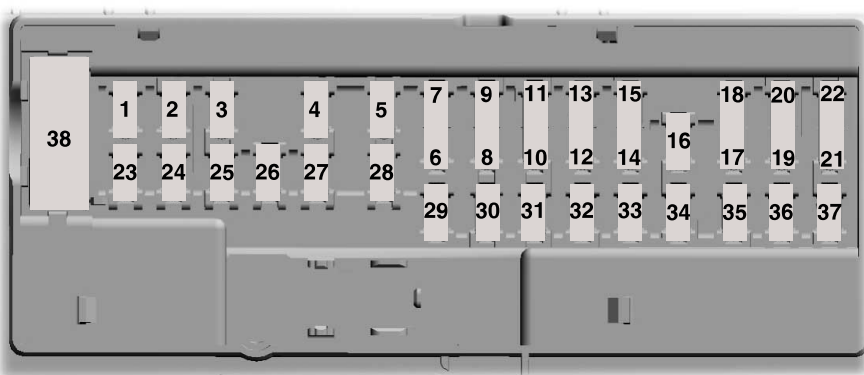
WARNING: Always disconnect the battery before servicing high current fuses.

Note: If your vehicle has dual batteries, disconnecting the primary under hood battery does not remove power from all circuits.

The fuse panel is to the left-hand side of the brake pedal and mounted onto the lower left-hand cowl panel. Remove the fuse panel cover to access the fuses.

To remove a fuse, use the fuse puller tool provided on the inside of the fuse panel cover.

Replace fuses with the same type and rating. See **Changing a Fuse** (page 160).



Fuses

Item	Rating	Protected Component
1	—	Not used.
2	10 A	Left-hand front and right-hand front door lock switch (cutaway). Inverter (cutaway). Connector (stripped chassis).
3	7.5 A	Power mirror switch (cutaway).
	—	Not used (stripped chassis).
4	20 A	Not used (spare).
5	20 A	Not used (spare).
6	10 A	Not used (spare).
7	10 A	Not used (spare).
8	5 A	Not used (spare).
9	5 A	Not used (spare).
10	—	Not used.
11	—	Not used.
12	7.5 A	Smart datalink connector.
13	7.5 A	Cluster. Steering column control module.
14	15 A	Not used (spare).
15	15 A	Not used (spare).
16	—	Not used.
17	7.5 A	Not used.
18	7.5 A	Run/start feed for front blend actuator/climate mode switch (cutaway). Run/start feed to stripped chassis connector (stripped chassis).

Fuses

Item	Rating	Protected Component
19	5 A	Radio transceiver module and telematics control unit (cutaway). Telematics control unit (stripped chassis).
20	5 A	Ignition switch.
21	5 A	Not used.
22	5 A	Body builder B-pillar connector (cutaway).
	5 A	Not used (stripped chassis).
23	30 A	Not used (spare).
24	30 A	Not used (spare).
25	20 A	Not used (spare).
26	30 A	Not used (spare).
27	30 A	Not used (spare).
28	30 A	Not used (spare).
29	15 A	Upfitter interface module (cutaway).
	—	Not used (stripped chassis).
30	5 A	Not used (spare).
31	10 A	Smart datalink connector.
32	20 A	Radio (cutaway).
33	—	Not used.
34	30 A	Not used (spare).
35	5 A	Tow haul switch.
36	15 A	Rear view mirror (cutaway). Camera lane departure (cutaway).
	—	Not used (stripped chassis).
37	20 A	Not used (spare).

Fuses

Item	Rating	Protected Component
38	30 A	Power window switches and motors (cutaway).
	—	Not used (stripped chassis).

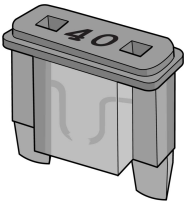
Note: Spare fuse amperage may vary.

CHANGING A FUSE

Fuses



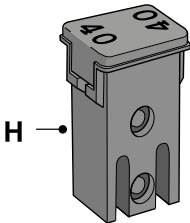
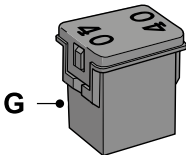
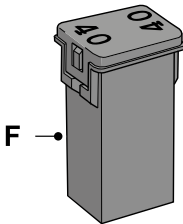
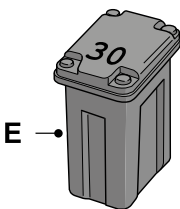
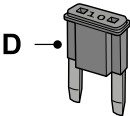
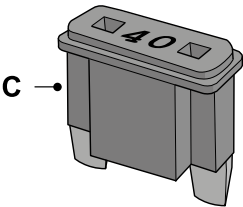
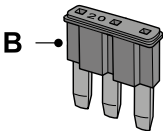
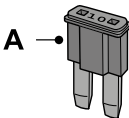
WARNING: Always replace a fuse with one that has the specified amperage rating. Using a fuse with a higher amperage rating can cause severe wire damage and could start a fire.



E217331

If electrical components in the vehicle are not working, a fuse may have blown. Blown fuses are identified by a broken wire within the fuse. Check the appropriate fuses before replacing any electrical components.

Fuse Types



Fuses

- A Micro 2.
- B Micro 3.
- C Maxi.
- D Mini.
- E M Case.
- F J Case.
- G J Case Low Profile.
- H Slotted M Case.

Maintenance

GENERAL INFORMATION

Have your vehicle serviced regularly to help maintain its roadworthiness and resale value. There is a large network of authorized dealers that are there to help you with their professional servicing expertise. We believe that their specially trained technicians are best qualified to service your vehicle properly and expertly. They are supported by a wide range of highly specialized tools developed specifically for servicing your vehicle.

If your vehicle requires professional service, an authorized dealer can provide the necessary parts and service. Check your warranty information to find out which parts and services are covered.

Use only recommended fuels, lubricants, fluids and service parts conforming to specifications. Motorcraft® parts are designed and built to provide the best performance in your vehicle.

Precautions

- Do not work on a hot engine.
- Make sure that nothing gets caught in moving parts.
- Do not work on a vehicle with the engine running in an enclosed space, unless you are sure you have enough ventilation.
- Keep all open flames and other burning material (such as cigarettes) away from the battery and all fuel related parts.

Working with the Engine Off

1. Set the parking brake and shift the transmission to park (P).
2. Switch off the engine.
3. Block the wheels.

Working with the Engine On



WARNING: To reduce the risk of vehicle damage and personal burn injuries, do not start your engine with the air cleaner removed and do not remove it while the engine is running.

1. Set the parking brake and shift the transmission to park (P).
2. Block the wheels.

OPENING AND CLOSING THE HOOD

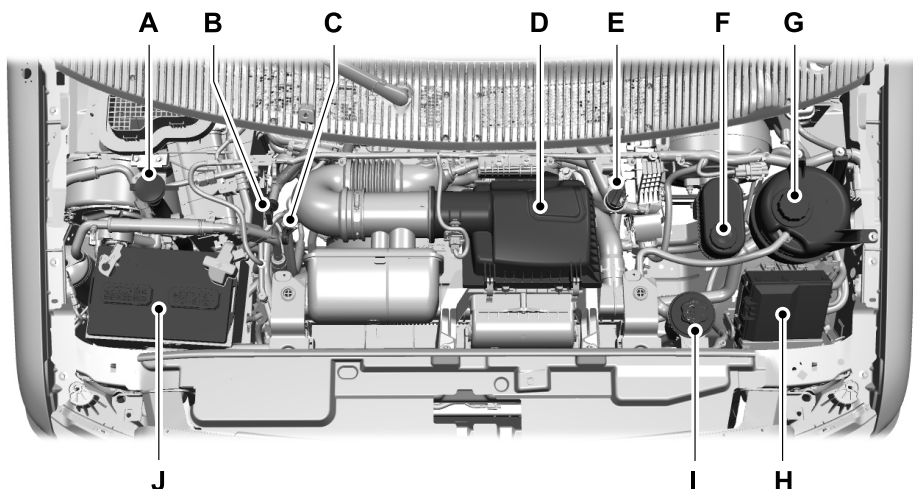


E196351

1. Inside the vehicle, pull the hood release handle located under the bottom left corner of the instrument panel.
2. Go to the front of the vehicle and push the auxiliary latch, located in the center of the top grille, to the left in order to release the hood.
3. Lift the hood and secure it with the prop rod.
4. To close, lower the hood and make sure that it is closed properly and fully latched.

Maintenance

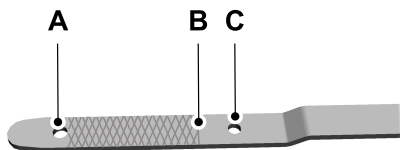
UNDER HOOD OVERVIEW



- A Windshield washer fluid reservoir. See **Washer Fluid Check** (page 178).
- B Automatic transmission fluid dipstick. See **Automatic Transmission Fluid Check** (page 171).
- C Engine oil dipstick. See **Engine Oil Dipstick** (page 164).
- D Air cleaner assembly. See **Changing the Engine Air Filter** (page 166).
- E Engine oil filler cap. See **Engine Oil Check** (page 164).
- F Brake fluid reservoir. See **Brake Fluid Check** (page 173).
- G Engine coolant reservoir. See **Engine Coolant Check** (page 167).
- H Engine compartment fuse box. See **Fuses** (page 151).
- I Power steering fluid reservoir. See **Power Steering Fluid Check** (page 174).
- J Battery. See **Changing the 12V Battery** (page 174).

Maintenance

ENGINE OIL DIPSTICK



- A Minimum.
- B Nominal.
- C Maximum.

ENGINE OIL CHECK

1. Make sure that your vehicle is on level ground.
2. Check the oil level before starting the engine, or switch the engine off after warm up and wait 15 minutes for the oil to drain into the oil pan.

Note: Checking the oil level too soon could result in an inaccurate reading.

3. Remove the dipstick and wipe it with a clean, lint-free cloth.
4. Reinstall the dipstick and make sure it is fully seated.
5. Remove the dipstick again to check the oil level.

Note: Read both sides of the dipstick and use the lowest oil level as the correct reading.

Note: If the oil level is between the maximum and minimum marks, the oil level is acceptable. Do not add oil.

6. If the oil level is at the minimum mark, immediately add oil.
7. Reinstall the dipstick. Make sure it is fully seated.

Note: The oil consumption of new engines reaches its normal level after approximately 3,000 mi (5,000 km).

Note: Increases in oil level can occur from frequent short trips that do not allow the engine to get to operating temperature, as well as frequent idling or low speed driving for long periods of time.

Note: If oil levels are continuously noted above the maximum mark, schedule a visit to your authorized dealer.

Adding Engine Oil



WARNING: Do not add engine oil when the engine is hot. Failure to follow this instruction could result in personal injury.



WARNING: Do not remove the filler cap when the engine is running.

Do not use supplemental engine oil additives because they are unnecessary and could lead to engine damage that the vehicle warranty may not cover.

1. Clean the area surrounding the engine oil filler cap before you remove it.
2. Remove the engine oil filler cap.
3. Add engine oil that meets our specifications. See **Capacities and Specifications** (page 226).
4. Reinstall the engine oil filler cap and turn it clockwise until you feel a strong resistance.

Note: Do not add oil further than the maximum mark. Oil levels above the maximum mark may cause engine damage.

Maintenance

Note: Immediately soak up any oil spillage with an absorbent cloth.

Engine Oil Pressure Warning Lamp



WARNING: If it illuminates when you are driving do not continue your journey, even if the oil level is correct. Have your vehicle checked.



It illuminates when you switch the ignition on.

If it illuminates when the engine is running this indicates a malfunction. Stop your vehicle as soon as it is safe to do so and switch the engine off. Check the engine oil level. If the oil level is sufficient, this indicates a system malfunction. Have your vehicle checked as soon as possible.

OIL CHANGE INDICATOR RESET

Base Cluster

Use the information display controls on the steering wheel to reset the oil change indicator.

From the main menu scroll to:

Message	Action and Description
Driver assist	Press the right arrow button, then from this menu scroll down to the following message.
Maintenance Monitor	Press the right arrow button, then from this menu scroll down to the following message.
Oil Life % Hold to Reset	Press and hold the OK button until the instrument cluster displays the following message. Reset Complete
	If the instrument cluster displays the following message, repeat the process. Reset Cancelled

High Series Cluster

Use the information display controls on the steering wheel to reset the oil change indicator.

Maintenance

From the main menu scroll to:

Message	Action and Description
Truck Info	Press the down arrow button, then from this menu scroll to the following message.
Maintenance Monitor	Press the OK button.
Oil Life: xxx%	Press the down arrow button, then from this menu scroll to the following message.
Oil Life	Press the OK button.
Oil Life Hold OK to Reset	Press and hold the OK button until the instrument cluster displays the following message.
	Oil Life: 100%
	When the oil change indicator resets, the instrument cluster displays 100%. Repeat the process if the oil change indicator does not reset.

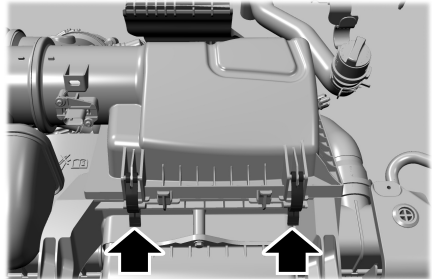
CHANGING THE ENGINE AIR FILTER



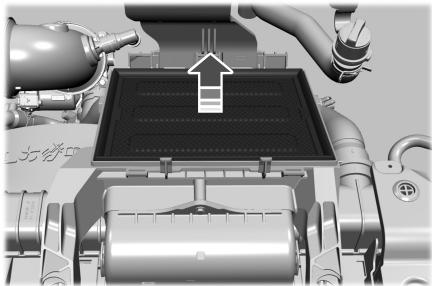
WARNING: To reduce the risk of vehicle damage and personal burn injuries, do not start your engine with the air cleaner removed and do not remove it while the engine is running.

Note: Failure to use the correct air filter element may result in severe engine damage. The customer warranty may be void for any damage to the engine if the correct air filter element is not used.

When changing the air filter element, use only the air filter element listed. See **Motorcraft Parts** (page 227). The air filter element should be replaced at the appropriate intervals. See **Normal Scheduled Maintenance** (page 252).



1. Release the clips (x2) that secure the two halves of the air filter housing together.



2. Carefully separate the two halves of the air filter housing.
3. Remove the air filter element from the housing.

Maintenance

4. Install the new filter element. Be careful to put the filter seal on top of the tray, making sure that the seal is not pushed down into the tray. This could cause filter damage and allow unfiltered air to enter the engine if not properly seated.
5. Install the air filter housing cover. Use special care to ensure that the air cleaner cover is reinstalled correctly. Verify that the tabs at the rear of the air cleaner housing cover are fully inserted into the slots at the rear of the air cleaner housing tray.
6. Secure the air filter housing clips (x2).

ENGINE COOLANT CHECK



WARNING: Do not remove the coolant reservoir cap when the engine is on or the cooling system is hot. Wait 10 minutes for the cooling system to cool down. Cover the coolant reservoir cap with a thick cloth to prevent the possibility of scalding and slowly remove the cap. Failure to follow this instruction could result in personal injury.



WARNING: To reduce the risk of personal injury, make sure the engine is cool before unscrewing the coolant pressure relief cap. The cooling system is under pressure. Steam and hot liquid can come out forcefully when you loosen the cap slightly.

When the engine is cold, check the concentration and level of the coolant at the intervals listed in the scheduled maintenance information. See **Scheduled Maintenance** (page 249).

Note: Make sure that the coolant level is between the **MIN** and **MAX** marks on the coolant reservoir.

Note: Coolant expands when it is hot. The level may extend beyond the **MAX** mark.

Maintain coolant concentration within 48% to 50%, which equates to a freeze point between -29°F (-34°C) and -35°F (-37°C). Use a refractometer to check coolant concentration. Do not use hydrometers or coolant test strips for measuring coolant concentration.

Adding Coolant



WARNING: Do not add coolant when the vehicle is on or the cooling system is hot. Failure to follow this instruction could result in personal injury.



WARNING: Do not put coolant in the windshield washer reservoir. If sprayed on the windshield, coolant could make it difficult to see through the windshield.



WARNING: Do not remove the coolant reservoir cap when the engine is on or the cooling system is hot. Wait 10 minutes for the cooling system to cool down. Cover the coolant reservoir cap with a thick cloth to prevent the possibility of scalding and slowly remove the cap. Failure to follow this instruction could result in personal injury.



WARNING: Do not add coolant further than the **MAX** mark.

Note: Automotive fluids are not interchangeable. Do not use coolant or windshield washer fluid outside of its specified function and vehicle location.

Note: Do not use stop leak pellets, cooling system sealants, or non-specified additives as they can cause damage to the engine cooling or heating systems. Resulting component damage may not be covered by the vehicle warranty.

Maintenance

Always use prediluted coolant approved to the correct specification to avoid plugging the small passageways in the engine cooling system. See **Capacities and Specifications** (page 226). Do not mix different colors or types of coolant in your vehicle. Mixing of engine coolants or using an incorrect coolant may harm the engine or cooling system components and may not be covered by the vehicle warranty.

Note: *If prediluted coolant is not available, use the approved concentrated coolant diluting it to 50/50 with distilled water. See **Capacities and Specifications** (page 226). Using water that has not been deionized may contribute to deposit formation, corrosion and plugging of the small cooling system passageways.*

Note: *Coolants marketed for all makes and models may not be approved to Ford specifications and may damage the cooling system. Resulting component damage may not be covered by the vehicle warranty.*

If the coolant level is at or below the minimum mark, add prediluted coolant immediately.

Top up the coolant level as follows:

1. Unscrew the cap slowly. Any pressure escapes as you unscrew the cap.
2. Add prediluted coolant approved to the correct specification. See **Capacities and Specifications** (page 226).
3. Add enough prediluted coolant to reach the correct level.
4. Replace the coolant reservoir cap. Turn the cap clockwise until it contacts the hard stop.
5. Check the coolant level the next few times you drive your vehicle. If necessary, add enough prediluted engine coolant to bring the coolant level to the correct level.

If you have to add more than 1.1 qt (1 L) of engine coolant per month, have your vehicle checked as soon as possible. Operating an engine with a low coolant level can result in engine overheating and possible engine damage.

Note: *During normal vehicle operation, the coolant may change color, and slightly darken. As long as the coolant is clear and uncontaminated, this color change does not indicate the coolant has degraded nor does it require the coolant to be drained, the system to be flushed, or the coolant to be replaced.*

In case of emergency, you can add a large amount of water without coolant to reach a vehicle service location. In this instance, qualified personnel:

1. Must drain the cooling system.
2. Chemically clean the coolant system.
3. Refill with coolant that meets the correct specification. See **Capacities and Specifications** (page 226).

Water alone, without coolant, can cause engine damage from corrosion, overheating or freezing.

Do not use the following as a coolant substitute:

- Alcohol.
- Methanol.
- Brine.
- Any coolant mixed with alcohol or methanol antifreeze.

Alcohol and other liquids can cause engine damage from overheating or freezing.

Do not add extra inhibitors or additives to the coolant. These can be harmful and compromise the corrosion protection of the coolant.

Maintenance

Recycled Coolant

We do not recommend the use of recycled coolant as an approved recycling process is not yet available.

Dispose of used engine coolant in an appropriate manner.

Follow your community's regulations and standards for recycling and disposing of automotive fluids.

Severe Climates

If you drive in extremely cold climates:

- It may be necessary to increase the coolant concentration above 50%.
- A coolant concentration of 60% provides improved freeze point protection. Coolant concentrations above 60% decrease the overheat protection characteristics of the coolant and may cause engine damage.

If you drive in extremely hot climates:

- You can decrease the coolant concentration to 40%.
- Coolant concentrations below 40% decrease the freeze and corrosion protection characteristics of the coolant and may cause engine damage.

Vehicles driven year-round in non-extreme climates should use prediluted coolant for optimum cooling system and engine protection.

Coolant Change

Change the engine coolant at the specific mileage intervals listed in scheduled maintenance. See **Capacities and Specifications** (page 226).

Fail-Safe Cooling

Fail-safe cooling allows you to temporarily drive your vehicle before any incremental component damage occurs. The fail-safe distance depends on ambient temperature, vehicle load and terrain.

How Fail-Safe Cooling Works

If the engine begins to overheat, the coolant temperature gauge moves toward the red zone.



A warning lamp illuminates and a message may appear in the instrument cluster display.



If the engine reaches a preset over-temperature condition, it automatically switches to alternating cylinder operation. Each disabled cylinder acts as an air pump and cools the engine.

When this occurs, your vehicle still operates, however:

- Engine power is limited.
- The air conditioning system turns off.

Continued operation increases the engine temperature, causing the engine to completely shut down. Your steering and braking effort increases in this situation.

When the engine temperature cools, you can restart the engine. Have your vehicle checked as soon as possible to minimize engine damage.

When Fail-Safe Mode Is Activated



WARNING: Fail-safe mode is for use during emergencies only. Operate your vehicle in fail-safe mode only as long as necessary to bring your vehicle to rest in a safe location and seek immediate repairs. When in fail-safe

Maintenance

mode, your vehicle will have limited power, will not be able to maintain high-speed operation, and may completely shut down without warning, potentially losing engine power, power steering assist, and power brake assist, which may increase the possibility of a crash resulting in serious injury.



WARNING: Do not remove the coolant reservoir cap when the engine is on or the cooling system is hot. Wait 10 minutes for the cooling system to cool down. Cover the coolant reservoir cap with a thick cloth to prevent the possibility of scalding and slowly remove the cap. Failure to follow this instruction could result in personal injury.

Your vehicle has limited engine power when in the fail-safe mode, drive your vehicle with caution. Your vehicle does not maintain high-speed operation and the engine may operate poorly.

Remember that the engine is capable of automatically shutting down to prevent engine damage. In this situation:

1. Pull off the road as soon as safely possible and switch the engine off.
2. If you are a member of a roadside assistance program, contact your roadside assistance service provider.
3. If this is not possible, wait a short period for the engine to cool.
4. Check the coolant level. If the coolant level is at or below the minimum mark, add prediluted coolant immediately.
5. When the engine temperature cools, you can restart the engine. Have your vehicle checked as soon as possible to minimize engine damage.

Note: *Driving your vehicle without repair increases the chance of engine damage.*

Engine Coolant Temperature Management (If Equipped)



WARNING: To reduce the risk of crash and injury, be prepared that the vehicle speed may reduce and the vehicle may not be able to accelerate with full power until the coolant temperature reduces.

If you tow a trailer with your vehicle, the engine may temporarily reach a higher temperature during severe operating conditions, for example ascending a long or steep slope in high ambient temperatures.

At this time, you may notice the coolant temperature gauge moves toward the red zone and a message may appear in the instrument cluster display.

You may notice a reduction in vehicle speed caused by reduced engine power to manage the engine coolant temperature. Your vehicle may enter this mode if certain high-temperature and high-load conditions take place. The amount of speed reduction depends on vehicle loading, grade and ambient temperature. If this occurs, there is no need to pull off the road. You can continue to drive your vehicle.

The air conditioning may automatically turn on and off during severe operating conditions to protect the engine from overheating. When the coolant temperature returns to the normal operating temperature, the air conditioning turns on.

If the coolant temperature gauge moves fully into the red zone, or if the coolant temperature warning or service engine soon messages appear in your instrument cluster display, do the following:

Maintenance

1. Pull off the road as soon as safely possible and shift the transmission into park (P).
2. Leave the engine running until the coolant temperature gauge needle returns to the normal position. If the temperature does not drop after several minutes, follow the remaining steps.
3. Switch the engine off and wait for it to cool. Check the coolant level.
4. If the coolant level is at or below the minimum mark, immediately add prediluted coolant.
5. If the coolant level is normal, restart the engine and continue driving.

AUTOMATIC TRANSMISSION FLUID CHECK

Have an authorized dealer check and change the transmission fluid and filter at the correct service interval. See

Scheduled Maintenance (page 249).

Do not use supplemental transmission fluid additives, treatments or cleaning agents. The use of these materials may affect transmission operation and result in damage to internal transmission components.

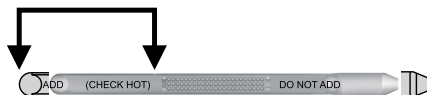
Checking Automatic Transmission Fluid

For scheduled intervals of the fluid checks and changes, See **Scheduled Maintenance** (page 249). Your transmission does not consume fluid. However, if the transmission is not working properly, for example, if the transmission slips or shifts slowly, or if you notice some sign of fluid leakage, check the fluid level as soon as possible.

Automatic transmission fluid expands when warmed. Obtain an accurate reading as follows :

1. Drive the vehicle approximately 19 mi (30 km) to reach normal operating temperature via the transmission fluid temperature gauge on the instrument cluster.
2. Park the vehicle on a level surface and engage the parking brake.
3. With the engine running, parking brake engaged and your foot on the brake pedal, move the gearshift lever through all of the gear ranges. Allow sufficient time for each gear to engage.
4. Put the transmission in park (P) and leave the engine running.
5. Remove the dipstick, wiping it clean with a clean, dry, lint free rag.
6. Install the dipstick, fully seating it in the filler tube.
7. Remove the dipstick and inspect the fluid level. The fluid should be in the designated area for normal operating temperature.

Low Fluid Level

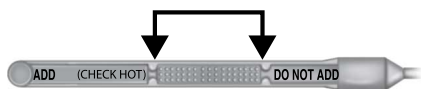


E163740

Do not drive the vehicle if there is no indication of fluid on the dipstick and the ambient temperature is above 50°F (10°C).

Maintenance

Correct Fluid Level



E163742

Drive the vehicle 19 mi (30 km) or until it reaches normal operating temperature. Check the fluid at the normal operating temperature of 196°F (91°C) to 215°F (102°C) on a level surface.

High Fluid Level



E163744

Fluid levels above the safe range may result in transmission failure. An overfill condition of transmission fluid may cause shift and engagement concerns, and possible damage.

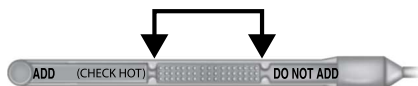
An overheating condition can cause high fluid levels.

Adjusting Automatic Transmission Fluid Levels

Note: Use of a non-approved automatic transmission fluid may cause internal transmission component damage.

Make sure to use the correct type of fluid. You can find the type of fluid used on the transmission dipstick, or in your Owner's Manual. See **Capacities and Specifications** (page 226).

If necessary, add fluid in 8 fl oz (250 ml) increments through the filler tube until the level is correct.



E163746

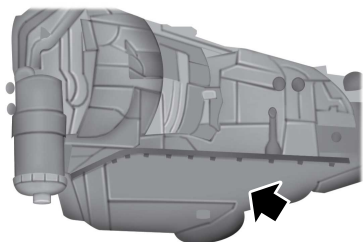
If an overfill occurs, have a qualified technician remove excess fluid.

Note: An overfill condition of transmission fluid may cause shift and engagement concerns, and possible damage.

Do not use supplemental transmission fluid additives, treatments or cleaning agents. The use of these materials may affect transmission operation and result in damage to internal transmission components.

Maintenance

Automatic Transmission Fluid Filter



E196355

Your automatic transmission has a serviceable transmission fluid filter inside the transmission bottom pan. For service intervals for the automatic transmission fluid and transmission filter, See **Scheduled Maintenance** (page 249).

For transmission filter maintenance, see your authorized dealer.

BRAKE FLUID CHECK

WARNING: Do not use any fluid other than the recommended brake fluid as this will reduce brake efficiency. Use of incorrect fluid could result in the loss of vehicle control, serious personal injury or death.

WARNING: Only use brake fluid from a sealed container. Contamination with dirt, water, petroleum products or other materials may result in brake system damage or failure. Failure to adhere to this warning could result in the loss of vehicle control, serious personal injury or death.

WARNING: Do not allow the fluid to touch your skin or eyes. If this happens, rinse the affected areas immediately with plenty of water and contact your physician.

WARNING: The brake system could be affected if the brake fluid level is below the **MIN** mark or above the **MAX** mark on the brake fluid reservoir.



1. Park your vehicle on a level surface.
2. Look at the brake fluid reservoir to see where the brake fluid level is relative to the **MIN** and the **MAX** marks on the reservoir.

Note: If the brake fluid level is between the **MIN** and the **MAX** marks on the reservoir, it is acceptable.

Note: If the brake fluid level is below the **MIN** mark or above the **MAX** mark, have your vehicle checked as soon as possible.

Note: To avoid fluid contamination, the reservoir cap must remain in place and fully tight, unless you are adding fluid.

Maintenance

Only use fluid that meets our specifications. See **Capacities and Specifications** (page 226).

Brake Fluid Service Interval

Brake fluid absorbs water over time which degrades the effectiveness of the brake fluid. Change the brake fluid at the specified intervals to prevent degraded braking performance.

For detailed interval information, see Scheduled Maintenance in your Owner's Manual or your local maintenance guide.

POWER STEERING FLUID CHECK



WARNING: A fluid level between the MAX and MIN lines is within the normal operating range and there is no need to add fluid. A fluid level not in the normal operating range could compromise the performance of the system.



WARNING: For E-350 and E-450 vehicles with the Hydro-Boost Brake System, do not press the brake pedal after the engine has been turned off. Pressing the brake pedal after the engine has been turned off will give a false power steering fluid level reading.

Only use fluid that meets Ford specifications. See **Hydraulic Power Steering Fluid Capacity and Specification** (page 235).

To top up the power steering fluid level do the following.

1. Start the engine and let it run until it reaches normal operating temperature.
2. Make sure the fluid is within the **MIN** and **MAX** range.

3. If the fluid level is low, add fluid to be within the **MIN** and **MAX** range. Do not overfill.
4. While the engine idles, turn the steering wheel left and right several times.
5. Recheck the fluid level in the reservoir.

Note: Do not operate the vehicle with a low power steering pump fluid level.

CHANGING THE 12V BATTERY



WARNING: This vehicle may have more than one battery. Removing the battery cables from only one battery does not disconnect your vehicle electrical system. Make sure you disconnect the battery cables from all batteries when disconnecting power. Failure to do so may cause serious personal injury or property damage.



WARNING: Batteries normally produce explosive gases which can cause personal injury. Therefore, do not allow flames, sparks or lighted substances to come near the battery. When working near the battery, always shield your face and protect your eyes. Always provide correct ventilation.



WARNING: When lifting a plastic-cased battery, excessive pressure on the end walls could cause acid to flow through the vent caps, resulting in personal injury and damage to the vehicle or battery. Lift the battery with a battery carrier or with your hands on opposite corners.

Maintenance



WARNING: Keep batteries out of reach of children. Batteries contain sulfuric acid. Avoid contact with skin, eyes or clothing. Shield your eyes when working near the battery to protect against possible splashing of acid solution. In case of acid contact with skin or eyes, flush immediately with water for a minimum of 15 minutes and get prompt medical attention. If acid is swallowed, call a physician immediately.



WARNING: Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. **Wash your hands after handling.**

Note: *If your vehicle battery has a cover, make sure it is reinstalled after the battery has been cleaned or replaced.*

Note: *Electrical or electronic accessories or components added to the vehicle by the dealer or the owner may adversely affect battery performance and durability.*

Your vehicle is fitted with a Motorcraft® maintenance-free battery which normally does not require additional water during its life of service.

For longer, trouble-free operation, keep the top of the battery clean and dry. Also, make certain the battery cables are always tightly fastened to the battery terminals.

If you see any corrosion on the battery or terminals, remove the cables from the terminals and clean with a wire brush. You can neutralize the acid with a solution of baking soda and water.

Always dispose of automotive batteries in a responsible manner. Follow your local authorized standards for disposal. Call your local authorized recycling center to find out more about recycling automotive batteries.

Reconnecting the Battery

Because your vehicle's engine is electronically controlled by a computer, some control conditions are maintained by power from the battery. When the battery is disconnected or a new battery is installed, the engine must relearn its idle and fuel trim strategy for optimum driveability and performance. Flexible fuel vehicles must also relearn the ethanol content of the fuel for optimum driveability and performance.

To begin this process.

1. Switch off all accessories and start the engine.
2. Run the engine until it reaches normal operating temperature.
3. Allow the engine to idle for at least one minute.
4. Turn the A/C on and allow the engine to idle for at least one minute.
5. Press the brake pedal. Release the parking brake. Shift the gearshift lever to drive (D) and allow the engine to idle for at least one minute.
6. Drive the vehicle for approximately 10 mi (16 km) to complete the relearning process.

Note: *If you do not carry out the above process, the idle quality of your vehicle may be adversely affected until the idle trim is eventually relearned.*

Flexible fuel vehicles operating on E85 may experience poor starts and driveability problems until the fuel trim and ethanol content have been relearned.

Maintenance

When the battery is disconnected or a new battery installed, the transmission must relearn its adaptive strategy. As a result of this, the transmission may shift firmly. This operation is considered normal and fully updates transmission operation to its optimum shift feel.

We recommend that the negative battery cable terminal be disconnected if you plan to store your vehicle for an extended period of time. This minimizes the discharge of your battery during storage.

Dual Batteries (If Equipped)

Your vehicle may be fitted with a frame-mounted battery located on the passenger side frame rail, behind the front passenger door. This battery is connected in parallel with the battery in the engine compartment. Both batteries are used to start the vehicle.

12V Battery – Warning Lamps



If it illuminates while driving, it indicates a charging system error. Switch off all unnecessary electrical equipment and have your vehicle immediately checked.

12V Battery – Information Messages

Message	Details
Check Charging System	The charging system needs servicing. If the warning stays on or continues to come on, have your vehicle checked as soon as possible.
Charging System Service Soon	The charging system needs servicing. If the warning stays on or continues to come on, have your vehicle checked as soon as possible.
Charging System Service Now	The charging system needs servicing. Have your vehicle immediately checked.

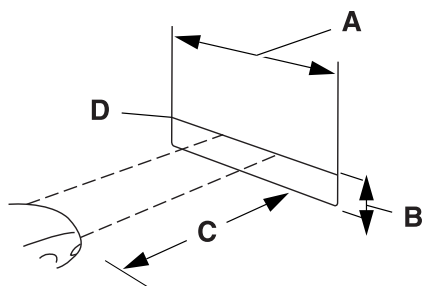
ADJUSTING THE HEADLAMPS

We properly aim the headlamps on your vehicle at the assembly plant. If your vehicle has been in an accident, have an authorized dealer check the alignment of your headlamps.

Vertical Aim Adjustment Procedure

You can only adjust the headlamps vertically. Your vehicle does not require horizontal aim adjustments.

Maintenance



- A 8 feet (2.4 meters).
- B Center height of lamp to ground.
- C 25 feet (7.6 meters).
- D Horizontal reference line.

To adjust the headlamps:

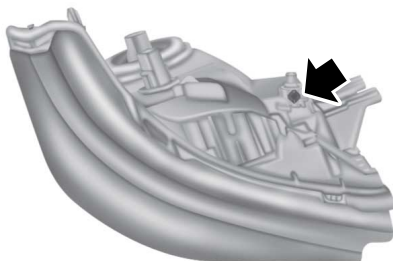
1. Park the vehicle directly in front of a wall or screen on a level surface, approximately 25 ft (7.6 m) away.
2. Measure the height of the headlamp bulb center from the ground and mark an 8 ft (2.4 m) horizontal reference line on the vertical wall or screen at this height.

Note: To see a clearer light pattern for adjusting, you may want to block the light from one headlamp while adjusting the other.

3. Turn on the low beam headlamps to illuminate the wall or screen and open the hood.



4. On the wall or screen, you will observe a flat zone of high intensity light located at the top of the right hand portion of the beam pattern. If the top edge of the high intensity light zone is not at the horizontal reference line, you will need to adjust the headlamp.



5. Locate the vertical adjuster on each headlamp. Using a Phillips #2 screwdriver, turn the adjuster either clockwise or counterclockwise in order to adjust the vertical aim of the headlamp.
6. Repeat steps 3 through 5 to adjust the other headlamp.
7. Close the hood and switch off the lamps.

Maintenance

WASHER FLUID CHECK



WARNING: If you operate your vehicle in temperatures below 40°F (5°C), use washer fluid with antifreeze protection. Failure to use washer fluid with antifreeze protection in cold weather could result in impaired windshield vision and increase the risk of injury or accident.

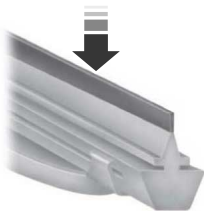
Add fluid to fill the reservoir if the level is low. Only use a washer fluid that meets Ford specifications. See **Capacities and Specifications** (page 226).

State or local regulations on volatile organic compounds may restrict the use of methanol, a common windshield washer antifreeze additive. Washer fluids containing non-methanol antifreeze agents should be used only if they provide cold weather protection without damaging the vehicle's paint finish, wiper blades or washer system.

FUEL FILTER

Your vehicle is equipped with a lifetime fuel filter that is integrated with the fuel tank. Regular maintenance or replacement is not needed.

CHECKING THE WIPER BLADES

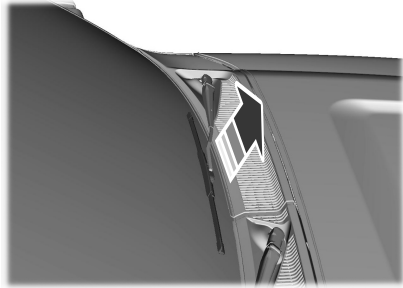


Run the tip of your fingers over the edge of the blade to check for roughness.

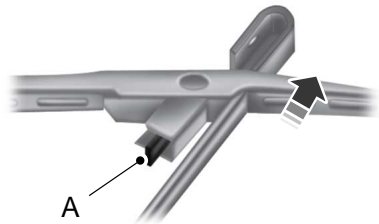
Clean the wiper blades with washer fluid or water applied with a soft sponge or cloth.

CHANGING THE WIPER BLADES

You can manually move the wiper arms when the ignition is off. This allows for ease of blade replacement and cleaning under the blades.



1. Pull the wiper blade and arm away from the glass.



E165794

2. Release the wiper blade lock (A) and separate the wiper blade from the wiper arm.
3. Install in the reverse order.

Maintenance

Note: Make sure that the wiper blade locks into place. Lower the wiper arm and blade back on the windshield. The wiper arms will automatically return to their normal position when you turn the ignition on.

- Replace wiper blades at least once per year for optimum performance.
- You can improve poor wiper quality by cleaning the wiper blades and the windshield.

REMOVING A HEADLAMP

1. Make sure the headlamp switch is in the off position, then open the hood.



E196385

2. Remove the three screws from the headlamp assembly and pull the assembly straight out.
3. Disconnect the electrical connector by squeezing the release tab and pushing the connector forward, then pulling it rearward.
4. Remove the headlamp.

To install the new lamp, follow the removal procedures in reverse order.

CHANGING A BULB

Lamp Assembly Condensation

Exterior lamps are vented to accommodate normal changes in pressure. Condensation can be a natural by-product of this design. When moist air enters the lamp assembly through the vents, there is a possibility that condensation can occur when the temperature is cold. When normal condensation occurs, a thin film of mist can form on the interior of the lens. The thin mist eventually clears and exits through the vents during normal operation. Clearing time may take as long as 48 hours under dry weather conditions.

Examples of acceptable condensation are:

- Presence of thin mist (no streaks, drip marks or droplets).
- Fine mist covers less than 50% of the lens.

Examples of unacceptable moisture (usually caused by a lamp water leak) are:

- Water puddle inside the lamp.
- Large water droplets, drip marks or streaks present on the interior of the lens.

Take your vehicle to a dealer for service if any of the above conditions of unacceptable moisture are present.

Replacing Headlamp Bulbs



WARNING: Make sure the bulbs have cooled down before removing them. Failure to follow this warning could result in serious personal injury.

Note: Grasp the bulb by only its plastic base and do not touch the glass. The oil from your hand could cause the bulb to break the next time the headlamps are operated.

Maintenance

Note: If the bulb is accidentally touched, clean it with rubbing alcohol before use.

1. Make sure the headlamp switch is in the off position, then open the hood.
2. Remove the headlamp. See **Removing a Headlamp** (page 179).
3. Disconnect the electrical connector by squeezing the release tab and pushing the connector forward, then pulling it rearward.



E196386

4. Remove the bulb assembly by turning it counterclockwise and pulling it straight out.

To install the new bulb, follow the removal procedures in reverse order.

Replacing Front Parking Lamp and Direction Indicator Bulbs



E196388

1. Make sure the headlamp switch is in the off position, then open the hood.
2. Remove the headlamp assembly. Refer to **Replacing Headlamp Bulbs** in this section.
3. Rotate the bulb socket counterclockwise and remove.
4. Carefully pry up the bulb straight out of the socket.

To complete installation, follow the removal procedures in reverse order.

Replacing Side Marker Bulbs



E196390

1. Make sure the headlamp switch is in the off position, then open the hood.
2. Remove the headlamp assembly. Refer to **Replacing Headlamp Bulbs** in this section.
3. Rotate the bulb socket counterclockwise and remove.
4. Carefully pry up the bulb straight out of the socket.

To complete installation, follow the removal procedures in reverse order.

Replacing Brake/Tail/Turn/Reverse Lamp Bulbs (Cut-Away Only)

1. Make sure the headlamps are off.

Maintenance



2. Remove the four screws and the lamp lens from the lamp assembly.
3. Carefully pull the bulb straight out of the socket and push in the new bulb.

Vehicle Care

GENERAL INFORMATION

Your dealer has many quality products available to clean your vehicle and protect its finishes.

CLEANING PRODUCTS

Materials

For best results, use the following products or products of equivalent quality:

For additional information and assistance, we recommend that you contact an authorized dealer.

Name	Specification
Motorcraft® Bug and Tar Remover, ZC-42 (U.S. & Canada)	
Motorcraft® Custom Bright Metal Cleaner, ZC-15 (U.S. & Canada)	ESR-M5B194-B
Motorcraft® Detail Wash, ZC-3-A (U.S. & Canada)	ESR-M14P4-A
Motorcraft® Engine Shampoo and Degreaser, ZC-20 (U.S.)	ESR-M14P3-A
Motorcraft® Engine Shampoo, CXC-66-A (Canada)	
Motorcraft® Premium Leather and Vinyl Cleaner, ZC-56 (U.S. & Canada)	
Motorcraft® Multi-Purpose Cleaner, CXC-101 (Canada)	
Motorcraft® Premium Windshield Wash Concentrate with Bitterant, ZC-32-B2 (U.S.)	WSS-M14P19-A
Motorcraft® Premium Quality Windshield Washer Fluid, CXC-37-F/M (Canada)	WSS-M14P19-A
Motorcraft® Professional Strength Carpet & Upholstery Cleaner, ZC-54 (U.S. & Canada)	
Motorcraft® Premium Glass Cleaner, CXC-100 (Canada)	ESR-M14P5-A
Motorcraft® Spot and Stain Remover, ZC-14 (U.S.)	
Motorcraft® Ultra-Clear Spray Glass Cleaner, ZC-23 (U.S.)	ESR-M14P5-A
Motorcraft® Wheel and Tire Cleaner, ZC-37-A (U.S. & Canada)	

Vehicle Care

CLEANING THE EXTERIOR

Wash your vehicle regularly with cool or lukewarm water and a neutral pH shampoo, we recommend Motorcraft Detail Wash.

- Never use strong household detergents or soap, for example dish washing or laundry liquid. These products can discolor and spot painted surfaces.
- Never wash your vehicle when it is hot to the touch, or during strong or direct sunlight.
- Dry your vehicle with a chamois or soft terry cloth towel to eliminate water spotting.
- Immediately remove fuel spillages, bird droppings, insect deposits and road tar. These may cause damage to your vehicle's paintwork or trim over time. We recommend Motorcraft Bug and Tar Remover.
- Remove any exterior accessories, for example antennas, before entering a car wash.
- When filling with AdBlue®, remove any residue on painted surfaces immediately.

Note: *Suntan lotions and insect repellents can damage painted surfaces. If these substances come in contact with your vehicle, wash the affected area as soon as possible.*

Cleaning the Exterior Precautions

Immediately remove fuel spillages, AdBlue residuals, bird droppings, insect deposits and road tar. These may cause damage to your vehicle's paintwork or trim over time.

Remove any exterior accessories, for example antennas, before entering a car wash.

Cleaning the Exterior Lamps

Note: *Do not scrape the exterior lamps lenses or use abrasives, alcoholic solvents or chemical solvents to clean them.*

Note: *Do not wipe the exterior lamps when they are dry.*

Exterior Chrome Parts

- Apply a high quality-cleaning product to bumpers and other chrome parts. Follow the manufacturer's instructions. We recommend Motorcraft Custom Bright Metal Cleaner.
- Do not apply the cleaning product to hot surfaces. Do not leave the cleaning product on chrome surfaces longer than the time recommended.
- Using non-recommended cleaners can result in severe and permanent cosmetic damage.

Note: *Never use abrasive materials, for example steel wool or plastic pads as they can scratch the chrome surface.*

Note: *Do not use chrome cleaner, metal cleaner or polish on wheels or wheel covers.*

Exterior Plastic Parts

For routine cleaning we recommend Motorcraft Detail Wash. If tar or grease spots are present, we recommend Motorcraft Bug and Tar Remover.

Stripes or Graphics (If Equipped)

Hand washing your vehicle is preferred however, pressure washing may be used under the following conditions:

- Do not use water pressure higher than 2,000 psi (14,000 kPa).
- Do not use water hotter than 179°F (82°C).

Vehicle Care

- Use a spray with a 40 degree wide spray angle pattern.
- Keep the nozzle at a 12 in (305 mm) distance and 90 degree angle to your vehicle's surface.

Note: *Holding the pressure washer nozzle at an angle to the vehicle's surface may damage graphics and cause the edges to peel away from the vehicle's surface.*

Underbody

Regularly clean the entire underside of your vehicle. This includes the chassis, body floor sheet metal and wheel wells using fresh water. Keep body and door drain holes free of debris or foreign material.

Under Hood

For removing black rubber marks from under the hood we recommend Motorcraft Wheel and Tire Cleaner or Motorcraft Bug and Tar Remover.

WAXING

Regular waxing is necessary to protect your car's paint from the elements. We recommend that you wash and wax the painted surface once or twice a year.

When washing and waxing, park your vehicle in a shaded area out of direct sunlight. Always wash your vehicle before applying wax.

- Use a quality wax that does not contain abrasives.
- Follow the manufacturer's instructions to apply and remove the wax.
- Apply a small amount of wax in a back-and-forth motion, not in circles.

- Do not allow wax to come in contact with any non-body (low-gloss black) colored trim. The wax will discolor or stain the parts over time.
 - Roof racks.
 - Bumpers.
 - Grained door handles.
 - Side moldings.
 - Mirror housings.
 - Windshield cowl area.
- Do not apply wax to glass areas.
- After waxing, your car's paint should feel smooth, and be free of streaks and smudges.

CLEANING THE ENGINE

Engines are more efficient when they are clean because grease and dirt buildup keep the engine warmer than normal.

When washing:

- Take care when using a power washer to clean the engine. The high-pressure fluid could penetrate the sealed parts and cause damage.
- Do not spray a hot engine with cold water to avoid cracking the engine block or other engine components.
- Spray Motorcraft Engine Shampoo and Degreaser on all parts that require cleaning and pressure rinse clean. In Canada, use Motorcraft Engine Shampoo.

Note: *If your vehicle has an engine cover remove the cover before application of Motorcraft Engine Shampoo and Degreaser. Immediately rinse away any over spray.*

Vehicle Care

- Never wash or rinse the engine while it is hot or running; water in the running engine may cause internal damage.
- Never wash or rinse any ignition coil, spark plug wire or spark plug well, or the area in and around these locations.
- Cover the battery, power distribution box, and air filter assembly to prevent water damage when cleaning the engine.

CLEANING THE WINDOWS AND WIPER BLADES

Car wash chemicals and environmental fallout can result in windshield and wiper blade contamination. Dirty windshield and wipers will result in poor windshield wiper operation. Keep the windshield and wiper blades clean to maintain windshield wiper performance.

To clean the windshield and wiper blades:

- Clean the windshield with a non-abrasive glass cleaner. When cleaning the interior of the windshield, avoid getting any glass cleaner on the instrument panel or door panels. Wipe any glass cleaner off these surfaces immediately.
- For windshields contaminated with tree sap, chemicals, wax or bugs, clean the entire windshield using steel wool (no greater than 0000 grade) in a circular motion and rinse with water.
- Clean the wiper blades with isopropyl rubbing alcohol or windshield washer concentrate.

Note: Do not use razor blades or other sharp objects to clean or remove decals from the inside of the heated rear window. The vehicle warranty does not cover damage caused to the heated rear window grid lines.

CLEANING THE INTERIOR



WARNING: Do not use cleaning solvents, bleach or dye on the vehicle's seatbelts, as these actions may weaken the belt webbing.



WARNING: On vehicles equipped with seat-mounted airbags, do not use chemical solvents or strong detergents. Such products could contaminate the side airbag system and affect performance of the side airbag in a crash.

For fabric, carpets, cloth seats and seats equipped with side airbags:

- Remove dust and loose dirt with a vacuum cleaner.
- Remove light stains and soil with Motorcraft Professional Strength Carpet & Upholstery Cleaner.
- If grease or tar is present on the material, spot-clean the area first with Motorcraft Spot and Stain Remover. In Canada, use Motorcraft Multi-Purpose Cleaner.
- If a ring forms on the fabric after spot cleaning, clean the entire area immediately (but do not oversaturate) or the ring will set.
- Do not use household cleaning products or glass cleaners, which can stain and discolor the fabric and affect the flame retardant abilities of the seat materials.

Mirrors

Do not clean the housing or glass of any mirror with harsh abrasives, fuel or other petroleum or ammonia-based cleaning products.

CLEANING THE INSTRUMENT PANEL AND INSTRUMENT CLUSTER LENS



WARNING: Do not use chemical solvents or strong detergents when cleaning the steering wheel or instrument panel to avoid contamination of the airbag system.

Note: Follow the same procedure as cleaning leather seats for cleaning leather instrument panels and leather interior trim surfaces. See **Cleaning Leather Seats** (page 186).

Clean the instrument panel and cluster lens with a clean, damp and soft cloth, then use a clean, dry and soft cloth to dry these areas.

- Avoid cleaners or polishes that increase the gloss of the upper portion of the instrument panel. The dull finish in this area helps protect you from undesirable windshield reflection.
- Do not use any household cleaning products or glass cleaners as these may damage the finish of the instrument panel, interior trim and cluster lens.
- Wash or wipe your hands clean if you have been in contact with certain products such as insect repellent and suntan lotion to avoid possible damage to the interior painted surfaces.
- Do not allow air fresheners and hand sanitizers to spill onto interior surfaces. If a spill occurs, wipe off immediately. Your warranty may not cover these damages.

If a staining liquid like coffee or juice has been spilled on the instrument panel or on interior trim surfaces:

1. Wipe up spilled liquid using a clean, soft cloth as quickly as possible.
2. Use Motorcraft Premium Leather and Vinyl Cleaner or a commercially available leather cleaning product for automotive interiors. Test any cleaner or stain remover on an inconspicuous area.
3. Alternatively, wipe the surface with a clean, soft cloth and a mild soap and water solution. Dry the area with a clean, soft cloth.
4. If necessary, apply more soap and water solution or cleaning product to a clean, soft cloth and press it onto the soiled area. Allow this to set at room temperature for 30 minutes.
5. Remove the soaked cloth, then with a clean, damp cloth, use a rubbing motion for 60 seconds on the soiled area.
6. Dry the area with a clean, soft cloth.

CLEANING LEATHER SEATS

Note: Follow the same procedure as cleaning leather seats for cleaning leather instrument panels and leather interior trim surfaces.

For routine cleaning, wipe the surface with a soft, damp cloth and a mild soap and water solution. Dry the area with a clean, soft cloth.

For cleaning and removing stains such as dye transfer, use Motorcraft Premium Leather and Vinyl Cleaner or a commercially available leather cleaning product for automotive interiors.

Note: Test any cleaner or stain remover on an inconspicuous area.

Vehicle Care

You should:

- Remove dust and loose dirt with a vacuum cleaner.
- Clean and treat spills and stains as soon as possible.

Do not use the following products as these may damage the leather:

- Oil and petroleum or silicone-based leather conditioners.
- Household cleaners.
- Alcohol solutions.
- Solvents or cleaners intended specifically for rubber, vinyl and plastics.

REPAIRING MINOR PAINT DAMAGE

We recommend that you contact an authorized dealer to identify your vehicle color code. Authorized dealers have touch-up paint to match your vehicle's color.

Before repairing minor paint damage, use a cleaner to remove particles such as bird droppings, tree sap, insect deposits, tar spots, road salt and industrial fallout.

Read the instructions before using cleaning products.

CLEANING THE WHEELS

1. Regularly clean them with a wheel cleaner. We recommend that you use Ford approved wheel cleaner if available.
2. Remove dirt and brake dust with a sponge.
3. Remove tar and grease with a bug and tar remover. We recommend that you use Ford approved bug and tar remover if available.

4. Thoroughly rinse the wheels with water after cleaning.

If you intend on parking your vehicle for an extended period after cleaning the wheels with a wheel cleaner, drive your vehicle for a few minutes before doing so. This reduces the risk of corrosion of the brake discs, brake pads and linings.

Do not clean the wheels when they are hot.

Note: *Some car washes could damage wheel rims and covers.*

Note: *Using non-recommended cleaners, harsh cleaning products, chrome wheel cleaners or abrasive materials could damage wheel rims, covers and bolts.*

VEHICLE STORAGE

If you plan on storing your vehicle for 30 days or more, read the following maintenance recommendations to make sure your vehicle stays in good operating condition.

We engineer and test all motor vehicles and their components for reliable, regular driving. Under various conditions, long-term storage may lead to degraded engine performance or failure unless you use specific precautions to preserve engine components.

General

- Store all vehicles in a dry, ventilated place.
- Protect from sunlight, if possible.
- If vehicles are stored outside, they require regular maintenance to protect against rust and damage.

Vehicle Care

Body

- Wash your vehicle thoroughly to remove dirt, grease, oil, tar or mud from exterior surfaces, rear-wheel housing and the underside of front fenders.
- Periodically wash your vehicle if it is stored in exposed locations.
- Touch-up exposed or primed metal to prevent rust.
- Cover chrome and stainless steel parts with a thick coat of auto wax to prevent discoloration. Re-wax as necessary when you wash your vehicle.
- Lubricate all hood, door and luggage compartment hinges and latches with a light grade oil.
- Cover interior trim to prevent fading.
- Keep all rubber parts free from oil and solvents.

Engine

- Change the engine oil and filter prior to storage because used engine oil contains contaminants which may cause engine damage.
- Start the engine every 15 days for a minimum of 15 minutes. Run at fast idle with the climate controls set to defrost until the engine reaches normal operating temperature.
- With your foot on the brake, shift through all the gears while the engine is running.
- We recommend that you change the engine oil before you use your vehicle again.

Fuel system

- Fill the fuel tank with high-quality fuel until the first automatic shutoff of the fuel pump nozzle.

Cooling system

- Protect against freezing temperatures.
- When removing your vehicle from storage, check coolant fluid level. Confirm that there are no cooling system leaks and that fluid is at the recommended level.

Disconnecting Your 12 Volt Battery

- Check and recharge as necessary. Keep connections clean.
- If storing your vehicle for more than 30 days without recharging the battery, we recommend that you disconnect the battery cables to maintain battery charge for quick starting.

Note: *It is necessary to reset memory features if you disconnect the battery cables.*

Brakes

- Make sure the brakes and parking brake release fully.

Tires

- Maintain recommended air pressure.

Miscellaneous

- Make sure all linkages, cables, levers and pins under your vehicle are covered with grease to prevent rust.
- Move vehicles at least 25 ft (7.5 m) every 15 days to lubricate working parts and prevent corrosion.

Removing Vehicle From Storage

When your vehicle is ready to come out of storage, do the following:

- Wash your vehicle to remove any dirt or grease film build-up on window surfaces.
- Check windshield wipers for any deterioration.
- Check under the hood for any foreign material that may have collected during storage such as mice or squirrel nests.
- Check the exhaust for any foreign material that may have collected during storage.
- Check tire pressures and set tire inflation per the Tire Label.
- Check brake pedal operation. Drive your vehicle 15 ft (4.5 m) back and forth to remove rust build-up.
- Check fluid levels (including coolant, oil and gas) to make sure there are no leaks, and fluids are at recommended levels.
- If you remove the battery, clean the battery cable ends and check for damage.

Contact an authorized dealer if you have any concerns or issues.

Wheels and Tires

GENERAL INFORMATION

Notice to Utility Vehicle, Van and Truck Owners



WARNING: Utility vehicles have a significantly higher rollover rate than other types of vehicles. To reduce the risk of serious injury or death from a rollover or other crash you must avoid sharp turns and abrupt maneuvers, drive at safe speeds for the conditions, keep tires properly inflated, never overload or improperly load your vehicle, and make sure every passenger is properly restrained.



WARNING: In a rollover crash, an unbelted person is significantly more likely to die than a person wearing a seat belt. All occupants must wear seat belts. Children and infants must use appropriate restraints to minimize the risk of injury or ejection.

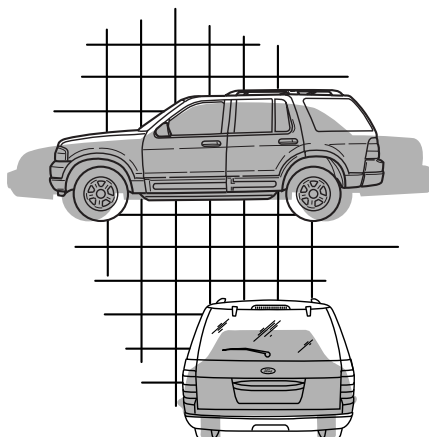


E145298

Utility vehicles and trucks handle differently than passenger cars in the various driving conditions that are encountered on streets, highways and off-road. Utility vehicles and trucks are not designed for cornering at speeds as high as passenger cars any more than low-slung sports cars are designed to perform satisfactorily under off-road conditions.

How Your Vehicle Differs from Other Vehicles

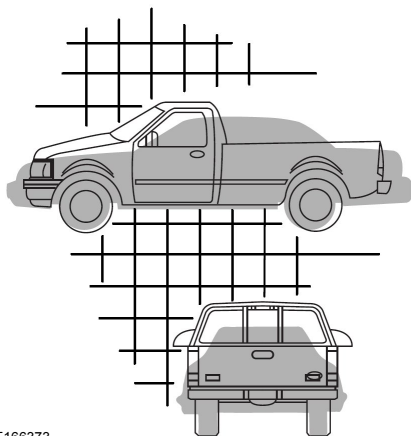
Sport-utility vehicles, vans and trucks can differ from some other vehicles in a few noticeable ways. Your vehicle may be:



E145299

Wheels and Tires

- Higher - to allow higher load carrying capacity and to allow it to travel over rough terrain without getting hung up or damaging underbody components.
- Shorter - to give it the capability to approach inclines and drive over the crest of a hill without getting hung up or damaging underbody components. All other things held equal, a shorter wheelbase may make your vehicle quicker to respond to steering inputs than a vehicle with a longer wheelbase.
- Narrower - to provide greater maneuverability in tight spaces, particularly in off-road use.



E166373

As a result of the above dimensional differences, sport-utility vehicles, vans and trucks often will have a higher center of gravity and a greater difference in center of gravity between the loaded and unloaded condition.

These differences that make your vehicle so versatile also make it handle differently than an ordinary passenger car.

TIRE CARE

Information About Uniform Tire Quality Grading



Tire Quality Grades apply to new pneumatic passenger car tires. The Quality grades can be found where applicable on the tire sidewall between tread shoulder and maximum section width. For example: **Treadwear 200 Traction AA Temperature A.**

These Tire Quality Grades are determined by standards that the United States Department of Transportation has set.

Tire Quality Grades apply to new pneumatic passenger car tires. They do not apply to deep tread, winter-type snow tires, space-saver or temporary use spare tires, light truck or LT type tires, tires with nominal rim diameters of 10 to 12 inches or limited production tires as defined in Title 49 Code of Federal Regulations Part 575.104 (c)(2).

Wheels and Tires

U.S. Department of Transportation Tire quality grades:

The U.S. Department of Transportation requires Ford Motor Company to give you the following information about tire grades exactly as the government has written it.

Treadwear

The treadwear grade is a comparative rating based on the wear rate of the tire when tested under controlled conditions on a specified government test course. For example, a tire graded 150 would wear one and one-half ($1\frac{1}{2}$) times as well on the government course as a tire graded 100. The relative performance of tires depends upon the actual conditions of their use, however, and may depart significantly from the norm due to variations in driving habits, service practices, and differences in road characteristics and climate.

Traction AA A B C



WARNING: The traction grade assigned to this tire is based on straight-ahead braking traction tests, and does not include acceleration, cornering, hydroplaning or peak traction characteristics.

The traction grades, from highest to lowest are AA, A, B, and C. The grades represent the tire's ability to stop on wet pavement as measured under controlled conditions on specified government test surfaces of asphalt and concrete. A tire marked C may have poor traction performance.

Temperature A B C



WARNING: The temperature grade for this tire is established for a tire that is properly inflated and not overloaded. Excessive speed, underinflation, or excessive loading, either separately or in combination, can cause heat buildup and possible tire failure.

The temperature grades are A (the highest), B and C, representing the tire's resistance to the generation of heat and its ability to dissipate heat when tested under controlled conditions on a specified indoor laboratory test wheel. Sustained high temperature can cause the material of the tire to degenerate and reduce tire life, and excessive temperature can lead to sudden tire failure. The grade C corresponds to a level of performance which all passenger car tires must meet under the

Wheels and Tires

Federal Motor Vehicle Safety Standard No. 139. Grades B and A represent higher levels of performance on the laboratory test wheel than the minimum required by law.

Glossary of Tire Terminology

***Tire label:** A label showing the original equipment tire sizes, recommended inflation pressure and the maximum weight the vehicle can carry.

***Tire Identification Number (TIN):** A number on the sidewall of each tire providing information about the tire brand and manufacturing plant, tire size and date of manufacture. Also referred to as DOT code.

***Inflation pressure:** A measure of the amount of air in a tire.

***Standard load:** A class of P-metric or Metric tires designed to carry a maximum load at set pressure. For example: For P-metric tires 35 psi (2.4 bar) and for Metric tires 36 psi (2.5 bar). Increasing the inflation pressure beyond this pressure does not increase the tire's load carrying capability.

***Extra load:** A class of P-metric or Metric tires designed to carry a heavier maximum load at 42 psi (2.9 bar). Increasing the inflation pressure beyond this pressure does not increase the tire's load carrying capability.

***kPa:** Kilopascal, a metric unit of air pressure.

***PSI:** Pounds per square inch, a standard unit of air pressure.

***Cold tire pressure:** The tire pressure when the vehicle has been stationary and out of direct sunlight for an hour or more and prior to the vehicle being driven for 1.0 mi (1.6 km).

***Recommended inflation pressure:** The cold inflation pressure found on the Safety Compliance Certification Label (affixed to either the door hinge pillar, door-latch post, or the door edge that meets the door-latch post, next to the driver's seating position), or Tire Label located on the B-pillar or the edge of the driver's door.

B-pillar: The structural member at the side of the vehicle behind the front door.

***Bead area of the tire:** Area of the tire next to the rim.

***Sidewall of the tire:** Area between the bead area and the tread.

***Tread area of the tire:** Area of the perimeter of the tire that contacts the road when mounted on the vehicle.

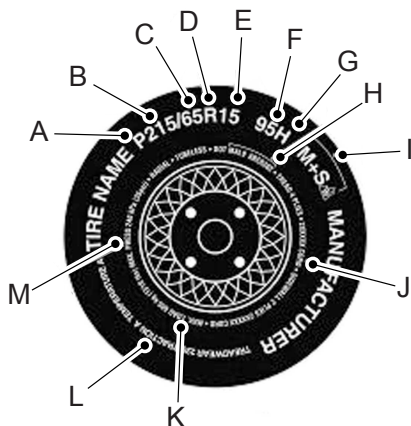
***Rim:** The metal support (wheel) for a tire or a tire and tube assembly upon which the tire beads are seated.

Wheels and Tires

Information Contained on the Tire Sidewall

Both United States and Canada Federal regulations require tire manufacturers to place standardized information on the sidewall of all tires. This information identifies and describes the fundamental characteristics of the tire and also provides a U.S. DOT Tire Identification Number for safety standard certification and in case of a recall.

Information on P Type Tires



P215/65R15 95H is an example of a tire size, load index and speed rating. The definitions of these items are listed below. (Note that the tire size, load index and speed rating for your vehicle may be different from this example.)

A. **P:** Indicates a tire, designated by the Tire and Rim Association, that may be used for service on cars, sport utility vehicles, minivans and light trucks. **Note:** If your tire size does not begin with a letter this may mean it is designated by either the European Tire and Rim Technical Organization or the Japan Tire Manufacturing Association.

B. **215:** Indicates the nominal width of the tire in millimeters from sidewall edge to sidewall edge. In general, the larger the number, the wider the tire.

C. **65:** Indicates the aspect ratio which gives the tire's ratio of height to width.

D. **R:** Indicates a radial type tire.

E. **15:** Indicates the wheel or rim diameter in inches. If you change your wheel size, you have to purchase new tires to match the new wheel diameter.

F. **95:** Indicates the tire's load index. It is an index that relates to how much weight a tire can carry. You may find this information in your owner's manual. If not, contact a local tire dealer.

Note: You may not find this information on all tires because it is not required by federal law.

Wheels and Tires

G. H: Indicates the tire's speed rating. The speed rating denotes the speed at which a tire is designed to be driven for extended periods of time under a standard condition of load and inflation pressure. The tires on your vehicle may operate at different conditions for load and inflation pressure. These speed ratings may need to be adjusted for the difference in conditions. The ratings range from 81–186 mph (130–299 km/h). These ratings are listed in the following chart.

Note: You may not find this information on all tires because it is not required by federal law.

Letter rating	mph (km/h)
L	75 (120)
M	81 (130)
N	87 (140)
Q	99 (159)
R	106 (171)
S	112 (180)
T	118 (190)
U	124 (200)
H	130 (210)
V	149 (240)

Letter rating	mph (km/h)
W	168 (270)
Y	186 (299)

Note: For tires with a maximum speed capability over 149 mph (240 km/h), tire manufacturers sometimes use the letters ZR. For those with a maximum speed capability over 186 mph (299 km/h), tire manufacturers always use the letters ZR.

H. U.S. DOT Tire Identification

Number: This begins with the letters DOT and indicates that the tire meets all federal standards. The next two numbers or letters are the plant code designating where it was manufactured, the next two are the tire size code and the last four numbers represent the week and year the tire was built. For example, the numbers 317 mean the 31st week of 1997. After 2000 the numbers go to four digits. For example, 2501 means the 25th week of 2001. The numbers in between are identification codes used for traceability. This information is used to contact customers if a tire defect requires a recall.

I. M+S or M/S: Mud and Snow, or

AT: All Terrain, or

AS: All Season.

Wheels and Tires

J. Tire Ply Composition and Material Used:

Indicates the number of plies or the number of layers of rubber-coated fabric in the tire tread and sidewall. Tire manufacturers also must indicate the ply materials in the tire and the sidewall, which include steel, nylon, polyester, and others.

K. Maximum Load: Indicates the maximum load in kilograms and pounds that can be carried by the tire. (affixed to either the door hinge pillar, door-latch post, or the door edge that meets the door-latch post, next to the driver's seating position), or Tire Label located on the B-pillar or the edge of the driver's door.

L. Treadwear, Traction and Temperature Grades:

***Treadwear:** The treadwear grade is a comparative rating based on the wear rate of the tire when tested under controlled conditions on a specified government test course. For example, a tire graded 150 would wear 1½ times as well on the government course as a tire graded 100.

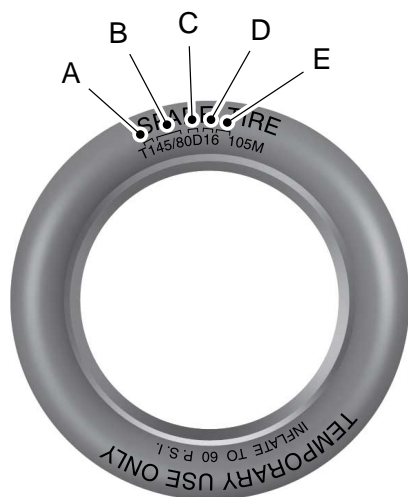
***Traction:** The traction grades, from highest to lowest are AA, A, B, and C. The grades represent the tire's ability to stop on wet pavement as measured under controlled conditions on specified government test surfaces of asphalt and concrete. A tire marked C may have poor traction performance.

***Temperature:** The temperature grades are A (the highest), B and C, representing the tire's resistance to the generation of heat and its ability to dissipate heat when tested under controlled conditions on a specified indoor laboratory test wheel.

M. Maximum Inflation Pressure:

Indicates the tire manufacturers' maximum permissible pressure or the pressure at which the maximum load can be carried by the tire. This pressure is normally higher than the vehicle manufacturer's recommended cold inflation pressure which can be found on the Safety Compliance Certification Label (affixed to either the door hinge pillar, door-latch post, or the door edge that meets the door-latch post, next to the driver's seating position), or Tire Label located on the B-pillar or the edge of the driver's door. The cold inflation pressure should never be set lower than the recommended pressure on the vehicle label.

Wheels and Tires



T type tires have some additional information beyond those of P type tires. These differences are described below:

A. **T:** Indicates a type of tire, designated by the Tire and Rim Association, that is intended for temporary service on cars, sport utility vehicles, minivans and light trucks.

B. **145:** Indicates the nominal width of the tire in millimeters from sidewall edge to sidewall edge. In general, the larger the number, the wider the tire.

C. **80:** Indicates the aspect ratio which gives the tire's ratio of height to width. Numbers of 70 or lower indicate a short sidewall.

D. **D:** Indicates a diagonal type tire.

R: Indicates a radial type tire.

E. **16:** Indicates the wheel or rim diameter in inches. If you change your wheel size, you have to purchase new tires to match the new wheel diameter.

Location of the Tire Label

You can find a Tire Label containing tire inflation pressure by tire size and other important information located on the B-Pillar or the edge of the driver's door.

Inflating Your Tires

Safe operation of your vehicle requires that your tires are properly inflated. Remember that a tire can lose up to half of its air pressure without appearing flat.

Every day before you drive, check your tires. If one looks lower than the others, use a tire gauge to check pressure of all tires and adjust if required.

At least once a month and before long trips, inspect each tire and check the tire pressure with a tire gauge (including spare, if equipped). Inflate all tires to the inflation pressure recommended by Ford Motor Company.

Wheels and Tires

You are strongly urged to buy a reliable tire pressure gauge, as automatic service station gauges may be inaccurate. Ford recommends the use of a digital or dial-type tire pressure gauge rather than a stick-type tire pressure gauge.

Use the recommended cold inflation pressure for optimum tire performance and wear. Under-inflation or over-inflation may cause uneven treadwear patterns



WARNING: Under-inflation is the most common cause of tire failures and may result in severe tire cracking, tread separation or blowout, with unexpected loss of vehicle control and increased risk of injury. Under-inflation increases sidewall flexing and rolling resistance, resulting in heat buildup and internal damage to the tire. It also may result in unnecessary tire stress, irregular wear, loss of vehicle control and accidents. A tire can lose up to half of its air pressure and not appear to be flat!

Always inflate your tires to the Ford recommended inflation pressure even if it is less than the maximum inflation pressure information found on the tire. The Ford recommended tire inflation pressure is found on the Safety Compliance Certification Label or

Tire Label (affixed to either the door hinge pillar, door-latch post, or the door edge that meets the door-latch post, next to the driver's seating position), or Tire Label located on the B-pillar or the edge of the driver's door. Failure to follow the tire pressure recommendations can cause uneven treadwear patterns and adversely affect the way your vehicle handles

Note: Do not reduce tire pressure to change the ride characteristics of the vehicle. If you do not maintain the inflation pressure at the levels specified by Ford, your vehicle may experience a condition known as shimmy. Shimmy is a severe vibration and oscillation in the steering wheel after the vehicle travels over a bump or dip in the road that does not dampen out by itself. Shimmy may result from significant under-inflation of the tires, improper tires (load range, size, or type), or vehicle modifications such as lift-kits. In the event that your vehicle experiences shimmy, you should slowly reduce speed by either lifting off the accelerator pedal or lightly applying the brakes. The shimmy ceases as the vehicle speed decreases.

Maximum Inflation Pressure is the tire manufacturer's maximum permissible pressure and the pressure at which the maximum load can be carried by the tire. This pressure is normally higher than

Wheels and Tires

the manufacturer's recommended cold inflation pressure which can be found on the Safety Compliance Certification Label (affixed to either the door hinge pillar, door-latch post, or the door edge that meets the door-latch post, next to the driver's seating position), or Tire Label located on the B-pillar or the edge of the driver's door. The cold inflation pressure should never be set lower than the recommended pressure on the Safety Compliance Certification Label or Tire Label.

When weather temperature changes occur, tire inflation pressures also change. A 10°F (6°C) temperature drop can cause a corresponding drop of 1 psi (7 kPa) in inflation pressure. Check your tire pressures frequently and adjust them to the proper pressure which can be found on the Safety Compliance Certification Label or Tire Label.

To check the pressure in your tire(s):

1. Make sure the tires are cool, meaning they are not hot from driving even a mile.

Note: *If you are checking tire pressure when the tire is hot, (for example, driven more than 1.0 mi (1.6 km)), never bleed or reduce air pressure. The tires are hot from driving and it is normal for pressures to increase above recommended cold pressures. A hot tire at or below recommended cold inflation pressure could be significantly under-inflated.*

Note: *If you have to drive a distance to get air for your tire(s), check and record the tire pressure first and add the appropriate air pressure when you get to the pump. It is normal for tires to heat up and the air pressure inside to go up as you drive.*

2. Remove the cap from the valve on one tire, then firmly press the tire gauge onto the valve and measure the pressure.

3. Add enough air to reach the recommended air pressure.

Note: *If you overfill the tire, release air by pressing on the metal stem in the center of the valve. Then recheck the pressure with your tire gauge.*

4. Replace the valve cap.

5. Repeat this procedure for each tire, including the spare.

Wheels and Tires

Note: Some spare tires operate at a higher inflation pressure than the other tires. For T type mini-spare tires, (see the Dissimilar spare wheel and tire assembly information for a description. Store and maintain at 60 psi (4.15 bar). For full-size and dissimilar spare tires, see the Dissimilar spare wheel and tire assembly information for a description. Store and maintain at the higher of the front and rear inflation pressure as shown on the Safety Compliance Certification Label or Tire Label.

6. Visually inspect the tires to make sure there are no nails or other objects embedded that could poke a hole in the tire and cause an air leak.

7. Check the sidewalls to make sure there are no gouges, cuts or bulges.

Checking Pressure when tires are hot:

If pressures are checked after tires have been driven for more than three minutes or more than 1 mile, (2 km) the tires become hot and the pressures will increase by approximately 4 psi (27.6 kPa). Therefore when the tire pressure is adjusted under these conditions, it should be increased to a gauge reading of 4 psi (27.6 kPa) greater than the recommended cold inflation pressure.

After inflating the tires while hot, make sure to recheck tire pressure later once the tires are cold.

For Example Only

Gauge reading of hot tire	33 psi (230 kPa)
If recommended, cold inflation pressure is	32 psi (220 kPa)
The hot tire pressure is only 1 psi (10 kPa) greater than the recommended cold inflation pressure. Therefore, add 3 psi (20 kPa) more to increase the hot pressure to 4 psi (30 kPa) over the recommended cold inflation pressure.	
New hot pressure	36 psi (250 kPa)

Tire Inflation Information



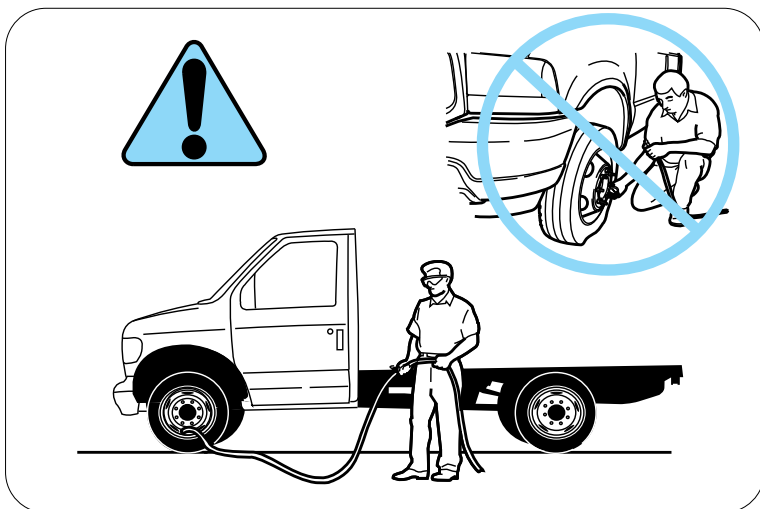
WARNING: An inflated tire and rim can be very dangerous if improperly used, serviced or maintained. To reduce the risk of serious injury, never attempt to re-inflate a tire which has been run flat or seriously under-inflated without first removing the tire from the wheel assembly for inspection. Do not attempt to add air to tires or replace tires or wheels without first taking precautions to protect persons and property.

Wheels and Tires

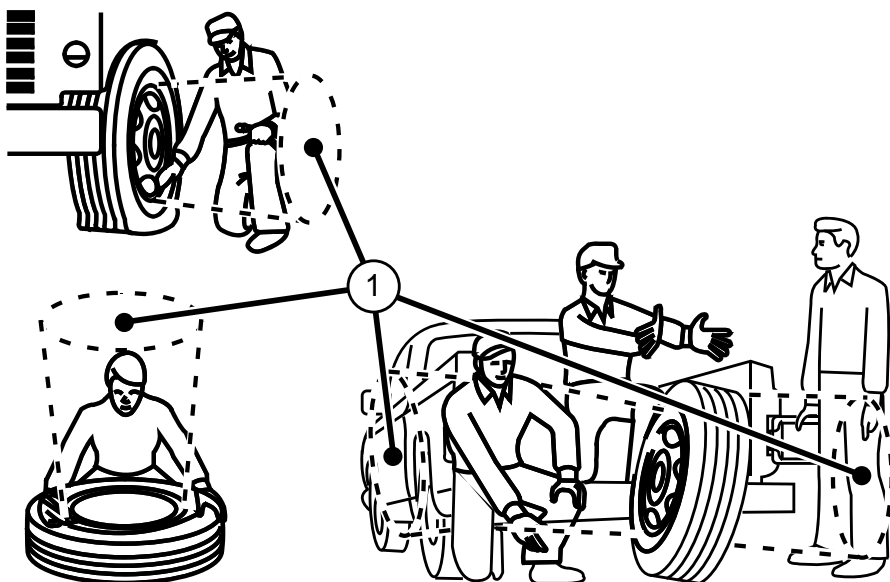
All tires with Steel Carcass Plies (if equipped):

This type of tire utilizes steel cords in the sidewalls. As such, they cannot be treated like normal light truck tires. Tire service, including adjusting tire pressure, must be performed by personnel trained, supervised and equipped

according to Federal Occupational Safety and Health Administration regulations. For example, during any procedure involving tire inflation, the technician or individual must utilize a remote inflation device, and ensure that all persons are clear of the trajectory area.



Wheels and Tires



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Note: *Stay out of the trajectory (1) as indicated in the illustration.*

Inspecting Your Tires and Wheel Valve Stems

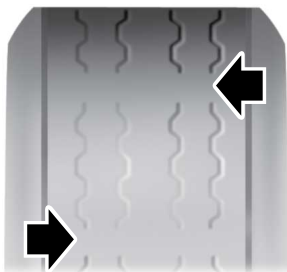
Periodically inspect the tire treads for uneven or excessive wear and remove objects such as stones, nails or glass that may be wedged in the tread grooves. Check the tire and valve stems for holes, cracks, or cuts that may permit air leakage and repair or replace the tire and replace the valve stem. Inspect the tire sidewalls for cracking, cuts, bruises and other signs of damage or excessive wear. If internal damage to the tire

is suspected, have the tire demounted and inspected in case it needs to be repaired or replaced. For your safety, tires that are damaged or show signs of excessive wear should not be used because they are more likely to blow out or fail.

Improper or inadequate vehicle maintenance can cause tires to wear abnormally. Inspect all your tires, including the spare, frequently, and replace them if one or more of the following conditions exist:

Wheels and Tires

Tire Wear



When the tread is worn down to $\frac{2}{32}$ inch (1.6 millimeters), tires must be replaced to help prevent your vehicle from skidding and hydroplaning. Built-in treadwear indicators, or wear bars, which look like narrow strips of smooth rubber across the tread appears on the tire when the tread is worn down to $\frac{2}{32}$ inch (1.6 millimeters).

When the tire tread wears down to the same height as these wear bars, the tire is worn out and must be replaced.

Damage

Periodically inspect the tire treads and sidewalls for damage (such as bulges in the tread or sidewalls, cracks in the tread groove and separation in the tread or sidewall). If damage is observed

or suspected have the tire inspected by a tire professional. Tires can be damaged during off-road use, so inspection after off-road use is also recommended.

Age



WARNING: Tires degrade over time depending on many factors such as weather, storage conditions, and conditions of use (load, speed, inflation pressure) the tires experience throughout their lives.

In general, tires should be replaced after six years regardless of tread wear. However, heat caused by hot climates or frequent high loading conditions can accelerate the aging process and may require tires to be replaced more frequently.

You should replace your spare tire when you replace the road tires or after six years due to aging even if it has not been used.

U.S. DOT Tire Identification Number

Both United States and Canada Federal regulations require tire manufacturers to place standardized information on the sidewall of all tires. This information identifies and

Wheels and Tires

describes the fundamental characteristics of the tire and also provides a U.S. DOT Tire Identification Number for safety standard certification and in case of a recall.

This begins with the letters DOT and indicates that the tire meets all federal standards. The next two numbers or letters are the plant code designating where it was manufactured, the next two are the tire size code and the last four numbers represent the week and year the tire was built. For example, the numbers 317 mean the 31st week of 1997. After 2000 the numbers go to four digits. For example, 2501 means the 25th week of 2001. The numbers in between are identification codes used for traceability. This information is used to contact customers if a tire defect requires a recall.

Tire Replacement Requirements

Your vehicle is equipped with tires designed to provide a safe ride and handling capability.



WARNING: Only use replacement tires and wheels that are the same size, load index, speed rating, and type as those originally provided for your vehicle. The recommended tire and wheel sizes can be found on the Tire Label on the driver side

door frame or the edge of the driver door. If this information is not found in those locations, or for additional options, contact your authorized dealer. Use of any tire or wheel not recommended, could affect the safety and performance of your vehicle, which could result in an increased risk of loss of vehicle control, vehicle rollover, personal injury and death.



WARNING: To reduce the risk of serious injury, when mounting replacement tires and wheels, you should not exceed the maximum pressure indicated on the sidewall of the tire to set the beads without additional precautions listed below. If the beads do not seat at the maximum pressure indicated, re-lubricate and try again.



WARNING: For a mounting pressure more than 20 psi (1.38 bar) greater than the maximum pressure, a Ford dealer or other tire service professional should do the mounting.



WARNING: Always inflate steel carcass tires with a remote air fill with the person inflating standing at a minimum of 12 ft (3.66 m) away from the wheel and tire assembly.

Wheels and Tires



WARNING: When inflating the tire for mounting pressures up to 20 psi (1.38 bar) greater than the maximum pressure on the tire sidewall, the following precautions must be taken to protect the person mounting the tire:

- Make sure that you have the correct tire and wheel size.
- Lubricate the tire bead and wheel bead seat area again.
- Stand at a minimum of 12 ft (3.6 m) away from the wheel and tire assembly.
- Use both eye and ear protection.

Important: Remember to replace the wheel valve stems when the road tires are replaced on your vehicle

The two front tires or two rear tires should generally be replaced as a pair.

The tire pressure sensors mounted in the wheels are not designed to be used in aftermarket wheels.

The use of wheels or tires not recommended by Ford Motor Company may affect the operation of your tire pressure monitoring system.

If the tire pressure monitoring system indicator is flashing, the system is malfunctioning. Your replacement tire might be incompatible with your tire pressure monitoring system, or some component of the system may be damaged.

Replacing a Tire That is Greenhouse Gas Certified

The tires installed on this vehicle at the factory as original equipment are certified for Greenhouse Gas and Fuel Efficiency regulations. Replacement tires must be of equal or lower rolling resistance level (TRRL or Crr). Consult with your tire supplier(s) for appropriate replacement tires.

Safety Practices



WARNING: If your vehicle is stuck in snow, mud or sand, do not rapidly spin the tires; spinning the tires can tear the tire and cause an explosion. A tire can explode in as little as three to five seconds.



WARNING: Do not spin the wheels at over 34 mph (55 km/h). The tires may fail and injure a passenger or bystander.

Wheels and Tires

HIGH SPEED DRIVING CAN BE DANGEROUS

Correct inflation pressure is especially important. However, at high speeds, even with the correct inflation pressure, a road hazard for example is more difficult to avoid and if contact is made, has a greater chance of causing tire damage than at a lower speed. Moreover, driving at high speed reduces the reaction time available to avoid accidents and bring your vehicle to a safe stop.

If you see any damage to a tire or wheel, replace it with the spare at once and visit a participating Tire Retailer.

Exceeding the maximum speeds shown on the following page for each type of tire will cause the tire to build up excessive heat which can cause tire damage that could result in sudden tire destruction and rapid air loss. Failure to control a vehicle when one or more tires experience a sudden air loss can lead to an accident.

In any case, you should not exceed reasonable speeds as indicated by the legal limits and driving conditions.

DO NOT OVERLOAD: DRIVING ON ANY OVERLOADED TIRE IS DANGEROUS

The maximum load rating of your tires is molded on the tire sidewall. Do not exceed this rating. Follow the loading instructions of the manufacturer of your vehicle and this will ensure that your tires are not overloaded. Tires which are loaded beyond their maximum allowable loads for the particular application will build up excessive heat that may result in sudden tire destruction. Do not exceed the gross axle weight rating for any axle on your vehicle.

TIRE ALTERATIONS

Do not make or allow to be made any alterations on your tires. Alterations may prevent proper performance, leading to tire damage which can result in an accident. Tires which become unserviceable due to alterations such as truing, whitewall inlays, addition of balancing or sealant liquids, or the use of tire dressing containing petroleum distillates are excluded from warranty coverage.

Wheels and Tires

REPAIRS - WHEREVER POSSIBLE, SEE YOUR TIRE RETAILER AT ONCE

If any tire sustains a puncture, have the tire demounted and thoroughly inspected by a tire retailer for possible damage that may have occurred. A tread area puncture in any passenger or light truck tire can be repaired provided that the puncture hole is not more than 1/4" in diameter, not more than one radial cable per casing ply is damaged, and the tire has not been damaged further by the puncturing object or by running underinflated. Tire punctures consistent with these guidelines should only be repaired by following the US Tire Manufacturers Association (USTMA) recommended repair procedures. Plug-only repairs done on-the-wheel are considered improper and therefore, not recommended. Such repairs are not reliable and may cause further damage to the tire.

STORAGE

Tires contain waxes and emollients to protect their outer surfaces from ozone and weather checking. As the tire rolls and flexes, the waxes and emollients continually migrate to the surface, replenishing this protection throughout the normal use of the tire. Consequently, when tires sit unused for long periods of time (a month or more) their surfaces

become dry and more susceptible to ozone and weather checking and the casing becomes susceptible to flat spotting. **For this reason, tires should always be stored in a cool, dry, clean, indoor environment. If storage is for one month or more, eliminate the weight from the tires by raising the vehicle or by removing the tires from the vehicle. Failure to store tires in accordance with these instructions could result in damage to your tires or premature aging of the tires and sudden tire failure.**

When tires are stored, be sure they are placed away from sources of heat and ozone such as direct sunlight, hot pipes and electric generators. Be sure that surfaces on which tires are stored are clean and free from grease, gasoline or other substances, which could deteriorate the rubber. Failure to store tires in accordance with these instructions could result in damage to your tires or premature aging of the tires and sudden tire failure.

Wheels and Tires

FOLLOW THESE MOUNTING RECOMMENDATIONS

Tire changing can be dangerous and must be done by professionally trained persons using proper tools and procedures as specified by the US Tire Manufacturers Association (USTMA). Single or dual assemblies must be completely deflated before demounting.

Your tires should be mounted on wheels of correct size and type and which are in good, clean condition. Wheels that are bent, chipped, rusted (steel wheels) or corroded (alloy wheels) may cause tire damage. The inside of the tire must be free from foreign material. Have your retailer check the wheels before mounting new tires. Mismatched tires and rims can explode during mounting. Also, mismatched tires and rims can result in dangerous tire failure on the road. If a tire is mounted by error on the wrong-sized rim, do not remount it on the proper rim – scrap it. It may have been damaged internally (which is not externally visible) by having been dangerously stretched and could fail on the highway.

Old valves may leak. When new tubeless tires are mounted, have new valves of the correct type installed. Tubeless tires must only be mounted on wheels designed for tubeless tires i.e., wheels which have safety humps or ledges.

It is recommended that you have your tires and wheels balanced. Tires and wheels, which are not balanced, may cause steering difficulties, a bumpy ride, and irregular tire wear.

Be sure that all your valves have suitable valve caps. The valve cap is the primary seal against air loss.

TEMPORARY SPARE TIRES

When using any temporary spare tire, be sure to follow the vehicle manufacturer's instructions.

REMEMBER... TO AVOID DAMAGE TO YOUR TIRES AND POSSIBLE ACCIDENT:

- CHECK TIRE PRESSURE AT LEAST ONCE EACH MONTH WHEN TIRES ARE COLD AND BEFORE LONG TRIPS.
- DO NOT UNDERINFLATE/OVERINFLATE.
- DO NOT OVERLOAD.
- DRIVE AT MODERATE SPEEDS, OBSERVE LEGAL LIMITS.

Wheels and Tires

- AVOID DRIVING OVER POTHOLE, OBSTACLES, CURBS OR EDGES OF PAVEMENT.
- AVOID EXCESSIVE WHEEL SPINNING.
- IF YOU SEE ANY DAMAGE TO A TIRE, REPLACE WITH THE SPARE AND VISIT ANY AUTHORIZED RETAILER AT ONCE.
- IF YOU HAVE ANY QUESTIONS, CONTACT YOUR AUTHORIZED RETAILER.

Driving habits have a great deal to do with your tire mileage and safety.

- *Observe posted speed limits
- *Avoid fast starts, stops and turns
- *Avoid potholes and objects on the road
- *Do not run over curbs or hit the tire against a curb when parking

Highway Hazards

No matter how carefully you drive there's always the possibility that you may eventually have a flat tire on the highway. Drive slowly to the closest safe area out of traffic. This may further damage the flat tire, but your safety is more important.

If you feel a sudden vibration or ride disturbance when driving, or you suspect your tire or vehicle has been damaged, immediately reduce your speed. Drive with caution until you can safely pull off the road. Stop and inspect the tires for damage. If a tire is under-inflated or damaged, deflate it, remove wheel and replace it with your spare tire and wheel. If you cannot detect a cause, have the vehicle towed to the nearest repair facility or tire dealer to have the vehicle inspected.

Tire and Wheel Alignment

A bad jolt from hitting a curb or pothole can cause the front end of your vehicle to become misaligned or cause damage to your tires. If your vehicle seems to pull to one side when you're driving, the wheels may be out of alignment. Have an authorized dealer check the wheel alignment periodically.

Wheel misalignment in the front or the rear can cause uneven and rapid treadwear of your tires and should be corrected by an authorized dealer. Front-wheel drive vehicles and those with an independent rear suspension may require alignment of all four wheels.

The tires should also be balanced periodically. An unbalanced tire and wheel assembly may result in irregular tire wear.

Wheels and Tires

Tire Rotation



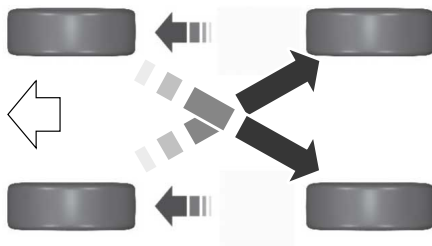
WARNING: If the tire label shows different tire pressures for the front and rear tires and the vehicle has a tire pressure monitoring system, then you need to update the settings for the system sensors. Always perform the system reset procedure after tire rotation. If you do not reset the system, it may not provide a low tire pressure warning when necessary.

Note: If your tires show uneven wear ask an authorized dealer to check for and correct any wheel misalignment, tire imbalance or mechanical problem involved before tire rotation.

Note: Your vehicle may be equipped with a dissimilar spare wheel and tire assembly. A dissimilar spare wheel and tire assembly is defined as a spare wheel and tire assembly that is different in brand, size or appearance from the road tires and wheels. If you have a dissimilar spare wheel and tire assembly it is intended for temporary use only and should not be used in a tire rotation.

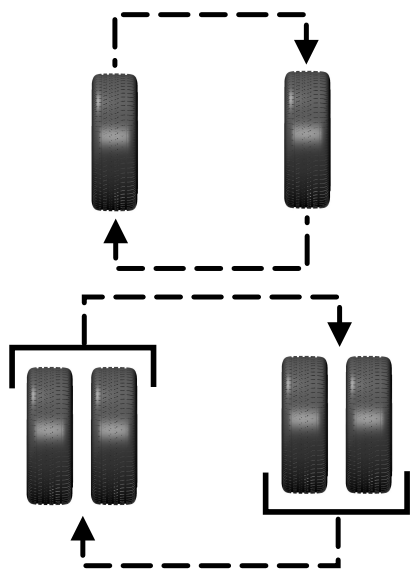
Note: After having your tires rotated, inflation pressure must be checked and adjusted to the vehicle requirements.

Rotating your tires at the recommended interval (as indicated in the Scheduled Maintenance chapter) helps your tires wear more evenly, providing better tire performance and longer tire life. Sometime irregular tire wear can be corrected by rotating the tires.



Rear-wheel drive vehicles and four-wheel drive vehicles (front tires at left of diagram).

Wheels and Tires



Dual rear wheel drive vehicle - six tire rotation (front tires at top of diagram).

If your vehicle is equipped with dual rear wheels it is recommended that the front and rear tires (in pairs) be rotated only side to side. We do not recommend splitting up the dual rear wheels. Rotate them side to side as a set. After tire rotation, inflation pressures must be adjusted for the tires new positions in accordance with vehicle requirements.

USING SNOW CHAINS



WARNING: Wheels and tires must be the same size, load index and speed rating as those originally fitted on the vehicle. Use of any other tire or wheel can affect the safety and performance of your vehicle. Additionally, the use of non-recommended tires and wheels can cause steering, suspension, axle, transfer case or power transfer unit failure. Follow the recommended tire inflation pressures found on the Safety Compliance Certification label, or the Tire Label on the B-Pillar or the edge of the driver door. Failure to follow this instruction could result in loss of vehicle control, vehicle rollover, or personal injury or death.

The tires on your vehicle have all-weather treads to provide traction in rain and snow. However, in some climates, you may need to use snow tires and cables. If you need to use cables, it is recommended that steel wheels (of the same size and specifications) be used, as cables may chip aluminum wheels.

Note: *The suspension insulation and bumpers help prevent vehicle damage. Do not remove these components from your vehicle when using snow tires and chains.*

Follow these guidelines when using snow tires and chains:

- If possible, avoid fully loading your vehicle.
- Install chains securely, verifying that the chains do not touch any wiring, brake lines or fuel lines.

Wheels and Tires

- Drive cautiously. If you hear the chains rub or bang against your vehicle, stop and retighten the chains. If this does not work, remove the chains to prevent damage to your vehicle.
- Remove the snow chains when they are no longer needed. Do not use snow chains on dry roads.

Please contact your upfitter for approved snow chain types/sizes and other recommendations for snow chain use.

TIRE PRESSURE MONITORING SYSTEM (IF EQUIPPED)



WARNING: The tire pressure monitoring system is not a substitute for manually checking tire pressures. You should periodically check tire pressures using a pressure gauge. Failure to correctly maintain tire pressures could increase the risk of tire failure, loss of control, vehicle rollover and personal injury.



WARNING: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. The term "IC:" before the radio certification number only signifies that Industry Canada technical specifications were met.

This device complies with Part 15 of the FCC Rules and with License exempt RSS Standards of Industry Canada. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.



Each tire, including the spare, if provided, should be checked monthly when cold and inflated to the inflation pressure recommended by the vehicle manufacturer on the vehicle placard or tire inflation pressure label. If your vehicle has tires of a different size than the size indicated on the vehicle placard or tire inflation pressure label, you should determine the proper tire inflation pressure for those tires.

As an added safety feature, your vehicle has been equipped with a Tire Pressure Monitoring System (TPMS) that illuminates a low tire pressure telltale when one or more of your tires is significantly under-inflated. Accordingly, when the low tire pressure telltale illuminates, you should stop and check your tires as soon as possible, and inflate them to the proper pressure. Driving on a significantly under-inflated tire causes the tire to overheat and can lead to tire failure. Under-inflation also reduces fuel efficiency and tire tread life, and may affect the vehicle's handling and stopping ability.

Please note that the TPMS is not a substitute for proper tire maintenance, and it is the driver's responsibility to maintain correct tire pressure, even if under-inflation has not reached the level to trigger illumination of the TPMS low tire pressure telltale.

Your vehicle has a TPMS malfunction indicator to indicate when the system is not operating properly. The TPMS malfunction indicator is combined with the low tire pressure telltale. When the system detects a malfunction, the telltale flashes for approximately one minute and then remains continuously illuminated. This sequence continues upon subsequent vehicle start-ups as long as the malfunction exists.

Wheels and Tires

When the malfunction indicator is illuminated, the system may not be able to detect or signal low tire pressure as intended. TPMS malfunctions may occur for a variety of reasons, including the installation of replacement or alternate tires or wheels on the vehicle that prevent the TPMS from functioning properly. Always check the TPMS malfunction telltale after replacing one or more tires or wheels on your vehicle to ensure that the replacement or alternate tires and wheels allow the TPMS to continue to function properly.

Note: *Only use tire sealants in roadside emergencies as they may cause damage to the tire pressure monitoring system sensor.*

Note: *If the tire pressure monitoring system sensor becomes damaged, it may not function.*

Changing Tires With a Tire Pressure Monitoring System



Note: *Each road tire is equipped with a tire pressure sensor located inside the wheel and tire assembly cavity. The pressure sensor is attached to the valve stem. The pressure sensor is covered by the tire and is not visible unless the tire is removed. Take care when changing the tire to avoid damaging the sensor.*

You should always have your tires serviced by an authorized dealer.

Check the tire pressure periodically, at least monthly, using an accurate tire gauge. See *Inflating Your Tires* in this chapter.

Understanding Your Tire Pressure Monitoring System

The tire pressure monitoring system measures pressure in your four road tires and sends the tire pressure readings to your vehicle. The low tire pressure warning light turns on if the tire pressure is significantly low. Once the light is illuminated, your tires are under-inflated and need to be inflated to the manufacturer's recommended tire pressure. Even if the light turns on and a short time later turns off, your tire pressure still needs to be checked.

When Your Temporary Spare Tire is Installed

When you replace one of the road tires with the temporary spare, the system continues to identify an issue to remind you that you need to repair and put back on the damaged road wheel and tire assembly on your vehicle.

To restore the full function of the tire pressure monitoring system, have the damaged road wheel and tire assembly repaired and remounted on your vehicle.

When You Believe Your System is Not Operating Properly

The main function of the tire pressure monitoring system is to warn you when your tires need air. It can also warn you in the event the system is no longer capable of functioning as intended. See the following chart for information concerning your tire pressure monitoring system:

Wheels and Tires

Low Tire Pressure Warning Light	Possible Cause	Customer Action Required
Solid warning light	Tire(s) under-inflated	Make sure tires are at the proper pressure. See Inflating your tires in this chapter. After inflating your tires to the manufacturer's recommended pressure as shown on the Tire Label, located on the edge of driver door or the B-Pillar, the vehicle must be driven for at least two minutes over 20 mph (32 km/h) before the light turns off.
	Spare tire in use	Repair the damaged road wheel and tire assembly and reinstall it on the vehicle to restore system function. For a description on how the system functions, see When your temporary spare tire is installed in this section.
	TPMS malfunction	If the tires are properly inflated and the spare tire is not in use but the light remains on, contact your authorized dealer as soon as possible.
Flashing warning light	Spare tire in use	Repair the damaged road wheel and tire assembly and reinstall it on the vehicle to restore system function. For a description on how the system functions, see When your temporary spare tire is installed in this section.
	TPMS malfunction	If the tires are properly inflated and the spare tire is not in use but the light remains on, contact your authorized dealer as soon as possible.

When Inflating Your Tires

When putting air into your tires, such as at a gas station or in your garage, the tire pressure monitoring system may not respond immediately to the air added to your tires.

It may take up to two minutes of driving over 20 mph (32 km/h) for the light to turn off after you have filled your tires to the recommended inflation pressure.

Wheels and Tires

How Temperature Affects Your Tire Pressure

The tire pressure monitoring system monitors tire pressure in each pneumatic tire. When driving in a normal manner, a typical passenger tire inflation pressure may increase about 2–4 psi (14–28 kPa) from a cold start situation. If the vehicle is stationary overnight with the outside temperature significantly lower than the daytime temperature, the tire pressure may decrease about 3 psi (21 kPa) for a drop of 30°F (17°C) in ambient temperature. This lower pressure value may be detected by the tire pressure monitoring system as being significantly lower than the recommended inflation pressure and activate the system warning light for low tire pressure. If the low tire pressure warning light is on, visually check each tire to verify that no tire is flat. If one or more tires are flat, repair as necessary. Check the air pressure in the road tires. If any tire is under-inflated, carefully drive the vehicle to the nearest location where air can be added to the tires. Inflate all the tires to the recommended inflation pressure.

Tire Pressure Monitoring System Reset Procedure



WARNING: To determine the required pressure(s) for your vehicle, see the Safety Compliance Certification Label (on the door hinge pillar, door-latch post or the door edge that meets the door-latch post, next to the driver seat) or the Tire Label on the B-Pillar or the edge of the driver door.

Note: You need to perform the tire pressure monitoring system reset procedure after each tire rotation.

To provide the vehicle's load carrying capability, some vehicles require different recommended tire pressures in the front tires as compared to the rear tires. The tire pressure monitoring system on these vehicles illuminate the low tire pressure warning light at two different pressures: one for the front tires and one for the rear tires.

Since tires need to be rotated to provide consistent performance and maximum tire life, the tire pressure monitoring system needs to know when the tires are rotated to determine which set of tires are on the front and which are on the rear. With this information, the system can detect and properly warn of low tire pressures.

System reset tips:

- To reduce the chances of interference from another vehicle, perform the system reset procedure at least 3 ft (1 m) away from another vehicle undergoing the system reset procedure at the same time.
- Do not wait more than two minutes between resetting each tire sensor or the system can time-out and you have to repeat the entire procedure on all four wheels.
- A double horn sounds indicating the need to repeat the procedure.

Performing the System Reset Procedure - Single Rear Wheel

Read the entire procedure before attempting.

1. Drive the vehicle above 20 mph (32 km/h) for at least two minutes, then park in a safe location where you can easily get to all four tires and have access to an air pump.
2. Place the ignition in the off position and keep the key in the ignition.

Wheels and Tires

3. Cycle the ignition to the on position with the engine off.
 4. Turn the hazard flashers on then off three times. You must accomplish this within 10 seconds. If you successfully enter the reset mode, the horn sounds once, the system indicator flashes and a message shows in the information display. If this does not occur, please try again starting at step 2. If after repeated attempts to enter the reset mode, the horn does not sound, the system indicator does not flash and no message shows in the information display, have the system checked as soon as possible.
 5. Train the tire pressure monitoring system sensors in the tires using the following system reset sequence starting with the left front tire in the following clockwise order: Left front - driver side front tire, Right front - passenger side front tire, Right rear - passenger side rear tire, Left rear - driver side rear tire.
 6. Remove the valve cap from the valve stem on the left front tire. Decrease the air pressure until the horn sounds.
- Note:** *The single horn tone confirms that the sensor identification code has been learned by the module for this position. If you hear a double horn, the reset procedure was unsuccessful, and you must repeat it.*
7. Remove the valve cap from the valve stem on the right front tire. Decrease the air pressure until the horn sounds.
 8. Remove the valve cap from the valve stem on the right rear tire. Decrease the air pressure until the horn sounds.
 9. Remove the valve cap from the valve stem on the left rear tire. Decrease the air pressure until the horn sounds. Training is complete after the horn sounds for the last tire trained, driver side rear tire, the system indicator stops flashing, and a message shows in the information display.
 10. Turn the ignition off. If you hear two short tones, the reset procedure was unsuccessful and you must repeat it. If you hear two short beeps when the ignition is off after repeating the procedure, have the system checked as soon as possible.
 11. Set all four tires to the recommended air pressure as indicated on the Safety Compliance Certification Label, affixed to either the door hinge pillar, door-latch post, or the door edge that meets the door-latch post, next to the driver seating position or Tire Label located on the B-Pillar or the edge of the driver door.

Performing the System Reset Procedure - Dual Rear Wheel

For further information see **Understanding Your Tire Pressure Monitoring System** and refer to **Dual Rear Wheel**, earlier in this section.

Read the entire procedure before attempting.

1. Drive the vehicle above 20 mph (32 km/h) for at least two minutes, then park in a safe location where you can easily get to all six tires and have access to an air pump.
2. Place the ignition in the off position and keep the key in the ignition.
3. Cycle the ignition to the on position with the engine off.

Wheels and Tires

4. Turn the hazard flashers on then off three times. You must accomplish this within 10 seconds. If you successfully enter the reset mode, the horn sounds once, the system indicator flashes and a message shows in the information display. If this does not occur, please try again starting at step 2. If after repeated attempts to enter the reset mode, the horn does not sound, the system indicator does not flash and no message shows in the information display, seek service from your authorized dealer.
 5. Train the tire pressure monitoring system sensors in the tires using the following system reset sequence starting with the left front tire in the following order: Left front - driver side front tire, Right front - passenger side front tire, Right outer rear -passenger side rear outer tire, Right inner rear - passenger side rear inner tire, Left outer rear - driver side rear outer tire, Left inner rear - driver side rear inner tire.
 6. Remove the valve cap from the valve stem on the left front tire. Decrease the air pressure until the horn sounds.
- Note:** *The single horn chirp confirms that the sensor identification code has been learned by the module for this position. If a double horn is heard, the reset procedure was unsuccessful, and you must repeat it.*
7. Remove the valve cap from the valve stem on the right front tire. Decrease the air pressure until the horn sounds.
 8. Remove the valve cap from the valve stem on the right outer rear tire. Decrease the air pressure until the horn sounds.
 9. Remove the valve cap from the valve stem on the right inner rear tire. Decrease the air pressure until the horn sounds.
 10. Remove the valve cap from the valve stem on the left outer rear tire. Decrease the air pressure until the horn sounds.
 11. Remove the valve cap from the valve stem on the left inner rear tire. Decrease the air pressure until the horn sounds. Training is complete after the horn sounds for the last tire trained, the system indicator stops flashing, and a message is shown in the information display.
 12. Turn the ignition off. If two short horn beeps are heard, the reset procedure was unsuccessful and you must repeat it. If after repeating the procedure and two short beeps are heard when the ignition is turned to off, seek assistance from your authorized dealer.
 13. Set all six tires to the recommended air pressure as indicated on the Safety Compliance Certification Label, affixed to either the door hinge pillar, door-latch post, or the door edge that meets the door-latch post, next to the driver seating position or Tire Label located on the B-Pillar or the edge of the driver door.

CHANGING A ROAD WHEEL



WARNING: To determine the required pressure(s) for your vehicle, see the Safety Compliance Certification Label (on the door hinge pillar, door-latch post or the door edge that meets the door-latch post, next to the driver seat) or the Tire Label on the B-Pillar or the edge of the driver door.

Note: *You should only use tire sealants in roadside emergencies as they may cause damage to the tire pressure monitoring system sensor.*

Wheels and Tires

Note: The tire pressure monitoring system indicator light illuminates when the spare tire is in use. To restore the full function of the monitoring system, all road wheels equipped with tire pressure monitoring sensors must be mounted on the vehicle.

Note: Do not use wheels or wheel nuts different than the original equipment, as this may damage the wheel or mounting system.

If you get a flat tire when driving, do not apply the brake heavily. Instead, gradually decrease your speed. Hold the steering wheel firmly and slowly move to a safe place on the side of the road.

Have a flat serviced by an authorized dealer to prevent damage to the tire pressure monitoring system sensors. See **Tire Pressure Monitoring System** (page 213). Replace the spare tire with a road tire as soon as possible. During repairing or replacing of the flat tire, have the authorized dealer inspect the tire pressure monitoring system sensor for damage.

Dissimilar Spare Wheel and Tire Assembly Information



WARNING: Failure to follow these guidelines could result in an increased risk of loss of vehicle control, injury or death.

If you have a dissimilar spare wheel and tire, then it is intended for temporary use only. This means that if you need to use it, you should replace it as soon as possible with a road wheel and tire assembly that is the same size and type as the road tires and wheels that were originally provided by Ford. If the dissimilar spare tire or wheel is damaged, it should be replaced rather than repaired.

A dissimilar spare wheel and tire assembly is defined as a spare wheel and tire assembly that is different in brand, size or appearance from the road tires and wheels and can be one of three types:

1. **T-type mini-spare:** This spare tire begins with the letter T for tire size and may have Temporary Use Only molded in the sidewall.

2. **Full-size dissimilar spare with label on wheel:** This spare tire has a label on the wheel that states: THIS WHEEL AND TIRE ASSEMBLY FOR TEMPORARY USE ONLY.

When driving with one of the dissimilar spare tires listed above:

- Do not exceed 50 mph (80 km/h).
- Do not load the vehicle beyond maximum vehicle load rating listed on the Safety Compliance Label.
- Do not tow a trailer.
- Do not use snow chains on the end of the vehicle with the dissimilar spare tire.
- Do not use more than one dissimilar spare tire at a time.
- Do not use commercial car washing equipment.
- Do not try to repair the dissimilar spare tire.

Using a dissimilar spare wheel and tire assembly can compromise the effectiveness of the following:

- Handling, stability and braking performance.
- Comfort and noise.
- Ground clearance and parking at curbs.
- Winter weather driving capability.
- Wet weather driving capability.
- All-wheel driving capability.

Wheels and Tires

3. Full-size dissimilar spare without label on wheel

When driving with the full-size dissimilar spare wheel and tire assembly:

- Do not exceed 70 mph (113 km/h).
- Do not use more than one dissimilar spare wheel and tire assembly at a time.
- Do not use commercial car washing equipment.
- Do not use snow chains on the end of the vehicle with the dissimilar spare wheel and tire assembly.

Using a dissimilar spare wheel and tire assembly can compromise the effectiveness of the following :

- Handling, stability and braking performance.
- Comfort and noise.
- Ground clearance and parking at curbs.
- Winter weather driving capability.
- Wet weather driving capability.
- All-wheel driving capability.

When driving with the full-size dissimilar spare wheel and tire assembly additional caution should be given to:

- Towing a trailer.
- Driving vehicles equipped with a camper body.
- Driving vehicles with a load on the cargo rack.

Drive cautiously when using a full-size dissimilar spare wheel and tire assembly and seek service as soon as possible.

Tire Change Procedure (If Equipped)



WARNING: The jack supplied with this vehicle is only intended for changing a flat tire in an emergency. Do not attempt to do any other work on your vehicle when it is supported by the jack, as your vehicle could slip off the jack. Failure to follow this instruction could result in personal injury or death.



WARNING: To help prevent your vehicle from moving when changing a wheel, shift the transmission into park (P), set the parking brake and use an appropriate block or wheel chock to secure the wheel diagonally opposite to the wheel being changed. For example, when changing the front left wheel, place an appropriate block or wheel chock on the right rear wheel.



WARNING: Do not attempt to change a tire on the side of the vehicle close to moving traffic. Pull far enough off the road to not obstruct the flow of traffic and avoid the danger of being hit when operating the jack or changing the wheel.



WARNING: Only use the jack provided as original equipment with your vehicle.



WARNING: The jack supplied with this vehicle is only intended for changing a flat tire in an emergency. Do not attempt to do any other work on your vehicle when it is supported by the jack, as your vehicle could slip off the jack. Failure to follow this instruction could result in personal injury or death.



WARNING: Only use the jack provided as original equipment with your vehicle.

Wheels and Tires



WARNING: Never place anything between the vehicle jack and your vehicle.



WARNING: Never place anything between the vehicle jack and the ground.



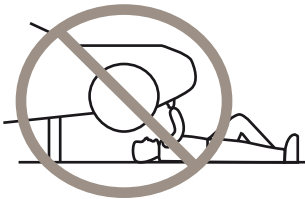
WARNING: Only use the specified jacking points. If you use any other locations you could damage vehicle components, such as brake lines.



WARNING: Failure to follow these guidelines could result in an increased risk of loss of vehicle control, injury or death.



WARNING: Only use the spare wheel carrier to stow wheels provided with your vehicle.

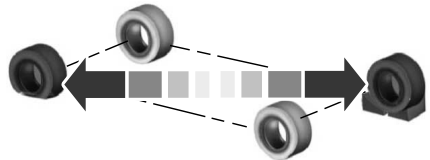


Note: *Passengers should not remain in your vehicle when the vehicle is being jacked.*

Note: *Do not use impact tools or power tools operating at over 200 RPM on the spare wheel carrier winch, which may cause it to malfunction and prevent a secure fit. Override the winch at least three times (there is an audible click each time) to make sure the wheel and tire fit securely.*

Note: *No maintenance or additional lubrication of your jack is required over the service life of your vehicle.*

1. Park the vehicle on a level firm ground and activate the hazard flashers.
2. Apply the parking brake, place the transmission in park (P), turn the engine off.

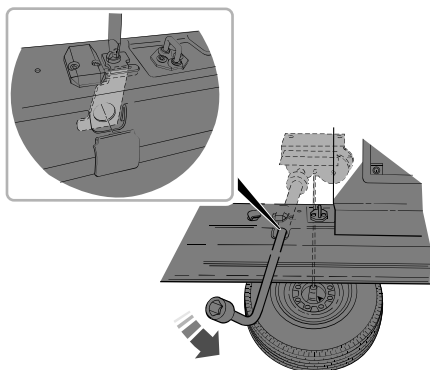


3. Block the wheel diagonally opposite the flat tire. For example, if the left front tire is flat, block the right rear wheel.

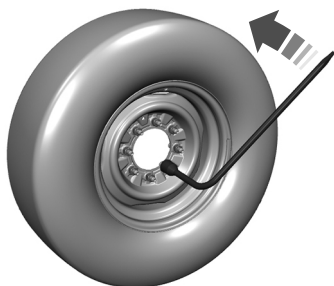
Removing the Spare Tire

1. To access the spare tire it must be lowered from its stowed position. Remove the thumb screw and anti-theft bracket as required. Use the wheel nut wrench tip to loosen it.
2. Guide the wheel nut wrench or jack handle through the hole and into the tube.
3. Turn the wrench or handle counterclockwise until the cable has slack and the tire can be slid rearward.
4. Remove the retainer from the spare tire and remove the spare tire.

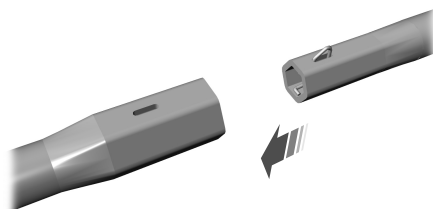
Wheels and Tires



5. Use the wheel nut wrench to remove the wheel trim, if equipped.
6. Loosen each wheel nut one-half turn counterclockwise. Do not remove them until the wheel is raised off the ground.

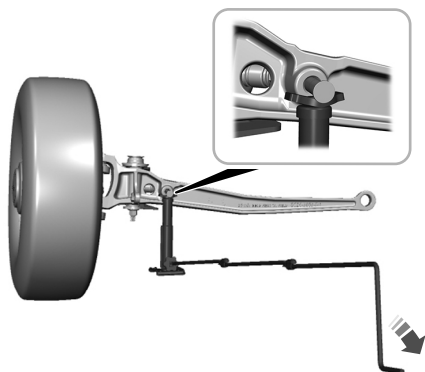


7. For E-350 dual wheel and E-450 equipped with hydraulic jacks, two handle extensions are used to operate the jack. To assemble, align the button with the hole and slide the parts together. To disconnect, press the button and pull apart.



Jacking the Vehicle

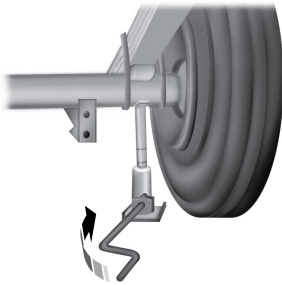
Position the jack under the correct jacking points according to following pictures.



Front axle jacking point: Place the jack under the pin on the front surface of the front axle.

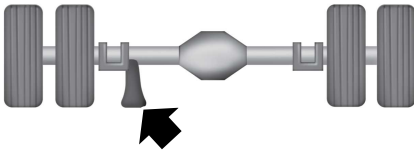
Note: Do not place the jack under or on the steering linkage.

Wheels and Tires



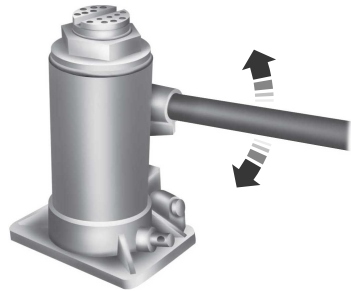
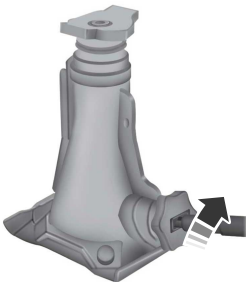
E201346

Rear axle jacking points: All models except E-350 and E-450 dual rear wheel.



E201347

Rear axle jacking points: E-350 and E-450 dual rear wheel.



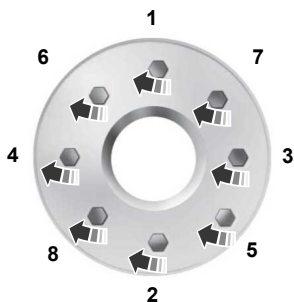
Turn the jack handle clockwise. For hydraulic jacks, operate the handle up-and-down until the wheel is completely off the ground and high enough to install the spare tire.

Installing the spare wheel and tire

1. Remove the wheel nuts with the wheel nut wrench, replace the flat tire with the spare, making sure the valve stem of the spare is facing outward when replacing a front wheel. For the rear wheel position on vehicles with single rear wheel fitments, install the spare with the valve stem facing outward. For vehicles with dual rear wheels, the valve stem of the spare must face outward when replacing an inner wheel, but must face inward when replacing an outboard wheel.
2. Install the wheel nuts and finger tighten. Do not fully tighten the wheel nuts until the wheel has been lowered.
3. Lower the vehicle completely by turning the jack handle counterclockwise.

Note: For hydraulic jacks, insert the release valve, open release valve slightly by turning the handle counterclockwise. Stop turning the release valve when vehicle start to lower. Close the valve when the vehicle is completely lowered.

Wheels and Tires



4. Install the wheel nuts in the sequence shown.

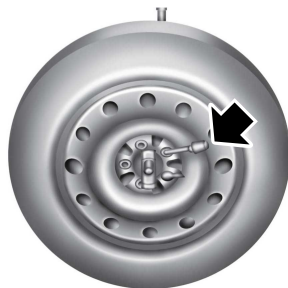


5. Remove the jack and fully tighten the wheel nuts in the sequence shown. See **Technical Specifications** (page 225).
6. Install any wheel covers or hubcaps. Make sure they snap into place.

Note: When installing the wheel center ornaments, make sure that the ornament retention towers on the back side of the ornament are aligned with the studs and wheel nuts and retain to the flange on the wheel nuts.

Stowing the Flat tire or Spare tire

1. Place the tire on end with the valve stem facing toward the front of the vehicle. Lay the tire on the ground, near the rear of the vehicle, with the valve stem side facing up.



2. Slide the wheel partially under the vehicle and install the retainer through the wheel center. If equipped, you may have to remove the wheel center cap prior to pushing the retainer through the center of the wheel. To remove the center cap, press it off with the wheel nut wrench tip from the inner side of the wheel. Pull on the cable to align the components at the end of the cable.
3. Turn the wheel nut wrench clockwise until the tire is raised to its stowed position underneath the vehicle. The wrench becomes harder to turn and the spare tire winch ratchets or slips when the tire is raised to its maximum tightness. A clicking sound is heard from the winch indicating that the tire is properly stowed. Check that the tire lies flat against the frame and is properly tightened.
4. Unblock the wheel.

Wheels and Tires

TECHNICAL SPECIFICATIONS

Wheel Lug Nut Torque Specifications



WARNING: When you install a wheel, remove any corrosion, dirt or foreign materials present on the mounting surfaces of the wheel or the surface of the wheel hub, brake drum or brake disc that contacts the wheel. Make sure to secure any fasteners that attach the rotor to the hub so they do not interfere with the mounting surfaces of the wheel. Installing wheels without following these steps can cause the wheel nuts to loosen and the wheel to come off while your vehicle is in motion, resulting in loss of vehicle control, personal injury or death.

Bolt size	lb.ft (Nm) ¹
9/16 x 18 two-piece lug nut	140 lb.ft (190 Nm)

¹ Torque specifications are for nut and bolt threads free of dirt and rust. Use only Ford recommended replacement fasteners.

On vehicles equipped with single rear wheels, retighten the lug nuts to the specified torque at 100 miles (160 kilometers) after any wheel disturbance (such as tire rotation, changing a flat tire, wheel removal).

On vehicles equipped with dual rear wheels, retighten the wheel lug nuts to the specified torque at 100 miles (160 kilometers), and again at 500 miles (800 kilometers) of new vehicle operation and after any wheel disturbance (such as tire rotation, changing a flat tire, wheel removal).



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On all two-piece flat wheel nuts, apply one drop of motor oil between the flat washer and the nut. Do not apply motor oil to the wheel nut threads or the wheel stud threads.



A Wheel pilot bore

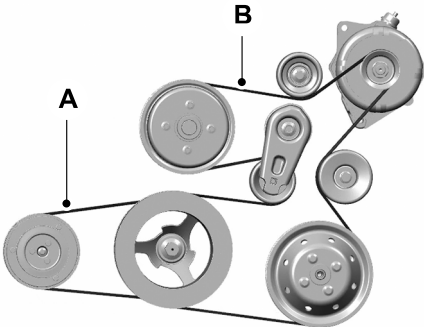
Inspect the wheel pilot hole and mounting surface prior to installation. Remove any visible corrosion or loose particles.

Capacities and Specifications

ENGINE SPECIFICATIONS

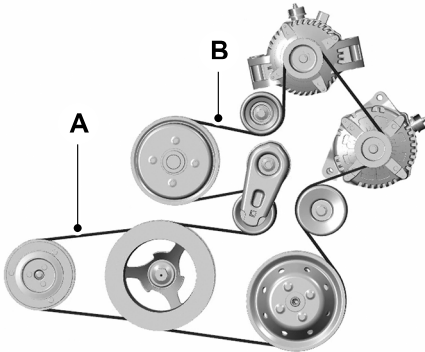
Engine	7.3L V8 Engine
Displacement.	445 in ³ (7,293 cm ³)
Required fuel.	Minimum 87 octane
Firing order.	1-5-4-8-6-3-7-2
Ignition system.	Coil near spark plug with spark plug wire
Spark plug gap.	0.049 in (1.25 mm) - 0.053 in (1.35 mm)
Compression ratio.	10.5:1

Drivebelt Routing Single Alternator



- A Drivebelt closest to the engine.
- B Drivebelt furthest from the engine.

Dual Alternator



- A Drivebelt closest to the engine.
- B Drivebelt furthest from the engine.

Capacities and Specifications

MOTORCRAFT PARTS - 7.3L

Component	Motorcraft Part number
Air filter element.	FA-2042
One battery.	BXT-65-750
Two batteries (optional).	BXT-65-750
Engine oil filter. ¹	FL-820-S
Spark plug.	SP-589
Transmission fluid filter.	FT-187
Windshield wiper blade.	WW-2005

¹ If a Motorcraft oil filter is not available, use an oil filter that aligns to SAE/USCAR – 36 Performance Specifications. Filter Type D.

We recommend Motorcraft parts that are available at your authorized dealer or at www.fordparts.com. We engineer these parts for your vehicle to meet or exceed our specifications. Use of other parts could impact vehicle performance, emissions and durability. Your warranty could be void for any damage related to use of other parts.

Capacities and Specifications

BULB SPECIFICATION CHART

Replacement bulbs are specified in the chart below. Headlamp bulbs must be marked with an authorized “D.O.T.” for

North America and an “E” for Europe to ensure lamp performance, light brightness and pattern and safe visibility. The correct bulbs will not damage the lamp assembly or void the lamp assembly warranty and will provide quality bulb illumination time.

Exterior Lamps

Lamp	Trade Name
Front side marker lamp.	W5W
Park lamp.	3157AK
Front direction indicator.	3157AK
Headlamp low beam.	H13
Headlamp high beam.	H13
Front clearance lamp (exterior mirror).	2825
Brake, rear and direction indicator lamp.	3157K
Reversing lamps.	3156

Interior Lamps

Lamp	Trade Name
Underhood Lamp.	906
Map lamp.	578
Dome lamp.	578
Cargo lamp.	578

To replace all instrument panel lights - see your authorized dealer.

Capacities and Specifications

ENGINE OIL CAPACITY AND SPECIFICATION

Use oil that meets the defined specification and viscosity grade.

If you do not use oil that meets the defined specification and viscosity grade, it could result in:

- Component damage that your vehicle warranty does not cover.
- Longer engine cranking periods.
- Increased emission levels.
- Reduced vehicle performance.
- Reduced fuel economy.



An oil that displays this symbol conforms to current engine, emission system and fuel economy performance standards of ILSAC.

We recommend Motorcraft motor oil for your vehicle. If Motorcraft oil is not available, use motor oils of the recommended viscosity grade that display the API Certification Mark for gasoline engines.

Do not use supplemental engine oil additives because they are unnecessary and could lead to engine damage that your vehicle warranty does not cover.

Capacities

Variant	Including the Oil Filter
All.	8.0 qt (7.57 L)

Materials

Name	Specification
Motorcraft® SAE 5W-30 Motor Oil (U.S.) Motorcraft® SAE 5W-30 Motor Oil / Huile moteur SAE 5W-30 Motorcraft® (Canada) XO-5W30-Q1SP, XO-5W30-Q1FS (U.S.) CXO-5W30-LSP6, CXO-5W30-LFS6 (Canada)	WSS-M2C961-A1

Capacities and Specifications

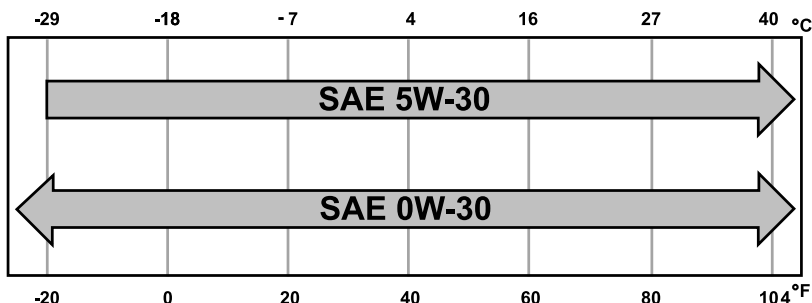
Alternative Engine Oil for Extremely Cold Climates

To improve engine cold start performance,

we recommend that you use the following alternative engine oil in extremely cold climates, where the ambient temperature reaches -22°F (-30°C) or below.

Materials

Name	Specification
Engine Oil - SAE 0W-30	WSS-M2C963-A1



Note: If you use your vehicle regularly above the altitude of 5,000 ft (1,524 m) and under the temperature of -4.0°F (-20°C), it is recommended to use the alternative engine oil.

If you do not use coolant that meets the defined specification, it could result in:

- Component damage that your vehicle warranty does not cover.
- Reduced vehicle performance.

COOLING SYSTEM CAPACITY AND SPECIFICATION

Use coolant that meets the defined specification.

Capacities

Variant	Quantity
All.	20.3 qt (19.22 L)

Capacities and Specifications

Materials

Name	Specification
Motorcraft® Yellow Prediluted Antifreeze/ Coolant(U.S.) Motorcraft® Yellow Prediluted Antifreeze/Coolant / Antigel/liquide de refroidissement prédilué jaune Motorcraft®(Canada) VC-13DL-G(U.S.) CVC-13DL-G(Canada)	WSS-M97B57-A2

FUEL TANK CAPACITY

Capacities

Variant	Quantity
Standard.	40 gal (151 L)
Optional or E-Super Duty.	55 gal (208 L)

Capacities and Specifications

AIR CONDITIONING SYSTEM CAPACITY AND SPECIFICATION



WARNING: The air conditioning refrigerant system contains refrigerant under high pressure. Only qualified personnel should service the air conditioning refrigerant system. Opening

the air conditioning refrigerant system can cause personal injury.

Use refrigerant and oil that meets the defined specifications.

If you do not use refrigerant and oil that meets the defined specifications, it could result in:

- Component damage that your vehicle warranty does not cover.
- Reduced vehicle performance.

Capacities

Variant	Refrigerant	Refrigerant Oil
Front only.	26.98 oz (0.765 kg)	7.00 fl oz (207 ml)
With prep pack.	33.02 oz (0.936 kg)	14.00 fl oz (414 ml)

Materials

Name	Specification
Motorcraft® R-134a Refrigerant (U.S.) R-134a Refrigerant / Frigorigène R-134a (Canada) YN-19 (U.S.) CYN-19-RB (Canada)	WSH-M17B19-A
Motorcraft® PAG Refrigerant Compressor Oil (U.S.) Motorcraft® PAG Refrigerant Compressor Oil / Huile PAG pour compresseur frigorifique Motor- craft® (Canada) YN-12-D (U.S. & Canada)	WSH-M1C231-B

WASHER FLUID SPECIFICATION

Capacities

Variant	Quantity
All.	Fill as required.

Capacities and Specifications

Materials

Name	Specification
Motorcraft® Premium Windshield Wash Concentrate with Bitterant(U.S.) Motorcraft® Premium Quality Windshield Washer Fluid -35 °C / Liquide lave-glace de haute qualité -35 °C Motorcraft®(Canada) ZC-32-B2(U.S.) CXC-37-M(Canada)	WSS-M14P19-A

AUTOMATIC TRANSMISSION FLUID CAPACITY AND SPECIFICATION

Use fluid that meets the defined specification and viscosity grade.

If you do not use fluid that meets the defined specification and viscosity grade, it could result in:

- Component damage that your vehicle warranty does not cover.
- Reduced vehicle performance.
- Reduced fuel economy.

Note: Only use MERCON LV transmission fluid for automatic transmissions that require MERCON LV transmission fluid. The use of any other fluid could cause transmission damage.

Capacities

Variant	Quantity
All.	17.4 qt (16.5 L) ¹

¹ Approximate dry fill capacity. Actual amount could vary during fluid changes.

Materials

Name	Specification
Motorcraft® MERCON® LV Automatic Transmission Fluid(U.S.) Motorcraft® MERCON® LV Automatic Transmission Fluid / Huile pour boîte automatique MERCON® LV Motorcraft®(Canada) XT-10-QLVC(U.S.) CXT-10-LV6(Canada)	WSS-M2C938-A

Capacities and Specifications

BRAKE FLUID SPECIFICATION

Use fluid that meets the defined specification.

- If you do not use fluid that meets the defined specification, it could result in:
- Component damage that your vehicle warranty does not cover.
 - Reduced brake performance.

Note: *Keep brake fluid clean and dry. Contamination with dirt, water, petroleum products or other materials could result in brake system damage and failure.*

Capacities

Variant	Quantity
Hydroboost Brake System.	Fill as required.
Vacuum Brake System.	Fill as required.

Materials

Name	Specification
Motorcraft® DOT 4 LV High Performance Motor Vehicle Brake Fluid(U.S.) Motorcraft® DOT 4 LV High Performance Motor Vehicle Brake Fluid / Liquide de frein automobile haute performance DOT 4 LV Motorcraft®(Canada) PM-20(U.S. & Canada)	WSS-M6C65-A2

Note: *Use of any fluid other than the recommended fluid could cause reduced brake performance and not meet our performance standards.*

- If you do not use fluid that meets the defined specification and viscosity grade, it could result in:
- Component damage that your vehicle warranty does not cover.
 - Reduced vehicle performance.

REAR AXLE FLUID CAPACITY AND SPECIFICATION

Use fluid that meets the defined specification and viscosity grade.

Capacities and Specifications

Capacities

Variant	Quantity
E-350 Dana axle M70FF (M267FF).	3.28 qt (3.1 L) ¹
E-450 Dana axle M70HD (M273HD).	4.86 qt (4.6 L) ¹

¹ Fill Dana rear axles to 0.24–0.55 in (6–14 mm) below the bottom of the fill hole.

Materials

Name	Specification
Motorcraft® SAE 80W-90 Premium Rear Axle Lubricant (U.S.) Motorcraft® SAE 80W-90 Premium Axle Lubricant / Lubrifiant pour essieux de très haute qualité SAE 80W-90 Motorcraft® (Canada) XY-80W90-QL (U.S.) CXY-80W90-1L (Canada)	WSP-M2C197-A

HYDRAULIC POWER STEERING FLUID CAPACITY AND SPECIFICATION

Use fluid that meets the defined specification.

If you do not use fluid that meets the defined specification, it could result in:

- Component damage that your vehicle warranty does not cover.
- Reduced vehicle performance.

Capacities

Variant	Quantity
All.	Fill as required.

Capacities and Specifications

Materials

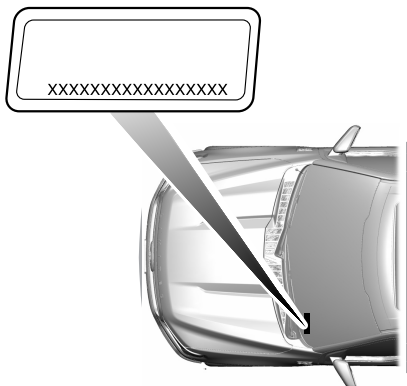
Name	Specification
Motorcraft® MERCON® LV Automatic Transmission Fluid(U.S.) Motorcraft® MERCON® LV Automatic Transmission Fluid / Huile pour boîte automatique MERCON® LV Motorcraft®(Canada) XT-10-QLVC(U.S.) CXT-10-LV6(Canada)	WSS-M2C938-A

Vehicle Identification

VEHICLE IDENTIFICATION NUMBER

LOCATING THE VEHICLE IDENTIFICATION NUMBER

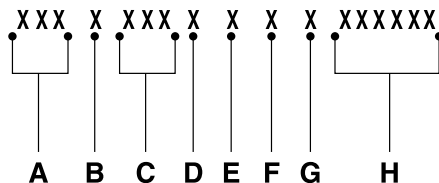
The vehicle identification number is on the left-hand side of the instrument panel.



Note: In the illustration, XXXX is representative of your vehicle identification number.

VEHICLE IDENTIFICATION NUMBER OVERVIEW

The vehicle identification number contains the following information:



- A World manufacturer identifier.
- B Brake system, gross vehicle weight rating, restraint devices and their locations.
- C Make, vehicle line, series, body type.
- D Engine or motor type.
- E Check digit.
- F Model year.
- G Assembly plant.
- H Production sequence number.

Connected Vehicle

CONNECTED VEHICLE REQUIREMENTS

Connected service and related feature functionality requires a compatible vehicle network.

Some remote features require additional service activation. Log in to your Ford account for details. Some restrictions, third party terms and message or data rates may apply.

CONNECTED VEHICLE LIMITATIONS

Evolving technology, cellular networks, or regulations could affect functionality and availability, or continued provision of some features. These changes could even stop some features from functioning.

CONNECTING THE VEHICLE TO A MOBILE NETWORK

WHAT IS THE MODEM



The modem allows access to a range of features built into your vehicle.

ENABLING AND DISABLING THE MODEM

1. Press **Settings**.
2. Press **FordPass Connect**.
3. Press **Connectivity Settings**.
4. Switch connectivity features on or off.

DISABLING THE CONNECTIVITY DEVICE

To disable the connectivity device, contact the Ford Customer Relationship Center.

CONNECTING FORDPASS TO THE MODEM

1. Make sure that the modem is enabled using the vehicle settings menu.
2. Open the FordPass app on your device and log in.
3. Add your vehicle or select your vehicle if already added.
4. Select the option to activate your vehicle.
5. Make sure that the name on the screen matches the name shown in your FordPass account.
6. Confirm that FordPass account is connected to the modem.

CONNECTED VEHICLE – TROUBLESHOOTING

CONNECTED VEHICLE – FREQUENTLY ASKED QUESTIONS

Why can I not confirm the connection of my FordPass account to the modem?

- The modem is not enabled. Switch vehicle connectivity on.
- The network signal is weak. Move your vehicle closer to a place where the network signal is not obstructed.

Audio System (If Equipped)

GENERAL INFORMATION



WARNING: Driving while distracted can result in loss of vehicle control, crash and injury. We strongly recommend that you use extreme caution when using any device that may take your focus off the road. Your primary responsibility is the safe operation of your vehicle. We recommend against the use of any

hand-held device while driving and encourage the use of voice-operated systems when possible. Make sure you are aware of all applicable local laws that may affect the use of electronic devices while driving.

Radio Frequencies and Reception Factors

Note: *Listening to loud audio for long periods of time could damage your hearing.*

Radio Reception Factors	
Distance and strength	The further you travel from a FM station, the weaker the signal and the weaker the reception.
Terrain	Hills, mountains, tall buildings, bridges, tunnels, freeway overpasses, parking garages, dense tree foliage and thunderstorms can interfere with the reception.
Station overload	When you pass a ground-based broadcast repeating tower, a stronger signal may overtake a weaker one and result in the audio system muting.

AUDIO UNIT



WARNING: Driving while distracted can result in loss of vehicle control, crash and injury. We strongly recommend that you use extreme caution when using any device that may take your focus off the road. Your primary responsibility is the safe operation of your vehicle. We recommend against the use of any hand-held device while driving and encourage the use of voice-operated systems when possible. Make sure you are aware of all applicable local laws that may affect the use of electronic devices while driving.



Note: *Depending on your vehicle option package, the controls may look different from what you see here.*

Note: *Some features, such as satellite radio, may not be available in your location. Check with an authorized dealer.*

Audio System (If Equipped)

Accessing the Sound Settings



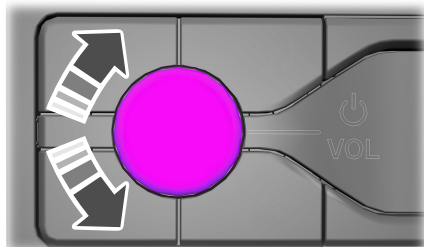
Press the button to adjust the sound settings. You can also activate and set the sensitivity of the adaptive or speed compensated volume.

Accessing the System Settings



Press the button.

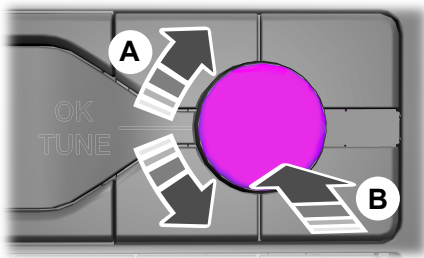
Adjusting the Volume



E260697

Turn to adjust the volume.

Changing Radio Stations



E260687

- A Auto or Manual tuning.
- B Station name tuning.

Note: You can change between auto or manual tuning with the rotary control using the system settings.

Note: You can change radio stations using the seek buttons.

Note: You can recall radio stations using the numeric preset buttons.

Pausing or Playing Media



In media mode, press and release the button to pause playback. Press the button again to resume playback.

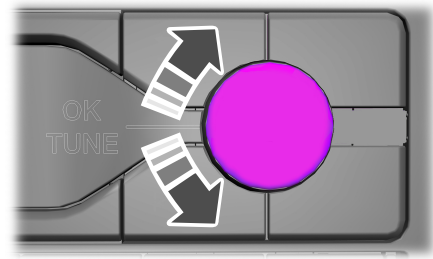
In radio mode, press the button to mute the signal. Press the button again to restore the signal.

Returning to the Previous Screen



Press and release the button.

Scrolling Through the Menu Options



E260782

Selecting Media

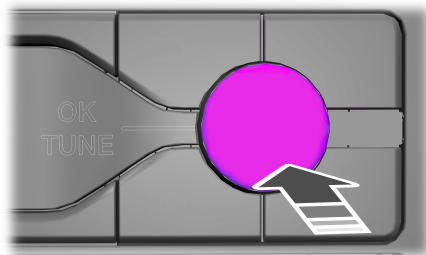


Press the button to select media mode.

Repeatedly press the button, or rotate the right-hand rotary control to scroll through the available media sources.

Audio System (If Equipped)

Selecting a Menu Option



E260781

Selecting the Radio



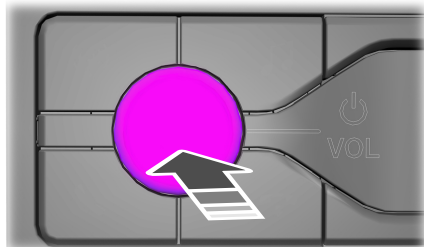
Press the button to select radio mode.

Press the button again to display the available radio sources. Repeatedly press the button, or rotate the right-hand rotary control to scroll through the available radio sources.

Setting a Memory Preset

Tune to a station then press and hold one of the numbered memory preset buttons. The audio mutes briefly while the system saves the station and returns once the station is stored.

Switching the Audio Unit On and Off



E260686

Press and release the button.

Using a Cell Phone



Press the button to either answer an incoming phone call or to make a phone call.



Press and hold the button to end a phone call.

Using Seek, Fast Forward and Reverse



Press and release the button to skip to the next track.

Press and hold the button to fast forward through the track.



Press and release the button to return to the beginning of a track.

Repeatedly press the button to return to previous tracks.

Press and hold the button to rewind.

In radio mode, select a frequency band and press and release either button. The system stops at the first station it finds in that direction.

Audio System (If Equipped)

In satellite radio mode, press and release to select the next or previous satellite radio station. If you select a specific category, such as jazz, rock or news, press to find the next or previous station in the category you select.

CONNECTING A BLUETOOTH® DEVICE

Pairing a Device



Press the button.

Select **Bluetooth®** and follow the instructions on the screen.

Note: When pairing a new device, you can choose to download contacts, set this as the primary device and enable Emergency Assistance.

STREAMING BLUETOOTH AUDIO

Selecting a Bluetooth® Source



1. Press the button to display the menu.
2. Repeatedly press the button to scroll to the **Bluetooth®** device.
3. Press the **OK** button.



Press the button to play the track. Press the button again to pause the track.



Press the button to skip to the next track.

Press and hold the button to fast forward through the track.



Press the button once to return to the beginning of the track.

Repeatedly press the button to return to previous tracks.

Press and hold the button to fast rewind.

Note: Not all functions are supported by all phones.

PLAYING MEDIA FROM A USB DEVICE

Supported Audio File Formats

You can play audio file formats including MP3, WMA, WAV, M4A, M4B, AAC, and FLAC.

Note: The NTFS file system is not supported.

Selecting the USB Device



Press the button to display the menu.

Repeatedly press the button to scroll to your USB device.

Press the **OK** button.

Playing from the USB Device



Press the button to play a track. Press the button again to pause the track.



Press the button to skip to the next track.

Press and hold the button to fast forward through the track.



Press the button once to return to the beginning of a track.

Repeatedly press the button to return to previous tracks.

Press and hold the button to fast rewind.

Audio System (If Equipped)

Sorting by Categories

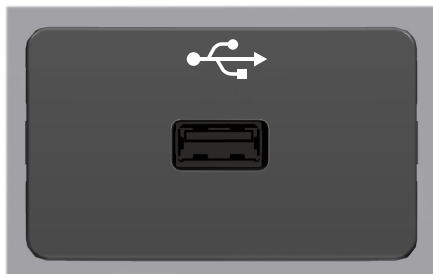
You can also sort and play music by specific categories, for example artist or album.

Press the **OK** button to view the available categories.

USB PORT



WARNING: Driving while distracted can result in loss of vehicle control, crash and injury. We strongly recommend that you use extreme caution when using any device that may take your focus off the road. Your primary responsibility is the safe operation of your vehicle. We recommend against the use of any hand-held device while driving and encourage the use of voice-operated systems when possible. Make sure you are aware of all applicable local laws that may affect the use of electronic devices while driving.



The USB port allows you to plug in media playing devices, memory sticks and charge devices.

Note: Not all USB ports in your vehicle have data transfer capabilities. See **Auxiliary Power Points** (page 80).

USING VOICE RECOGNITION

Phone Voice Service

This system allows you to use the voice recognition features of your phone and focus on your driving.



Press and hold the voice control button on the audio unit.

Note: This only works when connected via Bluetooth. See **Connecting a Bluetooth® Device** (page 242).

Note: When using voice recognition use the language set on the device.

Note: We recommend that you check your data plan before using your phone voice service through the system. Using them could result in additional charges.

Accessories

For a complete listing of the accessories that are available for your vehicle, please contact your authorized dealer or visit the online store web site:

Web Address (United States)
www.Accessories.Ford.com

Web Address (Canada)
www.Accessories.Ford.ca

We will repair or replace any properly authorized dealer-installed Ford Original Accessory found to be defective in factory-supplied materials or workmanship during the warranty period, as well as any component damaged by the defective accessories.

We will warrant your Ford Original Accessory through the warranty that provides the greatest benefit:

- 24 months, unlimited mileage.
- The remainder of your new vehicle limited warranty.

Contact an authorized dealer for details and a copy of the warranty.

Ford Licensed Accessories are the accessory manufacturer's designs. The manufacturer develops and therefore warrants Ford Licensed Accessories, and does not design or test these accessories to Ford Motor Company engineering requirements. Contact an authorized Ford dealer for the manufacturer's limited warranty details, and request a copy of the Ford Licensed Accessories product limited warranty from the accessory manufacturer.

For maximum vehicle performance, keep the following information in mind when adding accessories or equipment to your vehicle:

- When adding accessories, equipment, passengers and luggage to your vehicle, do not exceed the total weight capacity of the vehicle or of the front or rear axle (GVWR or GAWR as indicated on the Safety Compliance Certification label). Ask an authorized dealer for specific weight information.
- The Federal Communications Commission (FCC) and Canadian Radio Telecommunications Commission (CRTC) regulate the use of mobile communications systems that are equipped with radio transmitters, for example two-way radios, telephones and theft alarms. Any such equipment installed in your vehicle should comply with Federal Communications Commission (FCC) and Canadian Radio Telecommunications Commission (CRTC) regulations and should be installed only by an authorized dealer.
- An authorized dealer needs to install mobile communications systems. Improper installation may harm the operation of your vehicle, particularly if the manufacturer did not design the mobile communication system specifically for automotive use.
- If you or an authorized Ford dealer add any non-Ford electrical or electronic accessories or components to your vehicle, you may adversely affect battery performance and durability. In addition, you may also adversely affect the performance of other electrical systems in the vehicle.

AUXILIARY SWITCHES (IF

EQUIPPED)

For maximum vehicle performance, keep the following information in mind when adding accessories or equipment to your vehicle:

- When adding accessories, equipment, passengers and luggage to your vehicle, do not exceed the total weight capacity of the vehicle or of the front or rear axle (GVWR or GAWR as indicated on the Safety Compliance Certification label). Ask an authorized dealer for specific weight information.
- The Federal Communications Commission (FCC) and Canadian Radio Telecommunications Commission (CRTC) regulate the use of mobile communications systems equipped with radio transmitters, for example, two-way radios, telephones and theft alarms. Any such equipment installed in your vehicle should comply with Federal Communications Commission (FCC) and Canadian Radio Telecommunications Commission (CRTC) regulations, and should be installed by an authorized dealer.
- An authorized dealer needs to install mobile communications systems. Improper installation may harm the operation of your vehicle, particularly if the manufacturer did not design the mobile communication system specifically for automotive use.
- If you or an authorized Ford dealer add any non-Ford electrical or electronic accessories or components to your vehicle, you may adversely affect battery performance and durability. In addition, you may also adversely affect the performance of other electrical systems in the vehicle.



E163431

The auxiliary switch option package provides four switches, mounted in the center of the instrument panel. These switches operate when the vehicle is running or from battery power, depending on the switchable PDB fuse locations #82 and #83. Ford recommends, however, that the engine remain running to maintain battery charge when using the auxiliary switches for extended periods of time or higher current draws.

When switched on, the auxiliary switches provide 20 amps or 40 amps of electrical battery power for a variety of personal or commercial uses.

The switches include the fuse and relay kit. This kit contains the required fuses and relays that an authorized technician needs to install into the power distribution box, located under the hood. Refer to the instruction sketch included in the kit. Contact an authorized dealer for service.

Each switch includes a power lead (a blunt-cut and sealed wire) located in the underhood cowl shield above the engine block powertrain control module.

The power leads are coded as follows:

Accessories

Switch	Circuit Number	Wire Color	Fuse Amp Rating
AUX 1	CAC05	Yellow	40A
AUX 2	CAC06	Green with Brown Trace	40A
AUX 3	CAC07	Violet with Green Trace	20A
AUX 4	CAC08	Brown	20A

Learn more about auxiliary switches by visiting <https://www.fleet.ford.com/truckbbas/>.

Upfitter Interface Module (If Equipped)

The Upfitter Interface Module (UIM) is an electronic control module that operates equipment (such as lift buckets, cranes, motors, salt spreaders and snow plows) with external relays.

If you replace the module, it will require additional programming by the upfitter. Obtain this data directly from the upfitter company. The upfitter contact information is in the vehicle door opening.

For more information on the Upfitter Interface Module and the auxiliary switches, contact your upfitter.

Ford Protect

PROTECT YOURSELF FROM THE RISING COST OF VEHICLE REPAIRS WITH A FORD PROTECT EXTENDED SERVICE PLAN.

Ford Protect Extended Service Plans (U.S. Only)

Ford Protect extended service plan means peace of mind. It is the extended service plan backed by Ford Motor Company, and provides more protection beyond the New Vehicle Limited Warranty coverage. When you visit your Ford Dealer, Insist on Ford Protect extended service plans!

Ford Protect Can Quickly Pay for Itself

One trip to the Service Center could easily exceed the price of your Ford Protect extended service plan. With Ford Protect extended service plan you minimize your risk for unexpected repair bills and rising repair costs.

Up to 1,000+ Covered Vehicle Components

There are four mechanical Ford Protect extended service plans with different levels of coverage. Ask your authorized dealer for details.

1. PremiumCARE - Our most comprehensive coverage. With over 1,000 covered components, this plan is so complete it is probably easier to list what is not covered.
2. ExtraCARE - Covers 113 components, and includes many high-tech items.
3. BaseCARE - Covers 84 components.
4. PowertrainCARE - Covers 29 critical components.

Ford Protect extended service plans are honored by all authorized Ford dealers in the U.S., Canada and Mexico.

That means you get:

- Reliable, quality service at any Ford or Lincoln dealership.
- Repairs performed by factory trained technicians, using genuine parts.

Rental Car Reimbursement

1st day Rental Benefit

If you bring your car into your dealer for service, we'll give you a loaner to use for the day.

Extended Rental Benefits

If your vehicle is kept overnight for covered repairs, you are eligible for rental car coverage, including warranty repairs, and Field Service Actions.

Roadside Assistance

Exclusive 24/7 roadside assistance, including:

- Towing, flat-tire change and battery jump starts.
- Out of fuel and lock-out assistance.
- Travel expense reimbursement for lodging, meals and rental car.
- Assistance for taxi, shuttle, rental car coverage or other transportation.

Transferable Coverage

If you sell your vehicle before your Ford Protect extended service plan coverage expires, you can transfer any remaining coverage to the new owner. Which should give you and your potential buyer a little more peace of mind.

Ford Protect

Less Cost to Properly Maintain Your Vehicle

Ford Protect extended service plan also offers a Premium Maintenance Plan that covers all scheduled maintenance, and selected wear items. The coverage is prepaid, so you never have to worry about the cost of your vehicle's maintenance.

Covered maintenance includes:

- Windshield wiper blades.
- Spark plugs.
- The clutch disc (if equipped).
- Brake pads and linings.
- Shock absorbers.
- Struts.
- Engine belts.
- Engine coolant hoses, clamps and O-rings.
- Diesel exhaust fluid replenishment (if equipped).
- Cabin air filter replacement every 20,000 mi (32,000 km) (electric vehicles only).

Interest Free Finance Options

Just a 5% down payment will provide you with an affordable, no interest, no fee payment program allowing you all the security and benefits Ford Protect extended service plan has to offer while paying over time. You are pre-approved with no credit check or hassles. To learn more, call our Ford Protect extended service plan specialists at 800-367-3377.

Ford Protect Extended Service Plan
P.O. Box 321067
Detroit, MI 48232

Ford Protect Extended Service Plan (CANADA ONLY)

You can get more protection for your vehicle by purchasing a Ford Protect extended service plan. Ford Protect extended service plan is the only service contract backed by Ford Motor Company of Canada, Limited. Depending on the plan you purchase, Ford Protect extended service plan provides benefits such as:

- Rental reimbursement.
- Coverage for certain maintenance and wear items.
- Protection against repair costs after your New Vehicle Limited Warranty Coverage expires.
- Roadside Assistance benefits.

There are several Ford Protect extended service plans available in various time, distance and deductible combinations. Each plan is tailored to fit your own driving needs, including reimbursement for towing and rental. When you purchase Ford Protect extended service plan, you receive added peace-of-mind protection throughout Canada, the United States and Mexico, provided by a network of participating authorized Ford Motor Company dealers.

Note: *Repairs performed outside of Canada and the United States are not eligible for Ford Protect extended service plan coverage.*

This information is subject to change. For more information; visit your local Ford of Canada dealer or www.ford.ca to find the Ford Protect extended service plan that is right for you.

Scheduled Maintenance

GENERAL MAINTENANCE INFORMATION

Why Maintain Your Vehicle?

Carefully following the maintenance schedule helps protect against major repair expenses resulting from neglect or inadequate maintenance and may help to increase the value of your vehicle when you sell or trade it. Keep all receipts for completed maintenance with your vehicle.

We have established regular maintenance intervals for your vehicle based upon rigorous testing. It is important that you have your vehicle serviced at the proper times. These intervals serve two purposes; one is to maintain the reliability of your vehicle and the second is to keep your cost of owning your vehicle down.

It is your responsibility to have all scheduled maintenance performed and to make sure that the materials used meet the specifications identified in this owner's manual. See **Capacities and Specifications** (page 226).

Failure to perform scheduled maintenance invalidates warranty coverage on parts affected by the lack of maintenance.

Why Maintain Your Vehicle at Your Dealership?

Factory-trained Technicians

Service technicians participate in extensive factory-sponsored certification training to help them become experts on the operation of your vehicle. Ask your dealership about the training and certification their technicians have received.

Genuine Ford and Motorcraft Replacement Parts

Dealerships stock Ford, Motorcraft and Ford-authorized branded re-manufactured replacement parts. These parts meet or exceed our specifications. Parts installed at your dealership carry a nationwide 24-month or unlimited mile (kilometer) parts and labor limited warranty.

If you do not use Ford authorized parts they may not meet our specifications and depending on the part, it could affect emissions compliance.

Convenience

Many dealerships have extended evening and Saturday hours to make your service visit more convenient and they offer one stop shopping. They can perform any services that are required on your vehicle, from general maintenance to collision repairs.

Note: *Not all dealers have extended hours or body shops. Please contact your dealer for details.*

Protecting Your Investment

Maintenance is an investment that pays dividends in the form of improved reliability, durability and resale value. To maintain the proper performance of your vehicle and its emission control systems, make sure you have scheduled maintenance performed at the designated intervals.

Your vehicle is very sophisticated and built with multiple, complex, performance systems. Every manufacturer develops these systems using different specifications and performance features. That is why it is important to rely upon your dealership to properly diagnose and repair your vehicle.

Scheduled Maintenance

Ford Motor Company has recommended maintenance intervals for various parts and component systems based upon engineering testing. Ford Motor Company relies upon this testing to determine the most appropriate mileage for replacement of oils and fluids to protect your vehicle at the lowest overall cost to you and recommends against maintenance schedules that deviate from the scheduled maintenance information.

Your vehicle can be driven in such a way that dilutes and increases the level of oil by short trips that do not allow the engine to get to operating temperature, extended idling, and low speed driving for long periods of time.

We strongly recommend the use of only genuine Ford, Motorcraft or Ford-authorized re-manufactured replacement parts engineered for your vehicle.

Additives and Chemicals

This owner's manual and the Ford Workshop Manual list the recommended additives and chemicals for your vehicle. We do not recommend using chemicals or additives not approved by us as part of your vehicle's normal maintenance. Please consult your warranty information.

Oils, Fluids and Flushing

In many cases, fluid discoloration is a normal operating characteristic and, by itself, does not necessarily indicate a concern or that the fluid needs to be changed. However, a qualified expert, such as the factory-trained technicians at your dealership, should inspect discolored fluids that also show signs of overheating or foreign material contamination immediately.

Make sure to change your vehicle's oils and fluids at the specified intervals or in conjunction with a repair. Flushing is a viable way to change fluid for many vehicle sub-systems during scheduled maintenance. It is critical that systems are flushed only with new fluid that is the same as that required to fill and operate the system or using a Ford-approved flushing chemical.

Owner Checks and Services

Make sure you perform the following basic maintenance checks and inspections every month or at six-month intervals.

Check every month
Engine oil level.
Function of all interior and exterior lights.
Tires (including spare) for wear and proper pressure.
Windshield washer fluid level.

Scheduled Maintenance

Check every six months
Battery connections. Clean if necessary.
Body and door drain holes for obstructions. Clean if necessary.
Cooling system fluid level and coolant strength.
Door weatherstrips for wear. Lubricate if necessary.
Hinges, latches and outside locks for proper operation. Lubricate if necessary.
Parking brake for proper operation.
Seatbelts and seat latches for wear and function.
Safety warning lamps (brake, ABS, airbag and seatbelt) for operation.
Washer spray and wiper operation. Clean or replace blades as necessary.

Multi-point Inspection

In order to keep your vehicle running right, it is important to have the systems on your vehicle checked regularly. This can help identify potential issues and prevent major problems. We recommend having the following multi-point inspection performed at every scheduled maintenance interval to help make sure your vehicle keeps running great.

Multi-point inspection	
Accessory drive belt(s)	Horn operation
Battery performance	Radiator, cooler, heater and A/C hoses
Engine air filter	Suspension component for leaks or damage
Exhaust system	Steering and linkage
Exterior lamps and hazard warning system operation	Tires (including spare) for wear and proper pressure**

Scheduled Maintenance

Multi-point inspection	
Fluid levels*; fill if necessary	Windshield for cracks, chips or pits
For oil and fluid leaks	Washer spray and wiper operation

* Brake, coolant recovery reservoir, automatic transmission, power steering and window washer.

**If your vehicle is equipped with a temporary mobility kit, check the tire sealant expiration Use By date on the canister. Replace as needed.

Be sure to ask your dealership service advisor or technician about the multi-point vehicle inspection. It is a comprehensive way to perform a thorough inspection of your vehicle. Your checklist gives you immediate feedback on the overall condition of your vehicle.

NORMAL SCHEDULED MAINTENANCE

Note: Do not exceed the mileage or time intervals.

Maintenance	
Every 7,500 mi (12,000 km)	Rotate the tires, inspect tire wear and measure tread depth. ¹
	Inspect the wheels and related components for abnormal noise, wear, looseness or drag.
	Perform a multi-point inspection.
Every 10,000 mi (16,000 km) /12 months or 700 engine hours, whichever comes first	Change the engine oil and filter.

¹ Rotate the front wheels on vehicles with dual rear wheels when specified. Only rotate the rear wheels if you notice unusual wear.

Scheduled Maintenance

Maintenance	
Every 15,000 mi (24,000 km)	Inspect the automatic transmission fluid level. Consult dealer for requirements.
	Inspect the brake pads, rotors, hoses and parking brake.
	Inspect the engine cooling system strength and hoses.
	Inspect the exhaust system and heat shields.
	Inspect the steering linkage, ball joints, suspension, tie-rod ends, driveshaft and the U-joints.

Brake Fluid Maintenance ¹	
Every 3 Years	Change the brake fluid. ²

¹ Perform this maintenance item every 3 years. Do not exceed the designated time for the interval.

² Brake fluid servicing requires special equipment available at your authorized dealer.

Other Maintenance Items	
Every 30,000 mi (48,000 km)	Replace the engine air filter. Torque the rear axle U-bolts to specification.
Every 60,000 mi (96,000 km)	Replace the front wheel bearing grease and grease seal, if you use non-sealed bearings.
Every 97,500 mi (157,000 km)	Replace the spark plugs.
	Replace the rear axle fluid. See Special Operating Conditions Scheduled Maintenance (page 255).
Every 105,000 mi (168,000 km)	Inspect the accessory drive belts. ¹
Every 150,000 mi (240,000 km)	Change the automatic transmission fluid.
	Change the automatic transmission filter.
	Replace the accessory drive belts if not replaced within the last 100,000 mi (160,000 km).

Scheduled Maintenance

Other Maintenance Items	
	Replace the front wheel bearings and seals, if you use non-sealed bearings.
Every 200,000 mi (320,000 km)	Change the engine coolant. ²

¹ If not replaced, inspect every 15,000 mi (24,000 km).

² Initial replacement at ten years or 200,000 mi (320,000 km), then every five years or 100,000 mi (160,000 km).

Scheduled Maintenance

SPECIAL OPERATING CONDITIONS SCHEDULED MAINTENANCE

If you operate your vehicle **primarily** in any of the following conditions, you need to

perform extra maintenance as indicated. If you operate your vehicle **occasionally** under any of these conditions, it is not necessary to perform the extra maintenance. For specific recommendations, see your dealership service advisor or technician.

Towing a Trailer or Using a Car-top Carrier	
As required	Change the engine oil and filter as indicated by the instrument cluster display and perform services listed in the Normal Scheduled Maintenance chart.
Inspect frequently, service as required	Inspect the U-joints.
Every 22,500 mi (36,000 km)	Replace the rear axle fluid. See axle maintenance items under Exceptions .
Every 60,000 mi (96,000 km)	Replace the spark plugs.

Extensive Idling or Low-speed Driving for Long Distances, as in Heavy Commercial Use (Such as Delivery, Taxi, Patrol Car or Livery) Short Trips that do not allow the engine to get to operating temperature causing fuel dilution and an increase of the engine oil level	
As required	Change the engine oil and filter as indicated by the instrument cluster display and perform services listed in the Normal Scheduled Maintenance chart.
Inspect frequently, service as required	Replace the engine air filter.
Every 22,500 mi (36,000 km)	Replace the rear axle fluid. See axle maintenance items under Exceptions .
Every 60,000 mi (96,000 km)	Replace the spark plugs.

Scheduled Maintenance

Operating in Dusty or Sandy Conditions (Such as Unpaved or Dusty Roads)	
Inspect frequently, service as required	Replace engine air filter.
Every 5,000 mi (8,000 km)	Inspect the wheels and related components for abnormal noise, wear, looseness or drag.
	Rotate the tires ¹ , inspect tires for wear and measure the tread depth.
Every 5,000 mi (8,000 km) or six months	Change the engine oil and filter. ²
	Perform a multi-point inspection.

¹Vehicles with dual rear wheels should rotate the front wheels when specified; rear wheels only if unusual wear is noted.

²Reset your Intelligent Oil-Life Monitor after each engine oil and filter change. See **Oil Change Indicator Reset** (page 165).

Exclusive Use of E85 - Flex Fuel Vehicles Only	
Every oil change	If ran exclusively on E85, fill the fuel tank with regular unleaded fuel.

Exceptions

There are several exceptions to the Normal Schedule:

Axle(s) and transfer case, four-wheel drive vehicles, fluid changes or level checks are not required unless a leak is suspected or the assembly has been submerged in water. Contact an authorized dealer for service.

California fuel filter replacement: If you register your vehicle in California, the California Air Resources Board has determined that the failure to perform this maintenance item does not nullify the emission warranty or limit recall liability before the completion of your vehicle's useful life. We however, urge you to have all recommended maintenance services performed at the specified intervals and to record all vehicle service.

Hot climate oil change intervals: Vehicles operating in the Middle East, North Africa, Sub-Saharan Africa or locations with similar climates using an American Petroleum Institute (API) Certified for Gasoline Engines (Certification mark) oil of SM or SN quality, the normal oil change interval is 5,000 mi (8,000 km).

Scheduled Maintenance

If the available API SM or SN oils are not available, then the oil change interval is 3,000 mi (4,800 km).

Engine air filter replacement: The life of the engine air filter is dependent on exposure to dusty and dirty conditions. Vehicles operated in these conditions require frequent inspection and replacement of the engine air filter.

Customer Information

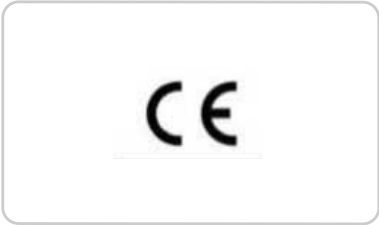
RADIO FREQUENCY CERTIFICATION LABELS

CRUISE CONTROL MODULE

Device	Supplier	Type Designation
Mid Range Radar (MRR)	Delphi/Aptiv	L2C0065TR

Argentina

European Union EU



Brazil

Ghana



NCA PRODUCT IDENTIFIER: OR2-9H-7E1-x4D

Djibouti

AGREE PAR LE MCPT (REPUBLIQUE DE DJIBOUTI)
Numéro d’agrément : 594/dpt/2017
Date d’agrément : 09/04/2017

Customer Information

Indonesia

SERTIFIKAT NOMOR : 53104/SDPPI/2017
PLG ID: 4927



HIDF16000009

Mauritania

AGREE PAR L'ANE MAURITANIE

Numéro d'agrément: 0409/ARE/2017

Date d'agrément: 12/04/2017

Israel

1. מספר אישור התאמה מטעם משרד התקשורת: 51-63483
2. תל איסור לבצע פעולות במכשור שיש בהן כדי לשנות את תכונותיו האלקטרוניות של המכשיר, ובכלל זה שינויי תוכנה, החלפת אנטנה סקורית או חוסמת אפשרות לחיבור לאנטנה חיצונית, בלא קבלת אישור משרד התקשורת, בשל החשש להפרעות אלקטרוניות.

Moldova



Jamaica

This product has been Type Approved
by Jamaica: SMA - L2C0065TR.

Morocco

Malaysia



AGREE PAR L'ANRT MAROC

Numéro d'agrément: MR 13639 ARNT 2017

Date d'agrément: 28/03/2017

Customer Information

Pakistan



Singapore

Complies with IMDA Standards
DA105753

Paraguay



South Africa



Serbia



South Korea



R-CMM-DLH-L2C0065TR

Customer Information

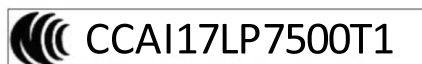
Syria

SyTRA
REGISTERED No:
FR00085-17

United Arab Emirates



Taiwan, China



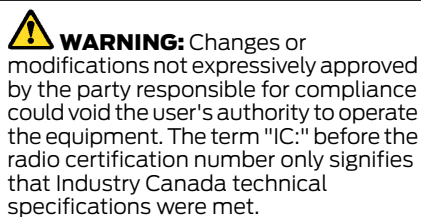
United Kingdom



Ukraine



United States and Canada



FCC ID: L2C0065TR

IC: 3432A-0065TR

Customer Information

This device complies with Part 15 of the FCC Rules and with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

- 1. This device may not cause harmful interference, and
- 2. This device must accept any interference received, including interference that may cause undesired operation.

Zambia



TIRE PRESSURE MONITORING SYSTEM SENSORS

Argentina



China



Democratic Republic of Congo

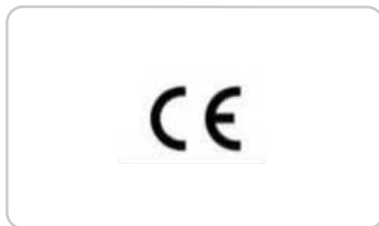
Agréé par l'ARPTC
N° d'homologation: HIR-0099/09/2016
Date d'homologation: 15/09/2016

Djibouti



Customer Information

European Union (EU)



The RED 2014/53/EU (replacing R&TTE Directive 1999/5/EC on 13 June 2016) explicitly states that instructions for intentional radiators include reference to "(a) frequency band(s) in which the radio equipment operates; and (b) maximum radio-frequency power transmitted in the frequency band(s) in which the radio equipment operates," in addition to carrying over the general operational instruction and Declaration of Conformity inclusion requirements from the R&TTE Directive.

Hereby, Schrader Electronics Ltd. declares that the radio equipment type FP4 is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address:

http://www.tpmseuroshop.com/documents/declaration_conformities

f=433.92MHz

P<10mW (e.i.r.p)

Schrader Electronics Ltd. 11 Technology Park, Belfast Road, Antrim BT41 1QS, Northern Ireland United Kingdom.

Ghana

Independent State of Samoa

NCA APPROVED: 2R9-8M-7E0-0BE



Customer Information

Israel

1. מספר אישור התאמה מסעם משרד התקשורת: 51-83847
2. חל איסור לבצע פעולות בזכשיר שיש בהן כדי לשנות את תכונותיו האלחוטיות של המכשיר, ובכלל זה שנויי תדונה, החלפת אנטנה מקורית או הוספת אפשרות לחיבור לאנטנה חיצונית, בלא קבלת אישור משרד התקשורת, כשל החשש להפרעת אלחוטיות.

Nigeria

Connection and use of this communications equipment is permitted by the Nigerian Communications Commission

Jamaica

This product has been Type Approved by Jamaica: SMA - FP4.

Oman

OMAN TRA

TA-R/3591/16

D080134

Mauritania

AGREE PAR L'ANE MAURITANIE
Numéro d'agrément : 0358/ARE/2016
Date d'agrément : 04/10/2016

Pakistan

Pakistan Telecommunication Authority



Approved by PTA 2016

Moldova

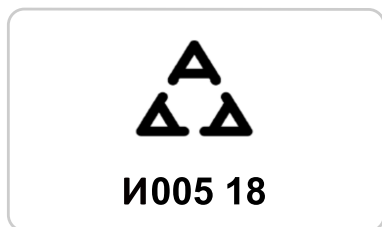


Customer Information

Paraguay



Serbia



Sierra Leone



TAN: 2016-002-0035

South Korea



Ukraine



Unites Arab Emirates (U.A.E.)

TRA REGISTERED No:
ER12204/22
DEALER No:
DA37380/15

United Kingdom



Customer Information

United States and Canada



WARNING: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. The term "IC:" before the radio certification number only signifies that Industry Canada technical specifications were met.

FCC ID: MRXFP4

IC: 2546A-FP4

This device complies with Part 15 of the FCC Rules and with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

TIRE PRESSURE MONITORING SYSTEM SENSORS

Argentina

CNC COMISIÓN NACIONAL
DE COMUNICACIONES

CNC ID: H-28035

Brazil



13309-22-08001

European Union EU



Customer Information

The RED 2014/53/EU (replacing R&TTE Directive 1999/5/EC on 13 June 2016) explicitly states that instructions for intentional radiators include reference to "(a) frequency band(s) in which the radio equipment operates; and (b) maximum radio-frequency power transmitted in the frequency band(s) in which the radio equipment operates," in addition to carrying over the general operational instruction and Declaration of Conformity inclusion requirements from the R&TTE Directive.

Hereby, Schrader Electronics Ltd. declares that the radio equipment type BG2BP4 is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address:

http://www.tpmseuroshop.com/documents/declaration_conformities

f=433.92MHz

P<10mW (e.i.r.p)

Schrader Electronics Ltd. 11 Technology Park, Belfast Road, Antrim BT41 1QS, Northern Ireland United Kingdom.

Israel

1. מספר אישור התאמה מטעם משרד התקשורת: 51-86230
2. חל אישור לבצע פעולות במכשיר שיש בהן כדי לשנות את תכונותיו האלחוטיות של המכשיר, ובכלל זה שינויי תוכנה, החלפת אנטנה מקורית או חוספת אפשרות לחיבור לאנטנה חיצונית, בלא קבלת אישור משרד התקשורת, כשל החשש להפרעות אלחוטיות.

Jamaica

This product has been Type Approved by Jamaica: SMA - BG2BP4.

Malaysia



HIDF16000009

Customer Information

Mexico

IFT: RLVSCBG22-2502

NR: 2022-05-I-0000331

Moldova



Serbia



Morocco

AGREE PAR L'ANRT MAROC

Numéro d'agrément:
MR00034968ANRT2022

Date d'agrément: 21/12/2022

Singapore

Complies with IMDA Standards

DA 00461

Paraguay



South Africa



Customer Information

South Korea



MSIP-R-C-SRD-BG2BP4

Taiwan



CCAB22LP0730T0

Thailand

- (1) เครื่องใช้โทรคมนาคมและอุปกรณ์อื่น มีความสอดคล้องตามข้อกำหนดของ กทท.
- (2) เครื่องใช้โทรคมนาคมและอุปกรณ์อื่นผ่านการแก้ไขข้อบกพร่องแล้ว ปลอดภัยต่อสุขภาพของมนุษย์
- รายการนี้ขึ้นเพื่อวัตถุประสงค์ที่คณะกรรมการกิจการโทรคมนาคมแห่งชาติประกาศ

Ukraine



Unites Arab Emirates (U.A.E.)

TRA REGISTERED No:

ER10488/22

DEALER No:

DA37380/15

United Kingdom



Customer Information

United States and Canada



WARNING: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. The term "IC:" before the radio certification number only signifies that Industry Canada technical specifications were met.

FCC ID: MRXBG2BP4

IC: 2546A-BG2BP4

This device complies with Part 15 of the FCC Rules and with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

WARRANTY INFORMATION

The following warranties may apply to your vehicle:

- New vehicle limited warranties.
- Emissions warranties, if applicable. (Note: Fully-electric vehicles are not eligible for emissions warranties.)
- Other warranties, if applicable.

Detailed warranty information specific to your vehicle can be found in the Warranty Guide at www.owner.ford.com.

The following California Warranty Statement, required by California regulations, applies to vehicles certified to California emissions standards and registered in a state that requires California emissions warranty. If applicable, additional California Emissions Warranties can be found in the Warranty Guide at www.owner.ford.com.

CALIFORNIA EMISSION CONTROL WARRANTY STATEMENT

YOUR WARRANTY RIGHTS AND OBLIGATIONS

The California Air Resources Board and Ford Motor Company are pleased to explain the emission control system warranty on your (year) vehicle. In California, new motor vehicles must be designated, built and equipped to meet the State's stringent anti-smog standards. Ford Motor Company must warrant the emission control system on your vehicle for the periods of time listed below provided there has been no abuse, neglect or improper maintenance of your vehicle.

Your emission control system may include parts such as the carburetor or fuel-injection system, the ignition system, catalytic converter and engine computer. Also included may be hoses, belts, connectors and other emission-related assemblies. Where a warrantable condition exists, Ford Motor Company will repair your vehicle at no cost to you including diagnosis, parts and labor.

MANUFACTURER'S WARRANTY COVERAGE:

(For 1990 and subsequent model passenger cars, light-duty trucks, and medium-duty vehicles.)

- For 3 years or 50,000 miles (whichever occurs first);

Customer Information

1) If your vehicle fails a Smog Check inspection, all necessary repairs and adjustments will be made by Ford Motor Company to ensure that your emission control system PERFORMANCE WARRANTY.

2) If any emission-related part on your vehicle is defective, the part will be repaired or replaced by Ford Motor Company. This is your short-term emission control system DEFECTS WARRANTY.

- For 7 years or 70,000 miles (whichever occurs first);

1) If an emission-related part listed in this warranty booklet specially noted with coverage for 7 years or 70,000 miles is defective, the part will be repaired or replaced by Ford Motor Company. This is your long-term emission control system DEFECTS WARRANTY.

OWNER'S WARRANTY RESPONSIBILITIES:

- As the vehicle owner, you are responsible for the performance of the required maintenance listed in your owner's manual. Ford Motor Company recommends that you retain all receipts covering maintenance on your vehicle, but Ford Motor Company cannot deny warranty solely for the lack of receipts or for your failure to ensure the performance of all scheduled maintenance.

- You are responsible for presenting your vehicle to a Ford or Lincoln dealer as soon as a problem exists. The warranty repairs should be completed in a reasonable amount of time, not to exceed 30 days.

- As the vehicle owner, you should also be aware that Ford Motor Company may deny you warranty coverage if your vehicle or a part has failed due to abuse, neglect, improper maintenance or unapproved modifications.

If you have any questions regarding your warranty rights and responsibilities, you should contact Ford Customer Service at 1-800-392-3673 or the California Air Resource Board at 9528 Telstar Avenue, El Monte, CA 91731.

New Vehicle Limited Warranty

Your vehicle comes with a New Vehicle Limited Warranty. The express warranties of the New Vehicle Limited Warranty are in substitution for and exclude all other liabilities of any kind whether arising under statute, in tort, by implication of law or otherwise including, to the full extent as may be allowed by law, liability for any other representations respecting the vehicle, statutory warranties or implied warranties or conditions as to its merchantability or fitness.

Download a free electronic copy or order one free printed copy of the most up-to-date Warranty Guide by visiting the Owner Manuals section of owner.ford.com (United States).

For Canada, visit ford.ca/warranty.

For Limo/Livery/Hearse vehicles: View and download your Warranty Guide by visiting the Warranty Information section of the Fleet website, fleet.ford.com/limo (United States only).

Appendices

ELECTROMAGNETIC COMPATIBILITY



WARNING: Do not place objects or mount equipment on or near the airbag cover, on the side of the front or rear seatbacks, or in areas that may come into contact with a deploying airbag. Failure to follow these instructions may increase the risk of personal injury in the event of a crash.

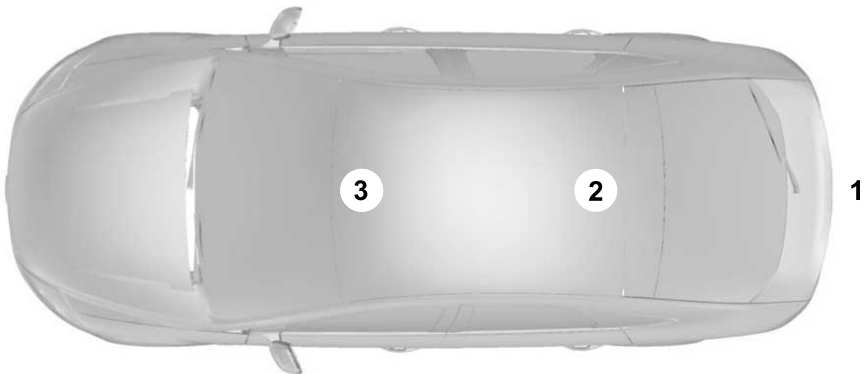


WARNING: Keep antenna and power cables at least 4 in (10 cm) from any electronic modules and airbags.

Note: We test and certify your vehicle to meet electromagnetic compatibility legislation. It is your responsibility to make sure that any equipment an authorized dealer installs on your vehicle complies with applicable local legislation and other requirements. Installation of some aftermarket electronic devices could degrade the performance of vehicle functions, which use radio frequency signals such as broadcast radio receiver, tire pressure monitoring system, push button start, **Bluetooth®** connectivity or satellite navigation.

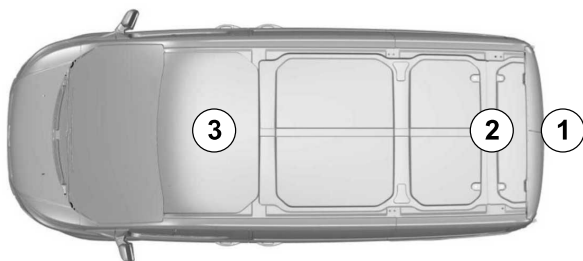
Note: Any radio frequency transmitter equipment in your vehicle, such as, cellular telephones and amateur radio transmitters, must keep to the parameters in the following illustrations and table. We do not provide any other special provisions or conditions for installations or use.

Car

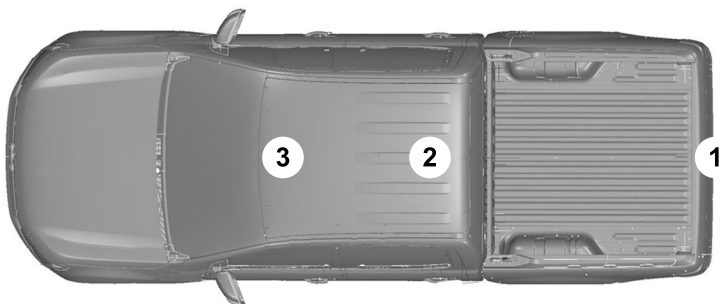


Appendices

Van



Truck



Appendices

Frequency Band MHz	Maximum Output Power Watt (Peak RMS)	Antenna Positions
1-30	50	1
50-54	50	2, 3
68-88	50	2, 3
142-176	50	2, 3
380-512	50	2, 3
806-870	10	2, 3

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QRT[®]-1 SERIES



MAX / DELUXE / STANDARD
4-POINT SECUREMENT
WHEELCHAIR RETRACTORS



QRT[®]-1 SERIES

The Securement System That Changed Everything

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

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



QRT MAX

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

More than 30 years ago, Q'STRAIT introduced the world's first fully integrated 4-Point wheelchair passenger securement system, now an industry standard the world over.

The QRT line of retractors are the linchpin of that system.



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

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

Anchorage Options

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



L-TRACK / L-POCKETS

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

SLIDE 'N CLICK

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

QRT-1 SERIES FEATURES COMPARISON

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



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QRT[®]-1 SERIES



MAX / DELUXE / STANDARD
4-POINT SECUREMENT
WHEELCHAIR RETRACTORS



QRT[®]-1 SERIES

The Securement System That Changed Everything

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

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



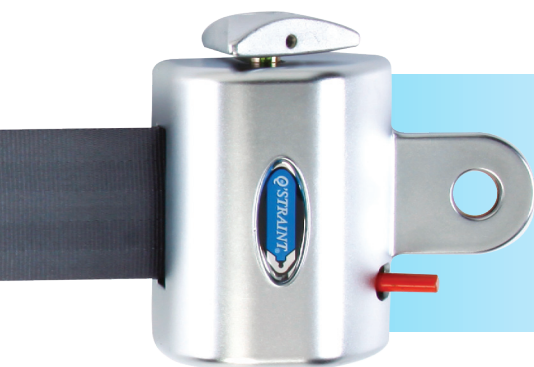
QRT MAX

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



QRT DELUXE

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



QRT STANDARD

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



More than 30 years ago, Q'STRAIT introduced the world's first fully integrated 4-Point wheelchair passenger securement system, now an industry standard the world over.

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Interchangeable. Eliminates confusion: no right, left, front or rear locations.	●	●	●	
Low Profile & Compact. Elimination of mounting bracket allows retractors to fit under most footrests.	●	●	●	
Accommodates Larger Wheelchairs. Reduced overall length leaves more room for wheelchairs.	●	●		
Ultra-Durable. Hardened steel and coated zinc for maximum corrosion resistance.	●	●	●	
Universal Design. Accommodates virtually all wheelchair designs, including scooters.	●	●	●	
J-Hook. Reduces twisting of belts and ensures proper securement for all wheelchair designs.	●	●	●	
Foot Release Lever. Easy release eliminates the stress of bending down.	●	●	●	



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Email: info@tramanco.com.au



Radio Engineering Industries, Inc.

www.radioeng.com

Rev A.0 Date: 9-02-19



Heavy Duty AM/FM/CD/DVD Weather Band Receiver, Rear USB w/ 1.5A Charging, Bluetooth® Hands Free Calling and Wireless Audio Streaming, Front/Rear Auxiliary Inputs and built in PA.



Installation/ Operation Manual

50W x 4

VR-5650

Thank you for purchasing VR-5650 AM/FM/CD/DVD Receiver from REI. This product is designed and tested to with stand temperature and vibration extremes. Please read the owner's manual carefully before attempting to install this unit.

If you have an installation question or need installation assistance, please call the:

SERVICE HOT LINE
1-877-726-4617 Toll Free USA & CANADA

IF ADDITIONAL INSTALLATION COMPONENTS ARE NECESSARY, CONTACT YOUR

REI SALES REP FOR:

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**** ANTENNAS & ANTENNA ADAPTERS**

**** SPEAKERS & GRILLS**


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(800)228-9275

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Your player will play DVDs with region code  labels on them.

FEATURES:

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Non-volatile memory back-up stores user settings when battery is disconnected

Clock Battery back-up

Output Power 50W x 4

Full Dot Matrix LCD display

Anti-skip Gear driven CD/DVD Mechanism

7 channel NOAA® Weather Band Tuner

AM/FM Stereo Tuner w/RBDS

Presets for up to 30 Radio Stations (18 FM, 12 AM)

EURO and USA frequency bands

USB MP3/WMA file playback w/ ID3 Tag Support

2 Aux Inputs (Front 3.5mm/Rear RCA A/V)

iPod® /iPhone® Smartphone Charging and Playback Control

Bluetooth® audio Streaming w/ support for Hands Free calling

Integrated Bluetooth® Microphone input

Rear Channel RCA Line outputs

Composite Video Output via locking BNC connection

Built in PA input (Microphones & Adapter Sold Separately)

ISO Connector for vehicles manufactured with the ISO connect harness

Wireless Remote Control

REI LIMITED WARRANTY

What Does This Warranty Cover?

This warranty only covers failures due to defects in materials or workmanship which occur during normal use.

What Does This Warranty Not Cover?

This warranty does not cover damage which occurs in shipment or failures which are caused by products not supplied by REI or failures which result from accident, misuse, abuse, neglect, mishandling, misapplication, faulty installation, set-up adjustment, improper maintenance, alteration, improper antenna, inadequate signal pick-up, maladjustment of consumer controls, modification, line power surge, or damage that is attributable to acts of God, or service by anyone other than a REI Factory Service Center. This warranty does not include service or labor charges connected with the determination or replacement of defective parts or the operation of this equipment. REI is not responsible for any labor charges incurred by any person or company other than REI authorized repair centers.

LIMITS AND EXCLUSIONS

There are no express warranties except as listed above.

REI SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OF THIS PRODUCT, OR ARISING OUT OF ANY BREACH OF THIS WARRANTY, INCLUDING WITHOUT LIMITATION, DAMAGES TO TAPES OR DISCS. ALL EXPRESS AND IMPLIED WARRANTIES, INCLUDING THE WARRANTIES OF MERCHANTABILITY, ARE LIMITED TO THE APPLICABLE WARRANTY PERIOD SET FORTH BELOW. Some states do not allow the exclusion or limitation of incidental or consequential damages, or limitations on how long an implied warranty lasts, so the above exclusions or limitations may not apply to you.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

What is the Period of Coverage?

REI will repair this product, free of charge, from the date of original purchase in the event of a defect in materials or workmanship as follows:

For ninety (90) days - microphones, speakers, antennas, housings, rechargeable batteries, remanufactured product and all non-warranty repairs (replaced parts and labor only).

For one (1) year - all other manufactured products.

For three (3) years - select manufactured motorcoach products.

For three (3) years - select surveillance equipment.

REI may have contractual agreements which provide REI motorcoach and surveillance products with additional coverage.

Call 877-726-4617 for details.

Any product supplied by REI, but not manufactured by REI, will include the original manufacturers warranty only.

What Will REI Do to Correct Problems?

Once the product is deemed by REI to be a warrantable defect, REI will, at its own discretion, repair or replace the product with new or reconditioned product. All warranty repairs and/or product replacements will include the remaining warranty from the original purchase date.

How Do You Get Service?

For assistance in obtaining service for REI products call toll free 877-726-4617 (Continental United States and Canada only) or 402-339-2200 (outside Continental United States and Canada) between the hours of 7:00A.M. - 5:00P.M. CST Monday thru Friday (excluding Holidays).

Prior to calling REI, customers must have the part number, serial number, VIN number (if it's a motorcoach product) and detailed description of the problem ready to provide to the REI service representative. After providing the proper information to REI, customers will be issued a return authorization number. When the REI service representative provides the return authorization number, they will also give instructions for returning the item. Any discrepancies in following this procedure may cause shipments to be refused or warranty claims to be rejected.

IMPORTANT! REI does not accept product returns for repair or replacement without first issuing a return authorization number. All returns must be sent freight prepaid and insured by the customer. REI will not accept COD shipments.

IMPORTANT! REI does not accept responsibility for lost shipments. It is the customer's responsibility to provide REI with the part number, serial number, return authorization number and shipper tracking number in the event REI does not have record of receiving product for repair or replacement.

Once warranty service has been performed on your product, REI will ship the item freight prepaid to any business address in the Continental United States or Canada. Customers located outside the Continental United States and Canada are responsible for all freight charges. Any duties or fees, if any, are the customer's responsibility.

Any repair deemed non-warranty by REI will be subject to all freight charges, and in some cases inspection fees, to be paid by the customer. These fees may exist regardless of whether the product is repaired. If a customer requires help in trouble shooting a problem, contact REI and request technical assistance before requesting a return authorization number.

What Must You Do To Keep This Warranty in Effect?

KEEP YOUR ORIGINAL PROOF OF PURCHASE AS IT MAY BE REQUIRED IN ORDER TO RECEIVE WARRANTY SERVICE.

Make sure the serial number is not removed, altered or defaced.

Do not attempt to have your product repaired by anyone other than a REI Factory Service Center.

Also, see "What Does This Warranty Not Cover".

REI AUTHORIZED REPAIR FACILITIES:

REI
6534 L Street
Omaha, Nebraska 68117
Phone: 877-726-4617

REI
1376 Bennett Drive, Unit 126
Longwood, Florida 32750

What if your Product is a Non-Warranty Repair?

All Products sent to REI for repair which are determined, at REI's discretion, to be non-warrantable repair may incur inspection fees regardless of actual repair being performed or will incur repair fees if the product is repaired. All non-warranty repairs include a 90 day warranty for any components that are replaced, if any, and labor performed. Inspection fees apply regardless of whether a product is determined to be non-warrantable prior to shipping to REI. All freight charges, duties or fees associated with non-warranty repair are the customer's responsibility.

USB INTERFACE

USB Standard.....	USB1.1/2.0 (Full Speed)
Maximum Supply	5V/1.5A
File System.....	Fat16/32

AUXILIARY INPUT SPECIFICATIONS

Input Voltage Maximum Voltage.....	1.2V
Frequency Response (+/- 1dB).....	20 – 20,000Hz
Input impedance.....	10K Ω

VIDEO

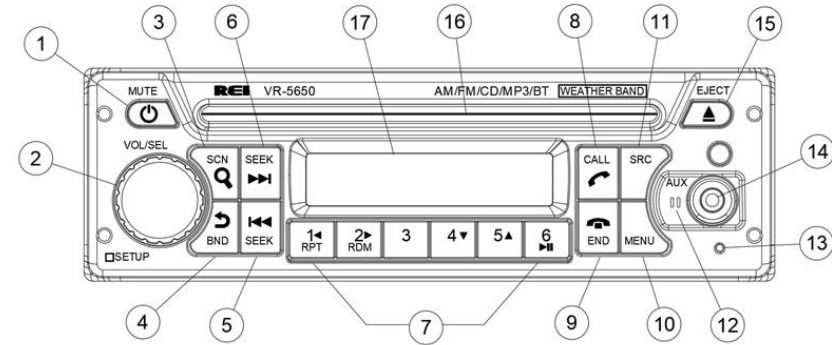
Color System	NTSC / PAL
Video Output	Composite 1.0 Vp-p (+/- 0.2) 75ohm
Video Input.....	Composite 1.0 Vp-p (+/- 0.2) 75ohm

DIMENSIONS

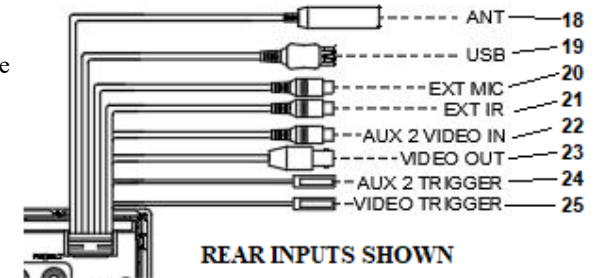
Chassis (W x H x D)	178mm (7") x 50mm (2") x 154mm (6")
Nosepiece (W x H x D)	188mm (7-3/8") x 58mm (2-1/4") x 17mm (5/8")
Weight	3.5lbs

**Due to continuous product improvement, specifications and design are subject to change without notice.*

CONTROLS AND INDICATORS



1. Power/Mute Button
2. Volume/Select Knob
3. Scan/Search Button
4. Band /Back Button
5. Tune /Seek/Track Back Button
6. Tune /Seek/Track Up Button
7. Preset Memory/Recall, Media Control Buttons
8. Call Connect/Transfer Button
9. Call End Button
10. MENU/Display Button
11. Source Select Button
12. Internal Bluetooth Microphone
13. Reset switch
14. Front AUX1 Input Jack
15. Disc EJECT Button
16. Disc Slot
17. Dot Matrix Display
18. Antenna input
19. USB input
20. EXTERNAL Bluetooth Microphone input
21. IR Remote extension input
22. Aux 2 RCA Composite Video Input
23. BNC Composite Video Output
24. Aux 2 Trigger Input
25. Video Trigger Output (Power Relay Control)



OPERATION

1) Power/Mute Button

Press the Power Button to turn the unit ON or hold to turn the unit OFF. The button will illuminate RED when OFF and BLUE when ON. When ON, press to MUTE the audio on/off. **Note: Radio can also be powered on by pressing any front button.**

2) Volume/Select Knob

Rotate the knob left or right to change the volume level.

Press the knob to select one of the following functions:

VOL---BASS---TREB---BAL---FAD

Upon choosing the function, rotate the knob to adjust the desired setting.

PLEASE NOTE: If the Volume/Select Knob has not been adjusted for 3 seconds it will automatically revert to the previous informational display.

Press and hold this button to access the radio SETUP MENU.

3) Scan/Search Button

Press and hold this button for 2 seconds to auto program available stations into the preset memory buttons. This function will erase previous memorized stations and store the newly searched stations. Once completed, the radio will scan for 5 seconds through each of the preset stations of either the AM or FM band and stop.

4) BAND/Back Button

Press this button to change radio bands as follows:

FM1—FM2—FM3—AM1—AM2

5) TUNE/SEEK DOWN Button

Under Radio mode, press this button momentarily to manually tune downward. Press and hold a button and the radio will automatically seek to the previous radio station. When playing digital media, use this button to track backwards to the previous track. This button also functions as Weather Band Channel access. Under Weather Band mode, press this button to select Weather Band channels 1-7.

6) TUNE/SEEK UP Button

Under Radio mode, press this button momentarily to manually tune upward. Press and hold a button and the radio will automatically seek to the next radio station. When playing digital media, use this button to track forwards to the next track. This button also functions as Weather Band Channel access. Under Weather Band mode, press this button to select Weather Band channels 1-7.

7) Preset Memory/Recall Buttons 1-6

Press these buttons momentarily to select the preset stations.

Press and holding a button will set the current station to the button being pressed.

****Preset buttons are pre-assigned frequencies in Weather Band Mode.**

SPECIFICATIONS

AUDIO SECTION

Power supply voltage (negative ground)12V DC (10V-18V)

Standby Current.....<5mA

Max Current Consumption.....10A

Speaker impedance4-8 Ohms per channel

Maximum Pre-output Voltage.....2.0Vrms/10k ohms

POWER OUTPUT

Continuous Output into 4Ω, @1KHz at 10 % THD4 x 25Watts

Maximum Power Output (Volume control Maximum).....50W×4 (at 1kHz)

FM TUNER

Range(USA) 87.5 – 107.9 MHz

(EUR) 87.50 – 108.00 MHz

Usable Sensitivity (S/N = 30dB).....7.34dBf.(0.6uV/75ohms)

Signal to noise ratio58dB (Mono)

Stereo separation (@ 1K Hz)42 dB

AM TUNER

Range(USA)530 – 1,710 kHz

(EUR) 522 – 1,620 kHz

Usable Sensitivity (S/N = 20dB).....23dBuV (14.4uV)

Signal to noise ratio (LEVEL60dbuV)..... 60 dB

WEATHER BAND TUNER

Range162.400 –162.550MHz

Usable Sensitivity (S/N = 20dB).....0.7uV(-9dBuV)

Signal to noise ratio (LEVEL40dbuV).....42dB

CD/DVD PLAYER

Signal/Noise Ratio (1kHz).....85dB

Frequency Response (+/- 1dB).....10 – 20,000Hz (+/-1dB)

Channel Separation 2 Channel (Stereo) > 60dB @ 1 kHz

Playable disc file format.....ISO 9660 Level 1/2, Romeo, Joliet

Usable Discs.....DVD, DVD-R/RW, DVD+R/RW/DL,
CD-R/RW, CD

BLUETOOTH®

Version.....Bluetooth® v5.0

Frequency Range.....2.402 – 2.480 GHz

Output power.....+4dBm Typ

Profiles supportedHFP, A2DP, AVRCP

PLAYABLE FILE TYPES:

FILE REQUIREMENTS (.MP3/.WMA using ISO 9660 formatting)

- The MP3 files with a sampling frequency of 8-48 kHz. And a bitrates between 8 to 320 kbps. Supports ID3 Tag Versions 1.0/1.1/2.2/2.3/2.4
- The WMA file with a sampling frequency of 32-48 kHz. And a bitrates between 48 to 320 kbps.

MPEG-4 FILE REQUIREMENTS (.MP4)

- Video Codec: MPEG-4 Simple Profile
- Audio Codec: AAC
- Bitrate: Max. 4 Mbps
- Frame rate: Max. 30 fps (30p/60i)
- Image size: Max. 720 *480 pixels
- File extension: .mp4

DivX® FILE REQUIREMENTS (.AVI)

- Files encoded with Xvid or divX Profiles, Max frame rate 30 fps (30p/60i)
- Video Codec: MPEG-4 Advanced Simple Profile
- Audio Codec: MP3/AC3/PCM
- Frame rate: Max. 30 fps
- Image size: Max. 720 *480 pixels

MPEG-1/MPEG-2 (.MPG)

- Video Codec: MPEG1/2 MPG1/2
- Audio Codec: MP1/2/3
- Frame rate: Max. 30 fps
- Image size: Max. 720 *480 pixels

JPEG(.JPG)

- Still image files up to a resolution of 3072 x 2048.
- File format used by digital still cameras.
- Not compatible with progressive JPEG.
- JPEG file name requires .jpg as extension

NOTE:

Individual file size limit is 2G in accordance with Fat16/32 file restrictions.

8) CALL Button

Press this button to Place or Answer an incoming call when successfully paired using the Hands-Free Profile on a Bluetooth® enabled phone. Press this button to transfer the call from the radio to the phone and vice versa.

9) END Button

Press this button to END a call when successfully paired using the Hands-Free Profile on a Bluetooth® enabled phone. Press this button to quickly disconnect a paired device from the radio when in BT PHONE mode.

10) MENU Button

Press this button to access the DVD menu. Press to change between Clock and Mode Information display when available.

11) Source Button

Press this button to navigate between source modes:
TUNER—WB—CD/DVD—USB(when connected)—BT PHONE—BT MUSIC (if paired)—AUX1—AUX2.

12) Internal Bluetooth® Microphone

Internal Microphone for Hands Free Bluetooth calling.

13) Reset Switch

In the unlikely event that the radio is not operating correctly, press the RESET button to restart the operating system of the radio.

14) Front AUX 1 Input Jack

The unit is equipped with a front panel 3.5mm auxiliary input (AUX 1) so you can connect your external portable audio player or portable satellite radio receiver. A second REAR (AUX 2)* RCA A/V jacks are also included on the rear of the radio.

15) Disc EJECT button

With the radio ON, press this button to EJECT the Compact Disc from the radio.

16) Disc Slot

Insert a Compact Disc label side up here. The radio will switch modes and begin playback after the file is loaded.

17) Dot Matrix Display

LED Dot Matrix display shows the radios operational information.

*It may be necessary to adjust the volume level of your devise to achieve an optimal volume level.

SETUP MENU

With the unit ON, press and hold the VOL/SEL button for 2 seconds. The LCD will display MENU. Rotate the VOL/SEL knob to choose the option and press to select.

- SCROLL ON/OFF

Choose how iPod/iPhone®, and ID3 tag information is displayed on the LCD. With the scroll set to ON, information is repeated continuously on the front display. When set to OFF, information is not displayed unless the user presses the MENU/DISPLAY button.

- LOUD ON/OFF

Choose to turn LOUDNESS ON or OFF.

- RDS ON/OFF

Choose to turn the RDS (Radio Broadcast Data System) Scrolling display ON or OFF.

- BT SET

- BLUETOOTH ON/OFF (Must be set to ON to access further)
- SEL DEV
- DISCOVER ON/OFF
- ANSWER AUTO ON/OFF
- DELETE ALL NO/YES (Delete ALL previously paired devices)
- RESET BLUETOOTH NO/YES
- ALL ON/FRONT ON/FRONT LEFT/FRONT RIGHT/REAR ON

Press the BACK button to EXIT the BT SET menu and return to previous

- MIC CARBON/DYNAMIC

The first option is to select a correct PA input based on the microphone type you are using. Rotate VOL/SEL button to choose type:

DYNAMIC

Microphone does NOT have on on-board volume control. PA volume control is built into the radio. Adjustments are made by keying the microphone.

CARBON

Microphone has on on-board volume control. Radio will not control the volume. Press VOL/SEL knob to make the desired selection.

- CONTRAST 0-35

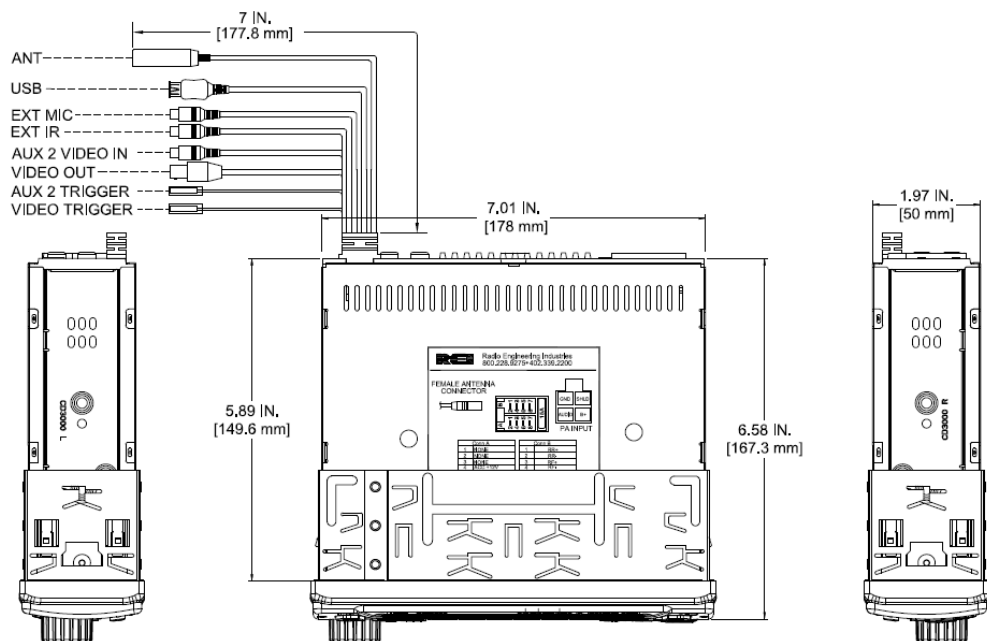
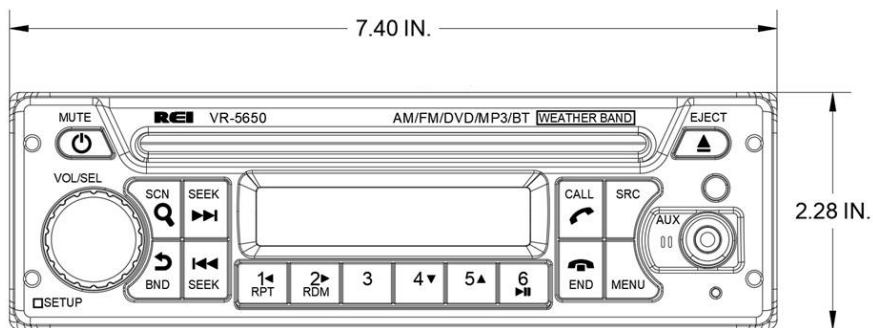
Rotate the VOL/SEL knob to choose the desired CONTRAST level of the display. Press the VOL/SEL knob to select.

- VER VR-5650-XXX

This is the firmware version present on the radio. Not all features described in this manual may be available on the radio at this time.

TROUBLE SHOOTING

Problem	Cause	Solution
Backlighting is on, but no LCD display	No power to BATTERY wire or blown 10A main fuse.	Check for both ACC & BATTERY voltage with Multi-meter, check all fuses.
No sound	Speakers not connected; speakers connected with bad splices; Speakers shorted to ground; speaker load is not within 4-8 Ω.	Connect speakers to harness; check all spliced wires; verify speakers not shorted to chassis; verify total speaker impedance. Check volume level.
Public Address can NOT be audible over speakers	PA setting in MENU is wrong; microphone is pinned wrong; wrong microphone type is used. Microphone is defective.	Turn the volume up on the microphone or radio when the LCD displays MIC; Check that the correct microphone type is connected. Check the PA settings in the radio menu.
LCD Display says MIC and front controls are locked	PA system is triggered	Remove microphone connection and verify correct pinning and or type, replace microphone. Reset the unit.
Cannot tune radio stations	The antenna cable is not connected. The signal is too weak. The radio is in the wrong frequency steps.	Connect the antenna cable. Check the frequency spacing in the SERVICE menu to the radio.
Audio is distorted or low.	Source audio level is too weak or overdriven. Bitrate of audio file is too large.	Adjust the volume level of the auxiliary source. Change the sample frequency or Bitrate of the file.
iPod® screen displays “loading” for a long period of time.	Device is not a supported device. The radio supports a majority of iPod® models, but not all are guaranteed.	Wait for iPod® to load or reconnect 30-pin plug. If still loading, then device is not supported, or has low battery. Use the AUX input or a Bluetooth® connection instead.
The Radio does NOT respond to the front buttons	An error in operation has occurred	Reset the unit from the front panel.
The Radio does not charge my device	The device requires additional current via the USB to charge the device	Unplug and try again. The USB can support 5V/1500mA.
My device will not connect to the radio via Bluetooth® &/or my device can't find the VR-5650 radio	Bluetooth® is set to OFF or the Discover mode is set to OFF on the radio.	Enter SETUP and set Bluetooth® to ON, set Discover mode to ON. Delete previously paired devices or Reset BT.
Digital media won't play, says Unsupported File Type	File Type is incompatible.	Re-encode file to a playable file type, see chart for details.



What's Included:

- 5mm Screws (Qty 4)
- Removal Tools
- Mounting Strap
- Rear Stud Hardware
- Operators Manual
- Remote

• CLOCK PRI ON/OFF

When set to on, the display defaults to LARGE format clock display. When set to off the clock displays in SMALL text format.

• LCD NORMAL/REVERSE/DIMMER

When set to NORMAL, the display defaults to BLACK text. When set to REVERSE, The TEXT is illuminated in Amber. When set to DIMMER, the ILLUMINATION +12V input controls the display.

To save and exit MENU mode, press and hold the VOL/SEL button.

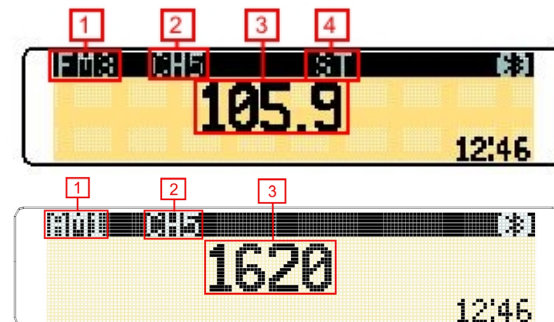
Note: Menu will exit automatically after 5 continuous seconds without saving any selections.

SETTING THE CLOCK

With the BLUE power light ON, press and hold the MENU button until the hour display begins to flash. Rotate Volume/Select Knob to adjust the hour. Press the MENU button again, and the minute display will flash. Rotate VOL/SEL Knob to adjust the minute. Press either the MENU button or let the radio time out for 3seconds on the LCD.

RADIO OPERATION

Use the SEEK/TUNE up/down buttons to tune stations. Press and hold any of the Preset buttons to save a desired station. Use the SCAN/SEARCH button to auto set and Scan channels.



1. AM/FM Band Preset Mode

Press the BAND button to switch from FM1, FM2, FM3, AM1, or AM2.

2. Preset Number

Displays the Preset Channel of the frequency.

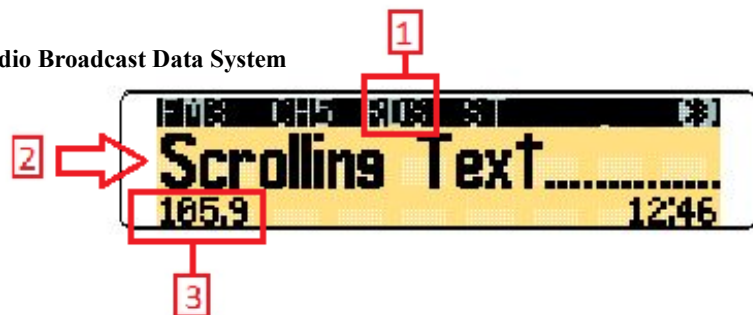
3. Frequency Display

Displays the Frequency of the current tuned station.

4. Stereo Indicator

Displays when the FM frequency is tuned in Stereo.

Radio Broadcast Data System



1. RDS Display Indication

When RDS is set to ON in the MENU, FM station's receiving RDS PS data will display this indicator.

2. RDS Text Information

Information such as the title and artist of the currently playing song.

3. Frequency Display

Displays the alternate location of the frequency when RDS is set to ON and

WEATHER BAND OPERATION

NOAA National Weather Radio Broadcasts from over 380 Locations throughout the U.S. on seven VHF/FM frequencies. Tune to receive continuous weather information 24 hours a day on one of the following frequencies.

For local station listing see: <http://www.nws.noaa.gov/nwr/nwrbr.htm>

Press preset 1 to select weather band channel 1 - 162.400MHZ

Press preset 2 to select weather band channel 2 - 162.425MHZ

Press preset 3 to select weather band channel 3 - 162.450MHZ

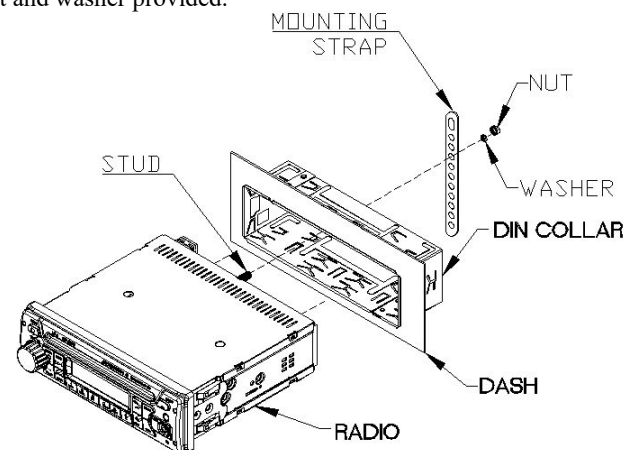
Press preset 4 to select weather band channel 4 - 162.475MHZ

Press preset 5 to select weather band channel 5 - 162.500MHZ

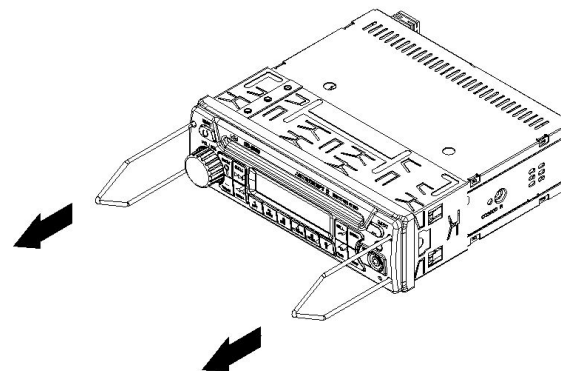
Press preset 6 to select weather band channel 6 - 162.525MHZ

**Press SEEK UP/DOWN to select weather band channel 7 - 162.550 MHz

3. If additional support is needed, bend the included support bracket, and secure it to the vehicle using a screw. Secure the opposite end to the rear stud on the radio using the nut and washer provided.

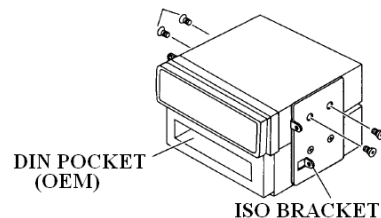


4. To remove the radio, insert the two release keys into the holes on the front face of the radio. The tools must be inserted with the notched side facing the radio. Slide the keys foreword until a click is heard. Then pull the radio out, releasing it from the DIN collar.



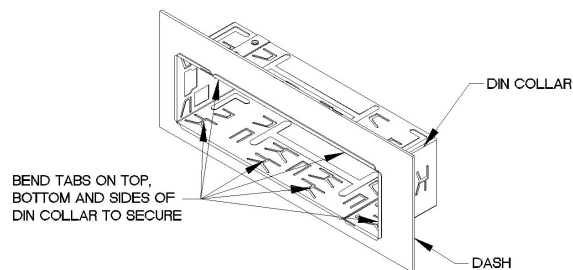
ISO INSTALLATION

1. For installations that do NOT require the use of the DIN collar. The radio has threaded holes in the chassis side panels for ISO mount applications. If necessary, four M5x10mm screws are included with the hardware pack to assist you.

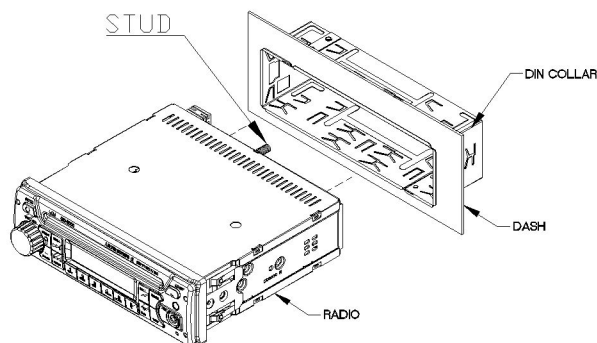


INSTALLING THE RADIO

1. Place the DIN collar into the dash opening. Bend the tabs outward as shown on the drawing below to lock into place.



2. Pass the harness and antenna cable through the DIN collar and connect to the back of the radio. Verify clearance; then gently insert the radio into the DIN Collar until both spring clips are locked into place.



CONNECTING A NEW BLUETOOTH® DEVICE

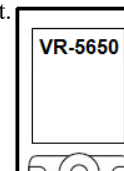
To connect your Bluetooth® device to the Radio, the device must first be paired. Verify that “BLUETOOTH” is set to “ON”, (refer to BT SET menu) and verify that “DISCOVERY” is set to “ON”, (refer to BT SET menu).

Pairing the Your mobile device with the Head Unit

Your mobile phone can initiate a search for new devices and pair to the unit. The following paragraph describes the pairing process:

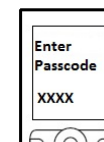
NOTE: Procedures for pairing mobile phones may vary slightly from manufacturer to manufacturer.

1. Verify that the Radio is powered up and ON.
2. Set the Bluetooth® function of the Mobile Device to ON.
3. Access the “Look for devices” feature of the Mobile device and begin searching. After searching, the Radio should appear in the list of devices as VR-5650. Press to accept.



4. A prompt to bond should appear on your Mobile device. Press to accept and continue the process. The device will then ask for the passkey, enter it on the mobile device.

NOTE: Some mobile devices require the passkey to connect. If your mobile device requires the passkey, you will need to enter it now. The default code is “0000”.

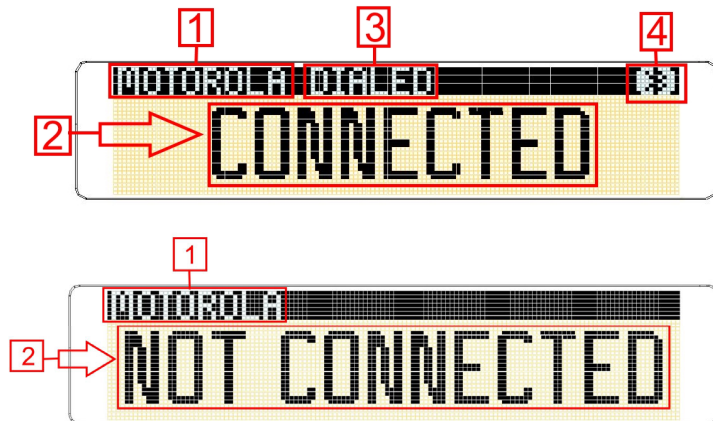


5. After entering the passkey, press OK. The Mobile device should display connected. The Bluetooth® icon on the Radio should appear in the upper right-hand corner of the screen.

NOTES:

- Only ONE mobile device can be paired with the Radio at a time.
- Turn “DISCOVERY OFF” to disable any unwanted Bluetooth® devices.
- After turning off the ignition, the Radio will automatically search for the last-connected Bluetooth® device, and if possible, restore the connection.
- This Radio does NOT support HSP (Head Set Profile)

BLUETOOTH® PHONE OPERATION



1. Bluetooth Phone ID

Displays the ID of previously paired Bluetooth Phones. Rotate to the VOL/SEL knob to display other paired devices and press the VOL/SEL to initiate re-connection.


2. Display information

Shows the connection status and phone number of the incoming or outgoing call.

3. Options Menu

When connected to a Bluetooth Enabled phone, Rotate the VOL/SEL knob to access DIALED, RECEIVED, MISSED, or PHONEBOOK.

- **DIALED** Displays all dialed calls from the currently connect phone.
- **RECEIVED** Displays all answered incoming calls from the currently connect phone.
- **MISSED** Displays all missed calls from the currently connect phone.
- **PHONEBOOK** Displays the contacts currently stored on the connected phone. Some phones require the user to accept the radio's permission to view contacts before displaying them on the radio.

The use can rotate and choose using the VOL/SEL button and press it to also select the desired number. Use the  button to return to the previous menu.

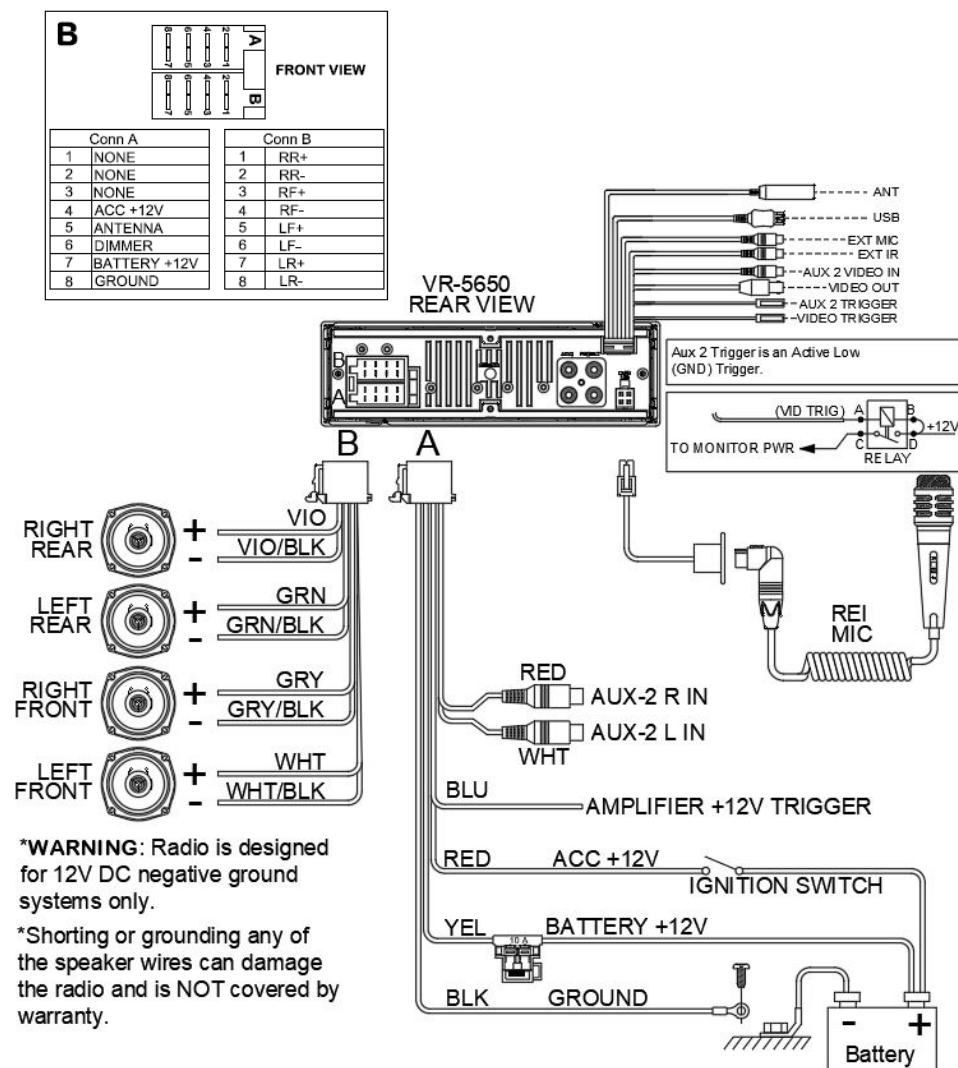
Once the phone number is displayed, press the CALL button to place the call.

4. Connection Status

Displays the Bluetooth® icon connection status of the radio.

TYPICAL INSTALLATION:

Follow this easy wiring diagram when installing Radio and Speakers.



BRIGHTNESS 0-100



CONTRAST 0-100



HUE 0-100



SATURATION 0-100

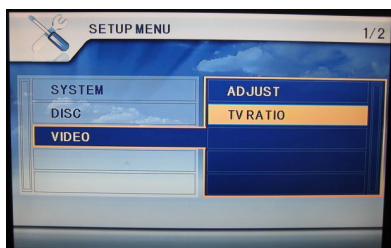


SHARPNESS 0-100

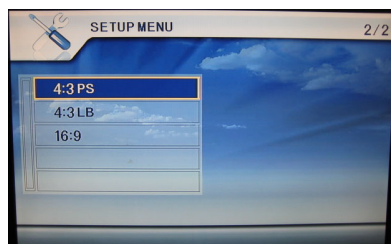
**TV RATIO:**

To select the appropriate aspect ratio of the connected monitors, select TV RATIO and press the PLAY/PAUSE button. Once selected, the user can scroll to choose either; 4:3 PAN & SCAN, 4:3 LETTERBOX, or 16:9 WIDE-SCREEN. Press the PLAY/PAUSE button to select the option.

TV RATIO



SELECT TV ASPECT RATIO



*The ZOOM button found on the remote control will also allow the user to adjust the picture during DVD playback to ZOOM in by 2X, 3X, 4X, 1/2, 1/3, 1/4, or OFF

BLUETOOTH® STREAMING AUDIO OPERATION

The unit allows you to play back audio files from your mobile device using a Bluetooth® connection. The Radio can control a Bluetooth® audio player via Advanced Audio Distribution Profile (A2DP) or Audio/Video Remote Control Profile (AVRCP). Bluetooth® audio players (or Bluetooth® adapters) compatible with these profiles can be connected to this Radio. Verify the device is connected via Bluetooth®, then Touch the SRC button on the front to access BT AUDIO.

**1. Bluetooth Phone ID**

Displays the ID of the paired Bluetooth Phone you are trying to stream audio from.

2. Connection Status

Displays the Bluetooth® icon connection status of the radio.

Press the PLAY/PAUSE button to listen to audio. While listening to audio the following functions are available:

- **SEEK UP:** Touch this button to play the next track.
- **PLAY/PAUSE:** Touch this button to pause playback. Touch again to resume playback.
- **SEEK DOWN:** Touch this button to play the previous track.

Press the MENU button to display Metadata information on the track itself (artist, track name, etc.). This option is only available on compatible devices.

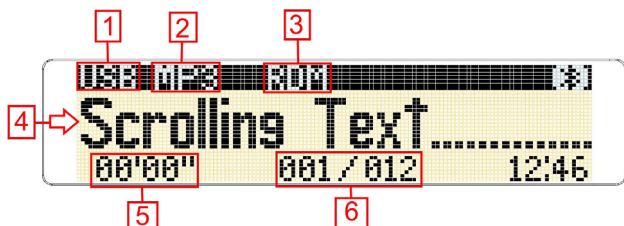
NOTE:

When there is an incoming call, the song will be paused. After the incoming call is finished, the screen will return to the music function screen and playback will continue.

Functionality may vary depending on the profile or device used.

iPod®/iPhone® OPERATION

To listen to audio through your apple device, verify that a Certified USB extension is connected to the USB pigtail on the rear of the radio. Next, connect the USB cable to the Apple device. Once connected, the iPod/iPhone® will begin charging the device. Press the SRC button to switch the source for playback. If the device has enough battery power, it will begin playback.



1. Operational Mode
2. Displays the file type
3. Shows the current playback option
4. Displays the Track Title, Artist, and Album information of the file if available.
5. Shows the elapse time of the audio track.
6. Indicates the file number and number of files in the folder.

When connected, the user can playback specific files or folders. First press the SEARCH button. The user can then rotate the VOL/SEL knob to select one of the following search options:

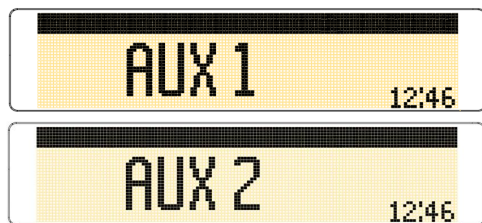
- Playlists
- Podcasts
- Audiobooks
- Songs
- Albums
- Artists

Press the VOL/SEL knob to choose. To return to a previous menu, press the RETURN button and choose again using the VOL/SEL knob. Use the radio's SEEK up/down buttons to change tracks, or the button to PAUSE or PLAY the track. To return to the iPod/iPhone® source from any other source menu, touch SRC on the front panel until the iPod/iPhone® icon is shown on the front display.

AUX 1/2 OPERATION

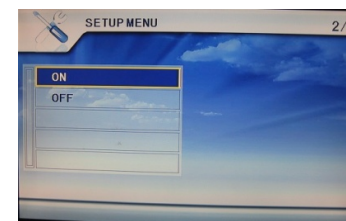
Press the SRC button on the front panel until the display shows either AUX 1 or AUX2. AUX 1 uses the front 3.5mm audio input while AUX 2 uses the rear RCA L/R audio inputs and the Composite Video RCA input. It may be necessary to adjust the VOLUME level of the AUXILARLY input device if too little or too much signal is present.

Aux 2 mode will pass video when connected to the RCA Video input. By connecting the AUX 2 trigger wire to ground, the radio will automatically switch sources to AUX 2.



AUTOPLAY:

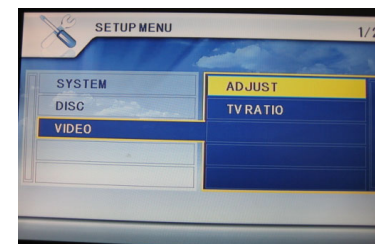
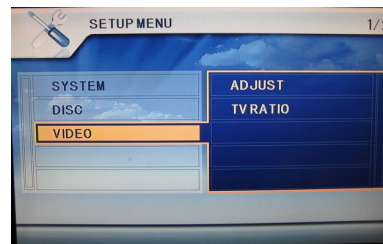
The AUTOPLAY option enables AUTO PLAY of most the DVD discs. When set to ON the disc will immediately begin playback when inserted, allowing the user to skip the MENU and previews section. When set to OFF the user must navigate to the disc MENU to playback the disc.



VIDEO OPTIONS

ADJUST:

The VIDEO options give the user control of the Video Output settings. To change, scroll to select ADJUST and press the PLAY/PAUSE button. Once selected, the user can scroll to choose the desired screen option to modify. Press the PLAY/PAUSE button to select the option; then scroll to choose the desired setting from 0 to 100. Press the PLAY/PAUSE button to confirm.



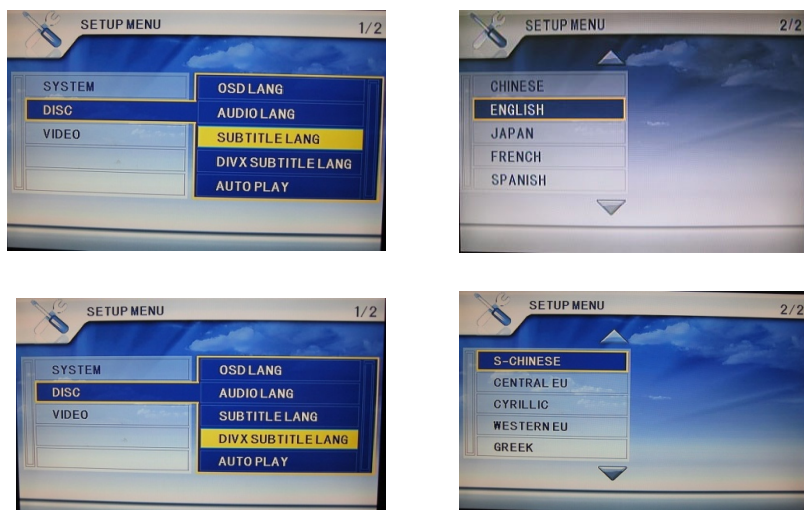
AUDIO LANG:

The AUDIO LANG option allows the user to change the default audio soundtrack on a DVD disc. The disc must support the language type. Due to different DVD encodings, this feature may not work on all discs, and the user may be required to access this feature from the main menu to the DVD. Press the PLAY/PAUSE button to confirm selection.



SUBTITLE LANG:

The SUBTITLE LANG option allows the user to change the default Subtitle Language displayed on the bottom of the screen for DVD discs. The disc must support the language type selected. Due to different DVD encodings, this feature may not work on all discs. If playing DIVX encoded media, select DIVX SUBTITLE LANG to change the subtitle language. Press the PLAY/PAUSE button to confirm selection.



CD OPERATION

Insert a disc into the unit, the radio will automatically switch MODE and begin playback after the media is successfully loaded. Use the SEEK UP/DOWN buttons to change tracks.



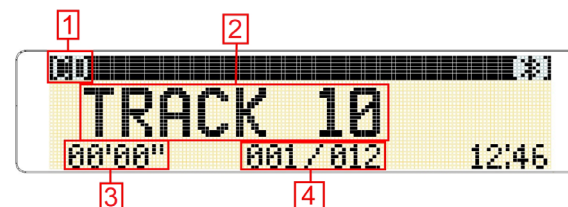
Press and hold this button to REPEAT Chapter, Title, or Off.



Press and hold this button to turn RANDOM on/off



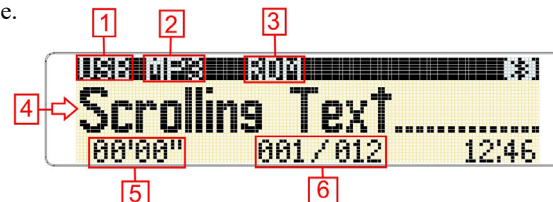
Press this button to PAUSE/PLAY the media



1. **Operational Mode**
2. **Shows the Track number of the ID3 tag information of the MP3 file.**
Press the DISPLAY button to switch from Title, Artist, or Album information
3. **Shows the elapse time of the audio track.**
4. **File number and number of files in the folder.**

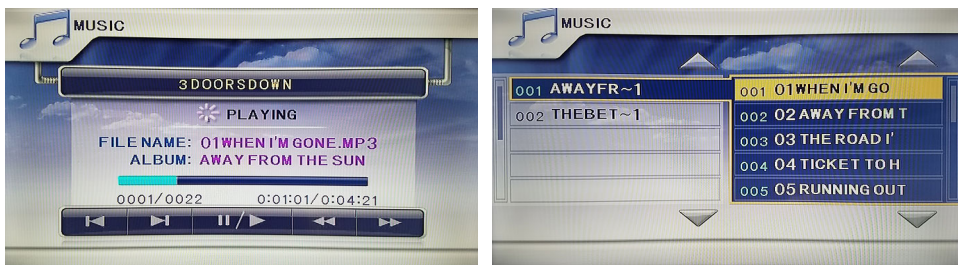
USB OPERATION


Insert a USB device into the rear input, press the SRC button to select this source.



1. **Operational Mode**
2. **Compressed media file format**
Displays either WMA or MP3 Compressed media file format file formats.
3. **Playback Mode of Operation**
Displays either RDM, RPT or nothing at all
4. **Shows the Track number of the ID3 tag information of the MP3 file.**
Press the DISPLAY button to switch from Title, Artist, or Album information
5. **Shows the elapse time of the file.**
6. **File number and number of files in the folder.**

Once selected, playback should begin automatically. Press the MENU button and use the PRESET buttons ▼ ▲ ◀ ▶ to navigate to a desired folder or file for playback.



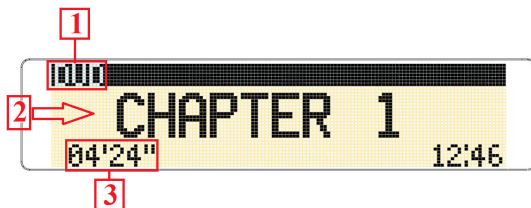
Use the  SEARCH Button to change the file type for playback when using USB.

i.e., MUSIC, PHOTO, or MOVIE when multiple formats are available.


See “**PLAYABLE FILE TYPES**” page for a list of compatible format types.

DVD OPERATION

Insert a disc into the unit, the radio will automatically switch MODE and begin playback after the media is successfully loaded.



1. Operational Mode
2. Shows the Track number
3. Shows the elapse time of the title.

Use the  button to return to the disc MENU.

Use the PRESET buttons ▼ ▲ ◀ ▶ to navigate the disc MENU for playback.

DEFAULT:

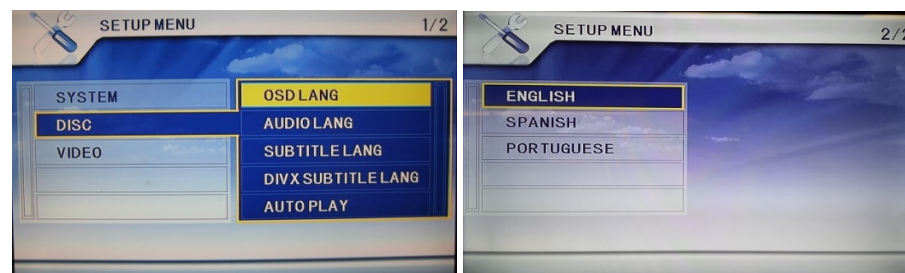
The DEFAULT option allows the user the option to return all SETUP settings to their default conditions including language options. Press the PLAY/PAUSE button to confirm selection.



DISC OPTIONS

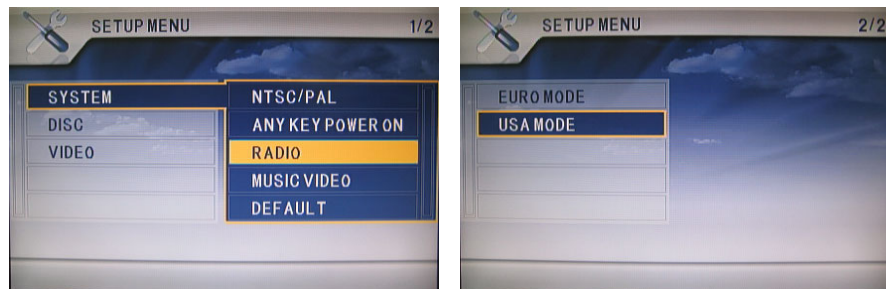
OSD LANG:

The OSD LANG option allows the user to change the default On-Screen Display (OSD) language displayed on the SETUP menu from ENGLISH, SPANISH to PORTUGUESE. Press the PLAY/PAUSE button to confirm selection.



RADIO:

The RADIO option allows the user choices between either EURO MODE or USA MODE. These modes will change the frequency steps of the FM/AM tuner in the radio. Press the PLAY/PAUSE button to confirm selection.



MUSIC VIDEO:

The MUSIC VIDEO option gives the user the option to output a composite video image during digital music playback. When ON is selected, the file information is displayed on the VIDEO OUT signal. When OFF is selected, the VIDEO OUT is not active. Press the PLAY/PAUSE button to confirm selection.



Below is CD IMAGE when set to ON



Below is MP3/WMA image when set to ON

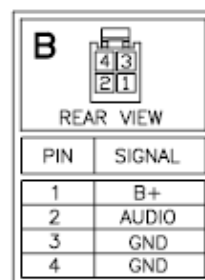


PA OPERATION (microphone sold separately)

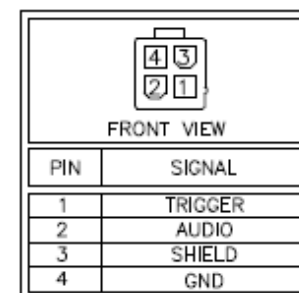
Connect a PA microphone into the 4-pin connector. Microphone has priority over all other audio modes and mutes the source audio being played when keyed. When the PA is triggered, the front display will show MIC, until the trigger is un-keyed. Any digital media being played at that time will be sent a PAUSE command. Once released, it will return to the previous source mode at the previous volume level. Any digital media will be given a PLAY command.

The PA operates regardless of radio status if the ACC and Battery power is applied to the radio.

When CARBON mode is set, the volume of the PA is only adjustable on the microphone itself. When set to DYNAMIC mode, the volume level is adjustable only when keyed from the front using the VOL/SEL button. A rear view of the optional radio PA connection is shown below:



Carbon PA



Dynamic PA

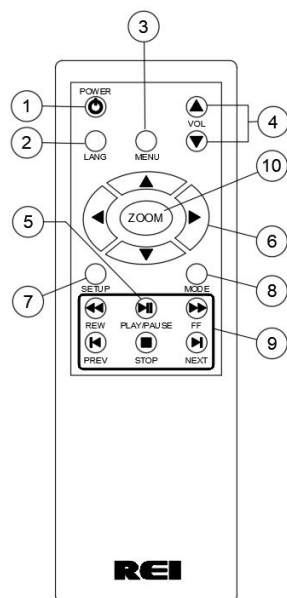
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REMOTE CONTROL

*Requires 2AA Batteries (included)



- (1) Power Button
- (2) Language Button
- (3) Menu Button
- (4) Volume Up/Down Buttons
- (5) Enter/Play/Pause Button
- (6) 4 Scroll Buttons
- (7) Setup Button
- (8) Mode Button
- (9) Playback Buttons
- (10) Zoom Button

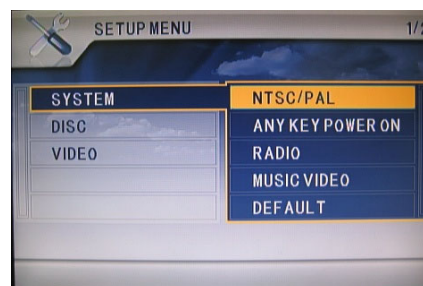
SETUP OPERATION

Setup operation requires the user be in either DVD/CD/USB mode to operate. When in one of these source modes, press SETUP on the remote to activate the on-screen display. Use the scroll up/down/left/right buttons to make changes. Use the PLAY/PAUSE button to accept changes. Press SETUP again to go BACK and/or EXIT at any time. Changes made in the SETUP menu will not return to default by pressing the RESET button on the front of the radio. To reset these changes, refer to the DEFAULT option in the SETUP menu.

SYSTEM OPTIONS:

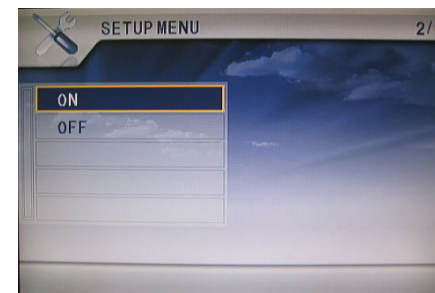
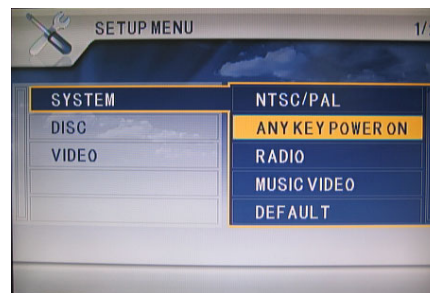
NTSC/PAL/AUTO:

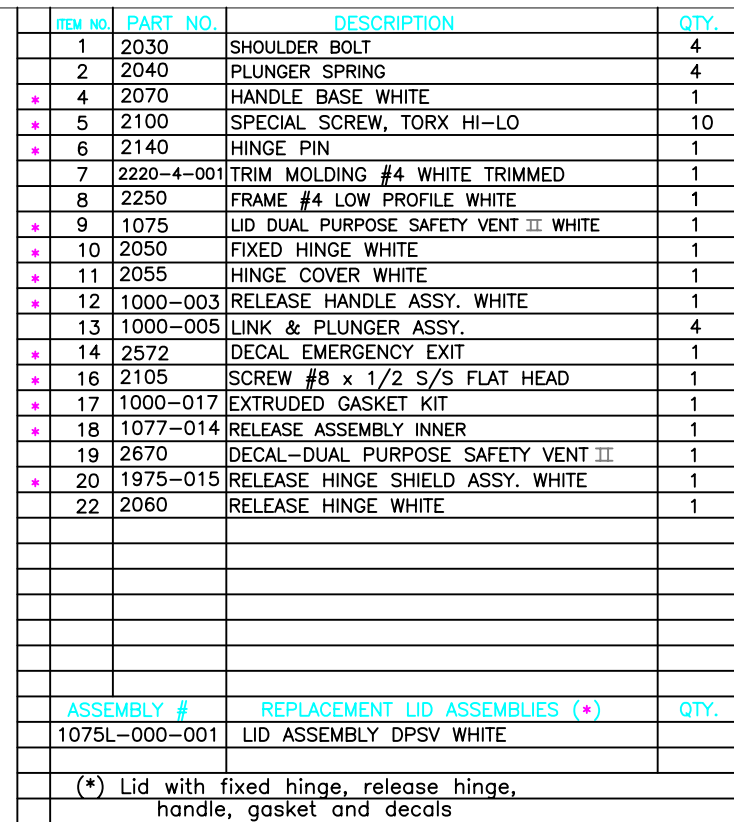
This option allows the user to choose a composite output signal to either NTSC or PAL depending on the video monitor used. The AUTO option will output the signal according to the current DVD title. Scroll to highlight the desired selection as shown on the right. Press the PLAY/PAUSE button to confirm selection.



ANY KEY POWER ON:

This option gives the user a choice between having any of the front panel buttons turn the radio on, or only the power button. Having the selection at ON means any button will power up the radio, having it set to OFF means only the power button can turn the radio on. Press the PLAY/PAUSE button to confirm selection.



[illegible]



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SAFE-T-SCOPE®

BACKUP CAMERA SYSTEMS



STSK4730
7" MIRROR MONITOR KIT
INSTALLATION/USER MANUAL

TABLE OF CONTENTS

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Component List and Description 3

Monitor Installation and Wiring Instructions. 4

Wiring Diagram 5

Camera Installation 6

Monitor Functions and Operations 7

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STSK4730 SAFE-T-SCOPE® 7" MIRROR MONITOR KIT

Rosco Vision Systems introduces a camera system for commercial vehicles. The new Safe-T-Scope® STSK4730 utilizes a windshield-mounted mirror. It is integrated with a 7" LCD monitor to display the rear-view image when the vehicle shifts into reverse. Additional inputs for left and right cameras are also featured. The 7" wide-angle monitor allows the driver to see obstructions behind the vehicle. In addition, the monitor brightness automatically adjusts between day and night modes. The STSK4730 complies with FCC (USA) guidelines.

The STSK4730 kit has the capability for use with three cameras. Contact your Rosco dealer to discuss camera purchasing options.

NOTE

- Please read this manual carefully before using the product.
- This system is intended as an aid to safe driving operation.
- Drivers must always use extreme caution when operating a vehicle.
- Specifications subject to change without prior notice.
- Keep all cables AWAY from rotating and electrically noisy components.
- Make sure all cables are fastened properly to prevent wire chafing, kinks, cuts, etc.



WARNING

- To prevent electrical shock, DO NOT OPEN MONITOR CASE.
- Avoid exposing monitor to water, rain, moisture etc.
- Do not disassemble the monitor. This voids the warranty.

COMPONENT LIST AND DESCRIPTION - STSK4750B

STSM244MO



7" LCD Monitor

STSM244PHAR



Power harness - 13-pin connector,
3 channel, 4-pin inputs

STSDF1003



STSM244 Mounting kit

STSC130



High-mount, wide angle look-down
camera with night vision
Available in black (STSC130B, shown),
white (STSC130W), and chrome
(STSC130R) finishes

STSH130



Adaptor for connecting the STSC130
camera to the STSH343 or other desired
extension cable

STSH343



33 ft. camera extension harness

MONITOR INSTALLATION

The STSM244 7" Windshield Mirror Monitor is designed to attach to the windshield button of the vehicle. An additional windshield button is included with the STSK4730 kit. The standard mount STSDF1003 is compatible with many common vehicle models. Please contact your Rosco dealer for alternative mounting options.

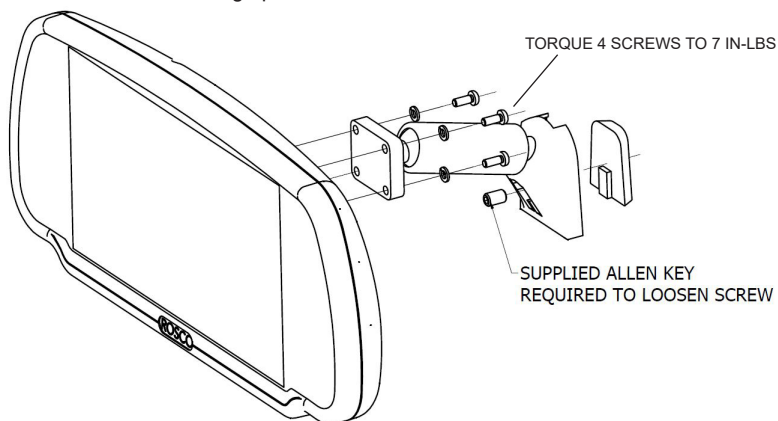


Fig. A

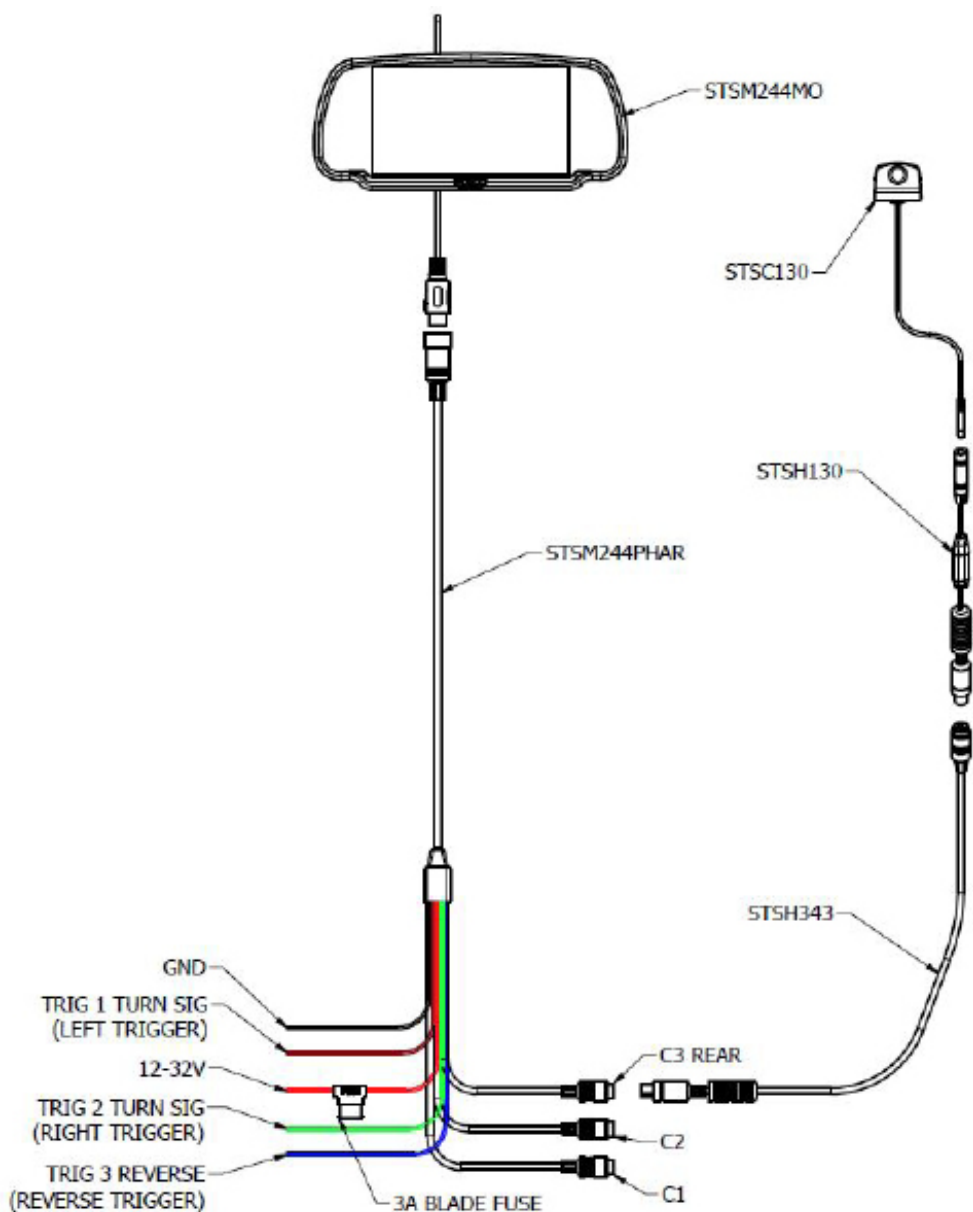
WIRING INSTRUCTIONS

- Once the monitor is mounted, if necessary, drill a 1" diameter hole near the monitor through which to pass the monitor cable and 13-pin connector. Clear any obstacles before drilling holes.
- Connect the black wire from the power harness to chassis ground. Connect the red wire to an ignition switched accessory (ex. radio) power source and ensure that the power source can provide operating current above 2 Amps.
- Connect the blue trigger wire to the vehicle's reverse signal circuit. DO NOT connect trigger to any constant power source. Connect the STSH343 camera extension cable to the connector labeled "C3 REAR" on the power harness.
- Connect the STSH130 standard-to-mini adaptor to the STSH343 camera extension cable.
- Connect the STSC130 camera to the STSH130 standard-to-mini adaptor.
- Connect the monitor's 13-pin connector to the power harness' 13-pin connector. Make sure the arrows on both connectors are aligned and pointing towards each other.
- All connections should be completely hidden from the vehicle operators. The harness should be tied/clamped to a rigid structure or rigid existing vehicle harness.
- Adhere to a 2 inch bend radius for all cables to prevent damage.

FUEL TANKERS & OTHER SPECIALTY VEHICLES:

- All electrical equipment fitted to petroleum vehicles must be connected via battery master switch. The electrical equipment must be isolated from the battery while the vehicles are loading and unloading. For other specialty vehicles, please check applicable codes and regulations prior to installation.
- Always consult your dealer when adding any electrical or electronic equipment to a vehicle fitted with a CAN-bus multiplex system.

WIRING DIAGRAM



For camera options, contact your Rosco dealer.

CAMERA INSTALLATION

EXAMPLE CAMERA INSTALLATION

1. Select a high and centered location at the rear of the vehicle to mount the camera.

IMPORTANT: When selecting this location it is highly recommended that the image transmitted by the camera show the rear bumper and area behind the vehicle.

2. It is not recommended mounting the camera near the lower area of the vehicle (ex. bumper). This reduces the view of the camera and increases the chance of physical damage to the camera.

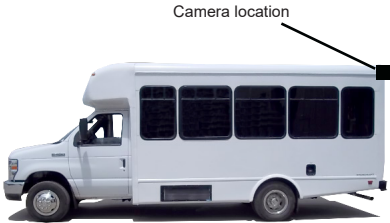
3. Once the location for the camera is chosen, drill the mounting hole to the inside of the vehicle using a 5/16 drill bit. Clear any obstacles before drilling the hole.

4. Attach the provided 3M double-sided tape to the back of the camera.

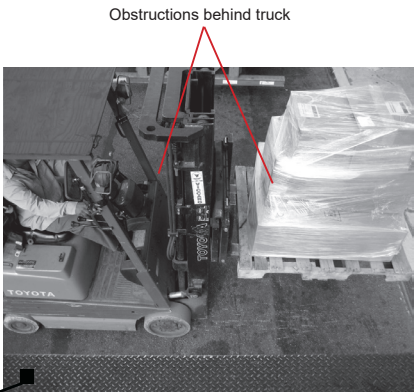
5. Insert camera wire through the newly drilled hole. Mount the camera securely in place.

6. To finalize the camera installation, hand-tighten the provided 5/16 nut to the back of the camera on the inside of the vehicle.

Fig. C



Mount the camera high and centered on the rear of the vehicle.



Typical view of a properly installed camera.

MONITOR FUNCTIONS AND OPERATIONS

i IMPORTANT: It is recommended that the menu buttons only be operated when the vehicle is in park or neutral.

1. & 3. ^ / v VOLUME/MENU SETTING ADJUST BUTTONS

Decrease/Increase audio volume when no menu is open.

Use these buttons to sort through the menu tabs when no menu parameter is highlighted.

Decrease/increase the value for a particular menu parameter.

2. MENU SETTING AND PAGE TOGGLE

Brings up the monitor settings menu. Press the button again to scroll through the various settings on a menu page and to access the camera settings menu page (see following page).

4. SELECT BUTTON

Scroll through camera channels. If no camera is connected, the display will be blue.

5. POWER ON/OFF

Turns the LCD on or off. The default state of the LCD is OFF when power is connected. The monitor will display any triggered input regardless of LCD power status.

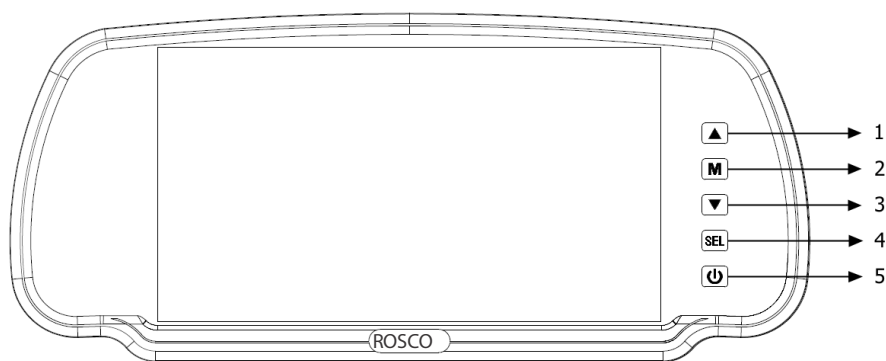


Fig. D

MONITOR SETTINGS AND MENU

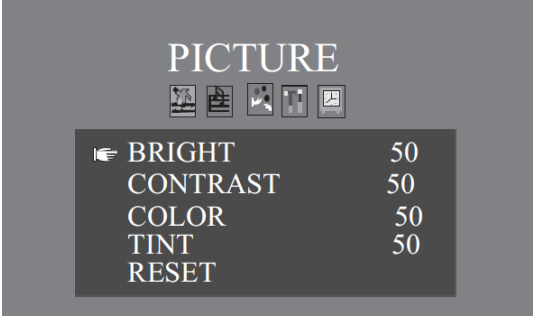
i NOTE: Press the **M** button to enter the menu and the **▲** or **▼** button to change pages.

MENU SETTINGS PAGE 1: PICTURE

Press the **M** button (see preceding page) to access this menu. Press **M** again to scroll through the lists of parameters. At an individual parameter (text will turn red when selected), press **▲** or **▼** to adjust the settings of each parameter.

Parameter	Options
BRIGHT	1~100. Default Auto, Daytime, and Nighttime = 50.
CONTRAST	1~100. Default Auto and Daytime = 50, Nighttime = 45.
COLOR	1~100. Default = 50.
VOLUME	1~100. Default = 50.
TINT ¹	1~100. Default = 50.
RESET	Resets all settings back to factory default
DAY MODE / NIGHT MODE denotes whether the monitor is applying daytime brightness or nighttime brightness, depending on the light sensor or the AUTO DIM setting in the OPTION menu page.	

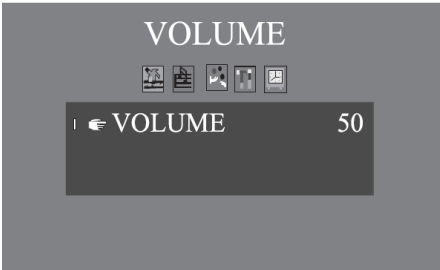
1. TINT only appears when the monitor is receiving a signal from the camera.



MENU SETTINGS PAGE 2: VOLUME

This menu allows the user to adjust the audio from the camera.

Parameter	Options
VOLUME	1~100. Default = 50.



MONITOR SETTINGS AND MENU

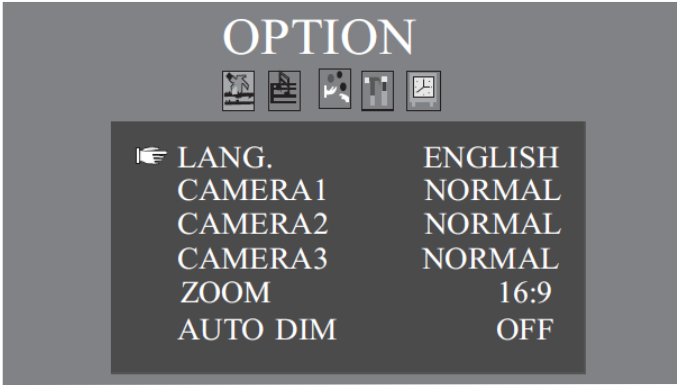
i NOTE: Press the **M** button to enter the menu and the **▲** or **▼** button to change pages.

MENU SETTINGS PAGE 3: OPTION

This menu allows the user to adjust the language, mirroring of the camera, aspect ratios, and the automatic dimming of the monitor.

Parameter	Options
LANG	English, Dutch, French, Spanish, Portuguese, or Italian. Default = English.
CAM1, 2, 3	Normal or Mirror. Default = Normal.
ZOOM	16:9 or 4:3. Default = 16:9.
AUTO DIM ¹	Auto, Day, Night, or Off. Default = Auto.
This monitor is built for use as a backup system and the default setting Normal displays a conventional backup camera image. Setting MIRROR would un-mirror the image. It is suggested to leave default on NORMAL.	

1. When altering picture in day/night mode, those values are saved for day/night mode until reset.



MONITOR SETTINGS AND MENU

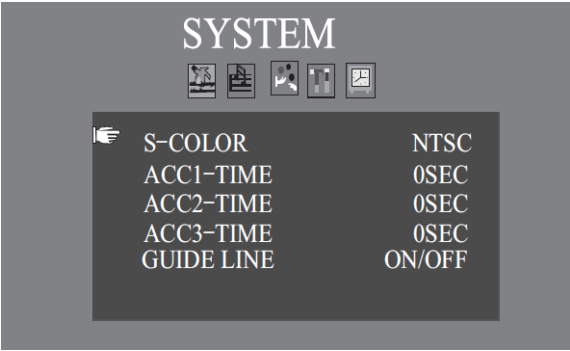
i NOTE: Press the **M** button to enter the menu and the **▲** or **▼** button to change pages.

MENU SETTINGS PAGE 4: SYSTEM

This menu allows the user to alter color of image, set a shut-off delay, and add parking guidelines. ACC-Time delays shut-off of the monitor when power to the corresponding trigger is cut. GUIDE LINE adds parking guidelines to the monitor to give perspective on the objects behind the vehicle.

Parameter	Options
S-COLOR ¹	Auto, NTSC, or PAL. Default = Auto.
ACC1, 2, 3-TIME	0~15 seconds. Default = 1 second.
GUIDE LINE ²	On or Off. Default = Off. Only available when reverse trigger wire is activated.
ACC3-TIME only works when the trigger is turned off, not the monitor.	

- 1. Rosco cameras are formatted for NTSC. It is recommended to leave parameters as is.
- 2. The guideline parameter only appears on Camera 3 (Camera 3 - Rear, trigger 3) and if the monitor is reset, the guidelines are removed.



STSK4730 TECHNICAL SPECIFICATIONS

PARAMETER	VALUE
Screen Size (Diagonal)	7" (18 cm)
Dimensions (L x W x T)	10" x 4.3" x 1.2" (25.4cm x 11cm x 3cm)
TV System	CVBS - NTSC
Video Inputs	1 Input
Input Format	4-pin
Trigger Inputs	1
Resolution	800 x 480 pixels
Brightness	700 cd/m ²
Contrast	450:1
Voltage	DC 12V~24V
Maximum Current Consumption	1,000mA
Viewing Angles Up/Down/Left/Right	60° x 60° x 75° x 75°
Shock Rating	2G
Vibration Rating	6G
Operating Temperature	-4°F to 158°F (-20°C to 70°C)
Storage Temperature	-22°F to 176°F (-30°C to 80°C)

NOTES



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90-21 144th Place, Jamaica, New York 11435

Tel. - (718) 526-2601 • Toll Free - (800) 227-2095

techsupport@roscovision.com

www.roscovision.com

BACKUP CAMERA SYSTEM

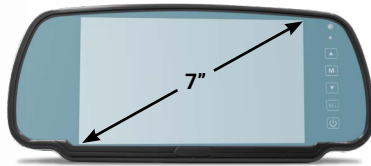
VEHICLE TYPES



Rosco's new 7" mirror/monitor kit includes the STSM244 that can easily be mounted on the vehicle's existing rear view mirror button. This new addition to the MOR-Vision® product line allows up to 3 camera inputs for maximum coverage in or around the vehicle.



STSM244



INTUITIVE USER INTERFACE

COMPATIBILITY

KIT COMPONENTS:

MONITOR: STSM244

CAMERA: STSC130(B)(W)(R)

HARNESSES: STSH343 (33FT GREY), STSH130 (ADAPTER HARNES)

STSM244 MONITOR	FEATURES
SCREEN SIZE	7"
RESOLUTION	800 x 480 pixels
BRIGHTNESS AFTER MIRROR GLASS	700cd/m ²
INPUT FORMAT	4-pin
NUMBER OF CAMERA INPUTS	3
NUMBER OF TRIGGER INPUTS	3
VIEWING ANGLES	L/75°, R/75°, UP/60°, DOWN/60°

STSM244 MONITOR	FEATURES
INPUT FORMAT	NTSC
SHOCK RATING	2G
VIBRATION RATING	6G
POWER SUPPLY	DC 12V ~ 32V
OPERATING TEMPERATURE RANGE	-4°F to 158°F -20°C to 70°C
STORAGE TEMPERATURE RANGE	-22°F to 176°F -30°C to 80°C
MAXIMUM CURRENT CONSUMPTION	1,000mA

BACKUP/SIDE CAMERA

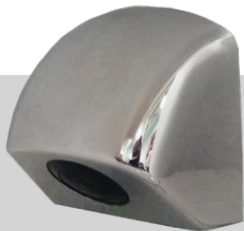
VEHICLE TYPES



The STSC130 Mini Color Camera is offered in 3 colors, Black, White, and Chrome to best fit your vehicle. This camera offers a 170° wide angle lens for an optimal view around the vehicle. This versatile camera can be configured as a backup or side camera for your application needs.



STSC130B
ACTUAL SIZE OF CAMERA



STSC130R



STSC130W

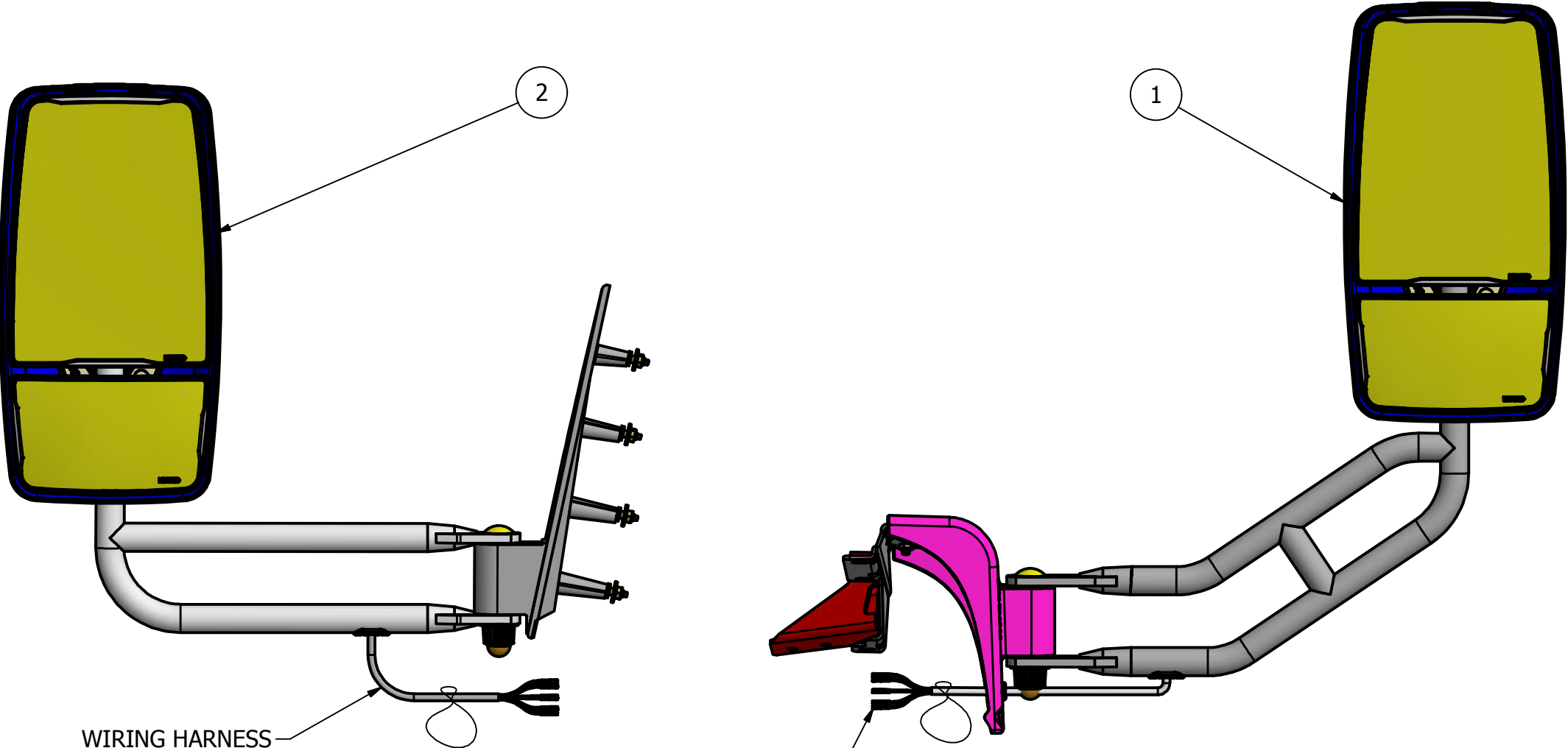
CAMERA OPTIONS:

STSK4730B INCLUDES STSC130B: BLACK
STSK4730W INCLUDES STSC130W: WHITE
STSK4730R INCLUDES STSC130R: CHROME

STSC130 CAMERA	FEATURES
RESOLUTION	733 x 493 pixels
INFRARED LEDS	0
NIGHT VISION RANGE	N/A
MINIMUM ILLUMINATION	0.2 LUX
IP RATING	IP69K
FIELD OF VIEW	170°

STSC130 CAMERA	FEATURES
OUTPUT FORMAT	NTSC
INPUT VOLTAGE RANGE	DC 12V ± 2V
OPERATING TEMPERATURE	-22°F to 149°F (-30°C to 65°C)
WEIGHT	0.71 lbs. (0.32 kg.)
DIMENSIONS W X H X D	1.5" x 1.0" x 1.4" (37mm x 25mm x 35mm)
MICROPHONE	N/A

ECO	REV	DESCRIPTION	DATE	AUTHOR
5921	A	RELEASED TO PRODUCTION	6/5/2012	gennady.grabovsky
	B	70 in EXPOSED LENGTH was 53 in	2/25/2013	gennady.grabovsky
6746	C	160 in. EXPOSED LENGTH WAS 130 in.	3/13/2014	gennady.grabovsky



MOUNTING HARDWARW KIT & INS1137 TO BE SHIPPED WITH ARM ASSY IN SEPARATE BAG. SEE SCR7095 FOR DETAILS.

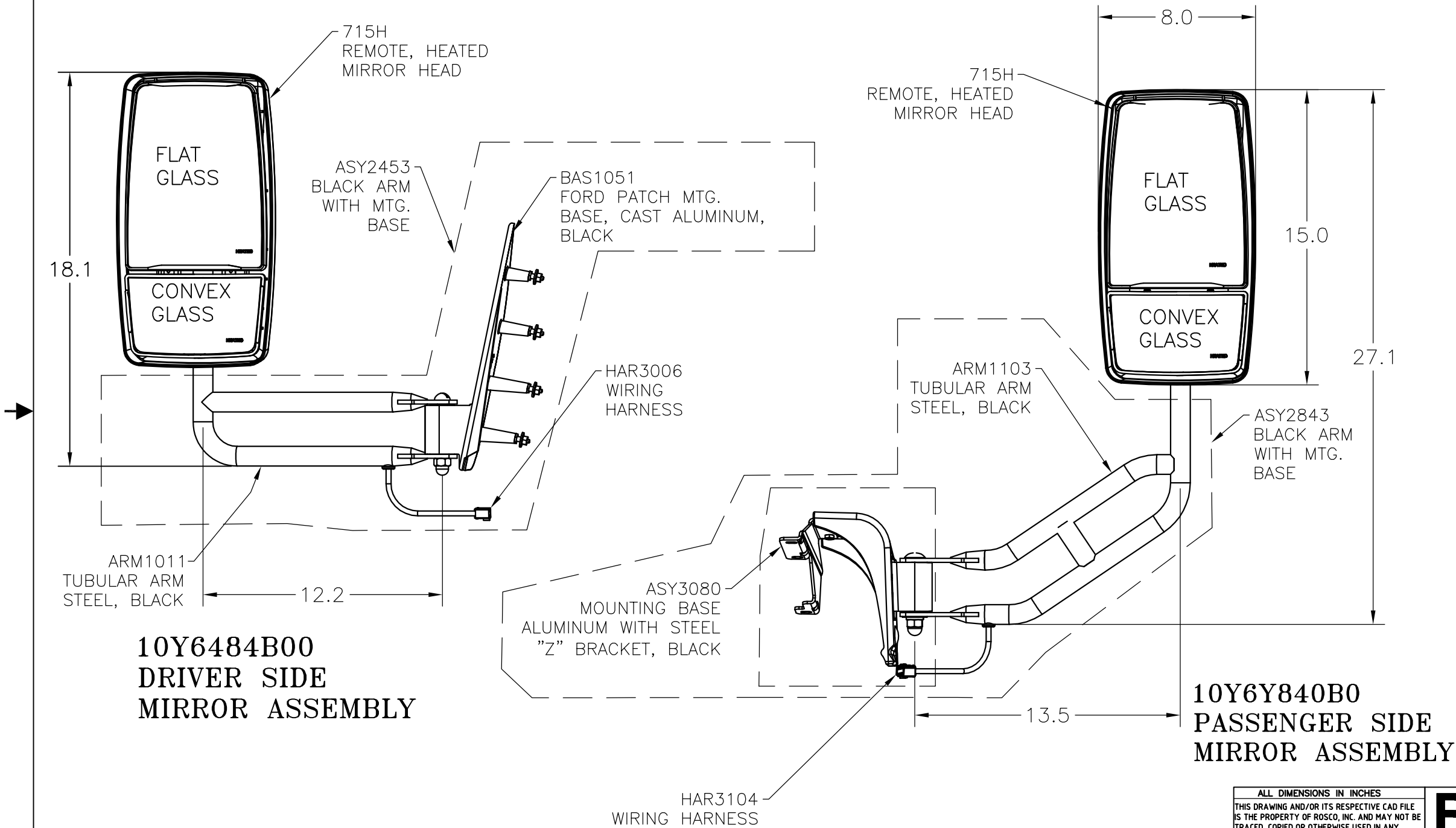
WIRING HARNESS
70in. EXPOSED LENGTH
CONNECTOR BAGGED

WIRING HARNESS
160in. EXPOSED LENGTH
CONNECTOR BAGGED

PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	ASM00300288	2008 FORD PASSENGER SIDE ACCUSTYLE MIRROR ASSY, FENDER MOUNT, EXT ARM, REMOTE, HEATED, BLACK ARM
2	1	ASM00300287	2008 FORD DRIVER SIDE ACCUYSTLE MIRROR ASSY, PATCH MOUNT, REMOTE, HEATED, BLACK ARM

DRAWN gennady.grabovsky	6/5/2012	ROSCO, INC			90-21 144TH PL. JAMAICA NY 11435 (718)526-2601				
CHECKED									
QA		TITLE 08 FORD KIT MIRROR ASSY, DRIVER AND PASSENGER SIDES, DRW, BLACK EXTENDED ARMS, REMOTE, HEATED, WIDE BODY.							
MFG									
ALL DIMENSIONS IN INCHES UNLESS OTHERWISE SPECIFIED									
ANGULAR TOLERANCES : ± 1.5		SIZE				DWG NO		REV	
TOLERANCES .X : ± 0.1									
TOLERANCES .XX ±		TOLERANCES .XXX ±		B		SSM00300244		C	
0 - 5.99"	0.03	0 - 5.999"	0.005						
6.00"- 11.99"	0.05	6.000"-11.999"	0.015	SCALE					
12.00"- 23.99"	0.06	12.000-23.999	0.020						
24.00-47.99"	0.08	24.000-47.999	0.025						
48.00" & UP	0.12	48.000" & UP	0.030						
				SHEET 1 OF 1					

#	DESCRIPTION	DATE	APPROVED
2	DELETED HARDWARE KIT	1/23/2008	BF



10Y6484B00
DRIVER SIDE
MIRROR ASSEMBLY

10Y6Y840B0
PASSENGER SIDE
MIRROR ASSEMBLY

DRAFT

ALL DIMENSIONS IN INCHES				ROSCO, INC				144-31 91st AVE.			
THIS DRAWING AND/OR ITS RESPECTIVE CAD FILE IS THE PROPERTY OF ROSCO, INC. AND MAY NOT BE TRACED, COPIED OR OTHERWISE USED IN ANY MANNER WITHOUT THE WRITTEN AUTHORIZATION OF ROSCO INC.								JAMAICA NY 11435			
DRAWN 12/12/2007				2008 FORD FENDER MOUNT KIT MIRROR ASSY DRIVER & PASSENGER SIDES, DRW (BLACK ARM)				(718)526-2601			
CHECK J. SERER											
APPR. BEN ENGLANDER											
ANGULAR TOLERANCES: ±1.5°				SIZE				DRAWN BY			
TOLERANCES .XX											
TOLERANCES .XXX				DWG NO				REV			
0 - 5.99"				0.03 0 - 5.999"				0.010			
6.00" - 11.99"				0.05 6.000" - 11.999"				0.015			
12.00" - 23.99"				0.06 12.000" - 23.999"				0.020			
24.00 - 47.99"				0.08 24.000 - 47.999"				0.025			
48.00" & UP				0.12 48.000" & UP				0.030			
SCALE				NTS				WEIGHT			
SHEET				1							



A CENTURY OF AUTOMOTIVE VISION SAFETY

Mirrors, Sunvisors, Cameras, and Video Recording

ROSCO COMMERCIAL WARRANTY

We warrant that all ROSCO mirror, camera, sun visor, and electronic vision products are free from defects in workmanship and materials for a period of ONE (1) YEAR from the date of receipt of the product. During the warranty period, we agree to provide a replacement for (or at our option repair) any ROSCO product and/or any one or more component parts of a ROSCO product, which malfunctions under normal use and service.

Upon discovering a defect, the customer must contact ROSCO for a return authorization and then must return the product, and/or component part, together with proof of date of receipt of the product, to ROSCO INC. 144-31 91 Ave. Jamaica, New York 11435. The customer and not ROSCO will be responsible for the payment of all removal, installation and transportation charges for return of defective products or components to ROSCO. Transportation charges for such return must be prepaid. The repaired or replaced equipment will be returned to the customer with transportation charges prepaid by ROSCO. Replacement (or repaired) products and/or component parts are warranted only for the unexpired term of the original warranty.

This warranty does not cover defects caused by neglect, misuse, incorrect application, incorrect installation, water damage, vehicle wash facilities, alteration or repair in any manner outside ROSCO's factory, or damage caused by the return shipment due to inadequate packaging or mishandling. If the alleged defect is due to any of these causes, the customer will be advised of the findings and asked what action is to be taken. If ROSCO is requested to repair the product, a repair charge estimate will be prepared and the customer's written permission (purchase order, repair, etc.) will be necessary to proceed with the repair of the product and/or component part. Transportation charges for such returns will be the responsibility of the customer.

This warranty may not be expanded by oral representation, written sales information, drawings or otherwise. Repair or replacement is the exclusive remedy for defective products under this warranty. This warranty is expressly in lieu of all other warranties, including any implied warranty of merchantability or any implied warranty of fitness for a particular purpose on any ROSCO product. ROSCO shall not be liable for any consequential or incidental damages for breach of any express or implied warranty on any ROSCO product.

Taller and wider headrest
with decreased backset.

FREEDMAN
SEATING COMPANY

The industry's
preferred driver
seat for truck and
buses, including
Ford & Chevy
cutaways.

Heavy duty recliner mechanism and
4-position adjustable lumbar support.

Optional
Lemans Armrest

Automotive grade 4-spring seat flex-o-lator
for even load support and long life.

SHIELD DRIVER | RECLINER SEAT

COMMERCIAL BUS / DELIVERY TRUCK

Shield driver seats are designed and tested to meet all applicable safety standards including 202A for superior head and neck support while providing superior comfort and style. The Shield recliner is the preferred driver seat for truck and buses, including 2011 and later Ford & Chevy cutaway buses. The Shield recliner mounts directly to the OEM base & slides on seat delete chassis.

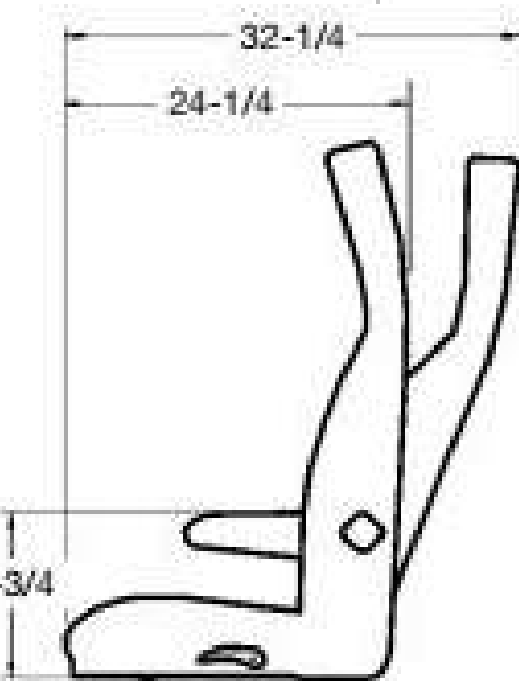
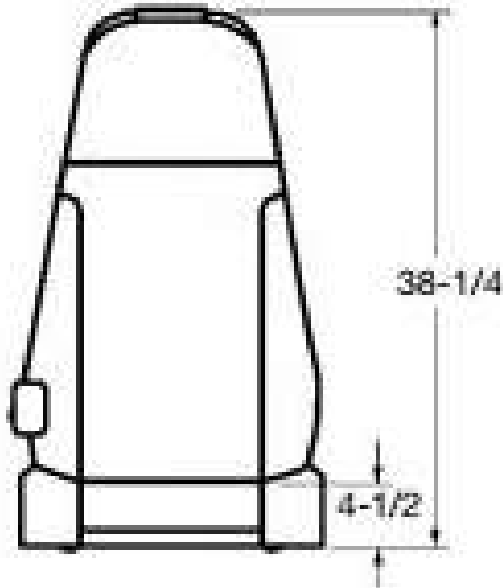
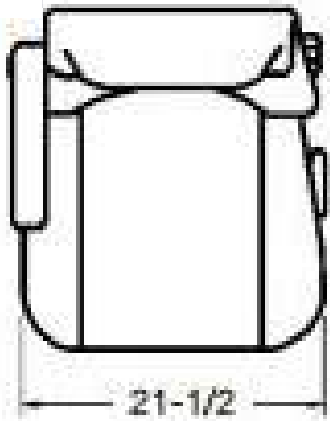


features

- Meets FMVSS 207/210/202a
- 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-lator 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
- 4-position adjustable lumbar support
- Heavy duty recliner mechanism
- Mounting brackets to fit Ford E-series and Chevy Cutaway seat delete bases
- Modified vinyl seat cover to accommodate substantial usage in the field.

options

- Shield or Lemans armrest
- Mesh map pockets
- Vertical Stitching
- Choice of fabric or vinyl
- Fore/Aft slide tracks, required for universal mounting
- Heater (seat mounted controls)
- Flame Blocker D-90 encapsulated cover
- Mesh Map Pocket
- Adnik Height Adjustable Power Pedestal Slides
- Driver Skirt for Power Pedestal



FREEDMAN[®]
SEATING COMPANY

4545 W. Augusta Blvd., Chicago, IL 60651
(773) 524-2440 (800) 443-4540 Fax (773) 252-7450
freedmanseating.com | info@freedmanseating.com



Freedman Seating is committed to lessening our impact on the planet. For your convenience, materials are now available online to download at www.freedmanseating.com.

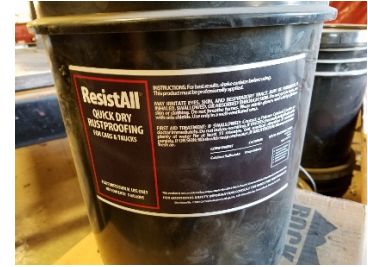
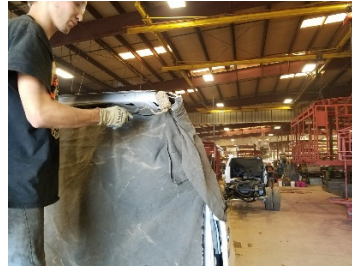


We are constantly updating and improving our seats; therefore we reserve the right to change or modify specifications or materials without notice. All Freedman Seating Company seats meet or exceed FMVSS standards

Rev. B		No. 32-01-0006-16
Implementation: 7/11/2016	Unit Corrosion Prevention Process	Written by: Juan Machuca
Models Affected:	All models	
Tools Necessary:		Total Pages: 01

Chassis Prep:

1. Starcraft Bus must comply with OEM requirements and/or guidelines
 - a. QVM E1002 requirement states – Protect all body panel drilled or punched holes or cutouts from corrosion with a product containing zinc-phosphate or barium-sulfate as the active ingredient. Zinc coating materials should contain a minimum of 92 percent zinc. Two part epoxy coatings are also effective.
 - b. Starcraft uses an approved QVM corrosion inhibitor with a calcium sulfonate active ingredient.



2. Steel cages must be sprayed with a rust inhibiting primer that will entirely cover all surface areas of the completed cage.
 - a. Proper protective equipment must be worn at all times during the primer application.
3. Barrier tape must be applied to the exterior of all cages to separate dissimilar metals from touching during the build process to prevent corrosion from occurring.



4. All exposed electrical grounds must be sprayed with a corrosion inhibitor.
5. Starcraft inspection department must thoroughly inspect grounds, cages, welds and barrier tape to ensure all areas of anti-corrosion applications are done properly or repaired appropriately.



Rev.	Reason for Revision	Approved By	Revised



06/21/2017

MB#

Z GUARD™ 9902 STAR

A wax based undercoating intended to protect commercial vehicles from corrosion. The wax electrochemically inhibits the rate of corrosion and also, due to the film characteristics, provides a coating resistant to stone impingement and elevated temperatures.

PHYSICAL PROPERTIES

Appearance	Black Liquid
% NVM by WT.	50
Density	10.43 lb/gal
Viscosity (after reduction with water) per Brookfield RVT #5 Spindle 20RPM	2500
Viscosity per #4 Zahn cup	26 sec.
Mechanical Stability	Excellent
Heat Stability	Excellent
V.O.C.	0.00 lbs/gal
D.O.T. Flammability Rating	>200q F
pH	8.5
Cryptometer/#2 Wedge, ASTM D1212	15
60° Gloss	< 5 matt finish)
Sag (mils)	>15

Z TECHNOLOGIES CORPORATION

World Leaders in Corrosion Protection

26500 Capitol Avenue, Redford, Michigan 48239-2597
Telephone (313) 937-0710 · Fax (313) 937-1470

Z GUARD 9902 STAR 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
Pencil Hardness	6B
Flexibility 180° bend over conical mandral	Pass
Salt Spray, ASTM B117, 1000 hours	Field, scribe, edge clean; slight blistering
Salt Fog Resistance (463PB-10-01), 240 hours.	Pass (No rust)
◆ 500 F x 16 hours plus 240 hrs salt fog	Pass (No rust)
◆ 325 F x 16 hours plus 16 hours humidity.	Pass (No rust, nor blisters)
Salt Fog Resistance (WSS-M2P178-A), 240 hours.	
◆ 662°F x 1 hour; 1°C water quench; plus 240 hrs salt fog.	Pass (#8-9 corrosion rating or <0.1% surface rust per ASTM D 610-95)
Salt Water Immersion, 5% NaCl, 100° F, 96 Hours	Pass
Detergent Immersion, 100° F, 48 Hours	Pass
Gravelometer, ASTM D3170, -20° F	Good(8A)
Poultice, GM 998-5470, 20 cycles	Pass
Q.U.V., ASTM G53, 3000 Hours	Pass
Q.U.V., 100 Hours + Salt Spray, 336 Hours	Pass
Q.C.T., 3000 Hours	Pass
Humidity Resistance, ASTM D2247, 2000 Hours	Pass
Sag resistance	≥5 mils
Impact (direct & reverse) ASTM D3281	160/40 inch-lbs.
Adhesion (FLTM B1 6-1 B) cross Hatch	5A Pass
Scab corrosion resistance, 20 cycles	Pass

APPLICATION

For ultimate protection, apply films to clean metals at a thickness of at least four (4) mils dry, by any of the following methods:

Airless spray, with a 33:1 1.5 - 3.5 GPM, .013 - .026 tip at 50-75 psi line pressure, 20 - 40 fan

www.ztechprotection.com

Z TECHNOLOGIES CORPORATION

World Leaders in Corrosion Protection

26500 Capitol Avenue, Redford, Michigan 48239-2597
Telephone (313) 937-0710 • Fax (313) 937-1470



STARTRANS BUS WARRANTY

NOTICE

Please return the warranty registration card to register the warranty with STARTRANS BUS so that STARTRANS BUS may record your rights under this limited warranty and to assure prompt assistance. Your dealer will provide the warranty card for you to sign. If you do not remember signing a STARTRANS BUS warranty card at the time of delivery, please contact your dealer.

1. Who Warrants the product

The product, as described and limited here, is warranted by the manufacturer and installer of the body: STARTRANS BUS, Division of Forest River, Inc., hereinafter referred to as STARTRANS BUS, 2408 Century Drive, Goshen, IN; an Indiana Corporation; and is administered by the STARTRANS BUS Customer Service Dept., Goshen, Indiana 46528.

2. Who Is Covered

STARTRANS BUS, the warrantor, extends this limited warranty to the original owner of the vehicle during the WARRANTY PERIOD.

3. What Is Covered

STARTRANS BUS, your warrantor, extends the following limited warranty to you, which limited warranty covers your conversion only as to material defects in all materials and workmanship supplied by or performed by STARTRANS BUS.

4. Warranty Period

The STARTRANS BUS limited warranty is for a period of one (1) year from the date of first delivery or 12,000 miles, whichever occurs first, except for other coverages listed under "Other Warranties that may Apply" and items listed under "Exclusions and Limitations" and "Limits of the Warranty."

5. Extended Warranty on Structural Items

Warrantor warrants to the original purchaser for a period of five (5) years from the date of first delivery or 75,000 miles, whichever comes first, that this produce shall be free of SUBSTANTIAL DEFECTS arising out of or relating to the structural portion of the product. THIS STRUCTURAL WARRANTY IS INTENDED TO COVER ONLY THE PERFORMANCE OF THE STEEL CAGE STRUCTURE OF THE BUS BODY.

Custom paint and/or tape application, if performed by STARTRANS BUS, is warranted to be free of substantial defects in workmanship and materials provided by STARTRANS BUS for one (1) year (12 months) from date of original purchase.

6. Other Warranties That May Apply

STARTRANS BUS does not warrant the base vehicle itself. The vehicle engine, chassis, drive train, suspension system, battery, and other chassis components are covered by a separate warranty offered by the manufacturer of the vehicle and administered by the manufacturer's authorized dealers. The tire manufacturer separately warrants tires. Examples of other manufacturer warranties, which may include the following, but not limited to:

- Electrical Components
- Air Conditioning and Heater(s)
- Wheelchair Restraints and Wheelchair Lifts

For a complete list of items and their respective warrantor, please contact STARTRANS BUS Customer Service Department.

7. Owner's Responsibility

Proper maintenance and cleaning of the exterior and interior of the vehicle is the responsibility of the owner. See the owner's manual for proper care instructions. Defects or damage as a result of improper care or maintenance are not covered by the warranty.

8. Exclusions and Limitations

Damage caused by abuse, misuse, neglect, failure to observe reasonable and required maintenance practices, acid rain, accidents, natural disasters, acts of war and normal wear and tear and facing of fabrics, carpeting and/or fiberglass are not covered. Light bulbs and fuses are not covered.

Damage or deterioration to the physical appearance of the unit if such damage is the result of normal use, wear and tear, or exposure to the elements.

Damages that may occur to the chassis, frame, other parts or components that occur due to overloading will not be covered and may invalidate portions of the STARTRANS BUS warranty.

Cosmetic or surface corrosion resulting from stone chips or scratches in paint are not covered.

STARTRANS BUS does not cover accessories covered by their own manufacturer's warranties. Those items listed in paragraph 6 above are not covered or warranted by STARTRANS BUS.

Replacement parts provided under terms of the warranty will whenever possible, match original equipment. When necessary, STARTRANS BUS will substitute parts of comparable function and value. Defective items may be replaced with new, remanufactured, reconditioned or repaired components.

Modifications, alterations or repairs performed by unauthorized personnel may invalidate portions of the STARTRANS BUS warranty. In addition, USING THIS VEHICLE TO TOW ANOTHER VEHICLE IS PROHIBITED AND MAY VOID WARRANTY. Contact STARTRANS BUS Customer Service before you make any changes.

9. Recovery Limitations

NO PERSON SHALL BE ENTITLED TO RECOVER FROM WARRANTOR FOR ANY CONSEQUENTIAL OR INCIDENTAL DAMAGES ARISING OUT OF OR RELATING TO ANY DEFECT IN THE PRODUCT. These limitations include, but are not limited to, loss of time; loss of use; loss of revenues, salaries or commissions; towing charges; bus fares; car rentals; gasoline expenses; telephone charges; inconvenience or other incidental damages.

10. How to get warranty service

To obtain warranty service, contact or visit the dealership where you originally purchased your vehicle or another warranty service facility designated by STARTRANS BUS. Have the dealership contact STARTRANS BUS Customer Service Department for authorization to have a warranty claim submitted. If you or your dealer has moved, or if your dealer is no longer in business, contact STARTRANS BUS Customer Service Department (see address and telephone numbers below) for the name of a STARTRANS BUS dealer nearest you. Your claim must be made within 30 days of the discovery of the defect. Based on the determination of STARTRANS BUS, and subject to the terms of the warranty, the warranty repair work will be authorized by STARTRANS BUS.

All warranty claims must be reported within the warranty period. Warranty personnel must authorize all warranty service prior to performance. Warranty service may be reported directly to the warrantor or to one of their authorized dealers. If warranty personnel approve warranty service, you must leave the unit at the appropriate warranty service location for a sufficient time to perform service.

11. Who Performs Warranty Service

The best place to obtain warranty service is at the dealership where you originally purchased your bus. If the dealership cannot perform the service work, they should call STARTRANS BUS Customer Service Department for assistance (see number below). If you are unable to visit your original dealer, contact STARTRANS BUS Customer Service Department (address below) for the name and location of a STARTRANS BUS dealer near you.

12. Dispute Resolution

Should you be unable to resolve a disagreement with your dealer regarding your right to pursue warranty coverage for a needed repair, contact the STARTRANS BUS Customer Service Department (see address below). If a dispute about warranty service arises between STARTRANS BUS and you, the owner, the disagreement will be resolved in accordance with the customary procedures of the American Arbitration Association relating to commercial transactions, or the dispute will be submitted to a panel of three (3) arbitrators for decision. The panel will be made up of one member appointed by STARTRANS BUS, one member appointed by the complainant/owner, and one member from the arbitrators group mentioned above. Any and all legal remedies shall be available to the owner after pursuing this informal dispute resolution if a ruling is entered against STARTRANS BUS and STARTRANS BUS fails to abide by the ruling. The expenses of arbitration will be paid by the party against whom the arbitrator(s) rule.

13. Limits Of Warranty

This written statement of limited warranty represents the entire warranty authorized and offered by STARTRANS BUS. There are no warranties or representations beyond those expressed in this written document. Any dealership, salesperson or agent cannot amend it. It expressly limits all warranties, including, but not limited to, by way of specification, both express and implied warranties, including warranties or merchantability and fitness for a particular purpose along with all other liabilities or obligations of STARTRANS BUS.

FEDERAL COMPLIANCE

THE TERMS OF THE WARRANTOR'S UNDERTAKING EXPRESSED IN THIS LIMITED WARRANTY ARE DRAFTED TO COMPLY WITH THE MAGNUSEN MOSS WARRANTY LEGISLATION, P.L. 93-637 OF 1974, AND OTHER APPLICABLE LAW. ANY WARRANTY PROVISIONS PROMULGATED BY THE FEDERAL TRADE COMMISSION PURSUANT TO RULES OR ANY OTHER LAW RELATIVE THERETO ARE EXPRESSLY INCORPORATED HEREIN. TO THE EXTENT ANY PROVISIONS OF THIS LIMITED WARRANTY ARE INCONSISTENT WITH STATE LAWS, ONLY THOSE PARTS INCONSISTENT ARE VOID.

STARTRANS BUS
Division of Forest River, Inc.
CUSTOMER SERVICE DEPT.
2408 Century Drive
Goshen, IN 46528
Phone: 877.258.1391
Fax: 574.970.6815



BODY CONSTRUCTION SPECIFICATION

The following information is submitted for all Startrans Bus products as supporting documentation of the structural soundness and impact resistance of the bodies manufactured. All vehicles are built using virtually the same materials with some minor differences in the height and width of cross members due to entry floor heights and/or body width variations.

A representative set of construction prints provided by engineering supplements this verbal accounting of our materials and assembly specifications.

If, in the reviewing of these written technical specifications and engineering frame prints submitted any questions arise, please contact us immediately for any clarification or help in interpretation and understanding.

3.0 Body Construction – General Frame Construction

Manufactured from corrosion-resistant aluminized steel, the floor, roof, side walls, rear wall, driver halo assembly and entry door assembly are wire welded (MIG) together to form an integral steel frame cage, then mounted with specified hardware to the rubber body mount points (pucks) supplied by the chassis manufacturer. Once joined to the chassis, the bus finishing process begins.

3.0.1 Floor frame construction and assembly –

- 3.0.1.1 Cross Members -- The floor cross members form the base structural support for the rest of the frame components. Our cross members are constructed of 14 gauge aluminized steel, formed to a capital “C” shape. Cross members over the fuel tank are made to provide the clearance needed to conform to FMVSS301, and include formed internal reinforcements welded in place for additional strength. All additional longitudinal and latitudinal structure is flush welded in place to form a one piece floor upon completion.*
- 3.0.1.2 Steel “Hat Posts” – 1”x1”x4” run the length of the floor between cross members and are welded into place. This extremely strong form is used to weld our HSLA steel seat track in place.*
- 3.0.1.3 Steel C Channel – 1”x1.5” C channel is welded in between cross members the full length of the floor in 5 places. Coupled with the Hat Posts this provides a one-piece strong “ladder” type frame for the flooring.*
- 3.0.1.4 Seat Track – 12 gauge roll formed high strength/low alloy steel is wire welded in place for seat mounting down each side of the bus, with lengths predicated on the floor plan chosen. This is yet another stiffener in our extensive construction process.*



- 3.0.1.5 Wheel Wells -- Constructed of 14 gauge steel, wheel wells are also welded in during the floor construction process. All seams in the wheel well are welded to create a one piece water resistant wheel housing structure. The wheel wells also provide additional strength to the body assembly, when welded in place.*
- 3.0.1.6 Structural Steel Angle – 1/8” thick 1.5” x 2.5” structural aluminized steel angle is used the full perimeter length of each floor assembly, welded to the ends of all floor cross members. This provides not only a flat plane for joining the sidewall assembly, but also ties all cross members together and provides additional side impact resistance.*
- 3.0.1.7 Additional structure – When adding vertical stanchions, wheel chair lifts and/or tie down options, additional structure is welded into the floor at locations specified by our engineering department on CAD drawings.*

3.0.2 Sidewall Construction –

- 3.0.2.1 Sidewall vertical member – The heart of our sidewall is the vertical structure, a roll formed 18 gauge aluminized steel capital “C” channel with 8 bends that create extreme strength and rigidity. The vertical member is installed in full lengths and in shorter sections below window frames. Additional vertical structure is used at both ends of the sidewall enabling the structure to withstand the forces applied by the vehicle when in motion.*
- 3.0.2.2 Steel Tubing – 1”x1” lower and 1”x3” upper 16 gauge aluminized steel tubing is welded in horizontally between vertical members to frame in window openings. This adds front to rear reinforcement as well.*
- 3.0.2.3 Seat Track – 11 gauge high strength low alloy roll formed steel track is welded down each sidewall below the window frame. While serving as a seat attaching device, it adds excellent structure to the sidewall and also adds excellent side impact resistance.*
- 3.0.2.4 Wheelchair Options – Add another layer of metal. Depending on track locations, another structure of 11 gauge thick aluminized steel is welded in place between each vertical member for attaching a shoulder belt mount. Also, additional structure is added to accommodate wheelchair door frames – either 1”x1” or 1”x2” 16 gauge aluminized steel tubing.*
- 3.0.2.5 Full length steel tubing – 1”x1” 16 gauge aluminized steel tubing is stitch welded to the sidewall bottom and top at each vertical member for attaching to the floor and roof sections, respectively.*

3.0.3 Rear Wall Construction –

- 3.0.3.1 Rear wall vertical member – The vertical sidewall capital “C” channel with 8 bends is also used in the rear wall assembly. Full length structure is used at varying places, depending on choice of rear window, or rear door. Shorter cut pieces are*



used above windows and doors. Additional side windows used with the rear door also change the configuration.

- 3.0.3.2 Steel Tubing – 1"x1" 16 gauge aluminized steel tubing is welded horizontally between vertical members to provide a window frame in the standard product, and used as an upper door frame in the optional rear assembly.*
- 3.0.3.3 Full length steel tubing – 1"x1" 16 gauge aluminized steel tubing is stitch welded to the rear wall top and bottom as in the sidewall assembly.*

3.0.4 Roof Construction –

- 3.0.4.1 Roof Bows – Radius formed one-piece 16 gauge aluminized steel roof bows formed as a modified hat post design with eight bends for exceptional strength and located on 16" centers (the closest in the industry), including 4 bends in the web similar to our vertical sidewall steel provide a roof structure capable of taking severe loads. They are then capped with top flat pieces from flange to flange to provide abundant surface area for securing the exterior roof material.*
- 3.0.4.2 Steel Tubing – 1"x1" 16 gauge aluminized steel tubing is welded in horizontally to frame all lower window openings and 1" x 3" 16 gauge aluminized steel tubing to all upper window openings as required. A full perimeter is also welded on to mate the roof to the side walls and rear wall, with short vertical pieces providing support on the front and rear ends. The 3" wide aluminized steel tube supplies a structural mounting surface for shoulder belt attachment and has been pull tested to federal standards.*

3.0.5 Driver Compartment Overhead Halo –

- 3.0.5.1 Steel Tubing – 1"x1" 16 gauge aluminized steel tubing is cut and jig welded into an integrated one piece structure spanning from the front roof bow of the body to the newly cut roof line of the cab. Also created during the structure manufacture is the housing for mounting the electronic circuit board.*
- 3.0.5.2 11 Gauge Steel – formed to make brackets used to mount to the chassis roof.*

3.0.6 False Floor (Cab to body transition) –

- 3.0.6.1 Steel Tubing – 2" x2" 16 gauge aluminized steel tubing is welded together forming a flat body floor transition from the step area back to the actual body area. An overhang on the curbside provides a secure attach point frontally for the entry door frame added later.*
- 3.0.6.2 Structural steel angle – 11 gauge 1.5"x1.5" structural angle is added in short lengths in five places to provide attachment points to the chassis floor.*



3.0.7 Interior Vertical Transition Frames –

3.0.7.1 Steel Tubing – 1"x1" 16 gauge aluminized steel tubing is used vertically and a ladder type assembly is made welding the 1x1 tube to .75"x.75" 11 gauge steel tube that is used horizontally in the assemblies. These pieces transition from the body fronts on each side to the driver halo side assembly and the entry door frame assembly on the curbside.

3.0.8 Entry Door & Step Assembly Frame –

3.0.8.1 Steel Tubing – 1"x1" 16 gauge and .75"x.75" 11 gauge aluminized steel tube is cut to length and welded together in a ladder type construction forming a rigid frame for attaching the entry door/step assembly.

3.0.9 Entry Door/Step Assembly –

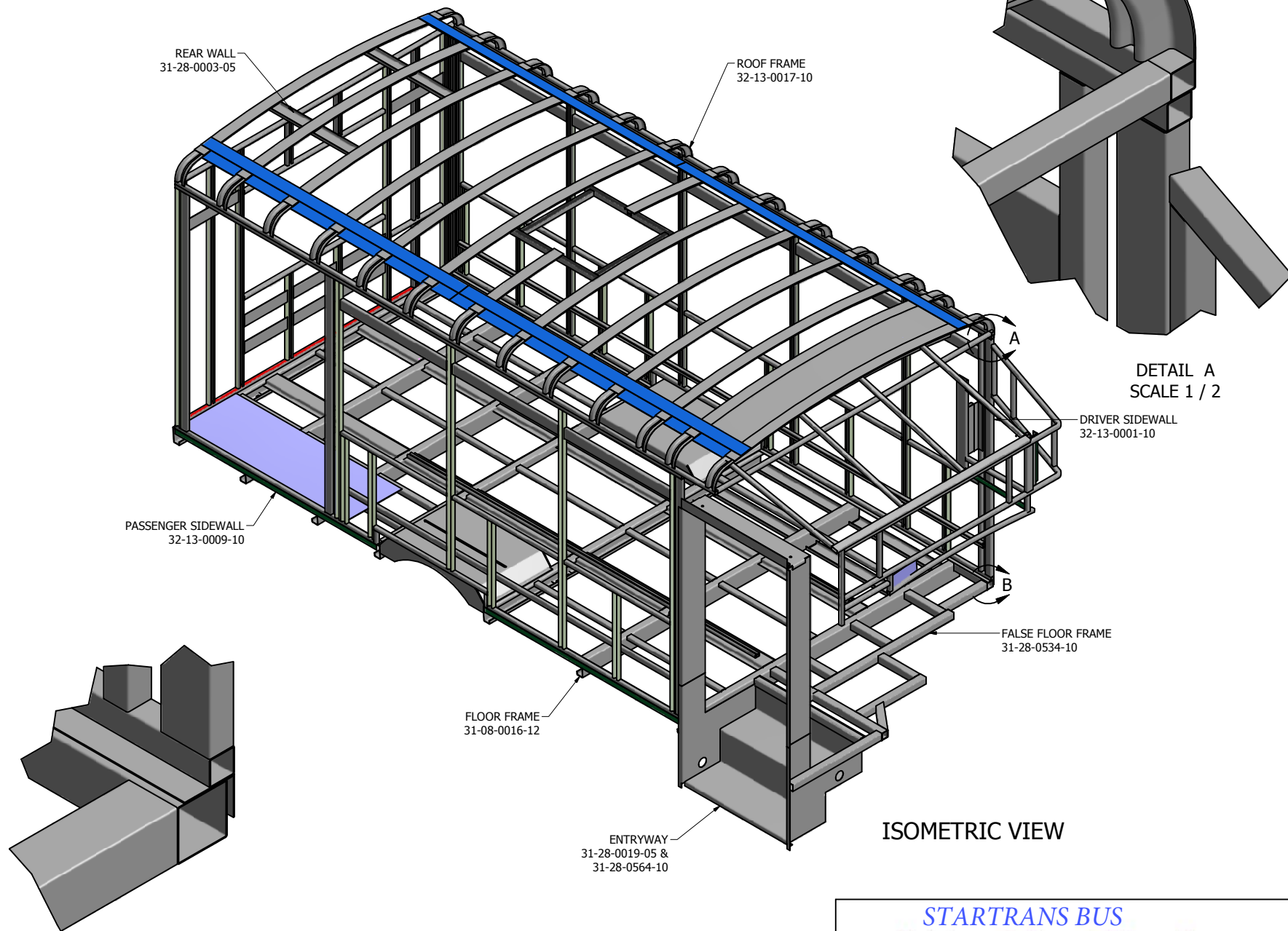
3.0.9.1 11 Gauge Steel – The step riser/tread piece is manufactured from one-piece 11 gauge steel and uses 90° bends at all risers and treads. The bottom tread also adds an additional 90° bend for additional strength and safety. Upper and lower side pieces are then attached and an 11 gauge flat plate with holes is used to bridge the lower and upper side pieces, then is stitch welded and plug welded to form a strong one piece assembly prior to inserting and welding to the entry step framing.

APPLICATION OF EXTERIOR SIDEWALL MATERIAL

GALVANIZED STEEL SIDEWALLS OR OPTIONAL FIBERGLASS/FRP/COMPOSITE SIDEWALLS

The standard exterior side walls are .024" galvanized steel pre-painted white with an underlayment of 5/32" luan. The interior side walls are 5/32" luan covered with a light gray FRP or padded vinyl (customer's choice). The foam filled steel cage is placed in the center and all layers are adhered using polyurethane hot melt adhesive. The wall and roof sections are run through a pinch roller to apply pressure to the assembly, thereby squeezing out any air bubbles.

Optional composite FRP exterior sidewall panels are installed using the same method.



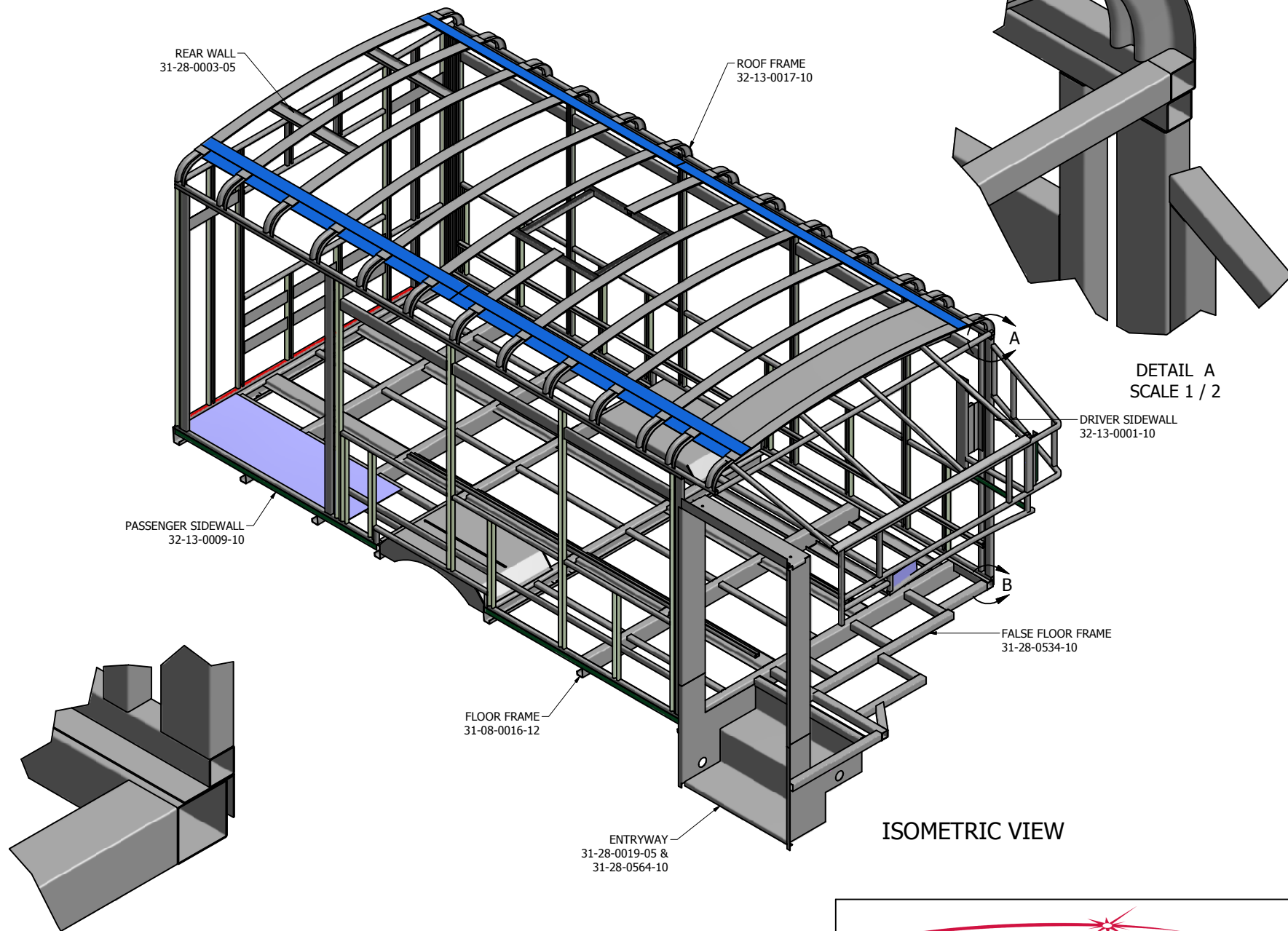
STARTRANS BUS

a division of Forest River, Inc.

DFTSN:	TAS	TITLE	Ford - 158 WB - 175 BOX CAGE W/C REAR LIFT, STANDARD STYLE FLOOR
DATE:	12/18/12	DWG NO	40016-2
		SHEET	1 OF 1

REVISION HISTORY				
ZONE CAGES	REV "A"	DESCRIPTION	DATE	APPROVED TAS
		Added missing standard roof steel	10/29/2013	

DETAIL B
SCALE 1 / 2



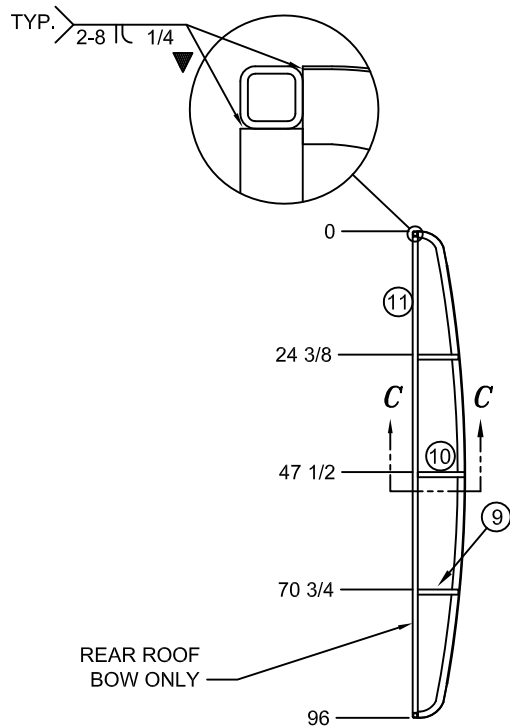
			
DFTSN: TAS		TITLE Ford Senator 2 - 158 WB - 175 BOX CAGE W/C REAR LIFT, CUT N BUTT STYLE	
DATE: 12/5/14		FLOOR DWG NO 40016-2	SHEET 1 OF 1

REVISION HISTORY				
ZONE	REV		DATE	APPROVED

DETAIL B
SCALE 1 / 2

▼ CRITICAL CONTROL ITEM

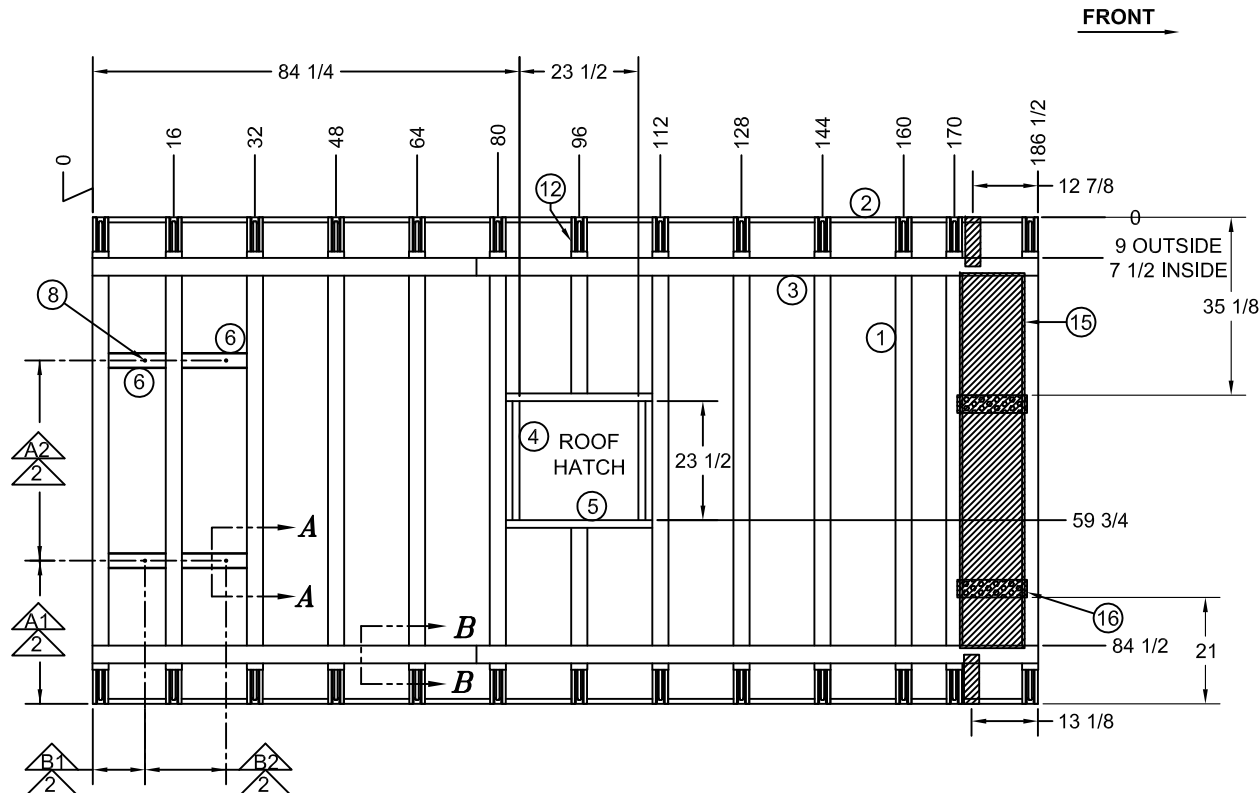
USAGE: 2011 ALLSTAR, FORD, 158" WB - MODEL 24



** WHEN ADDING REAR LUGGAGE ADD THE SIZE OF THE REAR LUGGAGE TO DIM. B1

NOTES:

- 1- DRAWING VIEWED FROM EXTERIOR SIDE OF UNIT.
- 2- A/C BOLT PATTREN MAY VARY SEE SALES ORDER.
- 3- BEFORE CUT ROOF HATCH SEE SALES ORDER.
- 4- SCREW LOCATION AT SEAMS AND EDGES 8" ON CENTER ALL OTHER LOCATION 16" ON CENTER.
- 5- SEALANT USAGE: 1/4" MINIMUM 3/8" MAXIMUM BEAD ON ALL ROOF FRAME TO LUAN SURFACES.
- 6- ADD STRAP FOR CHEVY ONLY



16	2		STRAP: 11ga. x 3-1/2" x 13-3/4"Lg.
15	1		PLATE: 16ga. x 12-3/4" x 75"Lg.
14	1		SHEET STEEL: 16ga. x 2" x 103"Lg.
13	2		SHEET STEEL: 16ga. x 3-1/2" x 38-1/2"Lg.
12	2	02062357	ROOF BOW W/CAP 16ga. x 3-3/16 x 35-1/4"Lg.
11	1		TUBE: 11ga. x 1" x 1" x 94"Lg. A-513
10	1		TUBE: 11ga. x 1" x 1" x 8-1/2"Lg. A-513
9	2		TUBE: 11ga. x 1" x 1" x 8"Lg. A-513
8	4		BOLT: 3/8-16 x 3"Lg. HEX HEAD
7	2		SHEET STEEL: 16ga. x 3-1/2" x 38-1/2"Lg.
6	4	70009046	"C" CHANNEL: 16ga. x 1" x 3-1/2" x 14-1/2"Lg.
5	2	70009047	"C" CHANNEL: 16ga. x 1-3/8" x 1-3/8" x 30-1/2"Lg.
4	2	70009047	"C" CHANNEL: 16ga. x 1-3/8" x 1-3/8" x 24-1/4"Lg.
3	4		SHEET STEEL: 16ga. x 3-1/2" x 120"Lg.
2	2		TUBE: 16ga. x 1" x 1" x 186-1/2"Lg. A-513
1	10	02062357	ROOF BOW W/CAP 16ga. x 3-3/16 x 96"Lg.
REF. No.	QTY.	PART No.	MATERIAL DESCRIPTION

STARTRANS

DATE: 10/13/10	TITLE
DFTSN: MDK	Frame, Roof Ford & Chevy SENATOR 2
CHKR:	DWG. No.
APRVD:	32-13-0017-10
SCALE	
DISK No.	SHEET 1 OF 2

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A 2011 STYLE UPDATES

REV.
LET.

DESCRIPTION OF CHANGE

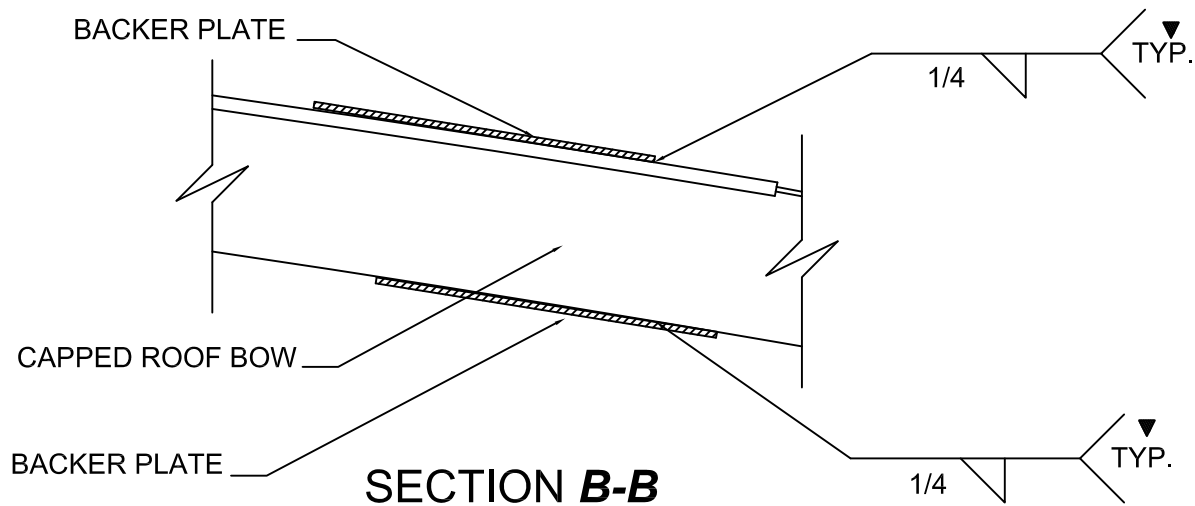
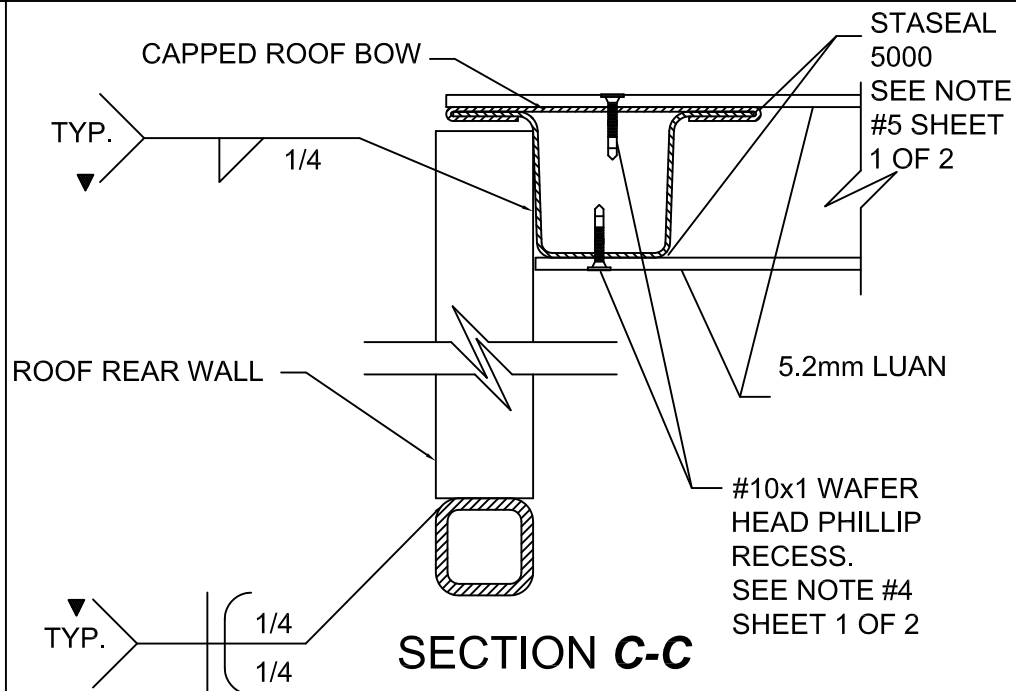
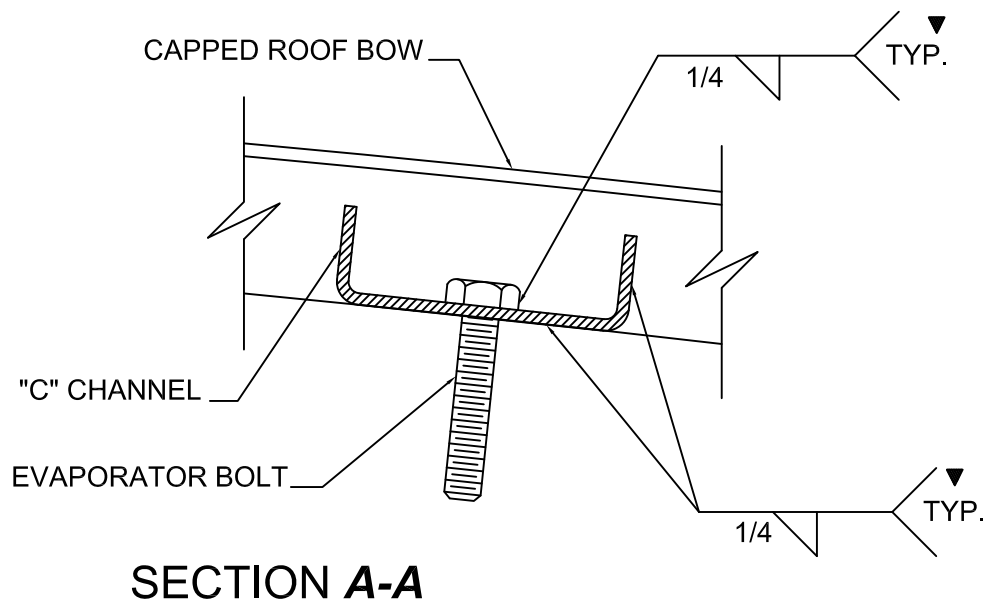
MK

10/29/13

ECN No.

TOLERANCE UNLESS
OTHERWISE SPECIFIED
± .00 ± .030
± .000 ± .015
± .0000 ± .005

▼ CRITICAL CONTROL ITEM



T/A-71 NEW STYLE	33-5/8	30	10	12-1/4
ACC 23022 SERIES	38	20	10	14-3/4
ACC 23023 SERIES	33-5/8	28-3/4	10	14-3/4
T/A-77	18-1/4	59-1/2	10	10-3/8
T/A-73	28-1/4	39-1/2	10	9-1/2
T/A-71 OLD STYLE	33-5/8	28-3/4	10	12-1/4
T/A-70	36-3/4	22-1/2	10	11-5/8
T/A-30	31	34	10	9-1/2
EM-14 & RE-29	30-3/4	34-1/2	10	9-1/2
EM-6 & RE-10	36	24	10	9-1/2
EM-3 & RE-30	28-1/4	39-1/2	10	16
RE-15 & RE-20	28-1/4	39-1/2	10	9-1/2
EM-1 & EM-2	28-1/4	39-1/2	10	9-1/2
EM-7 GEN 5	36-1/8	23-3/4	10	9-1/2
EM-2 GEN 5	32-3/8	31-1/16	10	9-1/2
EM-1 GEN 5	28-3/16	39-5/8	10	9-1/2
EVAPORATOR MODEL	A-1	A-2	B-1	B-2

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REV.
LET.

DESCRIPTION OF CHANGE

BY

CHK

DATE

ECN No.

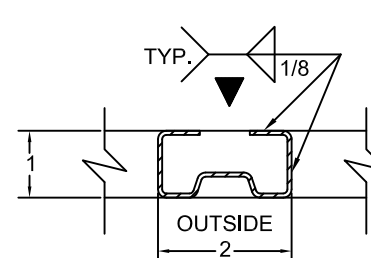
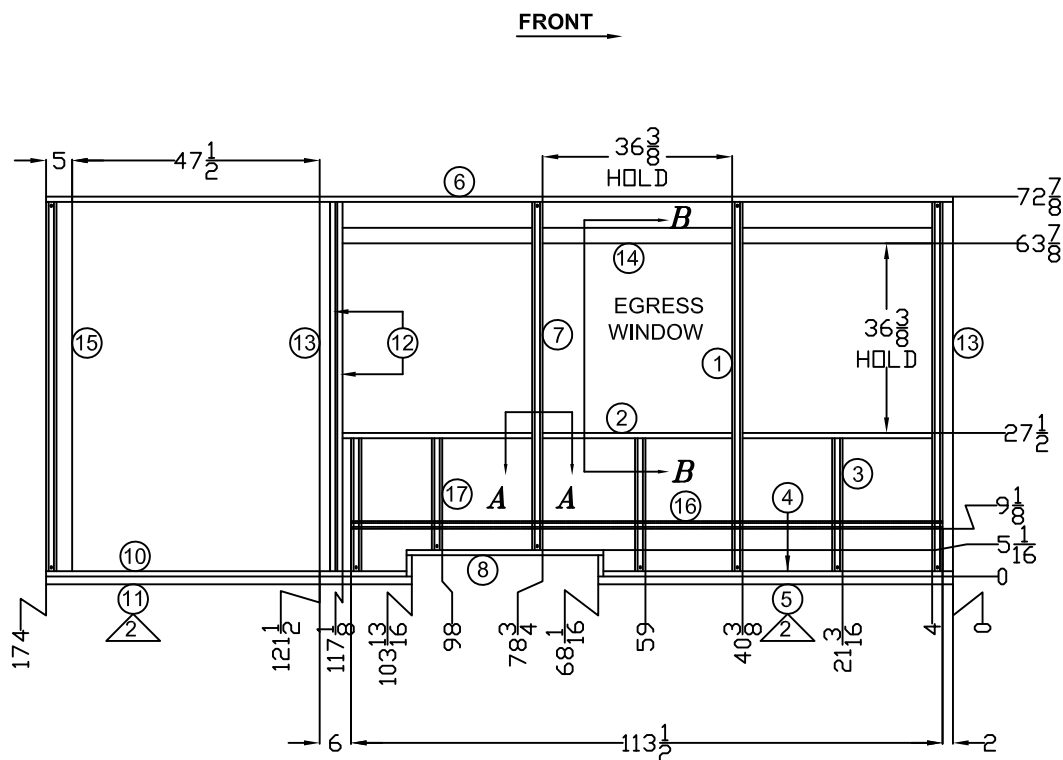
TOLERANCE UNLESS
OTHERWISE SPECIFIED
± .00 ± .030
± .000 ± .015
± .0000 ± .005

DATE: 10/08/10
DFTSN: MDK
CHKR:
APRVD:

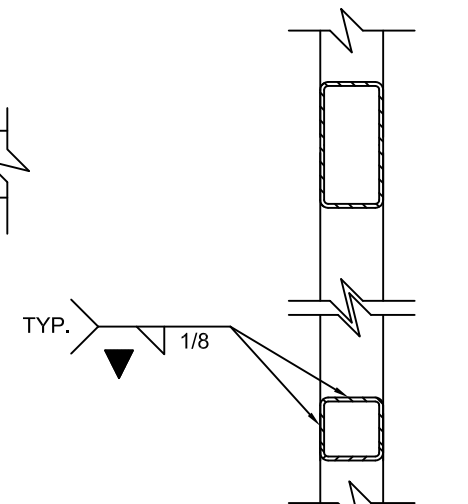
TITLE
**Frame, Details Roof, 2011
SENATOR 2**
DWG. No.
32-13-0017-10
SCALE
DISK No.
SHEET 2 OF 2

▼ CRITICAL CONTROL ITEM

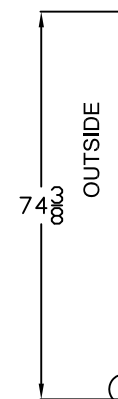
USAGE: FORD 158"WB/MODEL 24



SECTION A-A



SECTION B-B



STEEL ANGLE

NOTES:

- 1- DRAWING VIEWED FROM EXTERIOR SIDE OF UNIT.
- 2- ANGLE TO BE WELDED FLUSH WITH OUTSIDE EDGE OF WALL.

9	0		TUBE: 16ga. x 1" x 1" x 24-3/8"Lg. A-513
8	1		FRAME, SIDEWALL WHEEL WELL FORD
7	1	02062351	WALL BOW: 18ga. x 1" x 2" x 66-13/16"Lg. A-513
6	1	02071055	TUBE: 16ga. x 1" x 1" x 174"Lg. A-513
5	1	02071056	ANGLE: 11ga. x 1-1/2" x 2" x 68-1/16"Lg. A-513
4	1	02071055	TUBE: 16ga. x 1" x 1" x 67-1/16"Lg. A-513
3	3	02062351	WALL BOW: 18ga. x 1" x 2" x 25-1/2"Lg. A-513
2	3		TUBE: 16ga. x 1" x 1" x 36-3/8"Lg. A-513
1	4	02062351	WALL BOW: 18ga. x 1" x 2" x 70-7/8"Lg. A-513
REF. No.	QTY.	PART No.	MATERIAL DESCRIPTION

17	1		WALL BOW: 18ga. x 1" x 2" x 21-7/16"Lg. A-513
16	1		SEAT TRACK: 113-1/2"Lg.
15	1		TUBE: 16ga. x 1" x 3" x 70-7/8"Lg. A-513
14	3		TUBE: 16ga. x 1" x 3" x 36-3/8"Lg. A-513
13	2		TUBE: 18ga. x 1" x 2" x 70-7/8"Lg. A-513
12	2	02071055	TUBE: 16ga. x 1" x 1" x 70-7/8"Lg. A-513
11	1	02071056	ANGLE: 11ga. x 1-1/2" x 2" x 70-3/16"Lg. A-513
10	1	02071055	TUBE: 16ga. x 1" x 1" x 69-3/16"Lg. A-513

REF. No.	QTY.	PART No.	MATERIAL DESCRIPTION
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REV.
LET.

DESCRIPTION OF CHANGE

BY

CHK

DATE

ECN No.

TOLERANCE UNLESS
OTHERWISE SPECIFIED
± .00 ± .030
± .000 ± .015
± .0000 ± .005

DATE: 10/08/10
DFTSN: MKLINE
CHKR:
APRVD:

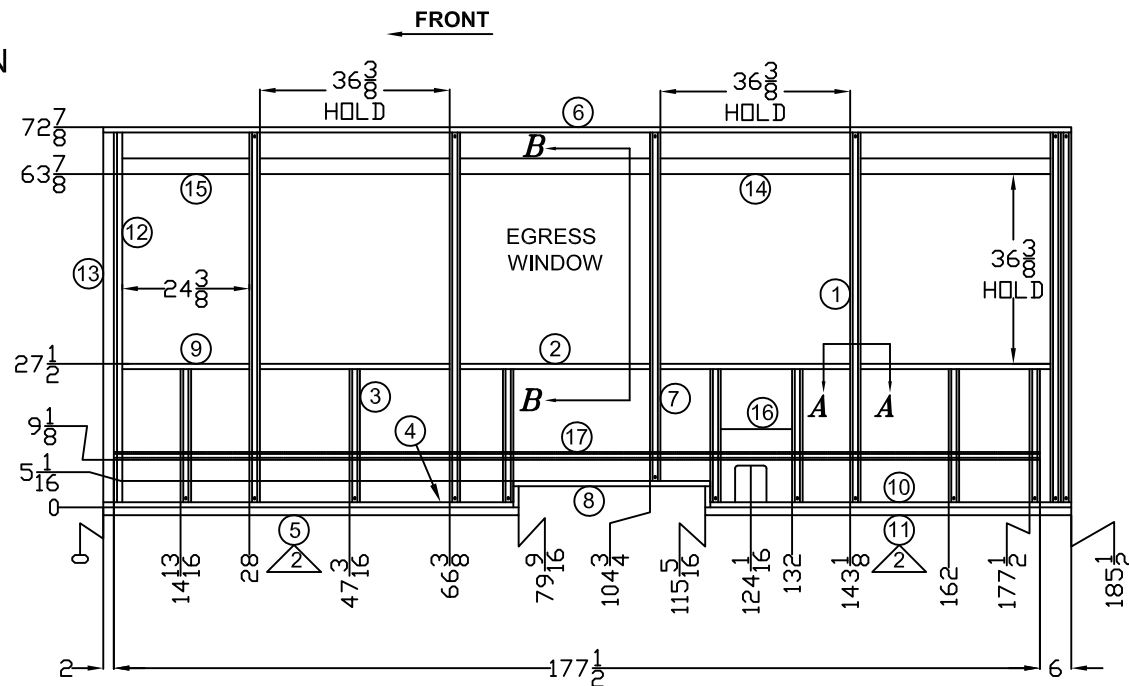
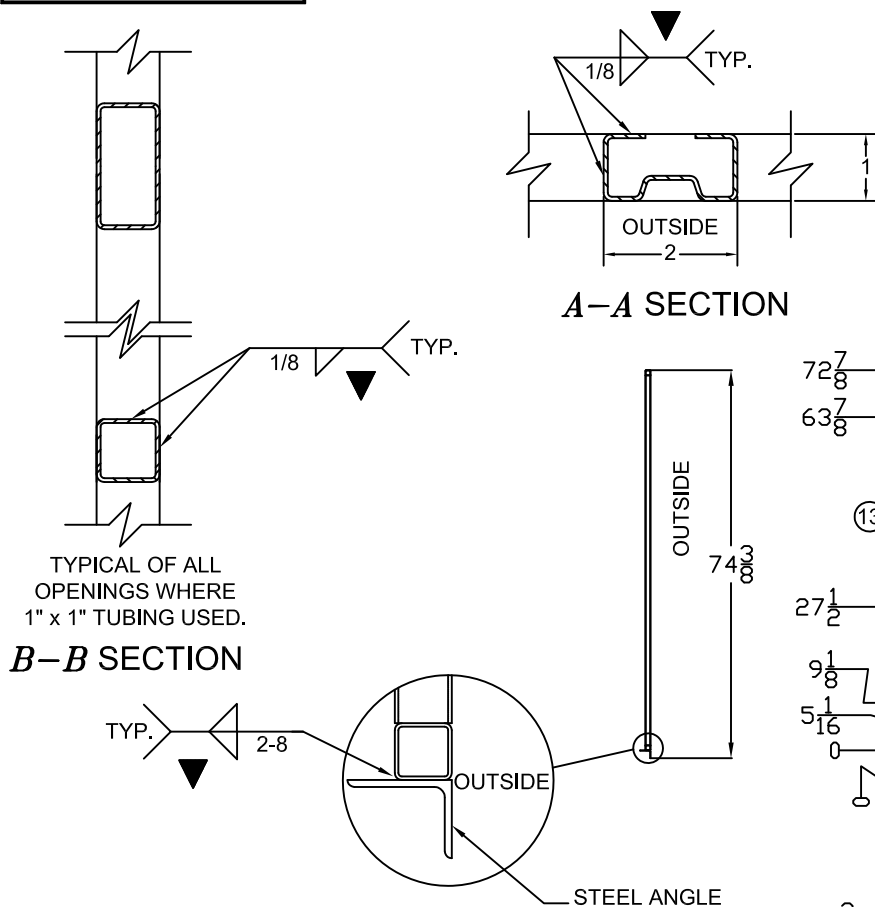
TITLE
158" WB MODEL 24, PASSENGER SIDEWALL,
REAR LIFT, STANDARD FLOOR
DWG. No. 32-13-0009-10
SCALE
DISK No. SHEET 1 OF 1

▼ CRITICAL CONTROL ITEM

USAGE: FORD 158"WB/MODEL 24

NOTES:

- 1- DRAWING VIEWED FROM EXTERIOR SIDE OF UNIT.
- 2- ANGLE TO BE WELDED FLUSH WITH OUTSIDE EDGE OF WALL.



9	1		TUBE: 16ga. x 1" x 1" x 24-3/8"Lg. A-513
8	1		FRAME, SIDEWALL WHEEL WELL FORD
7	1	02062351	WALL BOW: 18ga. x 1" x 2" x 66-13/16"Lg. A-513
6	1	02071055	TUBE: 16ga. x 1" x 1" x 185-1/2"Lg. A-513
5	1	02071056	ANGLE: 11ga. x 1-1/2" x 2" x 79-9/16"Lg. A-513
4	1	02071055	TUBE: 16ga. x 1" x 1" x 78-9/16"Lg. A-513
3	7	02062351	WALL BOW: 18ga. x 1" x 2" x 25-1/2"Lg. A-513
2	4		TUBE: 16ga. x 1" x 1" x 36-3/8"Lg. A-513
1	5	02062351	WALL BOW: 18ga. x 1" x 2" x 70-7/8"Lg. A-513
REF. No.	QTY.	PART No.	MATERIAL DESCRIPTION

17	1		SEAT TRACK: 177-1/2"Lg.
16	1		FUEL FILL BACKER BOARD
15	1		TUBE: 16ga. x 1" x 3" x 24-3/8"Lg. A-513
14	4		TUBE: 16ga. x 1" x 3" x 36-3/8"Lg. A-513
13	1		TUBE: 18ga. x 1" x 2" x 70-7/8"Lg. A-513
12	1		TUBE: 18ga. x 1" x 1" x 70-7/8"Lg. A-513
11	1	02071056	ANGLE: 11ga. x 1-1/2" x 2" x 70-3/16"Lg. A-513
10	1	02071055	TUBE: 16ga. x 1" x 1" x 69-3/16"Lg. A-513

REF. No.	QTY.	PART No.	MATERIAL DESCRIPTION
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REV.
LET.

DESCRIPTION OF CHANGE

BY

CHK

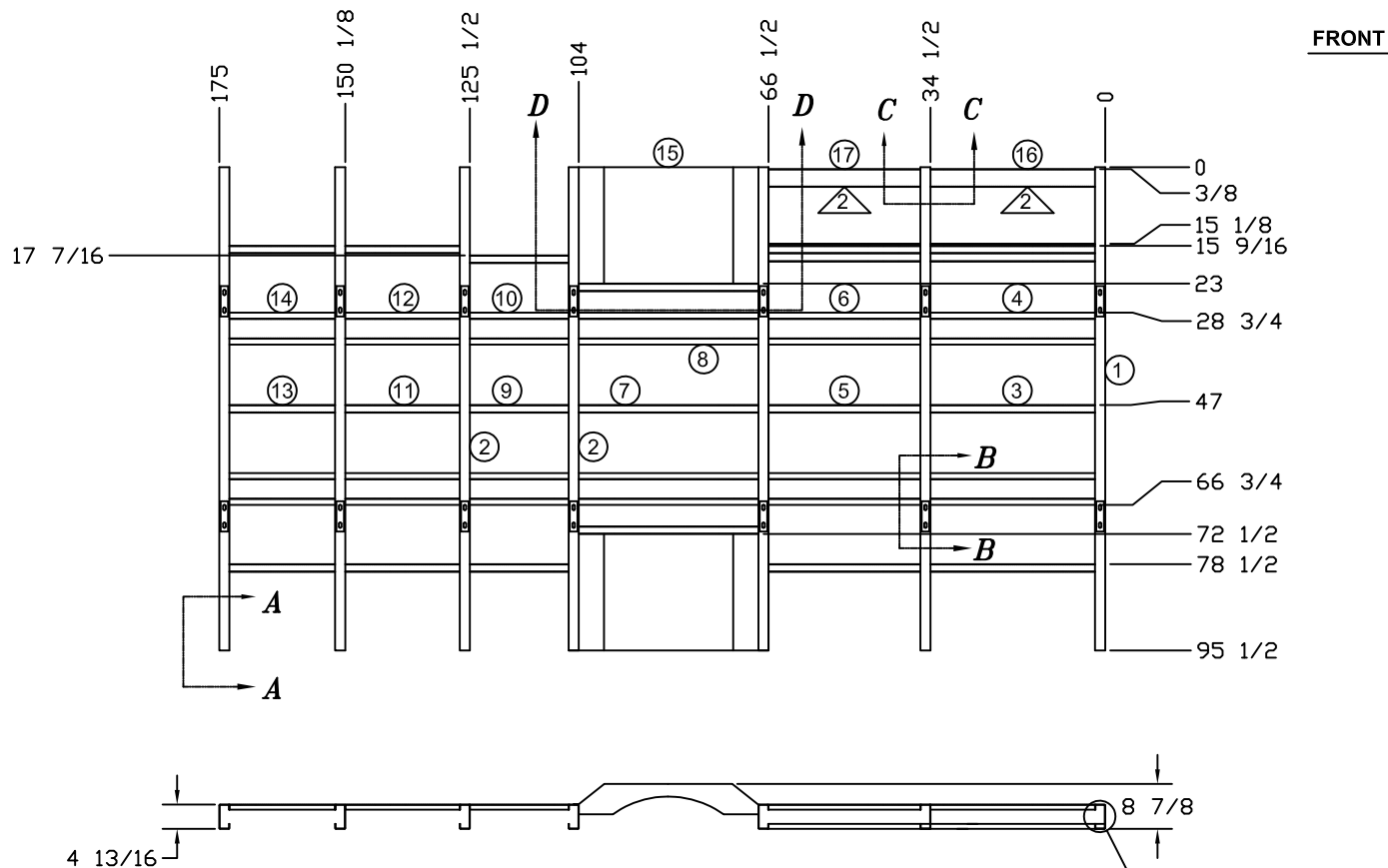
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ECN No.

TOLERANCE UNLESS
OTHERWISE SPECIFIED
±.00 ±.030
±.000 ±.015
±.0000 ±.005

DATE: 10/08/10
DFTSN: MKLINE
CHKR:
APRVD:

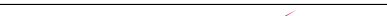
TITLE
158" WB MODEL 24, DRIVERS SIDEWALL,
ALL PASSENGER
DWG. No.
32-13-0001-10
SCALE
DISK No.
SHEET 1 OF 1



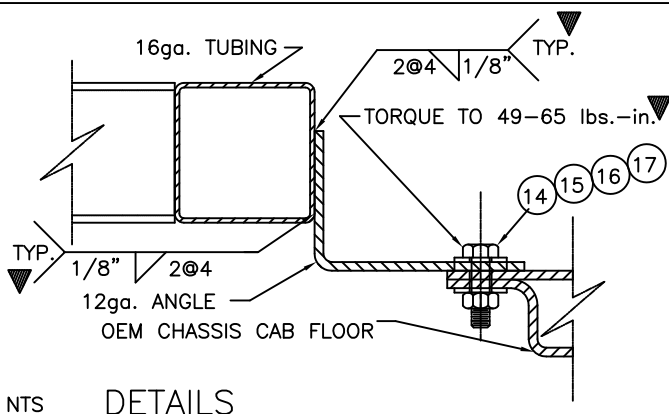
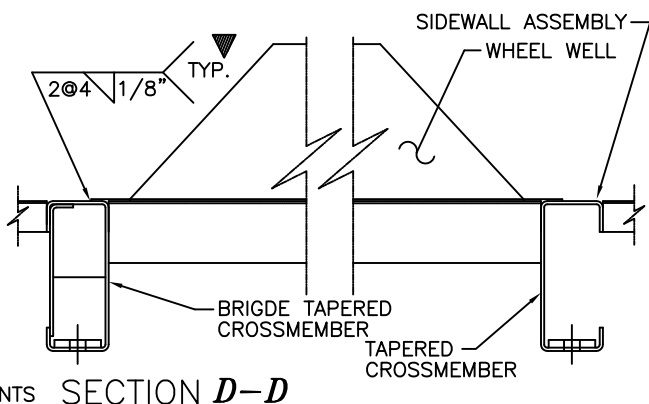
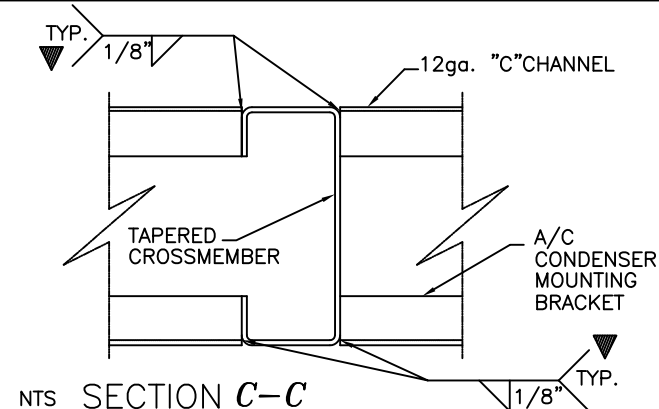
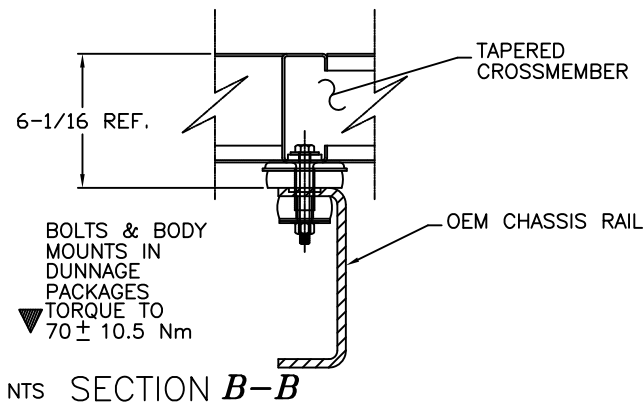
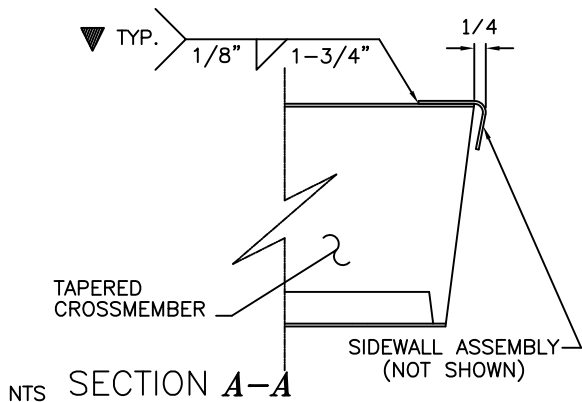
NOTES:

- 1- DRAWING VIEWED FROM INTERIOR SIDE OF UNIT.
- 2- LOCATION OF A/C BRACKETS: ONE MOUNT FLUSH WITH OUTSIDE EDGE OF CROSSMEMBER. THE OTHER MOUNTS 14-3/4" FROM OUTSIDE EDGE OF CROSSMEMBER.
- 3- SEE SHEET 2 OF 2 FOR DETAILS, TORQUE SPECIFICATIONS, SECTION VIEWS AND CUT LIST.

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							TOLERANCE UNLESS OTHERWISE SPECIFIED	WOOD	<div> TITLE Frame, Floor Ford 158" Wheel Base 175" Body</div>				
								+ 1/8"					
								+ 1°					
								OTHER					
A	RELEASED TO PRODUCTION					EF		1/17/06		+ 1/16"	DATE: 08/02/12	SCALE: 1	SHEET 1 OF 2
REV. LET.	DESCRIPTION OF CHANGE					BY	CHK	DATE	ECN No.	+ 1/2"	DFTSN: MDK	CHKR:	DWG. No.31-08-0016-12

▼ CRITICAL CONTROL ITEM

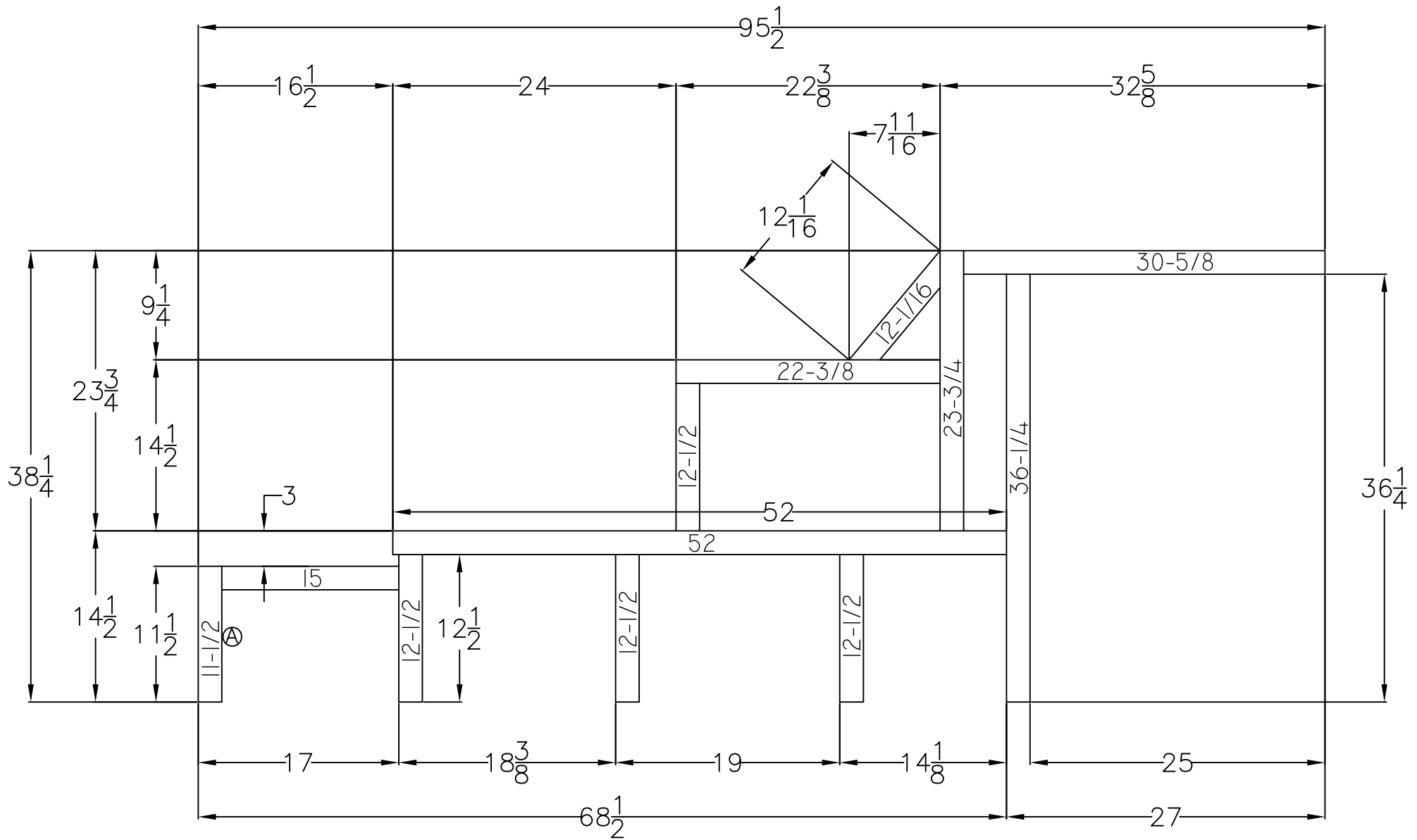


USAGE: 2012 FORD 158" WHEEL BASE, 175"BODY

17	7		"C" CHANNEL: 16ga. x 1" x 3-1/2" x 30"Lg.
16	7		"C" CHANNEL: 16ga. x 1" x 3-1/2" x 32-1/2"Lg.
15	2		WHEEL WELL WIDE BODY
14	2		HAT CHANNEL: 16ga. x 1" x 6-5/16" x 20-7/8"Lg.
13	3		"C" CHANNEL: 16ga. x 1" x 1-1/2" x 20-7/8"Lg.
12	2		HAT CHANNEL: 16ga. x 1" x 6-5/16" x 22-5/8"Lg.
11	3		"C" CHANNEL: 16ga. x 1" x 1-1/2" x 22-5/8"Lg.
10	2		HAT CHANNEL: 16ga. x 1" x 6-5/16" x 19-1/2"Lg.
9	3		"C" CHANNEL: 16ga. x 1" x 1-1/2" x 19-1/2"Lg.
8	2		HAT CHANNEL: 16ga. x 1" x 6-5/16" x 35-1/2"Lg.
7	3		"C" CHANNEL: 16ga. x 1" x 1-1/2" x 35-1/2"Lg.
6	2		HAT CHANNEL: 16ga. x 1" x 6-5/16" x 30"Lg.
5	3		"C" CHANNEL: 16ga. x 1" x 1-1/2" x 30"Lg.
4	2		HAT CHANNEL: 16ga. x 1" x 6-5/16" x 32-1/2"Lg.
3	3		"C" CHANNEL: 16ga. x 1" x 1-1/2" x 32-1/2"Lg.
2	2		Bridged Crossmember: 14ga. x 2 x 4-13/16 x 95-1/2
1	5		Crossmember: 14ga. x 2 x 4-13/16 x 95-1/2
REF. No.	QTY.	PART No.	MATERIAL DESCRIPTION

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MAT'L-16GA. 2" x 2" TUBE

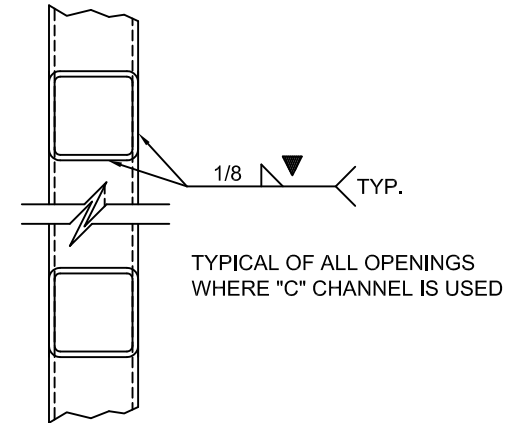
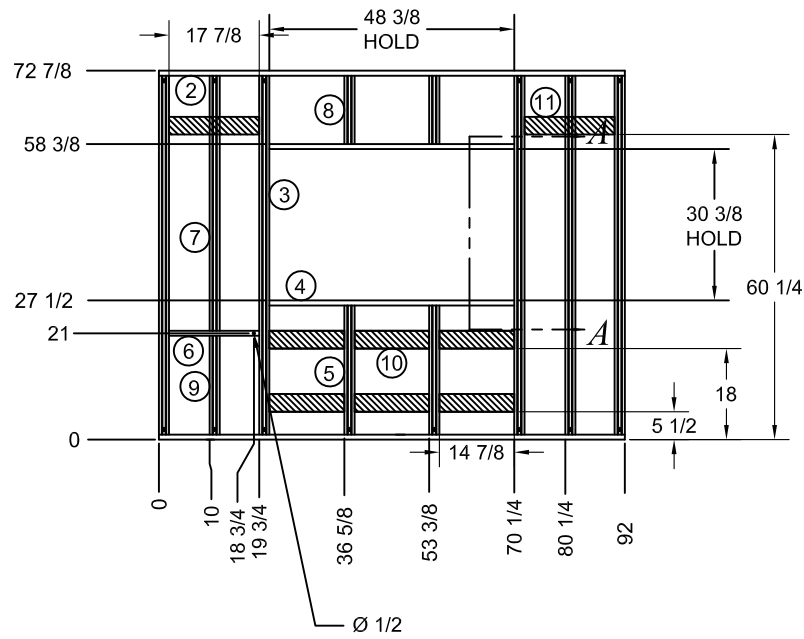
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A	SHORTENED TUBE 5/16"	MDK		6/14/10	
REV.	DESCRIPTION OF CHANGE	BY	CHK	DATE	ECN No.
LET.					

					
DATE: 06/10/10		TITLE: 2011 ALLSTAR NEW STYLE FALSE FLOOR			
DFTSN: MKLINE		CHKR:		DWG. No. 31-28-0534-10	
TOLERANCE UNLESS OTHERWISE SPECIFIED		APRVD:		SCALE	
±.00 ±.030				DISK No.	
±.000 ±.015				SHEET 1 OF 1	
±.0000 ±.005					

CRITICAL CONTROL ITEM

USAGE: ALLSTAR W/ REAR EGRESS WINDOW




SECTION A-A

NOTES:

1- DRAWING VIEWED FROM EXTERIOR SIDE OF UNIT.

11	2		STEEL PLATE: 11ga. x 3 1/2" x 17-7/8"Lg. A-513
10	6		STEEL PLATE: 11ga. x 3 1/2" x 14-3/4"Lg. A-513
9	1	02062351	WALL BOW: 18ga. x 1" x 2" x 19"Lg. A-513
8	2	02062351	WALL BOW: 18ga. x 1" x 2" x 12-7/8"Lg. A-513
7	1	02062351	WALL BOW: 18ga. x 1" x 2" x 50-7/8"Lg. A-513
6	1	02071055	TUBE: 16ga. x 1" x 1" x 17-3/4"Lg. A-513
5	2	02062351	WALL BOW: 18ga. x 1" x 2" x 25-1/2"Lg. A-513
4	2	02071055	TUBE: 16ga. x 1" x 1" x 48-3/8"Lg. A-513
3	5	02062351	WALL BOW: 18ga. x 1" x 2" x 70-7/8"Lg. A-513
2	2	02071055	TUBE: 16ga. x 1" x 1" x 92"Lg. A-513
1			

REF. No.	QTY.	PART No.	MATERIAL DESCRIPTION
			
		DATE: 09/20/10	TITLE
		DFTSN: MDK	Frame, Rear Wall With 30" x 48" Window
		CHKR:	DWG. No.
		APRVD:	31-28-0003-05
		SCALE	
		DISK No.	SHEET 1 OF 1

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REV.	DESCRIPTION OF CHANGE	BY	CHK	DATE	ECN No.
A	ADDED 11ga. STRAP STEEL REINFORCEMENT FOR BAGS AND RESTRAINTS			10/29/13	
LET.					

TOLERANCE UNLESS
OTHERWISE SPECIFIED
± .00 ± .030
± .000 ± .015
± .0000 ± .005

UNDERCOAT PROCESS INFORMATION

Forest River Bus includes an undercoat application with every vehicle produced. The undercoating protects the unit's most exposed areas from moisture, dirt, grime, salt and other weather-related elements. Trained technicians within two undercoating bays apply the undercoating.

Each vehicle is raised using a drive-on ramp lift system in one of the two undercoating bays. Various areas of the body conversion are masked off including, but not limited to: fuel fills, mud flaps, wheel wells, etc. A rust preventative is also added to the bottom edge of the metal skirts if applicable. A spray foam is applied for additional noise reduction as well as body seam sealing. The underbody is then sprayed with a tough, pliable, corrosion protectant material, which incorporates a sound-deadening property at a pressure of 40 psi. The application runs between 45 minutes to 1.5 hours pending vehicle length.

Forest River Bus follows the strict guidelines established by QVM. No undercoating is sprayed within 12" of the exhaust system or on fuel tank(s), brake lines, AC/heater hoses, heat shield, wire harnesses, driveshaft(s), rear suspension or OEM frame rail.

Undercoating data is available upon request.



FOREST RIVER BUS

2367 Century Drive • Goshen, Indiana 46528 • 800.348.7440 • www.forestriverinc.com

CHARLOTTE

Class 1 LED Low Profile Beacon



The Charlotte Class 1 LED beacon produces a superior warning signal that promotes safety in all work environments. A perfect solution for all commercial vehicles that are looking for a traditional strobe style beacon with the latest LED technology. This low-profile model in the series is available in both amber and white and comes standard with an adhered base gasket that assures a water-tight seal to your vehicle. A center drop wire and a traditional 3-hole screw mount make installation quick and easy. Each Charlotte beacon has four flash patterns to choose from.

FEATURES

- 2 beacons in the series
- Plug & play compatible with existing 3-hole beacon mounting patterns
- Center drop wire for ease of installation
- Best-in-class optics provides light output that meets SAE J845 Class 1 requirements
- 360 degree illumination provides outstanding visibility from all angles
- Adhered base gasket assures water-tight seal to the vehicle without the use of sealants



FLASH PATTERNS

1. Double*
2. Triple*
3. Quad*
4. Rotating

SPECIFICATIONS

INPUT VOLTAGE RANGE

10-30 VDC

CURRENT DRAW

1.35/1.85A (min/max)

LED COUNT

12

FLASH PATTERNS

4

OPERATING TEMPERATURE

-40° C to +65° C

DIMENSIONS

Height – 3.19"

Diameter – 6.7"

MOUNTING

Permanent (screw)

Adhered EVA gasket

CERTIFICATIONS

SAE J845/J2139 CLASS 1





FMVSS/CMVSS 108

IP Code IP67

WARRANTY

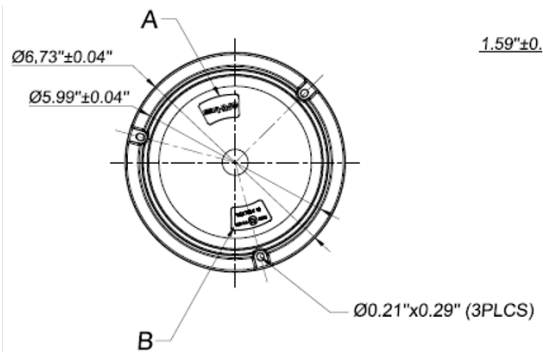
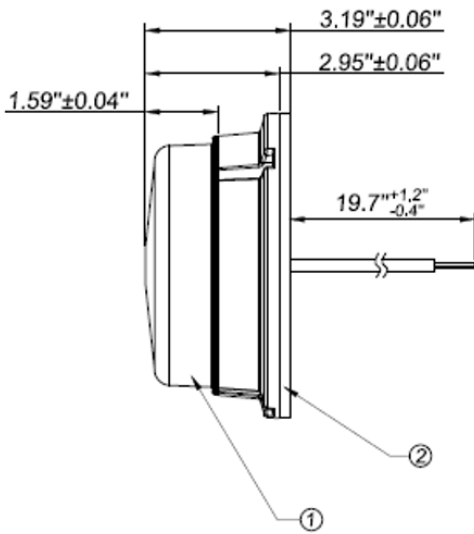
5 YEAR

OPTIONS

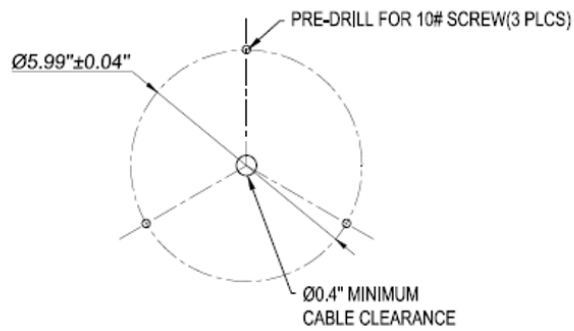
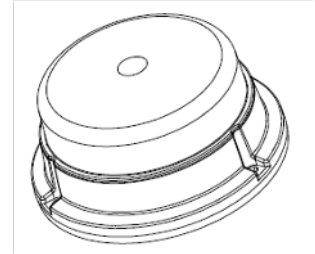
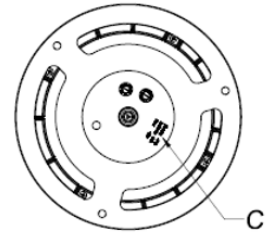
LENS	LED	MOUNT	CONNECTOR
 AMBER	 AMBER	SCREW	CABLE
 CLEAR	 WHITE	SCREW	CABLE

* SAE J845 Class 1 Compliant

CHARLOTTE LOW PROFILE BEACON INSTALLATION AND MODEL SELECTION



1.59"±0.



PART NUMBER	MOUNT	LENS / LED	CONNECTOR
100BC0004	SCREW	AMBER / AMBER	CABLE
100BC0003	SCREW	CLEAR / WHITE	CABLE

LEARN MORE

To learn more about the Charlotte Series LED Beacon, please visit our website at www.opti-luxx.com or call (616) 379-4142. Also, see our lighting products in action by following our YouTube channel.



Follow us on YouTube to see more Opti-Luxx products in action, including available flash patterns!





TA7722 Super (2) 10, Basic

Total System General BTU/hr: 120K

A complete Trans/Air system consisting of (1) TA77 Evaporator, (2) SMC2S Skirt Mount Condensers, and (2) 10 cid Compressors, installed separately from the OEM chassis compressor & dash evaporator with Basic Controls and a Trans/Air supplied mount kit.

Quality System: Trans/Air Manufacturing is registered to ISO9001:2015 by an accredited auditor.

Evaporator: **TA77**
Capacity: 61,190 (SAE) to 100,930 (IMACA) Btu/hr
Cooling Coil: (2) coils with raised lance aluminum fins on 3/8" rifled copper tubes
Expansion Valve: (2) 4 ton externally equalized thermostatic type
Blower Assembly: (3) 4.5 in diameter dual wheels
Total Blower Air Flow: 2220 ft³/min (3772 m³/hr) @ 0 Static
Motors: High performance double shaft, permanent magnet
Amperage: 20.0 A @ 13.5 Vdc / 10 A @ 27 Vdc
Housing: Galvannealed steel with ABS cover
Specification: All interior components shall meet FMVSS 302 for fire retardant specifications.

Condenser: **SMC2S Microchannel** (Skirt Mount)
Capacity: 48,364 (SAE) to 59,112 (IMACA) Btu/hr
Coil: Aluminum microchannel, 330 in² (2129 cm³) face area
Fan Assembly: (2) low profile, surface mounted 10 in diameter fans
Motor Type: Closed, permanent magnet
Amperage: 21.3 A @ 13.5 Vdc / 10.7 A @ 27 Vdc
Total Fan Air Flow: 1844 ft³/min (3133 m³/hr) @ 0 static
Filter Drier: 16 in³, R-134A compatible
Sight Glass: Moisture indicator, visible from outside of vehicle
Housing: Powder-coated galvannealed steel

Electrical Controls: **Basic II**
Fan Controls: 3 speed rotary switch @ driver
Temp Controls: Rotary manual switch @ driver
Protection: Fused main power distribution with individually fused motor.
Wiring: Color coded in fire retardant loom
Specification: All wiring and electrical controls shall meet SAE J1292 electrical specifications.

Hose/Fittings: **Trans/Air SAE J2064:**
Fittings: Steel with corrosion resistive coating, (2) grooves, and stainless-steel clips.
Hose: Type C with Butyl cover, Poly-amide barrier, rubber lining.
Specification: Exceeds SAE J2064 hose fitting integrity specification.

Compressor: **10 CID**
Protection: High/low pressure switches.
Specification: Mounts shall meet SAE J637 belt alignment specifications.

Warranty: **3 years**
Mileage: Unlimited
Inception: Date of in-service
Dealer demo: 6 month, 6000 miles
Coverage: All components and installation if installation is provided by Trans/Air.



TARABUS NT Specification Sheet

Product description and composition:

- The flooring shall be specially designed for buses.
- The flooring shall be flexible PVC flooring in 2.25 mm thickness, composed of a compact plasticized wear layer.
- The wear layer shall contain inlaid silicon carbide particles to improve slip resistance.
- The wear layer shall not contain aluminium oxide particles or quartz granules to prevent from maintenance and cleaning issues.
- The wear layer shall not contain fillers (fillers<5phr).
- The design shall be inlaid through the whole thickness of the wear layer.
- The intermediate layer of the flooring shall be made of a glass fibre grid, providing outstanding dimensional stability: $\leq 0.2\%$ according to EN 434.
- The flooring shall have a special textile backing designed for public transport vehicles, to enable bonding with acrylic glues onto plywood substrates or plywood with phenolic film substrates or aluminium.
- The flooring shall not crack and no white line shall appear when bended by 180 degrees.
- The welding rods shall be manufactured by the flooring manufacturer to enable a perfect weld.

Environment:

- The flooring shall be free from heavy metals (Lead, Cadmium, Barium, Tin, Chromium...).
- The flooring shall be free from DEHP plasticizer.
- The manufacturer of the floor covering must be in possession of a valid ISO 14001 certificate.

Technical characteristics:

- Fire class: the flooring material shall conform to the European Directive 95/28/EC
- Fire class: the flooring material shall conform to the FMVSS/CMVSS 302
- Fire class: the flooring shall have been tested to UTAC ST 18502/1 (Type A) and ISO 3795/76 (0mm/mn)
- Fire class: the flooring shall obtain CRF>0.50 W/cm² when tested according to NFPA 253 – ASTM E648
- The manufacturer of the floor covering must be in possession of a valid quality systems certificate, showing compliance with ISO 9001.

Installation:

- All joints must be welded using a hot welding gun and PVC welding rods. To ensure the right watertightness of the flooring system, no sealant shall be used between 2 flooring sheets.



Warranty Registration

TO REGISTER YOUR PRODUCT WARRANTY under the terms of Gerflor's North America Limited Product Warranty, please complete the form below and mail to:

Gerflor USA Inc
595 Supreme Dr
Bensenville 60106 IL USA.

I acknowledge having received and read GERFLOR's technical documents and specifications concerning the product warranty:

Product Type: _____

Roll numbers & Quantity (sq.yds/m²): _____

Installation Date: _____

Transit Authority: _____

Address: _____

State/Prov: _____ Zip/Postal Code: _____

OEM: _____

Address: _____

State/Prov: _____ Zip/Postal Code: _____

Represented by: _____

Signature: _____

TARABUS PRODUCT WARRANTY



TARABUS
TREND BOOK



TARABUS FLOORCOVERINGS LIMITED WARRANTY AGREEMENT

Warranty Terms and Conditions

GERFLOR, as a manufacturer, expressly warrants that TARABUS floorcoverings for buses and coaches are conform to the technical data sheet in force at the time of delivery.

GERFLOR further expressly warrants that the wear layer of TARABUS floorcoverings shall be free from defects in material for **12 years (twelve years)** from the date of sale, provided such floorcoverings are exclusively subject to normal use and service, and are installed and maintained in accordance exactly with GERFLOR's recommendations that the buyer declares to be aware of.

The wear layer consists of the material above the glass fiber web in the floorcovering. GERFLOR expressly warrants that the glass fiber web will not appear in the floorcovering for **12 years (twelve years)** from the date of sale.

This entire warranty will become null and void if conditions of the subflooring and method of installation do not conform exactly to GERFLOR's specifications.

This entire warranty does not cover damage caused, in whole or in part, by conditions beyond the control of GERFLOR, including but not limited to:

- Use for which material is not designated.
- Fire, explosion, or natural disasters.
- Faulty installation
- Casualties
- Ordinary wear and tear
- Abuse
- Faulty design or construction of the vehicles.
- Failure of the adhesive to adhere to the subfloor because of presence of moisture.
- Fault in the subfloor.
- Failure of the welding



- Uneven wear of sections of the floorcovering.
- Alteration of the initial appearance of the floorcovering, particularly in high traffic areas exposed to extreme heavy wear.
- Damage caused by negligent or improper maintenance procedures and other causes not specified but beyond the control of GERFLOR.
- Fading or discoloration from sunlight or heat.
- Mechanical damages, burns, chemical soiling or damage due to clamp or inadequate cleaning, not recommended by GERFLOR.

The presence of moisture between the TARABUS and the subfloor shall be considered proof of subfloor failure or faulty design or construction.

This warranty will be applied only if the product is admitted to be the only cause of disorder.

The sole and exclusive remedy against GERFLOR arising from the purchase or use of TARABUS is limited to supply of material in replacement of the sole defective part of material (after examination, verification and approval by GERFLOR) with material of equivalent quality –(colour shade between brand new material and existing one will be accepted by the owner)-. All other compensation of whatever nature will be excluded.

If the claim is accepted by GERFLOR, with respect to the warranty of the wear layer, for the first 2 (two) years from the date of sale, GERFLOR will supply the material, in replacement of defective one, free of charge. More than 2 (two) years from the date of sale, until the expiration of this express warranty of the wear layer, a depreciation of 7% (seven per cent) per year of the cost of supplied material will apply.

WARRANTY AND LIABILITY LIMITS

THE ABOVE EXPRESSED MANUFACTURER'S WARRANTY SHALL BE THE EXCLUSIVE WARRANTY AND LIMITED TO THE QUALITY OF THE PRODUCT, AND GERFLOR MAKES NO OTHER WARRANTIES. GERFLOR EXPRESSLY DISCLAIMS ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND IMPLIED WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE.

IT IS AGREED THAT GERFLOR SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, including but not limited to, loss of income, loss of use, damage to other property, the cost of removing and reinstalling TARABUS floorcoverings, attorney's fees, and any liability you may have with respect to any other person.



TIME LIMIT FOR PLACING A CLAIM

To be admissible, all claims by means of this warranty contract must be carried out by **registered letter with return receipt** addressed to GERFLOR, at the address indicated at the top of this warranty contract, **accompanied by the purchase invoice** for the Product, within THIRTY DAYS following finding of irregularities and within the aforementioned warranty contract time limit. If any clauses of this Warranty Agreement conflicted with the law or a given jurisdiction, only said clause would be considered inapplicable, the remaining text of the Agreement remaining unaffected.

This Limited Warranty shall be governed and construed in accordance with the laws of the State of Illinois without regard to any choice of law principles: All disputes that may arise between You and GERFLOR relating in any way to this Limited Warranty Agreement, to the extent such disputes cannot be resolved by negotiation between You and GERFLOR, shall be decided by arbitration carried out in accordance with the Federal Arbitration Act and the Commercial Arbitration Rules of the American Arbitration Association. In the event of such a dispute, arbitration may be initiated by a request for arbitration by either party hereto addressed to the other party, and shall be completed within sixty (60) days of such request unless extended because of unavailability of an arbitrator or other events beyond the control either party. The arbitrator shall be chosen by mutual agreement of the parties and, in the event the parties cannot so agree, either party may file a written application to have the arbitrator designated by the American Arbitration Association. The arbitration proceeding shall take place in Chicago, Illinois or such other location as the parties shall agree and shall be conducted in accordance with the Commercial Arbitration "Expedited" Rules of the American Arbitration Association. The arbitrator shall have all powers necessary to determine the issues presented, including without limitation, but subject to the terms of this Limited Warranty, any damages. The decision of the arbitrator shall be final and conclusive, both as to costs and the merits, and the parties agree that they shall be bound by this decision.





NEW

**THE LIGHTEST
THE STRONGEST
FLOORING**

WEIGHT REDUCTION



TARABUS

BUS & COACH FLOOR COVERINGS

Gerflor®
theflooringgroup

GAYA WOOD Noma



8297 Yosemite

NT



GAYA WOOD Walnut

GAYA WOOD Walnut



6057 Everglades

NT



4521 Yellowstone

MK

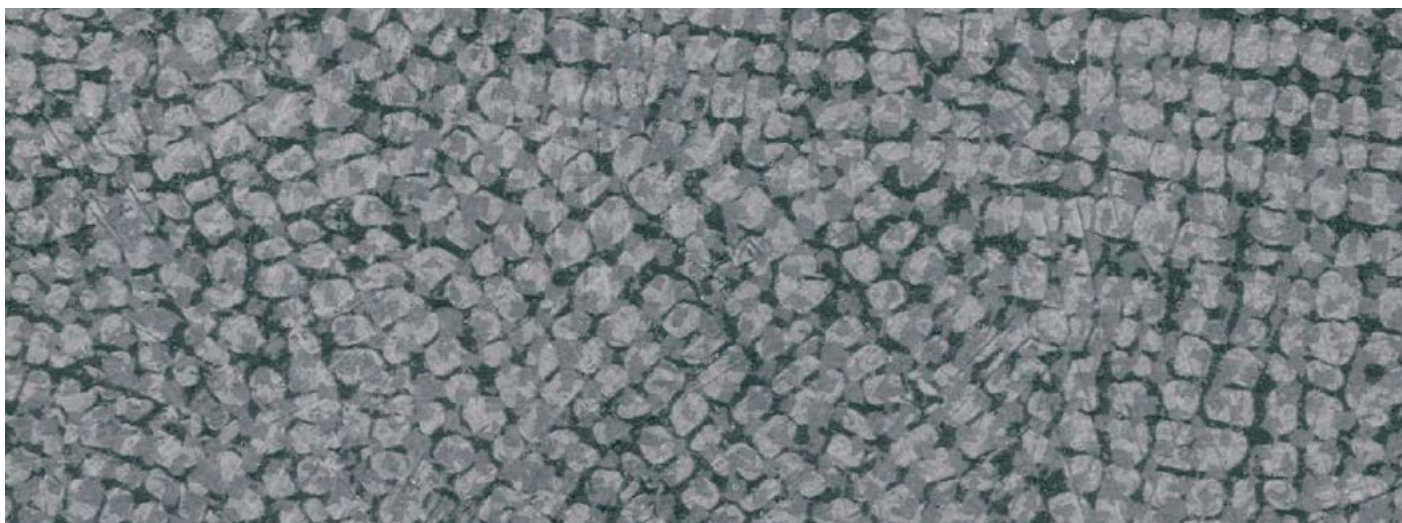
NT



3724 Kruger

NT

GAYA MOSAIC



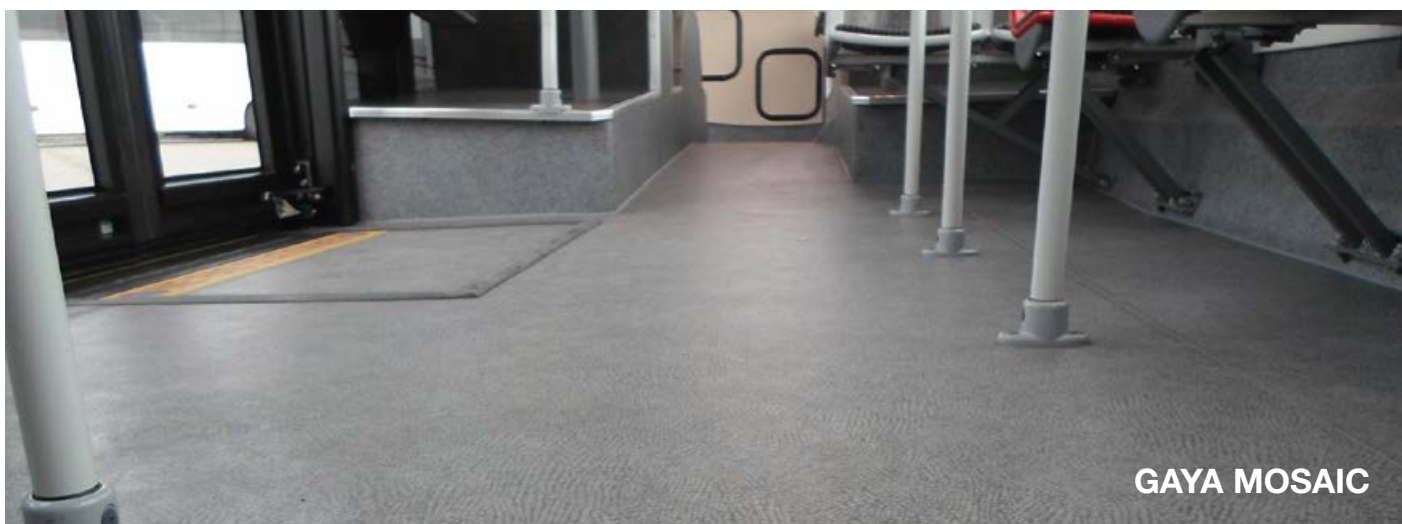
4482 Babel

NT



4519 Galata

NT



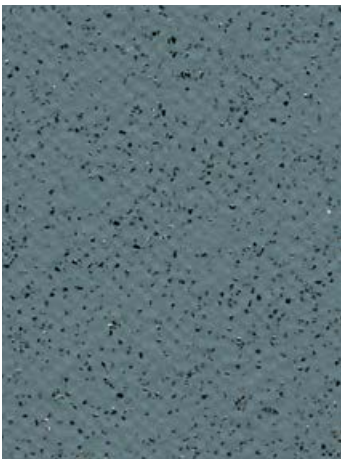
GAYA MOSAIC

SIRIUS



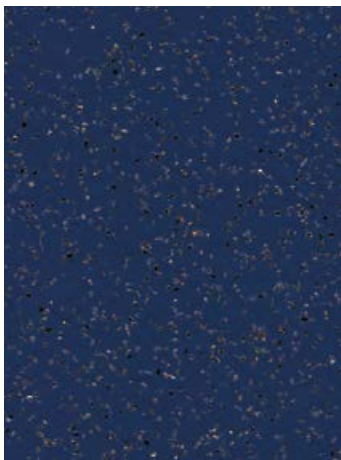
6768 Griffon

NT



6782 Dune

NT



6451 Corsaire

NT



6727 Anthracite

NT



6801 Graphite

NT

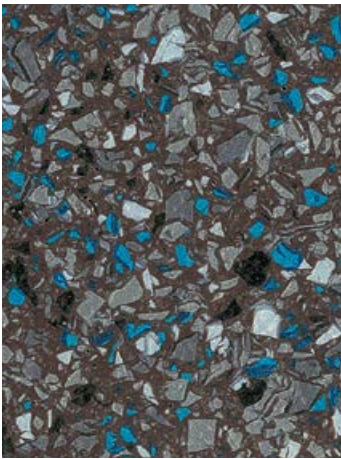
APOLLO



4776 Masan

MK

NT



4479 Kilimanjaro

MK

NT

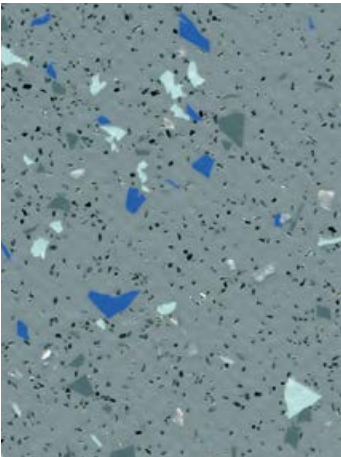


4517 Fuji

MK

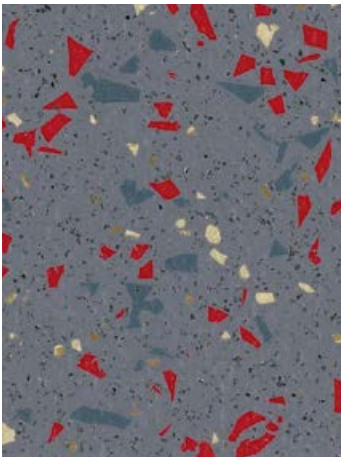
NT

HELIOS



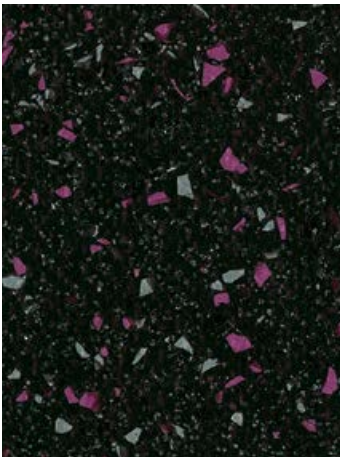
MK
NT

8804 Selenium



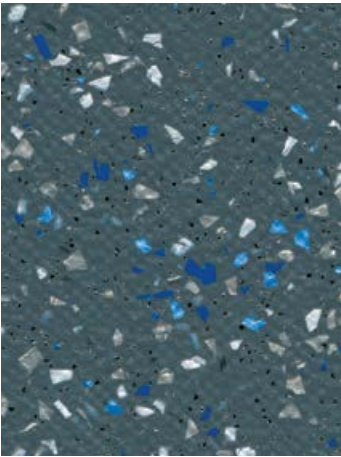
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4483 Dubnium



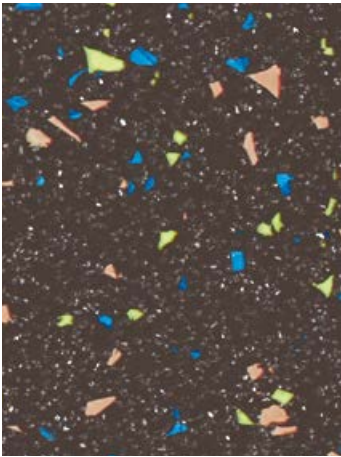
MK
NT

3740 Indium



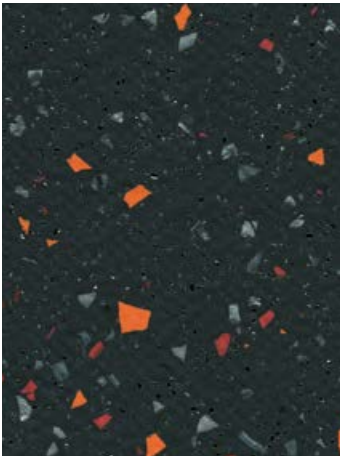
MK
NT

8805 Palladium



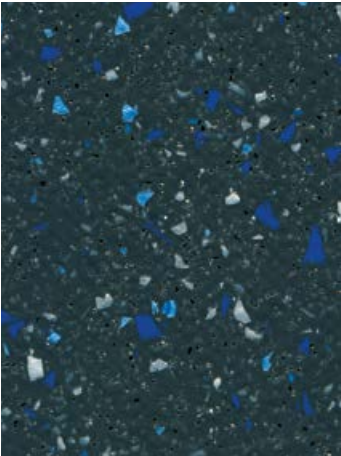
MK
NT

8031 Samarium



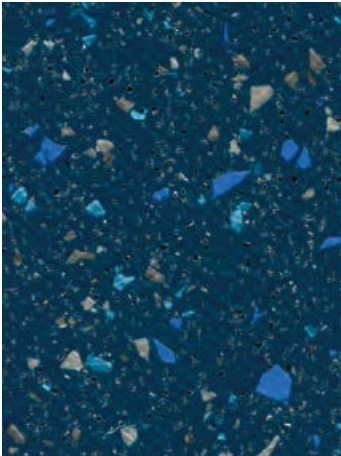
MK
NT

8803 Gallium



MK
NT

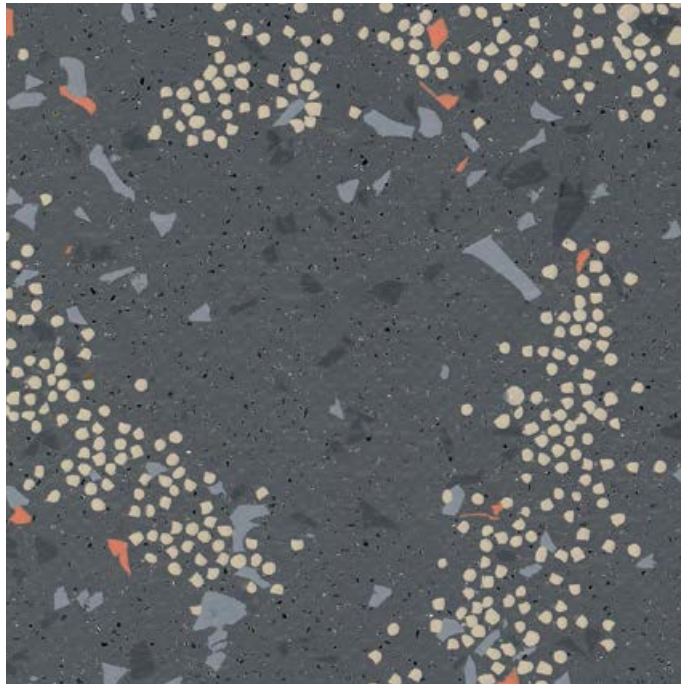
8806 Rhodium



NT

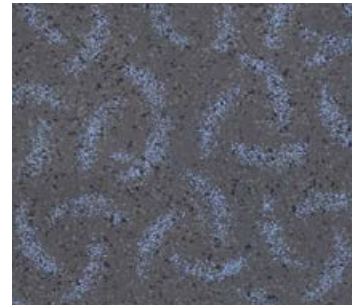
8486 Vanadium

MK Foam backing
NT Textile backing



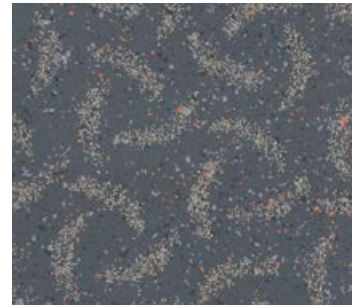
8816 Singapore

NT



NT

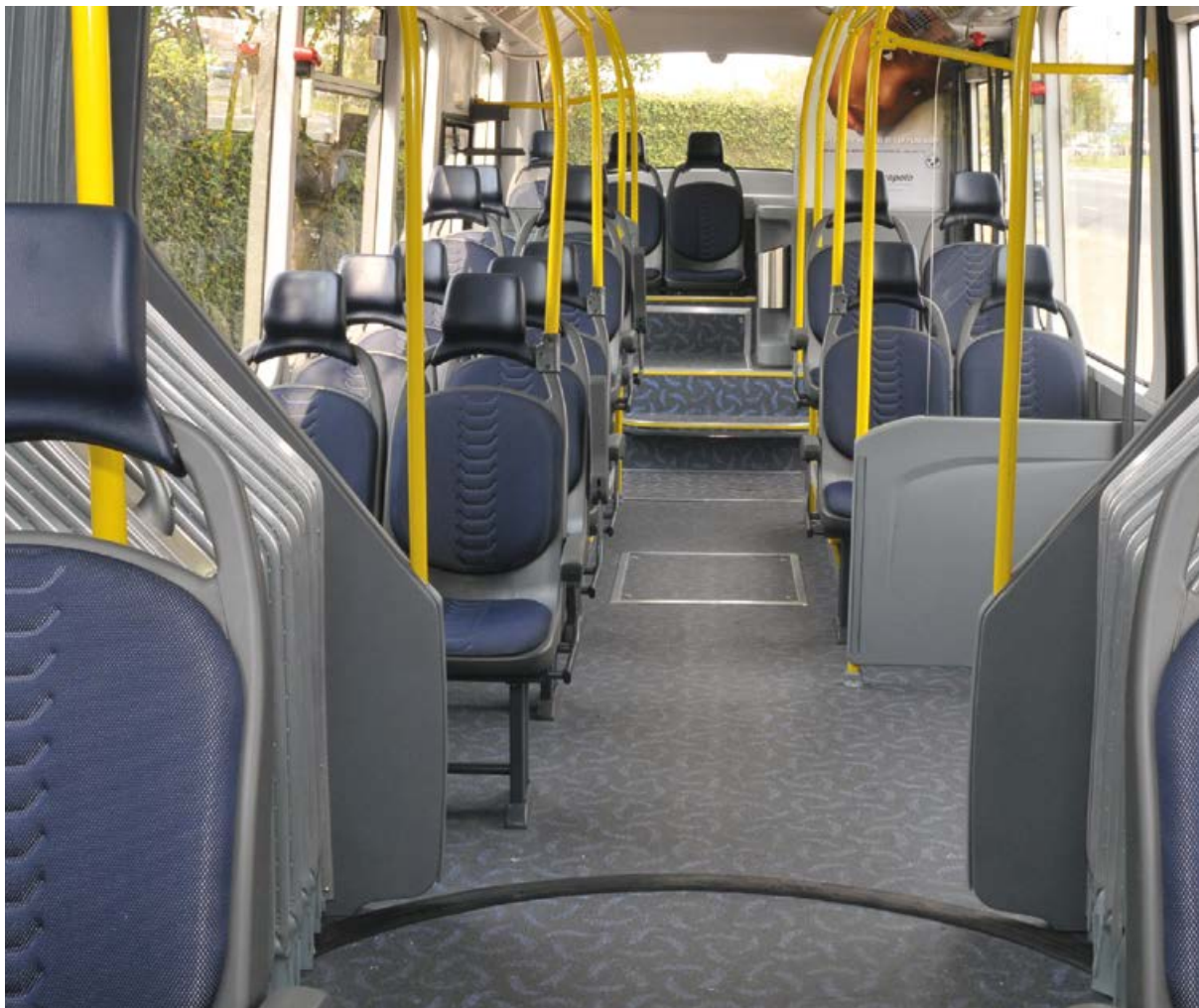
8729 Norway*



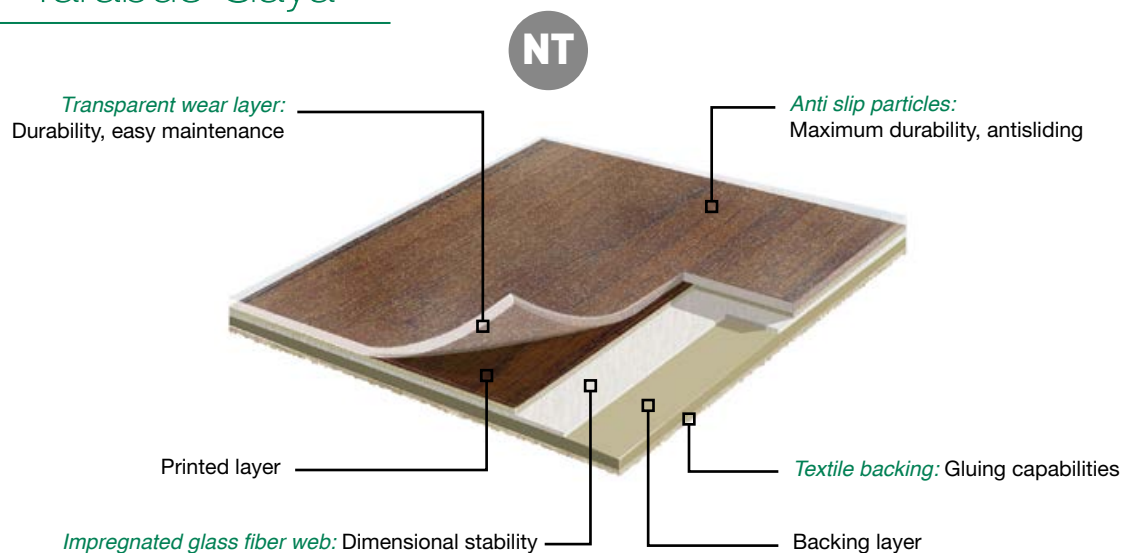
NT

8816 Singapore*

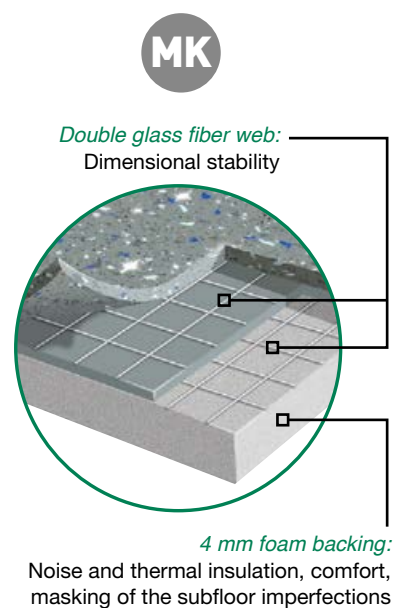
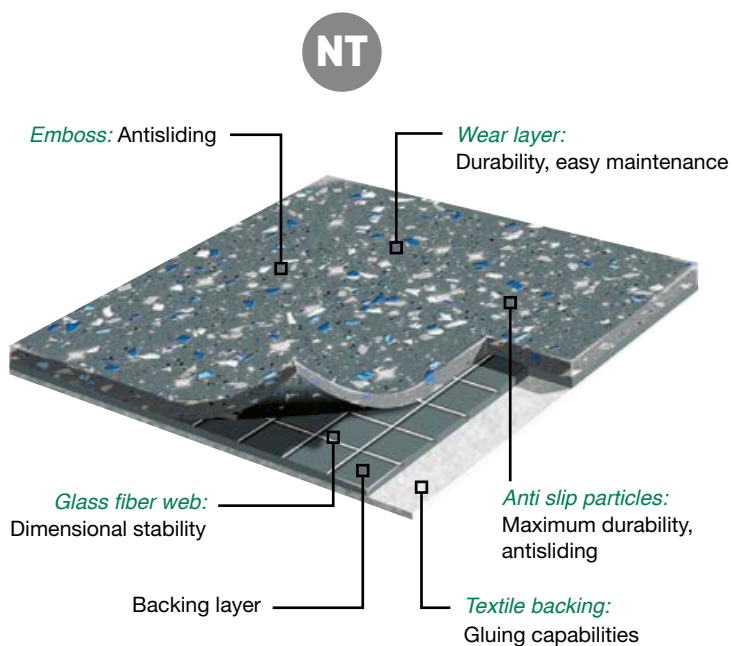
*Scale reduction



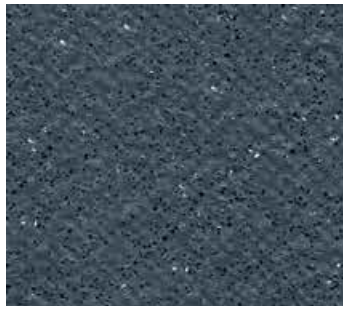
► Tarabus Gaya



► Tarabus standard



► Safebus X'tra



6822 Dark Grey

NT

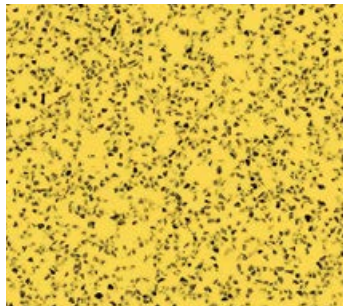
► Venus



6727 Anthracite

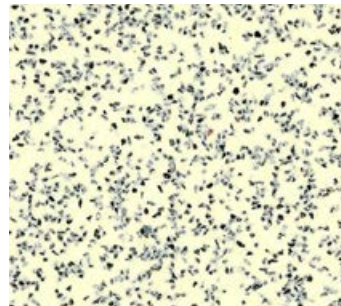
NT

► Safebus



6602 Caledonia

NT



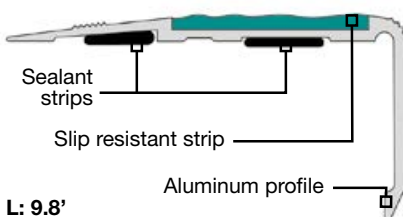
6203 Borneo

MK

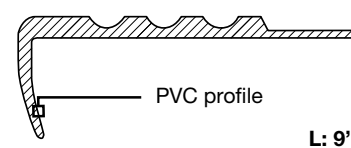
NT



► Stepbus



► Step nosing



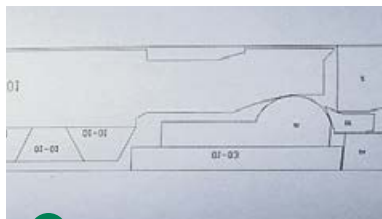
Yellow



White

KIT System

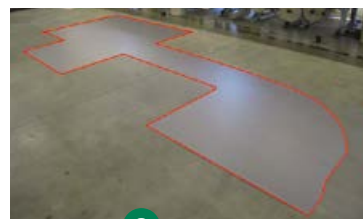
Pre-cut and pre-welded **TARABUS** floor covering system according to your drawings



1 Send us your floor plan layout



2 We cut with high precision



3 ...and pre-weld if required

TARABUS Self-Adhesive



TARABUS floor covering with self-adhesive backing

- > Environmental friendly bonding
- > Ready to bond
- > No curing time
- > Safer work conditions
- > Easy to use

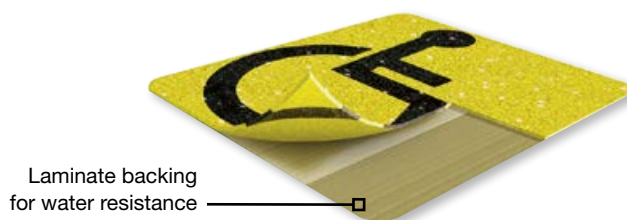
TIME SAVING

► TARABUS LOGO

- Location for person with reduced mobility
- Advertising & Promotion



Almost unlimited possibilities of water-resistant logos





PN: X3059997 - 03/2016

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Tel: 877 GERFLOR (437 3567)
Fax: 847 394 3753
tarabus@gerflor.com
tarabusbygerflor.com

Gerflor[®]
theflooringroup

TRAN SIGN®

YOUR DESTINATION BEGINS HERE



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

**STANDARD FEATURES**

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

SOFTWARE AND PROGRAMMING

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

**AVAILABLE ADVANCED FEATURES INCLUDE:**

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

**BUY AMERICA - MADE IN U.S.A.**

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

LED DESTINATOR™ WARRANTY INFO

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

**ABOUT TRANSIGN**

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

Transign®, 281 Collier Road, Auburn Hills, Michigan 48326
Toll Free: 855.535.7446 | Main: 248.623.6400 | Fax: 248.623.2930
www.transignllc.com

LED Destinator® Electronic Signs - Dimensions

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

Be sure to check out our other great products!



Stop Request Signs

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



Interior Passenger Information Sign

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



Roller Curtain Signs

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



Run Number Box

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



LED Run Number Box

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

Join Our Mailing List

www.transignllc.com/subscribe

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Toll Free: 855.535.7446 | Main: 248.623.6400 | Fax: 248.623.2930
www.transignllc.com

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LED SIGNAGE AND COMMUNICATION

- Signs and corresponding programming are capable of displaying different messages simultaneously. Messages may include current destination, route number, or next stop.
- The characters together are capable of displaying a constant-on single line message, and of flashing a multi-line message with a complete blackout to mark the end of each line of the message. The time of display of each line of a multi-line message is adjustable and the ability to display various symbols, as required
- All signs feature an auto-dimming for varying light conditions, and must include self-diagnostic capabilities for errors and outages.
- Fonts and color must be ADA compliant (Amber exterior) standard color
- Sign and hardware must include a 10 year warranty (all parts)
- All signage is ADA compliant and meet Buy America standards
- Lifetime sign programming and service assistance

PART 1 – OPERATOR CONTROL UNIT (OCU)

- In the absence of a single mobile data terminal (MDT), all LED signs (including destination, route, and interior information displays) is controlled via a single Operator Control Unit (OCU) capable of operating up to seven (7) on-board signs simultaneously. This OCU will be located within convenient reach and view of the seated driver so that all buttons are accessible. The OCU is located so that passengers cannot easily tamper with the settings.
- The system control console contains a vacuum fluorescent or LCD display. The system control console contains an audio annunciator that beeps to alert the operator to view the display for a message, or beeps indicating that a key is depressed. The system control console will continuously display the complete message associated with the selected destination code up to 15 characters. Entire sign system operates on 12VDC ignition power. 24V is available upon request.
- System memory allows for a minimum of 1,000 message lines, with the ability to scroll, flash, or stack multi-line messages.
- OCU has an optional input and firmware support for optional emergency switch the driver can push, capable of displaying “EMERGENCY” or “DIAL 911” on all exterior signs without direct OCU interaction. The emergency message can be cancelled by activating the switch a second time. The emergency message displays on the exterior of the bus only. The OCU does not display the emergency message.
- Programming software and support is included with each sign system. Uploading new programming to the OCU may be done via standard USB drive. Programming interface operates on Windows based PC and will allow for user modification of destination and message lists.
- OCU is configured with open J1708 firmware along with the availability of the appropriate communication connectors to allow software providers to push and trigger destination message changes through the OCU. We will provide API and firmware for software integration for future projects, at the TA’s discretion. This specific OCU must be specified and required by user.

PART 2 - DESTINATION SIGNS

Transign Model LED Destinator® Full Amber LED:

12 VDC Front and Side Electronic Destination Sign System. Front and side window with automatic brightness control. Signs can display stationary, scrolling, or flashing messages. Signage includes programming resources to be provided to the agency, one unit per sign kit. Sign system provided has a minimum of 10 year warranty period. Operator control unit is programmable and uses USB port technologies to accept thumb drives.

Front LED Destination Sign:

- Front destination sign is Amber LED with a minimum LED display of 4.75”(H) x 44” (W)- 12 pixels high x 112 pixels wide, 1,344 pixels, minimum viewing distance of up to 500’.
- Each LED’s has a diameter of 10mm with a 10mm pitch.
- The destination message is readable by a person with 20/20 vision from a distance of 250 feet.
- The sign has an equal readability at 65 degrees on either side of the line perpendicular to the center of the mean plane of the display.
- The entire display area of all signs is clearly visible and readable both in direct sunlight and at night.
- Front sign is capable of displaying scrolling or flash text, with a fixed left margin to display route number.
- Front sign is installed high in the windshield, or above the windshield enclosed in a suitable compartment.

Curb-Side LED Destination Sign:

- Side destination sign are Amber LED with a minimum LED display of 4.75”(H) x 31.50” (W)- 12 pixels high x 80 pixels wide, 960 pixels, minimum viewing distance of 250’.
- Each LED’s has a minimum size diameter of 10mm with a 10mm pitch.
- The destination message is easily read from the sidewalk level. The entire display area of all signs is clearly visible and readable both in direct sunlight and at night.
- Side sign is capable of displaying scrolling text, and may display similar or different messages from the front.
- Side sign is located in a passenger window behind the front passenger entrance door. Sign is mounted in top portion of side window.

Safe Fleet Transit & Coach Roof Hatches

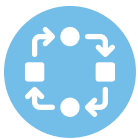
Ventilator and Emergency Escape Hatches



Enhance your passenger comfort and safety with a hatch from the leader in bus safety equipment.



Safe Fleet roof hatches demonstrate over 40 years of proven performance and come in a wide variety of styles and configurations. Hatches are also customizable to meet your specific application needs. Each hatch features a low-profile design and meets all FMVSS and CMVSS regulations.



Adaptable

Low profile design adapts to wide range of roof surfaces



High Strength

Constructed of high strength UV stable materials



Made in the USA

Proudly manufactured in North Carolina with over 40 years of proven performance



Warranty

5 Year Manufacturer Warranty



The Safe Fleet – Transpec family of ventilators and escape hatches – designed to meet the wide-ranging needs of today’s transit fleet.



Dual Purpose Safety Vent

The Dual Purpose Safety Vent is a combination roof ventilator/emergency exit that provides 5-position, fresh air ventilation and a simple release handle for emergency exit.

- Multi position fresh air vent
- Emergency exit
- Most popular model



Glass Safety Vent

The Safe Fleet Glass Roof Hatch is made of 4mm tempered glass with gray tint featuring an 18% light transmission and is also available in a motorized version.

- Multi position fresh air vent
- Emergency exit
- Glass panel to allow natural light into the vehicle cabin





Power Safety Vent

The Power Safety Vent II provides all the features of the Dual-Purpose Safety Vent II with the addition of an electric fan for extracting condensation, stale or hot air from inside the vehicle to improve passenger comfort.

- Multi position fresh air vent
- Emergency exit
- High-capacity powered exhaust fan provides ventilation in the closed position



Motorized Safety Vent

The Motorized Safety Vent (MSV) is an electrically operated combination roof ventilator/emergency exit that provides fresh air ventilation as well as a simple release handle that allows the hatch to hinge open for emergency exit. The ventilation portion of the hatch is controlled by a simple switch contained within the driver's compartment of the vehicle on which it is installed.

- Multi position fresh air vent
- Emergency exit
- Allows the ventilation feature to be controlled from driver's seat



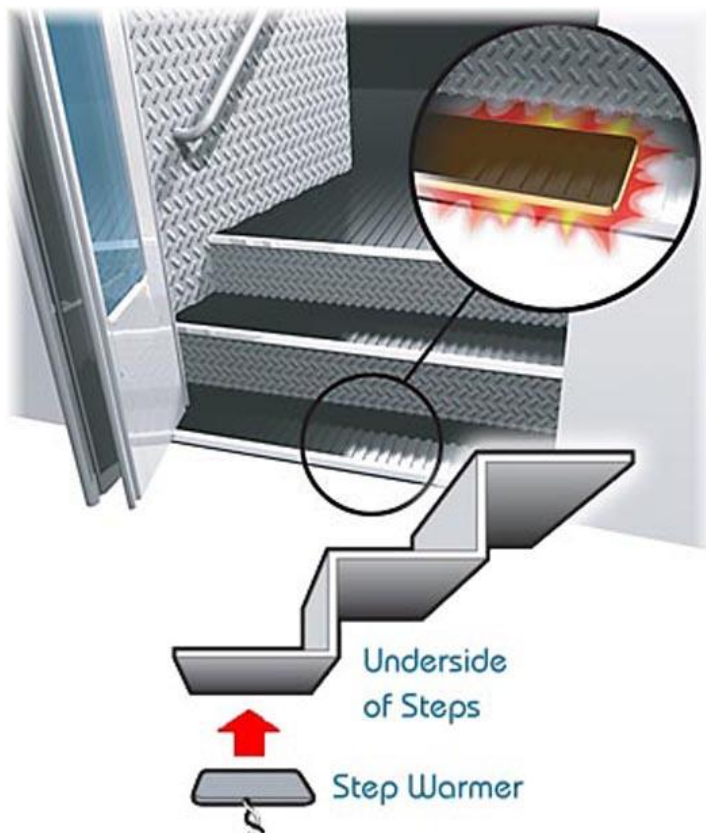
	COLORS	STATIC VENT	OUTSIDE RELEASE	RETENTION CABLE (1 or 2)	HATCH AJAR ALARM	ADHESIVE SEALANT	MULTILINGUAL DECALS
MODEL	STANDARD FEATURE & OPTIONS						
T1070 Series Dual Purpose Safety Vent II	White. Light Gray, Dark Gray, Black, Beige		●	●	●	●	●
T1670 Series Power Safety Vent II	White. Light Gray, Dark Gray, Beige	●	●	●	●	●	●
T2070 Series Motorized Safety Vent II	White. Light Gray, Dark Gray		●	●	●	●	●
T2870 Series Glass Roof Hatch	White. Light Gray, Dark Gray, Black			●	●	●	●

● Standard ● Optional



1245-SF-Hatch-BR-TR-091721

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ULTRAHEAT[®]



UHI Worldwide, Inc.

1314 Perkins Ave.

Elkhart, IN 46516

Phone: 574.522.6594

Info@uhiworldwide.com

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

<i>Entry Step Heaters</i>	<i>Heater Size</i>	<i>Voltage</i>	<i>Current Draw</i>	<i>Power Consumed</i>	<i>Heat Output</i>	<i>Active Heater Area</i>	<i>Step Heater Sizes</i>
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

Vulcan™ Series V1284HC Mobile DVR

12-CHANNEL MDVR

DIMENSIONS

- Height: 5.0 inches
- Width: 7.72 inches
- Depth: 12.60 inches
- Weight: 6.61 pounds

TWELVE (12) A/V INPUTS

- (8) HD channels 1080P + (4) IP channels up to 1080P

VIDEO OUTPUTS

- 2 channels

AUDIO OUTPUTS

- 2 channels, CVBS and VGA

CAMERA COMPATIBILITY

- (8) HD channels up to 1080P + (4) IP channels up to 1080P

STORAGE MEDIA

RECORDING MEDIUM

- Supports 3.5" hard disk up to 14TB and one (1) SD card slot

CAPACITY

- Up to 14TB

RECORDING OPTIONS

- SD card slot for redundant recording

INTERFACE

CAMERA CONNECTION

- (4) RJ45 IP camera connections
- (8) 4 Pin HD camera connections

NETWORK DATA CONNECTION

- Ethernet: RJ45 x 1 (10/100 M/1000M)
- IPC Ethernet: RJ45 (4x10/100M, PON Power Supply)

EXPANSION

- RS232 x 1, RS485 (for RFID and iPanel) CAN x 2

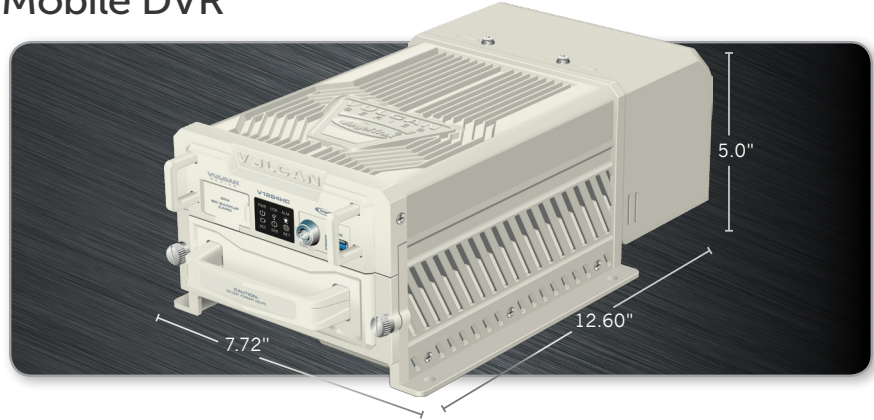
GPS INTERFACE

- Built-in, compatible with optional passive or active GPS antenna

DRIVER ACTION DETECTION

PANIC BUTTON

- The remote status indicator (panic button) can be connected to show MDVR power/record status without using a video monitor
- The driver-operated panic button has the following functions:
 - Solid green LED indicates that the unit has power and is recording
 - Event marker (panic button)



DRIVER ACTION DETECTION WIRES

- 8 signal wires individually programmable to indicate alarm or event

COMPRESSION FORMAT

- Video: H.264/H.265
- Audio: ADPCM, G.711U

RECORD RESOLUTION

DIGITAL

- Parallax View™ (horizontal resolution exceeds cinema 4K), 4MP (4192X1360), 1080P (1920X1080), 720P (1280X720) @30FPS

NTSC

- 1080P, 720P, WD1(928X480), WHD1(928X240), WCIF(464X240), D1(704x480), HD1(704x240), CIF(352x240)
- 8x720P@30FPS (HD) + 4x1080P@30FPS (IP) OR 8x1080P@10FPS (HD) + 4x1080P@30FPS (IP)

RECORDING OPTIONS

- **Continuous record:** System will record all channels continuously while vehicle is running (factory setting).
- **Alarm record:** System will record when an alarm is triggered.
- **Motion record:** System will record when the cameras detect motion while vehicle is running.
- **Schedule record:** System will boot and record according to user-selectable schedule.

ELECTRICAL & OPERATING REQUIREMENTS

AUTO ON/OFF DETECTION

- ACC detection

DELAY OFF SETTING

- User selectable up to 24 hours

OPERATING TEMPERATURE

- -40°F (-40°C) ~ 158°F (70°C) with heater or 14°F (-10°C) ~ 158°F (70°C)

OPERATING HUMIDITY

- 15% - 95%

BUILT-IN G-FORCE SENSOR

BUILT-IN WI-FI MODULE

BUILT-IN POWER PROTECTION

BUILT-IN GPS MODULE (REQUIRES ANTENNA)

POWER SUPPLY

INPUT RANGE

- DC 9-36V, ACC

OUTPUT CURRENT

- 5V@500mA, 12V@500mA

POWER CONSUMPTION

- Standby: ~0W
- Maximum: 100W
- Maximum (with heater): 125W

LOW VOLTAGE PROTECTION

- User selectable and programmed at installation

HYBRID COMPONENT™ TECHNOLOGY

Modular design for on-site service, maintenance and upgrades in minutes

HOUSING/CASING

- Removable, shock-mounted
- Vandal-resistant locking hard drive
- Shock-resistant: MIL-STD-810F
- Aluminum
- 2 built-in fans for temperature regulation

OPTIONAL AI FEATURES

OPTIONAL COMPONENTS

VIRTUAL SYNCHRONIZED MAPPING™

GPS ANTENNA (ACTIVE OR PASSIVE)

CELLULAR MODEM (COMPATIBLE WITH 5G/4G)

Specifications, features and applications of use are subject to change without notice. ▼ 07/2023 D

West Virginia - Ford Service Facilities							
<u>Service Facilities</u>	<u>Address</u>	<u>City & ST</u>	<u>County</u>	<u>Phone</u>	<u>Service Contact</u>	<u>Body Work</u>	<u>Comments</u>
Northern Panhandle							
Ohio Valley Ford Mercury	Route 250 Jefferson Ave	Moundsville, WV	Marshall	(304) 845-4244	John Dudley	Yes	has a lift works on other busses
Rich Galardi Ford	1625 Commerce	Wellsburg, WV	Brooke	(304) 737-0211	Dave White	No	has lifts seems confident
Eastern Panhandle							
Kent Parsons Ford Lincoln Mercury	Route 45 E Moler Ave	Martinsburg, WV	Berkeley	(304) 263-3344	Kelly Hess	Yes	does work on floor
Markwood Ford Mercury	RR 3 Box 3280	Keyser, WV	Mineral	(304) 788-7900	Mike Snyder	No	has lifts and refers to a local body shop
Roth Ford	HC 30 Box 40	Petersburg, WV	Grant	(800) 334-7684	Rick Oates	No	does work on ground only small work
Central West Virginia							
Astorg Ford Lincoln Mercury	2028 7th St	Parkersburg, WV	Wood	(304) 485-8585	Rob Ayers	No	has lifts body shop can't fit a bus
Campus Ford Lincoln Mercury	Route 7	Morgantown, WV	Monongalia	(304) 296-4477	Michelle Smith	No	has a lift
Chenoweth Ford Lincoln Mercury	Route 50 E	Clarksburg, WV	Harrison	(304) 623-6501	Mike Allawat	Yes	has a lift
Elkins Fordland	1211 Harrison Ave	Elkins, WV	Randolph	(304) 636-2222	Kent Winn	No	limited does work on ground
I77 Ford Mercury	HC 80 Box 71B	Ripley, WV	Jackson	(304) 372-3673	Chris Smith	No	has lifts works on other busses
J & J Ford	Route 7 W	Terra Alta, WV	Preston	(304) 789-2431	Terry Shreve	Yes	has lifts
Michael Motor	1061 State St	Gassaway, WV	Braxton	(304) 364-5935	Matt Loyde	Yes	has a lift
Midway Ford	201 Orchard Park Rd	Hurricane, WV	Putnam	(304) 562-3315	Mike Withrow	No	does work on ground small shop limited
Scott Ford Mercury	Route 7 W	Kingwood, WV	Preston	(304) 329-3673	Willy Alberico	No	has lifts works on other busses
Toothman Ford	Route 50 W	Grafton, WV	Taylor	(304) 265-3000	Jackie Bell	No	has lifts can recommend body shop
Wilson Ford Lincoln Mercury	1950 Fairmont Ave	Fairmont, WV	Marion	(304) 363-0500	Rico Insani	Yes	does work on ground works on other busses
Jack Garrett Ford	Route 1 Ripley Rd	Spencer, WV	Roane	(304) 927-2492	Mike Carpenter	Yes	has lift works on other busses
Tumpike Ford of Huntington	2480 5th Ave	Huntington, WV	Cabell	(304) 529-2260	Rusty Stover	Yes	has a lift and contact Chris Carel for body
Southern West Virginia							
Andy Clark Ford Lincoln Mercury	498 Courthouse Rd	Princeton, WV	Mercer	(877) 425-2128	Sheryl Belcher	Yes	has lifts sublets body work next door
Colonial Ford Lincoln Mercury	428 N Jefferson St	Lewisburg, WV	Greenbrier	(304) 645-2244	Kenny Miller	Yes	has lift and body work is separate company
Ramey Ford Lincoln Mercury	615 N Eisenhower Dr	Beckley, WV	Raleigh	(304) 256-7421	Scotty Bowman	No	does work on floor handles other busses

West Virginia - Braun Service Facilities

<u>Service Facilities</u>	<u>Address</u>	<u>City & ST</u>	<u>County</u>	<u>Phone</u>	<u>Located in District</u>
Van Lifts Unlimited	RR 12 Box 283	Hurricane, WV	Putnam	(304) 727-9478	Central West Virginia
Marietta Mobility	211 S. 8th Street	Marietta, OH	Washington	(800) 690-4950	*
Mobility Plus VA	323 S. College Ave.	Salem, VA	Independent	(540) 389-3400	*
Speclin Emergency Vehicle	100 Industrial St	Scottdale, PA	Westmoreland	(724) 887-8093	*
Keystone Coach Works, Inc.	4786 Library Road	Bethel Park, PA	Allegheny	(412) 833-1900	*
Total Mobility Services	4785 Penn Ave	Boswell, PA	Somerset	(814) 629-9934	*
Mountain International Trucks	408 Goff Mountain Rd	Cross Lanes, WV	Kanawha	(304) 776-5600	Central West Virginia
Matheny Motors	Third & Ann Streets	Parkersburg, WV	Wood	(304) 485-4423	Central West Virginia
Ironside Mobility Systems	687 Lofstrand Lane Unit P	Rockville, MD	Montgomery	(301) 279-5855	*
M.I.T.S. of Virginia	2075 West Main St.	Waynesboro, VA	Independent	(800) 420-6470	*
Mobility Works	1090 Mossie Blvd	Wall, PA	Allegheny	(412) 824-8091	*

West Virginia - Air Conditioning Service Centers

<u>Service Facilities</u>	<u>Address</u>	<u>City & ST</u>	<u>ZIP</u>	<u>County</u>	<u>Phone</u>	<u>District</u>	<u>Contact</u>
Mountain International Trucks	408 Groff Mountain Rd.	Cross Lanes, WV	25313	Kanawha	(304) 776-5600	Central West Virginia	Grant Morris
Mountain International Trucks	60 West White	Lewisburg, WV	24901	Greenbrier	(304) 536-2000	Southern West Virginia	Robert Morris
Sellers Truck 'N' Auto	1129 E. Pike St.	Clarksburg, WV	26301	Harrison	(304) 622-5876	Central West Virginia	*
Mountaineer Thermo-King	2252 Roxalana Rd	Dunbar, WV	25064	Kanawha	(304) 744-7344	Central West Virginia	*
Fleet Service Co.	3007 Chapline St	Wheeling, WV	26003	Ohio	(304) 232-6140	Northern Panhandle	*
West Virginia Truck & Trailer	1 Jain Dr.	Cross Lanes, WV	25313	Kanawha	(304) 755-0113	Central West Virginia	*
Hemlock Fleet Service	609 Division St	Parkersburg, WV	26101	Wood	(304) 422-3166	Central West Virginia	*
Tony's Auto Service	1112 First Street	Alexandria, VA	22314	Independent	(703) 683-5050	*	Tony Damiani
Truck Thermo King Inc	3650 S. Main Street	Harrisonburg, VA	22801	Independent	(540) 434-7004	*	Ken Showalter

RAIN BOOTH INFORMATION

Constructed as part of a corporate-wide pre-delivery inspection facility, the Forest River 20' x 50' motorized vehicle rain booth utilized by Starcraft and Startrans Bus offers exceptional performance in the area of water leak detection.



The motorized vehicle rain booth adds front wall nozzles to the design of the towable rain booth, simulating the pelting of oncoming rain at highway speeds. Both booths include two 1200 gallon recycling tanks and utilize a 12Horsepower pump with multi-bank filters capable of delivering 40 – 60 p.s.i. That equates to 300 gallons per minute pushed through the spray heads, or the equivalent of a 24 inch-per-hour downpour!

With nozzles directed at the roof, sidewalls, front and undercarriage, nothing goes untouched in our quest for leak elimination. Using both velocity and volume in our test procedure ensures our valuable customers that we are doing the utmost to deliver a leak-free product to them.



Visitors are always welcome to witness the test booths whenever they are in operation.