

All-New eSprinter  
Technical  
Overview and Key  
Upfit  
Considerations



# General Notes

*Compared to ICE 2500 Sprinter*

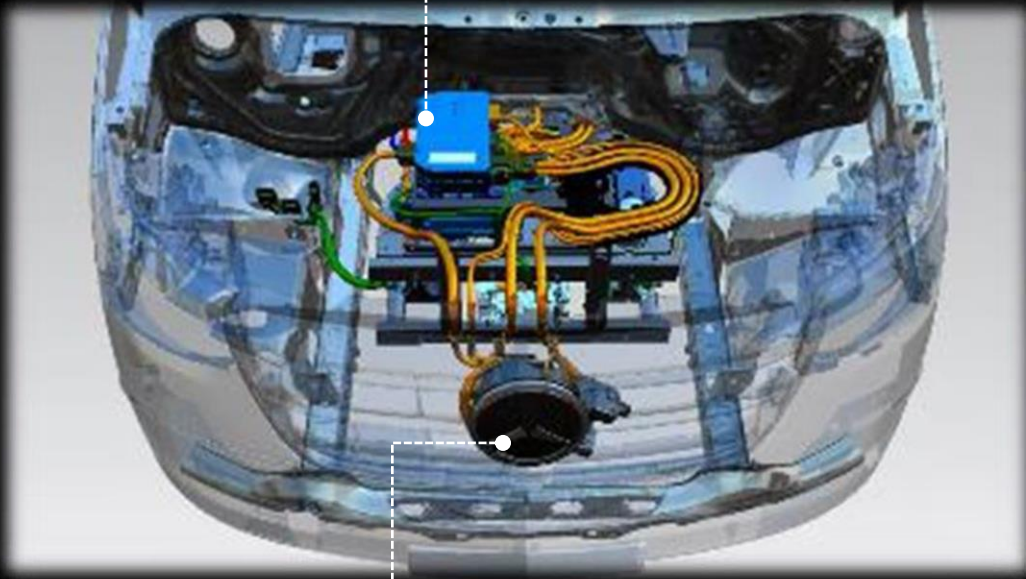
- No change to vehicle look and feel in the driver cabin area
- No change in internal structure (sidewall, windows, rear doors, roof etc.) rear of the B-pillar
- Due to the battery and motor mounted close to the chassis frame, there are certain “no upfit zones” – see next slides
- Ride height decrease by 0.2”
- Weight considerations – see next slides
- This document is meant to be for informational purposes only and is not exhaustive. Always refer to the relevant Body and Equipment Guideline document, available on <https://www.mbvans.com/en/upfitter/tech-info/beg>



# Charging Components Overview

## DC Contact Box

Controls charging plug and manages communication to and from onboard charger. Separates charging plug circuit and other HV components in a collision event to immediately shut down system.



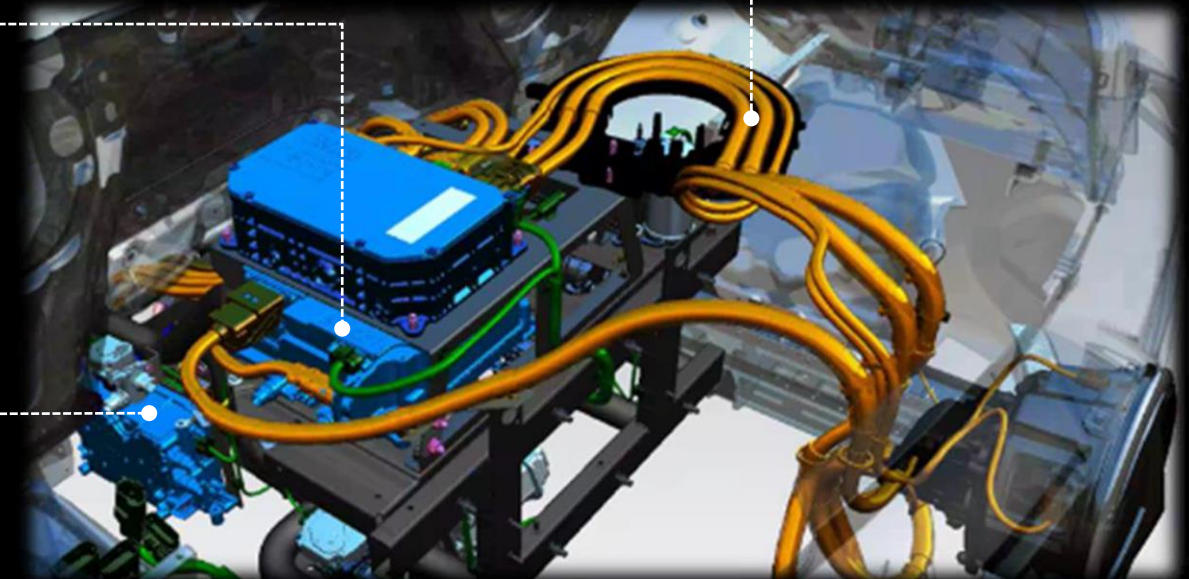
## Charging Plug

Combined Charging Socket Type 1 (J1772 type) located in front behind Mercedes-Benz star. AC charging (9.6 kW) with the top 5 poles and DC charging with the bottom 2 poles (50kW or 115 kW optional)



## AC Onboard Charger

Converts AC voltage (Level 2 charging up to 9.6 kW) to HV DC for batteries.



## DC/DC Converter

Down-rates voltage from HV battery to support 12V consumers (replaces classic alternator in ICE vehicle)

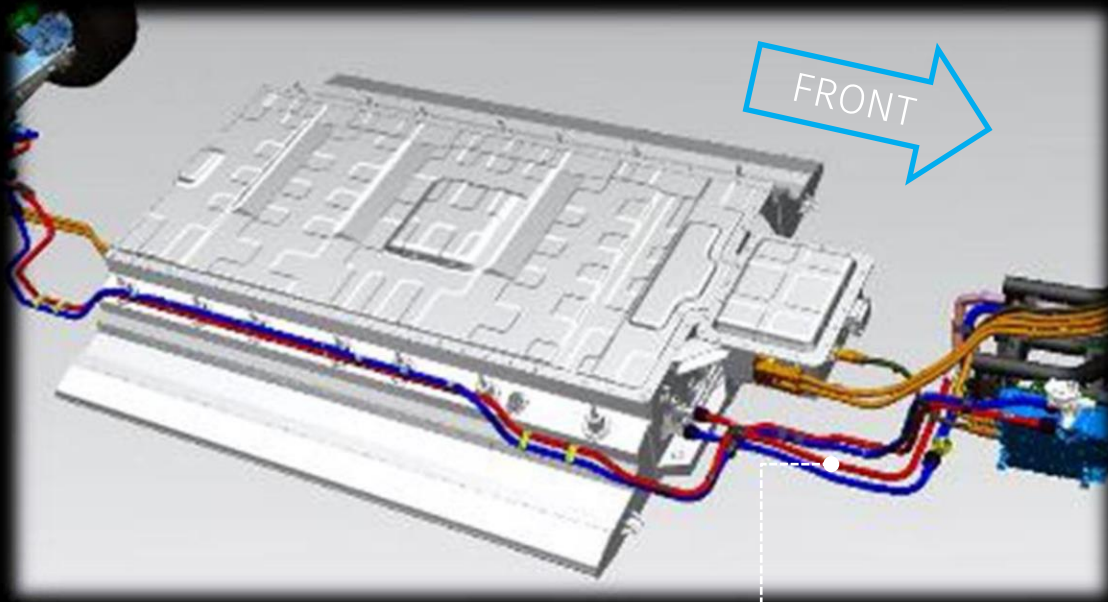


## HV Cables

Orange cables signaling 400V lines – only authorized personnel should handle.

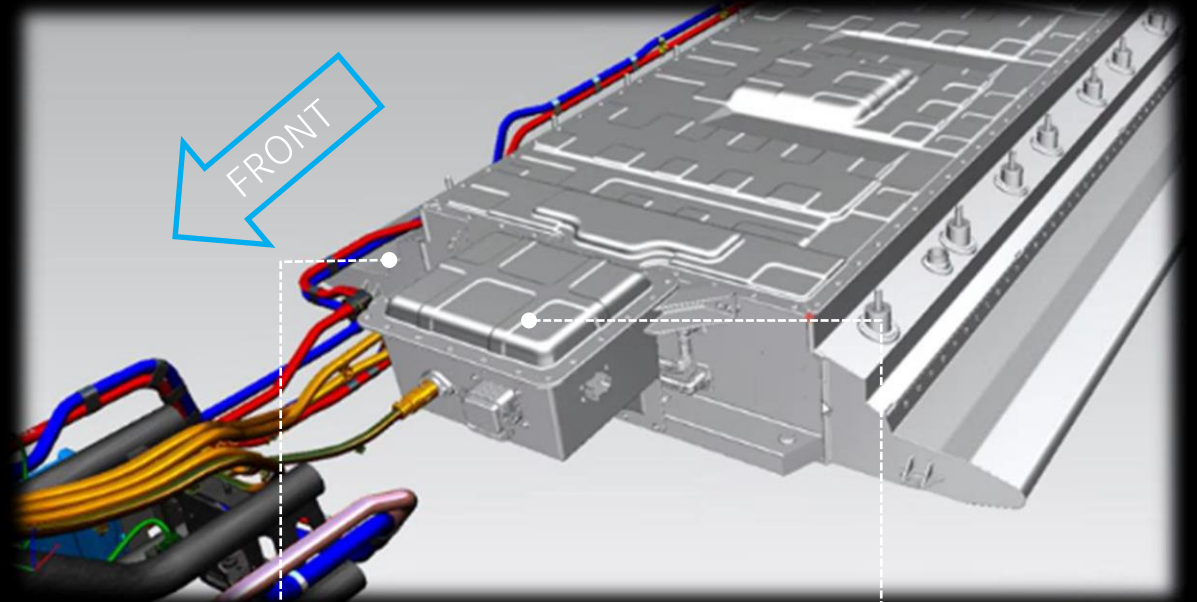


# High Voltage Battery – Lithium Iron Phosphate (LFP)



Coolant Lines

Active thermal management includes water-based heating/cooling lines ensuring battery operation is optimal.



Crash Structure Protection

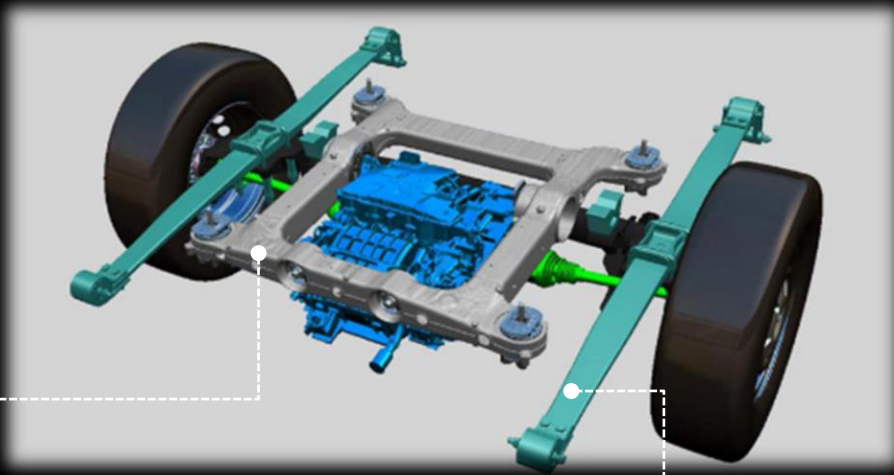
Battery body installed underneath van – no cargo space limitations.

Rigid structure mounts to frame  
Additional 5 mm/0.2” aluminum protection plate around battery.

HV Battery Masterbox

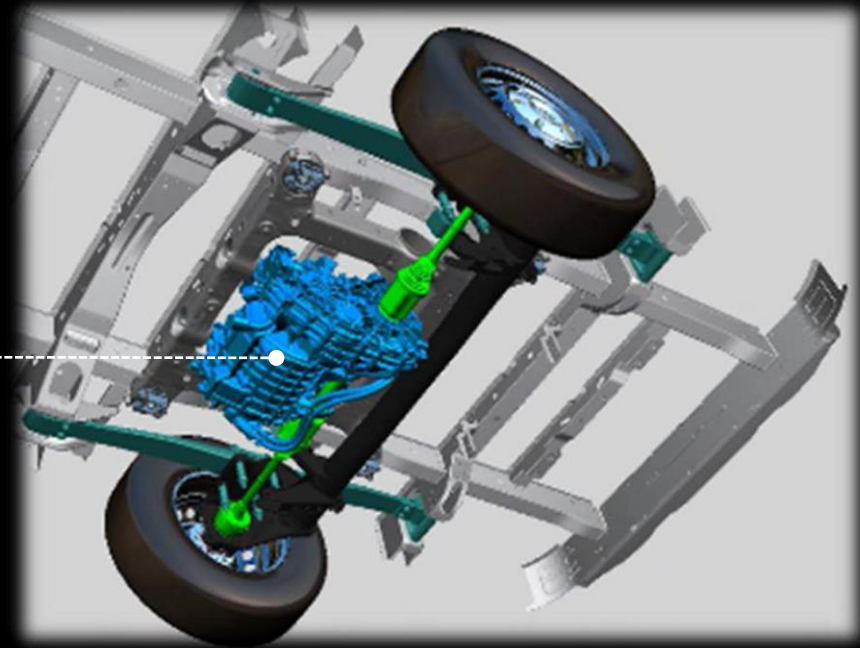
Intelligent battery control that is connected directly to DC Contact Box

# Rear Axle + Motor



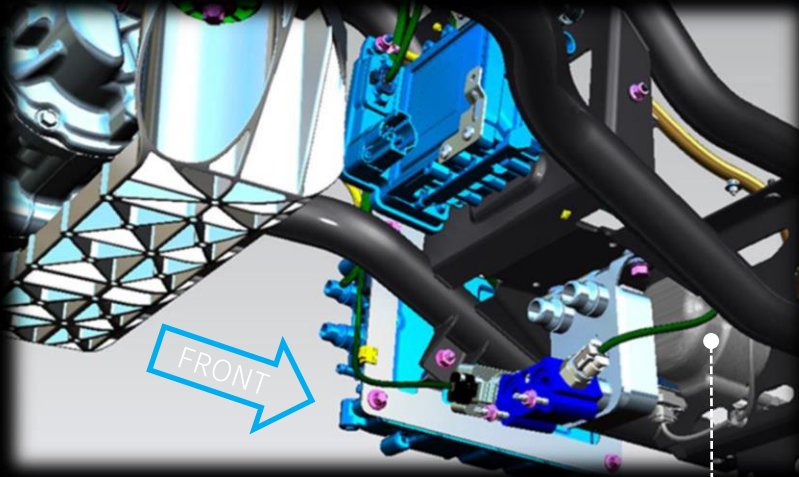
Support Frame  
Modular carrier for  
electric drive on rear  
axle

GFP Spring Leaf  
Fiberglass rear spring  
enhancing rigidity and  
reducing weight



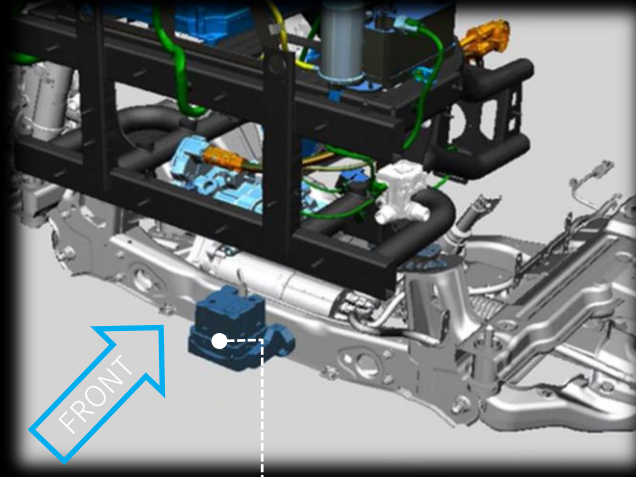
Electric Powertrain  
Contains electric motor (two variants  
available 100/150 kW), transmission and  
power electronics

# Additional Electric Components



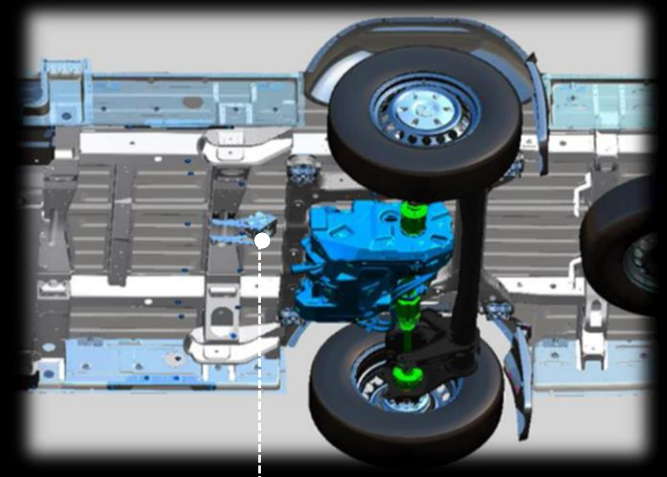
Electric Vacuum Pump

Ensures operation of brake booster by creating an additional vacuum pressure. Located next to the DC contact box.



Sound Generator (Front)

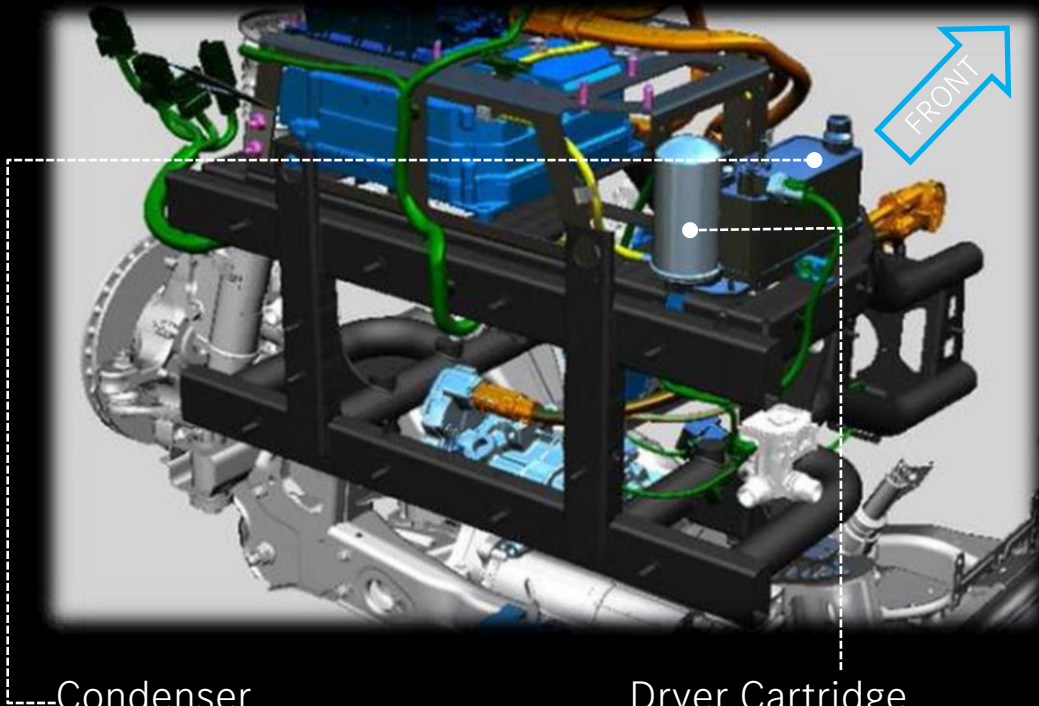
Increases sound for other road users due to EV silent operation. Active up to 18 mph and switches off once speed is over. Sound is heard at standstill or in 'N'. Located in the frame directly under driver cabin.



Sound Generator (Rear)

Increases sound for other road users due to EV silent operation. Active up to 18 mph and switches off once speed is over. Sound is heard at standstill or in 'N'. Located in front of electric powertrain

# Air Conditioning Components

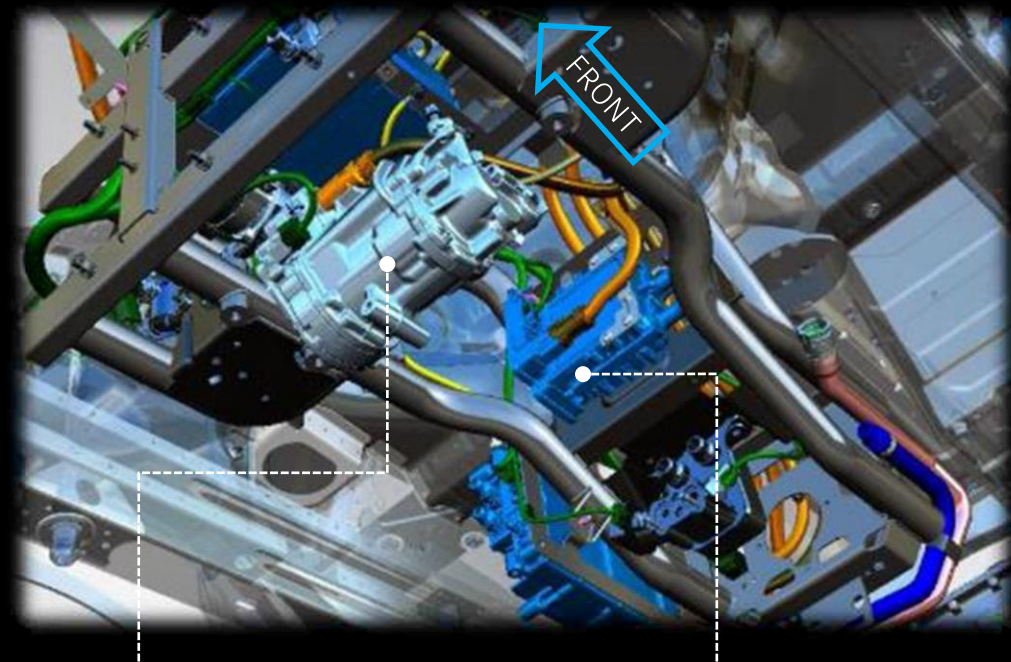


Condenser

Heat exchanger that liquifies high pressure refrigerant coming from the compressor

Dryer Cartridge

Prevention of coolant system contamination and ensures proper condensation of liquid refrigerant



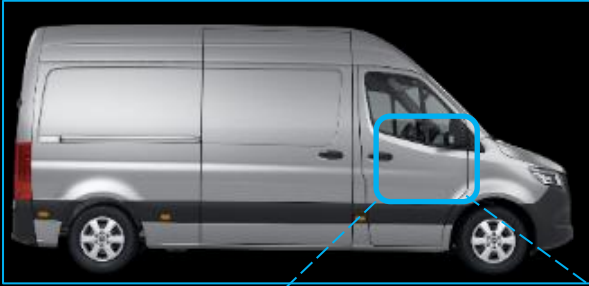
Compressor

Cools the cabin, HV battery under hot conditions and has a “heat pump” function diverting waste heat from HV battery, motor, intake air into the cabin

HV-PTC

Electric heater that is a sub-component of thermal management

# MBUX Multimedia System Code E7M - eSprinter



## Functionality

- Newest HU generation introduced
- Only the larger (10.25") screen available
- EV specific features like preconditioning, charging time etc. available
- "Hey Mercedes" has become more intuitive
- Wireless Remote UI connection for Apple CarPlay and Android Auto

## Benefits

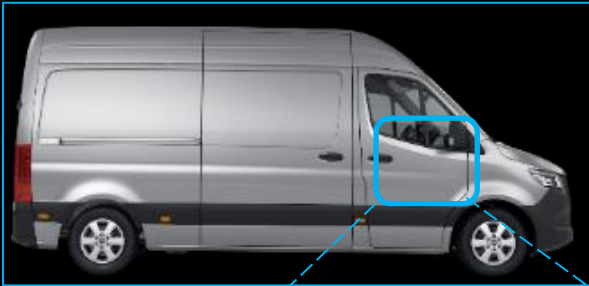
Extended range of options bringing in greater vehicle control, EV specific functions and increased comfort





# Limited Charging Programs Settings

## Code E20 - eSprinter



### Functionality

- eSprinter has charging settings as standard in the MBUX: Max. state of charge (driver can input a value and vehicle will not charge above this) and ECO charging (charging breaks are planned in vehicle route guidance)
- These can conflict with FMC charging programs/routes – option will disable these settings in the MBUX
- Both charging setting options are disabled

### Benefits

Fleet charging protocols can be followed without interruptions by incomplete charging or charging aborts due to conflict with vehicle charging settings



# Driving Programs

## Standard - eSprinter

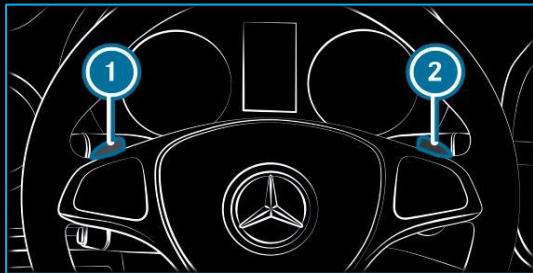


	<b>C</b> Comfort	<b>E</b> Economic	<b>MR</b> MaxRange
Driving performance	Max. 150 kW Max. 100 kW	Max. 100 kW*	Max. 80 kW*
Torque	Full power available always	Reduced	Restricted
Regenerative Braking	D++/D+/D/D-/Dauto		
Torque build up	Normal (similar to ICE)	Flatter (slower build up)	Flattest (slow build up)
Air conditioning/Heating	Normal (same as ICE)	Slightly limited (not very noticeable)	Restricted (cooling and heating limited)
Range impact	Reduced range (due to more power and significantly increased climate comfort)	WLTP range (but less than MR due to more power and increased climate comfort)	Maximizes range

*\*both motors are technically capable of 400 Nm/395 ft-lb ensuring that if max. power is requested via kick down (start up on a hill, entering a freeway via ramp etc.) it will be provided*



# Regenerative Braking Standard - eSprinter



D-  
(max.)

D  
(normal)

D+  
(limited)

D++  
(sailing)

D auto

## Functionality

- Different levels are selected via the paddle shifters on the steering wheel
- Brake lights are activated with D, D- modes and at regenerative speeds of  $-1.2 \text{ m/s}^2$  or greater
- Regenerative braking strength depends on various factors (e.g. vehicle weight, driving situation etc.)
- D auto provides unique functionality with an automatic adjustment of regeneration based on radar and live map data

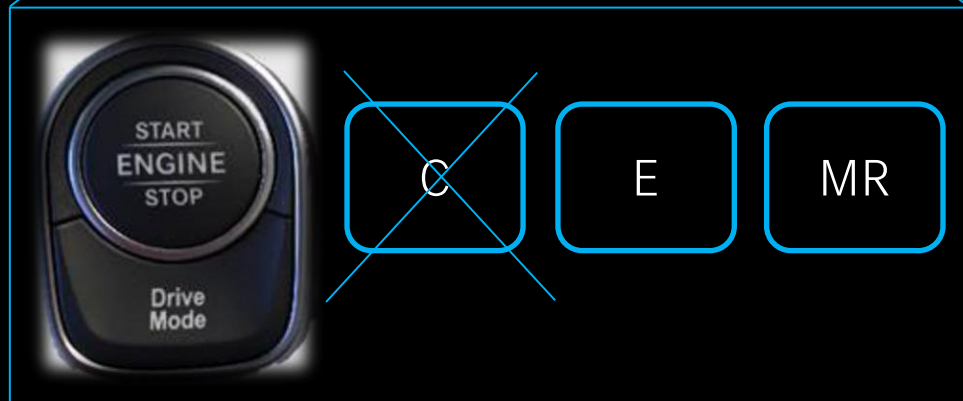
## Benefits

Variety of regenerative braking modes provide maximum flexibility to driver



# Comfort drive program deactivated

## Code E1P - eSprinter



### Functionality

- Driving program “C” Comfort is disabled from factory
- “E” (Economic) and MR (Maximum Range) are the only selectable driving programs
- This can only be done in combination with the 100 kW motor (M5E)

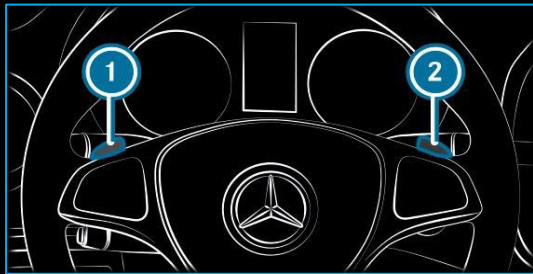
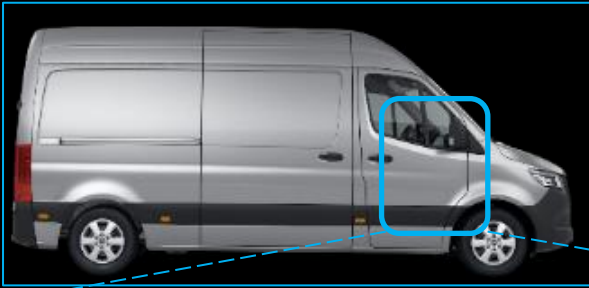
### Benefits

Fleet specific usage removing driver ability to choose another drive program and maximizing range of the vehicle



# Deactivation Regenerative Braking Selection

## Code E1Q - eSprinter



D-  
(max.)

~~D  
(normal)~~

~~D+  
(limited)~~

~~D++  
(sailing)~~

~~D auto~~

### Functionality

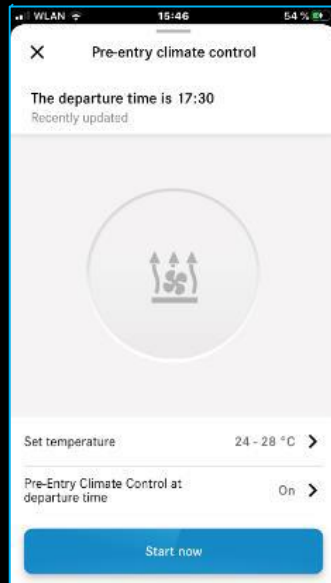
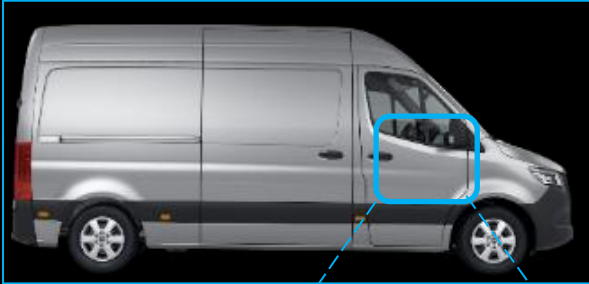
- Regenerative braking mode is locked to D- (maximum)
- This ensures the vehicle is constantly looking to recover the maximum amount of energy in to the high voltage batteries
- Prioritizes vehicle range and allows for efficient route planning for fleets
- Ensures uniform vehicle capability across entire fleet range

### Benefits

Efficient vehicle usage as well as less brake wear and tear reducing service costs for brake pads and discs



# Pre-Entry Climate Control Code H1K - eSprinter



## Functionality

- Feature sets a pre determined temperature in the vehicle before ready for use
- Several options to activate the function: when entering the vehicle, MBUX (starting time can be selected), Mercedes me app, “Max Comfort” button (can be switched on even when ignition is OFF)
- Operates regardless of whether a charging cable is plugged in and connected to the power grid

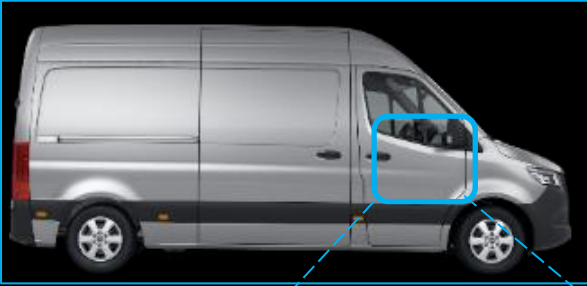
## Benefits

Desired interior temperature before departure for driver comfort. Battery SOC and vehicle range still maintained and prioritized when charging



# Energy Saving Mode, Climate Control

## Code H2K - eSprinter



Heating/climate control  
energy-saving mode  
active

### Functionality

- Under certain conditions (front doors open/open windows or long idling times), air conditioning/heating is significantly reduced
- Only activated either in drive mode “E” or “MR”
- Instrument cluster will display “Heating/Climate Control Energy-Saving Mode Active”
- Mode is deactivated when exceeding 44 mph or cabin temperature is below 59F

### Benefits

Mitigates inefficiencies leading to loss of range due to frequent behaviors common with delivery vehicles



# Thermal Management and Drive Efficiency

## Standard - eSprinter



### Functionality

- Waste heat recovery from the electric axle:
  - Reduction of heat losses through extended water circuit (bypass HV battery)
  - Thermal insulation of the heating circuit (pipes/hoses)
  - Reduction of thermal losses through the use of additional thermal technical elements (e.g. additional valves)
  - Heat pump functionality with extended use of energy recovery from the circulating cabin air
- The maximum possible climate performance can be called up in each driving program via the auxiliary heating/pre-climate control button when the ignition is switched on

### Benefits

Intelligent and efficient thermal management provides optimal Total Cost of Ownership





# Heated Steering Wheel Code CK8 - eSprinter



## Functionality

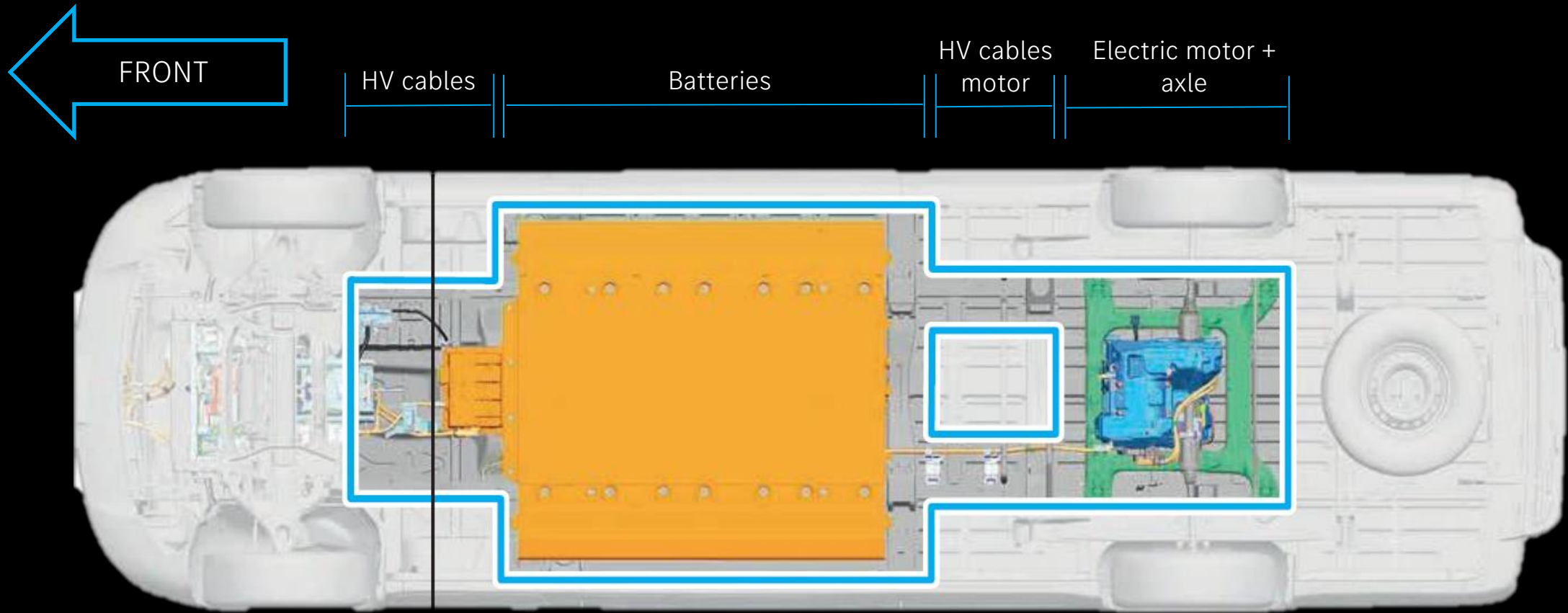
- Can be activated manually via the switch below the turn signal shifter or via “Hey Mercedes”
- Ignition has to be switched ON
- Entire steering wheel heated up to a temperature of 93 F and is ON until either deactivated manually or ignition is switched OFF
- Status of heating indicated by LED on the switch and a message in the instrument cluster
- No visual differences between steering with/without heating

## Benefits

Ensures driver comfort in extreme weather conditions. Independent operation to vehicle heating, maximizing driver comfort



# Upfit Related Considerations



Areas within blue are no-upfit zones!

*Note: there is plastic cladding underneath the van that must be removed to see this image*



# Upfit Related Considerations

- Do not tamper with HV lines and HV grounding points
- Do not disconnect the 12V battery, even in long periods of non-use, as it's needed to monitor the state of charge of the HV battery.
- Currently no ePTO option available on MY24 eSprinter. Refer to overview for powering aftermarket consumers. Please note that more detailed guidance on these connections are available in the “Body-Equipment-Guideline for Sprinter - Model Series 907”
- Do not install aftermarket partition walls/bulkheads that require mounting through the floor and B-pillar “No Drill Zone”. Exception when retrofitting Mercedes-Benz Genuine partition wall or authorized aftermarket partitions.
- Option B01 (ESP coding) for vehicles with CoG over 39” is not available on eSprinter



# Upfit Related Considerations

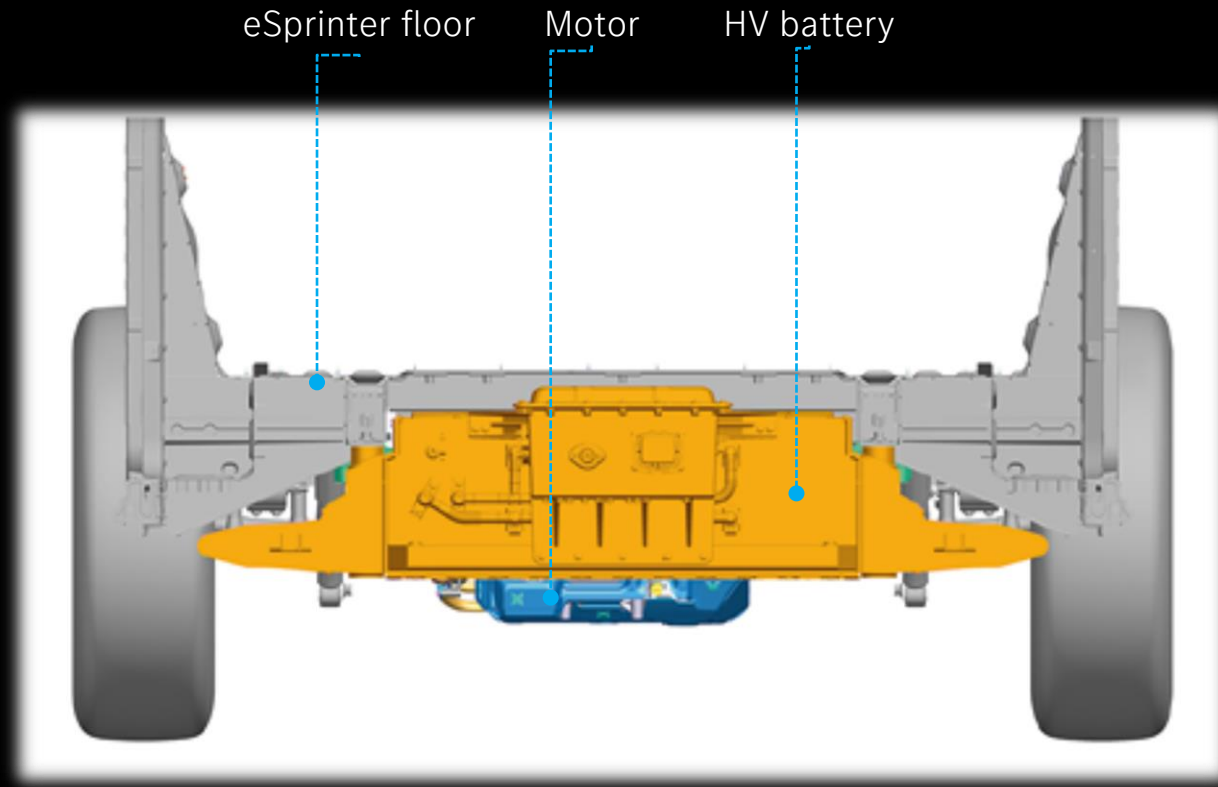
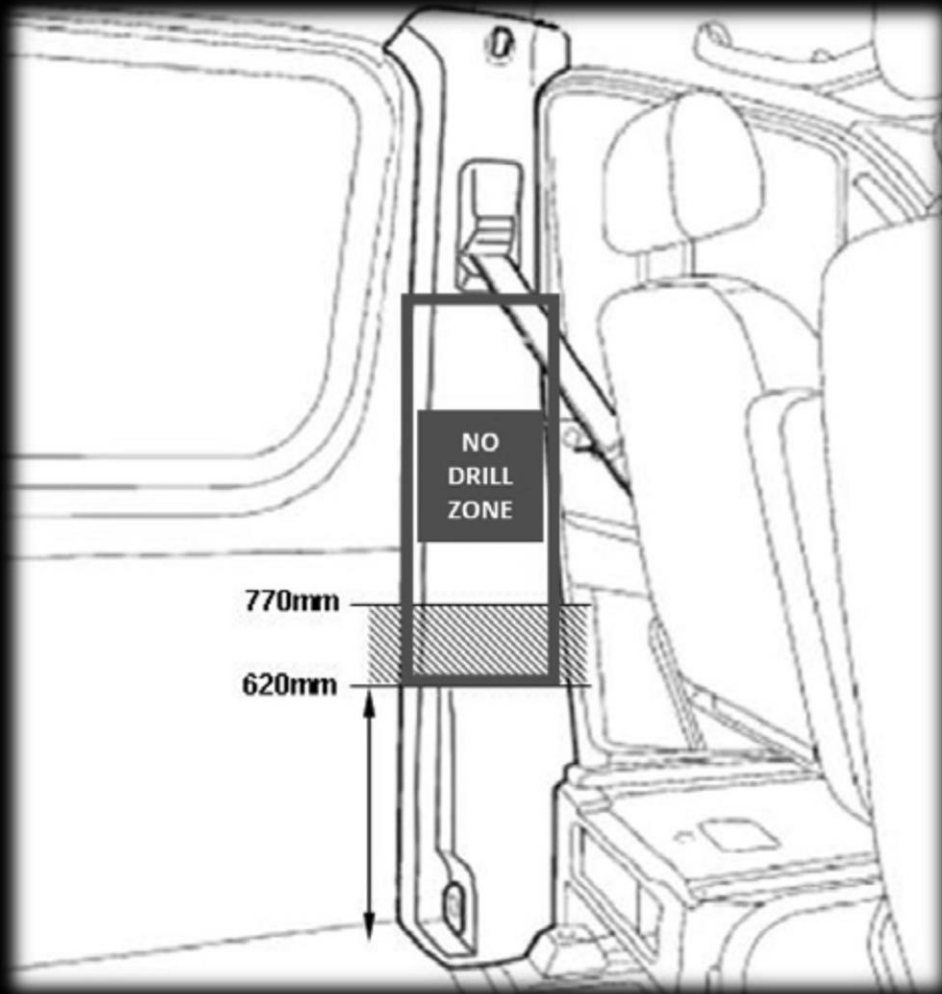
## Power supply for Upfitters:

- Range can be impacted with the use of the vehicle 12V main battery
- A sufficient state of charge of 12V main battery must be ensured for a proper functionality of the base vehicle.
- E36 (relay for additional battery) is recommended and is included when ordering E21/E2M

Vehicle Condition	Upfit Guidance	Power Output	Notes
Vehicle On → Power needed (max. 25A)	Connect to EK1 terminals only.  Do <u>not</u> connect to main Battery terminals.  Ensure a quiescent load of <1 mA when the vehicle is turned off.	0.3 KW	The maximum is 25A.  Only when vehicle is on.
Vehicle On → Power needed (max. 80A)	Connect to E36 only.  Install a current limitation system with a maximum of 80A if more than 80A are requested by the connected consumers.	1 KW	The maximum is 80A.  Only when vehicle is on.
Vehicle Off → Power needed (max. 80A)  E21 = 92 Ah AGM E2M = 70 Ah AGM	Connect directly to E21/E2M auxiliary Battery terminals.  Ensure that the circuit is fused appropriately between auxiliary battery and the consumer.	Limited by battery  E21 = 92 Ah AGM E2M = 70 Ah AGM	E21/E2M is isolated by the E36 cutoff relay when the vehicle is turned off.  When the vehicle is turned on, E21/E2M is recharged with 80A.
Vehicle Off → Power needed  Other battery types/ more capacity needed.	Connect DC/DC Converters with a maximum of 40A to E36.  Ensure external recharging if more power is needed.	Limited by battery  Batteries added by upfitter	Upfitter to ensure there is no voltage oscillation on the base vehicle triggered by upfitter components.



# Upfit Related Considerations



# Upfit Related Considerations

- Please contact us via [www.upfitterportal.com](http://www.upfitterportal.com) (Ask a Question - Upfitting: Mechanical), if there is an intention to install rear seats on the eSprinter
- Code VC4 (sidewall tracks, shoulder height) and code V42 (sidewall tracks, head height) highly recommend for mounting and attaching shelves
- Diagnostic devices can only be connected to the OBD II connector for diagnostic purposes/vehicle maintenance
- Electric welding is not permitted with HV batteries installed on the vehicle
- Please adhere to the weight guidelines (Unloaded Vehicle Weight, GVWR etc.) of the eSprinter. More information is available on "[Body-Equipment-Guideline for Sprinter - Model Series 907](#)" and "[Supplemental Guideline for eSprinter - Model Series 907 MY2024; Edition 2023-8](#)"

