FORD **Transit Courier/Tourneo Courier**
Body and Equipment Mounting Manual

Date of Publication:09/2025

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1.1 About this Publication

This Body and Equipment Mounting Manual (BEMM) is the publication for Transit Courier/Tourneo Courier. It includes general updates for vehicles built starting in Q3 2024, as well as specific updates for the 2026.75MY vehicles, which will be available from Q2 2026.

The main changes in this version are:

September 2025 (Part 1) - General Updates

1.2.1 Introduction Content updated
1.2.2 How to Use this Manual Content updated
1.2.3 Important Safety Instructions Section updated with content from deleted section 1.3.16 High Voltage Vehicle Systems
1.2.4 CAD Models Text updated
1.3.3 Worldwide Harmonised Light-Duty Vehicle Test Procedures (WLTP) Regulation updated
1.3.4 Emissions Performance & In-Service Compliance Regulation updated
1.3.6 Compliance and Vehicle Type Approval Section updated with relevant content from deleted section Conversion Homologation
1.3.9 General Product Safety Requirement Caution added
1.4 Contact Information Contact information updated
1.6 Electromagnetic Compatibility (EMC) Content updated
1.11 Vehicle Transportation Aids and Vehicle Storage Section updated with further information
2.4.5 Temporary Mobility Kit Section renamed (previously Tyre Repair Kit)
3.2.2 Fuel Fired Auxiliary Heaters Text updated to include warnings and cautions
4.1 Electrical System Overview New section
4.2.2 General Wiring and Routing Section updated
4.2.5 Grounding Reference to the installation of busbars removed
4.2.6 Prevention of Squeaks and Rattles Content updated
4.5.1 Guidelines When Converting Vehicles Warning added
4.9.1 Start-Stop Logic Content related to Start-Stop de-selection updated
4.19.1 ABS Connector-Vehicle Speed Signal Pin 32 identified for BEV variants and illustration added
4.20.1 Ground Points BEV warnings added
5.1.4 Precautionary Floor Drilling: ICE Title and content updated, images removed
5.1.5 Precautionary Drilling/Welding: BEV Title and content updated, images removed
5.1.6 Precautionary Floor Drilling: BEV Title and content updated

September 2025 (Part 2) - MY2026.75 Updates

4.3.1 CAN-Bus System Description and Interface CAN-Bus System diagrams updated
4.3.2 Body Control Module BCM Fuse Overview table updated
4.10.2 Digital Rear View Camera Illustrations updated
4.22 Driver State Monitoring Camera (DSMC) New section

August 2024:

1.3.9 General Product Safety Requirement Last warning is a new addition
1.4 Contact Information Updated
1.5.1 Order codes Updated
1.9 Jacking and Lifting Jacking and Lifting Points for ICE and BEV Images updated
1.12.8 Vehicle Dimension Key Overall height information updated in the table
1.12.10 Vehicles with Roof Mounted Units Table updated with BEV content
1.13 Hardware Table removed, new statement added
1.14.1 Centre of Gravity Position Centre of Gravity Height table added for ICE and BEV variants
1.15.2 Tow Bar Types All images are new
3.1 Engine / E-Drive BEV cautions added, BEV engine type added to the list
3.9 High Voltage System and Electric Drivetrain New section
4.2.12 Precautionary Drill Zones HV Cables New section
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4.2.14 Precautionary Drill Zones - Cable Ground New section
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4.2.18 Trailer Tow Connectivity Pin layout tables are updated
4.3.1 CAN-Bus System Description and Interface BEV-topology added
4.3.2 Body Control Module (BCM) Images and Fuse overview updated
4.4.1 LV Charging System Layout Diagram added for BEV
4.5.1 Guidelines When Converting Vehicles Transport mode procedure updated
4.7 Climate Control System C1 and C2 connector information added
4.19 Electrical Connectors and Connections 4.20.1 New section with vehicle speed signal information
4.20 Grounding Updated with BEV content

4.21 Acoustic Vehicle Alerting System (AVAS): New section
5.1.1 Body Structures - General Information Updated with BEV warnings
5.1.5 No Drill/No Weld Zones-BEV New section
5.1.6 BEV Van Floor Drilling New section
5.10.3 Seat Belt Reminder Second paragraph updated

It is recommended to review this manual in full.

It is the vehicle convertor's responsibility to review the online version for the most current information prior to starting any conversion.

This BEMM is for European and related markets sourced vehicles.

For further information please contact your National Sales Company representative or local Ford dealer. If they are unable to help you then please contact FPSV Technical Support at FPSVHelp@ford.com.

1.1.1 EV Training

Ford Customer Service Division (FCSD) develops the training and deploys it to the Ford Dealer Network. We will forward and/or provide our convertor partners the information to obtain training through links in Ford Service Info https://www.fordserviceinfo.com.

1.2 About this Manual

Refer to 1.2.1 Introduction and any subsequent sections.

1.2.1 Introduction

Content updated

The intention of this manual is to support the conversion industry. Although individual or private users can benefit from this manual, as a manufacturer, we want to provide genuine conversion businesses with information needed for vehicle conversion/modification. If, as a convertor, the information you require is not in this manual or you have further questions, please contact your National Sales Company representative or local Ford dealer. If they are unable to help you, then please contact FPSV Technical Support at FPSVHelp@ford.com.

This guide is published by Ford and provides general descriptions and advice for converting vehicles.

Any changes made to the vehicle must be carried out by a competent person and, upon completion, the vehicle must be returned to a safe state.

It must be emphasised that any change to the basic vehicle, which does not meet the enclosed guideline standards, may severely inhibit the ability of the vehicle to perform its function. Mechanical failures, structural failure, component unreliability or vehicle instability will lead to customer dissatisfaction. Appropriate design and application of body, equipment and/or accessories is key to ensuring that customer satisfaction is not adversely affected.

The information contained within this publication takes the form of recommendations to be followed when vehicle modifications are undertaken. It must be remembered that certain modifications may invalidate legal approvals and application for re-certification may be necessary.

Ford cannot guarantee the operation of the vehicle if non-Ford approved electrical systems are installed. Ford electrical systems are designed and tested to function under operational extremes and have been subjected to the equivalent of ten years of driving under such conditions.

This manual may contain references to features and options that have not been fitted to your particular vehicle. Variations occur across territories and can also be affected by external factors.

1.2.2 How to Use This Manual

Content updated

This manual covers vehicle conversion procedures.

The pages at the start of this manual list the content, by group. A group covers a specific portion of the vehicle.

The manual is divided into five groups:

- General Information
- Chassis
- Powertrain
- Electrical
- Body and Paint

The number of the group is the first number of a section number. Each title listed in the contents links to the relevant section of the manual.

In some sections of the book it may refer you to additional sections for information. The links have been provided in blue text. There is also an alphabetical index at the back of the manual. As with the contents pages, you will be able to link to sections. Click the page number to navigate to the section.

All left and right handed references to the vehicle are taken from a position sitting in the driver's seat looking forward unless otherwise stated.

All references to ADR vehicle standards are only applicable to the New Zealand markets. Where no ADR is specified, the EU standard is recommended.

As you read through this manual, you will come across: WARNINGS, CAUTIONS and NOTES.

If a warning, caution or note is placed at the beginning of a series of steps, it applies to multiple steps.

WARNING: Warnings are used to indicate that failure to follow a procedure correctly may result in death or personal injury.

CAUTION: Cautions are used to indicate that failure to follow a procedure correctly may result in damage to the vehicle or equipment being used.

NOTE: Notes are used to provide additional essential information required to carry out a complete and satisfactory conversion.

Megaphone icon/text in bold black indicates the updated area in the document.

 / Abc = Updated/New content

1.2.3 Important Safety Instructions

 Content updated

Appropriate conversion procedures are essential for the safe, reliable operation of all vehicles as well as the personal safety of the individual carrying out the work.

This manual cannot possibly anticipate all such variations and provide advice or cautions as to each. Anyone who does not follow the instructions provided in this manual must first establish that they compromise neither their personal safety nor the vehicle integrity by their choice of methods, tools or components.

WARNING: Any personnel working with or undertaking any modifications to the E-Transit Battery Electric Vehicle (BEV)must receive training for High Voltage (HV) vehicle systems prior to starting any work.

Working on High Voltage Electrical Vehicles is only allowed after completion of the appropriate training(s):

"Working on Electrical Vehicles" includes performing mechanical works, performing electrical work and switching activities on these vehicles.

"Electrical Vehicle" includes all possible types such as HEV (Full Hybrids), PHEV (Plug-In Hybrid Electric Vehicle), BEV (Battery Electric Vehicle) or other versions.

"Appropriate Training" means that you as a person who followed the training, has sufficient knowledge about the risks and the required safety measures to perform the work in a safe way. The competencies granted by this training are still up-to-date and have not expired.

WARNING: Orange coloured cables are HV system (approximately 400V DC) parts and must not be modified or rerouted.

CAUTION: There are limitations when adding additional electrical devices. Any power take-off consumption needs to be controlled within the guidelines. Extra equipment and usage may have an impact on weight and vehicle driving range.

1.2.4 CAD Models

 Text updated

As a convertor, to enable the virtual development of your vehicle, 3D data models in STEP and JT formats can be provided via CoLab upon request at FPSVhelp@ford.com.

1.3 Commercial and Legal Aspects

Refer to 1.3.1 Terminology and any subsequent sections.

1.3.1 Terminology

NOTE: Any modifications to the vehicle must be noted in the owner's handbook or new descriptive literature included with the owner's documentation.

Vehicle Convertor refers to any party altering the vehicle by converting the body and adding or modifying any equipment not originally specified and/or supplied by Ford.

Unique component or similar wording refers to non-Ford specified or after sale fitment not covered by Ford warranty.

1.3.2 Warranty on Ford Vehicles

Please contact the National Sales Company in the country where the vehicle will be registered for details of the terms of any applicable Ford warranty.

The Vehicle Convertor should warrant its design, materials and construction for a period at least equal to any applicable Ford warranty.

The Vehicle Convertor must ensure that any alteration made to a Ford vehicle or component does not reduce the safety, function or durability of the vehicle or any component.

The Vehicle Convertor shall be solely responsible for any damage resulting from any alteration made by the Vehicle Convertor or any of its agents to a Ford vehicle component.

The Vehicle Convertor releases Ford from all claims by any third party for any cost or loss (including any consequential damages) arising from work performed by a Vehicle Convertor, unless Ford has given its prior written consent to such liability.

1.3.3 Worldwide Harmonised Light-Duty Vehicle Test Procedures (WLTP)

 **Regulation updated**

WLTP takes into account individual optional equipment for weight, aerodynamics and rolling resistance, which have an impact on the fuel consumption and exhaust emissions. For incomplete and complete conversions, WLTP will now take into account the completed option equipment. Vehicle Convertors now have a new responsibility to recalculate the CO2 and fuel consumption for any completed vehicle by either using a tool provided by the OEM or contacting the OEM to obtain new values.

To determine the new values in line with WLTP, registered customers will now be able to access Ford's multi stage WLTP calculation tool via Ford Service Info. The WLTP calculator can be accessed at https://www.fordserviceinfo.com. You will need to register or login to use it.

It is advisable to control the weight, but without deteriorating other vehicle attributes and functions, (especially those related to safety and durability). It is also advisable for you to contact your local type approval authority for any questions related to the application of WLTP to multi stage conversions under Regulation 2018/858 and single vehicle approvals.

For additional information, refer to the following sections:

- 1.8 Vehicle Duty Cycle Guidelines
- 1.13 Package and Ergonomics
- Please go to https://www.fordpro.co.uk/en-gb/special-vehicles/publications/ for the most up to date version of the BEMM.
- Contact FPSV Technical Support at FPSVHelp@ford.com.

1.3.4 Emissions Performance & In-Service Compliance

 **Regulation updated**

The emissions regulation (EC) No 2017/1151, as amended, now includes new requirements for completed vehicles with regards to emissions performance and in-service compliance. Ford has developed an emissions envelope that the Vehicle Convertor must stay within.

For further information please contact FPSVHelp@ford.com. It is advisable for you to contact your local type approval authority for any questions related to the application of WLTP to multi stage conversions under regulation 2018/858 and single vehicle approvals.

1.3.5 Whole Vehicle Type Approval Regulations - EU Markets Only

WARNING: For non-European Union territories, please refer to local legislation.

Fitment of Parts and Accessories

NOTE: Ford parts fitted in the plant are covered by the Certificate of Conformity (CoC). The objective of the Regulation (EU) 2018/858 or applicable local legislation is to ensure that new vehicles, components and separate technical units put on the market provide a high level of safety and environmental protection. This will help to ensure that all vehicles are not damaged by the fitting or converting of certain parts or equipment, after they have been placed on the market or have entered service.

Vehicle Convertors are advised to check whether the fitment of parts require either type approval or Individual Vehicle Approval (IVA) before the vehicle is registered.

- Type Approval requires a Conformity of Production (CoP) inspection to be carried out at the conversion location to demonstrate that all vehicles of the same type will conform to the type approved specification.
- IVA requires inspection of an individual vehicle to establish compliance.

Conversions from Commercial Vehicle N1 to Passenger Car M1

Vehicle Convertors of passenger car M1 vehicles need to be aware of the latest Whole Vehicle Type Approval (Regulation (EU) 2018/858) or applicable local legislation, especially when the base vehicle is a commercial vehicle N1. This affects vehicles which are homologated to meet passenger car M1 regulations.

Guidance to Vehicle Convertors for M1 registered vehicles:

- The Vehicle Convertor is responsible for checking the vehicle ordered can meet all the regulations for type approval.
- Exemptions for certain regulations should be checked with latest regulation and approval authority.
- Where possible, order a Passenger Car M1 base vehicle such as Kombi M1 or Tourneo Courier M1.
- If specifying Air Conditioning (AC), check that the base commercial vehicle refrigerant meets the latest completed vehicle regulations. If the refrigerant needs to meet the required EU Climate Guidelines for M1, then Transit Courier N1 entities are not suitable.
- If Tyre Pressure Monitoring System (TPMS) is required, specify this when ordering.
- If Belt Minder is required, specify passenger airbag which includes the belt minder function for the driver.

For additional information, refer to 1.6 Conversion Homologation.

1.3.6 Compliance and Vehicle Type Approval

Section updated

- All components embodied on Ford vehicles are approved to the applicable legal requirements.
- Ford vehicles have Type Approval for the intended marketing territories.

WARNING: Exception - Incomplete vehicles require further approval when completed by the Vehicle Convertor.

- The Transit range has Type Approval for many territories, although the full range of vehicles shown in this manual are not necessarily released in all territories. Check with your National Sales Company representative.
- Significant changes to the vehicle may affect its regulatory compliance. Strict adherence to the original design intent for brakes, weight distribution, lighting, occupant safety and hazardous materials compliance, in particular, is mandatory.

When the conversion needs a new approval, the following information must be quoted:

- All dimensional, weight and centre of gravity data.
- The fixing of the body to the donor vehicle.
- Operating conditions.

The responsible Technical Service may require additional information and/or testing.

1.3.7 Multi Stage Type Approval

The Vehicle Convertor must agree all modifications and impacted regulatory requirements with the relevant approval authority and technical service. Any changes to the vehicle operating conditions must be advised to the customer.

1.3.8 Legal Obligations and Liabilities

The Vehicle Convertor should consult with its legal advisor on any questions concerning its legal obligations and liabilities.

1.3.9 General Product Safety Requirement

WARNINGS:

Do not exceed the gross vehicle mass (GVM), gross train mass, axle plates and trailer plate.

Do not change the tyre size or load rating.

Do not modify the steering system.

Excessive heat can build up from the exhaust system, in particular from the catalytic convertor and from the Gasoline Particulate Filter (GPF)/Diesel Particulate Filter (DPF). Ensure adequate heat shields are maintained. Maintain sufficient clearance to hot parts.

The travel and function of pedals must not be restricted.

Do not modify or remove heat protection shields.

Do not remove labels provided with the base vehicle. Ensure appropriate visibility.

Do not route any electrical cables with the Anti-Lock Braking System and Traction Control System cables because of extraneous signal risk. It is generally not recommended to hang electrical cables from existing harnesses or pipes.

Do not change original location or remove warning labels provided with the base vehicle in the driver's view. Ensure that labels remain in full view.

For Component Traceability, it is imperative that components removed during the conversion process are refitted to the same vehicle, in accordance with Ford Workshop Manual procedures.


Caution added


CAUTION: Ensure that components removed during conversion are kept clean and dry.

The Vehicle Convertor shall ensure that any vehicle it places in the market complies with the European General Product Safety Regulation (EU GPSR) 2023/988 (as amended periodically) or applicable local legislation.

The Vehicle Convertor shall also ensure that any alteration it makes to a Ford vehicle or component does not reduce its compliance with the EU GPSR or applicable local legislation.

The Vehicle Convertor shall release Ford from all liability for damages resulting from:

- Failure to comply with these Body Equipment and Mounting directives, in particular warnings.
- Faulty design, production, installation, assembly or alteration not originally specified by Ford.
- Failure to comply with the basic fit for purpose principles inherent in the original product.

Refer to 1.4 Contact Information.

1.3.10 Product Liability

The Vehicle Convertor shall be liable for any product liability (whether for death, personal injury, or property damage) arising from any alteration to a Ford vehicle or component made by the Vehicle Convertor or any of its agents. Ford shall not be liable for any such liability (except as provided by law).

The Vehicle Convertor or equipment manufacturer is liable for the:

- Operational reliability and road-worthiness of the vehicle to its original intent.
- Operational reliability and road-worthiness of any component or conversion, not listed in original Ford documentation.
- Operational reliability and road-worthiness of the vehicle as a whole (for example the body changes and/or additional equipment must not have a negative effect on the driving, braking or steering characteristics of the vehicle).
- Subsequent damage resulting from the conversion or attachment and installation of unique components, including unique electrical or electronic systems. Functional safety and free movement of all moving parts (for example axles, springs, shafts, steering mechanisms, brake and transmission linkage, and retarders).
- Functional safety and maintaining the tested and approved flexibility of the body and integral chassis structure.

1.3.11 Restraints System

WARNINGS:

Modifications to the restraints system are not allowed.

Airbags are explosive. For safe removal and storage during conversion follow the procedures in the Ford workshop manual.

Do not alter, modify or relocate the airbags, sensors and modules of the restraints system or any of its components.

Attachments or modifications to the front end, B Pillar or C Pillar of the vehicle may affect the airbag deployment timing and result in uncontrolled deployment.

For additional information, refer to 5.9 Airbag Supplemental Restraint System (SRS).

1.3.12 Drilling and Welding

WARNING: Before Drilling or Welding Boron steel parts see additional information in the following sections of this manual for Boron Steel parts, Precautionary and No Drill Zones.

Drilling and welding of frames and body structure have to be conducted following the guidelines in Welding and Frame Drilling and Tube Reinforcing sections.

For additional information, refer to the following sections:

- 4.2 Wiring Installation and Routing Guides
- 5.1 Body
- 5.5 Body Closures

1.3.13 Minimum Requirements for Braking System

It is not recommended to modify the braking system. If a special conversion should require modifications:

- Maintain original settings.
- Maintain brake certification load distribution.

Changes to the Anti-lock Braking System (ABS), Traction Control System (TCS) and Electronic Stability Control ESC (also known as ESP) system are not permitted.

1.3.14 Road Safety

The respective instructions should be strictly observed to maintain operational and road safety of the vehicle.

1.3.15 Acoustic Vehicle Alerting System (AVAS)

WARNING: Do not move or modify the components of the AVAS system. The Acoustic Vehicle Alerting System warning is a legal requirement.

Refer to 4.21 Acoustic Vehicle Alerting System.

High Voltage Vehicle Systems - Section deleted

1.4 Contact Information

As a manufacturer, we want to provide you with the information you need for your vehicle conversion/ modification. If the information you require is not in this manual or you have further questions, please contact your National Sales Company representative or local Ford dealer. If they are unable to help you then please contact FPSV Technical Support at FPSVHelp@ford.com.

Contact information updated

Market	Contact	Email/ Phone/ Address
Austria	Gerhard Konrad	gkonrad1@ford.com
Belgium	Luc Vanneste	lvannes4@ford.com
Britain	Keith Doxey	kdoxey@ford.com
	Mark Brierley	mbrierl7@ford.com
	Robert Jinks	rjinks1@ford.com
Czech Republic	Jan Hejnic	jhejnic@ford.com
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1.5 Conversion Type

Refer to 1.5.1 Order Codes and any subsequent sections.

1.5.1 Order Codes

The following tables show overviews of the available options which will assist in your conversion. It is necessary to take into account the anticipated usage of the modified vehicle in order to choose the appropriate specification of the base vehicle.

Please ensure that the base vehicle is ordered with all required options by your Ford dealer. Availability of options vary by territory. For availability please contact your National Sales Company representative or local Ford dealer. If they are unable to help you then please contact FPSV Technical Support at FPSVHelp@ford.com.

Electrical

Order Code	Option Name	Description
JZDAG	Wiring Harness Upfitter Connector	Provides a direct interface to power signals from the vehicle power distribution box. It is available only for Turkish Market.

Security

Order Code	Option Name	Description
AAKBA	Anti Pick Drivers Door Lock	Replacement Replock Driver's lock with special anti-pick lock.
AAKAC	Security Lock Group 1	Replacement to the SLD & RCD handles. Replaces 'pull' function with a mechanical key door opening actuation. Includes Replock/Anti-Pick lock, Loom Guards and Latch Shields.
AAKAD	Security Lock Group 2	Installation of Front Door Deadlocks (Drv & Pass), and hooklocks to SLD, RCD and Tailgate. Includes Replock/ Anti-Pick lock, Loom Guards and Latch Shields.
AAKAE	Security Lock Group 3	Installation of Front Door Deadlocks (Drv & Pass), and Armourshells to SLD & RCD. Includes Replock/ Anti-Pick lock, Loom Guards and Latch Shields.

Interior

Order Code	Option Name	Description
BDSAC	Cargo Stowage Rails	This option includes mid-height side rails with 8 moveable tie-downs for easy and efficient stowage of larger items in the cargo area.
BDIBD	Wood Load Floor Cover	This option adds a durable and protective 9 mm ply-wood floor cover - the standard 6 floor tie-down points are retained.

 Conversion Homologation - Section deleted

1.6 Electromagnetic Compatibility (EMC)

Content updated

WARNINGS:

Do not place objects or mount equipment on or near the airbag cover, on the side of the front or rear seat backs, 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.

Do not fasten antenna cables to original vehicle wiring, pipes, or hoses.

Keep antenna and power cables at least 10 cm (4 in) from any electronic modules and airbags.

NOTE: Ford Motor Company test and certify vehicles to meet electromagnetic compatibility legislation. It is the modifier's 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, tyre pressure monitoring system, push button start, Bluetooth® connectivity or satellite navigation.

NOTE: Any radio frequency transmitter equipment in the vehicle (such as cellular telephones and amateur radio transmitters) must keep to the parameters in the following illustrations and table. Ford Motor Company do not provide any other special provisions or conditions for installations or use.

NOTE: After the installation of RF transmitters, check for disturbances from and to all electrical equipment in the vehicle, both in the standby and transmit modes.

NOTE: Only fit one antenna in the positions shown to the roof of your vehicle.

NOTE: After the installation of RF transmitters, check for disturbances from and to all electrical equipment in the vehicle, both in the standby and transmit modes.

Check all electrical equipment:

- With ignition ON.
- With the engine running.
- During a road test at various speeds

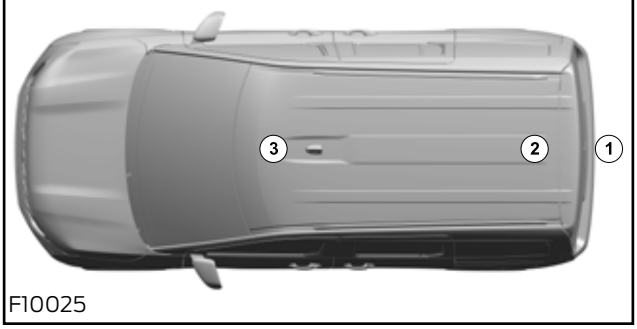
Check that electromagnetic fields generated inside the vehicle cabin by the transmitter installed do not exceed applicable human exposure requirements.

Frequency Overview

Frequency Band MHz	Maximum Output Power Watts (Peak RMS)	Antenna Position
1-30[1]	50W	1
50-54	50W	2, 3
68-87	50W	2, 3
144-174	50W	2, 3
380-512	50W	2, 3
806-940	10W	2, 3

[1] For Battery Electric Vehicles, this frequency is not approved when your vehicle is plugged-in and charging.

Permitted Antenna Locations



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Item	Description
1	Rear Antenna location 1
2	Rear Antenna location 2
3	Front Antenna location 3

1.7 Vehicle Duty Cycle Guidelines

It is necessary to take into account the customer usage profile and the anticipated vehicle duty cycles of the modified vehicle in order to choose the appropriate specification of the base vehicle.

It is necessary to select the appropriate drive, engine, gear ratio, gross vehicle mass, gross train mass, axle plates and payloads of the base vehicle to match the customer requirements.

Where possible, make sure that the base vehicle is ordered with any necessary plant fit options.

A high numeric gear ratio is recommended for vehicles with customer requirements for:

- high payload
- Trailer Tow
- frequent stop-go cycles
- high altitude and gradients
- terrain conditions such as found on building and construction sites

1.7.1 Conversion Impact on Fuel Economy and Performance

Any conversion may affect the fuel consumption and performance depending on the aerodynamic and the weight added by the conversion. The published information for fuel consumption for the incomplete base vehicles of category N1 are based on the European Regulation EC 715/2007 and 692/2008 (as last mentioned). The used reference mass includes a 'Default Added Mass' (DAM). It is advisable to control the weight, but without deteriorating other vehicle attributes and functions (especially those related to safety and durability).

1.7.2 Vehicle Ride and Handling Attributes

CAUTION: Do not exceed the axle plate, gross vehicle mass, trailer plate and gross trailer mass limits.

Conversions to the base vehicle that change the center of gravity may affect the ride and handling attributes.

NOTE: The vehicle should be evaluated for safe operation prior to sale.

1.8 End of Life Vehicle (ELV) Directive

The European End-of-Life Vehicle (ELV) directive requires that environmental and recycling aspects are integrated in the development process of new components and vehicles. This includes requirements with respect to:

- The overall recyclability (85%)/recoverability (95%) of vehicles.
- Limited use of hazardous substances including the elimination of prohibited substances such as lead, hexavalent chromium, cadmium and mercury.
- Publication of dismantling information.
- Parts Marking according to the corresponding ISO Standards: ISO 1043-1, 1043-2 and 11469 for plastics and ISO 1629 for rubber materials.
- Increasing use of recycled materials.
- Producers meet all, or a significant part of, the costs to take back End-of-Life Vehicles.

In addition to the requirements resulting from the End-of-Life Directive, other environmental targets should be taken into consideration such as:

- Minimising costs and environmental burden along the product lifecycle.
- Maximising use of renewable materials e.g. natural fibres.
- Minimising the presence of substances impacting vehicle interior air quality/clean compartment or allergenic reactions. This refers to aspects like smell, fogging, toxicity and allergy coming from materials in the interior.
- Eliminate use of prohibited substances which are listed in the Global Automotive Declarable Substance List (GADSL) at http://www.gadsl.org.

For continued legal compliance and environmental performance of all Ford products it is essential that any conversion of the vehicle is in compliance with the requirements listed above.

This is not a complete list of all legal requirements to be met by every converted vehicle.

1.9 Jacking and Lifting

Refer to 1.9.1 Jacking and any subsequent sections.

1.9.1 Jacking

WARNINGS:

Always position the vehicle on a hard level surface. If the vehicle must be jacked up on a soft surface use load spreading blocks under the jack. Always chock the wheel diagonally opposite the jacking point. Failure to follow these instructions may result in personal injury.

Use only the specified jacking points. If you use other positions, you may damage the body, steering, suspension, engine, braking system or the fuel lines.

Never place blocks of wood or similar underneath the vehicle jack in order to jack up the vehicle on soft ground. Failure to observe this instruction can lead to injuries.

Do not jack on any of the High Voltage components including battery. Using the high voltage box as jacking point could result in electric shock, personal injury, fire or death.

CAUTIONS:

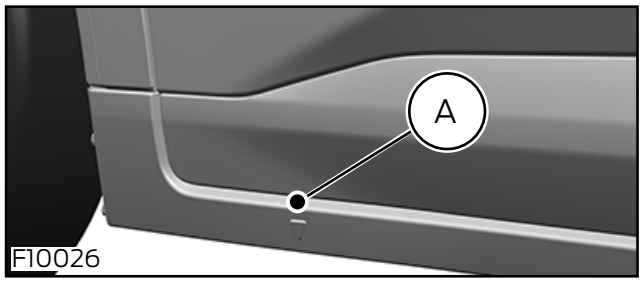
Make sure that access to the spare wheel is maintained when converting the vehicle or relocating the spare wheel.

Ensure there is sufficient clearance when positioning the jacking equipment to prevent damage of any underfloor components.

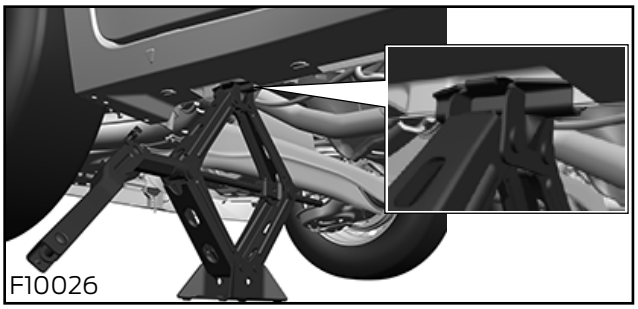
NOTE: When using the vehicle jack, refer to the owner guide for correct operating instructions.

NOTE: Make sure that reinforcements are installed to maintain the integrity of the original body structure for/at jacking points.

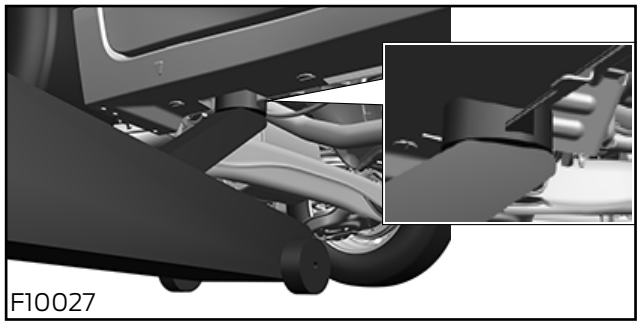
Sill Indentations (A) Showing Jacking Points



Vehicle Jack for Emergency Use



Trolley Jack for Maintenance Use



NOTE: Any modifications to the vehicle must be noted in the owner's handbook or new descriptive literature included with the owner's documentation.

Your vehicle may not have a spare tyre. Therefore you will have a Temporary Mobility Kit which will only repair one damaged tyre. The kit is located behind the driver's seat or under the passenger seat on Tourneo Courier or behind the driver's seat on Transit Courier.

For more information and usage of the Temporary Mobility Kit, please refer to the Owner's Manual.

NOTE: You can use the wheel brace to raise and lower the jack.

For information on the Temporary Mobility Kit, refer to 2.4 Wheels and Tyres.

1.9.2 Lifting

WARNINGS:

When lifting the vehicle with a two post lift for the removal of the engine/transmission or rear axle, make sure the vehicle is secured to the lift using vehicle retention straps to prevent tilting. Failure to follow these instructions may result in personal injury.

Do not lift on any of the High Voltage components including battery. Using the high voltage box as lifting point could result in electric shock, personal injury, fire or death.

CAUTIONS:

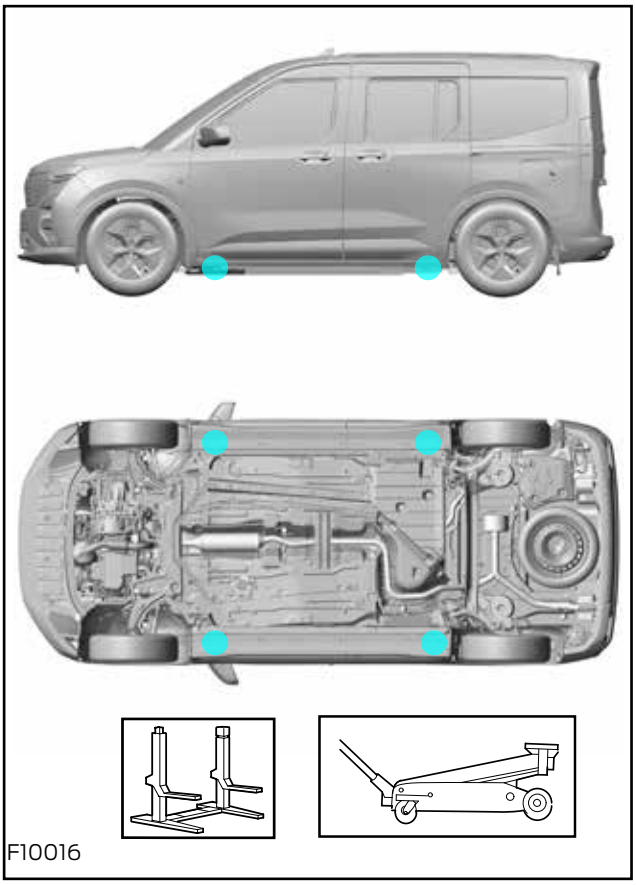
When lifting the vehicle with two post lift, vehicle lift arm adapters must be used under the lifting points.

When lifting the vehicle with a two post lift, the maximum kerb weight must not be exceeded.

It is important that only the correct lifting and support locations are used at all times.

Ensure there is sufficient clearance when positioning the lifting equipment to prevent damage of any underfloor components.

Jacking and Lifting Points- ICE



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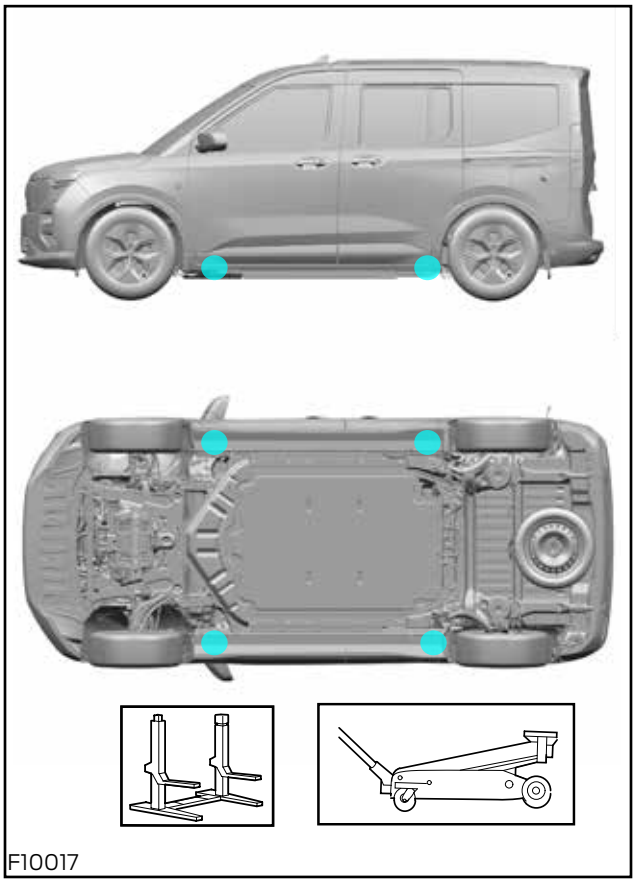
Jacking and Lifting Points- BEV



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1.10 Noise, Vibration and Harshness (NVH)

WARNING: Make sure that the modified vehicle complies with all relevant legal requirements.

Changes to the powertrain, engine, transmission, exhaust, air intake system or tyres may influence the exterior noise emissions. Therefore the exterior noise level of the converted vehicle has to be verified.

The interior noise levels should not be deteriorated by the conversion. Reinforce panels and structures as appropriate to avoid vibrations. Consider the usage of sound deadening material on panels.

1.11 Vehicle Transportation Aids and Vehicle Storage

Warning updated

WARNING: Transport Mode will reduce the risk of Powertrain System damage from multiple starts without sufficient engine run time to warm the vehicle up to normal operating temperatures. Exiting Transport Mode prior to upfitting/conversion increases the risk of Powertrain System damage.

CAUTION: Make sure that the protective covers are not removed from an incomplete vehicle until the conversion is started.

Tyre pressure bullet point updated

In addition:

- The windscreen wipers should be lifted off the glass and set upright.
- All air intakes should be closed.
- To avoid flat-spotting, tyre pressures should be increased but MUST NOT exceed the maximum tyre pressure marked on the tyre's side wall.
- The handbrake system should not be used.
- Apply suitable wheel chocks to prevent roll away.

A significant risk during storage is deterioration of vehicle bodywork, therefore, appropriate storage procedures must be observed, including periodic inspection and maintenance.

NOTE: Please refer to Owner's Manual for further information on preparing the vehicle for storage.

Claims arising from deterioration caused by incorrect storage, maintenance or handling are not the responsibility of Ford.

Vehicle Convertors must determine their own procedures and precautions, particularly where vehicles are stored in the open, as they are exposed to any number of airborne contaminants.

The following may be considered a sensible approach to storage:

Short term storage (up to 14 days):

- Wherever possible, vehicles should be stored in an enclosed, dry, well-ventilated area. This area must be on firm, well drained ground which is free of long grass or weeds and where possible, protected from direct sunlight.
- Vehicles must not be parked near/under foliage or close to water as additional protection may be necessary for certain areas of the vehicle.

Long term storage guideline updated

Long term storage (over 14 days):

- It is important to maintain the integrity of the 12V battery. The battery may be disconnected but not removed from the vehicle. A minimum charge level should be maintained through the use of a mains trickle charger or solar charger. After the vehicle is fully charged, do not keep the batteries on charge.
- The wiper blades should be removed and placed inside the vehicle. Make sure the wiper arms are suitably prevented from resting on the windscreen.
- Wheel trims (where fitted) should be removed and stored in the luggage compartment.
- Engage first gear (manual transmission) or place in park position 'P' (automatic transmission) and release the parking brake completely. Chock the wheels first if the vehicle is not on level ground.
- Set climate controls to the 'open' position to provide ventilation, where possible.
- Where protective film has been applied at manufacturing it must be left on the vehicle until prepared for delivery but must be removed after a maximum storage period of six months (film is date stamped to indicate required removal date).
- Make sure that all windows, doors, bonnet, lift gate, tailgate, luggage compartment lid, convertible top and roof opening panel are completely closed and the vehicle is locked.

Table and LV battery content extended with further information updated

Action/Time in Storage	Receiving	Every 15 Days	Monthly	Every 3 Months	Before Shipping
Check vehicle is clean	X	-	X	-	X
Remove external contamination	X	-	X	-	X
Visually check tyres	X	-	X	-	X
Check interior for condensation	X	-	-	X	X
Run engine for 5 minutes minimum with air conditioning switched on, where applicable (ICE only)	-	-	-	X	-
Check 12V battery condition (recharge if necessary)-applies to all vehicles except BEV	X	-	X (if connected -12V battery)	X (if disconnected -12V battery)	X
Applies to all BEV-check High Voltage battery state of charge, recharge if necessary	X	X	-	-	X

The Pre-Delivery Inspection (PDI) is the final opportunity to make sure a battery is fit for purpose prior to the customer taking delivery of their new vehicle. The battery must be checked and appropriate action taken prior to the vehicle being handed over to the customer. Test results must be recorded on the PDI repair order.

LV Batteries: To make sure the battery is maintained correctly and to assist in preventing premature failure, it is necessary to check and recharge the battery monthly while a vehicle is not in use. Where a battery is left below its optimum charge level for any length of time, it may result in premature failure of the battery.

Battery Drain Prevention: As part of the Vehicle Convertor process and to maximise battery life and prevent premature failure of the Ford batteries, protect and prevent battery discharge during any conversion or whilst the vehicle is in storage. This may include leaving the vehicle in Transport mode as long as possible, reducing the amount of crank cycling around the facility, door ajar events and duration. The voltage MUST be checked when receiving and before shipping. Recharge with an appropriate proprietary battery charger if the vehicle battery voltage is below 12.4V for all types of 12V batteries. Measure connected to the vehicle at ignition off and no loads active including interior or exterior lights in Off status.

Refer to 4.5 Battery Systems.

Content below added

- At no time should vehicles sit with the key in the ignition and the engine not running.
- Vehicles with push button start should not be left in accessory or run mode.
- All electrical features should be in the off position.
- All doors and hatches need to be completely closed.
- Keep ignition off (blade keys removed from ignition cylinder).
- Do not use indicators, fuel doors or headlights to "mark" a vehicle's status, for example to signal that a repair is finished or a vehicle is ready for collection.
- Ensure automatic transmission gear shifter is in Park (P) when the vehicle is stationary.
- Ensure Roll-Away Protection is active before exiting the vehicle (Car Wash Mode / Neutral Mode will be deactivated).

If the above recommended adjustments do not adequately reduce battery drain, you may explicitly request, in writing, that your Ford Dealer maintain or return the vehicle to Transport Mode in PDI. Please be aware that Transport Mode is designed for diagnostics, logistics and vehicle health monitoring during transportation. While active, therefore, it shares data with Ford, including but not limited to vehicle error codes, location and battery charge/fuel levels.

By requesting the continued use of Transport Mode, you acknowledge and consent to this ongoing data sharing which is used by Ford for broader product improvement, safety and logistics purposes. It is crucial that you ensure Transport Mode is deactivated before the vehicle is handed over to your end customers. Failure to do so will result in continued, inadvertent data sharing from the customer's vehicle. For more information about Transport mode refer to 4.5.1 Guidelines When Converting Vehicles**.**

HV Batteries: Subsequent stage manufacturers and vehicle convertors who will be working with BEV vehicles should develop a plan to potentially charge these vehicles.

Charging stations may be particularly important at vehicle receiving locations in case vehicles arrive with insufficient charge to manoeuvre through the manufacturing process.

Charging stations are recommended at vehicle storage locations.

Convertors should also check the High Voltage vehicle state of charge when it arrives and leaves their facility.

If the state of charge is less than 20%, charge to 40%.

1.12 Package and Ergonomics

Refer to 1.12.1 General Component Package Guidelines and any subsequent sections.

1.12.1 General Component Package Guidelines

WARNING: Do not modify, drill, cut or weld any suspension components, specifically the steering gear system, subframe or anti-roll bars, springs or shock absorbers including mounting brackets.

The Vehicle Convertor has to ensure that sufficient clearance is maintained, under all drive conditions, to moving components such as axles, fans, steering, braking system etc.

The Vehicle Convertor is responsible for all installed components during the conversion. The durability has to be confirmed by appropriate test procedures.

1.12.2 Driver Reach Zones

Controls and/or equipment required to be used while driving should be located within easy reach of the driver so as not to impair driver control.

1.12.3 Driver Field of View

WARNING: Make sure that the modified vehicle complies with all relevant legal requirements.

1.12.4 Conversion Effects on Parking Aids

WARNINGS:

Ensure that monitors mounted in the cabin meet the interior package and safety requirements.

System will not function if an aftermarket rear step or other rear mounted equipment is installed. Reverse Brake Assist feature will not automatically brake when a collision is imminent.

If modifying the vehicle's dimensions or extending the vehicle, ensure that the correct function of parking aids is maintained.

On conversions requiring a rear camera, the reverse signal may be taken as detailed in the electrical section, described in 'reversing lamps'.

Refer to 4.11 Exterior Lighting.

1.12.5 Aids for Vehicle Entry and Exit

Steps

WARNINGS:

Make sure that the modified vehicle complies with all relevant legal requirements.

If this modification alters the homologated dimensions, a new approval may be necessary.

CAUTION: Make sure that reinforcements are installed to maintain the integrity of the original body structure.

Where additional steps are installed, the required ground clearance line is to be maintained. The Vehicle Convertor must make sure that a movable step is set in the stored position when the vehicle is running. The step surface must be non-slip.

1.12.6 Front, Rear and Side Under-Run Protection

WARNING: Check local legislation for legal requirements.

Rear Under run Protection must be designed to directive ECE 58[(1)] or 70/221 EC[(1)].

[(1)] As amended periodically

1.12.7 Worldwide Harmonised Light-Duty Vehicle Test Procedures (WLTP) Calculation Inputs

NOTE: Transit and Tourneo Courier EcoBoost gasoline powertrains do not support any changes to Mass, Frontal Area or Tyres and will not work with the WLTP calculator.

The following attributes are required as part of the WLTP calculation for completed vehicles.

Mass of the Completed Vehicle

All modifications and changes that affect the actual mass of the vehicle must be taken into account. The definition of actual mass is described under the provisions of regulation 2017/1151 Annex XXI. The actual mass of the completed vehicle needs to be provided for the front and rear axle. This weight split will be important where the completed vehicle has mixed tyres between the front and rear.

Frontal Surface Area

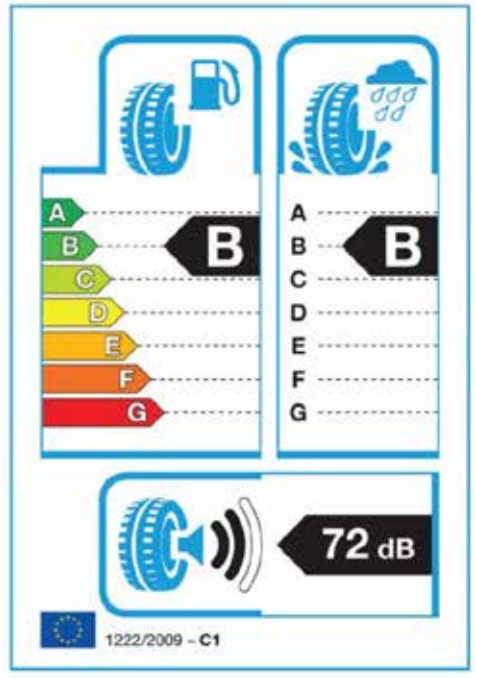
All modifications and changes that affect the frontal surface area of the completed vehicle must be taken into account. For further information please see information later in this section.

Tyre Rolling Resistance

Any changes in tyres fitted to the completed vehicle must be taken into account. The efficiency class and tyre class is needed to determine the correct calculation. This can be found on the tyre label as per the example below.

Exceeding Attribute Limits

As a requirement of the Vehicle Converter to use the base vehicle approval, the Vehicle Converter must stay within the defined limits of the BEMM and the Emissions Type Approval applicable to the vehicle. It is the responsibility of the Vehicle Convertor to ensure they stay within these defined limits to remain compliant with the vehicle performance. If the Vehicle Convertor wishes to exceed the limits they must seek clarification with the relevant technical service or type approval authority. In this case, the base approval may become invalid and the Vehicle Converter may need to re-certify the vehicle against the exceeded limits.



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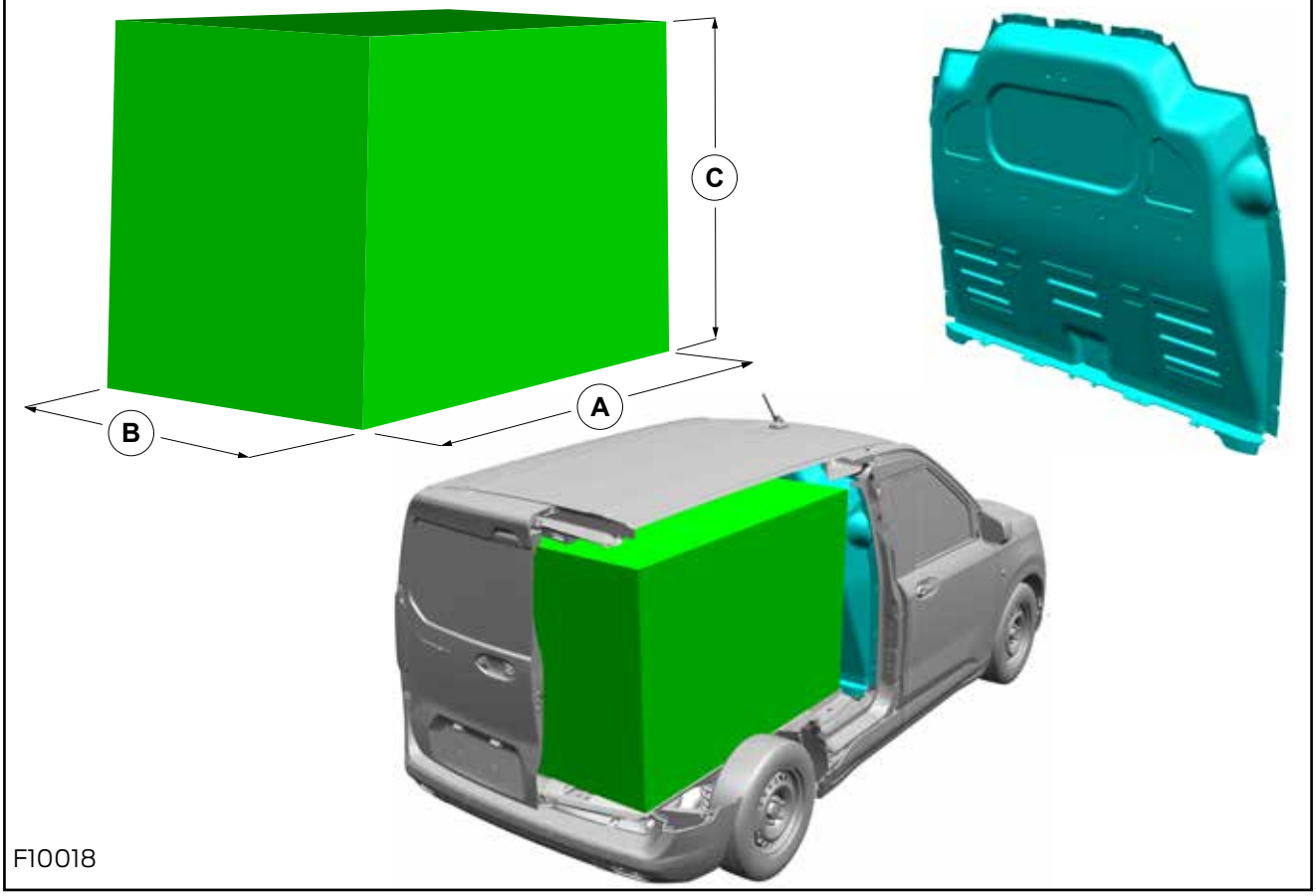
1.12.8 Vehicle Dimensions Key

Dimensions (mm)	Transit Courier			Tourneo Courier	
	Van	Van	DCIV		
	Trend/ Limited	Active	Trend	Trend / Titanium	Active
Wheelbase length	2692	2692	2692	2692	2692
Overall length	4337	4343	4337	4337	4343
Overall width with mirrors	2076	2076	2076	2076	2076
Overall width with folded back mirrors	1876	1876	1876	1876	1876
Overall width without mirrors	1800	1813	1800	1800	1813
Overall height (ICE)	1827	1850	1819	1817	1836
Overall height (BEV)	1852	1851	-	1837	1836

All dimensions are subject to manufacturing tolerances and refer to minimum specification models and do not include additional equipment. They are for guidance only.

1.12.9 Recommended Main Load Area Dimensions

Transit Courier/Tourneo Courier - Full Bulkhead - Fixed/Glazed



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Vehicle	A (mm)	B (mm)	C (mm)
L1 - H1	1428	1186	1085

For all other dimensions see the Transit Courier brochure.

1.12.10 Vehicles with Roof Mounted Units

NOTE: Transit and Tourneo Courier EcoBoost gasoline powertrains do not support any changes to Mass, Frontal Area or Tyres and will not work with the WLTP calculator.

Vehicle with Roof Mounted Units Frontal Area Calculation

NOTE: The WLTP calculator can be accessed at https://www.fordserviceinfo.com. You will need to register or login to use it.

NOTE: All standard/optional equipment have already been taken into account, i.e. base vehicle frontal area including mirrors.

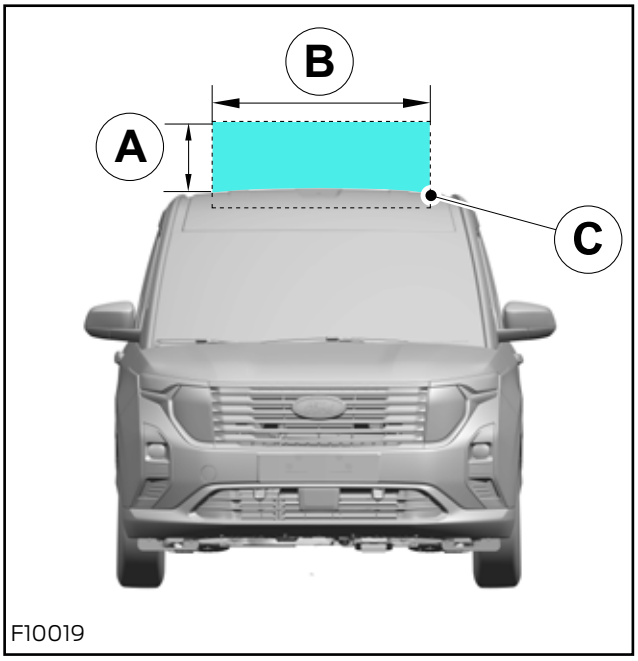
To minimise the effect on frontal area, roof mounted systems can be recessed into/below the original roof line of the vehicle.

For the height measurement (A), only measure the part of the unit that protrudes above the roof line. The Vehicle Convertor only needs to calculate the frontal area of the mounted unit (AxB) in m^2.

Applicable to vehicles with a Ref Mass not exceeding 2840kg (Kerb mass 2740kg). Refer to table below.

Vehicle Line	Body Style	Engine Family	Power [PS]	Driveline	Trans	Max Frontal Area M2	Max Tyre RR (Tyre Class)
Transit Courier (N1)	All	1.5 EcoBlue	All	All	All	3.2	7.7 RRC (C1)
Transit Courier	All	BEV	All	All	All	3.1	5.47 RRC (C1)

Frontal Area Calculation



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Item	Description
A	Roof Mounted Unit Height
B	Roof Mounted Unit Width
C	Integrated Roof Mounted Unit

1.13 Hardware

For hardware material and strength specification, refer to ISO 898-1, Nuts: ISE 898-2. For torque information, follow the procedures in the Ford Workshop Manual which can be accessed via Ford Service Info at https://www.fordserviceinfo.com.

1.14 Load Distribution

CAUTIONS:

Do not exceed the axle plated weights.

Do not exceed the gross vehicle mass.

NOTE: Overloading of the vehicle could result in unacceptable ground clearance.

NOTE: The centre of mass of the payload should be located within the wheelbase of the vehicle.

NOTE: Avoid one-sided load distribution.

NOTE: Uneven load distribution could result in unacceptable handling and braking characteristics.

NOTE: Load distribution outside of the permitted range may result in unacceptable steering, handling and braking characteristics.

1.14.1 Centre of Gravity Position

The position of the centre of gravity is changed when masses are added or removed from the vehicle. This may influence the steering characteristics, handling behaviour and the brake performance.

Lateral Position

WARNING: The difference right to left must not exceed 4% (absolute difference right to left/total weight in percent).

It is important to keep the Centre of Gravity laterally within given limits.

Lateral Centre of Gravity is determined by the vertical wheel forces difference, right (front right mass added to rear right mass) to left (front left mass added to rear left mass).

Vertical Position - Centre of Gravity Height

The Centre of Gravity Height of the vehicle is determined by the mass of the base delivered vehicle and the added and removed masses. In physics this relation is described by the Steiner's theorem.

The Centre of Gravity Height influences axle weights while braking. Centre of Gravity height influences roll stability. Safety systems will work properly within the given boundaries.

Maximum Vertical Centre of Gravity (CoG_z) Height

Vehicle	Wheelbase	Maximum Vertical Centre of Gravity (CG_z) Height (mm)
Kombi M1/N1 and Van ICE	All	685
Kombi M1/N1 BEV	All	610
Van BEV	All	595

1.14.2 Centre of Gravity Height Test Procedure

Measurement

Vehicle shall be loaded according to test specifications specified in ECE13-H ANNEX 9 (Vehicle Mass).

In order to check the centre of gravity height, the following described method is proposed.

For this test four scales are required. The test is possible with two scales but this requires more preparation and it results in lower accuracy.

Initially the vehicle weights needs to be measured in a horizontal position. Afterwards the front is lifted and weights measured again. The higher it is lifted the more accurate the results will be. The height is restricted by different possible touch conditions: between vehicle parts and roof, ground and environment.

In order to improve measurements, the following preparations need to be done:

- Fix wheel travel, for example: solid shocks, or spring fixes.

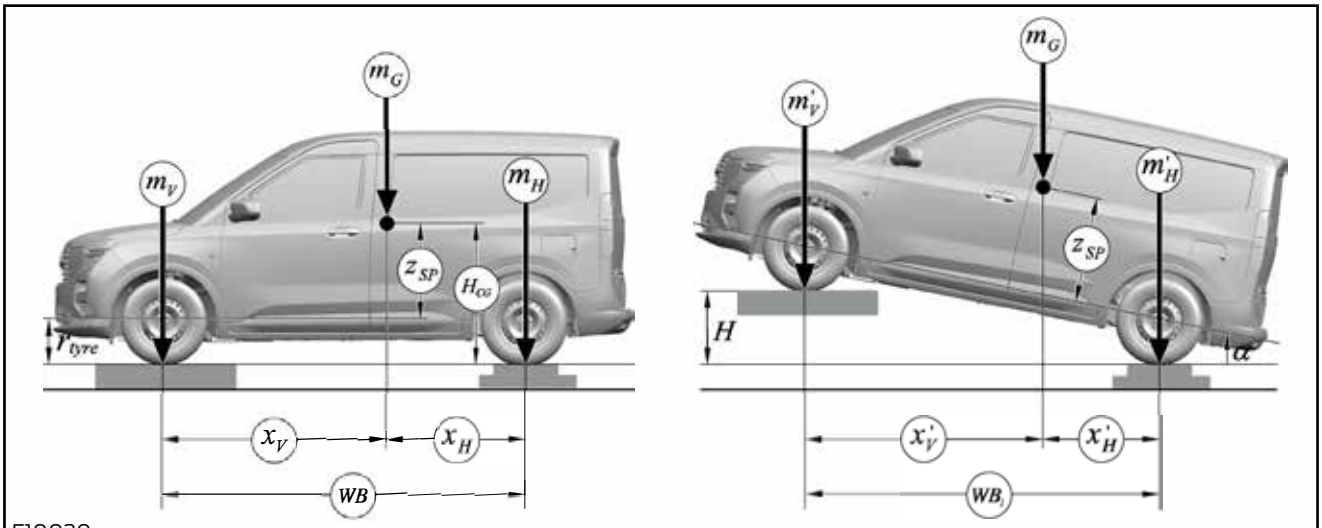
- Increase tyre pressure to maximum allowed value.
- It is important to remove all load - for example, moving items - from the vehicle or it should be properly fixed.
- Doors should be closed.

Before measuring the vehicle, the engine must be switched off. After lifting, it should be rolled freely in order to release tension in the tyres and suspension.

Calculation

In order to estimate the resulting Centre of Gravity (CG_Z) the axle load needs to be measured twice. The first measurement is in the horizontal plane and the second measurement is after the front is lifted. To get a consistent result, this test should be done 3 times independently with different heights.

To improve accuracy, repeat the test the other way around, where the rear end is lifted.



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Variables, to be measured, calculated or known			Measurement		
			1st	2nd	3rd
Wheelbase	WB	mm			
Front Axle Weight	m_V	kg			
Rear Axle Weight	m_H	kg			
Total Mass	$m_G = m_V + m_H$	kg			
Load Tyre Radius	r_{tyre}	mm			
Inclined Vehicle					
Front Axle Weight	m'_V	kg			
Rear Axle Weight	m'_H	kg			
Height (Lift)	H	mm			
^Inclination Angle		deg			
^^Ancilliary - Zsp					
^^Centre of Gravity Height $_Z$-H_{CG}		mm			

Inclination Angle:

$$\alpha = \arcsin\left[\frac{H}{WB}\right].$$

F10027

Ancillary and Centre of Gravity Height z:

$$z_{SP} = \frac{m_H - m_H^{'}}{m_G \cdot H} \cdot WB^2 \cdot \cos\alpha$$

$$z = H_{CG} = z_{SP} + r_{tyre}$$

F10028

1.14.3 Centre of Gravity Height Calculation

Given or measured parameter	
Wheelbase	WB
Front axle weight	m_V
Rear axle weight	m_H
Front height	H
Calculated and auxiliary parameter	
Centre of Gravity (CoG) height	Z_{SP}
Total vehicle mass	m_G
Distance front axle to CoG (horizontal)	X_V
Distance rear axle to CoG (horizontal)	X_H
Wheelbase (projected in horizontal)	WB_i
Front axle weight	m'_V
Rear axle weight	m'_H
Distance front axle to CoG (projected in horizontal direction)	X'_V
Distance rear axle to CoG (projected in horizontal direction)	X'_H
Inclination angle	arc sin
Front part of 'distance rear axle to CoG (horizontal)'	X_{H1}
Rear part of 'distance rear axle to CoG (horizontal)'	X_{H2}

1.14.4 Formulas

- Masses and lengths. Total vehicle mass is the sum of front and rear axle weights: $m_G = m_V + m$

The longitudinal distances between the Centre of Gravity and the centres of wheels equal:

$$x_V = \frac{m_H}{m_G} WB$$

$$x_H = \frac{m_V}{m_G} WB$$

F10029

In inclined system, the main variable is the inclination angle, which is the quotient of the lifting height and the wheelbase:

$$\sin \alpha = \frac{H}{WB}$$

F10030

Similar to the equation for the horizontal system, the distance projected in to the ground plane can be determined using the sum of moments around front and rear wheel centre:

$$x_V' = \frac{m_H'}{m_G} WB'$$

$$x_H' = \frac{m_V'}{m_G} WB'$$

F10031

The following equations apply:

$$WB' = WB \cos \alpha$$

$$x_{H2} = \frac{x_H'}{\cos \alpha}$$

$$x_{H1} = x_H - x_{H2}$$

F10032

Using the rule of proportion leads to the Centre of Gravity height formula:

$$\frac{x_{H1}}{z_{SP}} = \frac{H}{WB'}$$

$$z_{SP} = \frac{m_V - m_V'}{m_G \cdot H} \cdot WB^2 \cdot \cos \alpha \quad , \quad \alpha = \arcsin \left[\frac{H}{WB} \right]$$

or

$$z_{SP} = \frac{m_H' - m_H}{m_G \cdot H} \cdot WB^2 \cdot \cos \alpha \quad , \quad \alpha = \arcsin \left[\frac{H}{WB} \right]$$

F10033

1.15 Towing

Refer to 1.15.1 Tow Bar Requirements and any subsequent sections.

1.15.1 Tow Bar Requirements

When a tow bar device is required, the Vehicle Convertor should use a Ford approved tow bar. Contact your local Ford dealer for details.

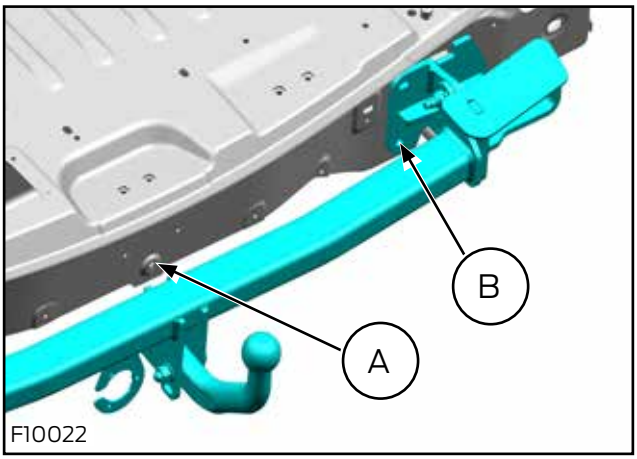
NOTE: Not all vehicles are suitable or approved to have tow bars fitted. See an authorised dealer for further information.

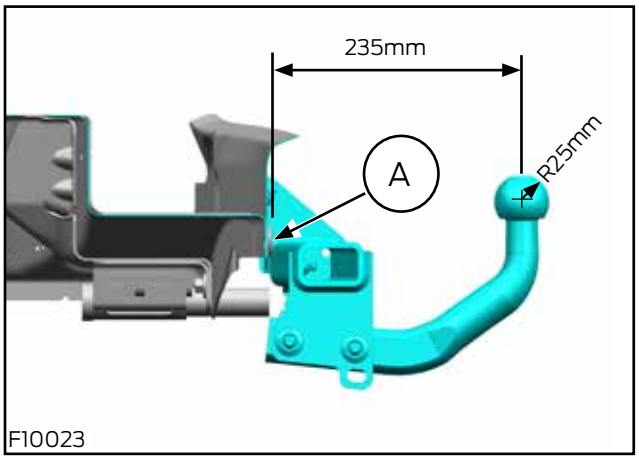
For further information on towing a trailer refer to the Owner's Manual.

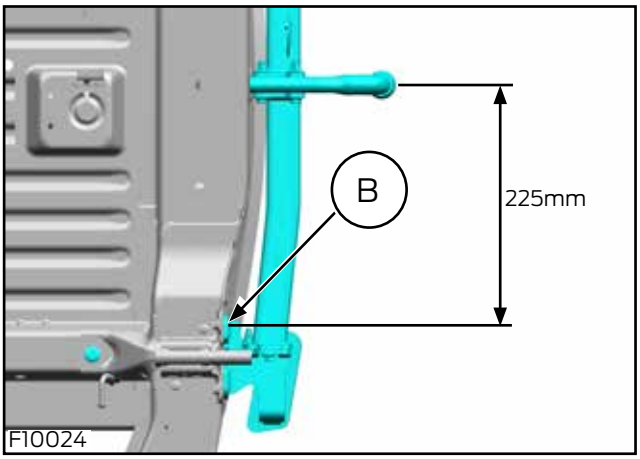
For tow bar devices fitted by the Vehicle Convertor the following applies:

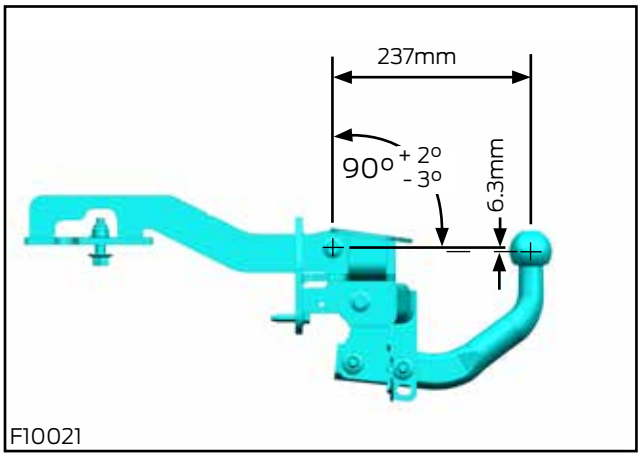
- Tow bar allowances must not exceed those of the standard vehicle.
- Any modifications to the vehicle must be noted in the owner's handbook or new descriptive literature included with the owner's documentation.
- Tow bar installations must meet the requirements of the EEC Directive 94/20 EC and/or ECE R55.

Tow Bar Dimensions









Item	Description
A	Center Slot on Lower panel (X) Datum
B	Tow Hook retainer plate hole (Y) Datum

The centre of the tow ball is 1100 mm from the centre line of the rear axle.

Refer to 4.2.17 Electrics for Tow Bar.

1.15.2 Tow Bar Types

When a tow bar device is required, it is recommended that the Vehicle Convertor should use a Ford approved tow bar.

For tow bar devices fitted by the Vehicle Convertor the following applies:

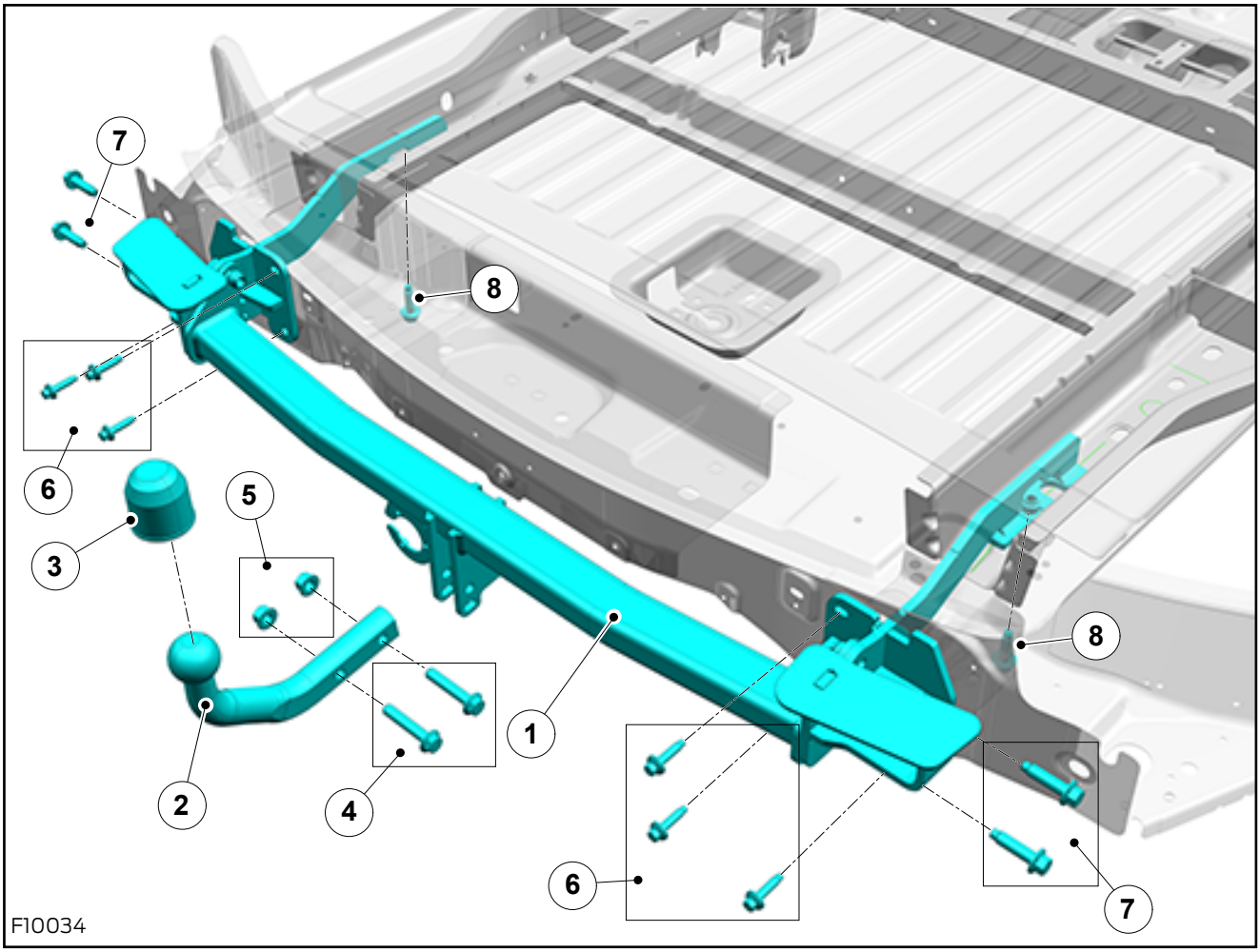
- Tow bar allowances must not exceed those of the standard vehicle.
- Any modifications to the vehicle must be noted in the owner's handbook or new descriptive literature included with the owner's documentation.
- The maximum allowable tow ball tongue load is 50kg on ICE and 30kg for BEV vehicles.
- Tow bar installations must meet the requirements of the Regulation ECE R55.

For further details and advice, please consult your National Sales Company representative or local Ford dealer. If they are unable to help you then please contact FPSV Technical Support at FPSVHelp@ford.com.

For further information on Towing a Trailer or Trailer Sway Control (TSC), refer to the Owner's Manual.

For Tow bar fitting instructions contact your local Ford dealer.

Tow Bar ICE and BEV



Item	Description
1	Tow Bar
2	Tow Ball
3	Cap
4	2x Bolt M12 x 65 10.9
5	2x Nut M12 10
6	6x Bolts M8 x 33 10.9
7	4x Bolts M12 x 40 10.9
8	2x Bolts M12 x 35 10.9

2.1 Suspension System

WARNINGS:

Do not modify, drill, cut or weld any suspension components, specifically the steering gear system, subframe or anti-roll bars, springs or shock absorbers including mounting brackets.

Interchangeability (including between different Transit variants) of springs, shock absorbers and jounce bumpers is not permitted as the changes in vehicle dynamic performance can affect the ESP system.

CAUTION: Modifications to the suspension system can cause a deterioration of the vehicle handling characteristics and durability.

2.2 Front Suspension

Refer to 2.2.1 Springs and Spring Mounting (Front) and any subsequent sections.

2.2.1 Springs and Spring Mounting (Front)

WARNINGS:

Do not modify, drill, cut or weld any suspension components, specifically the steering gear system, subframe or anti-roll bars, springs or shock absorbers including mounting brackets.

Interchangeability (including between different Transit variants) of springs, shock absorbers and jounce bumpers is not permitted as the changes in vehicle dynamic performance can affect the ESP system.

CAUTIONS:

When carrying out welding work the springs must be covered to protect them against weld spatter.

Do not touch springs with welding electrodes or welding tongs.

Make sure that loosened or removed and reinstalled components are properly reassembled and the torque set in accordance with manufacturer's requirements.

NOTE: Do not modify the wheelbase, track width or add any type of frame extension to vehicles fitted with Electronic Stability Control, ESC (also known as Electronic Stability Program, ESP).

NOTE: Do not damage the surface or corrosion protection of the spring during disassembly and installation.

2.3 Rear Suspension

Refer to 2.3.1 Springs and Spring Mounting (Rear) and any subsequent sections.

2.3.1 Springs and Spring Mounting (Rear)

WARNING: Do not modify, drill, cut or weld any suspension components, specifically the steering gear system, subframe, springs or shock absorbers including mounting brackets.

CAUTIONS:

When carrying out welding work the springs must be covered to protect them against weld spatter.

Do not touch springs with welding electrodes or welding tongs.

Make sure that components loosened or removed and reinstalled are properly reassembled and the torque set in accordance with manufacturer's requirements.

NOTE: Do not modify the wheelbase or add any type of frame extension to vehicles fitted with Electronic Stability Control, ESC (also known as Electronic Stability Program, ESP).

NOTE: Do not damage the surface or corrosion protection of the spring during disassembly and installation.

NOTE: Do not add any additional axles.

2.4 Wheels and Tyres

Refer to 2.4.1 Wheel Clearance and any subsequent sections.

2.4.1 Wheel Clearance

The distance from the tyre to the mudguard or wheel arch must be sufficient, even if snow or anti-skid chains are fitted and the suspension is fully compressed allowing for axle twist as well.

NOTE: Make sure that only approved wheels and/or permissible tyre sizes are fitted.

NOTE: Ensure access to the wheel and wheel jack and provide sufficient clearance in the wheel arch to allow changing the wheels after conversion.

2.4.2 Tyre Manufacturers

Replacement tyres should be of the same size, tread pattern and load rating as the original equipment manufacturer. Under these conditions the original tyre label should be satisfactory, however if the specified tyres and/or inflation pressures are changed then a new label should be affixed over the original label.

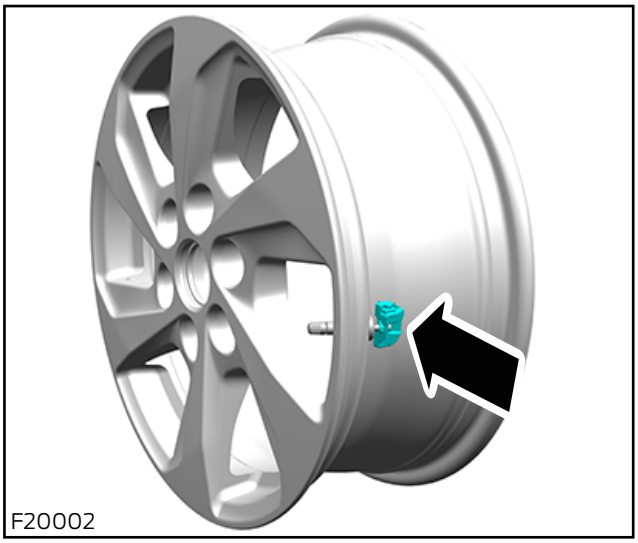
2.4.3 Tyre Pressure Monitoring System (TPMS)

Ford TPMS is a direct system, using physical pressure sensors. TPMS is calibrated according to the correct tyre pressure for the GVM of the vehicle. If the spare wheel is ordered on a base vehicle with TPMS, the tyre will not be supplied with a TPMS sensor.

If you need to replace a road wheel and tyre with the temporary spare wheel, the system will continue to identify a defect. This is to remind you to repair and refit the damaged road wheel and tyre to your vehicle. To restore the correct operation of the system, you must have the repaired road wheel and tyre assembly refitted to the vehicle.

NOTE: If fitting new tyres, you must ensure that the TPMS sensors are fitted correctly as outlined in the service literature. For further information refer to the Owner's Manual or contact your local Ford dealer.

The TPMS receiver is located in the overhead shelf and points directly towards the rear doors. For additional information, refer to 4.13 Handles, Locks, Latches and Entry Systems.



F20002

2.4.4 Spare Wheel

When converting the vehicle and/or relocating the spare wheel, access to the spare wheel must be ensured.

2.4.5 Temporary Mobility Kit

Your vehicle may not have a spare tyre. Therefore, you will have a Temporary Mobility Kit which will only repair one damaged tyre. In the Tourneo Courier, the kit is located behind the driver's seat or under the passenger seat. In the Transit Courier, it is behind the driver's seat.

For more information and usage of the Temporary Mobility Kit please refer to the Owner's Manual.

For information on vehicles with the spare wheel, refer to 1.9.1 Jacking.

2.4.6 Painting Road Wheels

CAUTION: Do not paint wheel clamp surfaces in contact with other wheels, brake drum or disc, hub and holes, or surfaces under wheel nuts. Any further treatment in these areas may affect the wheel clamp performance and the vehicle safety.

Mask the wheel when changing the colour or repairing paint.

2.5 Brake System

Refer to 2.5.1 General (Brake System) and any subsequent sections.

2.5.1 General (Brake System)

The Brake System must be fully functional when the vehicle conversion is completed. The vehicle brake operating modes must be checked, including warning system and parking brakes.

Brakes are certified to 71/320EEC and ECE R13H requirements as amended or ADR 35 or applicable local legislation.

WARNING: Do not restrict the airflow and cooling to the brake system.

CAUTION: Spoilers and wheel covers must not affect the brake cooling performance.

NOTE: Do not obstruct the view of the brake fluid reservoir level.

NOTE: The donor vehicle brake fluid reservoir is translucent so that it is possible to check the level of fluid without opening the reservoir which will reduce the risk of contamination. Do not move the brake fluid reservoir.

NOTE: The brake fluid reservoir must remain accessible for servicing and for adding brake fluid.

2.5.2 Brake Hoses General

CAUTION: Make sure that the front and rear brake hoses are not twisted and are correctly located away from body and chassis components.

Front and rear brake hoses must not rub, chafe or rest on body or chassis components. There must be clearance under all operating conditions, between full compression and extension and full lock to lock.

Brake lines must not be used to support or secure any other component.

2.5.3 Parking Brake

WARNINGS:

Do not modify the brakes.

Do not splice into the parking brake cable.

CAUTION: Make sure that a new parking brake cable is fitted if modification impacts the existing parking brake cable.

2.5.4 Hydraulic Brake - Front and Rear Brakes

WARNINGS:

Do not modify the brakes.

Do not modify the disc inflow and outflow of cooling air.

2.5.5 Anti-Lock Control — Stability Assist

WARNING: Do not modify any part of the braking system, including Anti-Lock Brake System (ABS), Traction Control System (TCS) and Electronic Stability Control (ESC), also known as Electronic Stability Program (ESP).

3.1 Engine/E-Drive

CAUTIONS:

Make sure to follow the equipment supplier's instructions for safety, warranty and sometimes legal compliance.

For Transit Courier/Tourneo Courier BEV, do not modify the halfshafts in the Electric Drive Assembly.

3.1.1 Engine/E-Drive Selection for Conversions

NOTE: Light duty emissions engines are available at Stage 6/EU6 emissions level for vehicle conversions not exceeding 2840kg.

The Vehicle Convertor is responsible for specifying the correct emissions engine to the latest E.E.C/E.U. Regulations depending on the completed vehicle category (N1/M1) and weight. The final weight of a vehicle including the conversion, determines whether a vehicle needs a light duty or heavy duty emissions engine.

The weight is based on the Reference Mass defined as the mass in running order, less a 75kg allowance for the driver, add a 100kg uniform mass.

3.1.2 Engine/E-Drive Types

Front Wheel Drive (FWD) Stage 6/ EU 6 emissions with Manual/Auto Transmissions

1.0 EcoBoost Petrol Engine 73.5kW (100PS)

Item	Description
Max Power kW/RPM	73.5kW (100PS) at 4200-6000 RPM
Max Torque Nm/RPM	170Nm at 1400-4000 1/RPM

1.0 EcoBoost Petrol Engine 91.9kW (125PS)

Item	Description
Max Power kW/RPM	91.9kW (125PS) at 6000 RPM
Max Torque Nm/RPM	200Nm at 1750-2500 RPM

1.5L EcoBlue Diesel Engine 73.8kW (100PS)

Item	Description
Max Power kW/RPM	73.3kW (100PS) at 3500 RPM
Max Torque Nm/RPM	250Nm at 2000-2500 RPM

BEV 100kW (136PS)

Item	Description
Max Power kW/RPM	100kW (136PS) at 4000 RPM
Max Torque Nm/RPM	290Nm at 2000-2500 RPM

3.2 Engine Cooling

NOTE: The installation must be in line with the appropriate legal requirements.

3.2.1 Auxiliary Heater Systems

WARNINGS:

Ford coolant additives are necessary for the complete function of the system. Only use Ford approved or equivalent specification components, to withstand any detrimental effects on the materials.

Do not mount components in front of the grille or in an area of air flow around the engine, which could affect the engine cooling.

CAUTIONS:

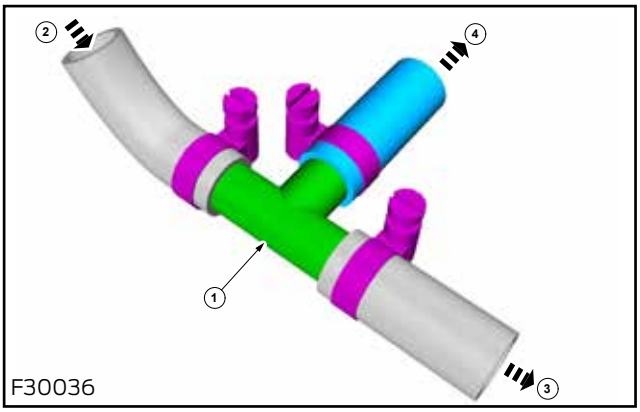
Only make connections into the heater hose between the front cab heater and water pump return inlet.

Do not exceed the vehicle's original coolant volume (without auxiliary heater) by more than 10%.

Maintain a coolant level between the maximum and minimum lines in cold condition after fill and de-aerating operations.

Only use the manufacturer recommended (or equivalent specification) coolant additives/anti-freeze. Do not mix coolant types.

Water Hoses for Auxiliary Heating System



Item	Description
1	Connector (aluminium or plastic)
2	Heater Hose (maintain heater fluid)
3	Original Flow
4	To Ancillary Equipment

- Coolant tube routing must be below the minimum line of the degas bottle.
- Use aluminium or plastic 'T' junction with swaged or beaded ends to prevent hose blow off. Reconnect original coolant tube as shown in view E74570 (in this section) with standard Ford water hose clip or suitable equivalent specification clip. Ensure interference fit between hose and 'T' joint.
- Tube routing must be secured to the body structure or suitable brackets, avoiding electrical components or wires, hot or moving parts and brake or fuel system components.
- Hose must be heat sleeved with appropriate material if within 100 mm of exhaust components (for example, manifold or exhaust gas recirculating).
- The vertical clearance between the critical cooling components (radiator, fan shroud and radiator brackets) and both the bonnet inner and outer (assembly) panels at design position shall not be less than 15 mm.
- There must be a minimum clearance of 10 mm between the engine assembly and flexible components (for example, hoses or wiring harnesses) affixed to front end sheet metal hardware, under a maximum engine torque roll condition.

3.2.2 Fuel Fired Auxiliary Heaters

Text changed to warnings and caution

WARNINGS:

Ensure that the exhaust gas from any auxiliary heating system cannot be re-circulated into the vehicle. The exhaust gases must not pass into the engine intake system or the air intake for the passenger compartment ventilation.

The heating system should be installed outside the passenger compartment. The location of the heating system should not be in close proximity to movable components.

CAUTION: Any body reworks which damage the paint must be fully protected against corrosion.

Refer to 5.12 Corrosion Prevention.

3.2.3 Air Flow Restrictions

WARNING: Do not mount components in front of the grille or in an area of air flow around the engine, which could affect the engine cooling performance.

CAUTION: Overheating within the engine compartment can seriously compromise component robustness.

NOTE: Please assume under bonnet environment is about 130°C when selecting appropriate materials.

3.3 Front End Accessory Drives

Refer to 3.3.1 Front End Accessory Drives (FEAD) and any subsequent sections.

3.3.1 Front End Accessory Drives (FEAD) — General Information

When the correct belt is used, tensioning is and remains fully automatic for the life of the belt.

CAUTIONS:

Only use the manufacturer's recommended (or equivalent specification) components.

Make sure that the ancillary pulley diameter is less than the crankshaft pulley diameter.

Front End Accessory Drive shields must be maintained at all times. If shields are removed, for example when attaching an ancillary unit, they must be replaced so that it is protected appropriately.

NOTE: No devices can be taken off the crank damper as this is a tuned device for system resonance.

NOTE: The shields are there to protect the Front End Accessory Drive system from stone ingress and also protect people from rotating parts under Start-Stop function.

The Eigen frequency of the bracket with auxiliary unit should be above the maximum excitation frequency of the main excitation order of the individual engine at engine top speed. On 4-cylinder inline engines, this is the second engine order.

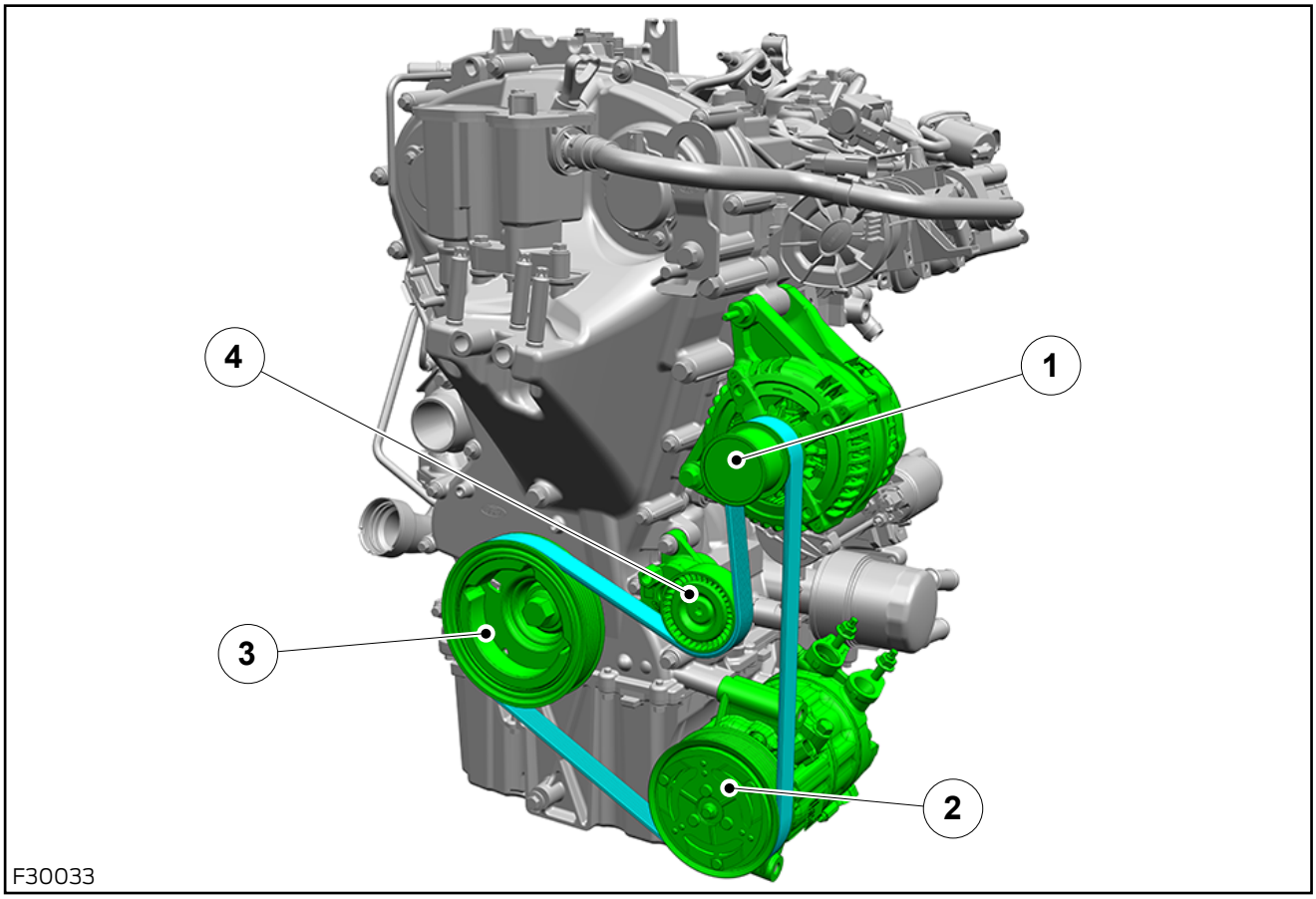
CAUTION: Do not fit an additional FEAD to a vehicle already equipped with an air conditioning compressor.

When engineering and installing a new front end accessory drive, i.e. belt driven from the crankshaft pulley, the longitudinal alignment must be within ±0.25 mm and angular within ±0.33º.

For most FEAD applications the longer, standard option, air conditioning belt can replace the standard belt and pulley layout.

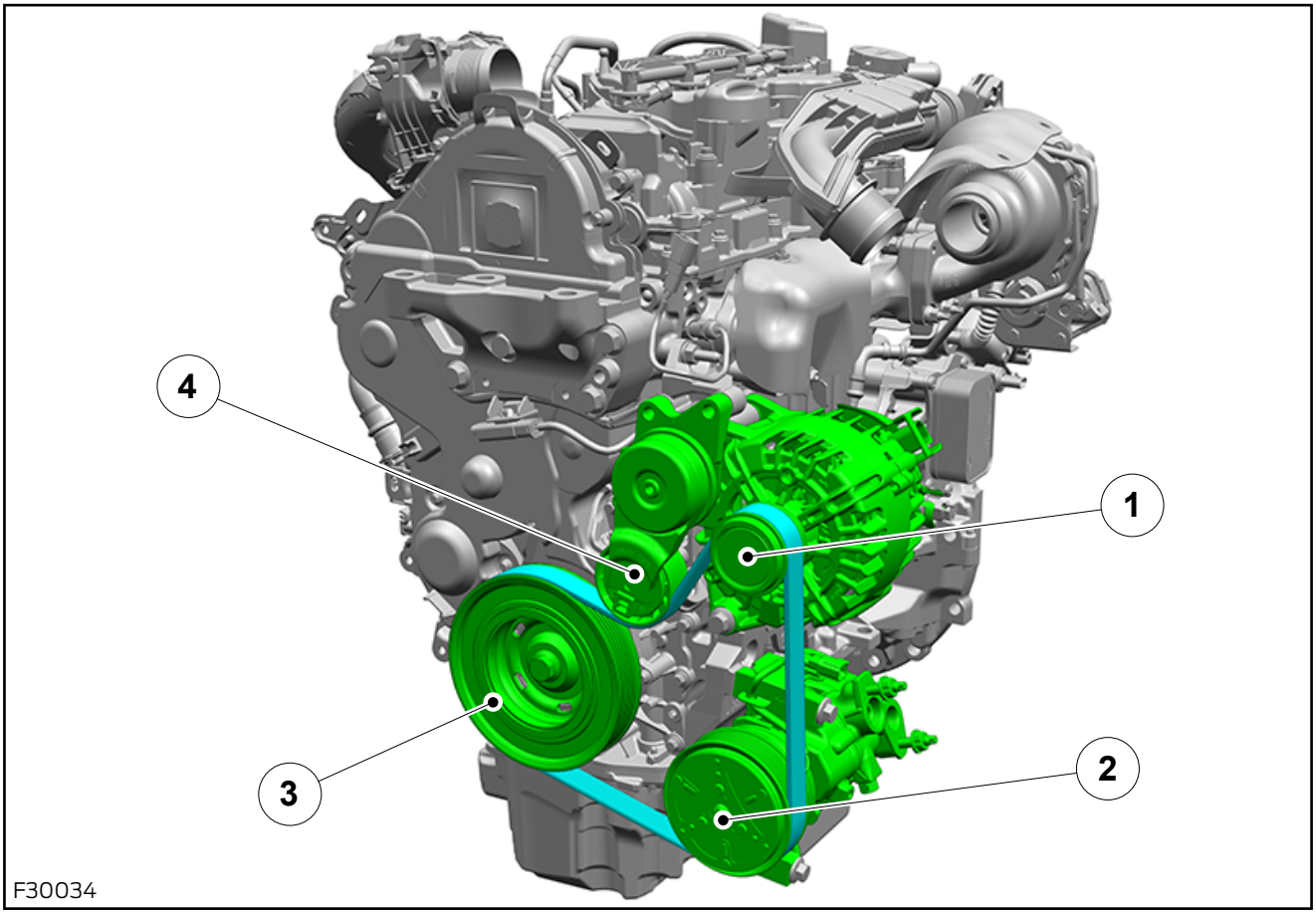
The maximum power that is available for FEAD applications at any engine speed is 6kW (in lieu of the 26Nm air conditioning compressor).

FEAD Layout FWD 1.0L EcoBoost GTDi Petrol Engine - with Air Conditioning



Item	Description
1	Alternator Pulley
2	Air Conditioning Compressor Pulley
3	Crankshaft Pulley
4	Tensioner

FEAD Layout FWD 1.5L EcoBlue TDCi Diesel Engine - with Air Conditioning



Item	Description
1	Alternator Pulley
2	Air Conditioning Compressor Pulley
3	Crankshaft Pulley
4	Tensioner

3.4 Clutch

The manufacturer does not offer the option of a reinforced clutch system. The axle ratio available is dependent on the weight of the specified donor vehicle.

It is necessary to select the appropriate drive, engine, gear ratio, gross vehicle mass, gross train mass, axle plates and payloads of the base vehicle to match the customer's order.

3.5 Manual Transmission

WARNING: Do not reroute external transmission gear shift cables.

B6 6 Speed Manual FWD Transmission is available for all engine types.

1.0L - B6 - 6 Speed Manual FWD Transmission

Gears	Base Transmission Ratio	Overall Ratios
	Gear Set G5D	Final Drive 4.267
1st	3.727	15.903
2nd	2.048	8.737
3rd	1.357	5.790
4th	1.032	4.404
5th	0.821	3.501
6th	0.690	2.946
Reverse	3.818	16.291

1.5L - B6 - 6 Speed Manual FWD Transmission

Gears	Base Transmission Ratio	Overall Ratios
	Gear Set D2	Final Drive 3.824
1st	3.727	14.251
2nd	2.048	7.829
3rd	1.258	4.810
4th	0.919	3.514
5th	0.738	2.822
6th	0.622	2.379
Reverse	3.818	14.599

3.6 Automatic Transmission

WARNINGS:

Do not reroute external transmission gear shift cables.

Do not change or adjust external transmission wiring or connectors.

Do not attach new or modified electrical cables to the transmission.

Do not attach new or modified components to the transmission.

Mechanical tachographs cannot be fitted to the 7DCT300 transmission.

7DCT300 - 7 Speed Dual Clutch FWD Transmission, 1.0L EcoBoost Gasoline Engine

Gears	Base Transmission Ratio	Overall Ratios
		Final Drive
1st	4.462	18.633
2nd	2.824	11.792
3rd	1.594	7.544
4th	1.114	5.274
5th	0.851	4.028
6th	0.771	3.222
7th	0.638	2.666
Reverse	3.869	18.315

3.7 Exhaust System

Refer to 3.7.1 Extensions and Optional Exhausts and any subsequent sections.

3.7.1 Extensions and Optional Exhausts

WARNINGS:

Do not modify the Selective Catalytic Reduction system (SCR), nor the location and orientation of its sensors. Any after-treatment devices (Gasoline and Diesel Particulate Filter/Catalyst/SCR) must not be relocated or permanently removed.

When modifying the exhaust routing, length or location of the exhaust tailpipe, ensure that no exhaust gas ingresses into the cabin or the cargo area. Use suitable measuring equipment to verify no exhaust gas ingresses.

CAUTIONS:

Non-standard systems must be tested for engine back pressure and all legal compliance (noise and emissions).

Make sure that for any pipes that require bending, the radius of the bend is minimum 2.5 x tube diameter.

Make sure that sufficient clearance is maintained for all driving conditions to all hot and moving components.

Take preventative measures to ensure welding spatter does not damage the aftertreatment substrate integrity when welding or cutting pipes.

In case of revising the exhaust routing, provide sufficient number of exhaust hangers and adequate locations to support the exhaust system.

NOTE: Where possible, all pipe connections should be designed so that the gas flows from smaller to larger diameter pipes.

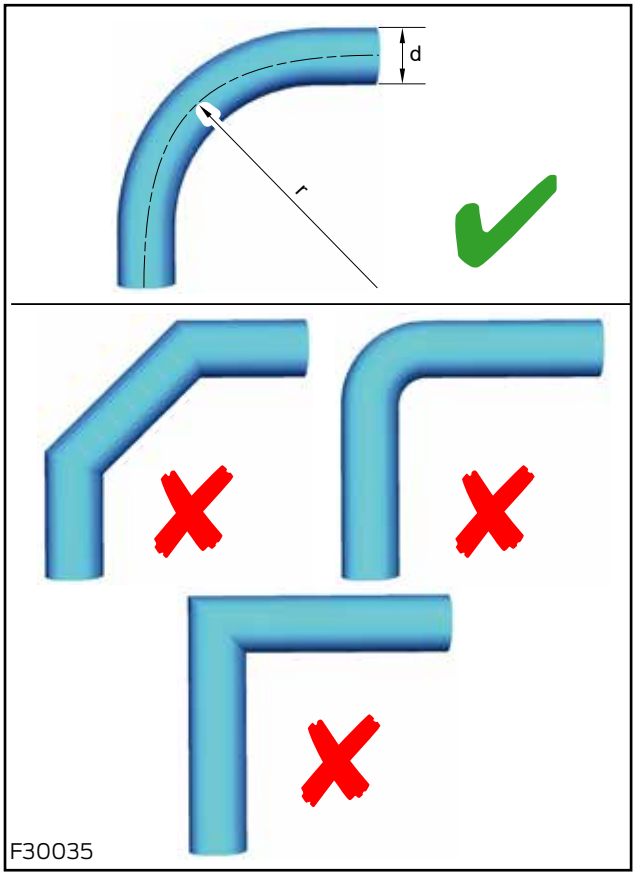
3.7.2 Exhaust Pipes and Supports

CAUTIONS:

Maintain the original set-up and heat shields.

Do not position any components closer than 150 mm nominal (100 mm minimum) clearance to the downpipe, the catalytic convertor, the diesel particulate filter and any part of the exhaust system.

Exhaust Pipe Design Principles



Item	Description
d	diameter
r	radius => 2.5d

3.7.3 Exhaust Heat Shields

Exhaust Heat Shields

- Catalytic convertors, in particular, operate at high temperatures.
- Ensure existing shields are maintained.
- Add further shields over exhaust system as necessary to avoid fire risk.

Standard Exhaust Heat Shields

CAUTION: Standard heat shields are available from your local dealer and can easily be fitted. Additional heat shields may be required over the modified exhaust system, particularly in areas of close proximity to the floor.

3.7.4 Gasoline (GPF) and Diesel Particulate Filter (DPF)

The GPF/DPF forms part of the emissions reduction systems fitted to your vehicle. It filters harmful particulates (soot) from the exhaust gas.

Regeneration

WARNING: Do not park or idle your vehicle over dry leaves, dry grass or other combustible material. The GPF/DPF regeneration process creates very high exhaust gas temperatures. The exhaust will radiate a considerable amount of heat during and after DPF regeneration and after you have switched the engine off. This is a potential fire hazard.

Unlike a normal filter which requires periodic replacement, the GPF/DPF has been designed to regenerate, or clean itself to maintain operating efficiency. The regeneration process takes place automatically.

If your journeys meet one of the following conditions:

- You drive only short distances.
- You frequently switch the ignition on and off.
- Your journeys contain a high level of acceleration and deceleration.

However, some driving conditions mean that you may need to carry out occasional trips with the following conditions to assist the regeneration process:

- Drive your vehicle in more favorable conditions, which you will find at higher vehicle speeds in normal driving, on a main road or motorway for a minimum of 20 minutes. This drive may include short stops that will not affect the regeneration process.
- Avoid prolonged idling and always observe speed limits and road conditions.
- Do not switch off the ignition.
- Select a suitable gear to ideally maintain engine speed between 1500 and 3000 RPM.

3.8 Fuel System

WARNINGS:

Do not cut into the original fuel supply lines.

Make sure that the modified vehicle complies with all relevant legal requirements.

CAUTION: Make sure that sufficient clearance is maintained for all driving conditions to all hot and moving components.

NOTE: Do not fasten anything to existing electrical components, wires or fuel lines.

For Precautionary Drill Zones, refer to 5.1 Body.

3.9 High Voltage System and Electric Drivetrain

WARNING: Before beginning any vehicle modifications refer to the following overview of High Voltage System Health & Safety Precautions.

3.9.1 High Voltage Health & Safety Precautions

WARNINGS:

Do not touch, drill, modify or obscure the orange High Voltage cables, fasteners, channels, strain relief, ground wire or connectors.

Service of the High Voltage system on this vehicle is restricted to qualified personnel. The required qualifications vary by region. Always observe local laws and legislative directives regarding electric vehicle service. Failure to follow this instruction may result in serious personal injury or death.

To prevent the risk of High Voltage shock, always follow precisely all warnings and service instructions, including instructions to de-energize the system. The High Voltage system utilises approximately 400V DC for BEV, provided through High Voltage cables to its components and modules. The High Voltage cables and wiring are identified by orange harness tape or orange wire covering. All High Voltage components are marked with 'High Voltage' warning labels with a 'High Voltage' symbol. Failure to follow these instructions may result in serious personal injury or death

Any work on the High Voltage system requires the Low Voltage Service Disconnect to be open and locked out. Failure to follow these instructions may result in serious personal injury or death.

Extreme heat, such as paint drying ovens, will cause the damage to the High Voltage battery. The High Voltage battery must be removed before using paint drying ovens longer than 45 minutes or with temperatures above 60°C (140°F). Failure to follow this instruction may result in damage to the high voltage battery, which could cause serious personal injury or death in a fire or explosion. Please refer to the Ford Transit/Tourneo Courier workshop manual.

De-energising the High Voltage system does not dissipate the voltage inside the High Voltage battery. The battery pack remains live and dangerous. Contact with the High Voltage battery pack internals may result in serious personal injury or death

Powertrain software calibrations must not be modified (this includes Electric Vehicle Control Module, Primary Drive Control Module, Battery Charge Control Module Battery Energy Control Module and Antilock Braking System Control Module).

Direct contact with high voltage components by personnel, tools or equipment should generally be avoided, including stepping on or leaning on them, setting tools on them, etc.

"High Voltage" is defined in UN ECE 100 as:

- Greater than 60 volts for Direct Current (DC) circuits.
- Greater than 30 volts RMS for Alternating Current (AC) circuits.

Subsequent stage manufacturers and Vehicle Convertors should NOT plan to connect with or modify the high voltage system or components in any way. Integration with the vehicle electrical system must be done only with the low voltage (12 volt) electrical system, or with outlet(s) provided with the "Pro Power Onboard" feature (where applicable).

Only qualified Ford service personnel should attempt to diagnose or repair any high voltage components or systems. Any personnel involved in engineering, subsequent stage manufacturing, modifying, or servicing vehicles with high voltage systems (content other than the HV systems) should be trained in basic understanding and safety principles regarding HV systems.

Emergency Response Guides – Information for First Responders may be helpful in developing an emergency response plan in case a vehicle with a HV system is damaged.

The following manufacturing operations are not recommended on vehicles with High Voltage systems:

- Welding anywhere on the chassis or installed body.
- Cutting or drilling operations near HV components.
- Operations generating significant heat near HV components, especially near the HV battery.
- Paint curing operations above 60°C (140°F) or longer than 45 minutes.

High Voltage Labels

On electric vehicles, 'WARNING' labels are located on High Voltage components throughout the vehicle as per the following examples. High Voltage warning symbols are not to be obscured or altered in any way:

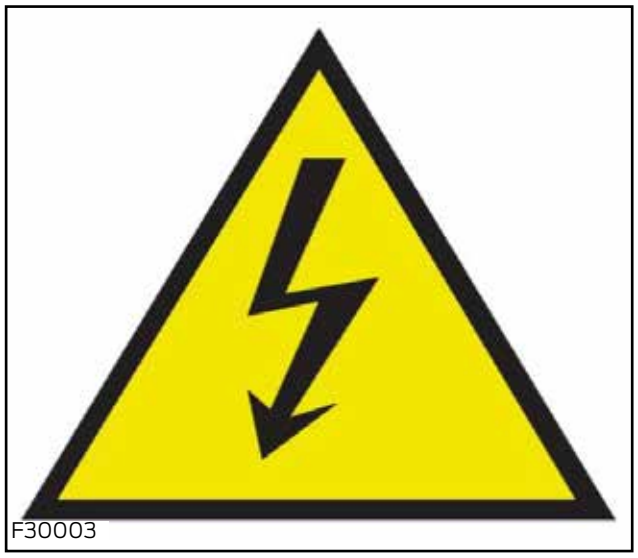
HV Label Example 1

F30001

HV Label Example 2

F30002

HV Label Example 3

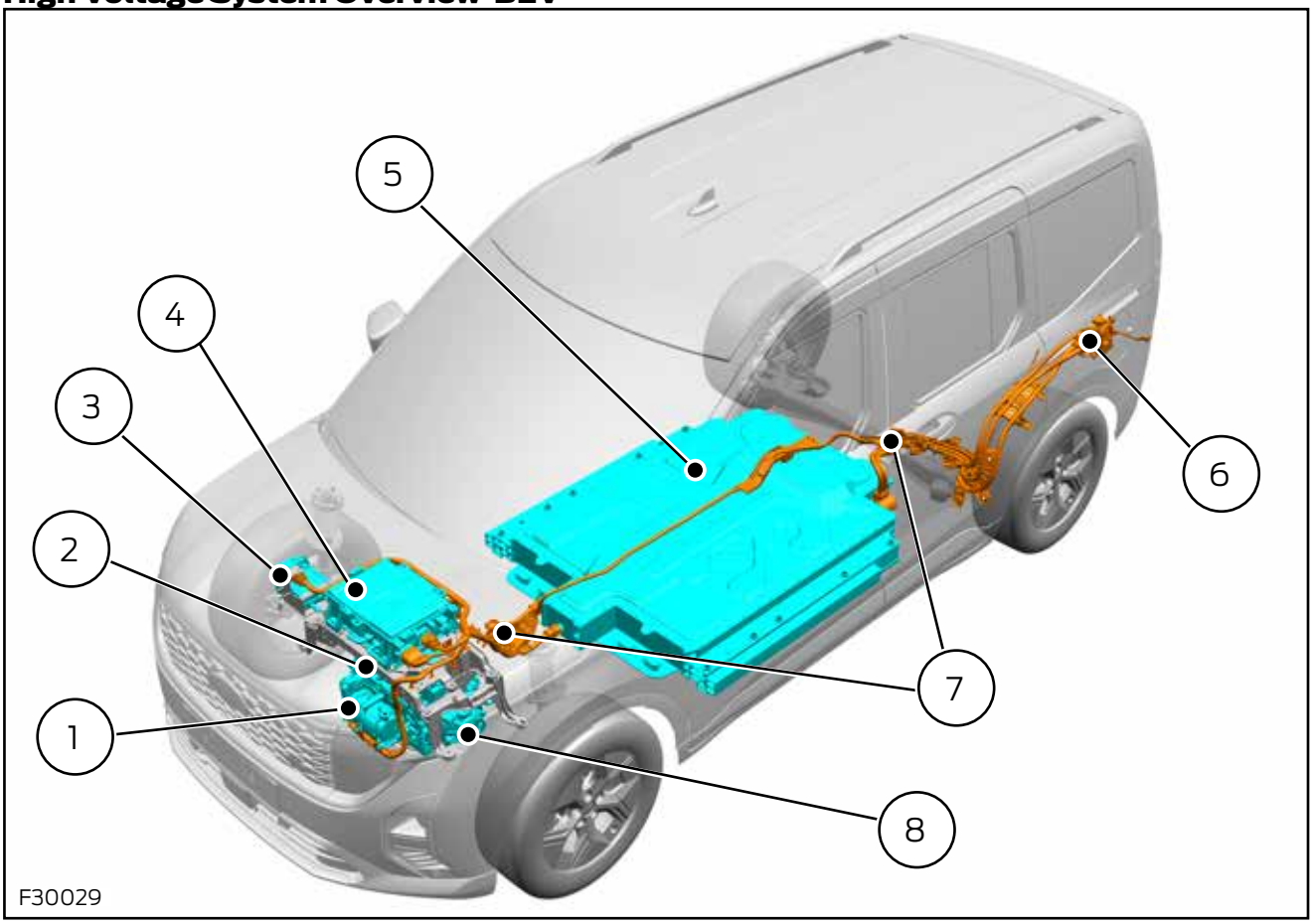


F30003

3.9.2 High Voltage System Overview

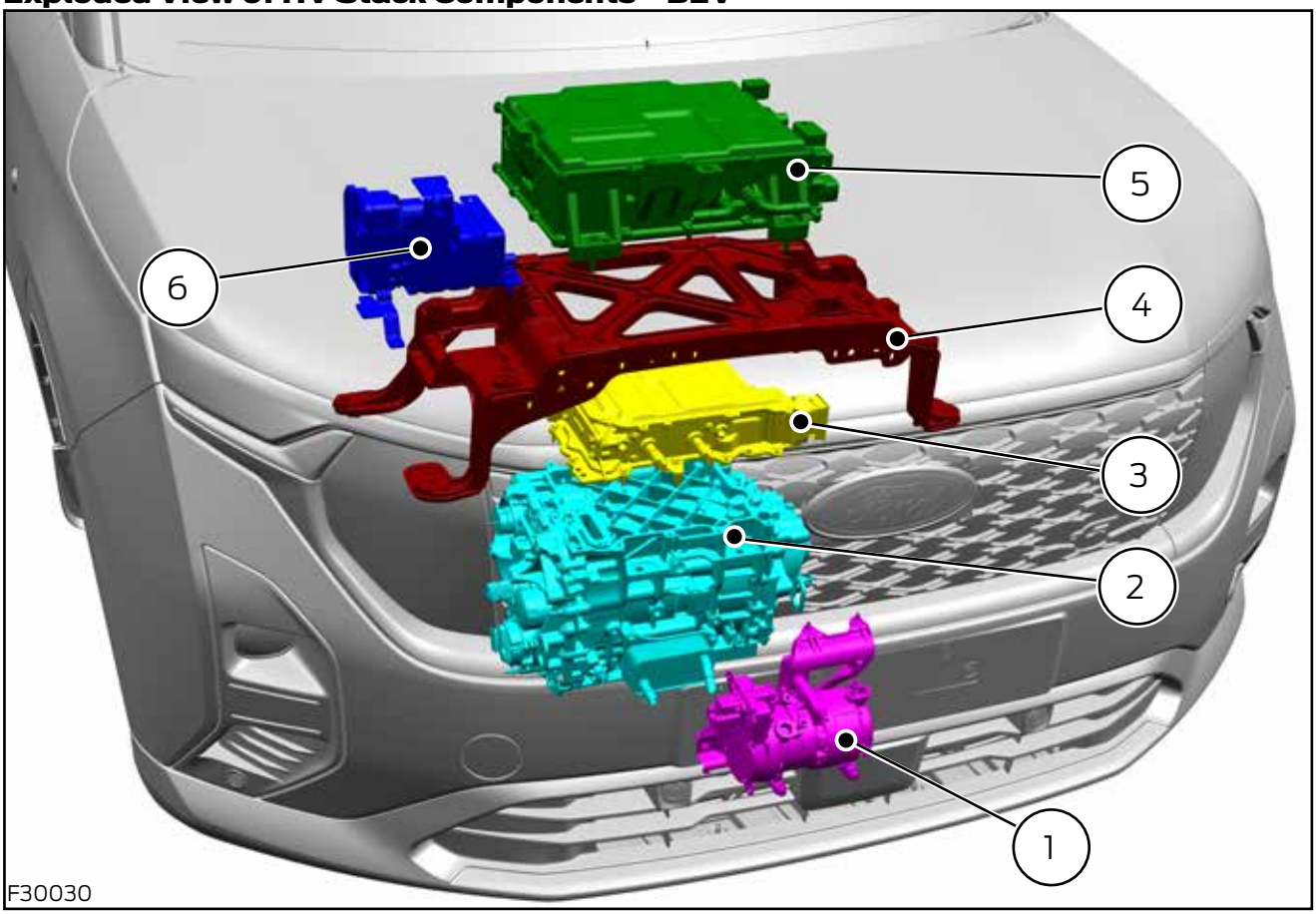
The High Voltage System on Transit/Tourneo Courier consists of a centrally mounted, underfloor High Voltage Battery Pack, a front-mounted 'stack' of HV control systems under the 'bonnet', that are mounted to the 'Megabrace' and an Electric Drive Assembly providing drive to the front wheels. These are connected by orange High Voltage cables and a system for cooling the components of the High Voltage system.

High Voltage System Overview-BEV



Item	Description
1	Electric Air Conditioning Compressor
2	Transmission Inverter Unit
3	High Voltage Heater
4	DC to DC Converter / Charger Module
5	High Voltage Battery Pack
6	High Voltage Charge Port Inlet
7	High Voltage Cables (in orange)
8	Power Drive Unit

Exploded View of HV Stack Components - BEV



Item	Description
1	Electric Air Conditioning Compressor
2	Power Drive Unit
3	Transmission Inverter Unit
4	Cradle/Brace
5	DC to DC Converter / Charger Module
6	High Voltage Heater

3.9.3 HV System De-Energising

Please refer to the Ford Transit Courier workshop manual for High Voltage Battery Disconnect and Connect procedure.

WARNING: De-energising the High Voltage system does not dissipate the voltage inside the High Voltage battery. The battery pack remains live and dangerous. Contact with the High Voltage battery pack internals may result in serious personal injury or death.

NOTE: When the HV system has been de-energised, the 12V Low Voltage system will remain live.

3.9.4 HV System Cooling

It is recommended that when installing an auxiliary heater and/or air conditioning system convertors meet or exceed the occupant comfort heating and cooling performance of the current production vehicle.

CAUTIONS:

For Transit/Tourneo Courier BEV, do not modify the High Voltage battery cooling system.

Do not modify any of the front-end seals to the cooling module. These prevent hot air recirculation from coming back into the AC Condenser

Do not splice into any compressor wire harness.

The performance of the Ford defrost and demisting system must not be diminished by the addition of an auxiliary heater and/or air conditioning system. Final Stage Manufacturers are reminded of their responsibility to maintain compliance to C/FMVSS 103 and EU 672/2010, windscreen defrosting and demisting systems.

Ford Motor Company OEM Front System Specifications for Transit Courier BEV:

- Thermostatic Expansion Valve (TXV) size: 1.5 Ton 2.3 +/- 0.1 bar
- AC Compressor Displacement: 34 cc Fixed
- R1234yf Refrigerant Charge: 520g
- Refrigerant Oil: 160 g
- Coolant Heater: 5.0 kW

AC and Heater Line Routings

- Do not route lines/hoses in the wheelhouse area.
- Do not route lines/hoses near sharp edges or moving component parts. There must be shield protection from any potential abrasive sources.

Battery Heating and Cooling

- The large traction battery on this vehicle is cooled by the chiller and otherwise surface convection. There is no low temperature radiator (LTR). The chiller is an evaporator connected to the AC system that produces cold coolant, instead of cold air, to cool the battery.
- The battery is heated with the same heater used for the cabin, although battery heating only occurs when the vehicle is connected to a charger.
- Vehicle performance effects due to battery thermal derate can occur, if the battery thermal system (heat, cool) is impacted, making the battery too hot or too cold for proper performance.

3.9.5 High Voltage Battery

Observe the following precautions when working on or around High Voltage Batteries:

- Do not cut the High Voltage battery case. Do not penetrate the batteries or case in any way.
- The High Voltage battery pack is located under the vehicle.
- The total voltage of the HV battery pack may be up to approximately 400V DC for BEV.
- The battery case is water resistant.
- The battery cells contain liquid electrolyte absorbed in a pouch casing. The electrolyte will not leak from the battery under most conditions. However, if the battery is crushed, it is possible for a small amount of electrolyte to leak.
- If possible, isolate and avoid contact with any electric vehicle components. If contact with the High Voltage system cannot be avoided, Personal Protective Equipment (PPE) such as a splash shield or safety goggles, gloves (minimum requirement is to use class00 – 500V DC resistance), an apron or overcoat and rubber boots are required when handling damaged batteries. Exposure to electrolyte could cause skin and/or eye irritation/burns. If exposed, rinse with large amounts of water for 10-15 minutes.

The high voltage system has a floating return reference, which is designed to completely isolate the HV system from the vehicle chassis and non-HV components and circuits. As part of the safety features built in to the HV system, measurements between the HV bus and vehicle ground are monitored during key “on” state to detect high voltage leakage or stray current to the chassis.

The power terminals of the high voltage battery are only activated when necessary for vehicle operation, including:

- When the vehicle is in key “on” or “accessory” state (“Ready” indicator lit in instrument cluster).
- When the 12V battery has a low state of charge - the HV battery will activate to charge the 12V battery through the DC-to-DC Convertor, even in the vehicle key “off” state.
- When the vehicle is plugged into a charging station (BEV only) - the charge port, charge unit, HV battery and wiring between these components may be active, with high voltage present even in the vehicle key “off” state.

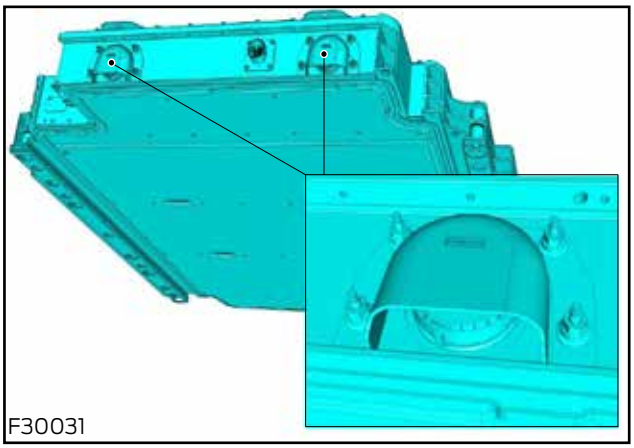
HV Battery Venting

1. The Transit/Tourneo Courier BEV HV battery is equipped with venting valves. No additional components nor obstructions (beyond any installed by Ford) shall be located in the same environment as the battery

(e.g., underbody) and within 150 mm of these features. Additionally, no components which may contain combustible liquids or gases at any time shall be added within 300 mm of these features.

2. There shall be no modifications or installed components which confine the air space near the outside of the HV battery or obstruct the free flow of air about the battery (beyond any installed by Ford).
3. Any cutouts or openings created between the occupant space and the vehicle underbody must be sealed to prevent air from passing from under the vehicle into the occupant space
4. If any primary ingress/egress paths for occupant spaces are located above or rearward of the HV battery – to the center of between 2 rear tyres, a metallic shielding shall be added to obstruct any air flow from the battery towards those ingress/egress paths, and redirect that air flow towards a side/rear area that is not a primary ingress/egress path.

HV Battery Vent-BEV


F30031

HV Battery Grounding

WARNINGS:

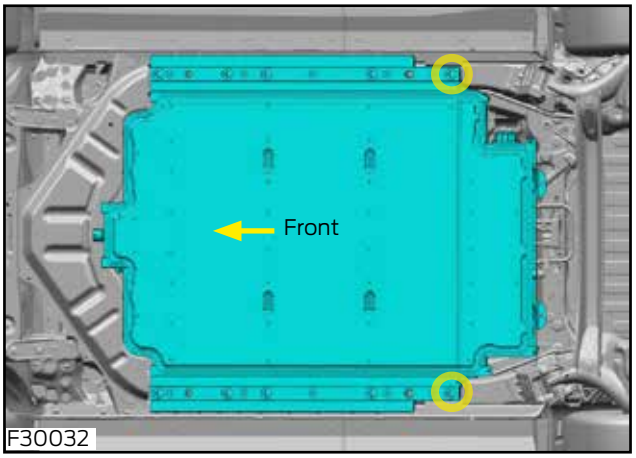
The following illustrations indicate the points where the High Voltage battery and cradle are grounded. These points should NOT be used as additional/auxiliary grounding points for the Low Voltage (12V) system.

Electrical ground paths (case grounds and/or ground straps and/or low voltage wiring) for High Voltage components on the Transit/Tourneo Courier must not be altered or modified in any way. Do not tamper with or modify any of these HV component fastener joints or ground points.

NOTE: As part of the safety features built in to the HV system, measurements between the HV circuitry and vehicle ground are measured using these ground paths. Therefore, HV battery ground paths must not be altered in any way.

Refer to 4.2.14 Precautionary Drill Zones - Cable Ground.

BEV HV Battery Grounding Fastener



3.9.6 EV Charging

Please refer to the Transit/Tourneo Courier Owner's Manual

NOTE: Mobile chargers provided with vehicles should be reserved for end customer use only, and not used during manufacturing or delivery processes, to prevent damage or loss.

4.1 Electrical System Overview - New section

WARNINGS:

It is recommended to follow the guidelines in the electrical sections of the BEMM. Incorrect design, for example, overloaded ground paths or insufficient mechanical protection to a third-party wiring, could lead to serious system or vehicle failure.

The fitting of voltage boosters or other devices to enhance alternator/DCDC output are not allowed. The fitting of such devices will not only invalidate vehicle warranties, but could damage either or both, the alternator and Engine Management System/Power Control Module, and possibly affect vehicle legal compliance. Check local legislation.

It is strongly recommended to always follow the guidelines of the BEMM when working on the vehicle electrical system. Not following the guidelines may result in an increased risk of vehicle fire, serious injury and death.

NOTE: Ford Motor Company has no control over the modification or installation process of the electrical content of auxiliary systems and therefore can take no responsibility for such installations.

4.2 Wiring Installation and Routing Guides

NOTE: For additional information and recommendations on materials and equipment for interfacing to the Ford systems, power and grounds, please contact your National Sales Company representative or local Ford dealer.

4.2.1 Wiring Harness Information

NOTE: Ford Motor Company has no control over the modification or installation process of the electrical content of auxiliary systems and therefore can take no responsibility for such installations.

The following provides an installation guide for conversions affecting electrical components and/or electrical systems. The aim is to maintain robust integration of auxiliary systems without compromising existing systems, by control of splicing techniques, module package location, electromagnetic compatibility (EMC) etc. The Vehicle Convertor must test their installation and ensure the design and function complies with all legal and homologation requirements.

4.2.2 General Wiring and Routing

 Section updated

Temperature requirements: Wiring systems in the vehicle interior are expected to function over the temperature ranges of –40ºF to 185ºF (-40ºC to 85ºC) for exposure and –40ºF to 167ºF (-40ºC to 75ºC) for function. For engine compartment and underbody, the minimum temperature is -40ºF (-40ºC), while the maximum exposure and operational temperatures are 257ºF (125ºC) for exposure and 221ºF (105ºC) for operational.

Make sure that the insulation is compatible with any fluids it may encounter, for example: gasoline, oil, antifreeze, brake fluid, transmission fluid and power steering fluid.

If a connector will be located in a hostile environment or wet area, use a sealed connector. 'Hostile environment' areas include the engine compartment, wheel wells, underbody, and doors.

In general, the distance between retention points for wiring not contained in a rigid shield should be less than 11.8" (300mm). For wiring inside the doors, this should be reduced to 5.91" (150mm).

Minimum clearances:
- 9.8" (250mm) from exhaust system
- 1" (25mm) from all sharp edges and moving parts
- 0.79" (20mm) from fluid lines
- 0.6" (15mm) from weld points
- 0.4" (10mm) from static components

If these clearances cannot be met, protect the wires with a convolute &/or heat shielding.

For vehicle modifications with walkthroughs, it is recommended to provide appropriate protection on the floor in the walkway.

Connecting blocks with screws or spring retention are not recommended due to the low frequency vibration that can occur in certain vehicles which could lead to terminals becoming loose.

A secondary clamp design is required on all eyelets to help avoid strain and breaking of a single conductor strand.

It is recommended to use a set ratchet crimp tool for the required crimp force.

Soldering is not permitted as the only method of retention. All connections must be crimped. Soldering should only be used as a supplementary retention method to the crimp, to reduce impedance.

If routing wiring through drilled metal, all holes need to be protected by a grommet or protective edging to avoid chafing.

All wires, single or multiple, should have a secondary form of mechanical protection, for example: cotton, PVC tape, conduit or sleeving, depending on the routing environment within the vehicle.

It is recommended to use edge clips, where required, to control routing of all cables in weather zone areas of the vehicle. For non-weather zone areas of the vehicle do not use edge clips.

4.2.3 Connector Pin Out Practices

When designing a harness to connect a component, it is best practice to put the female terminals in the harness side connection and the male terminals in the component side. When determining connector pin outs, make sure

that the Power and Ground circuits are not in close proximity or adjacent to one another. A minimum separation of 5 mm between Power and Ground circuits is required.

WARNING: Do not use connectors which cut through the outer covering and into the core wire.

CAUTION: Only use Ford approved connectors.

Cutting into vehicle wiring is not recommended because:

- Long term risk of a faulty connection developing.
- Potential fire risk from overloading.

All connections into existing wiring must be permanently insulated. Exterior connections must be waterproof.

When designing electrical circuits, or making alterations, the following must be considered:

- Current rating of wiring. See table 'Current Rating of Wire Sizes' in this section.
- Any voltage drop in the circuit should not lower the terminal voltage at consumption point to below 95% of battery voltage.
- Do not cut into the original harness.
- Additional Ground returns should be included to support new equipment.
- A supplementary circuit diagram and accompanying instructions should be added to the Owner's information or a separate manual supplied with the vehicle for each unique component.

Where wires are required to be extended, use designated break-in points. For these extensions, only Ford-approved connectors and Ford-approved jumper harnesses should be used.

4.2.4 Unused Connectors

Harnesses may have a number of unused connectors, depending on which features have been ordered on the donor vehicle, e.g. heated seats. Ford **do not** recommend the use of these connectors for any other purpose than that intended by design.

4.2.5 Grounding

If a new grounding point is required, avoid placing it in a wet area, especially for high current grounds. Ground connections should be routed back close to the location of the +12V supply. This helps to reduce the electromagnetic field, particularly generated by inrush current and improve electromagnetic compatibility.

Drill point screws are not to be used for any ground attachments:

- Do not ground to moving structures, for example: doors, deck lids, lift gates, as the ground return path through the hinges is not reliable.
- Do not exceed 2 eyelet or crimp terminals per stud connection for high current applications. Refer to 4.5 Battery Systems.
- Do not place electrical component attachments or ground nuts adjacent to vehicle fuel tanks or fuel lines.
- Each individual third party load must have a dedicated ground connected directly to the vehicle body ground or to the battery negative spare stud - see 'Additional Loads and Charging Systems' later in this section of the BEMM.
- Multiple grounds must not go to an interim splice to a main ground cable.

Reference to the installation of busbars removed

For identification of suitable grounding points, refer to 4.20 Grounding.

4.2.6 Prevention of Squeaks and Rattles

Content updated

Wiring should be positively retained every 300mm except when inside a door where retention should be every 150mm. All connectors should be positively retained. Use tapes which do not squeak against metal or plastic.

4.2.7 Water Leakage Prevention

Make sure the harness design includes drip-loops to prevent water seepage into the vehicle interior when wiring passes from the outside to the inside of the vehicle. The drip-loop is a section of wiring deliberately formed to

route below the point of entry into the vehicle. Water droplets on the harness will migrate under gravity to the lowest part of the harness.
Wiring from the door to the passenger compartment should be routed such that the door entry point is below the passenger compartment entry point, which creates a type of drip loop.

4.2.8 Wiring Splicing Procedures

TYCO-RAYCHEM crimp splices

F40280

Ford Motor Company strongly advises against the use of wire splicing due to the variable and unpredictable nature of the joint created. However, if it is decided that a wire splice is unavoidable, it must be made using **DuraSeal Heat-Shrinkable, Environmentally Sealed, Nylon-Insulated Crimp Splices** (manufactured by TYCO-RAYCHEM) such as from the D406 series. As a further process to improve the splice integrity, the splice should be further sealed with a suitable heat shrink tubing. See Figure F40280.

4.2.9 Wiring Specification

Current Rating of Wire Sizes

Cross Sectional Area (mm^2)	Maximum Continuous Current @75°C	Max Resistance (mΩ/m) @20°C
0.5	10	37.1
0.75	13	24.7
1	17	18.5
1.5	21	12.7
2	26	9.42
2.5	27	7.6
4	37	4.71
6	52	3.14
10	71	1.82
16	95	1.16
25	107	0.743

NOTE: The maximum continuous current (A) values for 75°C is a value that a generic PVC insulated, thin wall, bare copper conductor wire can carry under 75°C ambient temperature and can be taken as a reference for the wires inside of the vehicle. If a new wire is needed on engine compartment or any area near to higher temperature exposure, higher cross-sections or XLPE insulated wires are recommended.

When designing wire installations for additional equipment, use the cable size recommended by the equipment manufacturer or select a suitable size from the 'Current Rating of Wire Sizes' table.

4.2.10 Electromagnetic Compatibility (EMC) Awareness

WARNING: Do not route other wiring near/close to electrical cables with the Anti-Lock Brake System and Traction Control System cables because of extraneous signal risk. It is generally not recommended to hang extra wiring from existing looms or pipes.

The installation and routing of Ford wiring has been fully validated and has passed the requisite EMC tests. Ford Motor Company, however, are not responsible for the vehicle's EMC immunity when non-Ford-approved systems are installed. Wiring must be suitably fixed without any detrimental effect on other wiring.

Single or bunched looms must maintain the following clearances:

- 10 mm from static components (unless clamped to it)
- 250 mm from exhaust system
- 30 mm from rotating or moving components

Refer to 1.6 Electromagnetic Compatibility (EMC).

4.2.11 Wiring Through Sheet Metal

WARNING: Harnesses passing through sheet metal must be through protective grommets that also ensure a watertight seal. A windscreen type sealer should be used. Adhesive or tape is not acceptable.

NOTE: Holes must permit the appropriate connector to pass through.

NOTE: The maximum size of additional wire bundle diameter is 6 mm.

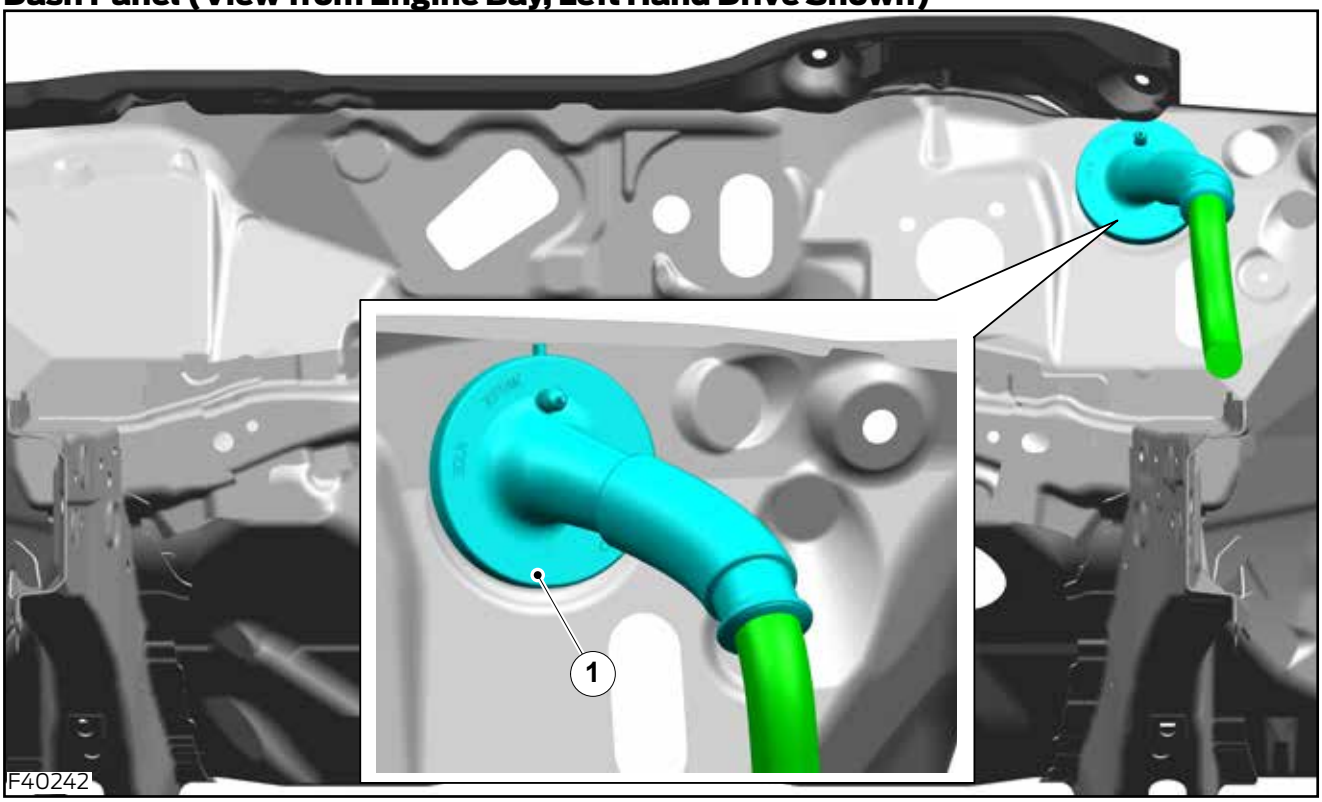
There is one location in the dash panel which has been identified for an additional hole to route wires through. See Figure F40242(view from engine bay) for location. The number of suitable locations will depend on the vehicle specification.

The grommet in location 1, shown in Figure F40242 is moulded directly to wire bundles in polyurethane foam material. It is not possible to feed extra wires through with the wire bundle. The grommet has an 'indent' moulded into the surface face, engine bay side, which shows the position where an additional hole can be made using the following procedure:

- Check that the immediate surrounding area is free from obstructions and/or components to prevent damage to critical systems.
- Use a suitable tool, for example: a drill or spike bit.
- Insert the drill or spike bit, keeping it horizontal and parallel, through the indent of the grommet. Ensure it does not extend further than 25 mm through the grommet surface, as this will help eliminate any possible damage to items on the passenger side of the grommet.

Ford-released hardware is available to support further vehicle installations. Only Ford-released hardware and parts should be used.

Dash Panel (View from Engine Bay, Left Hand Drive Shown)



Item	Description
1	Dash Grommet Left Hand Side

4.2.12 Precautionary Drill Zones High Voltage (HV) Cables

WARNINGS:

Do not touch, drill, modify or obscure the orange High Voltage cables, fasteners, channels, strain relief, ground wire or connectors.

Fasteners that upfitters install must point away from the battery so as not to cause damage to the battery. Do not add a fastener into the vehicle that would point toward the HV battery.

No components or structure installed by an upfitter shall result in contact, penetration (especially added fasteners pointed towards the high voltage battery or other electrical components), separation, or other damage to the high voltage electrical system or any portion thereof when the vehicle is tested in any manner.

Do not modify the High Voltage Charge Port Inlet Connector/Mounting Bracket.

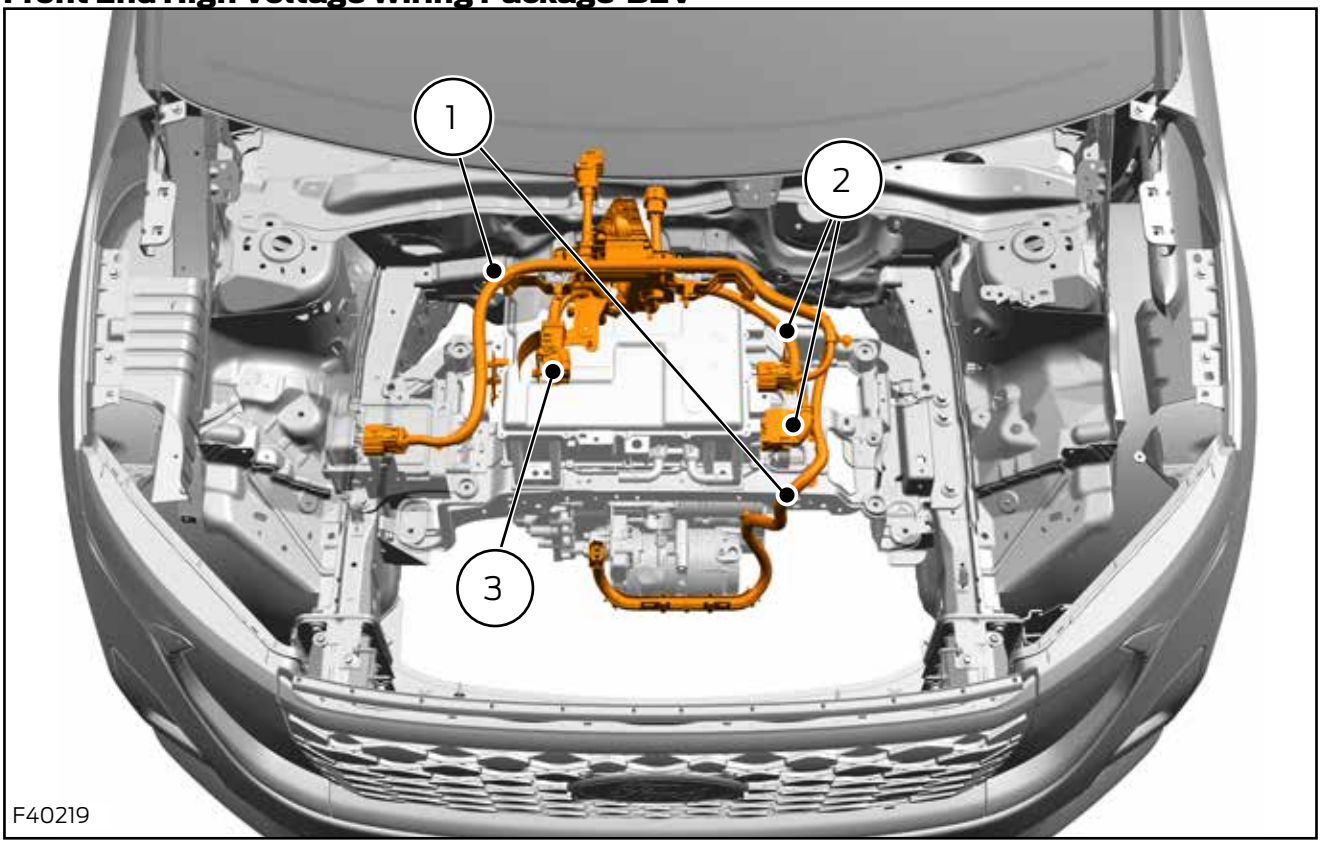
Do not modify these High Voltage/Low Voltage grounding locations/joints/fasteners of the Charge Port Harness Package Grounds.

Do not modify the length of any of the orange high voltage cables.

Do not remove fasteners and protective shield from the Charge Port Inlet Harness.

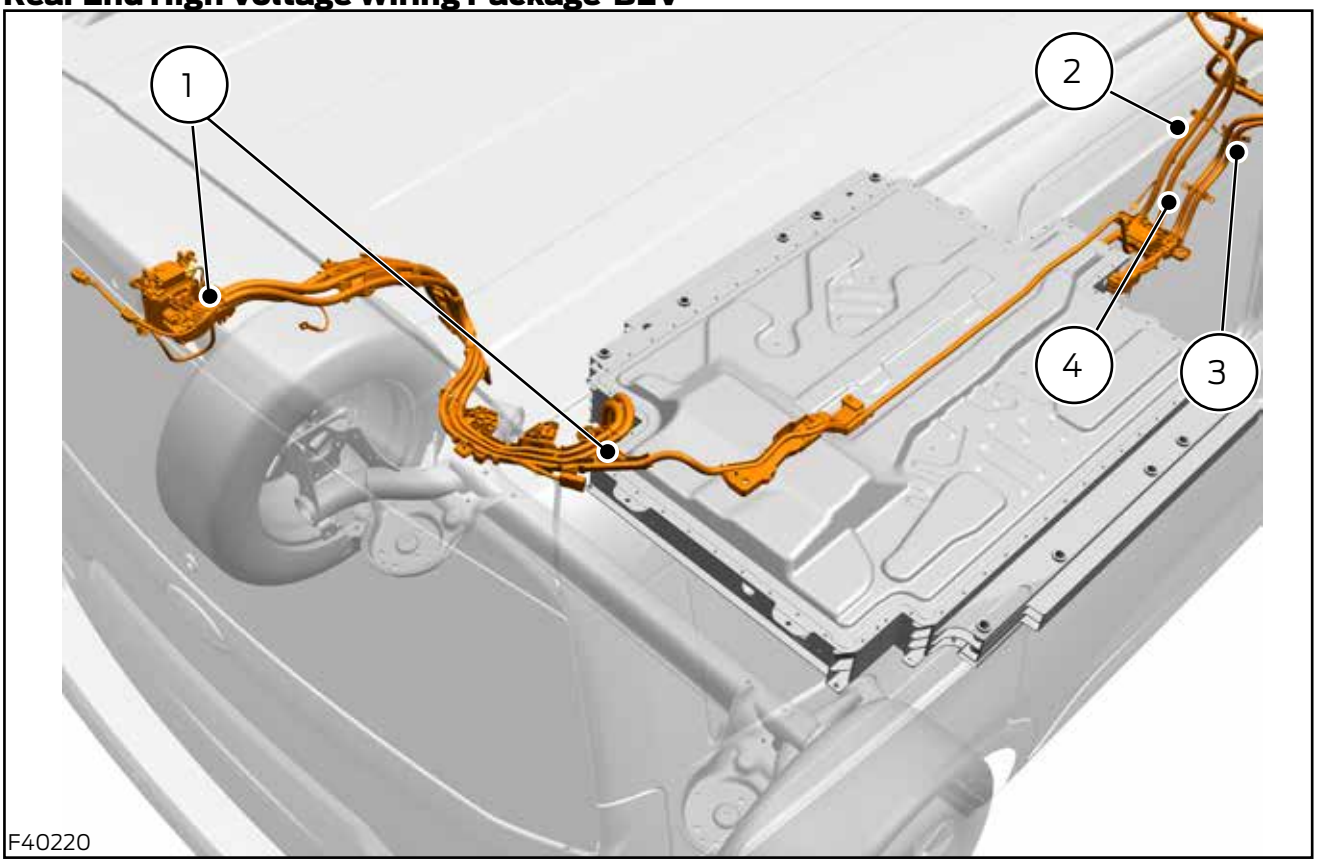
CAUTION: Take precaution when undertaking drilling or any other operation in or near any HV cable to prevent damage.

Front End High Voltage Wiring Package-BEV



Item	Description
1	Air Conditioning (AC) Compressor Harness
2	High Voltage (HV) Jumper Harness
3	Primary Drive Unit Harness

Rear End High Voltage Wiring Package-BEV



Item	Description
1	Charge Port Harness
2	AC Compressor Harness
3	Primary Drive Unit Harness
4	HV Jumper Harness

4.2.13 Precautionary Drill Zones - HV Modules, LV Cables and Connectors

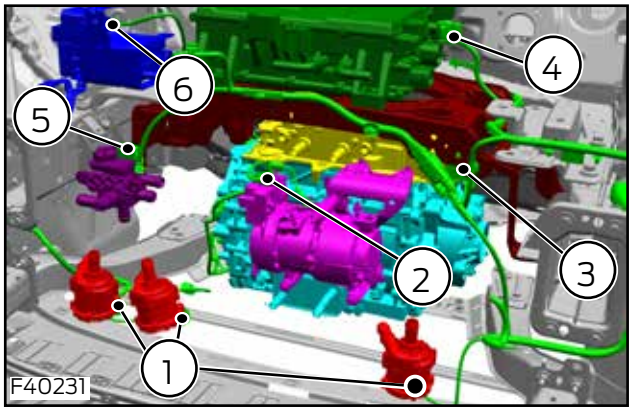
CAUTION: Beware when drilling or undertaking any operation near the LV cable that connects to the High Voltage modules, as this could negatively impact vehicle performance. The LV cable also includes a ground for HV components.

WARNINGS:

Take precautions when drilling or undertaking any other operation, in the areas indicated, in order to prevent damage to any components.

Do not modify any existing Low Voltage cable connections.

LV Connectors: Front of HV Stack-BEV



Item	Description
1	LV Connector to Cooling Pumps
2	LV Connector to Electric Air Conditioning Comp
3	LV Connector to Transmission Inverter Unit
4	LV Connector to DC to DC Converter / Charger Module
5	LV Connector to coolant valve
6	High Voltage Heater

4.2.14 Precautionary Drill Zones Cable Ground

WARNINGS:

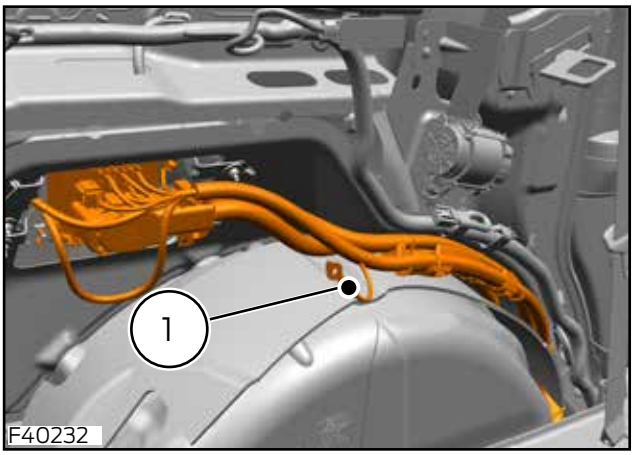
Take precautions when undertaking drilling, or any other operation, in or around the high voltage stack or electric drive assembly in order to prevent damage to any components. HV grounding points in the vehicle are not to be touched.

Do not modify any High Voltage grounding locations, connectors or joints.

On the Transit/Tourneo Courier BEV, the High Voltage (HV) circuitry is not grounded to the body/chassis in the same way as the Low Voltage (12V) system. As part of the safety features built in to the HV system, measurements between the HV circuitry and vehicle ground are measured using these ground paths. Therefore, HV module ground paths must not be altered in any way.

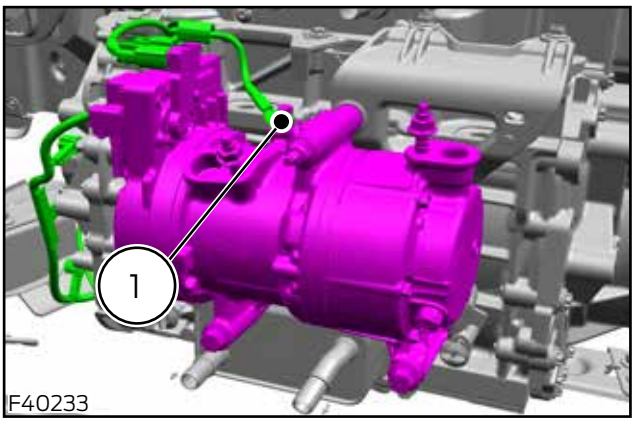
Do not modify these High Voltage/Low Voltage grounding locations/joints/fasteners of the Charge Port Harness Package Grounds.

Cable Grounding: Charge Port HV Cable Ground-BEV



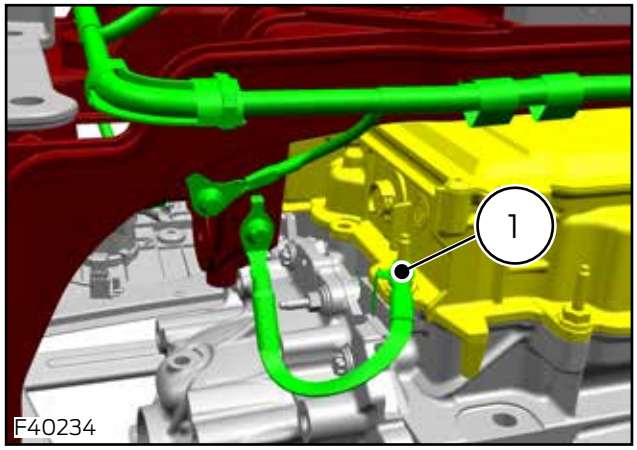
Item	Description
1	Charge Port HV Cable Ground-BEV

Cable Grounding: High Voltage Modules LV Cable Ground-BEV



Item	Description
1	Air Conditioning (AC) Compressor LV Cable Ground-BEV

Cable Grounding: High Voltage Modules LV Cable Ground-BEV

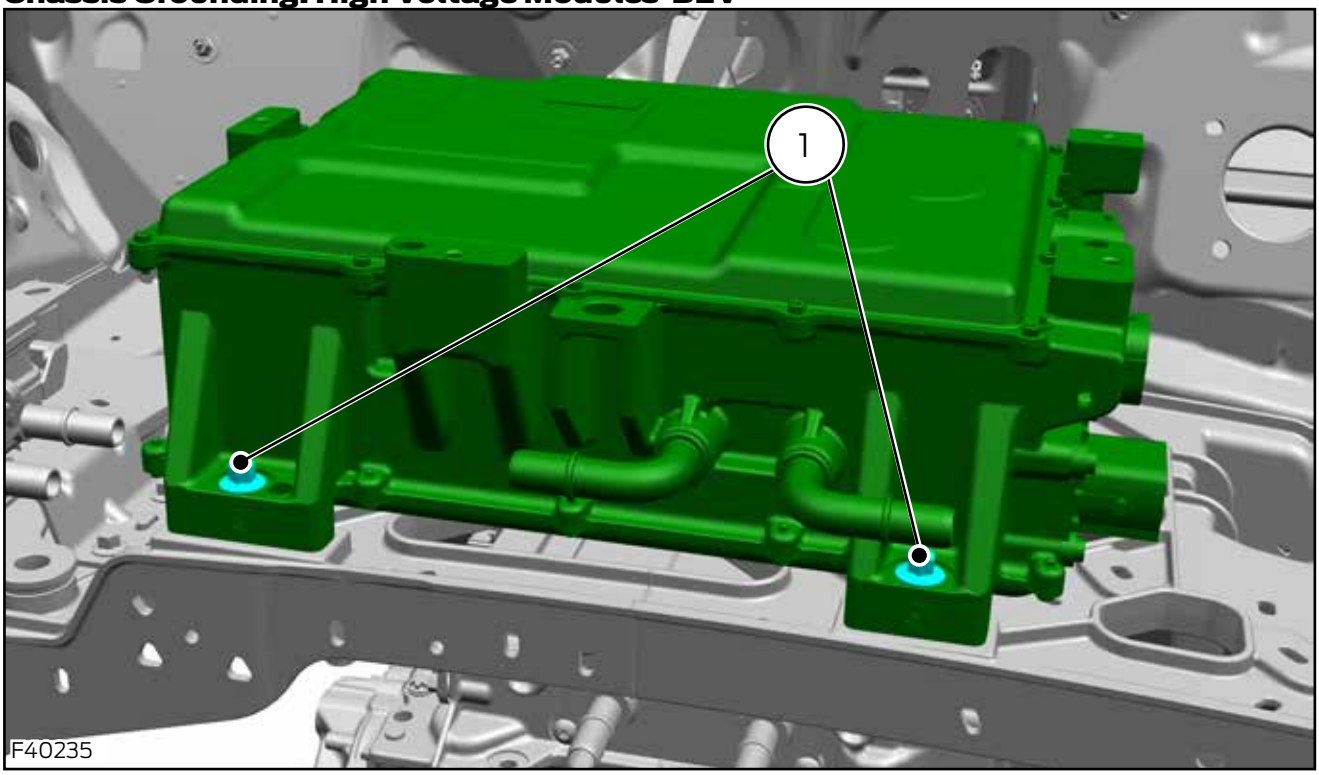


Item	Description
1	Transmission inverter unit LV Cable Ground-BEV

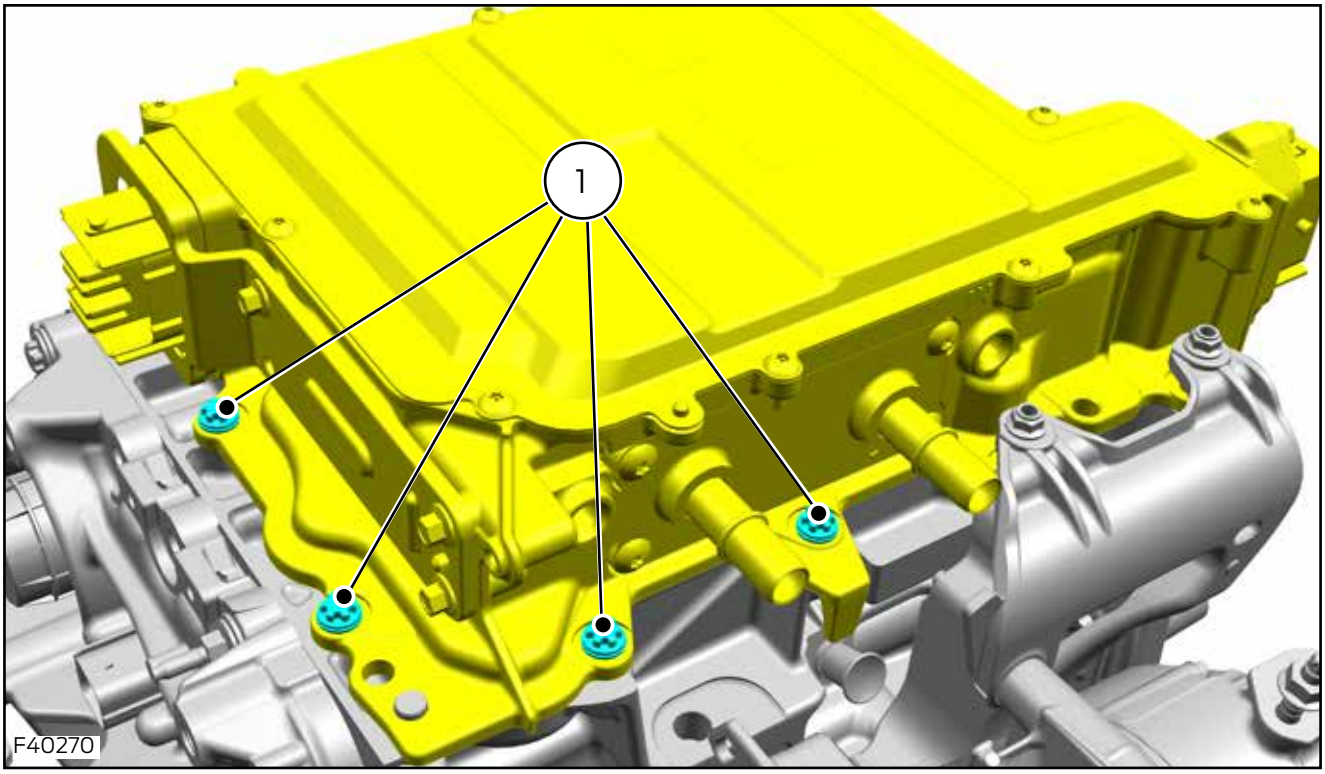
4.2.15 Precautionary Drill Zones-Chassis Grounding

WARNING: Do not modify locations/joints of the Electric Drive Assembly Ground Path from the Inverter System Controller to the Electric Drive Unit or Chassis Cross member.

Chassis Grounding: High Voltage Modules-BEV



Item	Description	Quantity
1	Chassis Grounding High Voltage BEV Modules	X4



Item	Description	Quantity
1	Chassis Grounding High Voltage BEV Modules	X9

4.2.16 No Drill Zones — Rear Cargo Area

CAUTION: Do not drill into the vehicle before checking the No Drill Zones and electrical wire routing.

NOTE: Refer also to 5.10.2 B Pillar No Drill Zone for details of the restrictions in the area around the Seat Belt installation.

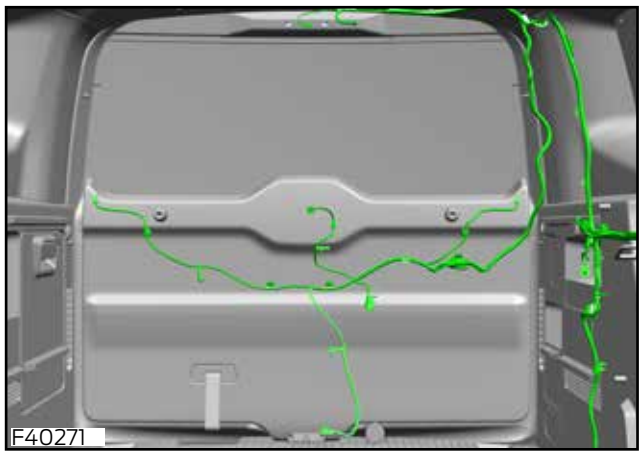
The following images show the routing of cabling in the rear cargo area. This indicates the Precautionary Drill Zones where there is wire routing that is to be avoided, (for example: when installing cladding and racking). The same care should also be taken when using self-tapping screws. Not all derivatives are shown but the routing is the same for roof line and wheelbase with regards to 'B', 'C' and 'D' pillars or roof bows and doors. Other non-electrical systems may also be present, for example - fuel tank under the floor, so it is important to check before drilling. For additional information refer to the following links.

For additional information, refer to the following sections:

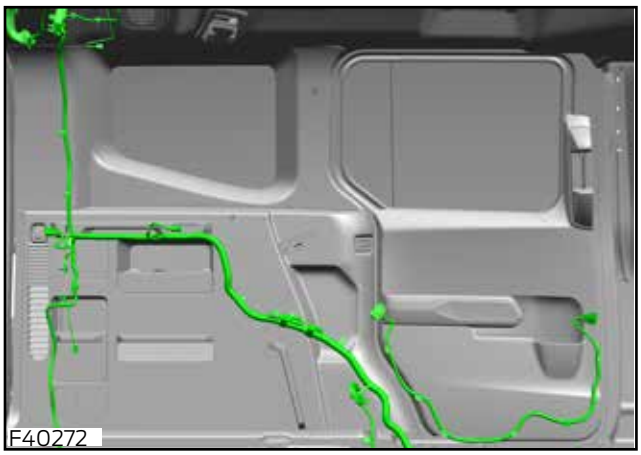
- 1.12.8 Vehicle Dimensions Key for Wheel Base and Roof Height dimensions
- 5.1 Body No Drill Zones - Fuel Tank Under Floor
- 5.2 Racking Systems
- 5.3 Loadspace Load Compartment Tie Downs
- 5.5 Body Closures No Drill Zones - Closures

Tourneo Courier

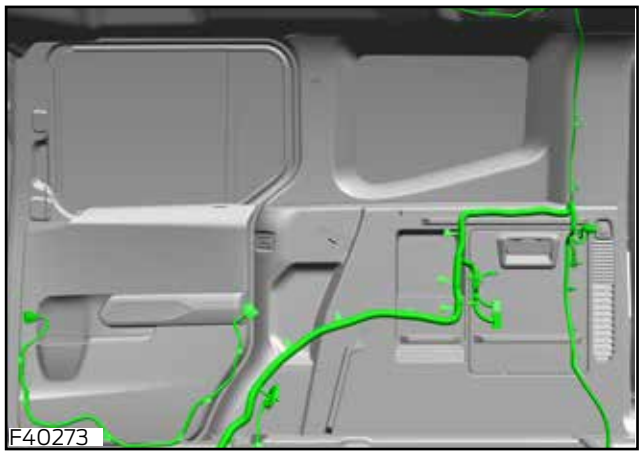
No Drill Zones - Rear Cargo Area (Lift Gate)



No Drill Zones - Rear Cargo Area (Left Side)



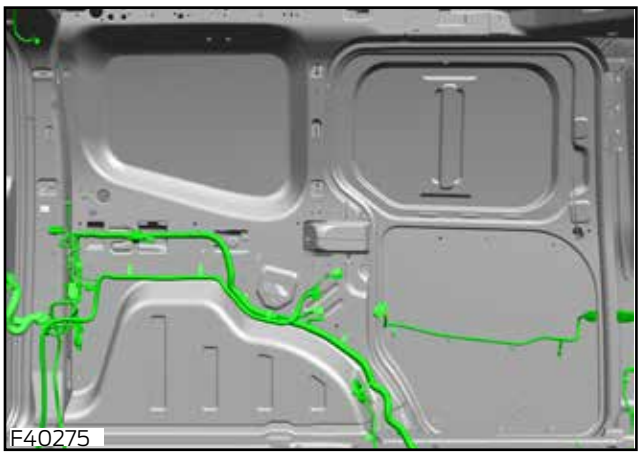
No Drill Zones - Side Load Door (Right Side)



Transit Courier

No Drill Zones - Rear Cargo Area (Rear Doors)

No Drill Zones - Side Load Door (Left Side)



No Drill Zones - Rear Cargo Area (Right Side)

4.2.17 Electrics for Tow Bar

NOTE: The Ford trailer tow system is integrated with the Ford park aid system. When a trailer is connected, the system communicates on CAN only, to deactivate reverse park aid feature, there is no hardwired interface. It is not possible to turn off reverse park aid with an aftermarket trailer tow system.

NOTE: For Van tow bars, it is necessary to connect into the rear lamp unit.

NOTE: If tow bar connectors are not used, appropriate fixing and cover must be applied for protection from water and contaminant ingress.

NOTE: The trailer detect circuit is part of the Ford Trailer Tow module, it can only be implemented on vehicles with power locking and perimeter or CAT 1 alarms.

Tow bar electrical system may be ordered as a 13-pin DIN connector as part of the original vehicle build.

Where trailer towing needs to be added to an existing vehicle, and to ensure compliance with lighting regulations, the appropriate wiring accessory kit can be obtained from your Ford Dealer.

Fitment of non-Ford trailer tow wiring is not advisable due to Body Control Module control of lighting, and meeting lighting regulations. Contact your local Ford dealer for details of a harness that connects to the base vehicle harness.

Each output driver could handle a current of 15A but it is not recommended to always run to this maximum. A higher current is interpreted as short circuit. If a short circuit is detected, the related output will be switched off. The following table shows the recommended output maximums per circuit.

The TTM offers a battery charge output. This output is used for loading a trailer battery with a maximum parameter current of 10A. If the current exceeds 10A the output is switched off until the current drain goes below 10A. The voltage used to charge this battery is designed to maintain current charge up to 10A but not fully charge the battery or let it discharge. This voltage is approximately 13.5V. Full charge strategy should be performed separately.

The maximum total current is 30A of all circuits. If this is exceeded the battery charge output is switched off.

Summary:

- Max permanent current: 10A
- Switch on condition:
  - Power Mode > = Accessory_1
  - Total power consumption (all lamps + battery charge) < 30A
  - Permanent battery charge output current < = 10A
  - 9V < TTM power supply voltage < 16V
- Short circuit detection: 30A

4.2.18 Trailer Tow Connectivity

If trailer tow system is to be added, the correct wiring and module needs to be ordered.

NOTE: It is mandatory that a trailer is detected. Therefore at least one of the following lamps have to be connected in the **on mode** or in the **standby mode** (anti-theft mode): Stop right, Stop left or Direction Indicator left.

If a trailer is detected the trailer detection hardware output (JP3-pin 5) is set low (open drain).

If a short circuit is detected or an overheating of the drivers occurs, the related output remains off until an ignition cycle is performed and the engine is restarted.

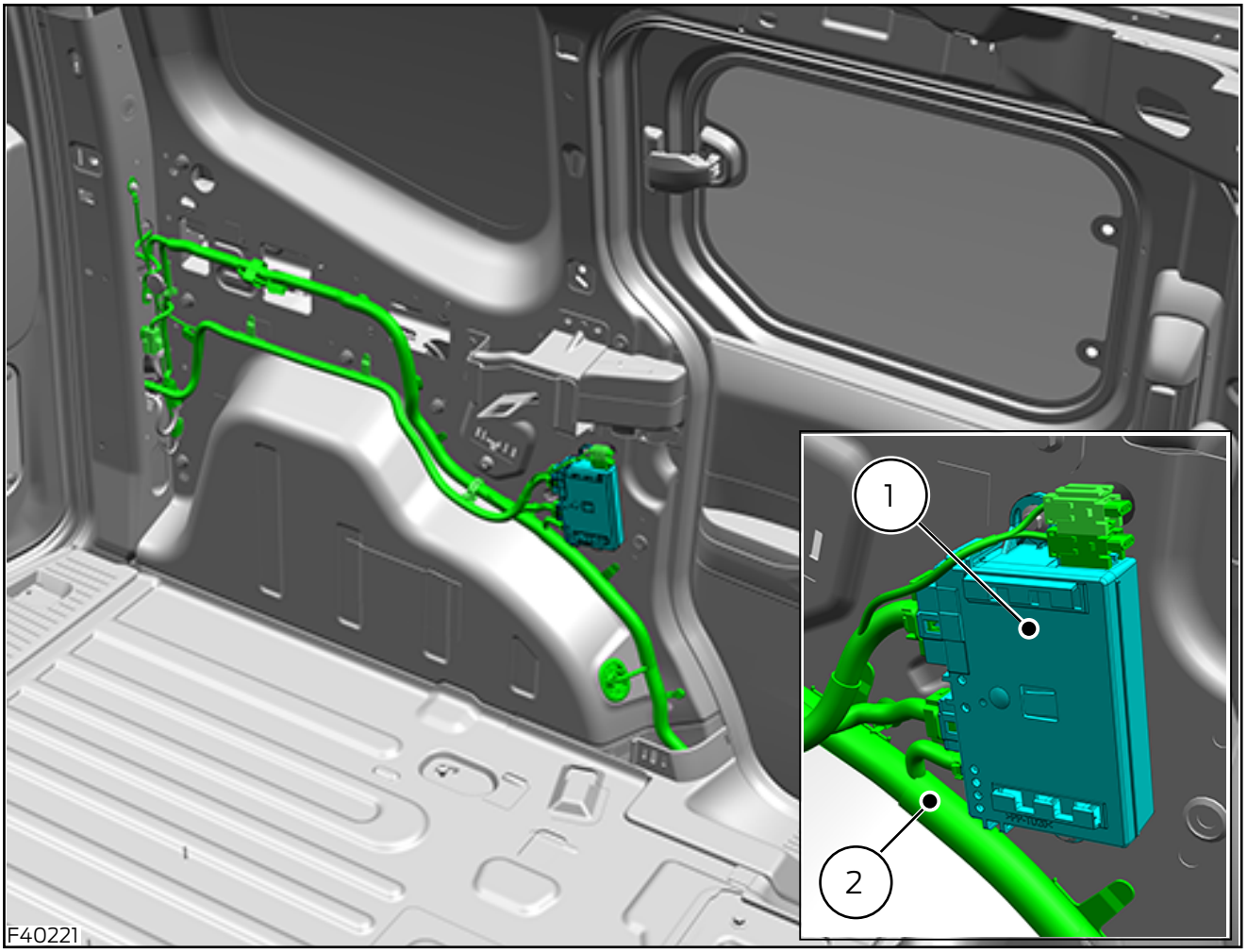
The trailer detection uses a strategy of having a 1K ohm resistor, if the lights are not actually switched on to detect that the trailer has been connected. If a trailer light is already switched on, the related current will be checked.

The Trailer Tow Module **does not** support the incremental load of powering side marker lamps on a trailer. If these are required, they should also be driven using separate relays.

Trailer Tow features are enabled via the Ford Diagnostic Repair System (FDRS). There may be a dealer charge for this service.

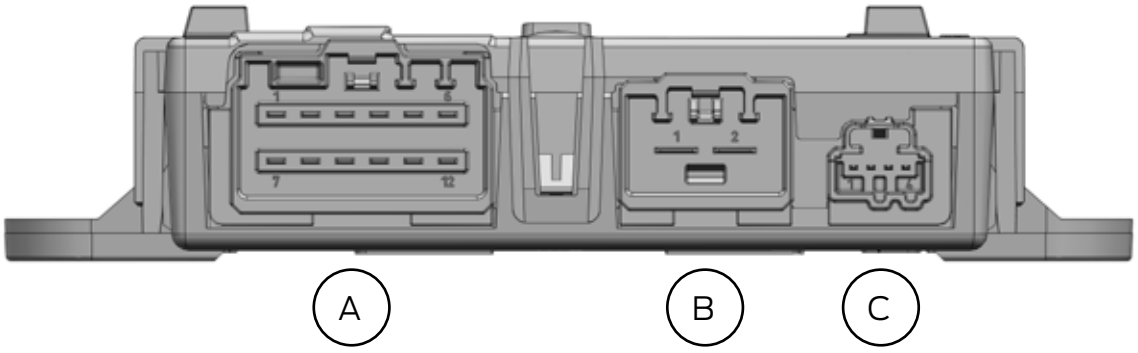
FDRS access can be purchased from Ford Service Info https://www.fordserviceinfo.com.

Trailer Tow Module and Harness



Item	Description	Part Number
1	Trailer Tow Module	PZ3T-19H517-E*
2	Main Body Harness	R2XJ-15A416-A*

Trailer Tow Module



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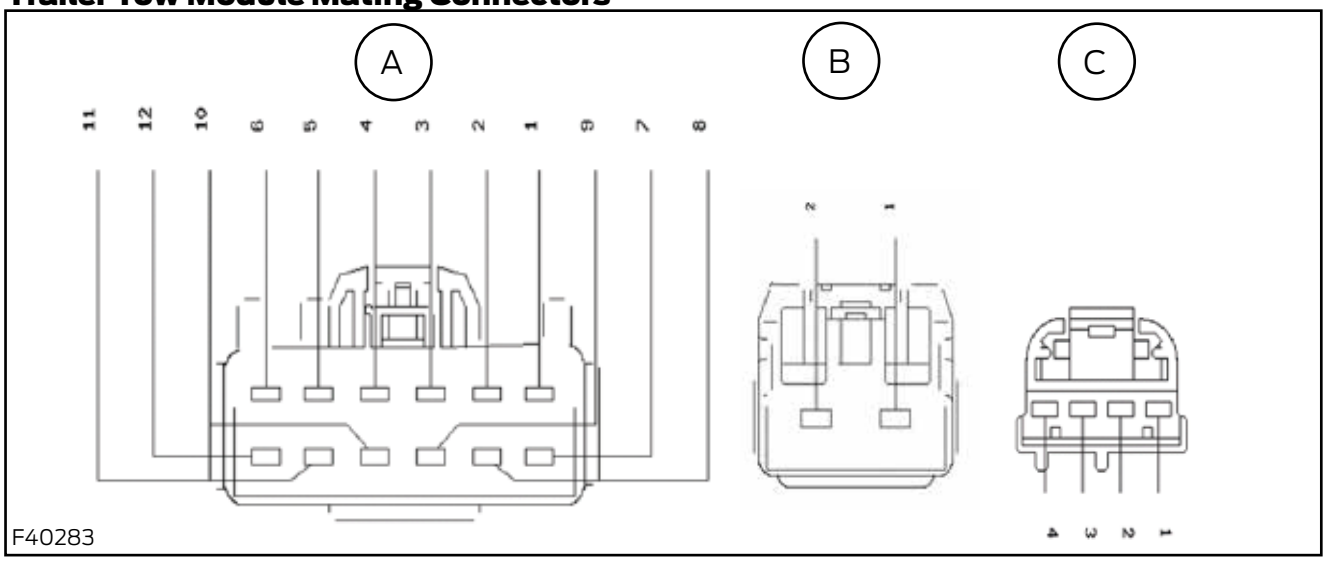
Item	Description	Part Number
A	12 Way connection	4S7T-14489-Y*
B	2 Way connection	3M5T-14489-K*
C	4 Way connection	4L3T-14A464-L*

Trailer Tow Module Connectors Pin Layout (Figure F40283)

Component Terminal Number	Feature	Current (A)		Voltage (V)	
		Min	Max	Min	Max
Connector A					
1	Left Turn Lamp	1.13	1.89	8	19.0
2	Right Turn Lamp	1.13	1.89	8	19.0
3	Park Lamps	3.62	6.03	8	19.0
4	Not used	-	-	-	-
5	Reversing Lamps	2.26	3.78	8	19.0
6	Battery Charging	15.0	15	8	16.0
7	Stop Lamps	4.54	7.57	8	19.0
8	Rear Fog Lamp	2.26	3.78	8	19.0
9	Trailer Tow Connect Signal	0.002	0.002	5	5
10	Not used	-	-	-	-
11	Not used	-	-	-	-
12	Battery Charge	15.0	15	8	16.0
Connector B					
1	PWR01:PAAT	0.5	25.1	8	19
2	PWR01:PAAT	0	30	8	16
Connector C					
1	Power Ground	0.5	0.5	0	0
2	MS 1 CAN -	0.1	0.1	8	8
3	MS 1 CAN+	0.1	0.1	8	8
4	Trailer Tow Anti-Theft	0.013	0.013	8	19

Trailer Tow Module Mating Connectors

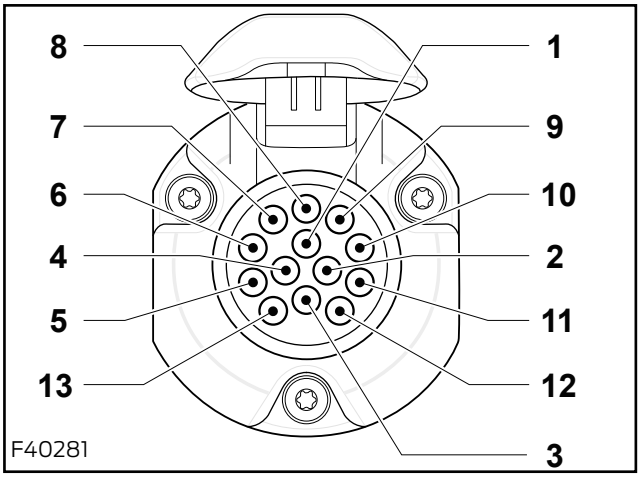


Trailer Tow Connectivity 13 Pin Socket

Pin	Description	Colour
1	Left Turn Lamp	Yellow
2	Fog	Grey/Orange
3	Lamp Ground	Black/Purple
4	Right Turn Lamp	Green
5	Right Position License Lamp	Yellow/Green
6	Stop Lamps	Red
7	Left Position License Lamp	Purple/White
8	Reversing Lamp	Grey/Brown
10	KL15 Ignition	Grey/Yellow
11	Ignition Ground KL15	Black/Purple
13	Power Ground	Black/Purple

Any pins not listed in the table above are not to be used.

Trailer Tow 13 Pin Socket



4.3 Communications Network

Refer to 4.3.1 CAN-Bus System Description and Interface and any subsequent sections.

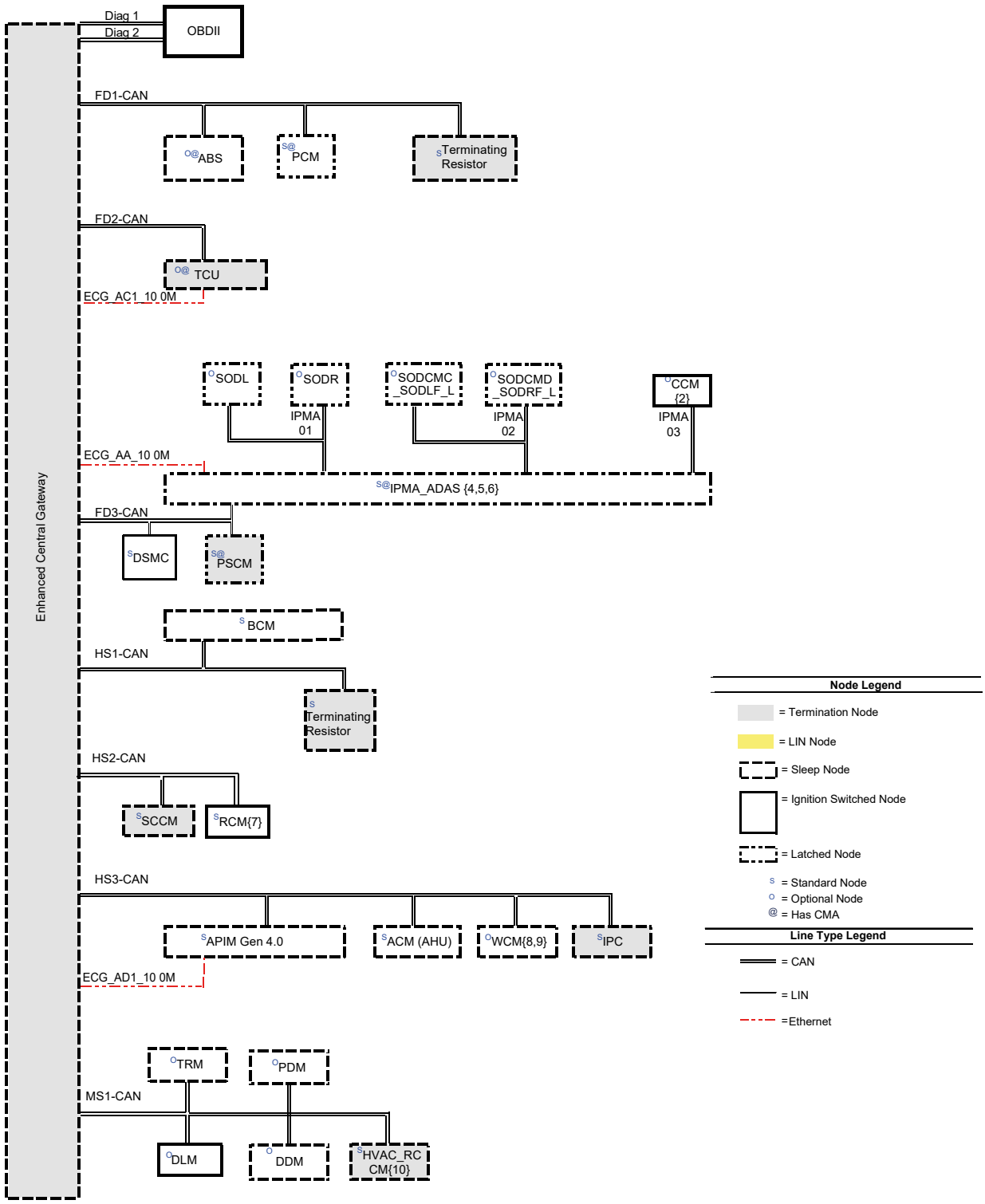
4.3.1 CAN-Bus System Description and Interface


CAN-Bus System diagrams updated


WARNING: Do not tamper with, cut into or connect to any of the CAN-Bus interface wiring or connectors. The addition of unapproved CAN-Based modules could impact the safe operation of the vehicle.

The Controller Area Network (CAN) uses propriety message sets to communicate between the devices shown via Medium Speed (MS), High Speed (HS), Fast Data (FD) and Private Buses. In addition, there are localised applications of Local Interconnect Network (LIN) and ISO 9141 K-line serial links.

CAN -Bus System - ICE



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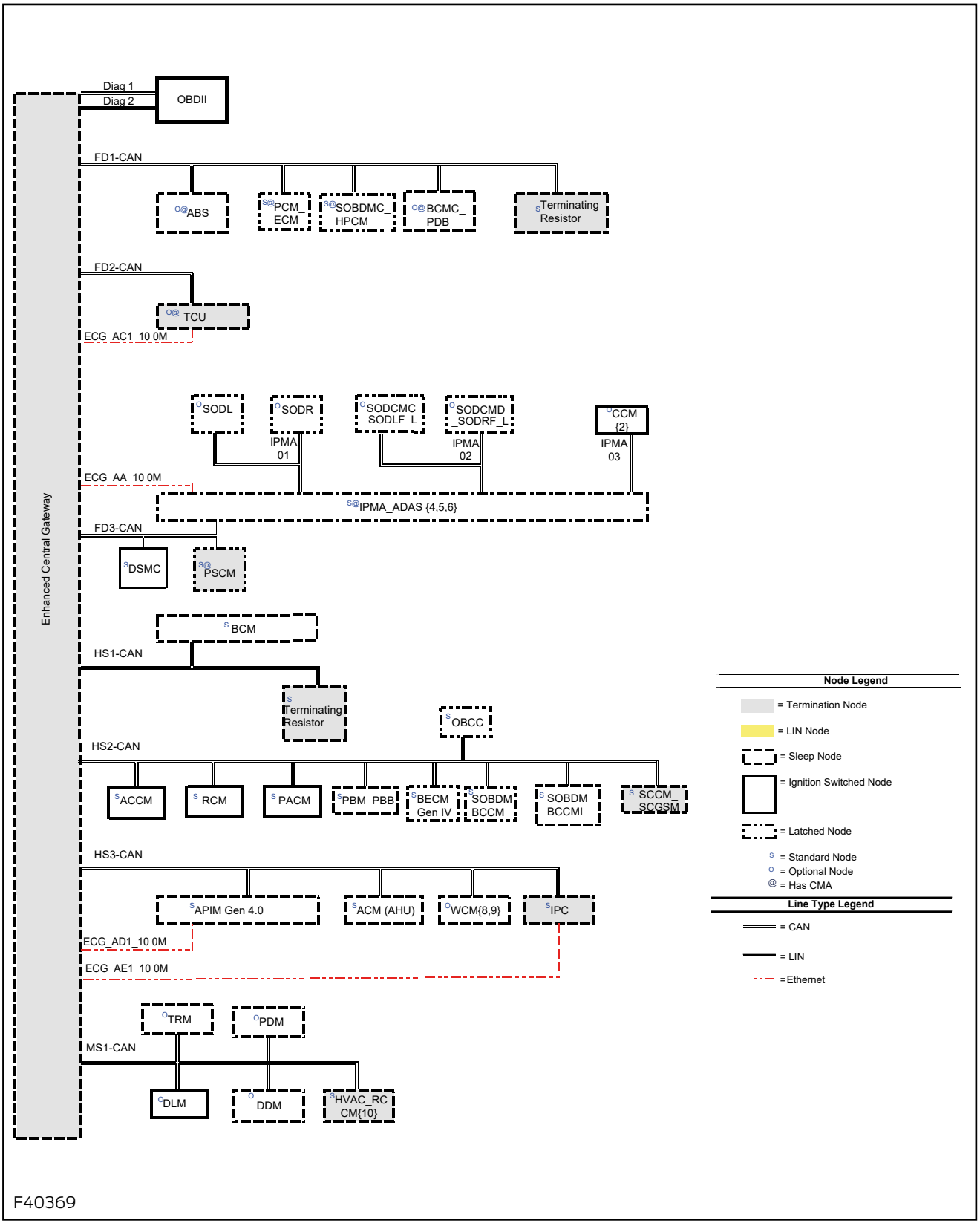
CAN-Bus System - BEV



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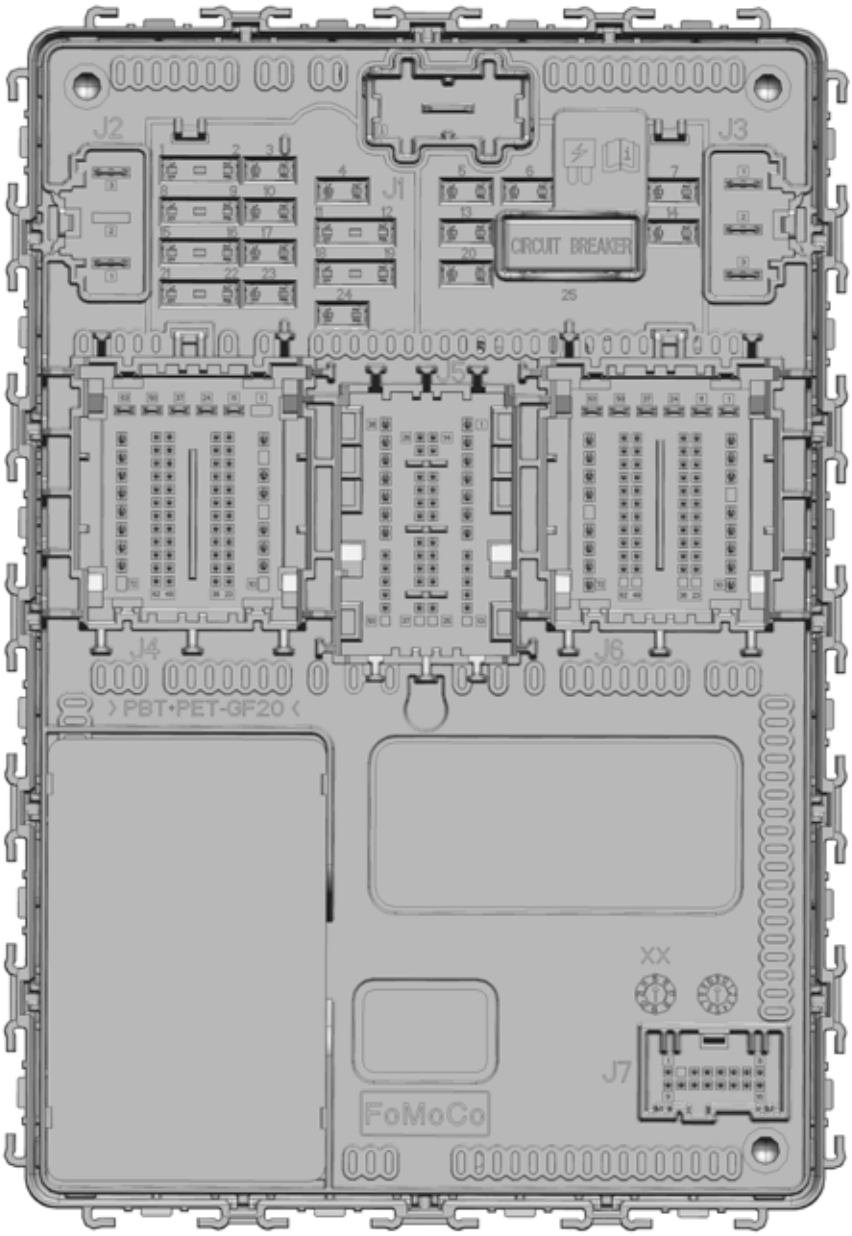
Communication Network System

Item	Description	Item	Description
ABS	Anti-Lock Brake Module	ICP	Interface Control Panel
ACM	Audio Control Module	IPC	Instrument Panel Cluster
ACCM	Air Conditioning Control Module	LIN	Local Interconnect Connector
AGS	Active Grill Shutter	LSM	Light Switch Module (Headlamps)
AHCM	Auxiliary Heater Control Module	MS CAN	Medium Speed CAN
APIM	Auxiliary Protocol Interface Module	OBCC	Off-Board Charge Controller
BBS	Battery Backed-up Sounder	OBD	On-Board Diagnostic
BCM	Body Control Module	PACM	Pedestrian Alert Control Module
BECM	Battery Energy Control Module	PATS	Passive Anti-Theft Immobiliser
BMS	Battery Management System	PBM	Parking Brake Module
CCM	Long Range Radar - Front	PCM	Powertrain Control Module
CSI	Charge Status Indicator	PDB	Power Distribution Box
CSM	Combined Sensor Module	PDM	Passenger Door Module
DCAC	DCAC Inverter	PSCM	Electric Power Assist Steering
DDM	Driver Door Module	RAIN	Rain Sensor
DDS	Driver Door Switch	RCM	Restraints Control Module
DLM	Driver Lockout Module	RUS	Rear Ultrasonic Sensor
ECG	Enhanced Central Gateway	SCCM	Steering Column Control Module
ESCL	Electronic Steering Column Lock	SFWM	Smart Front Wiper Module
EWP	Electric Water Pump	SOBDMC	Secondary OBD Control Module
FD CAN	Fast Data Speed CAN	SODCM	Side Obstacle Detection Control Module
FUS	Front Ultrasonic Sensor	TCU	Telematics Control Unit
HS CAN	High Speed CAN	TRM	Trailer Tow Lighting Module
HVAC	HVAC Control Module	WCM	Wireless Accessory Charging Module

4.3.2 Body Control Module (BCM)

BCM Fuse Overview table updated



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Item	Description
J1	Battery Power
J2	Battery power 2
J3	Power Windows
J4	Instrument Panel
J5	Main Body
J6	Main Body 2
J7	Interior Antennas

WARNINGS:

Unapproved and/or incorrect connection to any of the mating wiring can cause either the associated systems to shut down (overload protection), or permanent damage to the BCM itself.

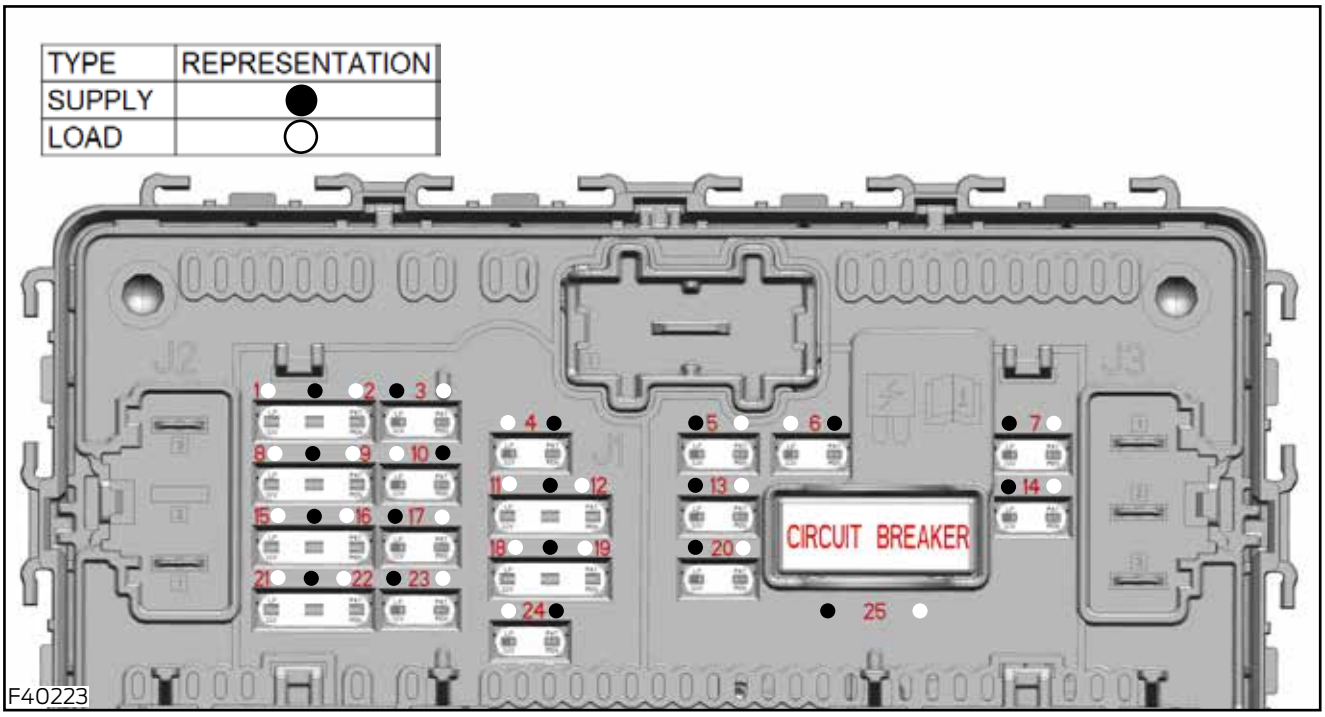
Vehicle BCM configuration must NOT be modified once the vehicle has left a Ford production plant, except for any changes that may be carried out using dealership integrated diagnostic systems equipment.

The BCM is responsible for management of most of the vehicle's exterior and interior lighting, locking, security,

and headlamps control system.

Repeated overloading of circuits can result in output lock-out requiring dealer reset. Repeated dealer resets can result in permanent loss of a function.

BCM Fuse Overview



# on Housing BCM	PIN Location	Fuse Value	Type	Paired With	Function
F1	C4-71	5A	Micro 3	F2	Restraints Control Module
F2	C4-70	5A	Micro 3	F1	N/A
F3	C6-03	10A	Micro 2		N/A
F4	C4-24	10A	Micro 2		Enhanced Central Gateway & Integrated Control Panel
F5	NA	20A	Micro 2		Door Lock
F6	C6-02	10A	Micro 2		Delayed Accessory Power & Driver Door Power Window Switch
F7	C3-01	30A	Micro 2		Door Control Module (Passenger)
F8	C4-69	5A	Micro 3	F9	Dash Cam
F9	C4-68	5A	Micro 3	F8	Electrochromic Mirror & Indicator Passenger Air Bag Deactivation (PADI)
F10	C4-63	10A	Micro 2		N/A
F11	C4-02	5A	Micro 3	F12	Instrument Cluster & Steering Wheel Column Control Module
F12	C6-69	5A	Micro 3	F11	Intrusion/Inclination Sensor & Power Window Driver Switch
F13	NA	15A	Micro 2		Door Unlock
F14	C3-02	30A	Micro 2		Door Control Module (Driver)
F15	C4-67	15A	Micro 3	F16	Steering Wheel Column Control Module
F16	C4-66	15A	Micro 3	F15	N/A
F17	C4-50	15A	Micro 2		SYNC Module
F18	C6-71	7.5A	Micro 3	F19	Wireless Accessory Charging Control Module/Driver State Monitoring Camera
F19	C6-70	7.5A	Micro 3	F18	Battery Backed Sounder
F20	NA	10A	Micro 2		Anti-Theft Alarm Horn

F21	C4-64	7.5A	Micro 3	F22	Remote Climate Control Module & Ignition Switch & Start-Stop Button
F22	C4-65	7.5A	Micro 3	F21	Telematics Embedded Modem
F23	C4-37	20A	Micro 3		Radio
F24	C4-11	20A	Micro 2		Dash Cam
F25		30A	PTC		All Power Window Switches

BCM Output Information

Function	Controlling Device	Load Type	Vehicle Load	Max Load	Overload Condition
Left Front Low Beam	High Side Driver	x1 H7 bulb	4.40A	6.2A	Output Shutdown
Right Front Low Beam	High Side Driver	x1 H7 bulb	4.40A	6.2A	Output Shutdown
Left Front High Beam	High Side Driver	x1 H15 bulb major filament /x1 H1 bulb	4.85A/5.50A	6.2A	Output Shutdown
Right Front High Beam	High Side Driver	x1 H15 bulb major filament/x1 H1 bulb	4.85A/5.50A	6.2A	Output Shutdown
Left Front Fog Lamp	High Side Driver	x1 H11 bulb	4.60A	5.4A	Output Shutdown
Right Front Fog Lamp	High Side Driver	x1 H11 bulb	4.60A	5.4A	Output Shutdown
Left Front Daytime Running Light (Low Series)	High Side Driver	x1 H15 bulb minor filament	1.50A	3.0A	Output Shutdown
Left Front Daytime Running Light (High Series)	High Side Driver	x1 LED Driver Module LED Daytime Running Light	1.80A	3.0A	Output Shutdown
Right Front Daytime Running Light (Low Series)	High Side Driver	x1 H15 bulb minor filament/	1.50A	3.0A	Output Shutdown
Right Front Daytime Running Light (High Series)	High Side Driver	x1 LED Driver Module LED Daytime Running Light	1.80A	3.0A	Output Shutdown
Left Front Turn Indicator/ Hazard Lamp (Low Series)	High Side Driver	x1 PY21W bulb	2.00A	3.3A	Output Shutdown
Left Front Turn Indicator/ Hazard Lamp (High Series)	High Side Driver	x1 LDM LED Turn Indicator	2.00A	3.3A	Output Shutdown
Right Front Turn Indicator/ Hazard Lamp (Low Series)	High Side Driver	x1 PY21W bulb	2.00A	3.3A	Output Shutdown
Right Front Turn Indicator/ Hazard Lamp (High Series)	High Side Driver	x1 LDM LED Turn Indicator	2.00A	3.3A	Output Shutdown
Left Rear Turn Indicator/Hazard Lamp	High Side Driver	x1 PY21W bulb	2.00A	2.8A	Output Shutdown
Right Rear Turn Indicator/ Hazard Lamp	High Side Driver	x1 PY21W bulb	2.00A	2.8A	Output Shutdown
Left Front Position Lamp (Low Series)	High Side Driver	x1 H15 bulb minor filament	0.3A	1.0A	Output Shutdown
Left Front Position Lamp (High Series)	High Side Driver	x1 LDM LED Position	0.20A	3.0A	Output Shutdown
Right Front Position Lamp (Low Series)	High Side Driver	x1 H15 bulb minor filament	0.30A	3,0A	Output Shutdown
Right Front Position Lamp (High Series)	High Side Driver	x1 LDM LED Position	0.20A	1.0A	Output Shutdown
Left Rear Position Lamp	High Side Driver	x1 P5W bulb	0.5A	1,0A	Output Shutdown
Right Rear Position Lamp	High Side Driver	x1 P5W bulb	0.5A	1.0A	Output Shutdown

Left Rear Stop Lamp	High Side Driver	x1 P21W bulb	2.00A	3.0A	Output Shutdown
Right Rear Stop Lamp	High Side Driver	x1 P21W bulb	2.00A	3.0A	Output Shutdown
Center High Mounted Stop Lamp	High Side Driver	x1 LED string CHMSL	<0.3A	0.5A	Output Shutdown
License Plate Lamp	High Side Driver	x2 W5W bulb	0.8A	1.0A	Output Shutdown
Rear Fog Lamps	High Side Driver	x2 P21W bulb	4.00A	5.5A	Output Shutdown
Reverse Lamps	High Side Driver	x2 P21W bulb	4.00A	6.0A	Output Shutdown
Run Start Relay	High Side Driver	Relay	0.3A	0.42A	Output Shutdown
Battery Saver Relay (Engine)	High Side Driver	Relay	0.62A	0.84A	Output Shutdown
Battery Saver Relay (Body)	High Side Driver	Relay	2.52A	3.36A	Output Shutdown
Wireless Charge Enable	High Side Driver	LED Driver	0.03A	0.05A	Output Shutdown
Engine Control Unit Wake up	High Side Driver	Resistor	0.10A	0.15A	Output Shutdown
Intrusion/Inclination Sensor	LIN	MUX	0.15A	0.21A	Output Shutdown
Battery Backed Sounder	LIN	MUX	0.15A	0.21A	Output Shutdown
Head Lamp Switch	LIN	MUX	0.15A	0.21A	Output Shutdown
Battery Monitoring Sensor	LIN	MUX	0.16A	0.22A	Output Shutdown
Power Distribution Box	LIN	MUX	0.16A	0.22A	Output Shutdown
Electronic Steering Column Lock	LIN	MUX	0.16A	0.22A	Output Shutdown
Interior Lighting	High Side Driver	Bulb	2.4A	5.6A	Output Shutdown
Backlighting LED	High Side Driver	Bulb	2.4A	5.6A	Output Shutdown
Interior Antenna (PEPS) x2	High Side Driver	Coil	0.16A	0.22A	Output Shutdown
Vehicle Horn	High Side Relay Driver	Micro Relay	0.3A	0.42A	Output Shutdown
Alarm Siren	High Side Driver	Electro Mechanical Sounder	4A	6A	Output Shutdown
Lock/Double Lock Output	Bi-Directional Driver	Latch motor x5 max	6A	10A	Output Shutdown
Unlock Output	Bi-Directional Driver	Latch motor x5 max	6A	10A	Output Shutdown
Liftgate release	High Side Driver	Relay	2A	4A	Output Shutdown
Electronic Steering Column Lock Control	High Side Driver	Relay	2A	4A	Output Shutdown
Exterior Antenna 1 (Door Handle Antenna)	Coil Driver	Coil	0.22 A	0.3 A	Current Limiter
Exterior Antenna 1 (Door Handle Antenna)	Coil Driver	Coil	0.22 A	0.3 A	Current Limiter
Light Bar (Coast to coast Light)	High Side Driver	LED x2	2A	4A	Output Shutdown

4.4 LV Charging System (12V)

The Transit Courier electrical system is a 12V supply with a negative ground return. The alternator and battery equipment used as standard are designed for normal operations with the type of engine fitted. Before installing additional electrical equipment check that the battery capacity, technology type, harness load capability, and alternator output are suitable for the extra load.

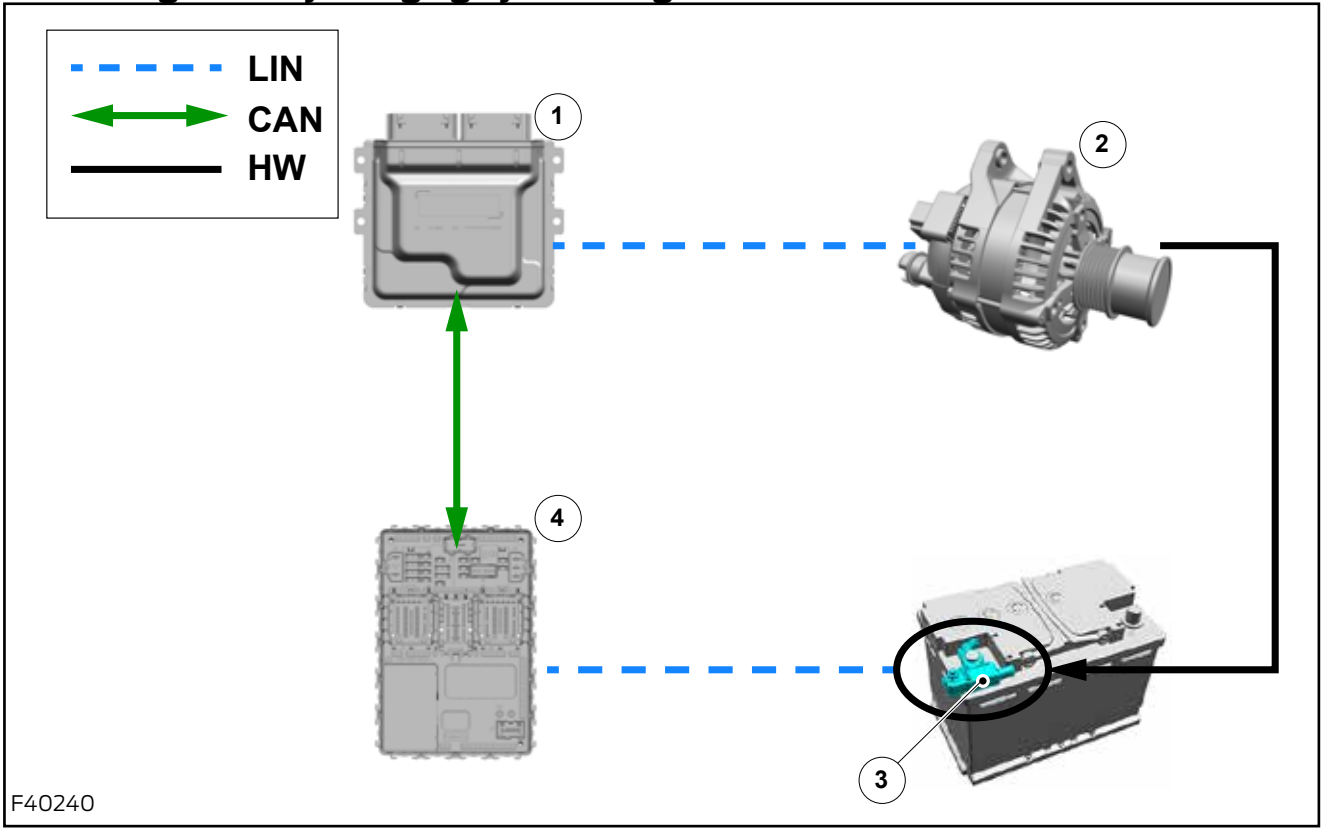
The battery capacity, technology and charge available from the alternator must be adequate to ensure engine cranking in unfavourable climatic conditions.

The Transit Courier utilises multiplexed vehicle electronics. It is recommended that the appropriate Ford proprietary accessory systems are used. Inappropriate or incorrect connection of additional equipment could cause misoperation, or damage to the vehicle, and so will invalidate any warranty.

Do not jump start the vehicle directly from the battery. Use designated jump-start points. Refer to the Owner's Manual.

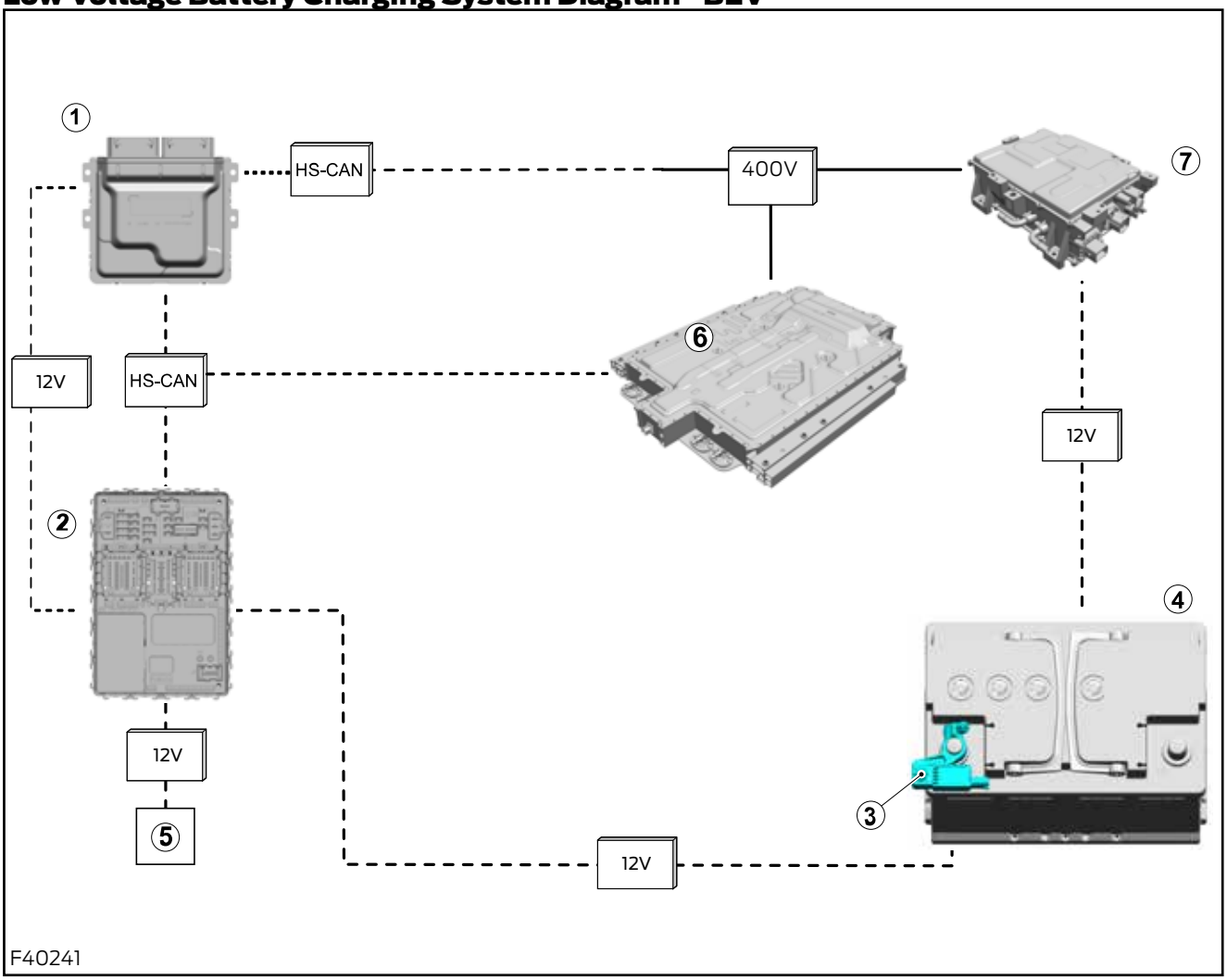
4.4.1 LV Charging System Layout

Low Voltage Battery Charging System Diagram - ICE



Item	Description
1	Power Control Module (PCM)
2	Alternator
3	Battery Monitoring Sensor (BMS)
4	Body Control Module (BCM)

Low Voltage Battery Charging System Diagram - BEV



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Item	Description	Item	Description
1	Power Control Module (PCM) or Engine Control Module (ECM)	5	Electrical Consumers
2	Body Control Module (BCM)	6	High Voltage Battery
3	Battery Monitoring Sensor (BMS)	7	High Voltage DC/DC Convertor
4	Low Voltage Battery		

4.4.2 Smart Regenerative Charging (SRC)

In vehicles with SRC only, both the alternator and BMS are connected to PCM via the same LIN bus. BMS works as a sensor for battery current, battery voltage and battery temperature and also includes battery models. It sends the required information to the PCM, where the information is processed with system status and results in charging requests. PCM functions will need to ensure voltage quality based on electrical load information from the BCM and EATC via HEC.

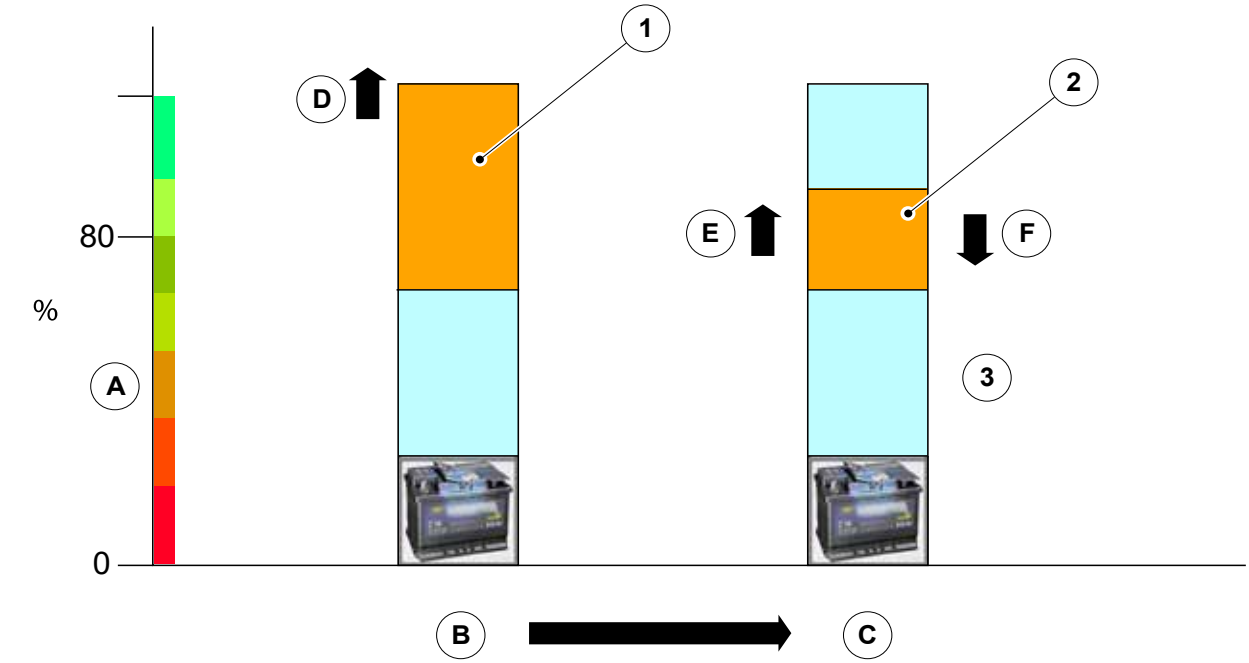
Using the information received, the PCM determines the optimised charging voltage set point, considering the above aspects. This then adjusts the value received, if necessary, and passes it on to the alternator via the LIN. The smallest possible set value for the alternator voltage (V) is 12.2V, while the maximum charging voltage may be anywhere between 14.5V and 14.9V. However, when the battery is in a refresh phase, the voltage could occasionally reach up to 15.2V. These refresh phases are required as the battery charge status is 80% over long periods of time.

In vehicles with Start-Stop functionality, the LIN network includes three slave nodes, namely alternator and BMS. BMS is still an essential component to provide battery information for stop-start operations from an electrical energy management perspective.

The following Figure F40282 demonstrates the difference between SRC and conventional battery charging. Conventional charging aims to charge the battery to the highest possible levels. During this process, the battery temperature is monitored (inferred temperature) and the battery must not be overcharged. By comparison, SRC

uses the information from the Battery Monitoring Sensor (voltage, current and direct temperature) to maintain the battery more accurately at a calibrated state of charge. This means that the battery has a certain amount of extra charging capacity at all times. If the BCM detects that the charge status is above the calibrated value, the alternator charging voltage is reduced in order to discharge the battery. If the opposite occurs and too low a value is detected, the charging value is increased in order to return the battery to the calibrated value.

Smart Regenerative Charging and Conventional Charging



F40282

Item	Description
A	State of Charge — SOC
B	Conventional Charging
C	Regenerative Charging
D	Charging continuously
E	Charging during deceleration
F	Discharge during normal driving
1	High SOC control target
2	Partial SOC control
3	Charging continuously

4.4.3 SRC Override

There are two control methods to switch the power supply system to Conventional Charging. This may be required for convertors requiring battery voltage that is being charged by the alternator in the range of 14.0 to 14.9V. Such applications include boost or supplemental battery charging, compensation for voltage drop or high ampere electrical loads whilst the engine is running.

1. Start-Stop Override

There are two options to deactivate Start-Stop:

- Start-Stop button. After a key cycle, Start-Stop is again available.
- For a permanent solution, please contact your local Ford Dealer.

2. SRC Deactivation

To deactivate SRC, please contact your National Sales Company representative, or local Ford dealer.

4.4.4 Charge Balance Guidelines

The base vehicle is fitted with a 150A or 165A alternator. There is a label on the rear of the alternator showing the part number and size of the installed part.

It is recommended to conduct a charge balance calculation in case the conversion comprises a high number of electrical consumers or high electrical consumption is expected.

4.4.5 Circuit Diagrams

Full vehicle wiring and circuit diagrams are in the Ford Workshop Manual.

4.4.6 Fitting Equipment Containing Electric Motors

WARNING: When electric motors are to be fitted, account must be taken of the potentially high inrush currents that a motor can draw.

CAUTION: The following must be observed:

- **All motors must be driven via relays with contacts rated at least 3 times the maximum rated current of the motor.**
- **All motor supply circuits must be individually fused with the proper fuse rating for the motor.**
- **All power wiring must be rated for at least 3 times the rating of the motor and installed as far away as possible from any existing vehicle wiring.**
- **All motors fitted should be fully suppressed to European Legislation relating to Electromagnetic Compatibility to ensure electrical interference does not affect the vehicle systems.**
- **Add EMC emissions statement to CE approval.**

4.4.7 Vehicle Electrical Capacity — Alternator

WARNING: Do not cut into the alternator wires. The alternator is LIN controlled. It does not have a conventional D+ (engine start) signal line.

Engine	Alternator Part Number	Rating (A)
1.0L EcoBoost Gasoline	JX6T-10300-FA	150A
1.5L EcoBlue Diesel	JX6T-10300-KC	165A

4.5 Battery Systems

WARNINGS:

If serviceable batteries are fitted, it is essential that regular checks are made to determine that the electrolyte (acid) levels are correctly maintained. There is a level indicator in each cell.

Take necessary safety precautions when handling batteries, for example: protective clothing, eye and hand protection.

Ensure batteries are charged in a designated charging area that is correctly ventilated.

Vehicles with Start-Stop require an enhanced battery (Enhanced Flooded Battery/Improved Flooded Battery). You must replace the battery with one of exactly the same specification and technology. For the correct battery replacement please contact your local Ford dealer.

4.5.1 Guidelines When Converting Vehicles

WARNING: The fitting of voltage boosters or other devices to enhance alternator output are not allowed. The fitting of such devices will not only invalidate vehicle warranties, but could damage either or both, the alternator and Engine Management System/Power Control Module, and possibly affect vehicle legal compliance. Check local legislation.

Operator requirements for additional and specialised electrical equipment varies. The vehicle convertor must, therefore, consider the following points when designing the installation:

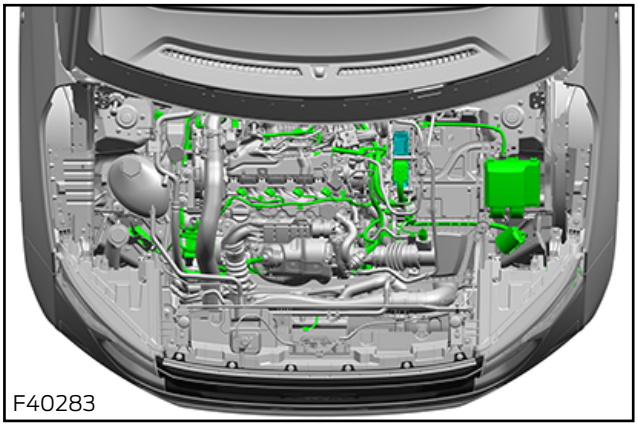
- Legality and regulatory conformity of the base vehicle.
- Driveability and serviceability of the base vehicle.
- The effect of regulations governing the proposed conversion including National Legislation in the country of sale.
- The method of integrating the circuit into the base vehicle.
- No additional circuits are to be run alongside the electrical circuits (shown in blue in Figure F40241) associated with the Engine Management System (shown in green in Figure F40242), due to the possible inductive or electrostatic coupling of electrical interference.
- It is important to also read relative information on Start-Stop and SRC.

Refer to 4.4 LV Charging System (12V).

- The materials and installation must meet the quality standards described in this section. Any additional equipment or components must be designed such that they have no adverse Electromagnetic Compatibility (EMC) effect on the vehicle.
- Take special care with the routing of existing electrical harnesses within the vehicle to avoid damage when fitting additional equipment. Also see section concerning installation of equipment containing an electric motor.

Additional added electrical loads should be connected to the body ground and not directly to the battery negative terminal. All additional electrical loads should be correctly fused.

Electrical Circuits Associated with Power Management System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NOTE: If a Vehicle Convertor intends to add a second battery, please contact FPSV Technical Support at FPSVHelp@ford.com.

NOTE: Make sure that the added key off loads do not exceed 5mA. If loads are likely to exceed 5mA, the Convertor should consider adding a split charge system.

To add electrical loads at engine run is not recommended. This may exceed the alternator output capability particularly when using vehicle high power features such as air conditioner or heated screens.

Battery Voltage Requirements and Testing

To maximise battery life, at the time of arrival at the Vehicle Convertor, all Batteries must have a minimum Open Circuit Voltage (OCV) of not less than 12.5V. When the Closed Circuit Voltage (CCV) is applied, the voltage must not be less than 12.4V. This applies to any of the Ford battery technologies.

All voltages are to be measured with an accuracy of: ± 5% of values published using calibrated meters.

Stored and Delayed Vehicles

For additional information on vehicle storage, refer to 1.11 Vehicle Transportation Aids and Vehicle Storage

Transport Mode

Warning added

WARNING: The only method to return the vehicle to Transport mode is by using a Ford diagnostic service tool with the correct level of security clearance. The Ford dealer has the correct tools and level of security to do this if required.

If the cluster displays 'Transport Mode', the vehicle may have reduced functionality. This mode is mainly to conserve battery life/warranty during pre-delivery.

NOTE: To change from transport mode to normal mode **'temporarily'**, keep the ignition at run, turn on and off hazard switch twice in 10 seconds.

The maximum duration of this temporary pause mode is 120 minutes.

NOTE: To change from 'Transport Mode' to 'normal mode'; keep the ignition on, press the brake pedal five times, turn on and off hazard switch twice (in any combination) within a 10 second period.

NOTE: Vehicles should remain in 'Transport Mode' (where possible) during storage and prior to handover to customer.

Battery Charging Procedure

WARNING: Do not connect to any Ground or +12 volt potential points other than that specified in the Owner's Manual. There is a dedicated charge point under the bonnet. Failure to comply may lead to high current paths that may damage peripherals and Electronic Control Units (ECU), especially in a jump start condition.

CAUTION: Some batteries will require specific charging profile. Therefore you must use a suitable battery charger (e.g. DC-DC charger) for your selected battery. Please consult your battery supplier.

1. Cold Batteries will not readily accept a charge. Therefore, Batteries should be allowed to warm up to at least 5ºC (41ºF) before charging. This may require four to eight hours at room temperature depending on the initial temperature and battery size.
2. A battery which has been completely discharged may be slow to accept a charge initially, and in some cases may not accept a charge at the normal charger setting. When Batteries are in this condition, charging can be started by use of the dead battery switch or boost charge on chargers that have this facility.
3. To determine whether a battery is accepting a charge, follow the manufacturer's instructions for the charger, for use of the dead battery/boost charge mode.

Battery Cable Fixing Torque

For vehicles with BMS the battery cables should be fixed to the terminal positive and negative posts with a torque of 13.5 Nm ± 1.2 Nm. For additional information see BMS later in this section.

4.5.2 Battery Options

Any different batteries must be checked for correct functionality on a Start-Stop or Smart Regenerative Charging (SRC) vehicle.

For additional information, refer to the following sections:

- 4.9 Electronic Engine Controls Start-Stop and SRC
- 4.4 LV Charging System

NOTE: If the wrong batteries are fitted or are incorrectly configured, Start-Stop or SRC may not function properly.

Battery Part Number	Type	Size	Engine
L1TT-10655-BA	EFB 70Ah, 700A CCA	H6	1.0L Gasoline

4.5.3 Battery Rules

- Third party Batteries are isolated from the standard Ford system at key off.
- For external charging of Batteries, ensure that the maximum voltage of 15.2V is not exceeded. Normal proprietary charging equipment should operate below this voltage.

4.5.4 Battery Configurations

Start-Stop and SRC will operate within specification only if a correct battery configuration is installed in the vehicle.

NOTE: The following battery configurations are NOT compatible with Start-Stop and SRC:

- Battery types other than those listed in the Battery Part Number and Usage Table
- Extra Batteries other than factory fit such as 2 or more, if not isolated from existing power supply at Key off

Start-Stop and SRC system functionality cannot be guaranteed with these configurations. If such a battery configuration is required, it is recommended not to equip the vehicle with Start-Stop in the factory so the vehicle should be originally ordered without. It will not be possible to decommission the Start-Stop and SRC features due to Homologation, Vehicle Tax and Excise Requirements.

If the battery type on a vehicle with Start-Stop or SRC is changed to other compatible derivatives (see battery configuration table) it is required to reconfigure the vehicle to the new battery types from the dealer. Central car configuration can be updated at a dealership.

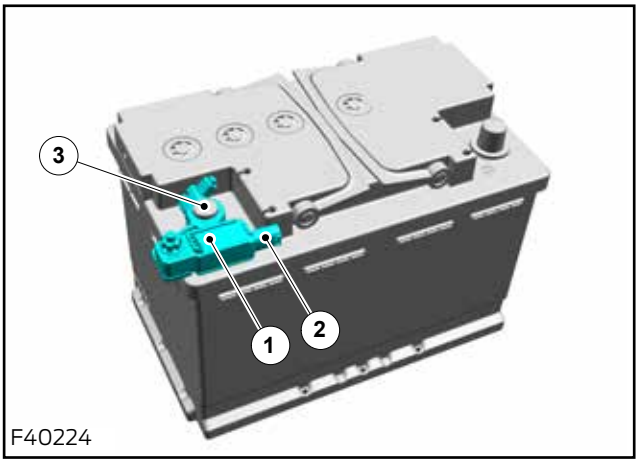
Additional Loads and Charging Systems

WARNING: Under no circumstances should any additional connections be made directly to any of the vehicle's battery terminals.

All loads that exceed 100mA continuous key off load must be fitted with an isolation switch or disconnected relay. In general, all loads should have some form of isolation. This is to protect from discharging Batteries at ignition off and interfering with the BMS correlation of battery state of charge. This supply should also have a dedicated protection fuse of the correct value. High loads should also be grounded directly to the vehicle body and not the negative battery terminal. Connecting to the negative battery terminal will bypass the BMS and affect the correct assessment of the battery state of charge. Refer to BMS section in this manual.

If separate charging systems are added, the ground side of the charger must also be connected to the body. Each battery must also have a separate charger as the batteries are isolated at Ignition off and two minutes after key on if the vehicle is not ready or engine is not running.

4.5.5 Battery Monitoring Sensor (BMS)



F40224

Item	Description
1	1. Battery Monitoring Sensor (BMS) H1BT-10C679-A.
2	2. Plug-in connection — Local Interconnect Network (LIN) and Battery Positive +12V (B+) Feed.
3	3. Connection to Negative Terminal of Main Battery Post — See 'Battery Cable Fixing Torque'.

The BMS continuously monitors the condition of the battery. To do this, it is bolted directly to the negative terminal of the battery. It is recommended that this is not removed. However, if removal is required, please refer to the workshop manual or contact your National Sales Company representative, or local Ford dealer. If they are unable to help you then please contact FPSV Technical Support at FPSVHelp@ford.com.

Any third party installations should ideally be activated via ignition or engine RUN. Regardless of battery system, it will still be required to frequently charge when at long periods of engine off.

After the convertor system is installed, it is recommended to measure the total key off load to the battery with a clamp on ammeter calibrated and sensitive to milliampere's (mA). Perform this test after 45 minutes of key off with all doors shut so that the vehicle remains in sleep mode. The key off load should not exceed 20mA.

4.6 Climate Control System

WARNINGS:

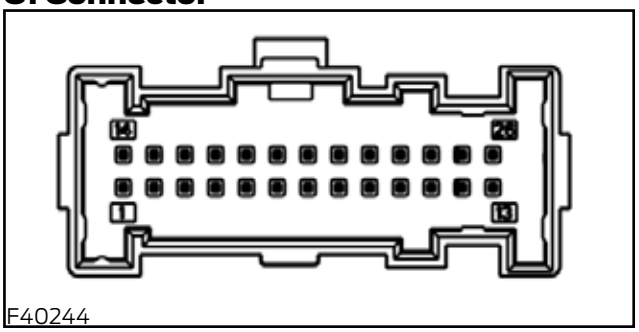
Information provided in this section is for convertor's reference only. Any unauthorised modifications to the climate control system will result in malfunction of the system.

Do not use propylene glycol based coolant.

NOTE: The Transit Courier/Tourneo Courier Climate Control system utilises shared components from other vehicles, which may have higher feature levels and systems. Therefore, in addition to pins that are not used generally, there are others that are not available and could impede function or cause damage if connected for external use.

- Never secure hoses or tubes to the transmission fill or dip stick or to any fuel system or brake component.
- Do not route heater or refrigerant lines near or directly over any exhaust system component, including the exhaust manifolds.
- Avoid routing of hoses in the wheelhouse or stone kick-up arch. If routing is required in these areas, shield against stone pecking as appropriate.
- Do not route hoses near sharp edges. Utilise guards to protect against cutting or chafing.

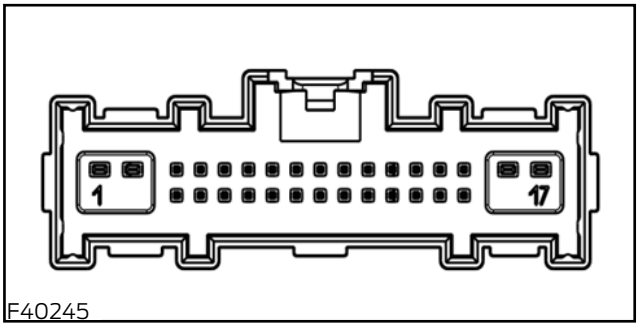
C1 Connector



F40244

Item	Description
Pin 1	Signal Ground
Pin 2	ECU - Climate - Door Position Sensors
Pin 3	ECU - Climate - Door Position Sensors
Pin 4	Switch - Econ. Control (ECO)
Pin 8	ECU - Climate - Left Temp. Door Motor Clockwise
Pin 9	ECU - Climate - Left Temp. Door Motor Counter-Clockwise
Pin 10	Sensor - Left Temp. Door Motor Position Feedback
Pin 11	ECU - Blower Motor Relay
Pin 12	Switch - Maximum Defrost Request
Pin 13	ECU - Climate - Maximum Defrost Indicator
Pin 16	ECU - Climate - Sensor - Door Position Recirc. Feedback
Pin 17	Connector - Diagnostic - CAN Bus Medium Speed High
Pin 18	Connector - Diagnostic - CAN Bus Medium Speed Low
Pin 19	Sensor - A/C Evaporator Temperature (ACET)
Pin 20	ECU - Climate - Front Mode Door Motor Counter - Clockwise
Pin 21	ECU - Climate - Front Mode Door Motor Clockwise
Pin 22	ECU - Climate - Front Mode Door Motor Position Feedback
Pin 23	ECU - Climate - Blower Motor Control
Pin 24	ECU - Climate - Door Motor Recirc. Clockwise
Pin 25	ECU - Climate - Door Motor Recirc. Counter - Clockwise
Pin 26	Powered At All Times

C2 Connector



F40245

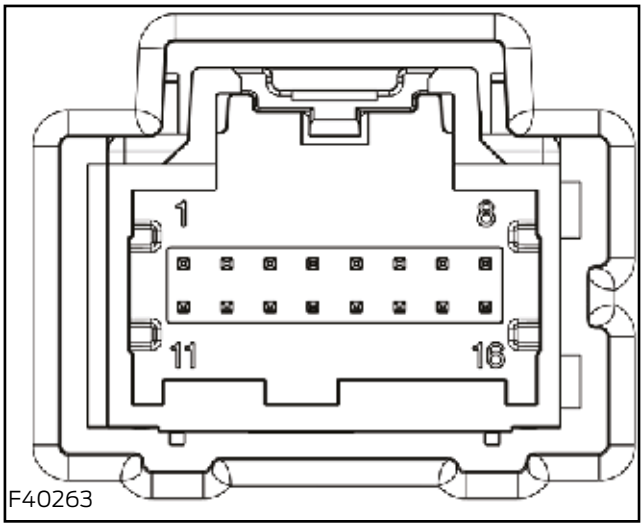
Item	Description
Pin 1	ECU - Driver Seat Heater Element +
Pin 2	ECU - Passenger Seat Heater Element +
Pin 4	Sensor - Discharge Temp- Left 2nd (Left Front Panel)
Pin 5	Sensor - Discharge Temp. - Left 2nd (Left Front Floor)
Pin 19	ECU - Humidity Sensor
Pin 21	Sensor - Sun Load - Left
Pin 22	Sensor - Sun Load - Right
Pin 25	Sensor - Front In-Car Temperature 2
Pin 26	Sensor - Front In-Car Temperature 3
Pin 29	Sensor - Front In-Car Temperature 1 or Single

4.7 Instrument Panel Cluster (IPC)

WARNING: Do not tamper with, cut into or connect to any of the CAN-Bus interface wiring or connectors.

Most of the functions are managed over the CAN-Bus interface by Connector J1.

J1 Connector



4.8 Horn

A single horn is fitted to the vehicle. Any other aftermarket horn (for example an air horn) will need to be driven by a separate relay energised by the horn circuit.

4.9 Electronic Engine Controls

CAUTION: Do not make any additional connections to the electrical circuits associated with the engine management system.

NOTE: It is not necessary to disconnect or remove engine management modules.

4.9.1 Start-Stop Logic

Content related to Start-Stop deselection updated

WARNINGS;

The engine may restart automatically if required by the system.

Switch the ignition off before opening the bonnet or carrying out any maintenance.

Always switch the ignition off before leaving your vehicle, as the system may have shut down the engine but the ignition will still be live.

The system may not function if you leave additional electrical loads connected with the ignition off.

It is very important not to make any modifications to the shielding around exposed moving parts on the engine, for example the drive belt.

General Information

Start-Stop is designed to improve fuel economy and reduce CO2 emissions by automatically stopping the vehicle's combustion engine during idle phases when it is not required for motive power and restarting it when required.

Start-Stop Logic

Automatic engine stops and restarts are controlled by the Start-Stop logic within the Engine Control Module (ECM), known as the Start-Stop scheduler. This is connected to a number of vehicle and powertrain signals, sensors and switches and decides when to shut down and when to restart the engine, based on the particular Start-Stop strategy employed.

Stop-in-Neutral is a Start-Stop strategy applicable to manual transmission vehicles which stops the engine, subject to inhibitors, when the vehicle is stationary AND neutral is selected AND the clutch has been fully released. The engine is restarted on clutch pedal press in neutral.

Inhibitors

Sometimes the engine may not shut down or may restart due to one or more system inhibitors being active. The engine will shut down only when all inhibitors are cleared, which may be some time after the transmission is shifted to neutral and the clutch pedal is released.

Typical examples of inhibitors are:

- If the ambient temperature is below the lower limit or above the higher limit for Start-Stop.
- Engine coolant temperature not warmed up (value dependent on ambient temperature).
- Heated front screen is on.
- Insufficient battery charge to sustain a stop event or too high a current drain or battery is cold.
- Driver's door has been opened and vehicle has not been driven over 5kph since.
- Engine management reason, for example: during a Gasoline (GPF) and Diesel Particulate Filter DPF regeneration event.
- The ABS warning lamp is on or the vehicle is on a steep gradient.
- High electrical load where total vehicle current drain exceeds 50A.
- Ford Engine RPM Speed Controller System is active.
- Unrecognised Batteries fitted or BMS damaged or removed.
- Start-Stop/ECO button is deselected by the user.
- Accelerator pedal or clutch pedal is not released.
-

- Greater than 100mA continuous load at ignition off. The BMS will be unable to correctly assess battery state of charge.
- Vehicle in Factory or Transport mode.

Stall Recovery/Start Abortion Recovery

Stall Recovery is an additional feature available with Start-Stop and is active even if Start-Stop itself has been deselected or is inhibited. Under stall recovery, an automatic engine restart is invoked if the clutch pedal is fully depressed immediately following a vehicle stall, thus enabling the driver to quickly recover from a stall condition without needing to cycle the ignition key/start button. Stall recovery is only available for 5 seconds following a stall.

Start-Stop Deselection

The Start-Stop function can be deselected by the driver by navigating to the driver assistance menu on the Center Stack and pressing on the "Auto Start-Stop" button (the driver assistance menu can also be accessed through a hard button on the dash panel). Pressing the button again will make auto Start-Stop active.

Vehicle Modification Considerations

There are two main considerations: impacts to Start-Stop behaviour as a result of vehicle modifications and impacts from the Start-Stop system.

Impacts to Start-Stop Behaviour

Inhibitor occurrence may be increased by vehicle modifications. For example, the 12V energy management system on the vehicle is designed to allow the engine to shut down only if the current drain is less than 50A. High current loads may lead to this threshold being exceeded. In addition, engine stops will be inhibited if the battery state of charge drops by 2% while the engine is stopped, which may occur if added electrical loads are active during key off periods. When installing extra peripherals, be aware of the continuous/quiescent current drain of such equipment, even when in Off or Standby mode. Any module should not load more than 5mA (milliamps) when off.

NOTE: Regardless of the battery configuration, key off load in excess of 100mA for 7 days or more will cause Start-Stop to inhibit.

For additional information, refer to 4.5 Battery Systems Battery Monitoring Sensor.

Start-Stop is only designed to operate with batteries that are calibrated to the system. Fitting additional batteries — or the incorrect type — will cause incorrect state of charge assessment, leading to Start-Stop becoming permanently inhibited and therefore the fuel saving features lost. This is the same for Smart Regenerative Charging (SRC).

Refer to 4.4 LV Charging System (12V) SRC.

The driver's door switch and seat buckle switch are used to help identify if the driver has left the vehicle and prevent engine shutdowns. If any modifications are made to the door or switch, then this functionality may be affected. If the driver's door is not used, then ensure this switch is permanently closed (input grounded).

The system uses signals from switches/sensors on the clutch, brake and accelerator pedals along with the transmission shift mechanism. To avoid compromising the safety of the system, no electrical connection should be made to any of these signals.

Impacts from Start-Stop System

Start-Stop is designed to shut down the engine when it would otherwise be idling. Some modifications may rely upon a running engine to operate. The driver may need to use the Start-Stop deselect button to disable Start-Stop when such devices are being used. The starter relay should never be bypassed or driven directly.

4.10 Information and Entertainment System

Refer to 4.10.1 Audio Head Unit (AHU) - Multimedia in Car Entertainment (ICE) Pack Summary and any subsequent sections.

4.10.1 Audio Head Unit (AHU) - Multimedia in Car Entertainment (ICE) Pack Summary

The Multimedia System you have, as a standard fit, will depend on the market region, body style, and model of the vehicle.

NOTE: Depending on the vehicle upgrade you are planning, it is important to order the right level parts that include new Instrument Panel Harness, Instrument Panel Bezel and Hood.

AHU/Multimedia ICE Packs

AHU/ICE Pack	Description
ICEFP	LOW AUDIO (0C) with SYNC 4, without DAB
ICEFR	MID AUDIO (1C) with CNECTV, SYNC 4 and DAB

4.10.2 Digital Rear View Camera

NOTE: Only vehicles with SYNC radios have the capability to support Ford camera fitment of the Digital Rear View Camera (DRVC).

NOTE: The vehicle will need to have certain parameters reconfigured. Therefore it is recommended that DRVC connection and reconfiguration to be carried out at an authorised Ford dealership not to invalidate warranty.

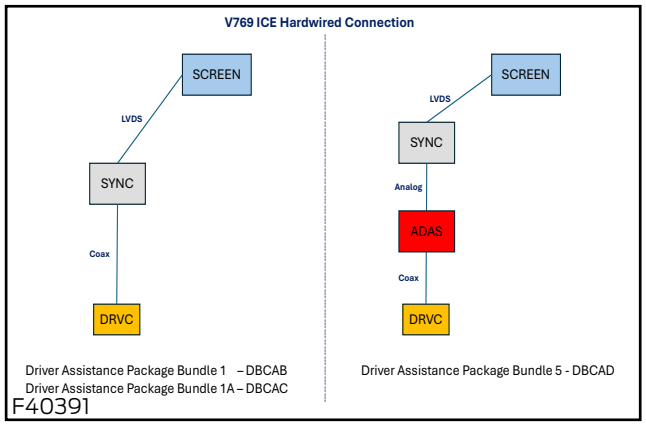
SYNC module provides power to the DRVC through “Power Over Coax”. DRVC communicates with the SYNC module via coax cable.

The display will only provide rear view camera information when reverse gear is engaged.

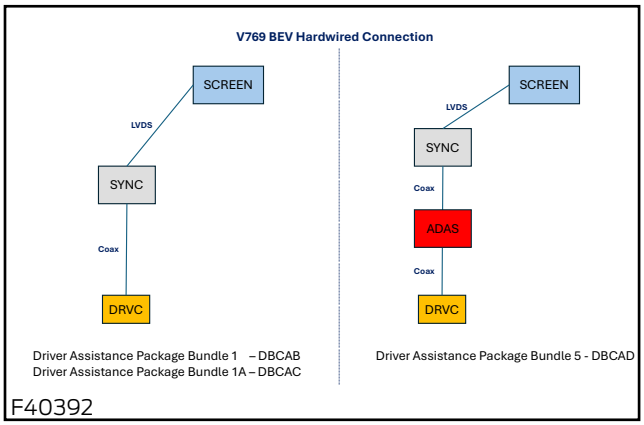
Illustrations updated

Connection Strategy

ICE Variants



BEV Variants



Cellular Phones - Section deleted (outdated)

4.11 Exterior Lighting

WARNINGS:

Make sure that the modified vehicle complies with all relevant legal requirements.

Do not tamper with the base system (controlled by Body Control Module and multiplex architecture) and any feeds taken from the associated wiring or controller.

For further information on Exterior Lighting and Fuses, please refer to 4.3.2 Body Control Module (BCM).

4.12 Interior Lighting

Refer to 4.12.1 Additional Internal Lamps and any subsequent sections.

4.12.1 Additional Internal Lamps

Additional cabin interior lighting may be obtained by directly accessing the connector inside the dome lamp in the cabin.

Additional load space interior lighting may be obtained by directly accessing the connector inside the load space lamps in the load space area.

CAUTION: The maximum total internal lamp load must not exceed 3A.

Power Supply for the Interior Lights

Cabin and cargo areas come from the battery save system, Body Control Module (BCM) pin C6-72. The courtesy lamps are controlled by on the BCM which are C6-17.

For additional information on BCM, refer to 4.3 Communications Network.

Courtesy system switches on and off the lamps automatically when door is locked or unlocked and the door is opened or closed.

Each of these pins on the BCM can take a load of 3A at 12V. The battery saver system provides power for the interior lighting for a limited time. Lamps that are controlled by the battery save circuit will extinguish 30 to 180 minutes after ignition off (dependent on vehicle configuration).

Fluorescent lighting must not be connected to the existing interior cabin or cargo lighting as it is not compatible with the pulse width modulated (PWM) lighting circuit and may cause premature failure of the Fluorescent lighting.

4.13 Handles, Locks, Latches and Entry Systems

Refer to 4.13.1 Door Removal or Modification and any subsequent sections.

4.13.1 Door Removal or Modification

CAUTION: If an additional third party control system is incorporated into the Ford Locking/ Unlocking System the Crash Event Mid Speed Can Signal must be utilised to override the third party control system to trigger a crash unlock feature within the locking system in case of a relevant event.

For derivatives requiring no doors, to ensure door ajar warnings do not appear on the instrument cluster and the interior lamp does not stay on, for any doors that are not fitted, the Body Control Module (BCM) must be connected in the following way:

C6-29 left front door ajar - ground
C6-32 right front door ajar - ground

4.13.2 Central Locking

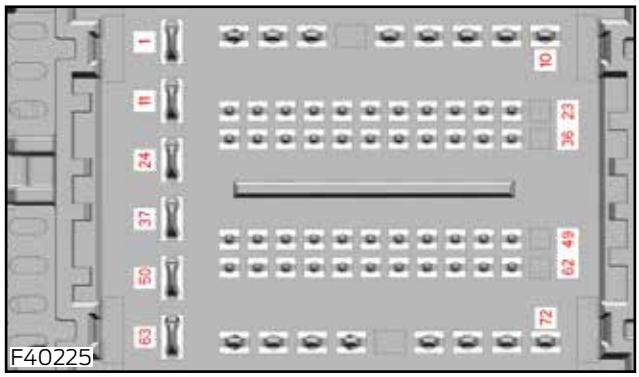
Locking is controlled by the BCM. There is current sensing on certain locking circuit pins as part of the security system – if these are tampered with, locking performance cannot be guaranteed.

Locking Configurations

The following list details specific locking scenarios that have been noted by customers:

1. Slam locking – this is a configurable parameter in BCM (dealerships can only switch off this feature, but not switch on).
2. N1 lock reconfiguration into no deadlocks – this can be reconfigured to be central-locking only by a Ford Dealer (via Dealership hotline).
3. Auto unlock - There is an option to configure central unlock where the driver's door, when opened, will automatically unlock all doors except any doors controlled by the third button on the key fob.

C6 Connector



F40225

BCM	Function
C6 - 1	Central Lock
C6 -10	Liftgate Release
C6 - 11	Central Unlock
C6 - 50	Double Lock
C6 - 68	Driver Door Unlock

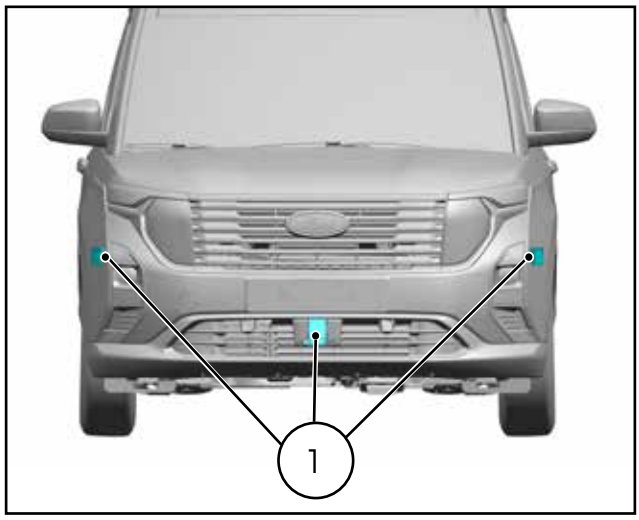
4.14 Adaptive Cruise Control

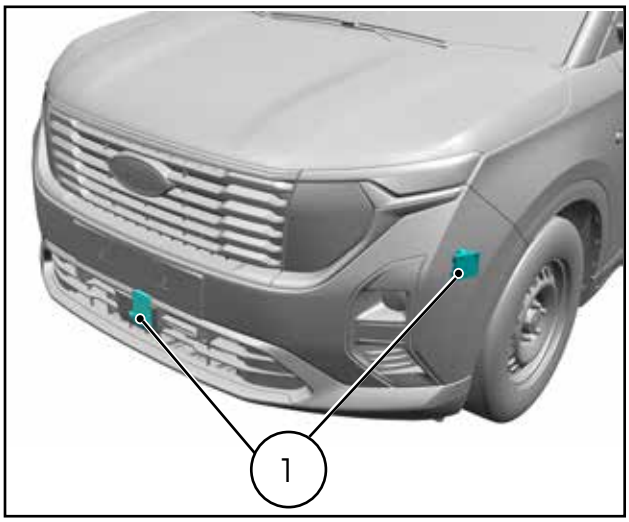
CAUTION: For converted vehicles fitted with adaptive cruise control, where vehicle mass or geometry is significantly altered, it is recommended that the radar vertical alignment and system functionality is checked by a Ford dealer. For further information refer to Workshop Manual or Owner's Manual.

NOTE: Do not obstruct the cruise control radar or front short range radars, please see Figures F40226 and F40236 for reference. If the radars are obstructed, Adaptive Cruise Control or Pre-Collusion Assist functionality may be affected.

NOTE: Do not paint the front grille of the vehicle as this may affect the functionality of the cruise control radar.

Adaptive Cruise Control Radar





Item	Description
1	Adaptive Cruise Control Radar

4.15 Blind Spot Information System

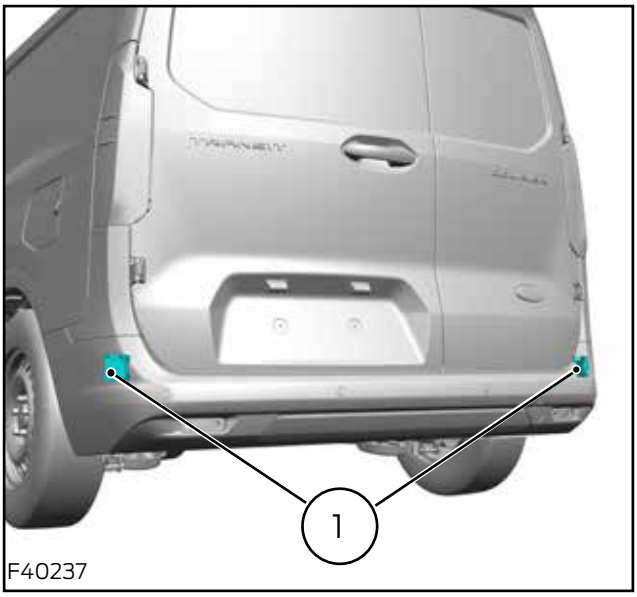
WARNING: The Blind Spot Information System (BLIS) feature will not function if any conversion or installation is in the field of the multiple-beam radar modules which are packaged in the rear quarter panels - one each side.

NOTE: Do not apply bumper stickers and/or repair compound to these areas, this can cause degraded system performance.

NOTE: The BLIS alert indicator(s) may turn on during heavy rain even though no vehicle(s) has entered the blind zone.

NOTE: If your vehicle has a tow bar with a factory equipped trailer tow module and it is towing a trailer, the sensors will automatically turn the BLIS off. If your vehicle has a tow bar but no factory equipped trailer tow module, it is recommended to turn the BLIS off manually. Operating the BLIS without the Blind Spot Trailer Tow package and a trailer attached will cause poor system performance.

BLIS location

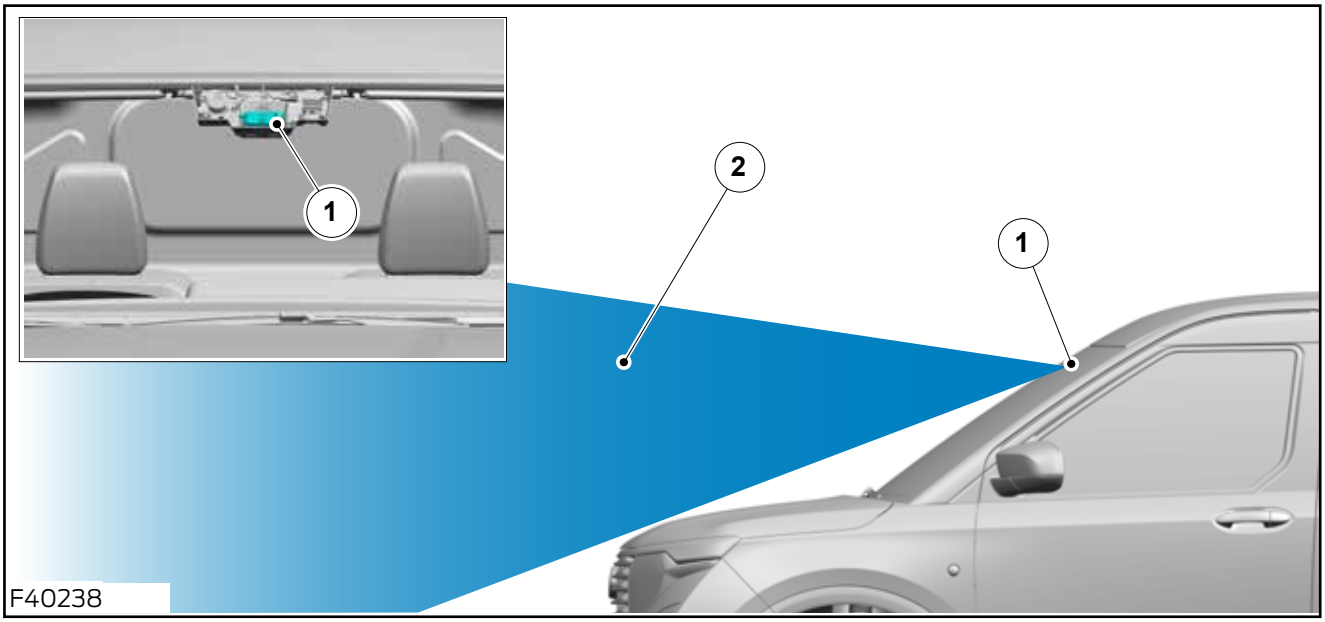


Item	Description
1	Multiple-beam radar module

4.16 Front Windscreen Camera

NOTE: The Front Windscreen Camera features (if available: Pre-Collision Assist, Lane Keeping System, Auto High Beam, Traffic Sign Recognition, Intelligent Speed Assist, Wrong Way Alert, Adaptive Cruise Control, Intelligent Adaptive Cruise Control) will not function if any conversion or installation is in the field of view from the Front Windscreen Camera.

NOTE: For converted vehicles fitted with Front Windscreen Camera, where vehicle mass or geometry is significantly altered, a new calibration for the camera sensor needs to be made.



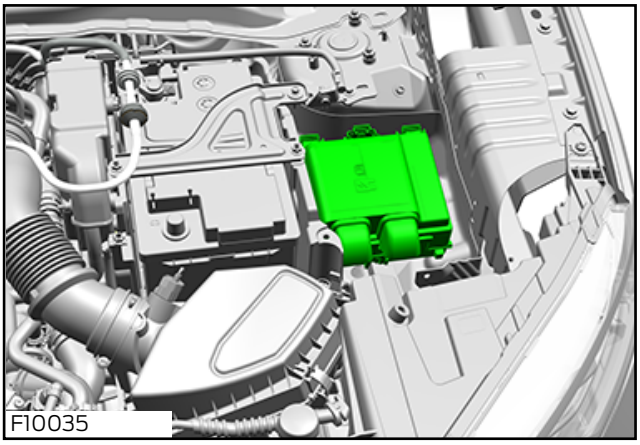
Item	Description
1	Lane keeping system camera located behind the interior rear view mirror trim
2	View cone from camera, horizontal direction and downwards to the bonnet edge of the vehicle

4.17 Fuses

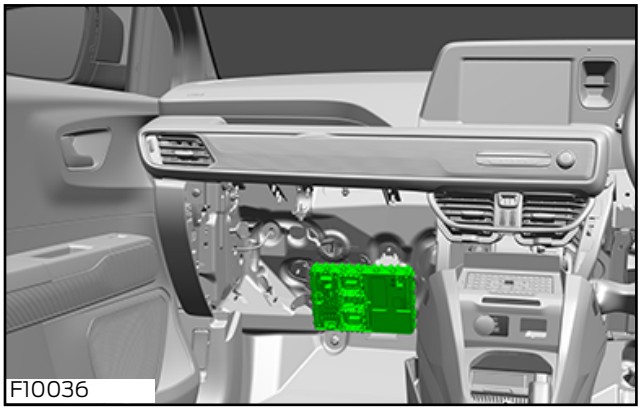
WARNING: No increase in existing vehicle standard fuse capacity is allowed under any circumstances. There are spare fuses in the Engine Junction Box (EJB) and the Passenger Junction Box (PJB). Spare fuses can be used in some cases. The vehicle convertor/modifier must provide additional fuses as required. Please refer to chart below.

NOTE: Only use Ford fuses as shown in table below. Other fuses may interfere with the validated fusing strategy.

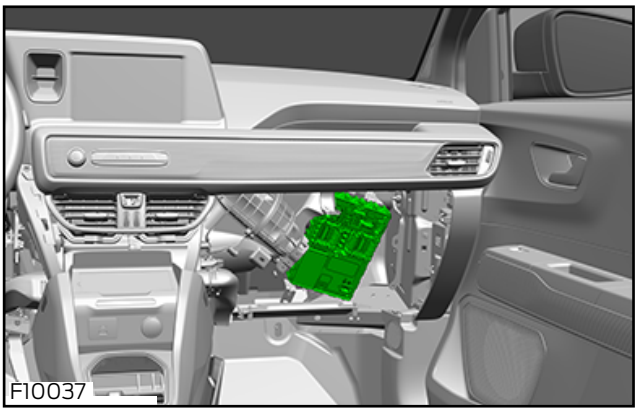
Engine Junction Box


F10035

Passenger Junction Box (Right Hand Drive)


F10036

Passenger Junction Box (Left Hand Drive)


F10037

Engine Junction Box Fuses	Ampere Rating	Colour
MICRO2		
GU5T-14G590-BBA	5A	Tan
GU5T-14G590-BDA	10A	Red
GU5T-14G590-BEA	15A	Blue
GU5T-14G590-BFA	20A	Yellow
DG9T-14A094-LB	25A	White
MCASE		
GU5T-14G593-AFA	20A	Blue
GU5T-14G593-AGA	25A	White
GU5T-14G593-AHA	30A	Pink
KU5T-14G599-AVA	40A	Green
KU5T-14G599-AYA	60A	Yellow
JCASE		
7T4T-14A094-DA	40A	Green
7T4T-14A094-FA	60A	Yellow
Body Control Module Fuses	**Ampere Rating**	**Colour**
MICRO2		
DG9T-14A094-HB	10A	Red
DG9T-14A094-JB	15A	Blue
DG9T-14A094-KB	20A	Yellow
DG9T-14A094-MB	30A	Green
MICRO3		
DG9T-14A094-NB	5A	Tan
DG9T-14A094-SB	7.5A	Brown
DG9T-14A094-RB	15A	Blue

Windscreen Wipers

The base wiper system should not be tampered with (controlled by Steering Column Control Module and multiplex architecture with LIN technology).

NOTE: Power to wiper motors is limited by the size of the wiring and associated relays. If any alternative wiper installation is made, it must have a specification equivalent to Ford components.

Refer to 5.8 Glass, Frames and Mechanisms.

4.18 Special Vehicle Options (SVO) Harnesses and Aftermarket Kits

WARNING: Only Ford release wiring should be used to support added vehicle functionality. If the implementation of wiring other than this is required, Ford guidelines must be followed.

For additional information, refer to the following sections:

- 4.17 Fuses
- 4.21 Grounding

Aftermarket Harnesses and Kits

Part Number	Aftermarket Harnesses and Kits
R2XJ-15A416-A*	Trailer Tow Kit

4.19 Electrical Connectors and Connections

WARNINGS:

The CAN-Bus should not be tampered with as this may lead to failure of safety critical components such as Anti-Lock Braking System (ABS).

Do not use connectors which cut through the outer covering and into the core wire.

CAUTION: Only use Ford approved connectors.

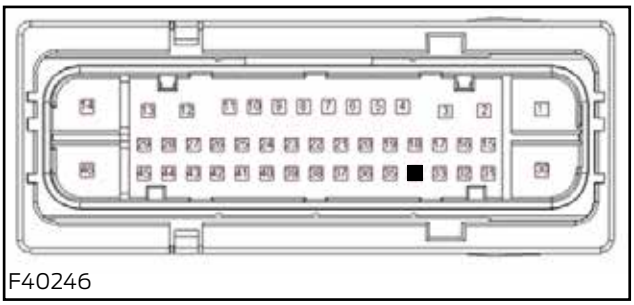
4.19.1 ABS Connector-Vehicle Speed Signal

Vehicle speed signal can be read through ABS Connector (MU5T-14A464-F*) pin 34 (ICE) pin 32 (BEV) for special vehicle use cases such as for a taximeter.

Pin 32 identified for BEV variants and illustration added

ABS Connector

ICE with Electronic Stability Control - Pin 34



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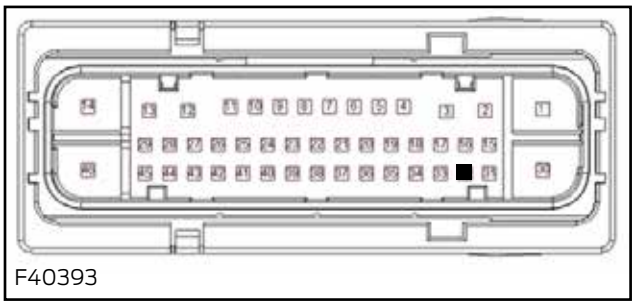
BEV with Electric Boost Brake - Pin 32



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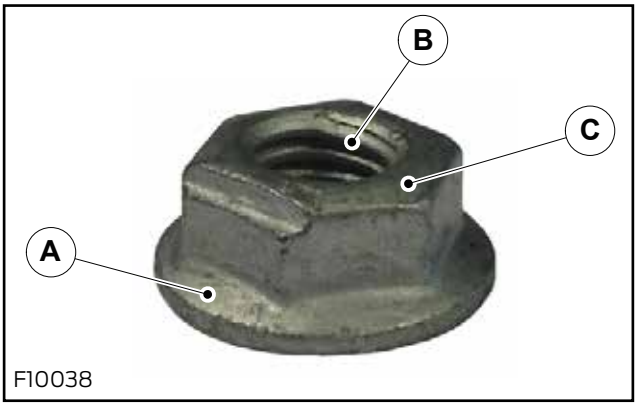
4.19.2 High Current Supply and Ground Connections

WARNINGS:

A self-locking crimp hexagonal nut MUST be used for high current terminal stud connections, for battery positive and negative or chassis ground. Do not use locking, split washers or nylon lock type nuts.

It is recommended to only use one eyelet per stud for high current applications. If more than one eyelet per stud is unavoidable, the highest current eyelet feed should be connected closest to the supply terminal. Do not exceed two eyelets or crimp terminals per stud connection.

Self-Locking Crimp Hexagonal Nut



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Item	Description
A	Large flange for maximum surface area current flow and large clamp force area.
B	Crimp/locking feature is obtained by deformed female thread only.
C	Finish must be a low resistance material which complies with the Restricted Substance Management Standards (RSMS).

4.20 Grounding

Refer to 4.20.1 Ground Points and any subsequent sections.

4.20.1 Ground Points

BEV warnings added

WARNING: It is recommended to use only one eyelet per stud for high current applications. If more than one eyelet per stud is unavoidable, the highest current eyelet feed should be connected closest to the supply terminal. Do not exceed two eyelets or crimp terminals per stud connection.

BEV - Electrical ground paths for High Voltage components (includes Low Voltage ground points for the High Voltage system) must not be utilised as additional ground points for 12V system applications.

BEV - All the High Voltage components on the Transit/Tourneo Courier BEV are either grounded through the metallic case or through a ground cable/wire or an EMC ground strap. Do not tamper with or modify any of these HV component fastener joints or grounding points.

CAUTIONS:

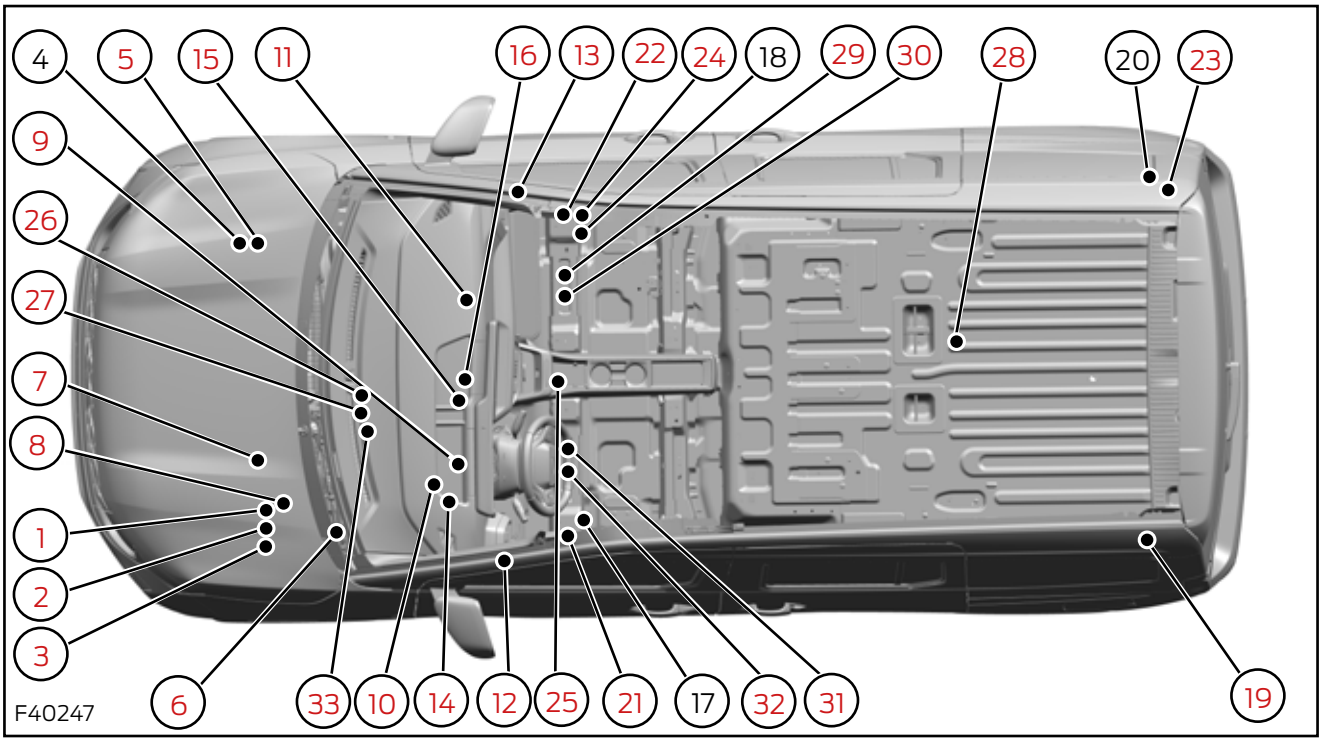
Using alternative points may affect the vehicle integrity.

Make sure that all ground points are tightened to the correct torque.

Ground wires should be brought back to the Ford ground points provided, please refer to the following figures. For very high current users, it is recommended that the ground connection is made directly to the ground point close to the battery ground point. For High Current Supply and Ground Connections, refer to 4.5 Battery Systems.

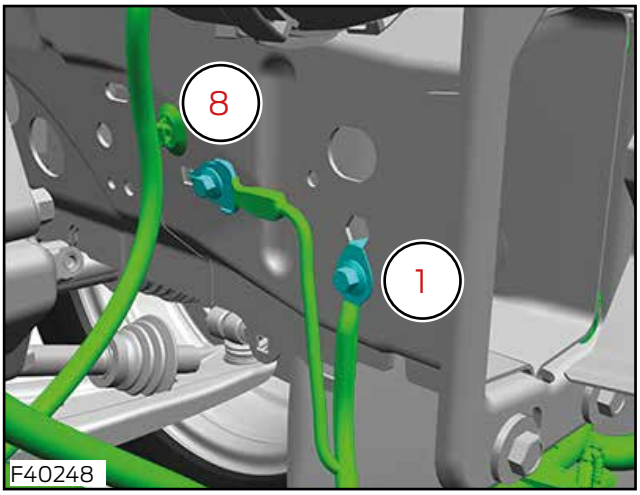
If a new grounding point is required, avoid zones exposed to exterior influences (such as humidity, water, salt and/or stone pecking), especially for high current grounds. Ground connections should be routed back close to the location of the +12V supply. This helps to reduce the electromagnetic field particularly generated by inrush current and improve electromagnetic compatibility.

Overall Ground Point Location



Point No.	Location	Type (use of ground point)	Vehicle Type	Powertrain (BEV/ICE)	Harness No.
1	Side Member Front LHS	DCT Trans/BEV Ground	Transit/Tourneo	Common	14290
2	Side Member Front LHS	Ground LHS Side Rail	Transit/Tourneo	ICE	14290
2	Side Member Front LHS	Ground LHS Side Rail	Transit/Tourneo	BEV	14290
3	Side Member Front LHS	Ground LHS Side Rail	Transit/Tourneo	ICE	14290
3	Side Member Front LHS	Ground LHS Side Rail	Transit/Tourneo	BEV	14290
4	Side Member Front RHS	Ground Front Fender RHS	Transit/Tourneo	Common	14290
5	Side Member Front RHS	Ground Front Fender RHS	Transit/Tourneo	Common	14290
6	Engine Bay LHS	Shock Tower Ground	Transit/Tourneo	ICE	14290
6	Engine Bay LHS	Shock Tower Ground	Transit/Tourneo	BEV	14290
7	Engine Bay	BEV Ground AC COMP.	Transit/Tourneo	Common	14G574
8	Side Member Front LHS	Ground Front Reinforcement LHS-BEV	Transit/Tourneo	Common	14290
9	Cross Car Beam LHS	IP Main Bundle	Transit/Tourneo	Common	14401
10	Cross Car Beam LHS	IP Main Bundle	Transit/Tourneo	Common	14401
11	Cross Car Beam RHS	IP Main Bundle	Transit/Tourneo	Common	14401
12	A-Pillar LHS	HWS Ground	Transit/Tourneo	Common	14B599
13	A-Pillar RHS	HWS Ground	Transit/Tourneo	Common	14B599
14	Cross Car Beam LHS	IP Main Bundle	Transit/Tourneo	Common	14401
15	Cross Car Beam Middle	IP Main Bundle	Transit/Tourneo	Common	14401
16	Cross Car Beam Middle	SYNC Module	Transit/Tourneo	Common	14401
17	Floor Front Cross Member LHS	Ground Rocker Panel	Transit/Tourneo	ICE	14A005
18	Floor Front Cross Member RHS	Ground Rocker Panel	Transit/Tourneo	ICE	14A005
19	D-Pillar LHS	Ground Bundle	Transit/Tourneo	Common	14A005
20	D-Pillar RHS	ADAS Ground	Transit/Tourneo	Common	14A005
21	Floor Front Cross Member LHS	Ground Rocker Panel	Transit/Tourneo	ICE	14A005
22	Floor Front Cross Member RHS	Ground Rocker Panel	Transit/Tourneo	ICE	14A005
23	D-Pillar RHS	Ground Bundle	Transit/Tourneo	Common	14A005
24	Floor Front Cross Member RHS	ADAS Redundant Ground	Transit/Tourneo	BEV	14A005
25	Gear Box Mount on Front Floor	Inverter Ground	Transit/Tourneo	BEV	14A005
26	Front Electric Drivetrain Module	Radio Frequency Interference (RFI) Suppression Ground	Transit/Tourneo	BEV	19A095
27	Front Electric Drivetrain Module	Radio Frequency Interference (RFI) Suppression Ground	Transit/Tourneo	BEV	19A095
28	Rear Floor Cross Member	Tunnel Harness Ground	Transit/Tourneo	BEV	14405
29	Floor Front Cross Member RHS	Ground Rocker Panel	Transit/Tourneo	BEV	14A005
30	Floor Front Cross Member RHS	Ground Rocker Panel	Transit/Tourneo	BEV	14A005
31	Floor Front Cross Member LHS	Ground Rocker Panel	Transit/Tourneo	BEV	14A005
32	Floor Front Cross Member LHS	Ground Rocker Panel	Transit/Tourneo	BEV	14A005
33	Rear of Cradle	AC Compressor Ground	Transit/Tourneo	BEV	14G574

Ground points highlighted in red are safety critical and must not be used as additional ground points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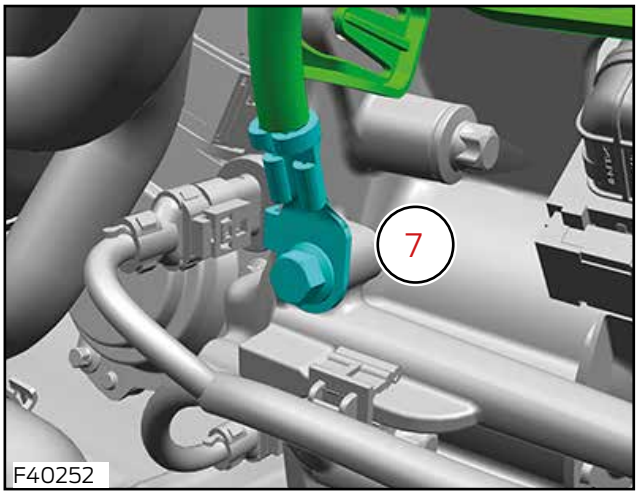
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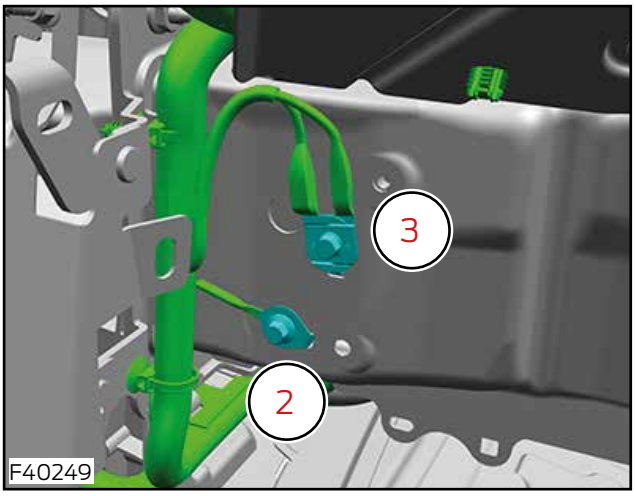
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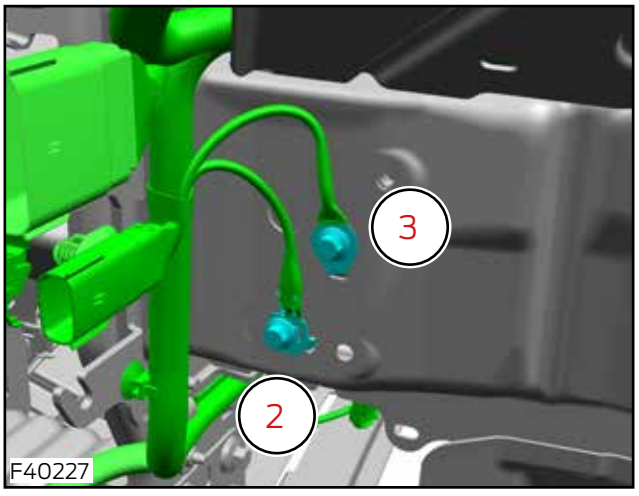
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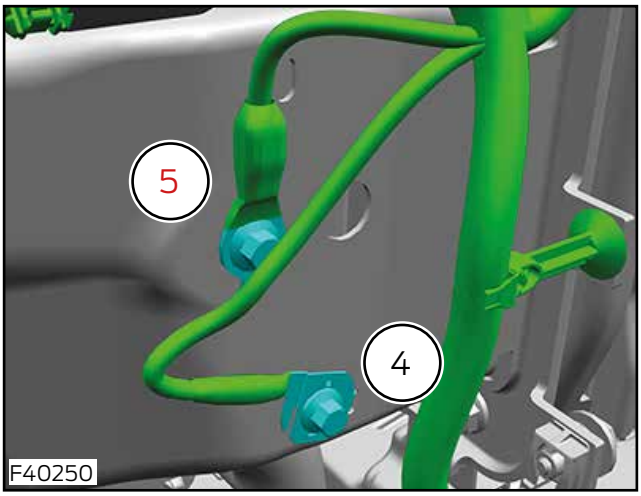
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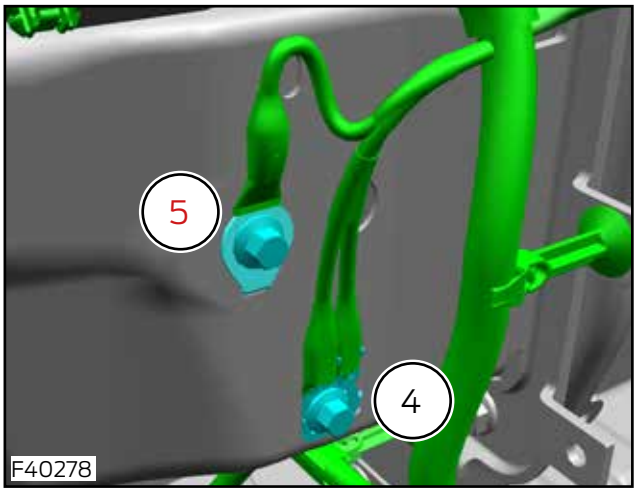
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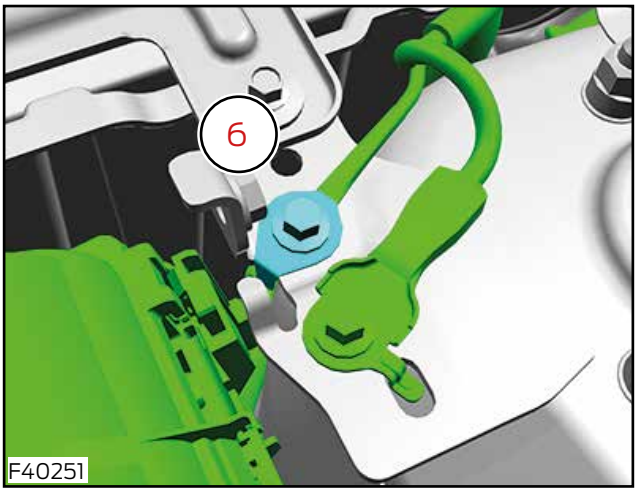
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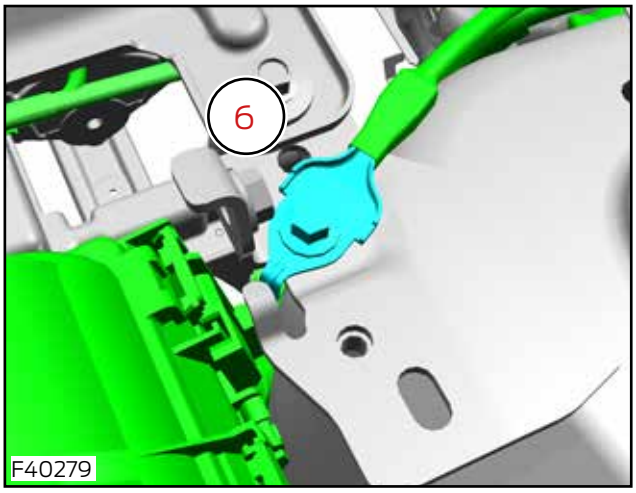
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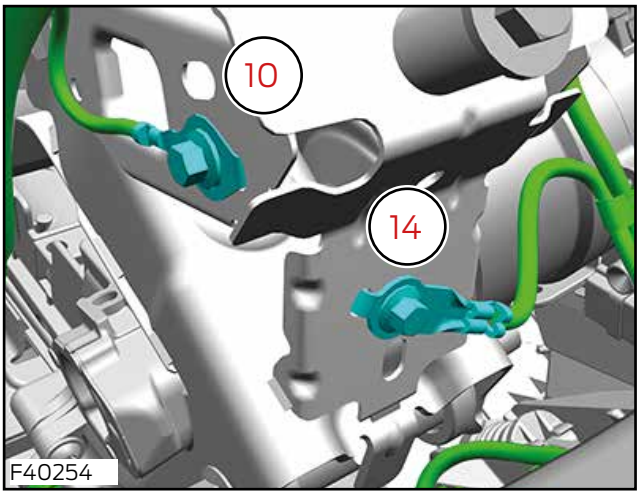
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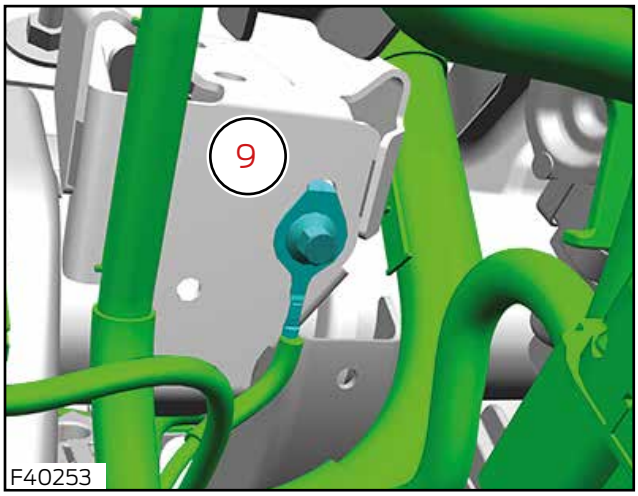
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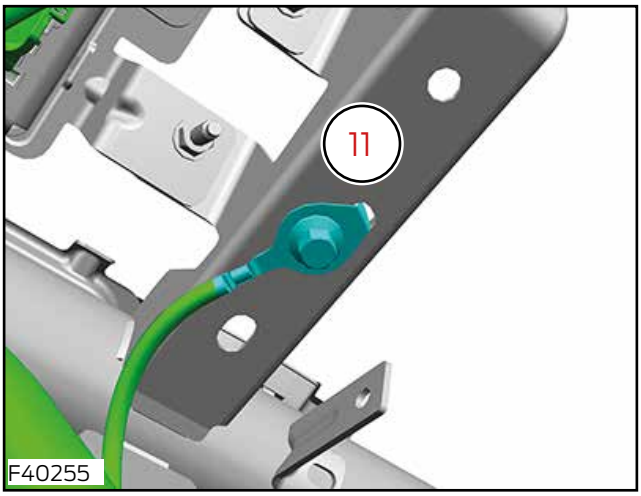
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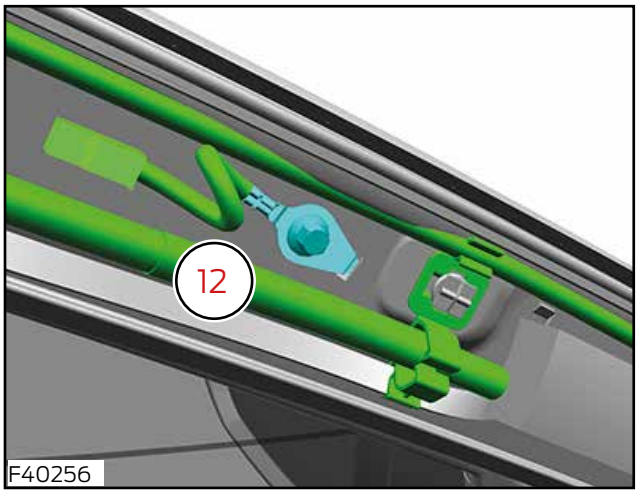
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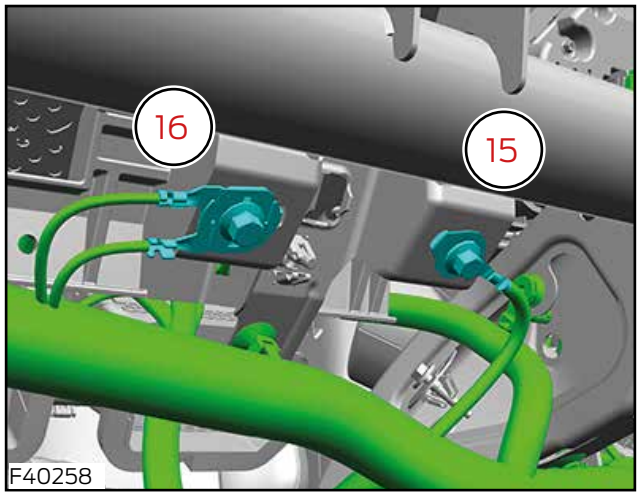
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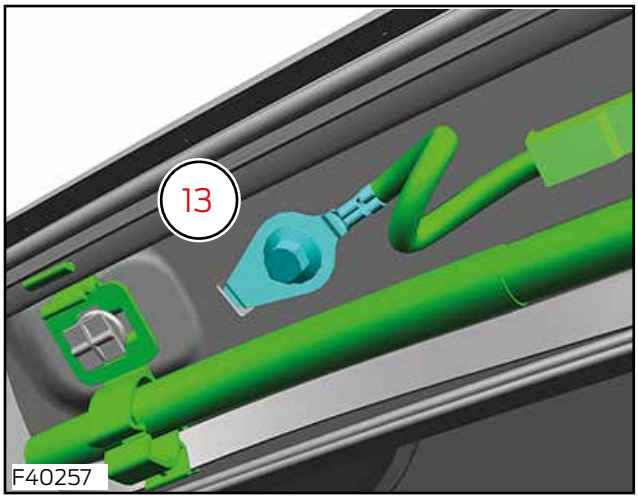
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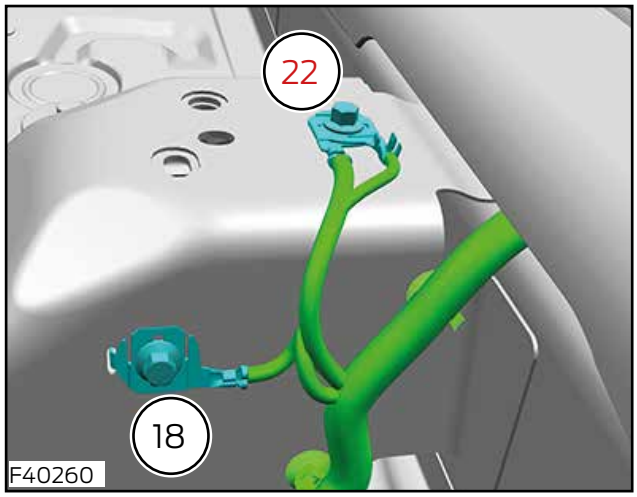
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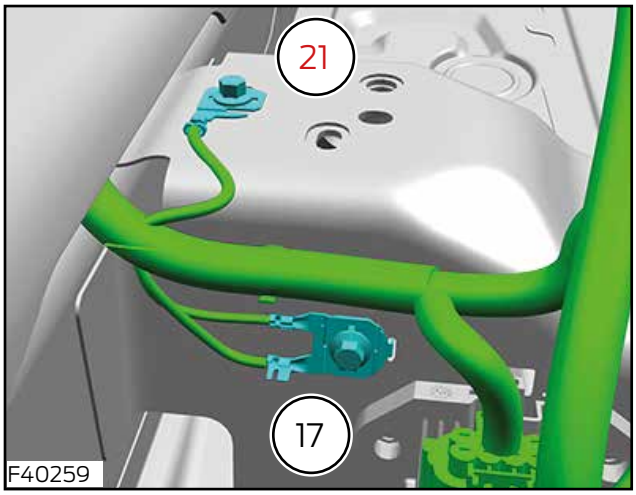
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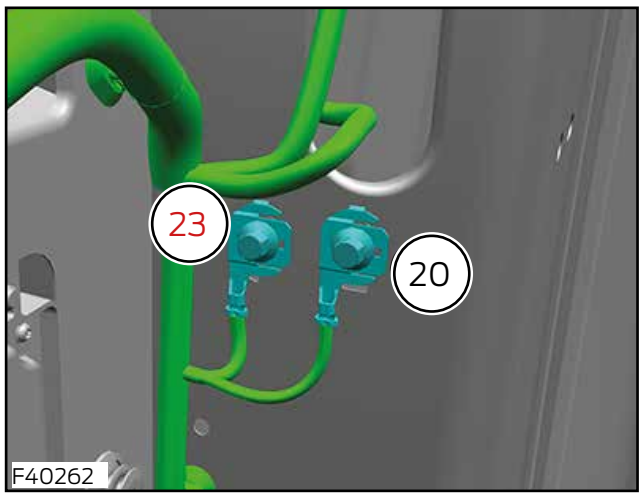
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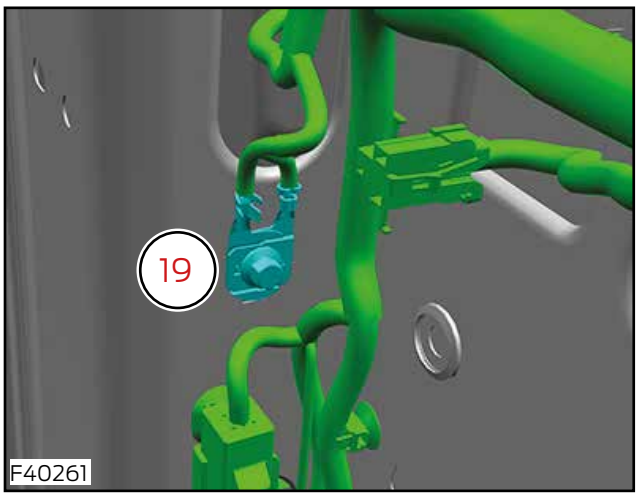
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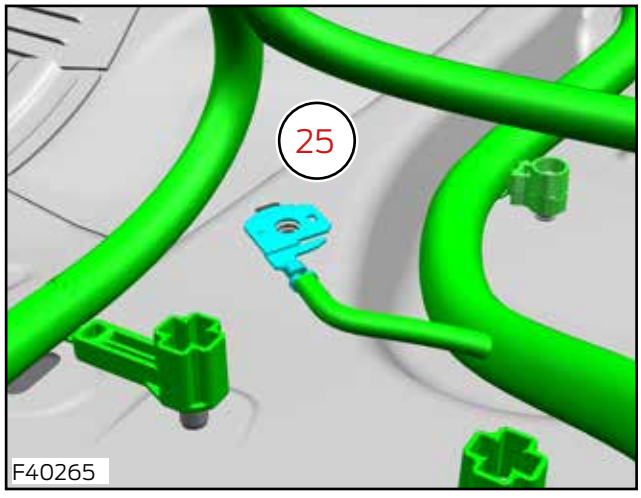
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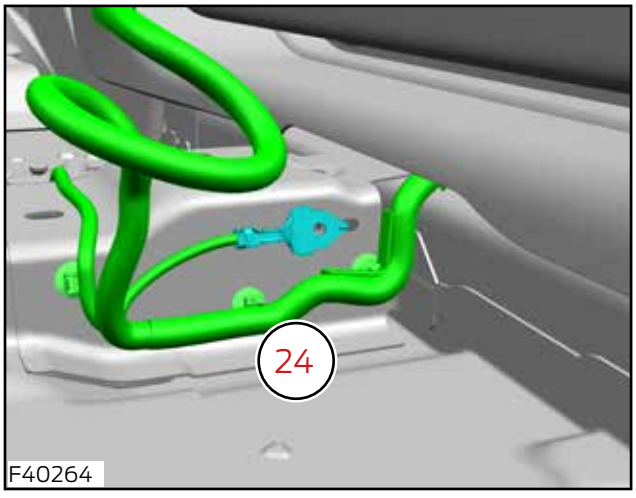
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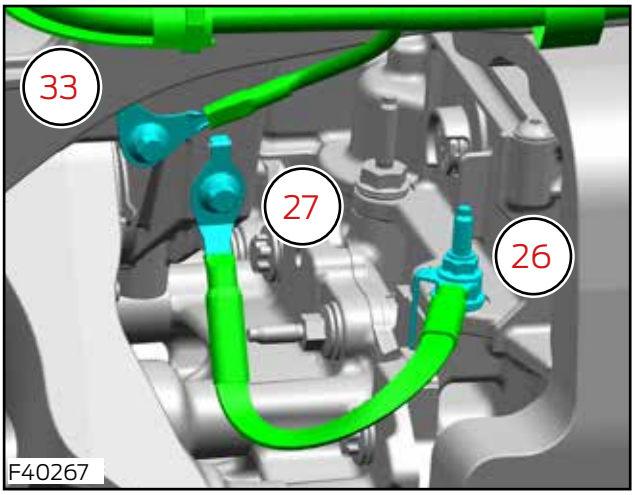
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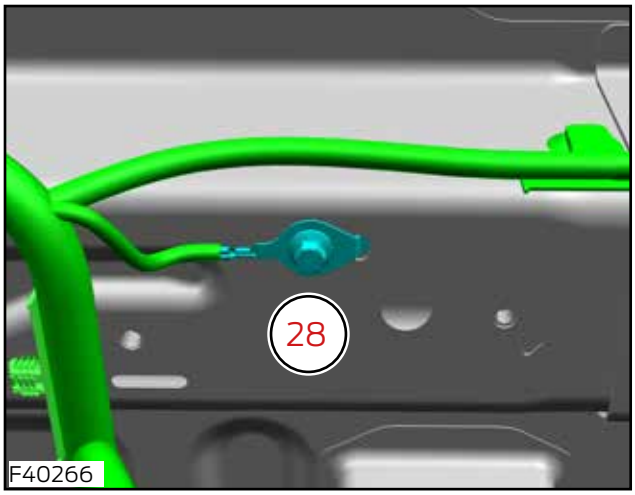
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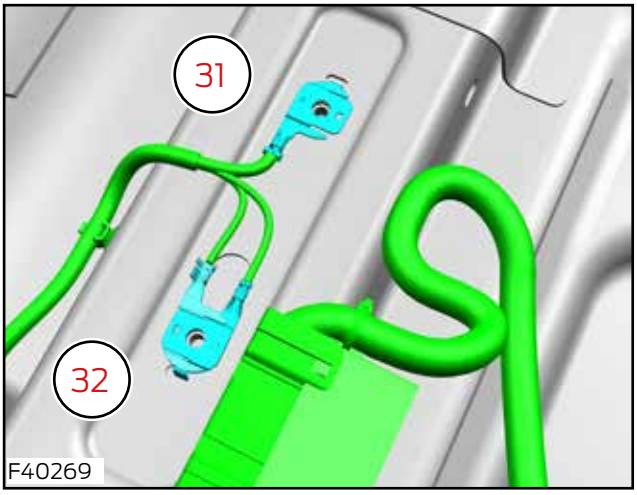
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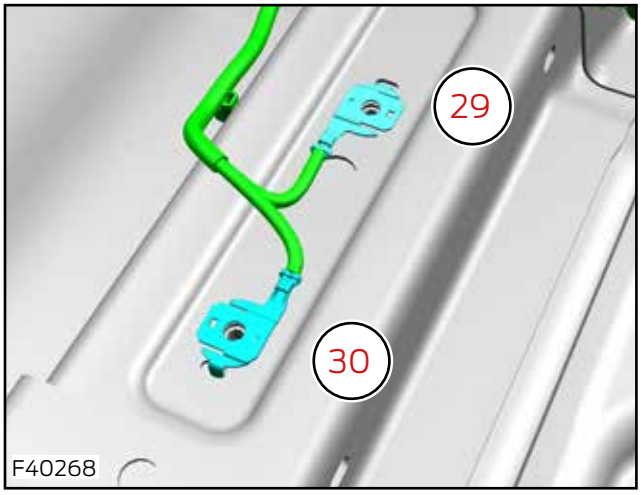
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F40268

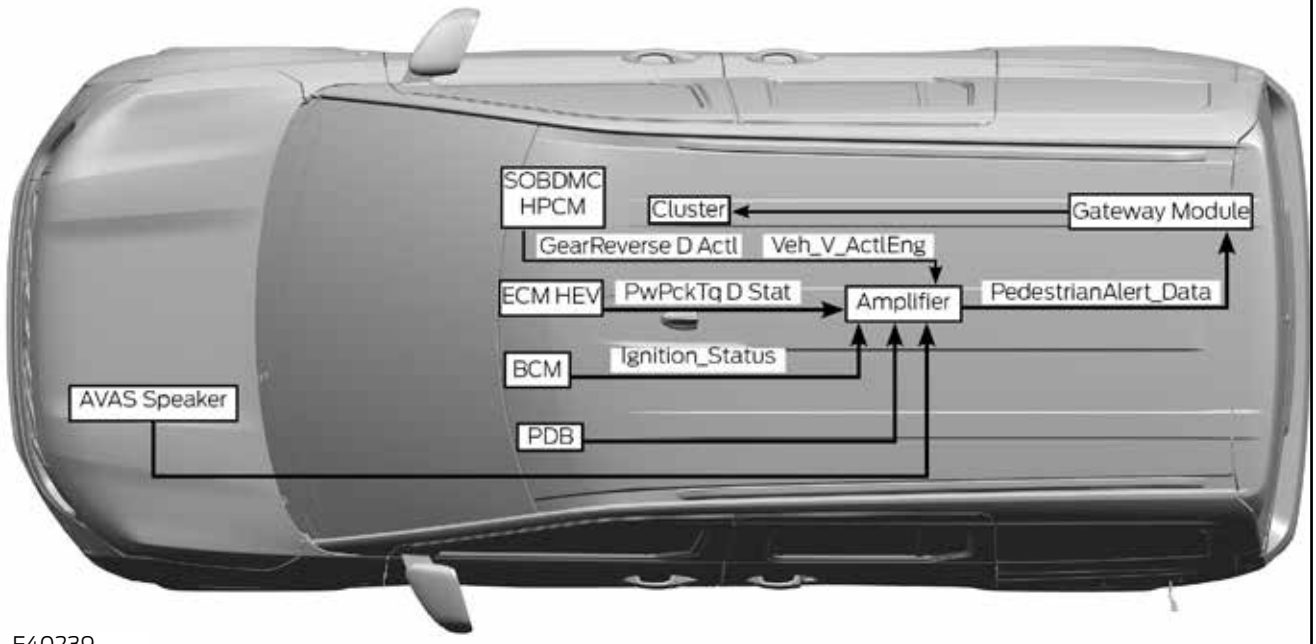
4.21 Acoustic Vehicle Alerting System (AVAS)

WARNING: Do not move or modify the components of the AVAS system. The Acoustic Vehicle Alerting System warning is a legal requirement.

All Transit/Tourneo Courier BEV vehicles are equipped with AVAS (Acoustic Vehicle Alerting System).

It is not permitted to remove, change position or obscure the AVAS speaker.

AVAS System



F40239

4.22 Driver State Monitoring Camera (DSMC) - New section

WARNINGS:

The Driver State Monitoring Camera (DSMC) is a legal requirement specified in the General Safety Regulation Batch C, which enters force on 7th of July 2026 for all new registrations in EU and associated markets.

The DSMC feeds signals to the Driver Alert System (DAS) needed to comply with the GSR Batch C requirements.

Do not disconnect or remove the DSMC as it would render the vehicle not legal.

Do not modify the DSMC location, housing or any of its components.

Do not place electromagnetic field emitters near the DSMC without approval from Ford Electromagnetic Compatibility team.

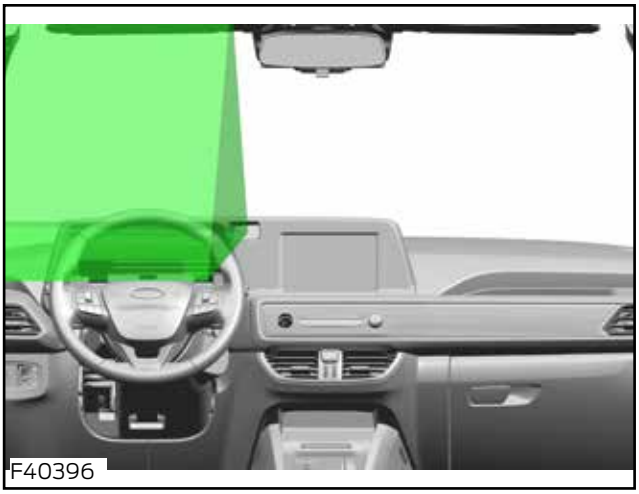
CAUTIONS:

Do not interfere with the DSMC field of view or with the field of illumination of the DSMC infra-red light LEDs. Disturbance to the field of view will impact the functionality and performance of the DSMC. Disturbance to the field of illumination will create reflections and shadowed areas that will impact the functionality and performance of the DSMC.

Do not remove or modify the infra-red filter lens in front of the camera. Replace only with original part if damaged or scratched.

Do not alter or modify the DSMC bracket (trinket tray) or its cover as it will impact DSMC functionality.

Front View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ISO View


F40397

5.1 Body

Refer to 5.1.1 Body Structures and any subsequent sections.

5.1.1 Body Structures - General Information

WARNINGS:

Extreme heat, such as paint drying ovens, will cause the damage of the High Voltage battery. The High Voltage battery must be removed before using paint drying ovens longer than 45 minutes or with temperatures above 60°C (140°F). Failure to follow this instruction may result in damaging the High Voltage battery, which could cause serious personal injury or death in a fire or explosion. Please refer to the Ford Transit Courier workshop manual.

The following components, as installed by Ford Motor Company, should not be removed, relocated, altered, or modified in any way:

High voltage battery, battery connectors, battery bracket (carrying structure), outriggers, energy absorption members, brackets, and attachment hardware.

Front-end structure, including aluminium extrusion assembly ("Megabrace"), attachment brackets, and attachment hardware.

When carrying out vehicle conversions the following points should be considered:

- Make sure that the vehicle structural integrity is maintained.
- Do not drill into closed frame body members.
- Make sure that the design for the body alterations or additional structure disperses the load evenly.

CAUTION: Uneven load distribution could result in unacceptable handling and braking characteristics.

- Repaint metal edges after cutting or drilling. All metal edges must comply with exterior and interior protection legislation.
- All fixings through the floor, sides or roof must be sealed.

Ensure proper sealing against ingress of water, salt, dust, after cutting or drilling the body. Use Ford approved sealing and finishing materials, and underbody corrosion protection. Refer to 5.12 Corrosion Prevention.

- Make sure that fixings in the B pillar, C pillar and/or D pillar area do not encroach on the seat belts or seat belt reels.

Refer to 5.9 Airbag Supplemental Restraint System (SRS).
For Load Compartment Tie Downs (Load Lashing Points), refer to 5.3 Loadspace.

WARNINGS:

Do not drill Boron steel parts, see Figure F50060 in this section.

Before drilling the floor, check the Precautionary Drill Zones, see Figures F50050, F50061 in this section.

For additional information on No Drill Zones, refer to the following sections:

- 4.2 Wiring Installation and Routing Guides
- 5.5 Body Closures

5.1.2 Welding

WARNING: Do not weld Boron steel parts, see Figure E214559 rev1 in this section.

Before welding work is performed on a vehicle body, all safety measures for the protection of people, modules and electrical components must be observed.

Electronic Components

NOTE: After disconnecting the power supply and before performing further work, a waiting period of up to 15

minutes is required. depending on the vehicle. Work on airbag systems may only be performed by personnel who have a relevant certificate of competence.

Increased use of comfort and safety electronics in modern motor vehicles also requires the greatest attention to be paid during body work. Over voltages produced during welding and in alignment work during body shell rectification, may cause electronic systems to be damaged. In particular, the safety instructions for performing welding work on vehicles with airbag systems must be adhered to.

Pay attention to the following points:

- Disconnect the battery negative clamp and cover the battery terminal.
- Disconnect the electrical connector at the airbag control module.
- If welding is to be performed directly near a control module, it must be removed beforehand.
- Never connect the negative cable of the welder near an airbag or a control module.
- Connect the negative cable of the welder close to the location of the weld.

Before Welding

Interior surfaces of new bodywork components which will no longer be accessible after installation and must be painted beforehand. The welding flanges are treated with a special welding primer. The joint areas are not always accessible from inside later; therefore, prepare these areas so that no soot is produced by burning paint during welding.

NOTE: In order to ensure that the corrosion protection produced in production is not destroyed, the working area must be kept as small as possible.

NOTE: Do not touch cleaned, bare metal with bare hands. The dampness of your hands will corrode the metal.

Procedure:

- Remove the primer or paint/zinc layer in the welding area using a tress wire brush to prevent the formation of soot from the paint.
- Thoroughly clean the welding area with a metal cleaning agent and rub dry.
- Coat the welding flange with welding primer on all sides and allow to dry.

NOTE: The welding primer must only be applied thinly to the spot welding area, to minimise spattering when welding.

The following points must be noted when welding:

- Zinc starts to melt at about 420°C.
- Zinc vaporises at a temperature of about 900°C.
- The amount of heating determines the damage to the zinc coating, and therefore to the corrosion protection.
- Resistance spot welding is particularly suitable for welding zinc coated panels, because no widespread. warming occurs.
- With electrolytically zinc-plated panels there is no need for any special preparation because the zinc coating does not need to be removed.

After Welding

During work, body panels are often heated at very high temperatures, which results in the destruction of the corrosion protection. Working of the affected areas is therefore vital:

- Grind the welded seams flat and clean thoroughly with silicone remover. Dry with a lint-free cloth.
- If the join area is accessible from the inside, the transition area to the paint must be abraded for all types of join, so that good adhesion of primer is achieved later.
- If the join area is not accessible from the inside and the cleaning and sanding work cannot be done, ensure that there is as little contamination as possible in the area of the repair. This allows the cavity wax applied later to penetrate the join area without hindrance.

NOTE: Only apply a small amount of panel cleaner to the cleaning cloth when cleaning the area. Make sure that no cleaner reaches the connecting flange, so that the welding primer is not washed away.

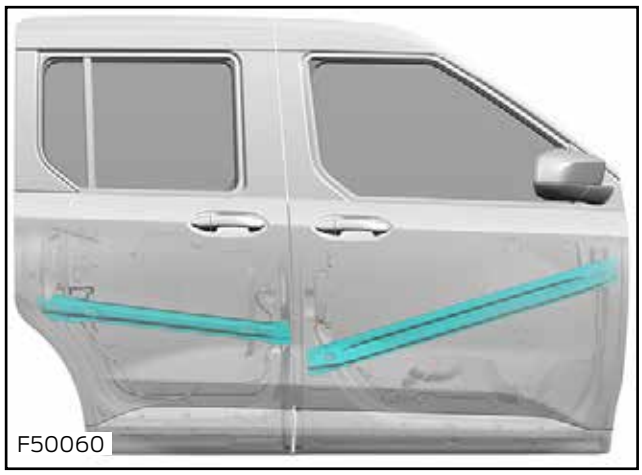
Priming After Welding

Primer should be applied to the welded flanges after cleaning. A check must also be made that the production

corrosion protection is present in the area of the flanges. Any damage must also be re-primed.

5.1.3 Boron Steel Parts

Boron Steel Parts - Precautionary Drill or Weld Zones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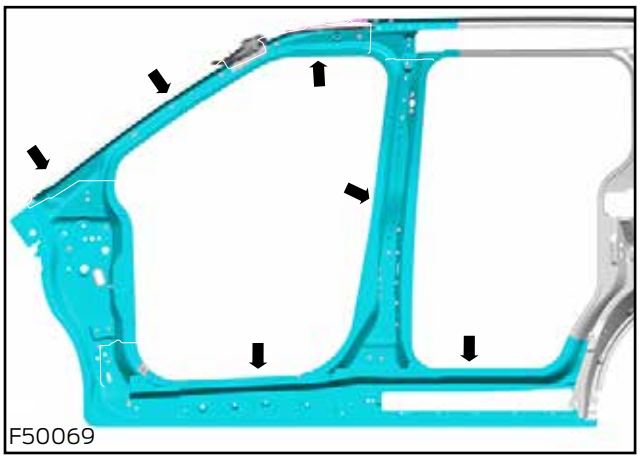
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5.1.4 Precautionary Floor Drilling: ICE

Title and content updated, images removed

WARNING: All fixings through the floor, sides or roof must be sealed.

CAUTION: Care should be taken when drilling the floor of the passenger compartment and rear cargo area. The fuel tank, Diesel Exhaust Fluid (DEF)/urea tank, brake lines, exhaust and electric cables are present below the floor.

It is recommended that Transit/Tourneo Courier Van CAD is obtained to understand vehicle component placement/location of Fuel/DEF tanks, fuel filler, wire harness routing and hydraulic brake line routing. As a convertor, CAD can be requested by contacting FPSVHelp@ford.com.

When adding holes/fasteners to the floor of the vehicle, consideration must be given to all components below the floor.

It is strongly recommended that drill-depth stops be used. Drill stop depth shall not exceed 25 mm maximum depth.

NOTE: Repaint metal edges after cutting or drilling. All metal edges must comply with exterior and interior protection requirements.

Refer to:

- 5.1.1 Body Structures - General Info
- 5.12 Corrosion Prevention

5.1.5 Precautionary Drilling/Welding: BEV

Title and content updated, images removed

WARNINGS:

It is strongly recommended that no drilling, welding, or any other operation be performed in order to prevent damage to the components placed underneath the floor including HV/LV system components, HV/LV cables, coolant/AC/brake lines

Refer to separate guidance in section 5.1.6 Precautionary Floor Drilling: BEV

Do not weld to the High Voltage battery, casing, or bracket.

Do not ground welding equipment to the battery, battery casing, or battery bracket.

All additional components that are attached to the body structure must not contain sharp edges that point towards the traction battery. This is to minimise the potential risk of damage to components within the traction battery itself.

Fasteners that upfitters install must point away from the battery so as to not to cause damage to the battery. Do not add a fastener into the vehicle that would point toward the HV battery.

Remove all sharp edges or burrs after cutting or drilling.

Re-paint metal edges after cutting or drilling. All metal edges must comply with exterior and interior protection requirements.

Refer to:

- 5.1.1 Body Structures - General Information
- 5.12 Corrosion Prevention

CAUTIONS:

Do not drill into the vehicle before checking the precautionary drill zones and electrical wire routing.

It is strongly recommended that drill-depth stops be used.

It is recommended that 3D CAD is obtained for convertor use to understand vehicle component placement in vehicle line location. As a convertor, 3D CAD can be requested by contacting FPSVHelp@ford.com.

5.1.6 Precautionary Floor Drilling: BEV

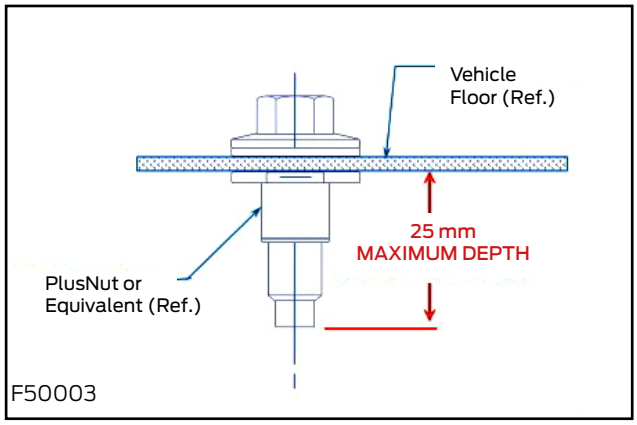
Title and content updated

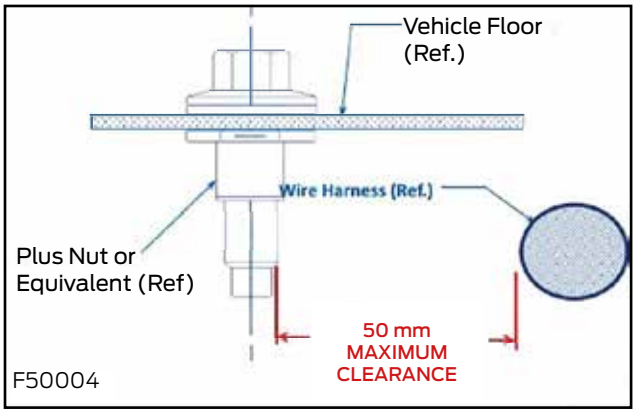
WARNING: **All fixing or wiring holes through the floor, sides or roof must be sealed with plugs, grommets, or tape to prevent the ingress of harmful liquids, gases, and heat to the cabin. Sealing components must be robust up to a temperature of no less than 95°C and should retain their sealing functionality at this elevated temperature for a minimum of 30 minutes.**

Whilst it is recommended that no drilling is undertaken, some limited drilling and fixing is permissible on the cargo floor area of the BEV Van variant; providing the following guidelines are explicitly followed:

Take precautions when undertaking drilling, or any other operation, rearward of the B-Pillar in order to prevent damage to any components under the Van floor. HV grounding points in the vehicle are not to be touched:

- When adding holes/fasteners to the floor of the vehicle to secure upfits, consideration must be given to all components below the floor.
- It is strongly recommended that drill-depth stops be used. Drill stop depth shall not exceed 25 mm MAXIMUM DEPTH.
- Fasteners (including PlusNut® or equivalent) extending below the floor of the vehicle shall not exceed 25 mm MAXIMUM DEPTH (Figure F50003).
- Fasteners (and/or alternative fastening method) extending below the floor of the vehicle shall have 50.8 mm MINIMUM CLEARANCE to any surrounding High/Low Voltage wiring and/or coolant line routing and/or hydraulic brake line routing to prevent any damage/chafing. (Figure F50004)





For additional information, refer to the following sections:

- 5.1.1 Body Structures - General Information
- 5.12 Corrosion Prevention

5.1.7 Front End Integrity for Cooling, Crash, Aerodynamics and Lighting

Cooling: Continuous air flow through the front end and engine compartment is not to be hindered by adding any additional equipment.

Lighting: Do not alter the lighting system.

Crash: Do not cut, drill or weld any parts that are load path relevant in case of crash. Do not add material in the crash zone. This could affect the crash sensor calibration.

The side airbag system is not permitted if:

- A swivelling device is fitted on the front seats.
- Any additional material or structure is attached to the B pillar inner and/or outer area.

5.2 Racking Systems

Refer to 5.2.1 Racking Systems and any subsequent sections.

5.2.1 Racking Systems

- Frames should be rigid, self-supporting and bolted through the floor, use reinforcements on the underfloor.
- It is not recommended to drill through the floor in combination with plastic load floor liners.
- Ensure proper sealing against ingress of water, salt, dust, after cutting or drilling the body. Use Ford approved sealing and finishing materials, and underbody corrosion protection.
- To minimise stress in body side upper area, additional cross brace roof bows are to be used.
- If linings are planned for the inside of the load area, all racking through bolts must be designed to be accessible through the lining to the body structure with spreader plate.
- No load bearing fixing to the lining only.
- For increased crash performance the racking system should be designed with diagonal reinforcements.
- Vehicle should be equipped with Ford standard option bulkhead to give best protection to driver and front passengers.
- Preferably, there should be a rack each side to balance the vehicle load.

For additional information, refer to 5.12 Corrosion Prevention.

For additional information on Precautionary/No Drill Zones, refer to the following sections:

- 4.2 Wiring Installation and Routing Guides
- 5.1 Body
- 5.5 Body Closures

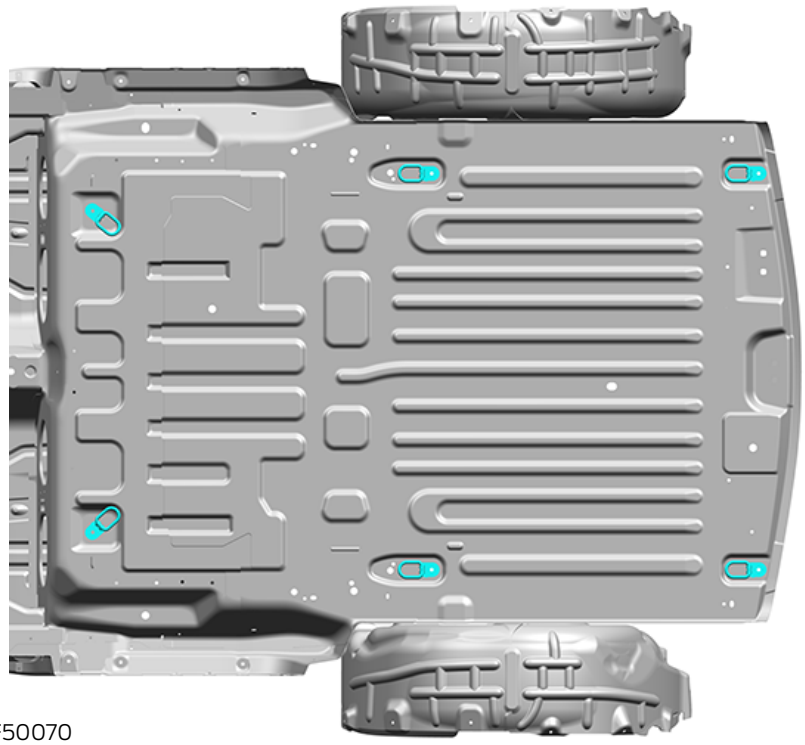
5.3 Loadspace

Refer to 5.3.1 Load Compartment Tie Downs and any subsequent sections.

5.3.1 Load Compartment Tie Downs

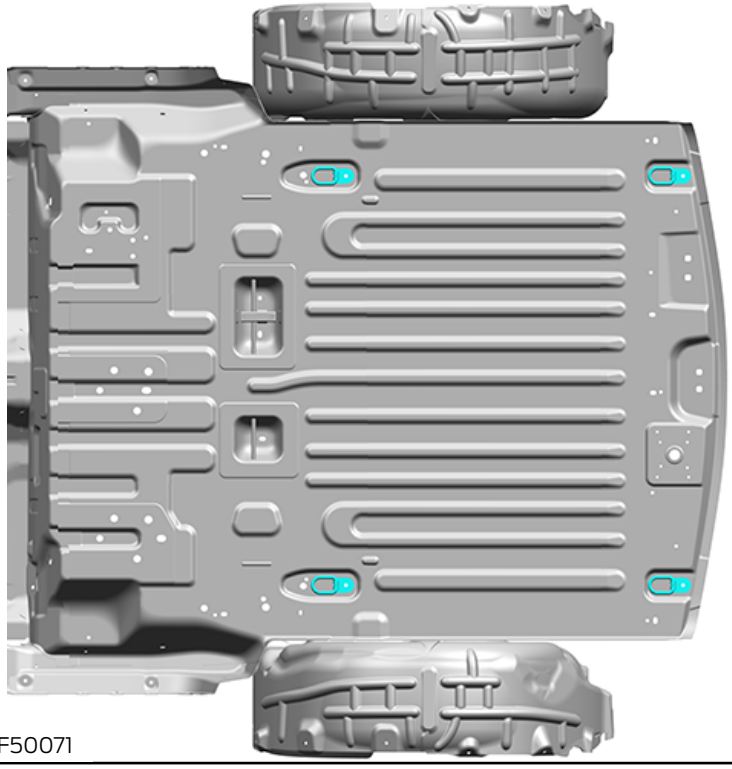
All vehicles are fitted with load compartment tie downs, these are all 'D' rings as shown in E214561a and E214561 rev1. Not all vehicles will have all locations shown and will depend on the base vehicle. For additional fixing locations. Refer to 5.2 Racking Systems.

Load Tie Downs: Transit Courier



F50070

Load Tie Downs: Tourneo Courier



F50071

5.4 Interior Partitions

Refer to 5.4.1 Partitions (Bulkhead) and any subsequent sections.

5.4.1 Partitions (Bulkhead) - Driver and Front Passenger(s) Protection on Van

CAUTION: Bulkheads serve an important function and are legally required in some territories.

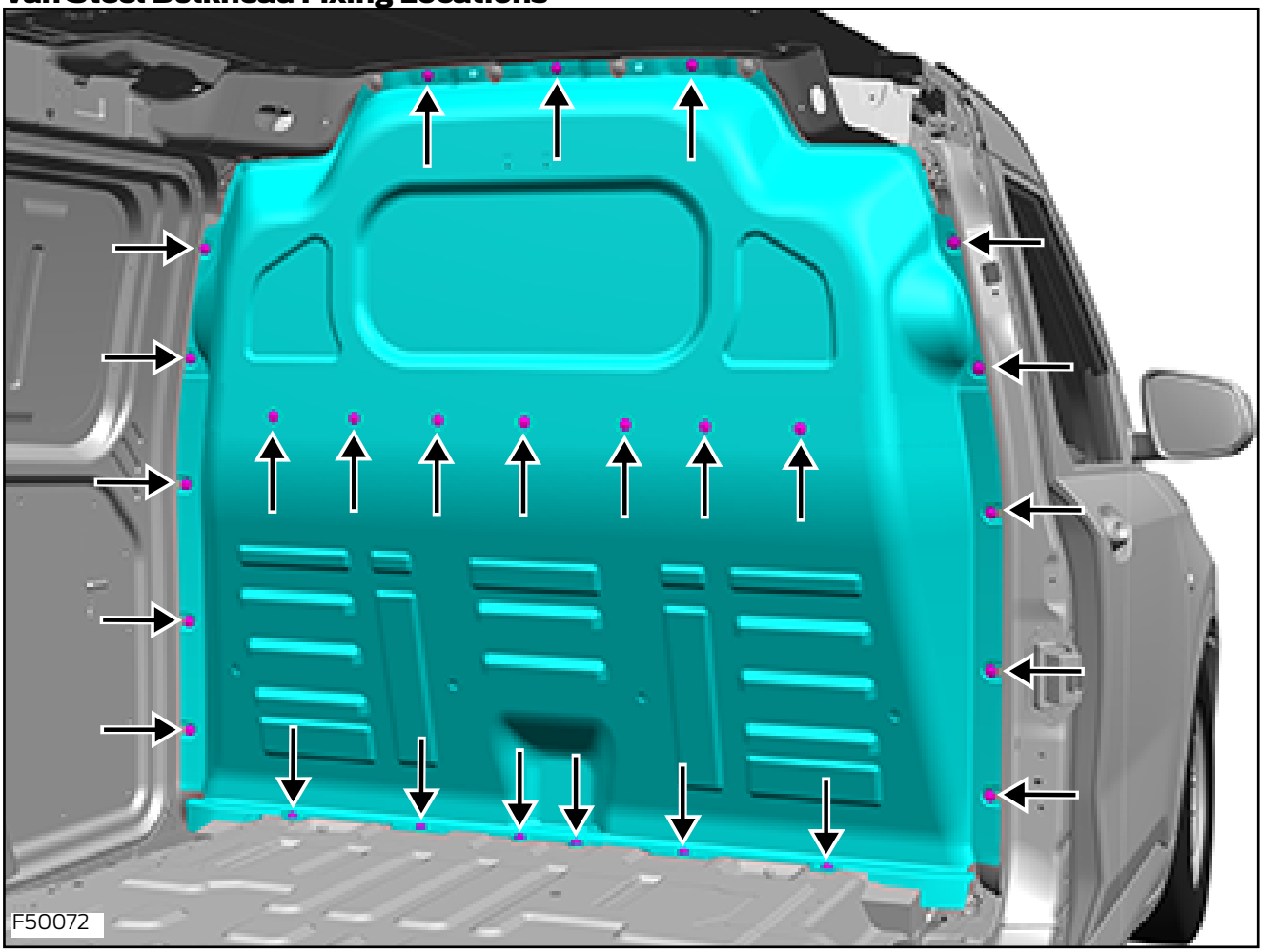
It is the vehicle convertor's responsibility to ensure local current legislation governing bulkheads and protective window grilles is met. It is also the convertor's responsibility to ensure legal load constraint requirements if using a non-Ford standard bulkhead.

Standard Ford bulkheads do have a clearance between bulkhead and body structure to allow natural body flexing and an air circulation from the cab to the rear load space for ventilation control.

Air circulation and body flexing must also be given consideration when engineering an alternative bulkhead. It is not recommended to restrict driver or passenger seat adjustment travel.

The following figure shows the standard bulkhead fixing locations on 'B' pillar. These are weld nuts for M6. The standard range of Ford bulkheads can be retro-fitted at these points. Standard Ford Bulkheads are fitted with tamper-proof bolts.

Van Steel Bulkhead Fixing Locations



5.5 Body Closures

Refer to 5.5.1 Security, Anti-Theft and Locking System and any subsequent sections.

5.5.1 Security, Anti-Theft and Locking System

CAUTION: To avoid locking system security complications, it is recommended to discuss with your local Ford dealer prior to conversions taking place.

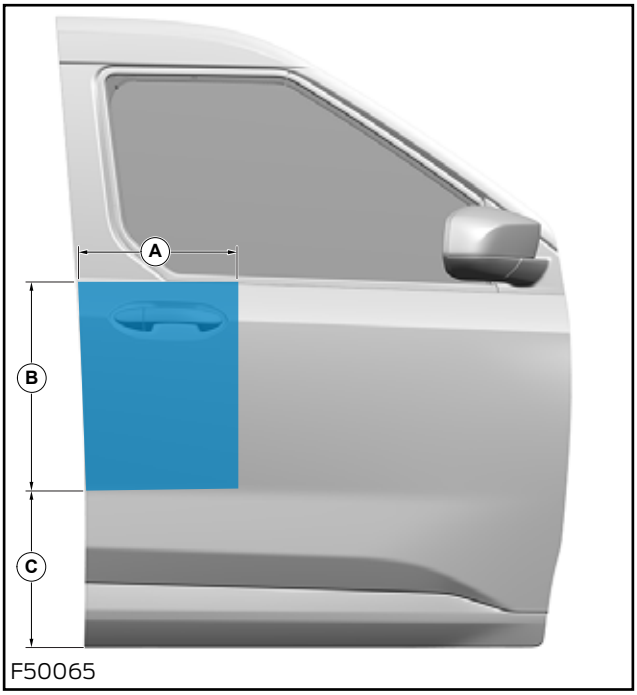
NOTE: It is not recommended to alter the locking system or damage the security shielding around the lock and latch.

When removing and reapplying door seals, take care to fit correctly using the same seals as this is critical to door closing efforts. Before re-assembly of the seals, body flanges need to be properly cleaned. It is recommended is to use new seals and to discard the old ones for better water management performance. Any modification to the sealing flanges or surfaces will require consultation with your local Ford dealer. This may also include air extraction/venting adjustments to assist door close efforts if significant changes to closures are required.

The Body Control Module is designed to work specifically with the Ford Transit/Tourneo Courier lock and latch mechanisms and therefore drives latches to lock and unlock for specific time periods. Additional power locking functionality should be based around the use of additional Ford Transit/Tourneo Courier latch mechanisms. Additional latches can be driven via relays connected in parallel with existing latches.

The following figures outline the areas in which it is not advisable to drill.

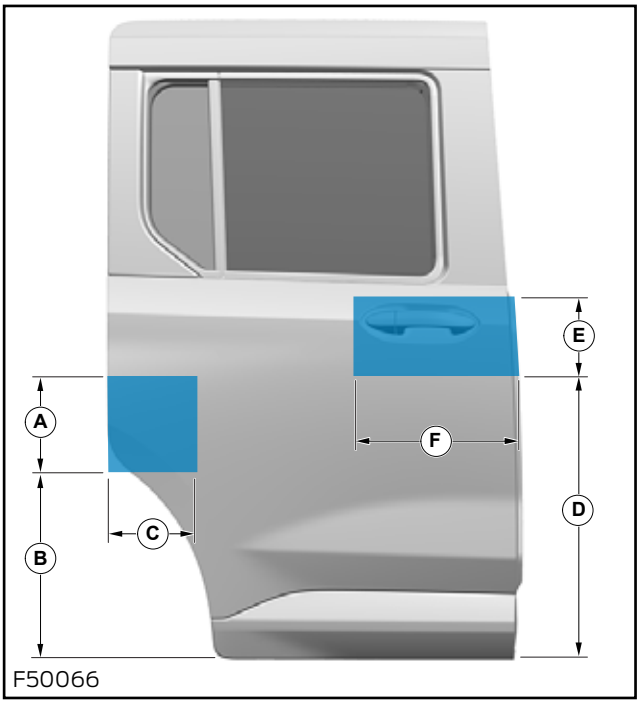
No Drill Zone - Driver and Passenger Doors



F50065

Item	Description
A	322 mm
B	475 mm
C	340 mm

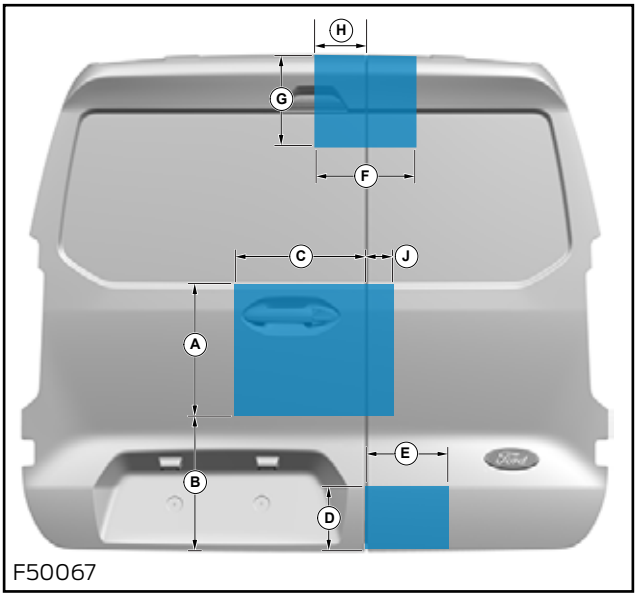
No Drill Zone - Side Sliding Doors



F50066

Item	Description
A	215 mm
B	500 mm
C	240 mm
D	680 mm
E	130 mm
F	350 mm

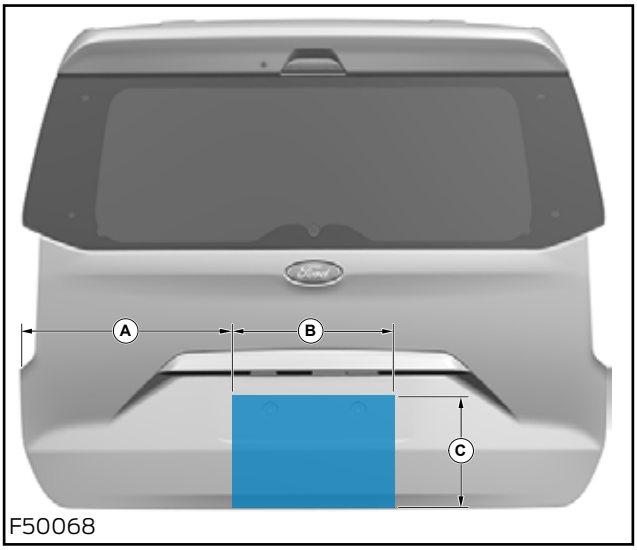
No Drill Zone - Rear Cargo Doors



F50067

Item	Description
A	275 mm
B	400 mm
C	340 mm
D	180 mm
E	195 mm
F	270 mm
G	260 mm
H	135 mm
J	40 mm

No Drill Zone - Lift-Gate



F50068

Item	Description
A	620 mm
B	280 mm
C	225 mm

5.6 Interior Trim

Refer to 5.6.1 Load Compartment Interior Lining and any subsequent sections.

5.6.1 Load Compartment Interior Lining

Do not damage the lock, hinge, latch or check arm system (electrical cables, release system) when applying interior lining.

Be careful not to damage the weather shield (water shield covering inner door access hole) when removing or applying interior door trim.

WARNINGS:

Plan fixing points for other fitments such as racking, to ensure through bolting can be achieved. Fixing to the lining material may be inadequate for normal safe operation of the vehicle.

Varnish or paint wooden interior cargo area panels if exposed to high humidity conditions.

The additional weight of the linings on doors may require additional reinforcements to the door and pillar at the hinge and check mechanism.

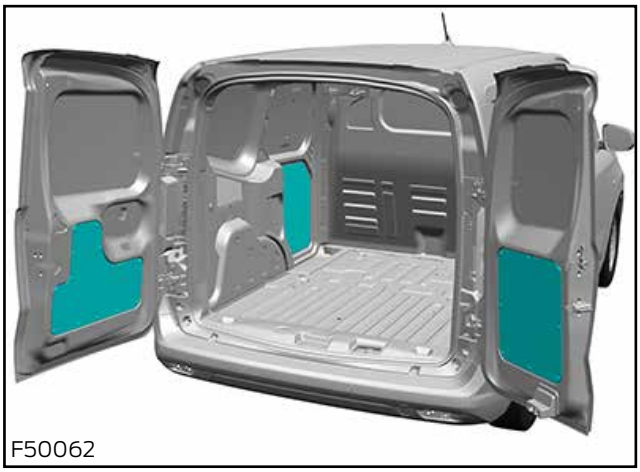
5.6.2 Plywood Lining/Cladding

CAUTION: Do not drill into the vehicle before checking the Precautionary/No Drill Zones and electrical wire routing.

For additional information, refer to the following sections:

- 4.2 Wiring Installation and Routing Guides
- 5.1 Body
- 5.5 Body Closures

- Panels should be precision cut by machine, not by hand jigsaw, to reduce rough edges and splinters.
- Panels should be pre-drilled.
- Do not drill through floor panels, use existing load lashing points when securing the panels.
- It is recommended that when fitting a plywood floor that it is joint free.
- Use aluminium floor trims.
- Plywood should be water resistant (WBP, water and boil proof).
- It is recommended to use 9 mm thickness for floors and 4 mm thickness for side and door lining.



F50062

5.7 Seats

NOTE: When reassembling the seat and the seat belt, use specified bolts and ensure to apply the specified torque.

5.7.1 Van (Seats)

CAUTION: Do not install seats in the rear cargo area of a van.

5.7.2 Heated Seats

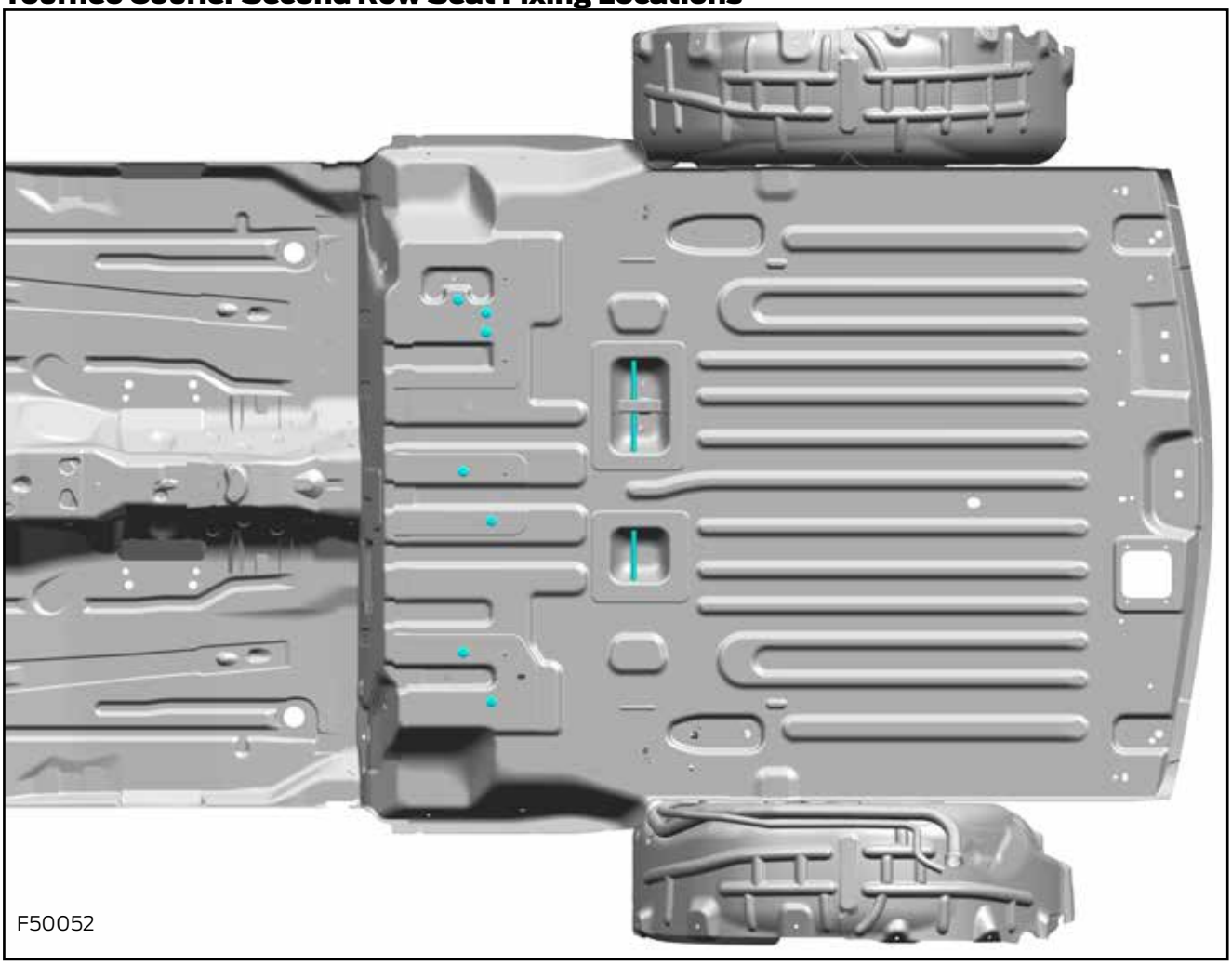
WARNING: The electrical feed for the original heated Ford seat must not be used for other purposes, e.g. other electrical consumers.

It is not advisable to retrofit heated seats due to potential airbag operation or malfunction (incorrect configuration).

5.7.3 Rear Seat Fixing Positions

The following Figure F50052 shows the second row seat fixing positions in the floor.

Tourneo Courier Second Row Seat Fixing Locations



F50052

5.8 Glass, Frames and Mechanisms

Refer to 5.8.1 Heated Windscreen and Heated Rear Window and any subsequent sections.

5.8.1 Heated Windscreen and Heated Rear Window

WARNING: The base system should not be tampered with (controlled by body control module and multiplex architecture) and no feeds taken from the associated wiring or controller.

These options are not suitable for aftermarket or Vehicle Convertor fit.

5.9 Airbag Supplemental Restraint System (SRS)

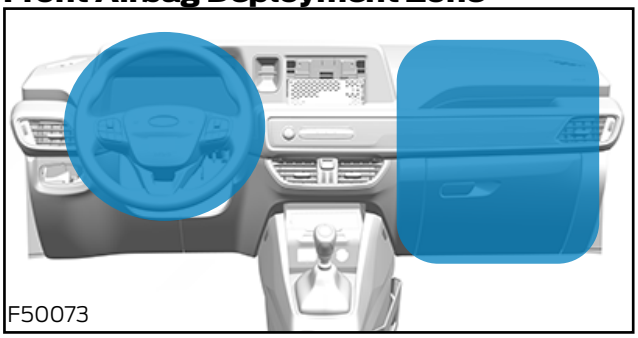
Refer to 5.9.1 Airbag Deployment Zones and any subsequent sections.

5.9.1 Airbag Deployment Zones

Front Airbag Deployment Zones

WARNING: Do not place accessories in the deployment zone of the driver and passenger airbags as they may impair airbag deployment.

Front Airbag Deployment Zone


F50073

Side and Curtain Airbag Deployment Zones

WARNING: Do not place accessories in the deployment zone of the side and curtain airbags as they may impair airbag deployment.

NOTE: It is recommended to specify a base vehicle without airbags if planning modifications in this area.

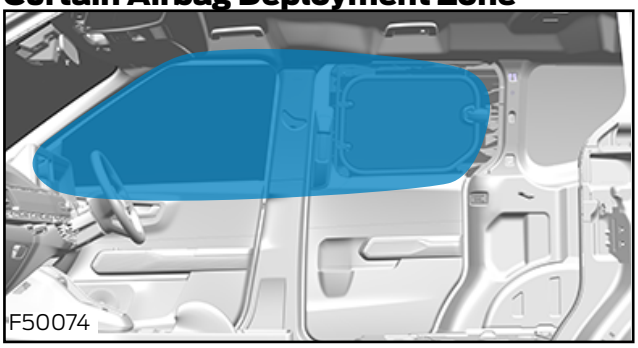
NOTE: All Kombi M1 Buses are specified with side and curtain airbags as standard fitment.

Side Airbags (Seat Mounted): The side airbags on this vehicle have not been validated for use with swivelling front seats. Do not specify a base vehicle with side airbags if planning to retrofit a swivelling device on the front seats and/or an armrest on the outer side of the front seats; this may affect the function and/or deployment of the side airbags. Ensure any seat covers installed are designed to be used with side airbag equipped seats.

Curtain Airbags: Extensive conversions to the roof and headlining may impair deployment of the curtain airbags. If roof or headlining is to be modified or replaced, do not specify curtain airbags on the base vehicle.

If access to the roof is required, to install roof mounted exterior accessories for example, ensure the unmodified headlining is refitted using the existing mounting points.

Curtain Airbag Deployment Zone


F50074

5.9.2 Restraints Control Module (RCM)

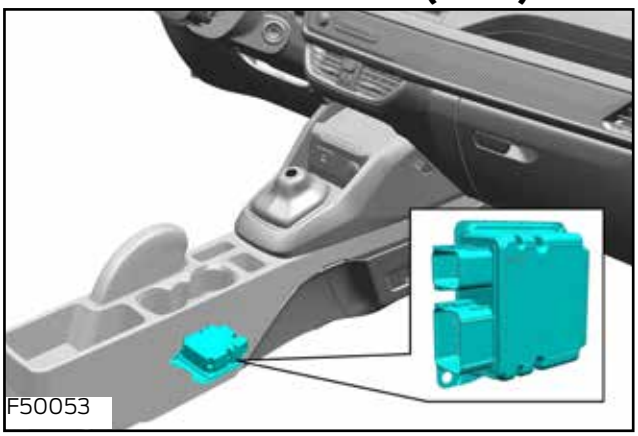
WARNINGS:

Modifications or reinforcements in the area of the RCM may affect the side airbag deployment timing and result in uncontrolled side airbag deployment.

The RCM device is protected by the parking brake and console, to prevent damage from occupants when stepping past the seat to access the rear of the vehicle. The parking brake and console should be maintained in their fitted position to ensure protection for the RCM.

The RCM is located between the front seats, underneath the parking brake console. See Figure F50053.

Restraints Control Module (RCM)



5.9.3 Front Side and Door Sensors

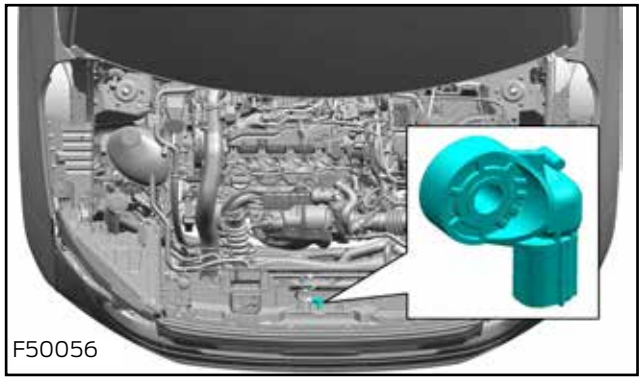
WARNINGS:

Modifications or reinforcements in the area of the sensors may affect the side airbag deployment timing and result in uncontrolled side airbag deployment.

Drilling or grinding operations in these areas are only permitted when battery cables are disconnected.

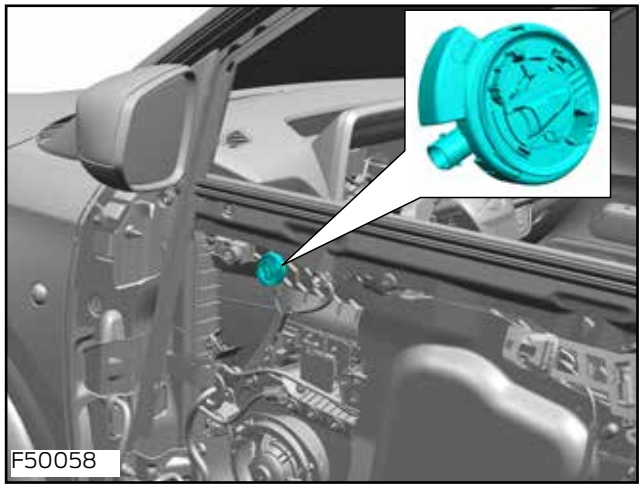
If the battery is disconnected, refer to 4.5 Battery Systems Battery Monitoring Sensor section to reconnect it. The airbag sensor for the front airbags is located behind the front grille. See Figure F50056.

Front Sensor



Side Sensors - B Pillar

Front Door Pressure Sensor



The pressure sensors for the side airbags are located in the first row doors, see Figure F50058.

5.10 Seatbelt Systems

Refer to 5.10.1 Seatbelts and any subsequent sections.

5.10.1 Seatbelts

WARNINGS:

Follow removal and installation procedures for the seatbelt system to ensure correct function of the restraints system.

Seat Belt Buckles must not be modified in situ on the Seats. If Seat Belt Buckle requires modification or removal, then this must be performed by OEM Seat supplier.

The removal and reinstallation of the seatbelt, buckle or any component of the seatbelt system should be avoided. However, if removal and re-installation of the system is required during the conversion, follow the removal and installation guidelines of the seatbelt system as described in the workshop manual.

When removing the seatbelt system, a seat belt webbing forked retainer should be applied to the webbing 200 mm below the webbing button stop. This prevents a situation where all the webbing runs back into the retractor and the retractor becomes locked.

When reinstalling, fit the retractor to the body first and gently pull the webbing out of the retractor to allow fitment of the D loop; then remove the forked retainer. If the retractor is locked, allow a small amount of webbing to reel back into the retractor to allow the webbing lock to release. Do not attempt to release the retractor by pulling on the webbing with significant force or by manually interfering with the locking mechanism.

5.10.2 B Pillar No Drill Zone

WARNINGS:

Do not drill in right hand/left hand side retractor assembly area.

Drilling is only permitted in the green area indicated.

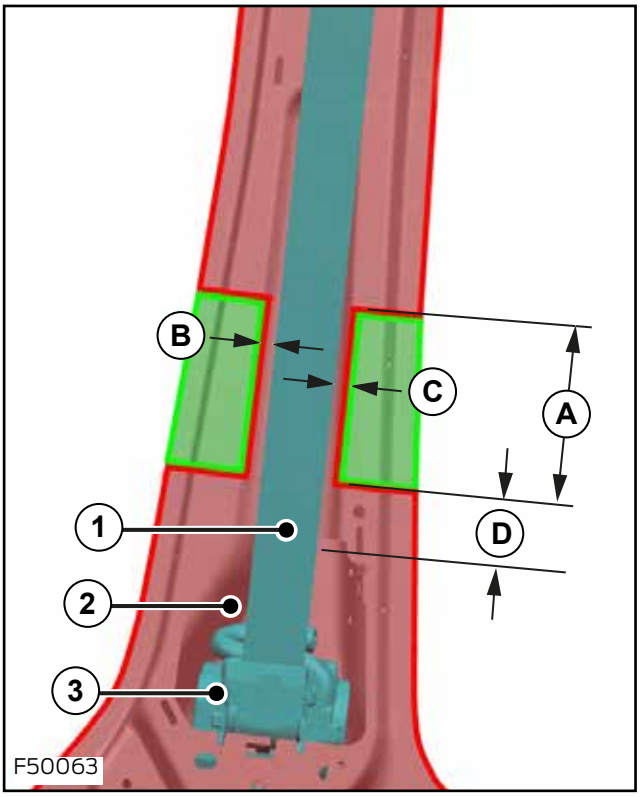
(Retractor damage):

If drilling holes are near or above the retractor and anchor pretensioner, the mechanisms must be covered to prevent swarf/debris from falling into the assembly and causing functional issues.

(Webbing damage):

- **Any additional hardware fitted must not cut, pinch or interfere with the seatbelt webbing along its entire path (from retractor to D-ring area).**
- **Avoid sharp brackets near webbing; all edges must have a minimum radius of 0.5 mm.**
- **Avoid upfitting parts that may change the belt routing to the occupant.**

Front Seat Belt/B Pillar Drill Zone Definition



Item	Description
1	Seatbelt Webbing
2	Retractor Hole
3	Retractor
A	200 mm
B	15 mm Left of Webbing
C	15 mm Right of Webbing
D	30 mm above Retractor Hole

5.10.3 Seat Belt Reminder

For front row, for all seats, buckle sensor is provided. Only passenger seats have occupant presence detection mat.

For rear seats, buckle sensor is provided in all variants. Additionally, only Kombi M1 EU seats have occupant presence detection mat on rear seats.

Seat Belt Reminder is a legal requirement for all new vehicles. For front seats a sensor is provided in the seatbelt buckle to sense the seatbelt wearing status of the occupant, in addition to occupant detection mats in the seats. For rear seats the seatbelt buckle sensor is provided only, depending on the market and body type (Kombi M1/N1). If a vehicle is modified, these functions must be retained.

If factory-fitted seats are removed and refitted as part of a conversion, the Seat Belt Reminder function will need to be reconfigured using the following procedure:

Permanent Deactivation/Reactivation Procedure
The deactivation/reactivation procedure will deactivate/reactivate the audible signal for front seats individually or all the rear seats together.

1. With the vehicle stationary, switch the ignition to On position
2. Perform 4 buckling and unbuckling actions. The sequence should start and end with ‘unbuckled’.
3. The Seat Belt Reminder tell-tale lamp flashing will confirm successful deactivation/reactivation.

NOTE: Any seat belt buckle can be used for the procedure.

NOTE: Additional (non-factory-fitted) seats cannot be added to the belt-minder function using this procedure.

NOTE: The convertor shall not provide the procedure for Seat Belt Reminder deactivation to the owner/operator via handbook or other easily accessible sources.

If the seat trim is exchanged (or added in the case of Fabricless seats being ordered), the functionality of the Seat Belt Reminder will need to be successfully tested during trim development. The final seat assembly will need to be verified for function at End-Of-Line. Please contact FPSVHelp@ford.com for further information.

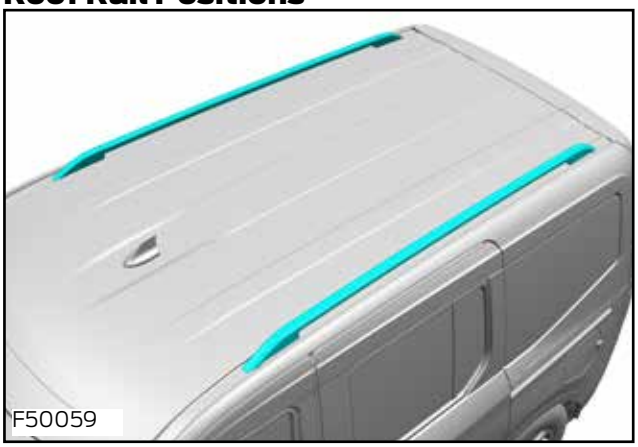
5.11 Roof

Refer to 5.11.1 Roof Racks and Load Carriers and any subsequent sections.

5.11.1 Roof Racks and Load Carriers

WARNING: Avoid all antenna positions when retrofitting a sunroof or any roof mounted units.

Roof Rail Positions



NOTE: If roof rails are required on a vehicle it is recommended to order them on the base vehicle.

NOTE: Refer to the Owner's Manual for maximum roof load, including roof rack.

NOTE: Maximum roof rack length should consider liftgate in fully opened position.

Roof racks may be fitted to the roof rails on all Transit Courier, Tourneo Courier variants, providing the following is satisfied:

- The carried load does not exceed the recommended weight stated in the Owner's Manual.
- The load is evenly distributed (convertor to ensure Owner's information book identifies this limitation).
- It is recommended that the rack leading edge should not be located forward of the rear edge of the driver's door, or B pillar.

5.12 Corrosion Prevention

Refer to 5.12.1 General (Corrosion Prevention) and any subsequent sections.

5.12.1 General (Corrosion Prevention)

Avoid drilling into closed frame body members to avoid the risk of corrosion from swarf.

If drilling is required, however:

- Re-paint metal edges and protect against corrosion after cutting or drilling operations.
- Endeavour to remove all swarf from inside the side member and treat to prevent corrosion.
- Apply corrosion protection inside and outside of the chassis frame.

For Welding, refer to 5.1 Body.
For Painting, refer to 2.4.6 Painting Road Wheels.

5.12.2 Repairing Damaged Paint

After cutting or reworking any sheet metal on the vehicle, the damaged paint must be repaired.

Ensure all materials are compatible with the relevant Ford specifications and maintain the original performance where possible.

5.12.3 Under Body Protection and Material

WARNING: do not overcoat or contaminate surfaces of components such as brakes or catalytic converters.

Ensure all materials are compatible with the relevant Ford specifications and maintain the original performance where possible.

Some proprietary products affect the original coatings.

5.12.4 Contact Corrosion

When using different materials with a different electrochemical potential, ensure that materials are isolated from each other to prevent contact corrosion caused by a potential difference.

Use appropriate isolation materials. Where possible, choose materials with low level of electrochemical potential difference.

A

B

C

D

E

F

G

H

I


Ford