



# Conversion Guideline

## Opel Vivaro [X82]

Part 2 - Chapter 4 - 6



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## Conversion Guideline - Part 2

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## 4. ELECTRICS / ELECTRONICS

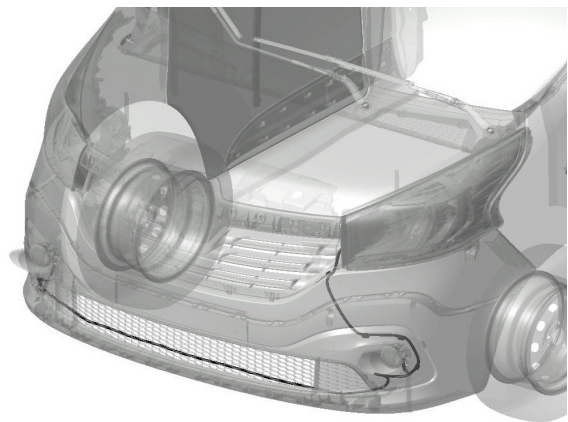
### 4.1. LOCATION OF WIRING / GROUNDS / COMPONENTS

#### 4.1.1. ELECTRICAL WIRING ROUTING

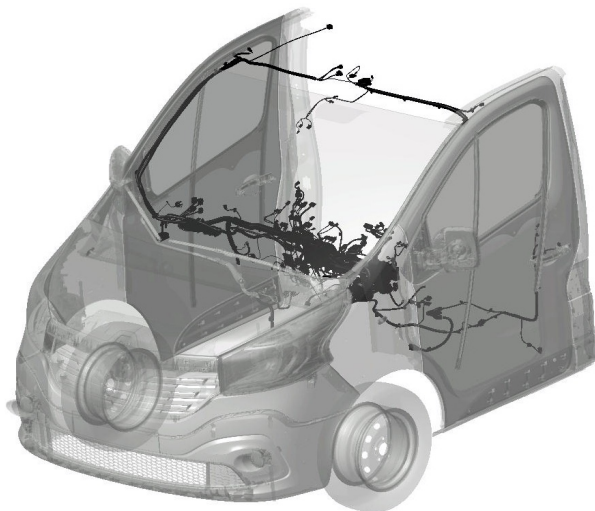
Engine wiring



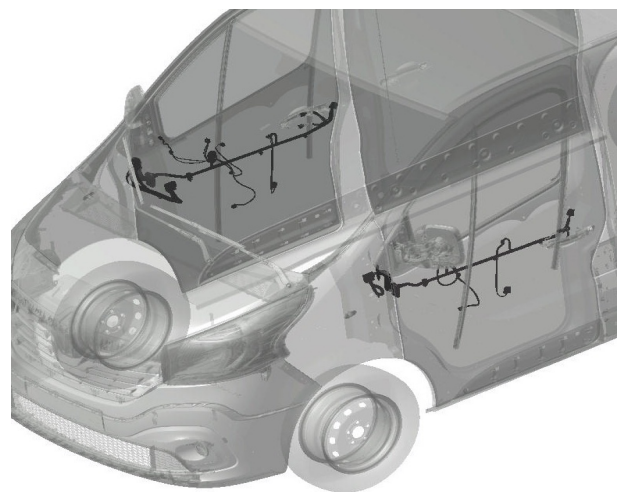
Front end wiring



Dashboard wiring



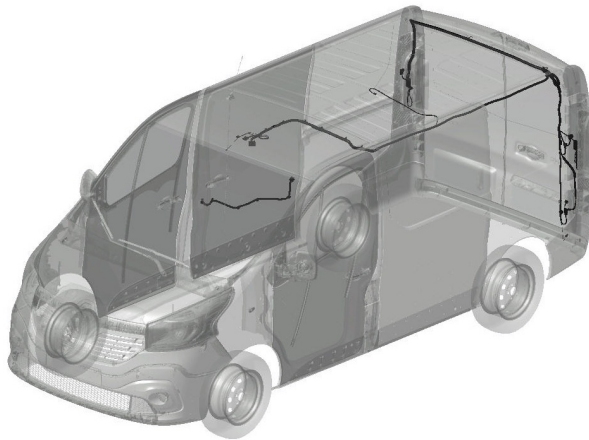
Front door wiring



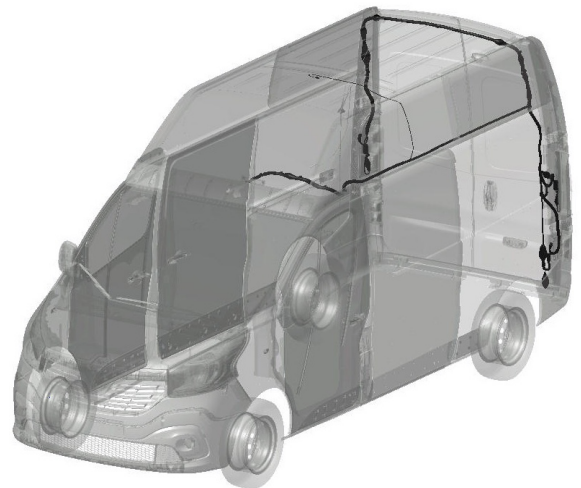
Sliding side door wiring and PANEL VAN mono-bloc wiring

Wiring on rear attachment ring protected by vertical duct

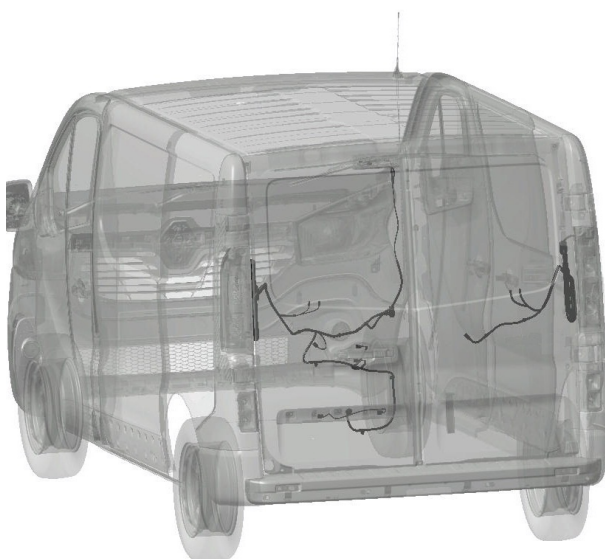
Mono-bloc wiring H1



Mono-bloc wiring H2



Hinged door wiring

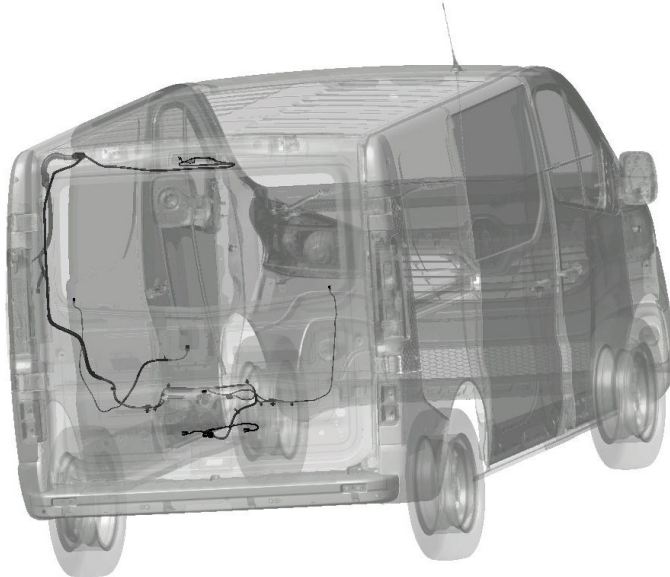


Hinged door wiring H2

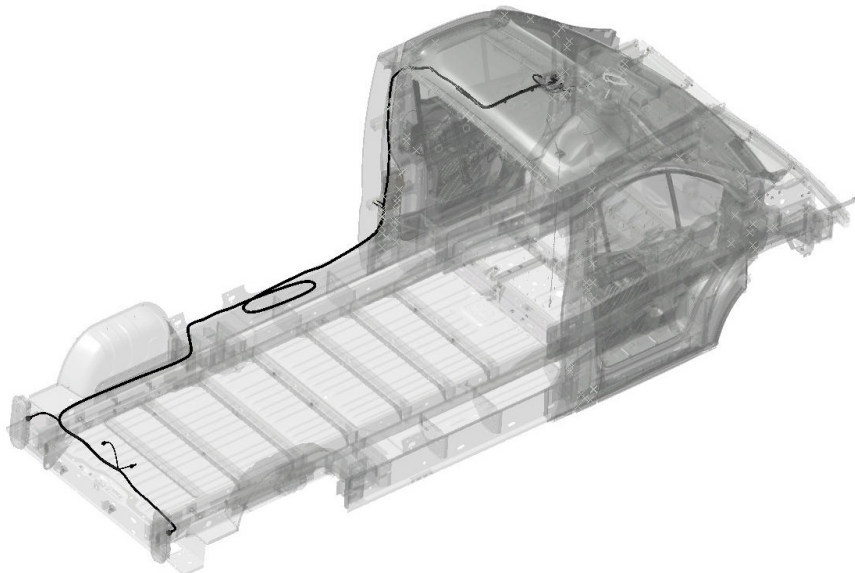




### Tailgate wiring



### Platform Cab Wiring



### Note:

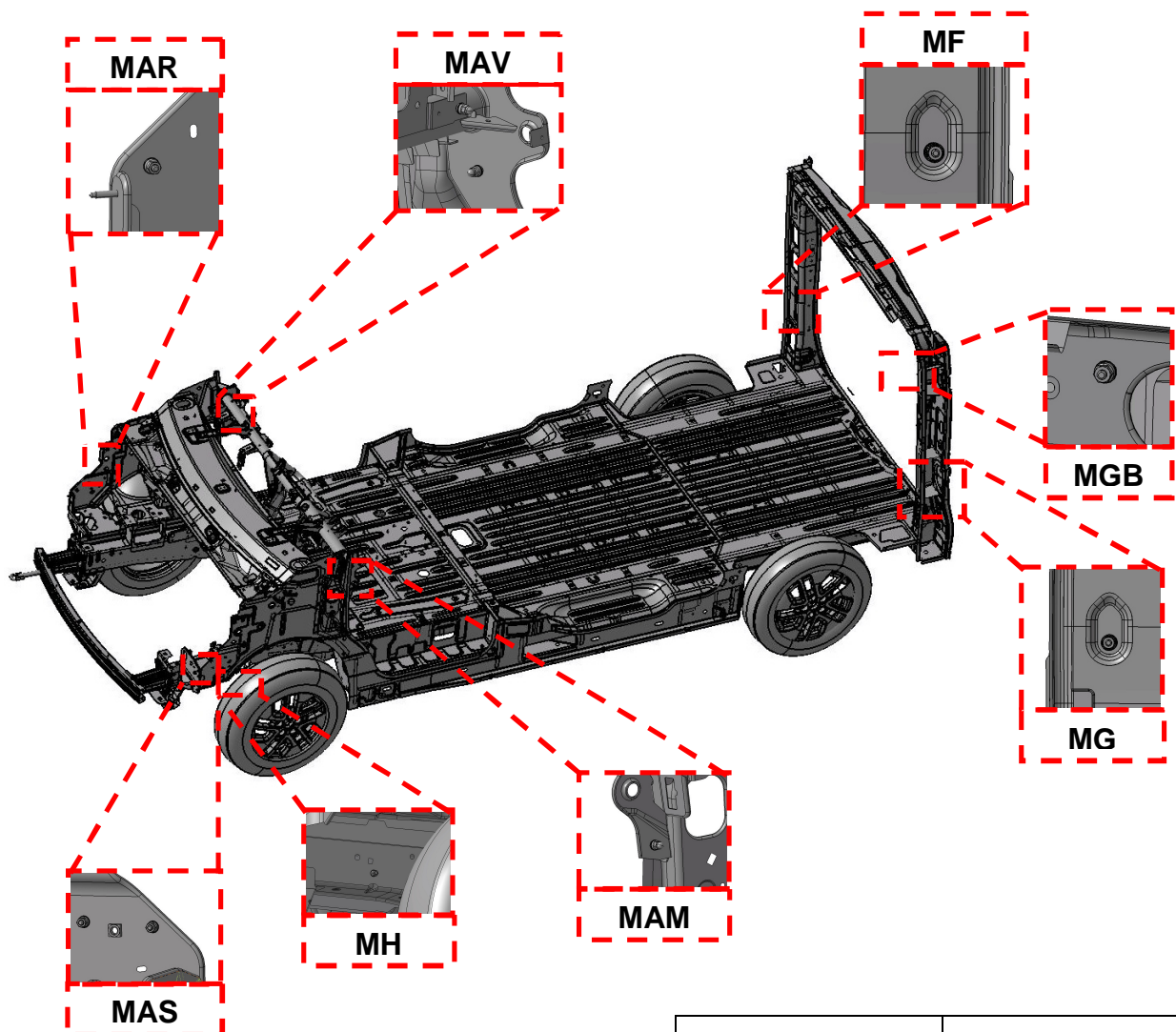
*To obtain more specific diagrams, refer to the workshop repair manual using the type and serial number of the vehicle.*

#### 4.1.2. LOCATION OF GROUNDS

For grounding on an existing nut, stud or screw, the rules in the General Technical Conversion Guide should be followed, given in the section specific to the subject.

Note: It is highly recommended to use the electrical grounds shown below.

Bare body

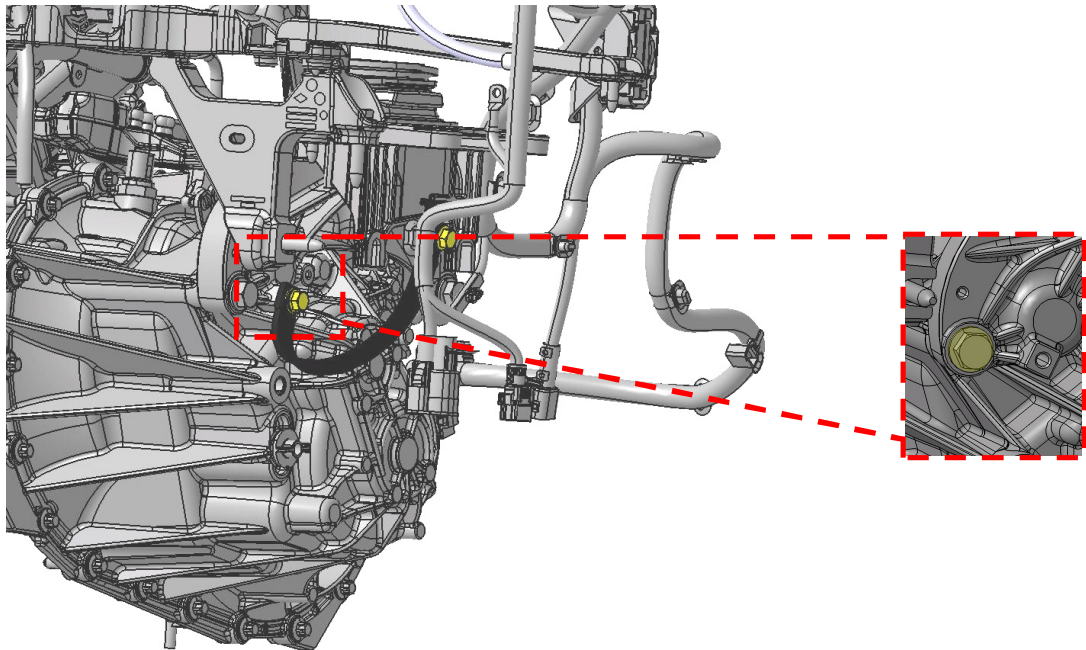


Type of nut	M6
Tightening torque	8Nm $\pm$ 15%

It is vital that the tightening torques of the ground points be complied with in order to meet the safety and/or regulatory requirements.

## ENGINE COMPARTMENT GROUNDS

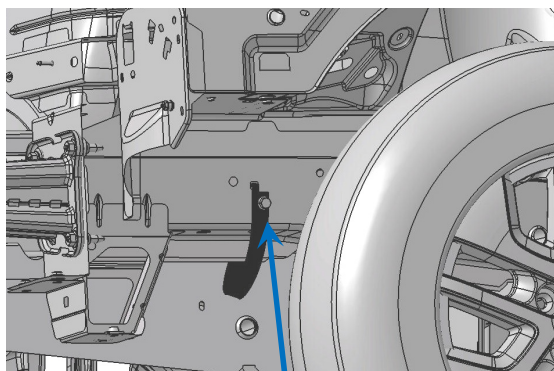
### Gearbox



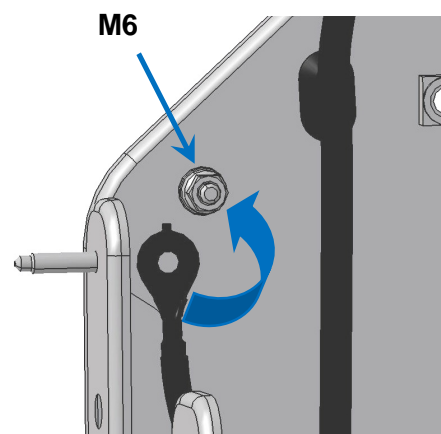
For gearbox: Tightening of the terminals must be done with an M8 self-tapping screw, [redacted] and a tightening torque of 21 Nm. (The tightening torque must be increased from 21 to 24 Nm for stacked terminals).

Gearbox/Side member: MH

Front right-hand pillar lining: MAR



**M8**

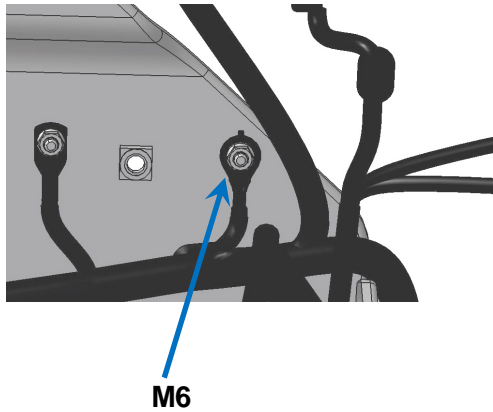


**M6**

OPEL VIVARO (X82)  
4.1 – LOCATION OF WIRING / GROUNDS / COMPONENTS

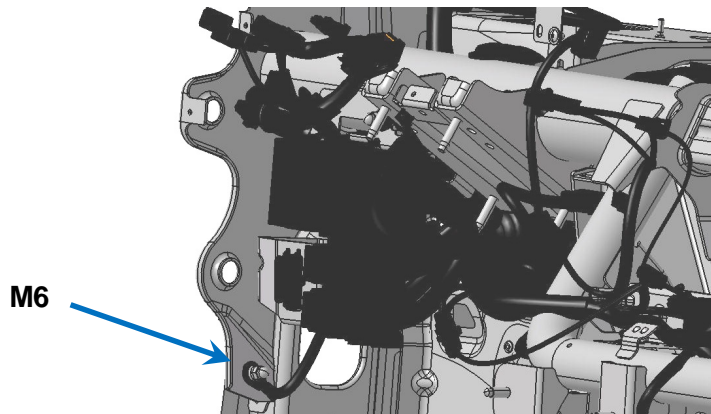


Front left-hand pillar lining: MAS

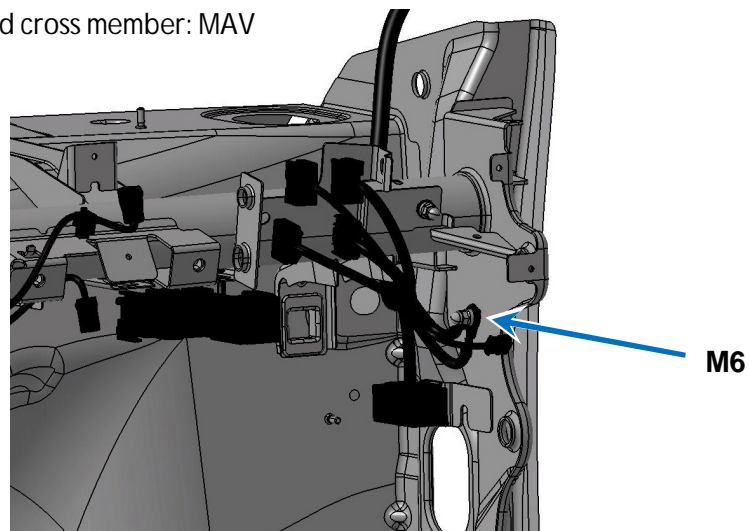


DASHBOARD GROUNDS

Left-hand dashboard cross member: MAM



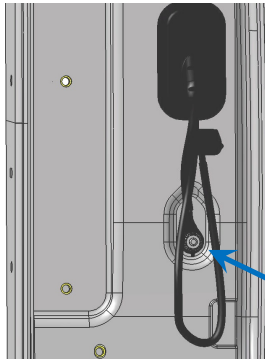
Right-hand dashboard cross member: MAV



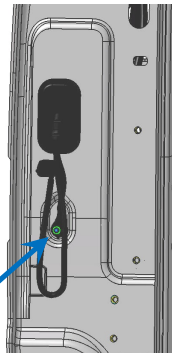


REAR AREA GROUNDS

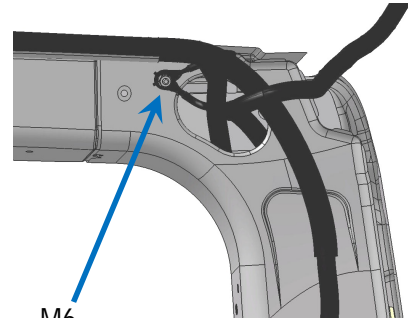
Right-hand: MF



Left-hand side: MG



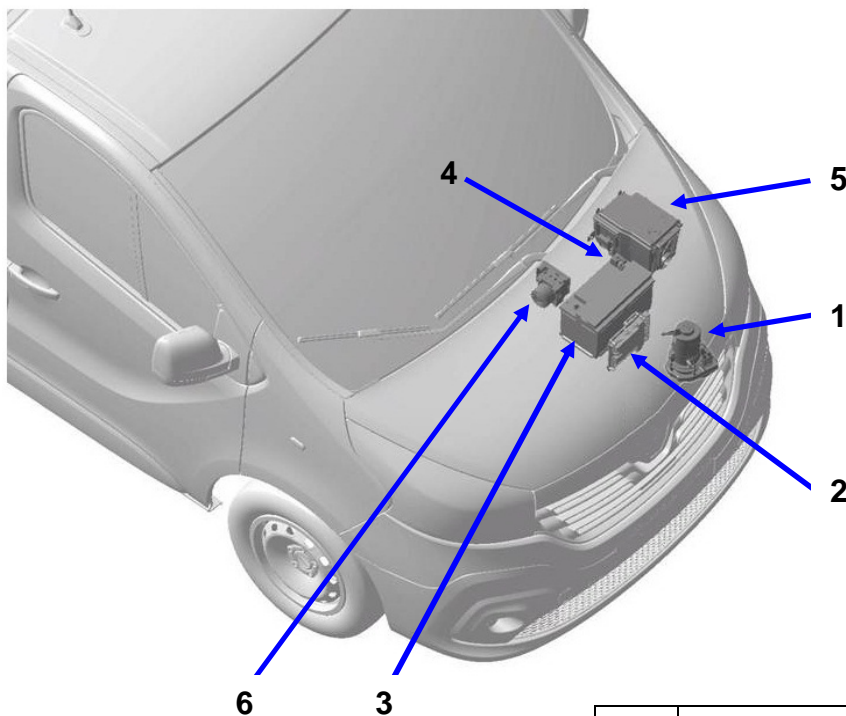
Left-hand side: MGB



M6

M6

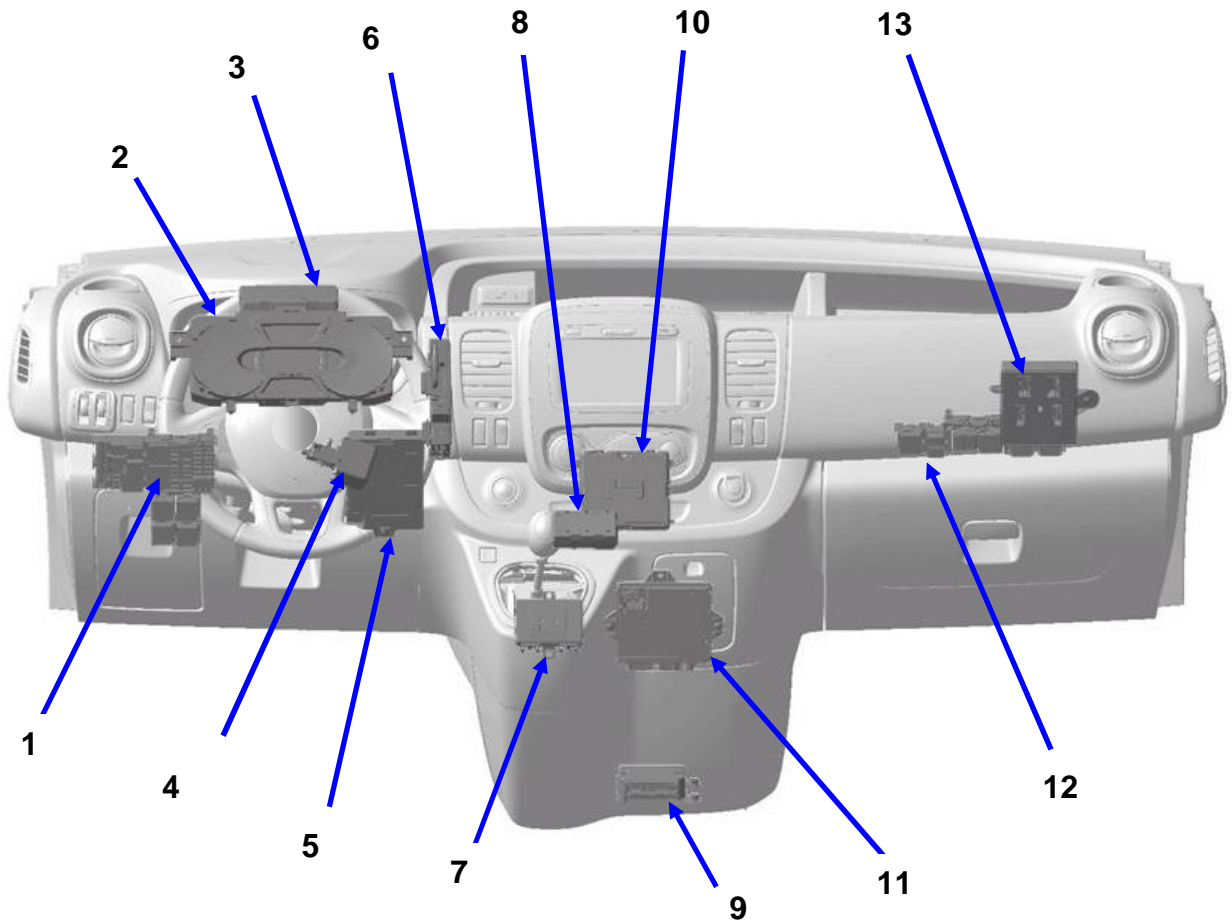
4.1.3 LOCATION OF ELECTRICAL COMPONENTS



1 :	Power steering electro-pump assembly
2 :	Fuel injection computer
3 :	Battery
4 :	Current sensor
5 :	Engine connection unit
6 :	ABS/ASR/ESP hydraulic unit *

\* ABS = Anti-lock Braking System  
ASR = Active Traction Control System  
ESP = Electronic Stability Program

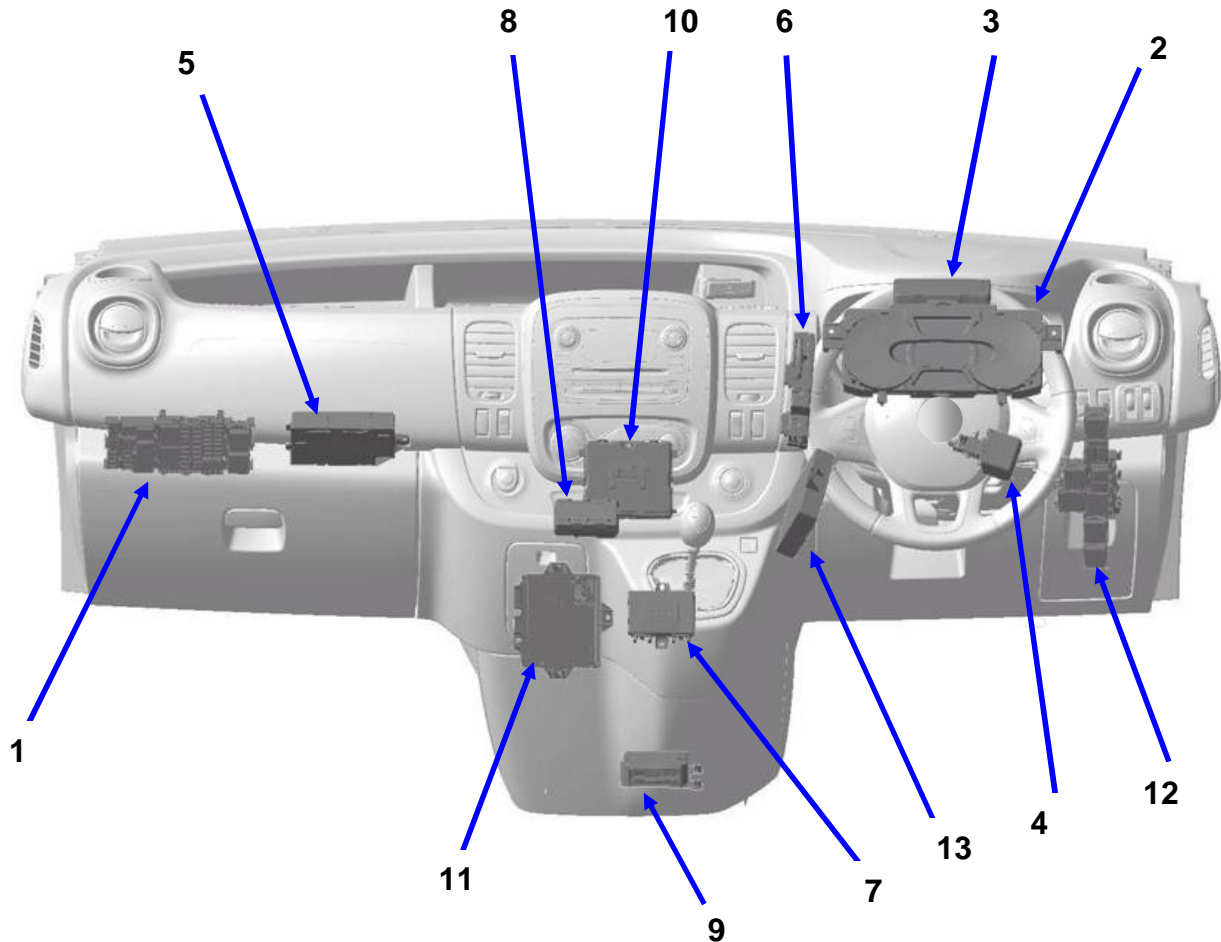
LEFT-HAND DRIVE DASHBOARD AREA



1:	BFRH: Passenger compartment Relay and Fuse Box
2:	Instrument panel
3:	TCU: Telematic Control Unit
4:	Electric anti-theft system
5:	BCM: Body Control Module UCH: Passenger Compartment Central Unit
6:	HFM card reader
7:	BIC: Display Interface Unit

8:	SSPP: Tyre Pressure Monitoring System
9:	Airbag computer
10:	A/C Box: Air Conditioning Box
11:	Approved Conversions Unit
12:	BFRO: Optional Relay and Fuse Box
13:	EMM: Energy Management Module

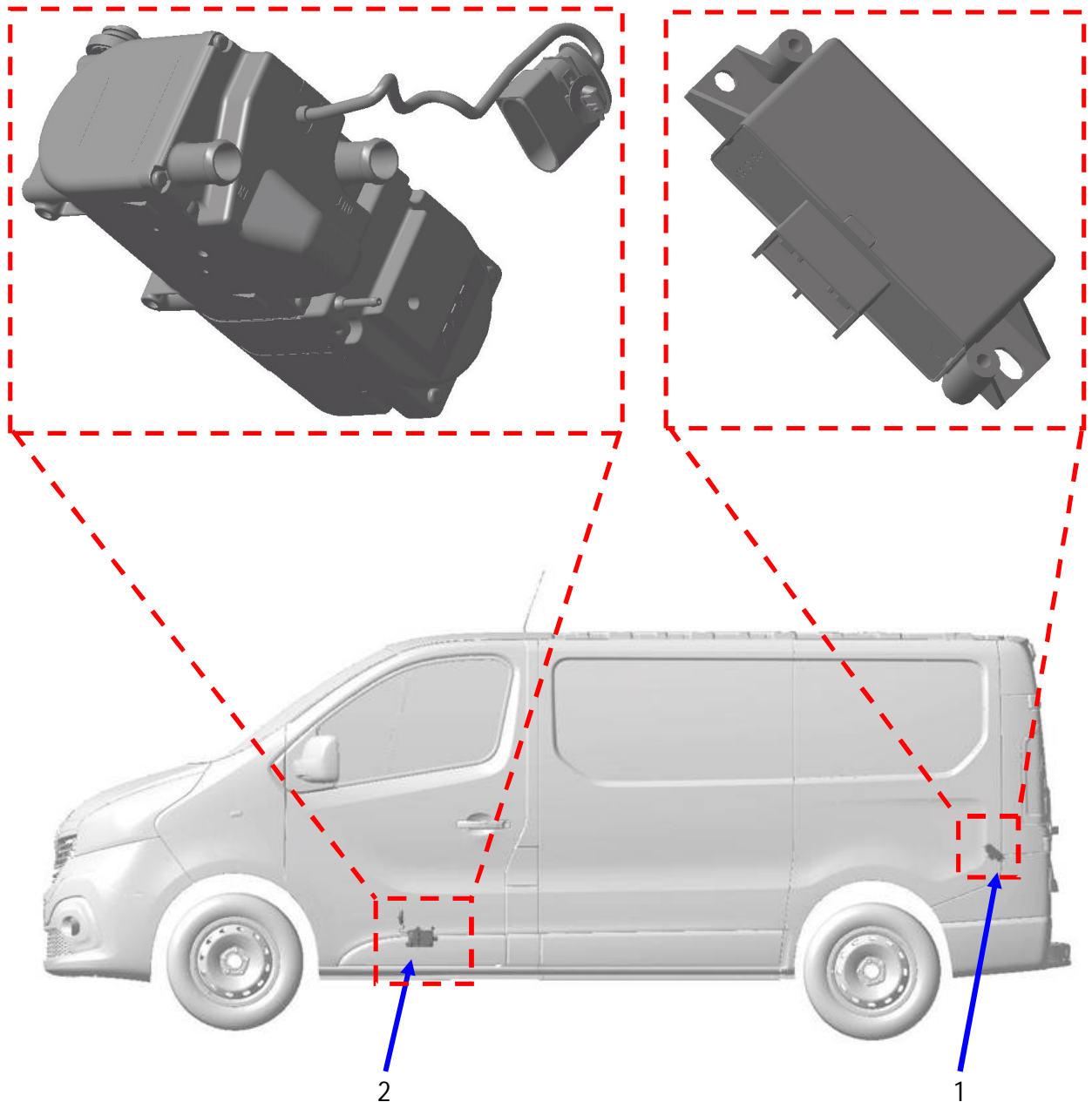
RIGHT-HAND DRIVE DASHBOARD AREA



1:	BFRH: Passenger compartment Relay and Fuse Box
2:	Instrument panel
3:	TCU: Telematic Control Unit
4:	Electric anti-theft system
5:	BCM : Body Control Module UCH: Passenger Compartment Central Unit
6:	HFM card reader
7:	BIC: Display Interface Unit

8:	SSPP: Tyre Pressure Monitoring System
9:	Airbag computer
10:	A/C Box: Air Conditioning Box
11:	Approved Conversions Unit
12:	BFRO: Optional Relay and Fuse Box
13:	EMM : Energy Management Module

OTHER AREAS



1:	Rear parking distance control ECU on lining of left-hand body side
2:	Additional heater ECU on underbody



4.2. FUSE-RELAY BOX-ENGINE CONNECTION UNIT

IN PREPARATION

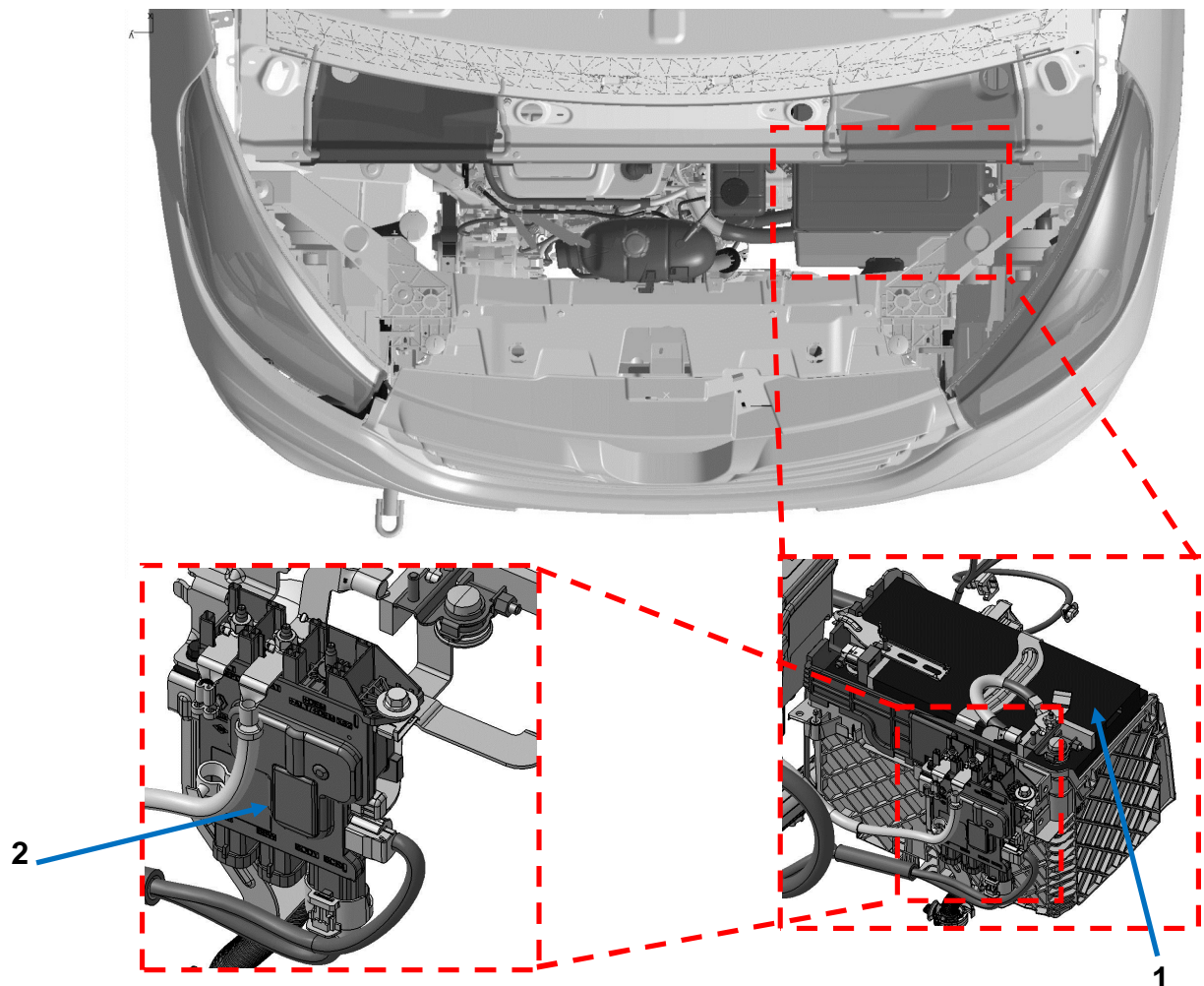
4.3. SERVICE BATTERY / POSITIVE TERMINAL (+) / NEGATIVE TERMINAL (-)

4.3.1. SERVICE BATTERY

Several types of battery are available depending on the vehicle criteria

Battery location.

The battery is located inside the engine compartment on the left-hand side between the shock absorber turret and the headlight.



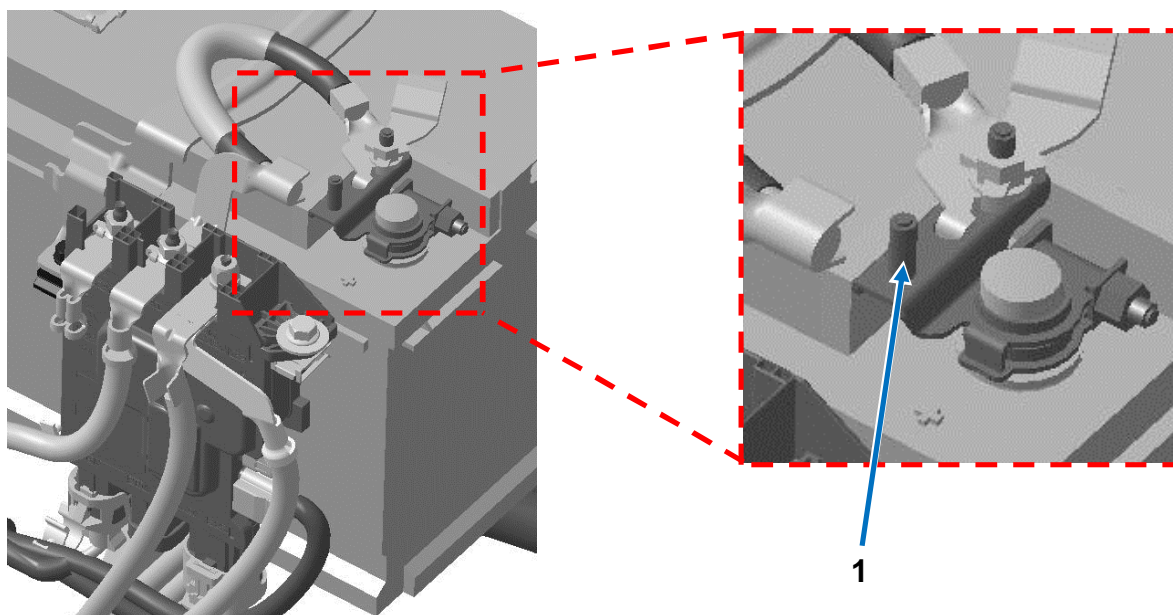
1:	Battery
2:	Electrical distribution unit

Battery versions

Type	START / STOP.	Temperate	Grand froid
L3 / 720A	without	x	
L4 / 800A	with	x	
L4 / 760A	without		x

4.3.2. BATTERY POSITIVE TERMINAL (+)

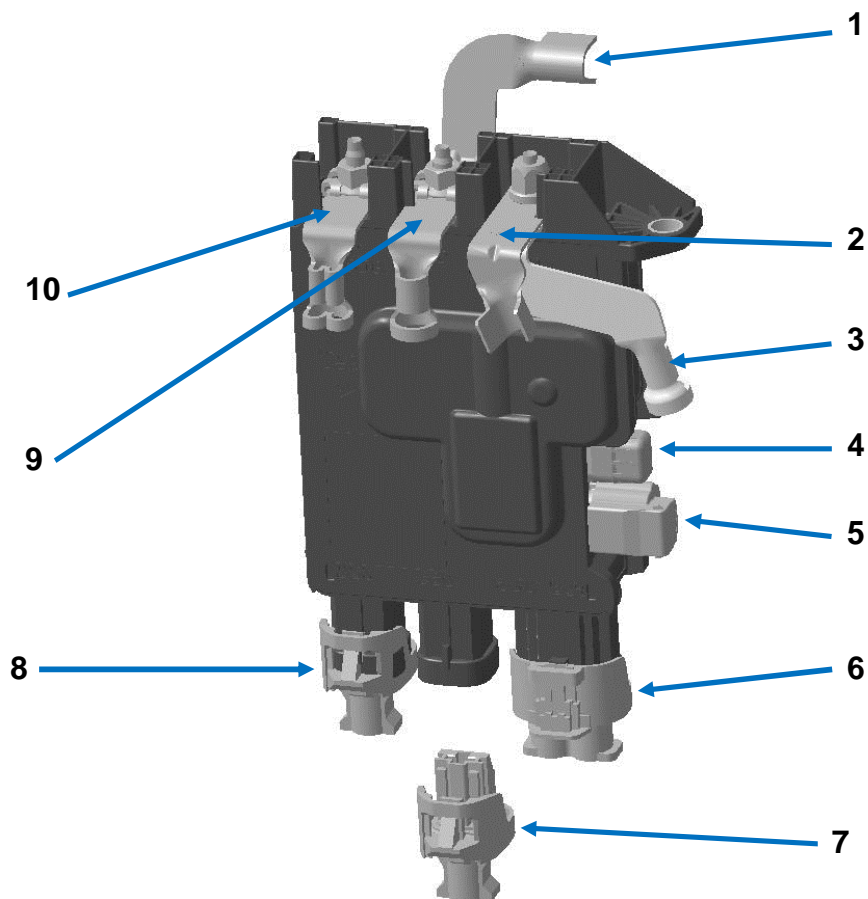
Presence of an electrical distribution unit called the "BDU" with built-in fuses.



**Caution: Battery output is not protected by a fuse, to be fitted close to the terminal**

1:	M6 high power free nut (current above 40 A)
----	---

Electrical distribution unit (BDU)



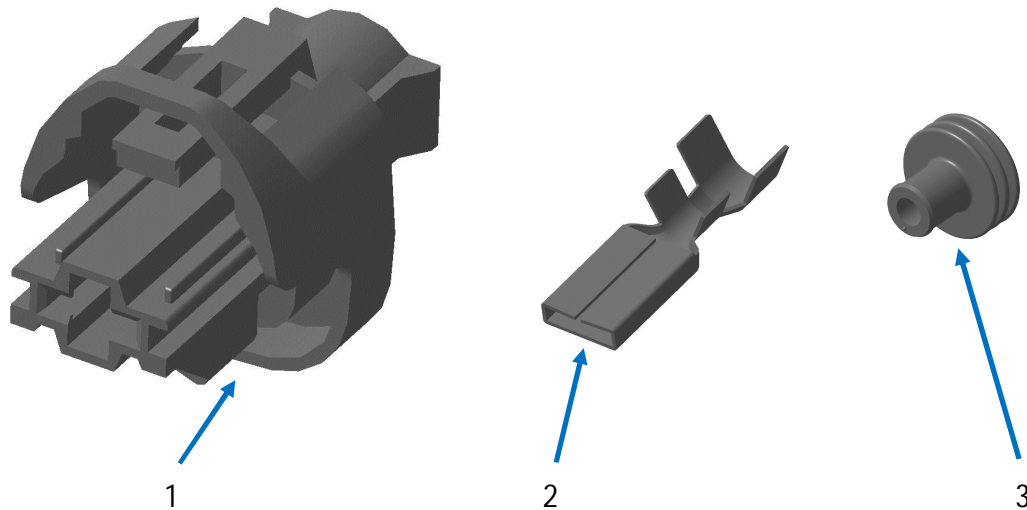
1:	Battery protection supply wiring	
2:	Engine wiring (Alternator)	300A
3:	Engine wiring (starter motor)	300A
4:	Mini fuse with cap (Start/Stop)	5A
5:	Cab wiring (Start/Stop)	
6:	Cab wiring (conversion KPD and KC6 options or trailer tow bar)	50A
7:	<i>Reserved for purpose-body builder conversions,</i>	*
8:	Engine wiring (engine management)	35A
9:	Engine Connection Unit	
10:	Cab wiring (power steering)	120A

Connector (7) is available to bodybuilders.

\* The 80 A fuse is unable to withstand more than 43 A permanent. For values greater than 40 A, the Pin on the battery positive (+) terminal should be used (see § 3.1)

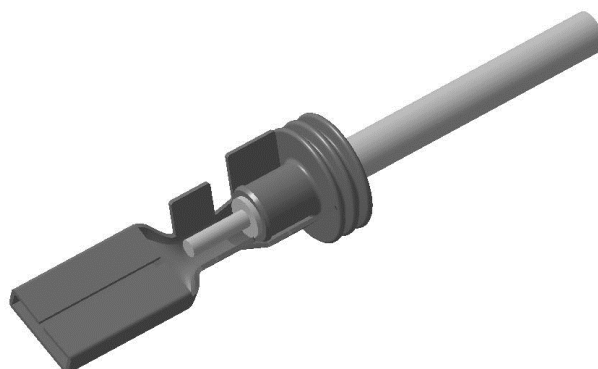
Details of bodybuilder connector (7)

Connector (7) is available to bodybuilders from the OPEL / VAUXHALL network. Only one maximum current of 43 A can be taken.



	Parts		TYCO	Function
1 :	Clip holder		1544680-1	One-way connector clip holder
2 :	Clip 8MM NG1		1544227-1	Range 3 to 6 mm <sup>2</sup>
			1544228-1	Range 7 to 10 mm <sup>2</sup>
3 :	Single wire joint		1544316-1	Ø Insulation 3.1 to 4.2 mm
			1544316-2	Ø Insulation 4.6 to 5.7mm
4 :	Wire			

Detail before crimping the clip and seal

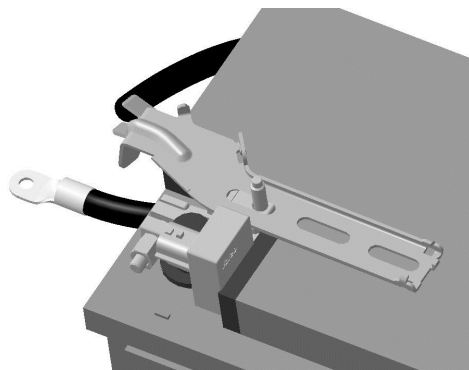




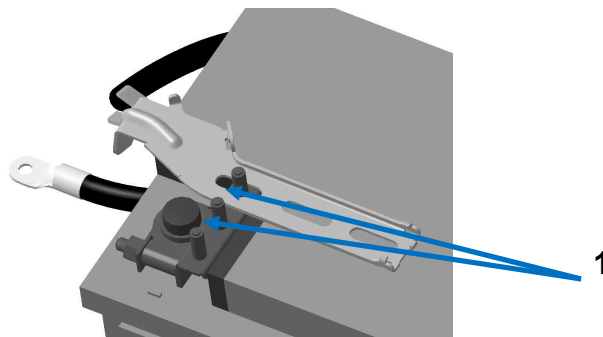
### 4.3.3. BATTERY NEGATIVE TERMINAL (-)

With START / STOP.

All batteries with the Start/Stop option are prohibited to pick up an earth on the negative terminal



Without START / STOP.



	Negative terminal (-)	Tightening torque Nut on terminal
1 :	(x2) M6 free studs	8Nm ± 15%

- Depending on the electrical assessment, the electrical power take-off may be conditioned with the engine running information.
- The wiring must be red and supported inside the battery tray and as close to the terminal block as possible in order to avoid any vibration that could lead to damage of a terminal block or loosening of the nut. A red insulating sleeve is necessary for the terminal.

## OPEL VIVARO (X82)

### 4.3 – SERVICE BATTERY / POSITIVE TERMINAL (+)/ NEGATIVE TERMINAL (-)



#### Wiring protection

There must be no contact between the wiring and the brake or fuel pipes.

Use a category 3 resin, lightweight felt or tape-type protection in the engine compartment and on the underbody and category 1 to 3 for the other sections not subjected to high temperatures (see "Wiring" data sheet).

As the split-grooved sleeve type protection is abrasive and may cause corrosion (paint wear) and noise (in hollow body sections) it must be immobilised.

If the original wiring is near to a split-grooved sleeve, a spacer (double adjustment bracket) must be added in order to avoid any contact (risk of wear and short circuit).

#### 4.4. CAN-MULTIPLEX NETWORKS

Vehicle CAN (Controller Area Network) architecture: for information purposes only.  
Any modifications to the CAN network are prohibited.

The multiplex network allows the various computers to exchange their data (see diagram above).  
The network is connected to the diagnostic socket and satisfies the CAN protocol

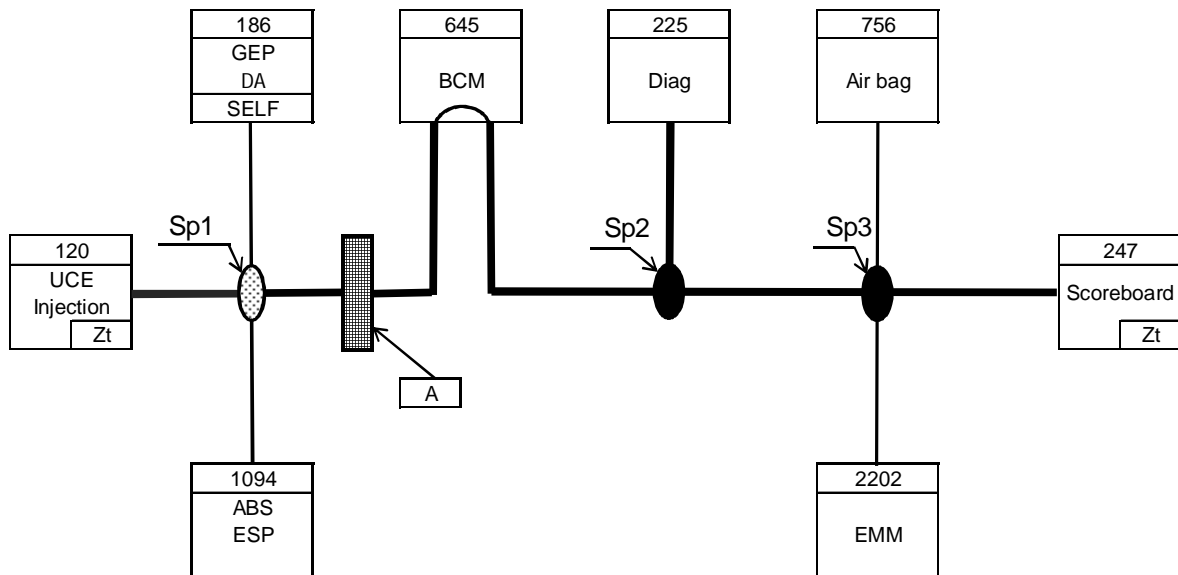
A CAN-BUS Interface modul for Conversion is available as an option on all versions. This module can be used to recover certain information that is available on the multiplexed network (see also Chapter 4.10)

Note:









- A check of the multiplex network can only be carried out using the OPEL / VAUXHALL diagnostic tool.
- If one of the ECUs is replaced, configuration needs to be carried out using the OPEL / VAUXHALL diagnostic tool

CAN diagrams

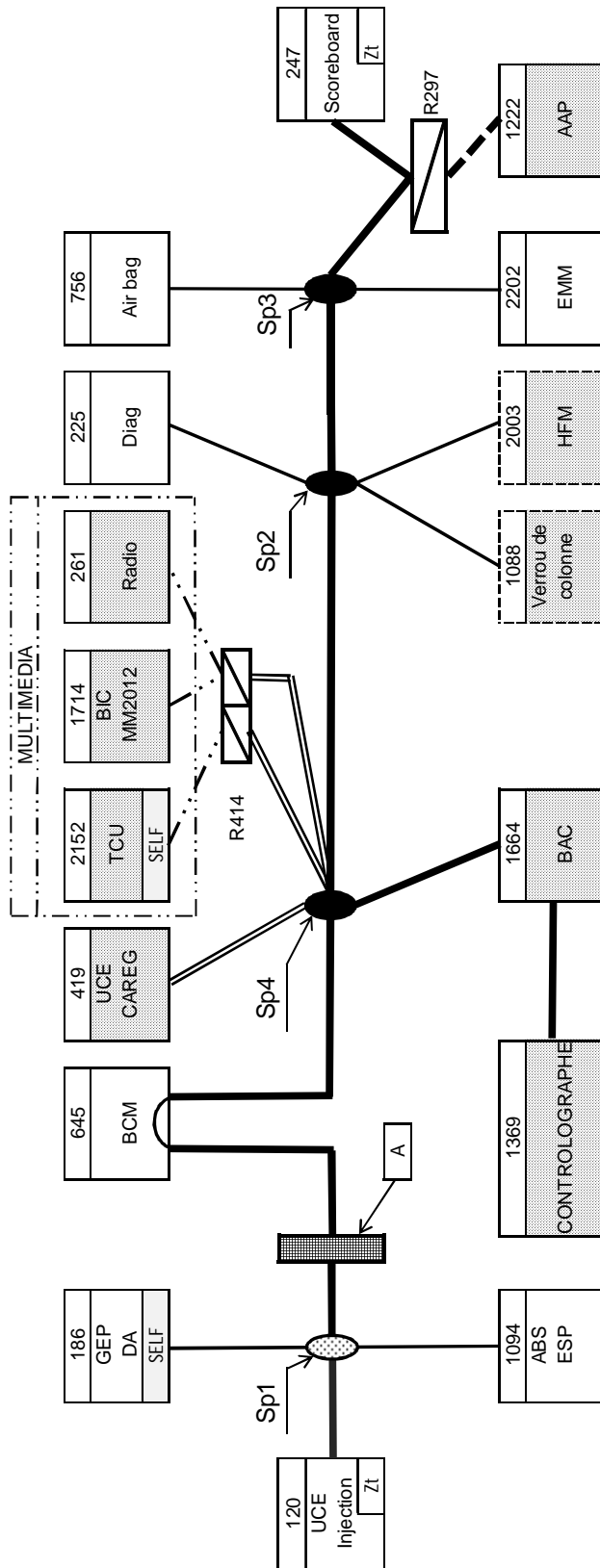
Entry level version











Légende des Schémas

	multimedia		Unit and computer codes
	Splicing		optional ECU
	Bulkhead bushing		wiring multimedia
	Wiring rear left		wiring cockpit

Top-of-the-range version



Légende des Schémas

	multimedia		Unit and computer codes
	Splicing		optional ECU
	Bulkhead bushing		wiring multimedia
	Wiring rear left		wiring cockpit



Explanation

AAP	Parking distance control
UCE	Injection computer
EEM	Electrical Energy Management
ABS / ESP	Anti-lock Braking System / Electronic Stability Program
Scoreboard	Instrument panel
BCM	UCH : Passenger Compartment Central Unit
CAREG	Climate control
HFM	Hands-free access
Airbag	Airbag ECU
TCU	Telematic Communication Unit
BIC	CAN interface unit
BAC	Approved Conversions Unit
GEP / DA	Power steering electro-pump assembly
Diag	Diagnostic socket

#### 4.5. AVAILABLE ELECTRICAL CURRENT

Vehicles are available with two alternator power ratings: 150 A and 185 A

These alternators are combined with their battery as described below:

- 150 A alternator with a VRLA battery of 70 Ah and 720 A
- 185 A alternator with a VRLA battery of 80 Ah and 800 A

Example of alternator applications

##### Alternator 150A

As standard, only for TEMPERATE climate vehicles with the following options:

- |             |  |
|-------------|--|
| - C60 & K08 | Manual front air-conditioning + Auxiliary heater, fuel fired         |
| - CJ5 & K08 | Manual front/rear air-conditioning + Auxiliary heater, fuel fired    |
| - C68 & K08 | Regulated front air-conditioning + Auxiliary heater, fuel fired      |
| - CJ4 & K08 | Regulated front/rear air-conditioning + Auxiliary heater, fuel fired |
| - C36       | Auxiliary heater (for Combi only)                                    |

##### Alternator 185A

As standard, only for TEMPERATE climate vehicles without the following options:

- |             |  |
|-------------|--|
| - C60 & K08 | Manual front air-conditioning + Auxiliary heater, fuel fired         |
| - CJ5 & K08 | Manual front/rear air-conditioning + Auxiliary heater, fuel fired    |
| - C68 & K08 | Regulated front air-conditioning + Auxiliary heater, fuel fired      |
| - CJ4 & K08 | Regulated front/rear air-conditioning + Auxiliary heater, fuel fired |
| - C36       | Auxiliary heater (for Combi only)                                    |

##### Note:

*It is possible to replace the 150 A alternator against a 185 A alternator by the customer service.*

Alternator according to engine index

Alternator 150A with ESM & START / STOP.

TEMPERATE	GEN1	Level	Engine / index	Emissions control	kW	Gearbox
		D1	R9M/408	Euro5	66	PF6, 6-speed manual
	D2	R9M/450	Euro4	85	PF6, 6-speed manual	
		R9M/408	Euro5	85	PF6, 6-speed manual	
		R9M/450	Euro5	85	PF6, 6-speed manual	
	GEN2	D3	R9M/450	Euro5	103	PF6, 6-speed manual

Alternator 185A with ESM & START / STOP.

EXTREME COLD	GEN1	Level	Engine / index	Emissions control	kW	Gearbox
		D1	R9M/408	Euro5	66	PF6, 6-speed manual
	D2	R9M/450	Euro4	85	PF6, 6-speed manual	
		R9M/408	Euro5	85	PF6, 6-speed manual	
		R9M/450	Euro5	85	PF6, 6-speed robotised	
	GEN2	D3	R9M/450	Euro5	103	PF6, 6-speed robotised

Available current

The tables below show the different electrical currents available (in amps) according to whether a 150 A or 185 A alternator is used.

Front-wheel drive vehicle 150 A alternator

Powertrain	Version	Without fast idle 900	With fast idle		
			1000	1100	1200
GEN1	Non AC	10A	17A	20A	27A
	AC				
GEN2	Non AC	20A	27A	30A	37A
	AC				

Front-wheel drive vehicle 185 A alternator

Powertrain	Version	Without fast idle 900	With fast idle		
			1000	1100	1200
GEN1	Non AC	-	-	-	-
	AC				
GEN2	Non AC	20A	31A	35A	42A
	AC				

AC = Air Condition

Warning:

*The value given is the average value available when the engine is running and under the worst case fuel consumption conditions.*

*The electrical equipment added is given priority over the vehicle's basic additional electric heating (thermo plungers) and may thus jeopardise the vehicle's comfort level*

Reminder:

*Any electrical equipment added must be protected by fuses. These fuses must have a value appropriate to the equipment consumption and wire section.*

Power voltage management strategy

Various alternator voltage variation management strategies are applied to ensure optimized fuel consumption.

- Floating management → without START / STOP.
- ESM → with START / STOP.

Important:

- make sure there is voltage compatibility with the consumers added (including computers)
- make sure there is voltage compatibility with the coupling of additional batteries (see battery coupling sheet)

On vehicles without START / STOP

The voltage of the electrical network fluctuates between 13.5 V and 15.6 V during the engine running phases.

This voltage management may be deactivated in the OPEL / VAUXHALL network via the Clip diagnostic tool. This will drop back to a value of **XXX**

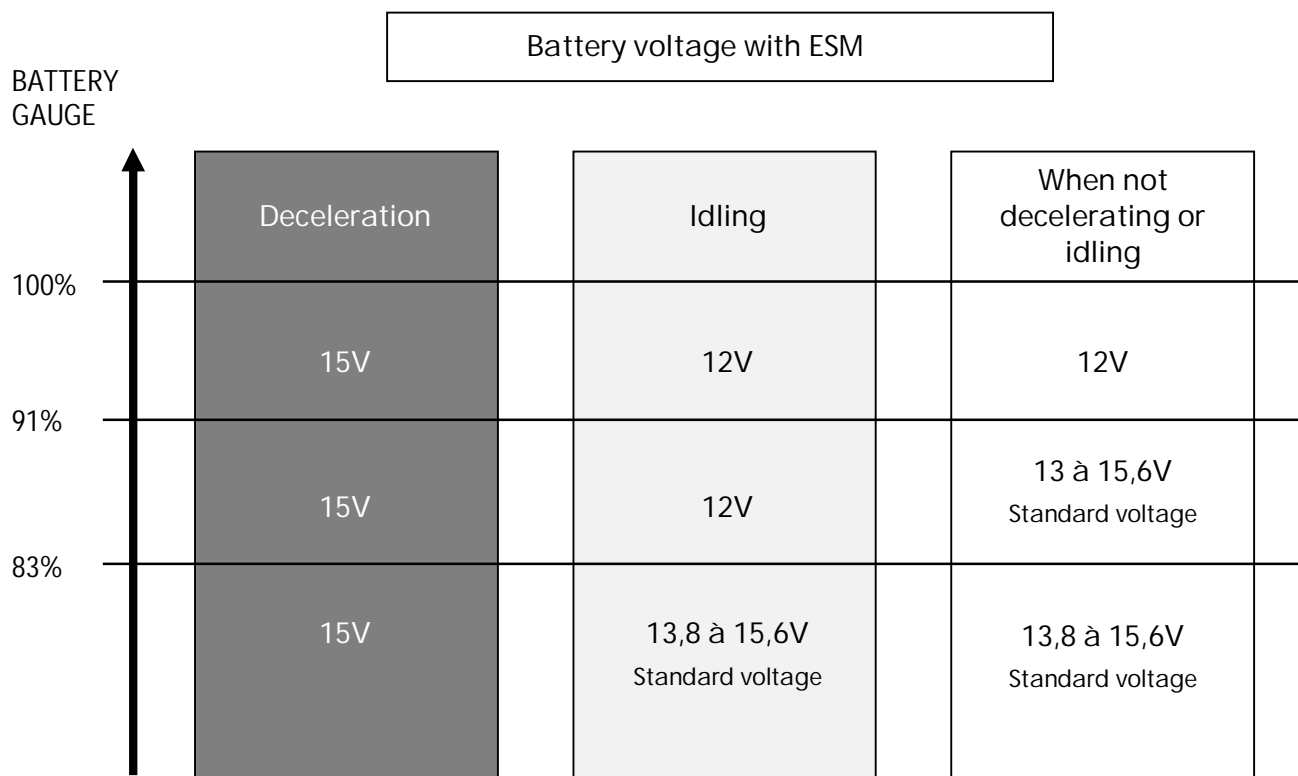
On vehicles with START / STOP

Under normal conditions, the battery voltage can vary from 12 V to 15.6 V depending on the vehicle battery charge rate.

During the deceleration phase, the voltage delivered by the alternator is 15 V.

Voltage of computers with START / STOP

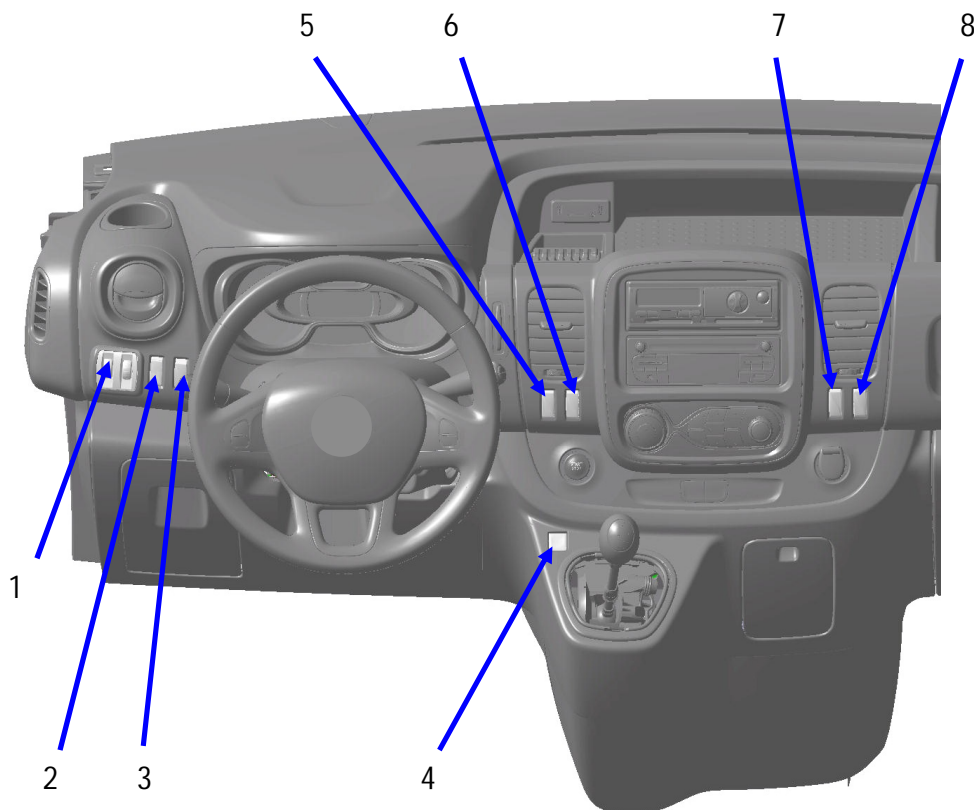
When the vehicle is started, the voltage can fall to 6.4 V. This should be considered by the bodybuilder when he is adding control units.



#### 4.6. INSTALLATION OF SWITCHES

Depending on version, five spaces for switches may be provided on the dashboard.  
Switch for parking distance control (3), switch for cruise control/speed limiter (5) switch to override Start/Stop (6) switch for rear de-icing (7) and switch for fast idle (8).

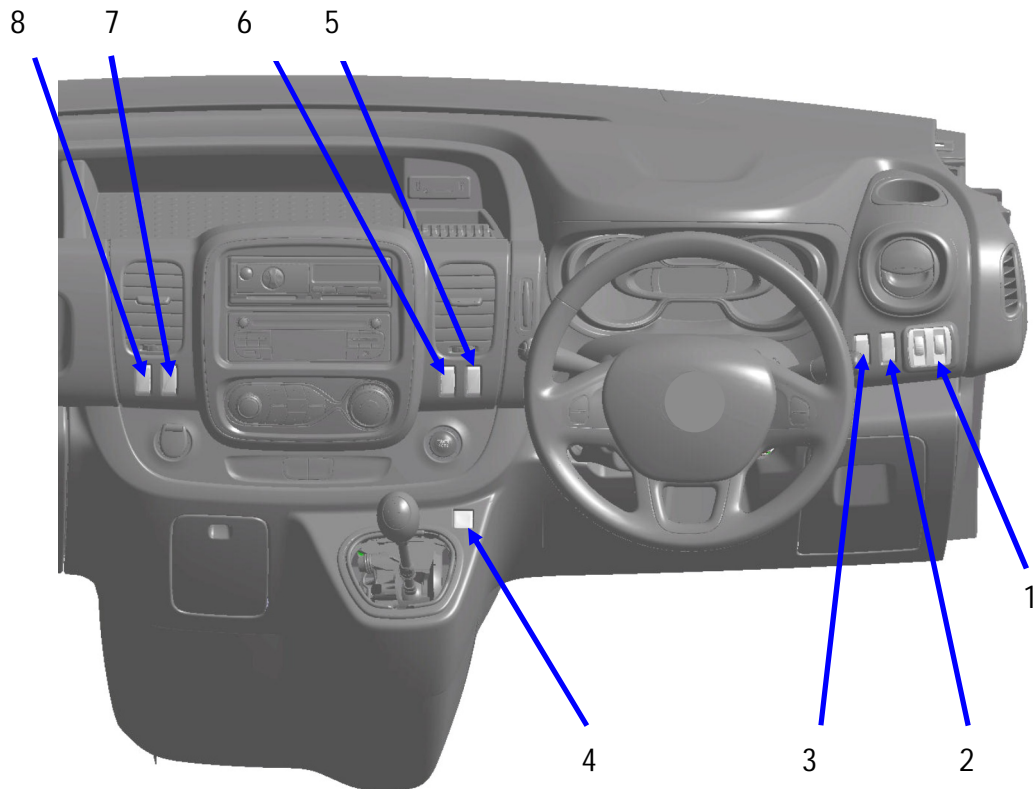
Switches on left-hand drive version



Item	Function	Item	Function
1 :	Headlight height adjustment and adjustment of instrument panel brightness	5 :	Cruise control/Speed limiter (Standard on Combi and optional on panel van)
2 :	Traction control	6 :	Start/Stop (option)
3 :	Rear parking distance control (option)	7 :	De-icing/demisting of rear screen and rear-view mirrors (option)
4 :	ECO mode	8 :	Fast idle (option)



Switches on right-hand drive version



Item	Function	Item	Function
1 :	Headlight height adjustment and adjustment of instrument panel brightness	5 :	Cruise control/Speed limiter (Standard on Combi and optional on panel van)
2 :	Traction control	6 :	Start/Stop (option)
3 :	Rear parking distance control (option)	7 :	De-icing/demisting of rear screen and rear-view mirrors (option)
4 :	ECO mode	8 :	Fast idle (option)

#### 4.7. START / STOP

The START/STOP option controls the automatic stopping of the engine when the vehicle stops and automatic restarting when a deliberate restart is detected, in order to optimise fuel consumption and pollution.

Note :

*When an automatic stop occurs, the following pictogram appears on the instrument panel:*



*The automatic switch off of the engine cannot be permanently disabled*

*The START/STOP option can be deactivated temporarily via a switch (the function is automatically reactivated each time the engine is switched on)*

Special case of the fast idle :

*As the fast idle is activated, START/STOP function is disabled automatically. (For example: power take off with refrigeration compressor)*

*Automatic restart by pressing the clutch pedal after engine stop is not locked.*

#### Operating conditions

To cause the engine to stop automatically

- Clutch pedal released
- AND vehicle in neutral
- AND speed threshold OR distance threshold exceeded since the last automatic stop
- AND no parking manoeuvres (reverse gear not engaged)
- AND Minimum speed of the vehicle
- AND doors, tailgate and engine bonnet closed
- AND minimum battery charge level
- AND outdoor temperature range
- AND thermal Comfort reached
- AND motor temperature reached
- AND driver on seat with fastened seat belt (version keyless vehicle)

## Restart conditions

### Automatic restart:

- The clutch pedal AND neutral or clutch pedal fully pushed down when gear is engaged
- START/STOP switch pressed
- Vehicle speed (during acceleration on a slope or when the vehicle is pushed)

### Technical restart:

- Repeated on the brake pedal and / or need support of the braking system
- outside temperature
- Failure detected in some components (ABS, neutral, speed ....)
- Thermal comfort (automatically with a time delay)
- Battery charge status

Note: For more details, refer to the Vehicle User Manual

## Convertibility conditions recommendations and restrictions

### Recommendations and restrictions

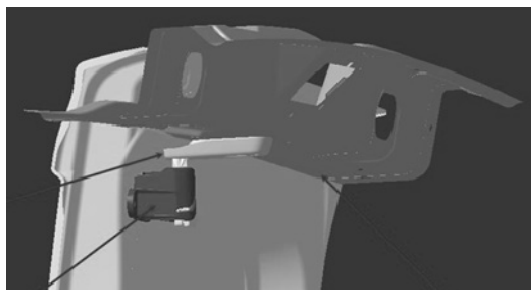


Risk that the vehicle will not detect that it is abandoned and the engine could start again automatically after automatic engine stop.

- For the panel van:

It is prohibited to remove switches for closing the doors / hoods / doors of the vehicle or install additional doors / hoods / doors whose opening would not be detected by the vehicle.

When removing the partition it is essential to remove the support system of the left swing door for vehicle versions which are equipped with.



- The START/STOP option is not available for Platform Cab with Euro5.
- Platform Cab with Euro 6 will be standard equipment with START/STOP. Therefore each added door must necessarily be recognized by a switch which is connected in series to the contact switch of the driver door.

### Vehicle servicing

Before carrying out any servicing on the vehicle, the battery must be disconnected (to avoid the START/STOP causing the engine to start unexpectedly).

### Sensors



- It is prohibited to modify the information issued by the sensors connected to the START/STOP system (particularly for opening elements).
- It is permitted to take the information from the bonnet sensor for alarms

### Impacts associated with the START / STOP function

- Loss of function following excessively frequent stoppages. If the battery is not sufficiently charged, START/STOP cancels itself out.
- Engine restart after automatic stop with no action to ensure safety (maintaining of the power brake system vacuum level, battery voltage level, etc.)
- Fluctuation of the voltage generated by the alternator (see Chapter No. 4.5 - available power)

## 4.8. REAR DOOR CENTRAL LOCKING / PARKING BRAKE INFORMATION

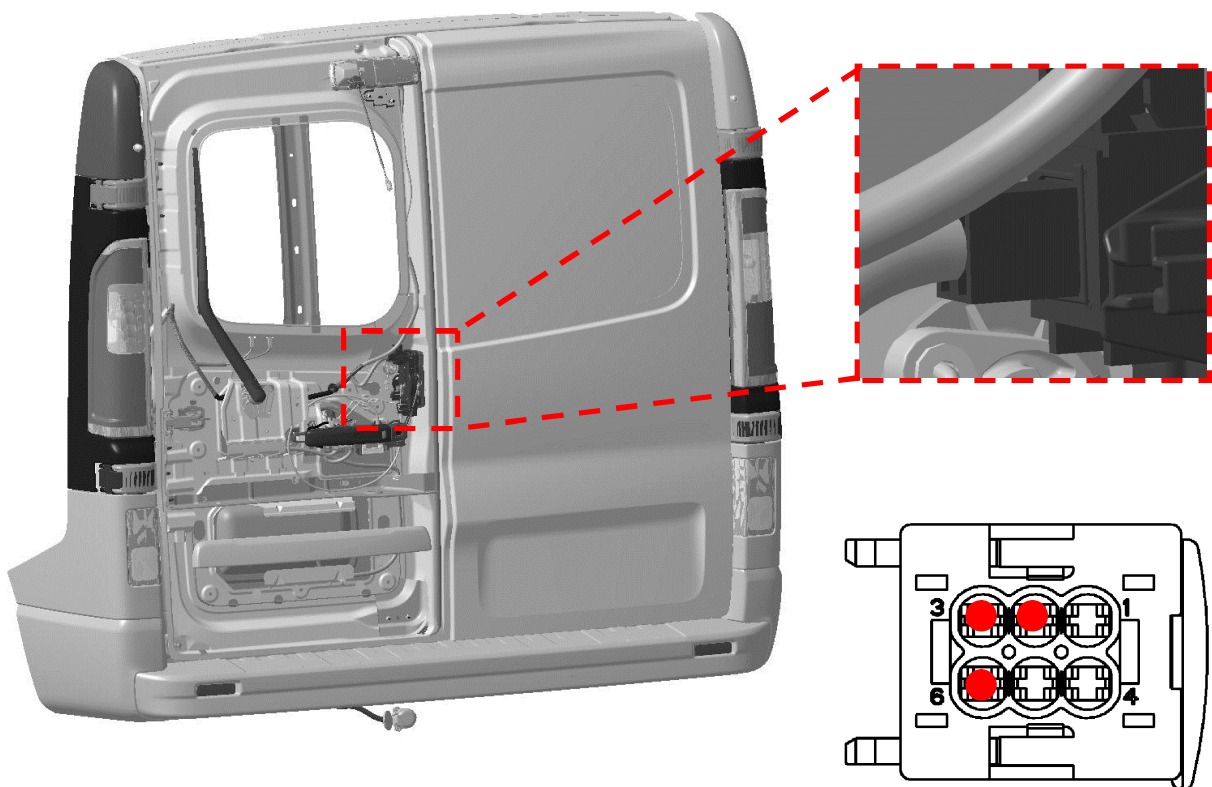
### 4.8.1. REAR DOOR CENTRAL LOCKING

Some conversions may require the removal of the loading area's hinged rear door or tailgate central locking feature.

To avoid generating a fault in the computer that manages the locks, closing of the rear lock has to be simulated via the electrical connector below:

*Important: This operation is not permitted for vehicles with a hands-free card.*

#### Left-hand hinged door, version

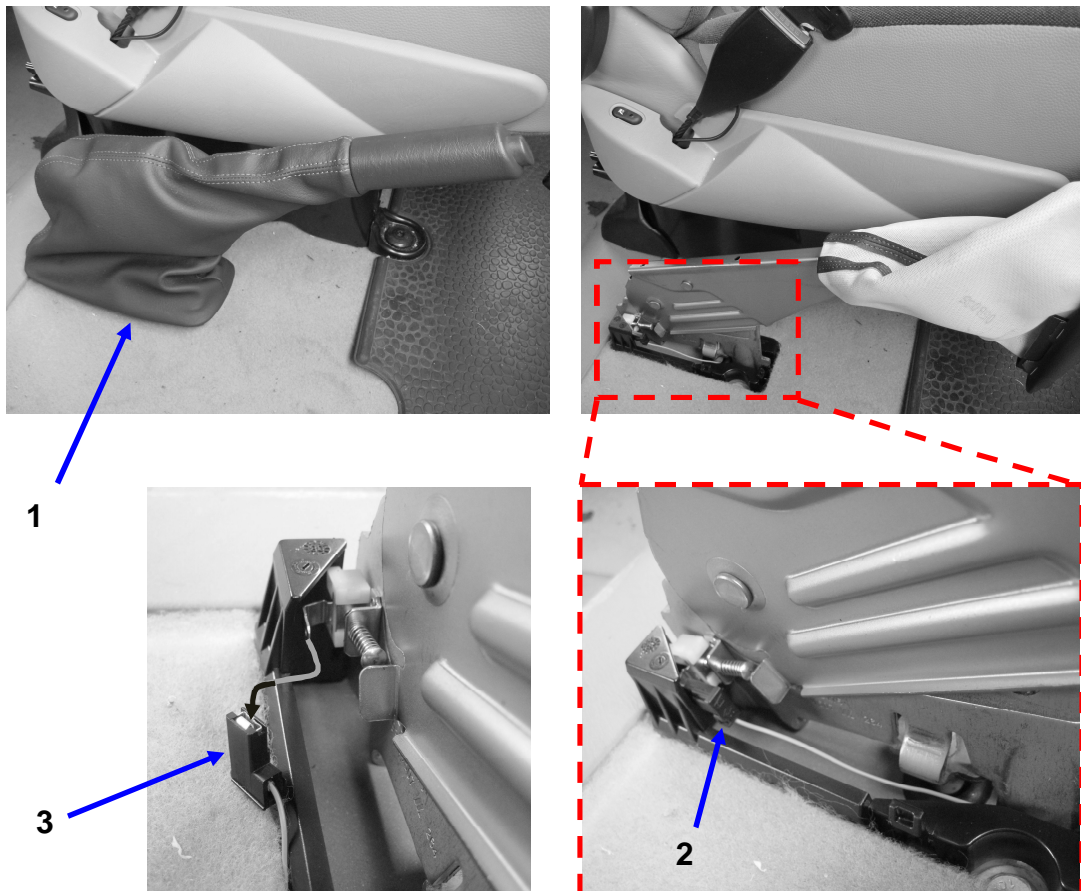


Remove ways 2, 3 and 6 from the hinged door lock 6-way connector.

#### 4.8.2. PARKING BRAKE INFORMATION

Before working on the vehicle, refer to the "Electrical Connections" data sheet.

The parking brake information is earthed when the brake is applied. This connection can be accessed on the hand brake.



1 :	Hand brake
2 :	Hand brake wiring
3 :	Hand brake wiring disconnected

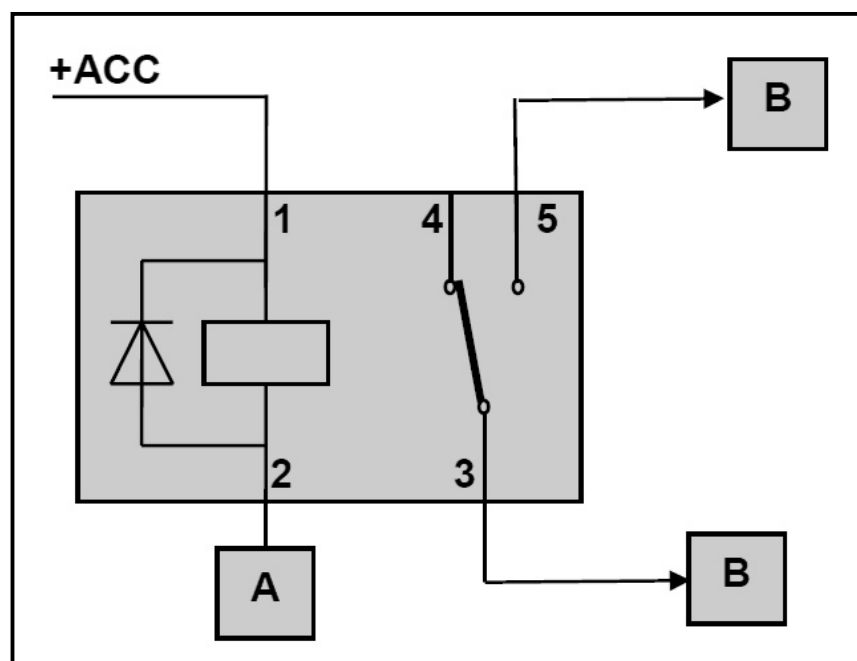


To retrieve this information, it must be sent using a relay equipped with a free wheel diode.

For example, the following relay can be used:

- 40 Amp relay,
- 20 Amp relay,

### CONNECTION DIAGRAM



A :	Handbrake information
B :	Dry contact to recover handbrake information
+ACC :	+Accessories power supply, 1 <sup>st</sup> notch on the ignition key

Note: *relay power supply must not be connected directly to the battery positive terminal*

#### 4.9. WIRING LOOM FOR CONVERSIONS OPTION "KPD" / FAST IDLE OPTION "UF3"

##### 4.9.1. WIRING LOOM FOR CONVERSIONS OPTION "KPD"

This option manages the vehicle's power for the addition of an electrical consumer and avoids the risk of battery discharge (a fault likely to keep the vehicle off the road).

##### General information

The option "KPD" contains a 6-way connector and a 2-way connector.

##### 6-way Connector

The 6-way connector (1) is accessible on the left-hand side of the dashboard behind the Passenger Compartment Fuse and Relay Box.

- "Engine running" information
- Activation of a fast idle
- + 12 V load shedding current distribution power supply
- "Side Light" information
- "Hand brake" information

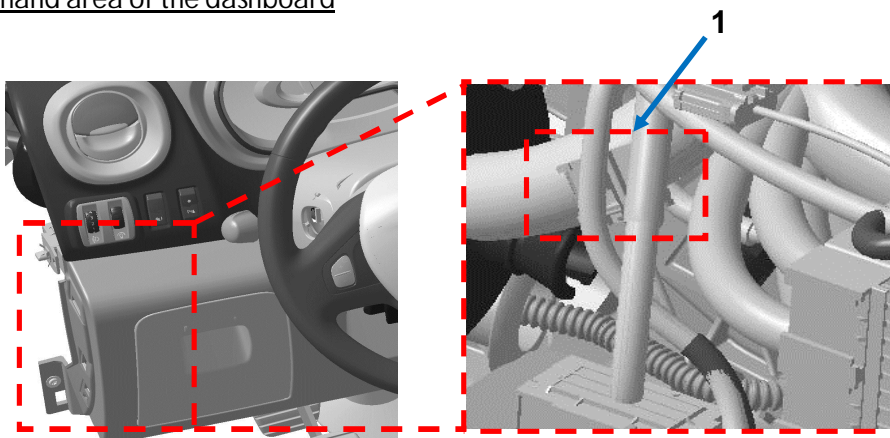
##### 2-way Connector

The 2-way connector (2) is accessible on the left-hand side underneath the seat.

- 12 V power supply with max. current of 40 A

##### Location of the 6-way connector

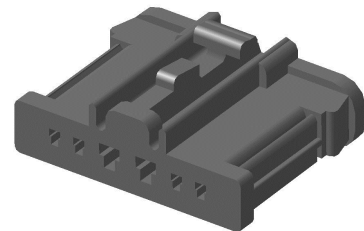
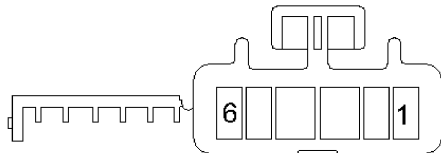
##### Left-hand area of the dashboard



The option "KPD" 6-way connector (1) is accessible on the left-hand side of the dashboard behind the Passenger Compartment Fuse and Relay Box.

It is secured on the dashboard wiring using a tear-off link. Extra length is provided for the connection.

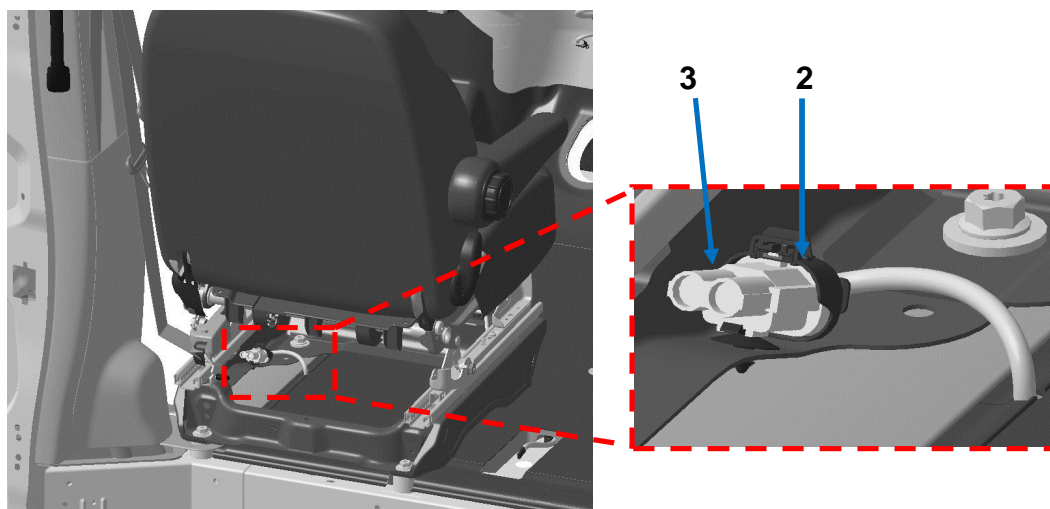
6-way Connector



Ways	Connections	Allocations
1 :	BMT2	+ 12V "engine running" information (max. 8 A/wire section 1 mm <sup>2</sup> )
2 :	3ADA	Fast idle control (500 mA max. wire section 0.35 mm <sup>2</sup> )
3 :	SBP4	+12 V load shedding (max. 16 A/wire section 1.5 mm <sup>2</sup> )
4 :	LPH	+ 12 V Side lights (lamp) (max. 500 mA/wire section 0.35 mm <sup>2</sup> )
5 :	H1	"Ground" information with hand brake applied (max. 500 mA/wire section 0.35 mm <sup>2</sup> )
6 :	MAN	Ground (section large enough to adapt to the +12 V current distribution) (wire section 1.5 mm <sup>2</sup> )

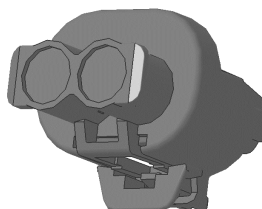
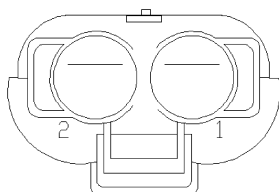
Location of the 2-way connector

Left-hand area of floor panel underneath the seat (symmetrical for right-hand drive)



The 2-way connector (2) is accessible on the left-hand side underneath the driver's seat. It is waiting to be used along with its counterpart (3)  , but it is necessary to obtain the contacts

2-way Connector



Way	Allocation
Way 1 (BP23)	+12 V direct battery power supply for maximum consumption of 40 A (wire section 7 mm <sup>2</sup> ). Protected by a 50 A fuse,
Way 2 (MAN)	Ground (wire cross-section 7 mm <sup>2</sup> large enough to adapt to the battery +12 V current).

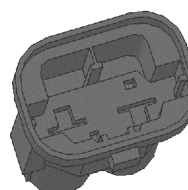
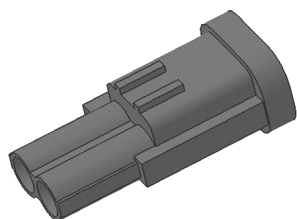
Note:

*The maximum permanent current of this power supply must not exceed 40 A.  
This line is protected by the 50 A fuse fitted in the electrical distribution unit (BDU)*

Important:

*This power supply is connected directly to the battery. The vehicle is therefore not protected by the energy management system. Risk of battery discharge*

2-way connector interface contacts



CONNECTOR <span style="background-color: #cccccc; display: inline-block; width: 50px; height: 1em;"></span>			
Wire section		Supplier reference	Supplier
3 to 6 mm <sup>2</sup>		P790861	TYCO
7 to 10 mm <sup>2</sup>		P790862	TYCO

#### 4.9.2. FAST IDLE OPTION "UF3"

*The fast idle function is not possible on a vehicle that does not have the option "UF3" or option "KPD" or option "KC6"*

##### General information

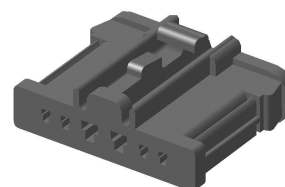
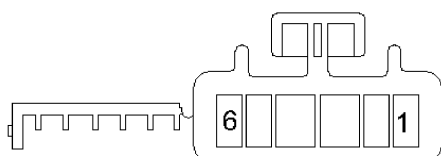
Fast idle function is used to increase the idle speed of the vehicle to provide more power and/or electrical energy.

The standard vehicle idle speed is 850 rpm.

The fast idle default value is 1000 rpm. This value can be set to between 1000 and 2000 rpm in increments of 100 rpm. And also a value of 860 rpm. This operation is carried out in the OPEL / VAUXHALL network using the "Clip" diagnostic tool.

On the manual gearbox it is possible to re-program the prohibited "UF3" (idle) speed using the CLIP diagnostic tool.

##### Option "KPD" connector



Ways	Connections	Allocations
1:	BMT2	+ 12V "engine running" information (max. 8 A/wire section 1 mm <sup>2</sup> )
2:	3ADA	Fast idle control (500 mA max. wire section 0.35 mm <sup>2</sup> )
3:	SBP4	+12 V load shedding (max. 16 A/wire section 1.5 mm <sup>2</sup> )
4:	LPH	+ 12 V Side lights (lamp) (max. 500 mA/wire section 0.35 mm <sup>2</sup> )
5:	H1	"Ground" information with hand brake applied (max. 500 mA/wire section 0.35 mm <sup>2</sup> )
6:	MAN	Ground (section large enough to adapt to the +12 V current distribution) (wire section 1.5 mm <sup>2</sup> )

### Operation and safety

The driver controls the operation of the fast idle by pressing a button on the dashboard.

The fast idle is activated approximately 4 seconds after the engine starts, even if the button is in the ON position when the engine is started.

The function is deactivated if the coolant temperature warning light or any other engine warning light comes on.

### With manual gearbox

- By default, the vehicle is configured with a deactivation speed of almost zero (around 0.5 km/h)
- For a fast idle below 1300 rpm, the deactivation speed can be set up to 30 km/h
- For a fast idle above 1300 rpm, it is not possible to change the deactivation speed. The vehicle cannot drive with fast idle.
- Pressing the clutch pedal deactivates the fast idle.

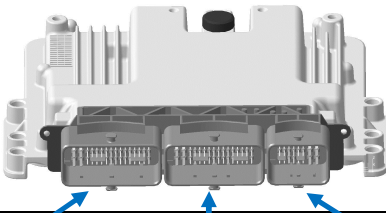
### With robotised gearbox

- Activation is possible in neutral gear.
- Pressing the accelerator pedal deactivates the fast idle.
- Deactivation at speeds > 0 km/h, the vehicle cannot drive with fast idle.

### Injection computer (euro4 & 5)

For R9M Euro4 & 5 engines, the computer in question is the EDC17C42, and the operating principle is as follows:

- Use of an injection computer input +12 V supply on the corresponding pin of connector B pin G2 (see table below)

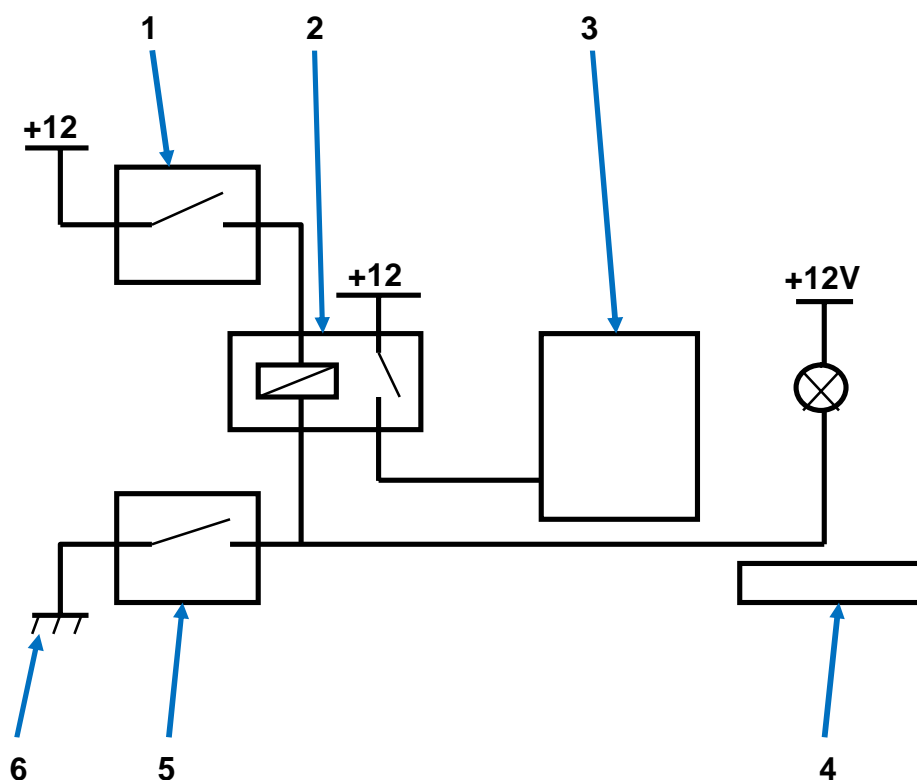
PIN	B-G2																																											
Connector	B																																											
																																												
	Connector C				Connector B				Connector A																																			
	M	L	K	J	H	G	F	E	D	C	B	A	1	2	3	4	A	B	C	D	E	F	G	H	J	K	L	M	1	2	3	4	H	G	F	E	D	C	B	A	1	2	3	4



Parking brake switch:

For safety reasons, some conversions may require activation of the fast idle to be combined with the parking brake applied information as follows:

Fast idle diagram

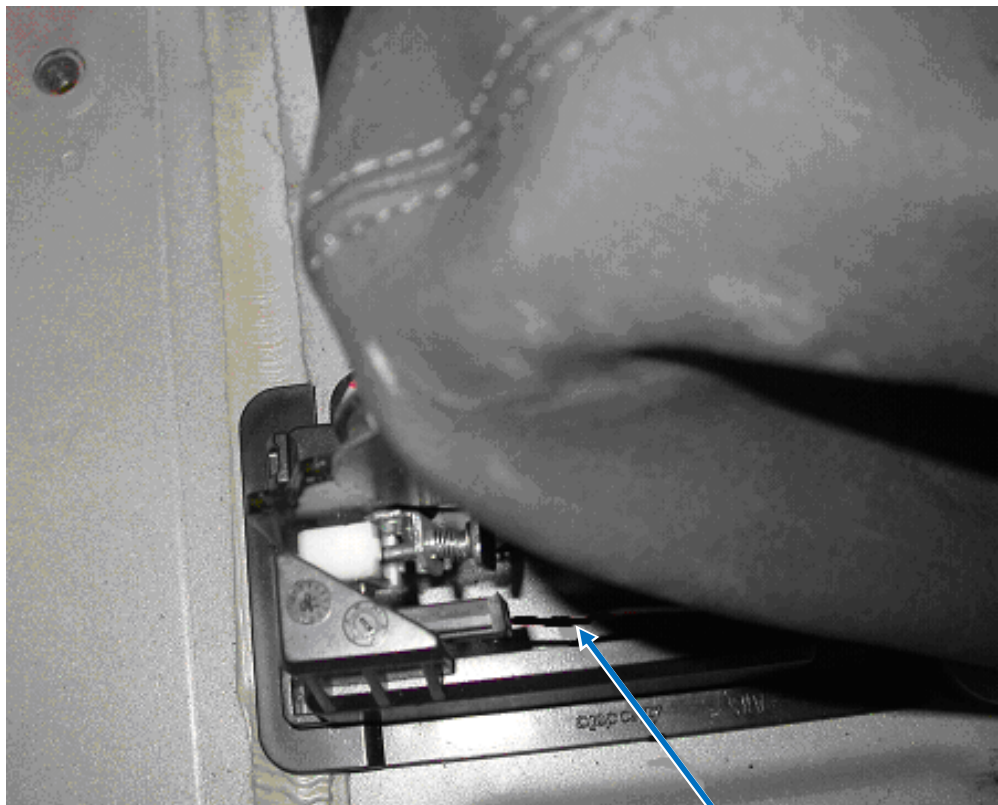


1:	Fast idle control
2:	Relay
3:	Injection computer
4:	Instrument panel warning light
5:	Hand brake switch
6:	Ground

## Parking brake information

### Cab area

- This connection is grounded when the brake is applied and can be accessed via the hand brake connector device 156AA.
- Requires the use of a crimp sleeve on connection H1
- This information must be controlled by a single relay.



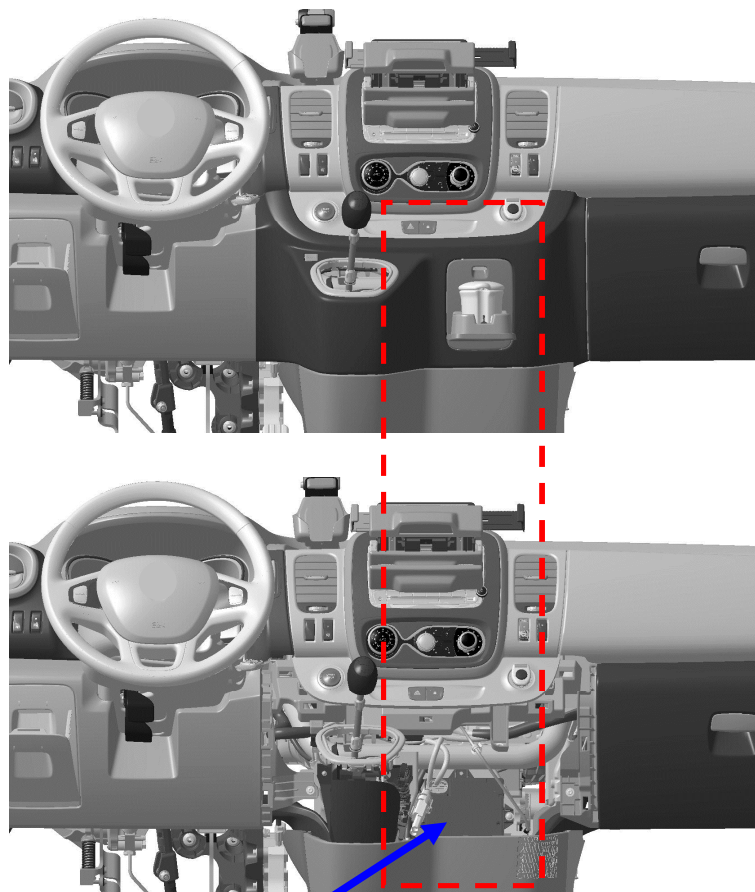
7

7:	H1 connection of hand brake connector 156AA.
----	--

#### 4.10. CAN – BUS INTERFACE, OPTION "KC6"

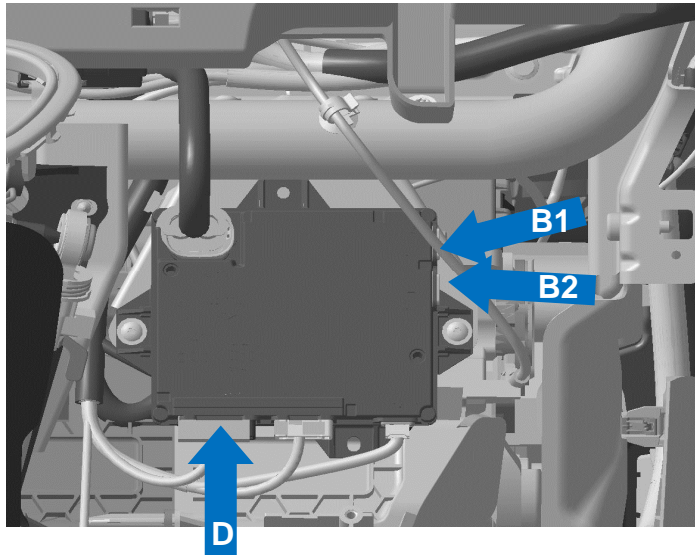
The CAN - bus interface unit is available as an option on all versions. This unit is used to retrieve certain information available on the multiplex network.  
The unit is mounted on the dashboard cross member behind the centre console for both left-hand drive and right-hand drive vehicles.

Location CAN - bus interface



CAN - bus interface unit

### Location of connectors specifically for bodybuilders



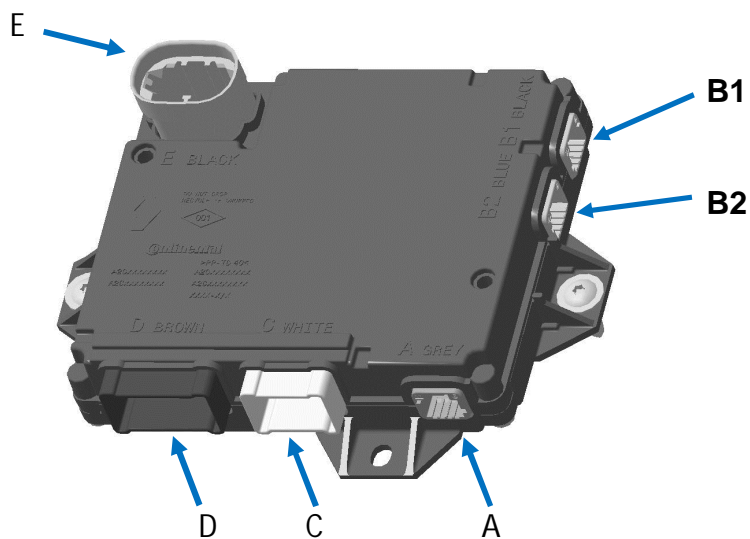
### Details CAN - bus interface unit

**Note:**

Connectors "A", "E" and "C2") are strictly for OPEL / VAUXHALL use.

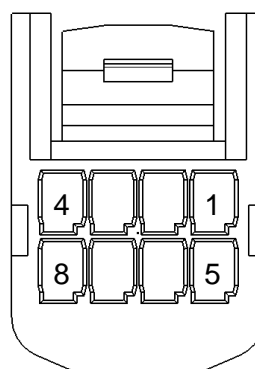
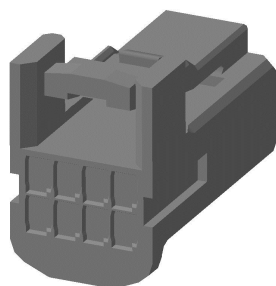
Connectors "B1" and "B2" are specifically for bodybuilders (CAN and logic outputs).

Connector "D" is specifically for bodybuilders if the vehicle does not have the option tow bar. (Power outputs).



WITHOUT TOW BAR				
Item	Connector unit	Way		Clip-holder supplier reference
D	BROWN	12		SUMITOMO 6098-6956
SPECIFIC TO BODYBUILDERS				
B1	BLACK	8		TYCO 0-1379659-1
B2	BLUE	8		TYCO 0-137-9659-3

Details of Black connectors B1 / 5 (8 way)



B1	Connector / TYCO 0-1379659-1			
Way	Information <u>available by default</u>	Input/Output	Type I/O	Max. Ampere
1:	CAN ADAP2 500K (CANHS_L3)	I/O	Communication [CRS1]	10 mA
2:	ABS regulation	S	Low Side ILAB.8.250.REL	250mA
3:	Clutch position	S		250mA
4:	Brake position	S		250mA
5:	CAN ADAP2 500K (CANHS_H3)	I/O	Communication [CRS1]	10 mA
6:	Door opening/closing	S	Low Side ILAB.8.250.REL	250mA
7:	Engine running	S		250mA
8:	<i>Not connected</i>	N/A		

**NOTE:**

*Ways 2, 3, 4, 6, and 7 are able to supply other information\* (See Chapter 3.2) via a reprogramming operation carried out within the OPEL/VAUXHALL network*

*Ways 1 and 2 specific to the CAN for bodybuilders (See table on pages 6, 7 and 8)*

Details of B2 BLUE (8-way) connectors

B2	Connector [REDACTED] / TYCO 0-1379659-3			
Way	Information <u>available by default</u>	Input/ Output	Type I/O	Max. Ampere
1:	Vehicle speed	S	Low Side ILAB.6.45 + I limit deviation	45mA
2:	Neutral signal	S	Low Side ILAB.8.250.REL	250mA
3:	Door opening signal	S		250mA
4:	Ignition key position	S		250mA
5:	Engine speed	S	Low Side ILAB.6.45 + I limit deviation	45mA
6:	Hand brake switch	S	Low Side ILAB.8.250.REL	250mA
7:	ESP regulation	S		250mA
8:	Fast idle control	S		100mA

**NOTE:**

*Ways 2, 3, 4, 6, and 7 are able to supply other information\* via a reprogramming operation carried out within the OPEL/VAUXHALL network*

*\* Reprogramming in the OPEL/VAUXHALL network*

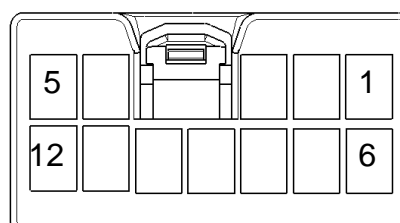
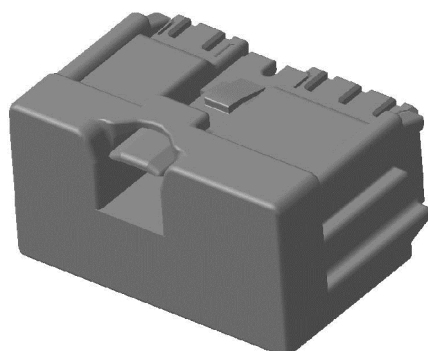
Door switch	Neutral	Active trajectory control
Ignition contact switch	Auto gearbox fault warning light on	Trajectory control fault
Door locking	Side lights	Gear engaged
Direction indicators	Main beam headlights	
Brake check	Marker lights	
Engine status	Front fog lights	
Air conditioning compressor	ESP activation status indicator light	
Start-up	Hand brake switch	
Clutch switch	ABS operation	
Reverse gear	ABS operating fault	

Details of clips for B1 or B2 (8-way) connectors

The contacts for use with these two connectors are TH clips, [REDACTED] (TYCO 0-1674298-1) for wire sections 0.22 to 0.5 mm<sup>2</sup>



Details of D connector (12-way)



D	Connector / SUMITOMO 6098-6956			
Way	Tow bar power levels	Input/ Output	Type I/O	Max. Ampere
1 :	Max 2 x 21W (Lmax = 2mH)	S		4A
2 :	Max 2 x 21W (Lmax = 2mH)	S		2A
3 :	Max 21W (Lmax = 2mH)	S		2A
4 :	Max 3 x 21W (Lmax = 1mH)	S		8A
5 :	Max 21W+ 5W (Lmax = 2mH)	S		5A
6 :	Max 2 x 21W	S		4A
7 :	Max 21W (Lmax = 2mH)	S		2A
8 :	Max 6 x 5W (Lmax = 3mH)	S		5A
9 :	Max 21W (Lmax = 2mH)	S		2A
10 :	Max 21W+ 5W (Lmax = 2mH)	S		2A
11 :	Max 6 x 5W (Lmax = 3mH)	S		5A
12 :	Lmax = 2mH	S		2A

**NOTE:** *In the event of accidental overload on one way, this is deactivated. To reactivate, the vehicle must be set to standby (APC off/lights off/vehicle locked. On standby for 2 min. 20s after locking)*

Details of clips for D connector (12-way)

	SUMITOMO reference	Sections mm <sup>2</sup>
	8240-0368	0,3 à 0,5
	8240-0369	0,75 à 1
	8240-0370	1,25 à 1,5
	8240-0371	1,75 à 2,5

*\*Ways 1 and 2 specific to the CAN for bodybuilders (See table below)*

OPEL VIVARO (X82)  
4.10 – CAN - BUS INTERFACE OPTION "KC6"



INPUT				OUTPUT					Configuration (customization), Logical, Power and PWM Actions		
Information Part	Information Needs	By Means of	CAN_V status	Frame Name	Parameters	Id (hex) Can ADAP2	MSB position	LSB position	Périod CAN	Processing gateway from CANV parameters to CAN_ADAP2	Processing gateway from CANV parameters to logical, PWM and Power outputs parameters
Motor (Moteur)	engine speed (Régime moteur)	CAN and PWM		ADAP_Base1	EngineRPM	0E7	Byte N° 1 - Bit N° 7	Byte N° 2 - Bit N° 0	40	copy CANV value into CAN_ADAP2 value	2 pulses by motor turn 0 < RPM < 7000 turn/min
Pedal (Pédalier)	State accel pedal (Etat/pédale accel)	CAN		ADAP_Base1	DriverRequest	0E7	Bit N° 7	Byte N° 3 - Bit N° 0	40	code on one byte	
		CAN		ADAP_Base1	EngineCoolantTemp	0E7	Byte N° 4 - Bit N° 7	Byte N° 4 - Bit N° 0	40	copy CANV value into CAN_ADAP2 value	
		CAN		ADAP_Base1	FuelConsumption	0E7	Byte N° 5 - Bit N° 7	Byte N° 5 - Bit N° 0	40	copy CANV value into CAN_ADAP2 value	
Braking (Freinage)	Information speed (Information vitesse)	CAN and PWM		ADAP_Base1	VehicleSpeed	0E7	Byte N° 6 - Bit N° 7	Byte N° 7 - Bit N° 0	40	copy CANV value into CAN_ADAP2 value	Fmax = 390 Hz F = (5/3,6) x speed in km/h
Motor (Moteur)	Motor revolution (Moteur/rotation)	CAN, log and Power	00 engine stopped 01 Reserved 10 independant running engine 11 running engine-driven	ADAP_Base2	EngineStatus	0E8	Byte N° 1 - Bit N° 7		40	If CAN V value = 00 or 01 Driver value = 0 If CAN V value = 10 or 11 then Driver value = 1	
Lights (Eclairage)	brake lights (Feux Stop)	CAN, log and Power	001 Brake pedal not pressed 010 Brake pedal pressed 100 Brake pedal confirmed pressed 111 unavailable	ADAP_Base2	BrakeSwitch Engine Control	0E8	Byte N° 1 - Bit N° 6		40	If CAN V value = 000 or 001 or 011 or 101 or 110 or 111 Driver value = 0 If CAN V value = 010 or 100 then Driver value = 1	
Alt-condition (Clim)	AC active (AC actif)	CAN, log and Power	0 Compressor clutch off 1 Compressor clutch on	ADAP_Base2	ACCompressor Authorized	0E8	Byte N° 1 - Bit N° 5		40	If CAN V value = 0 Value = 0	
Pedal (Pédalier)	Clutch (embrayage)	CAN, log and Power	00 Not used 01 Clutch pedal not pressed 10 Clutch pedal pressed at minimum 11 Unavailable								
			00 Not used 01 Clutch pedal not pressed at maximum 10 Clutch pedal pressed at maximum 11 Unavailable	ADAP_Base2	ClutchSwitch	0E8	Byte N° 1 - Bit N° 4		40	If CAN V value = 10 then Value = 1 Else value = 0	
Door (Porte)	Info door open (Info porte ouverte)	CAN, log and Power	00 Unavailable Value 01 Passenger door closed 10 Driver door open 11 Not Used 00 Unavailable Value 01 Passenger door closed 10 Passenger door open 11 Not Used 00 Unavailable Value 01 Rear Right door closed 10 Rear Right door open 11 Not Used 00 Unavailable Value 01 Tail Gate door closed 10 Tail gate door open 11 Not Used 00 Unavailable Value 01 Rear Left door closed 10 Rear Left door open 11 Not Used	ADAP_Base2	DoorSwitches	0E8	Byte N° 1 - Bit N° 3		40	If one CAN V value = 10 then Value = 1 If one CAN V value = 00 or 11 Value = safe value = 0 else Value = 0	
State Vehicle (Etat véhicule)	Key position contact (position clé de contact (ACC-APC))	CAN, log and Power	0000 Sleeping 0001 Technical Wakeup 0010 CutOffPending 0011 BatTempLevel 0100 AccessoryLevel 0101 IgnitionLevel 0110 StartingProgress 0111 EngineRunning 1000 AutoStart 1001 EngineSystemStop 1111 UnavailableValue	ADAP_Base2	IgnitionSwitch	0E8	Byte N° 1 - Bit N° 2		40	If CAN V value > or = 0100 and < or = 1001 Driver value = 1 else If CAN V value < 0100 Driver value = 0 Else value = safe value = 0	

Note: Subject to errors and technical amendments. The electronic version of the body guidelines is the decisive source of up-to-date data on body guidelines (online body guidelines). Data status February 2014

OPEL VIVARO (X82)  
4.10 – CAN - BUS INTERFACE OPTION "KC6"



INPUT				OUTPUT						Configuration (customization), Logical, Power and PWM Actions	
Information Part	Information Needs	By Means of	CAN_V states	Frame Name	Parameters	Id (hex) Can ADAP2	MSB position	LSB position	Périod CAN	Processing gateway from CANV parameters to CAN_ADAP2	Processing gateway from CANV parameters to logical, PWM and Power outputs parameters
Door (Porte)	Information ... door (Info conda /deconduite de la porte)	CAN, log and Power	0 Vehicle not locked from the outside by the customer 1 Vehicle Locked from the outside by the customer	ADAP_Base2	DoorsLocked	0E8	Byte N° 1 - Bit N°1		40		If CAN V value = 0 Value = 0 If CAN V value = 1 then
Illumination (Eclairage)	left and right flashing (Clignotant G et D)	CAN, log and Power	000 left and right flashing indicators OFF 001 left flashing indicator ON and right flashing indicator OFF 010 left flashing indicator OFF and right flashing indicator ON 011 left flashing indicator ON and right flashing indicator ON 111 Unavailable	ADAP_Base2	FlashingIndicators	0E8	Byte N° 1 - Bit N°0		40		If CAN V value = 001 or 010 Driver value = 1 else Driver value = 0
Illumination (Eclairage)	Warning	CAN	000 left and right flashing indicators OFF 001 left flashing indicator ON and right flashing indicator OFF 010 left flashing indicator OFF and right flashing indicator ON 011 left flashing indicator ON and right flashing indicator ON 111 Unavailable	ADAP_Base2	HazardLight	0E8	Byte N° 2 - Bit N°7		40		If CAN V value = 011 Driver value = 1 then Driver value = 0
State Vehicle (Etat véhicule)	Stop AutoState	CAN, log and Power	0000 Sleeping 0001 Technical Wakeup 0010 CurOffPending 0011 BatTempoLevel 0100 AccessoryLevel 0101 IgnitionLevel 0110 StartingInProgress 0111 EngineRunning 1000 AutoStart 1001 EngineSystemStop 1111 Unavailable/value	ADAP_Base2	***** Fixed to zero *****	0E8	Byte N° 2 - Bit N°6	Byte N° 2 - Bit N°0	40	***** Fixed to zero *****	
				ADAP_Base3	AutoStart	0E9	Byte N° 4 - Bit N°6		100		If CAN V value = 1000 Driver value = 1 else Driver value = 0
				ADAP_Base6	AIRBAGMalfunction	0EC	Byte N° 1 - Bit N°0		100	copy CANV value into CAN_ADAP2 value	
				ADAP_Base6	DriverSafetyBeltReminder	0EC	Byte N° 1 - Bit N°1	Byte N° 1 - Bit N°2	100	copy CANV value into CAN_ADAP2 value	
Illumination (Eclairage)	Reversing lights (Feux de recul) Rear Gear info (Info marche AR)	CAN, log and Power	00 not used 01 Rear Gear not Engaged 10 Rear Gear Engaged 11 unavailable	ADAP_Base6	RearGearEngaged	0EC	Byte N° 1 - Bit N°3		100		If CAN V value = 01 Driver value = 0 If CAN V value = 10 then Driver value = 1 If CAN V value = 00 or 11 Value = 0
Gearbox (Boîte de vitesses)	Neutral (Pointmort (selon DT véhicule))	CAN, log and Power	00 not used 01 neutral contact not reached 10 neutral contact reached 11 unavailable	ADAP_Base6	NeutralContact	0EC	Byte N° 1 - Bit N°5		100		If CAN V value = 01 Driver value = 0 If CAN V value = 10 then Driver value = 1 If CAN V value = 00 or 11 Value = 0
Gearbox (Boîte de vitesses)	Failure (Défaut BV (BVR))	CAN, log and Power	00 Not used 01 No warning 10 AT major failure warning (Level 2) 11 Unavailable value	ADAP_Base6	AT_Level2FailureDisplayRequest	0EC	Byte N° 2 - Bit N°7		100		If CAN V value = 01 Value = 0 If CAN V value = 10 then Value = 1 If CAN V value = 00 or 11 Value = 0
State Vehicle (Etat véhicule)	Key VAC/VSC	CAN	00 Keyless vehicle 01 Unavailable 10 Not used 11 Key vehicle	ADAP_Base6	Key Vehicle	0EC	Byte N° 2 - Bit N°0	Byte N° 2 - Bit N°1	100	copy CANV value into CAN_ADAP2 value	

Note: Subject to errors and technical amendments. The electronic version of the body guidelines is the decisive source of up-to-date data on body guidelines (online body guidelines). Data status February 2014

#### 4.11. REAR LIGHTS / INTERIOR LIGHTING INFORMATION

##### 4.11.1. REAR LIGHTS INFORMATION

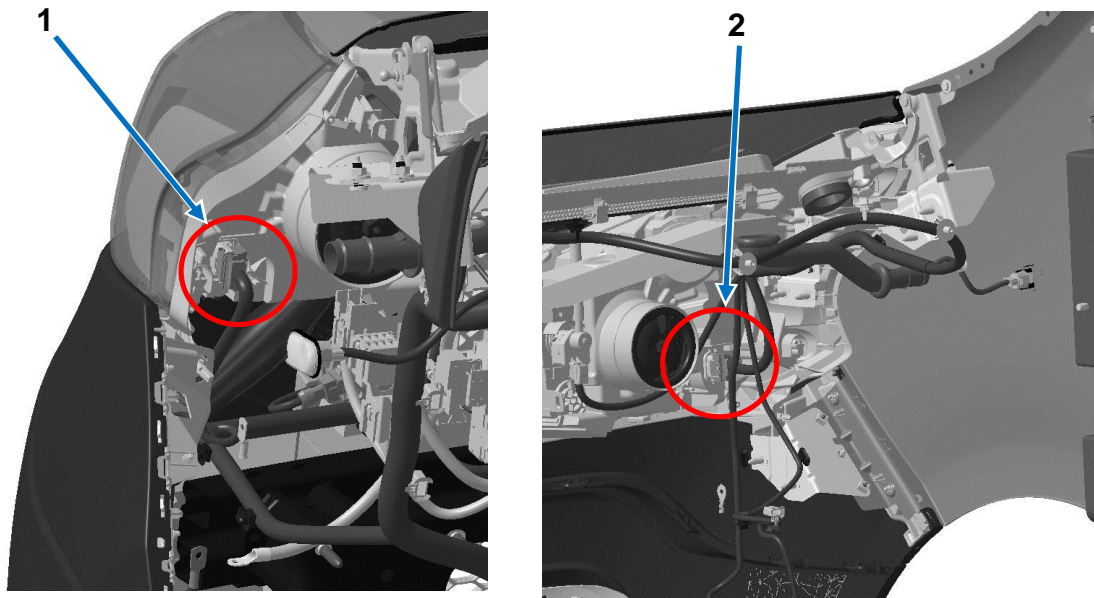
**Important:** *the vehicle electronic system is not authorised to supply power-consuming devices other than those fitted to the vehicle.*

This information is available at several locations on the vehicle:

- Engine compartment
- Cabin area
- Rear area

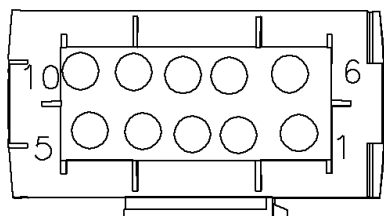
Engine compartment

Details of connector positions



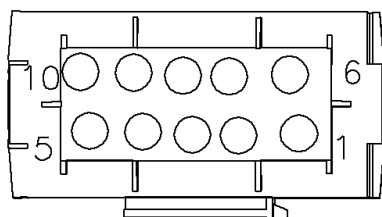
1:	10-way connector (left-hand side)	2:	10-way connector (right-hand side)
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Front left-hand headlight connection (227AA)



Way	Connections	Allocations
1 :	MAS	Ground
2 :	RPG	+ Right-hand main beam headlight
3 :	CPG	+ Right-hand dipped beam headlight
4 :		
5 :		
6 :	11T	+ Right-hand daytime running lights (DRL)
7 :	64C	+ Right-hand direction indicator
8 :	LPAV	+ Front side light
9 :		
10 :		

Front right-hand headlight connection (226AA)

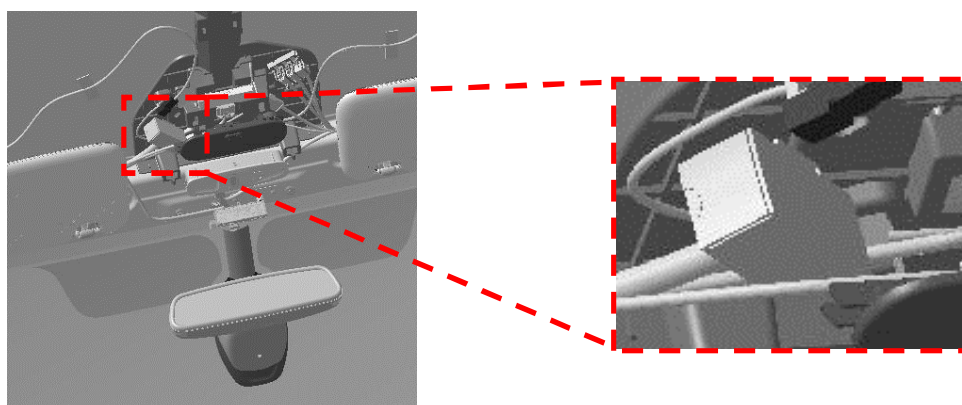


Way	Connections	Allocations
1 :	MAR	Ground
2 :	RPD	+ Right-hand main beam headlight
3 :	CPD	+ Right-hand dipped beam headlight
4 :		
5 :		
6 :	11S	+ Right-hand daytime running lights (DRL)
7 :	64D	+ Right-hand direction indicator
8 :	LPAV	+ Front side light
9 :		
10 :		

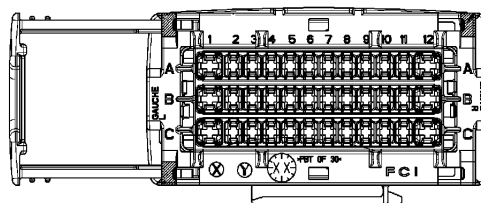
Cabin area

Above the windscreen in the centre area of the vehicle behind the roof lining, are the connecting connectors and wiring for the rear area.

Position details of the 36-way connector



Details of the 36-way connector

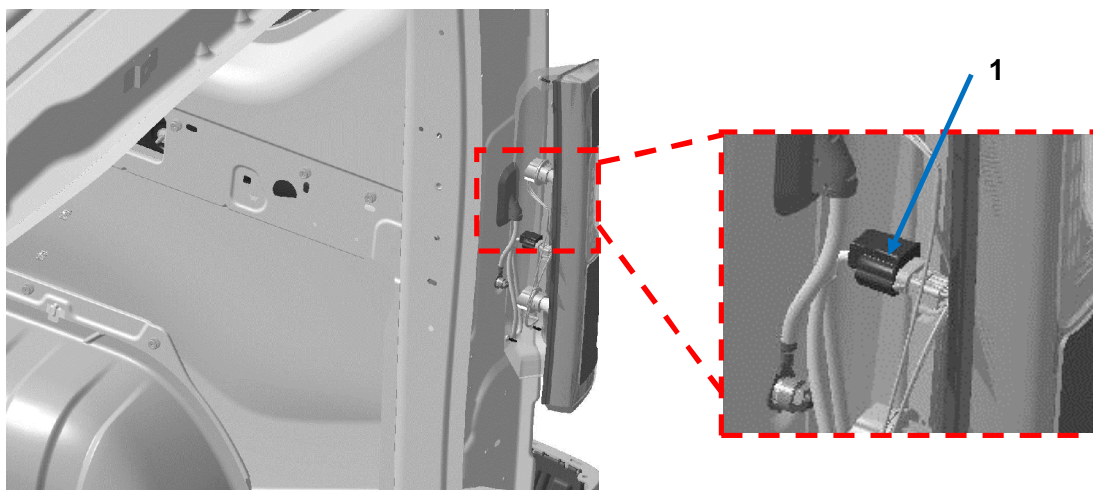


Ways	Connections	Allocations
A1 :	15LP	Rear screen de-icing/demisting control
A2 :	9BC	Trailer fog light control via towing module
A3 :	38MN	One-speed blower for rear additional heater
A4 :	38MP	Two-speed blower for rear additional heater
A5 :	38MQ	Three-speed blower for rear additional heater
A6 :	AP41	+ APC fuse protection air conditioning ECU
A7 :	34D	+ Signal Rear right-hand speaker
A8 :	34C	- Signal Rear right-hand speaker
A9 :	34B	- Signal Rear left-hand speaker
A10 :	34A	+ Signal Rear left-hand speaker
A11 :	65AA	+ Control trailer brake light via towing module
A12 :	SP4A	+ Protected relay & + Combi rear accessory socket (J82)
B1 :	BMT4	+ Bat engine running Accessory socket Panel van loading area (F82)
B2 :	H66P	+ Control reversing light
B3 :	LPAR	Protected rear side light
B4 :	LPDB	Right-hand trailer side light via towing module
B5 :	65G	+ Brake lights
B6 :	LPH	Side lights Number plate lights
B7 :	20S	Authorised power, tailgate or compartment door opening motor
B8 :	9P	+ Control protected rear fog light
	9BA	+ Control Rear right-hand fog light control via towing module
B9 :	64DA	Rear right-hand indicator light control via towing module
	64D	Right-hand direction indicator control
B10 :	64CA	Rear left-hand vehicle direction indicator light control via towing module
	64C	Left-hand direction indicator control
B11 :	20D	+ Control electric door locking
B12 :	BP47	+ Protected battery & + Trailer (pre-equipped for after-sales)
C1 :	36E	+ Control rear screen wiper time-delay
C2 :	36A	+ Control rear screen wiper
C3 :	13E	- Control ceiling light time-delay (EMPT20)
C4 :		
C5 :	13 <sup>E</sup>	- Control ceiling light time-delay (EMPT10)
C6 :	BPT2	+ Protected battery ceiling light time-delay
C7 :	20AR	Compartment door super-locking motor control
C8 :	87T	Ignition switch 1 notch signal compartment door or tailgate
C9 :	151T	Caravan present signal
C10 :	133B	Instrument panel CANH signal Electric Central Unit
C11 :	133C	Instrument panel CANL signal Electric Central Unit
C12 :	AP9	+ Protected after ignition rear screen wiper.



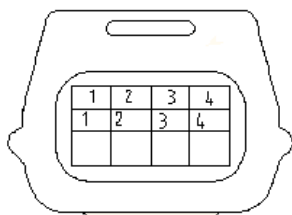
## Rear upper section area

This information is also available for the rear right-hand and left-hand lights.



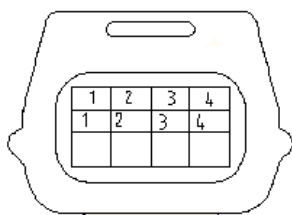
1 :	4-way connector (right-hand side)
-----	-----------------------------------

### Light connection rear right-hand upper section (1)



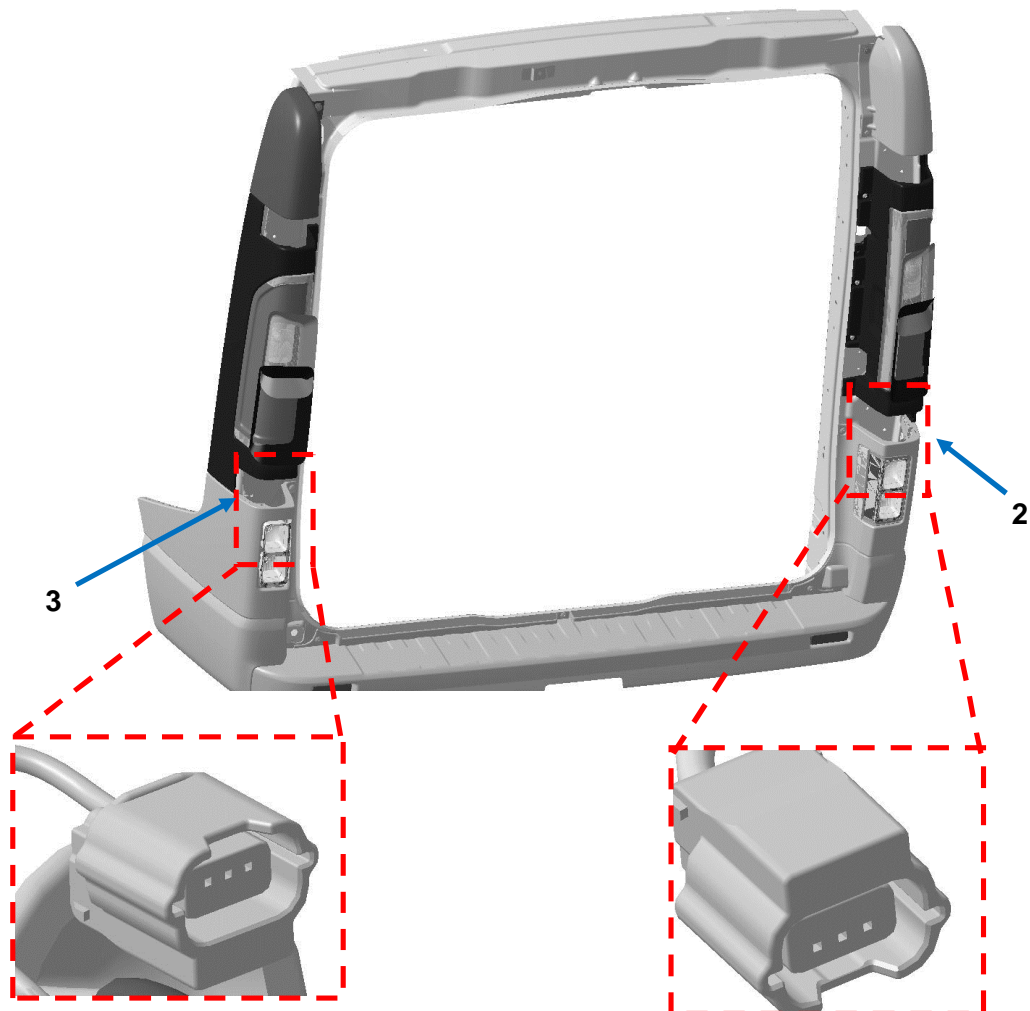
Way	Connection	Allocations
1 :	MF	Ground
2 :	LPAR	Side light
3 :	65G	Brake light
4 :	64D	Direction indicator lights

### Light connection rear left-hand upper section (1)

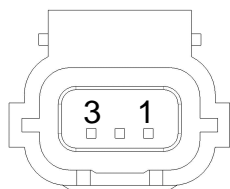


Way	Connection	Allocations
1 :	MG	Ground
2 :	LPAR	Side light
3 :	65G	Brake light
4 :	64D	Direction indicator lights

Rear lower section area

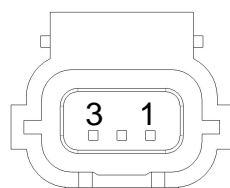


Lower rear right-hand light connection (2)



Way	Connection	Allocations
1:	MG	Ground
2:	9P	Rear fog light
3:	H66P	Reversing light

Lower rear left-hand light connection (2)



Way	Connection	Allocations
1:	MG	Ground
2:	9P	Rear fog light
3:	H66P	Reversing light

#### Electrical currents available for the rear lights

- Vehicles with towing socket: each of these connections must be used to control a single relay (no power available).
- Vehicles without towing socket: it is possible to connect onto each link a consuming unit with power equal to that of the bulbs on the towing device, i.e.:
  - Left-hand side light connection: 1 x 5W consumer
  - Right-hand side light connection: 1 x 5W consumer
  - Brake light link: 2 x 21W consumer (or 1x consumer of 42W)
  - Reversing light connection: 1 x 21W consumer
  - Left-hand direction indicator: 1 x 21W consumer
  - Right-hand direction indicator: 1 x 21W consumer
  - Fog light: 1 x 21W consumer

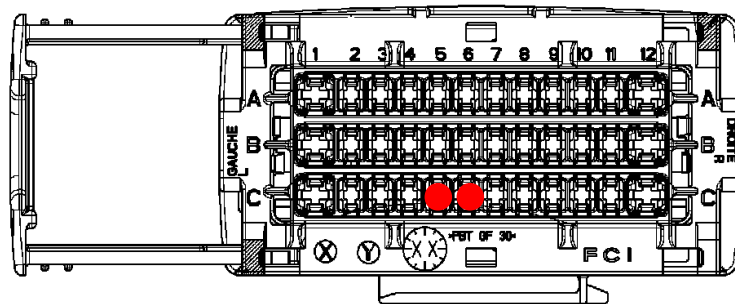
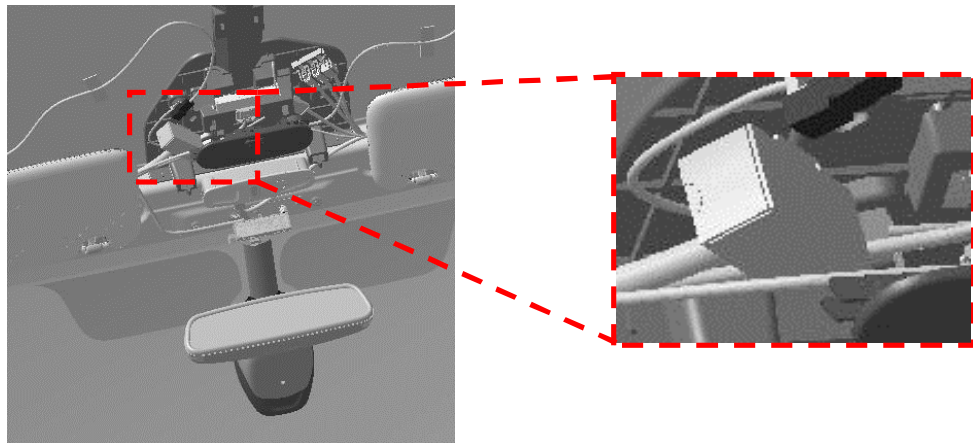
#### 4.11.2. INTERIOR LIGHTING: ADDING OR MODIFYING

##### Energy recovery conditions

- The total number of electrical consumers must not exceed 30 W
- The progressive ground is a timed analogue signal. Under no circumstances may this signal be relayed.
- Each of these wires may be lengthened by 3 metres (max.) and an over-consumption not exceeding 500 mA (6 W) may be taken from each.
  - The timed power supply should control a relay that will control another power supply.
  - A specific ground should be used (the progressive ground will no longer be usable).
  - If open door information is required, a panel switch should be added. The door switches built into the locks are not capable of powering the ceiling lights

### Electrical information from the ceiling lights

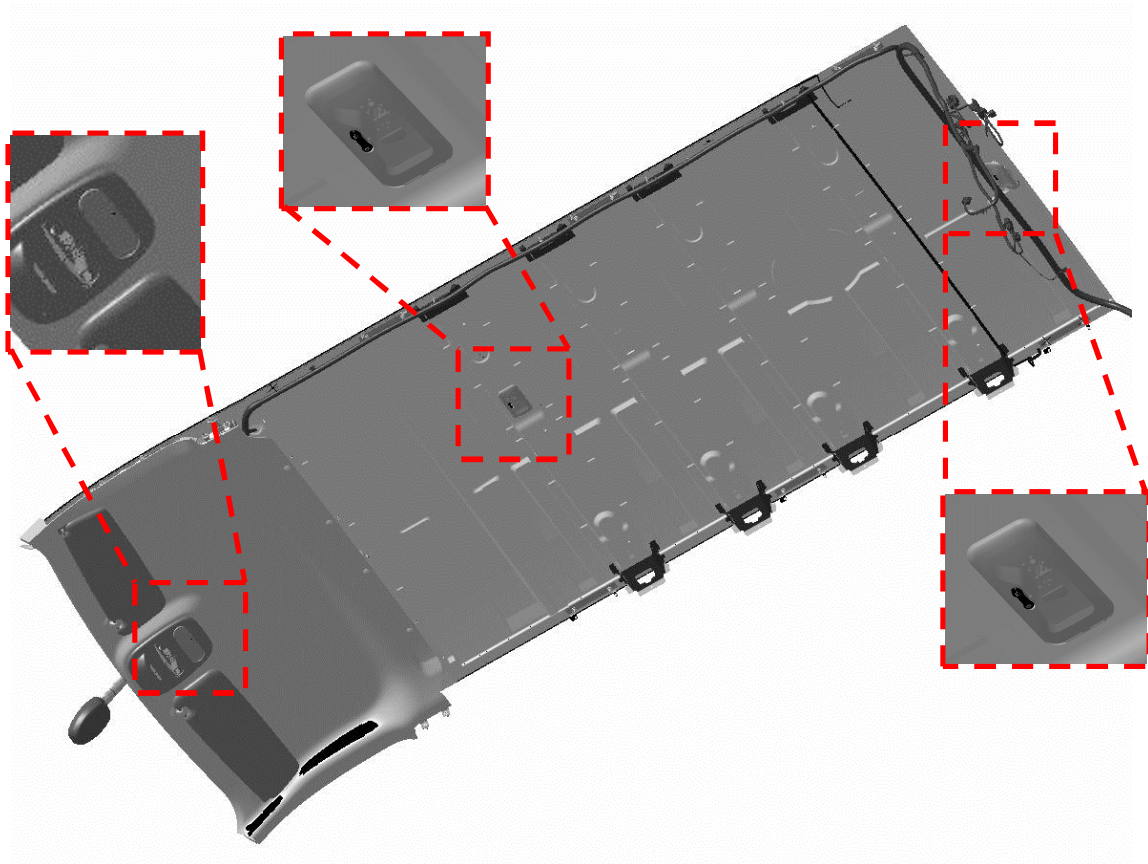
Above the windscreen in the centre area of the vehicle behind the roof lining, are the 36-way connectors and wiring for the rear area.



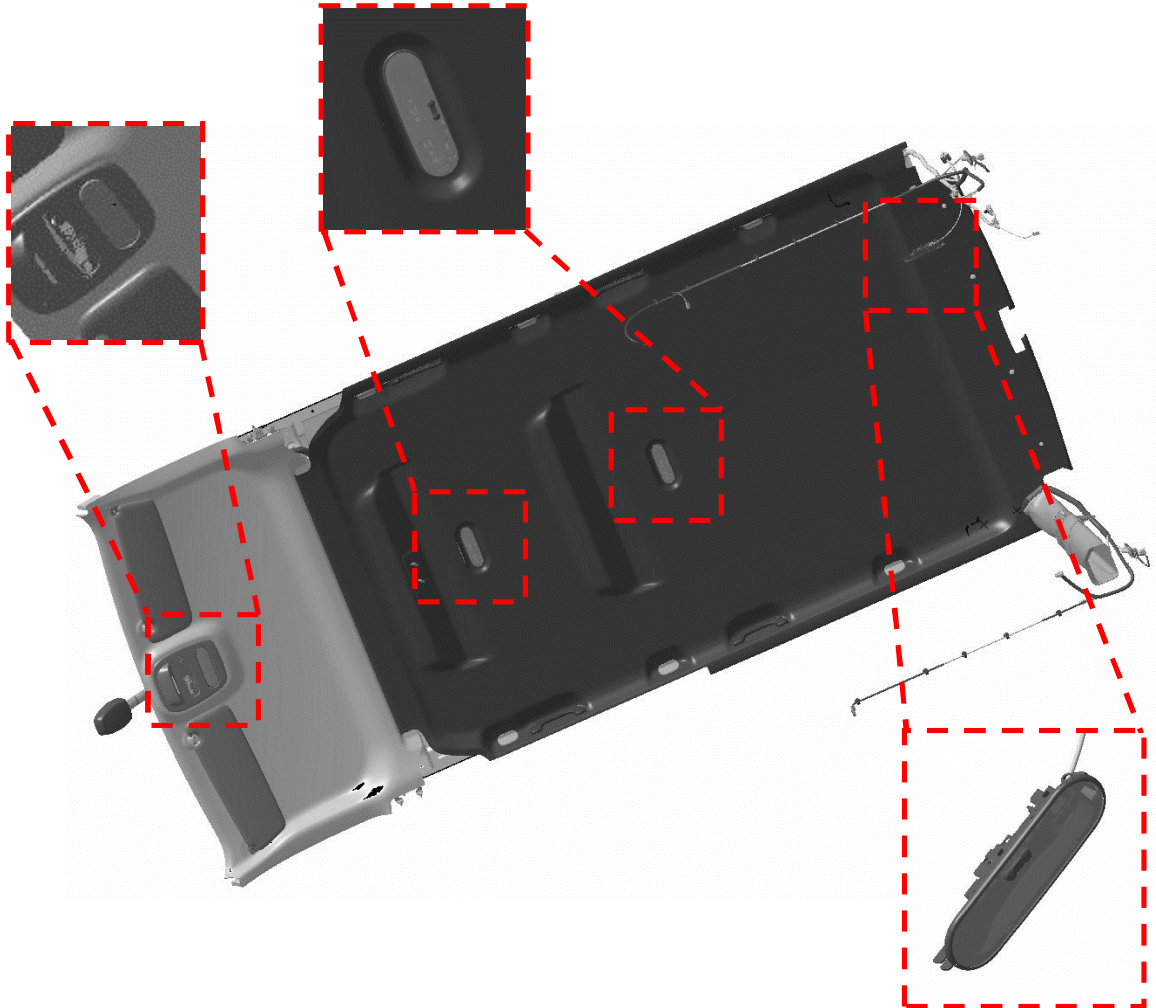
Way	Connection	Allocation
C5	13E	Progressive active ground when door opens and degressive when door closes or +APC.
C6	BPT2	+12V Timed

## Distribution of ceiling lights

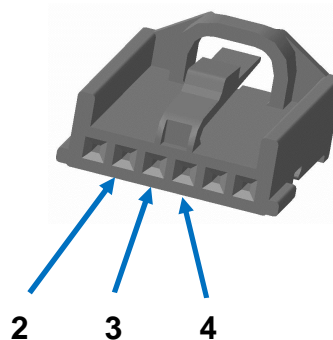
### Panel Van



Combi



Ceiling lights connector excluding cab



Way	Connection	Allocation
2	13E	Progressive active ground when door opens and degressive when door closes or +APC
3	M*	Permanent ground
4	BPT2	+12V Timed



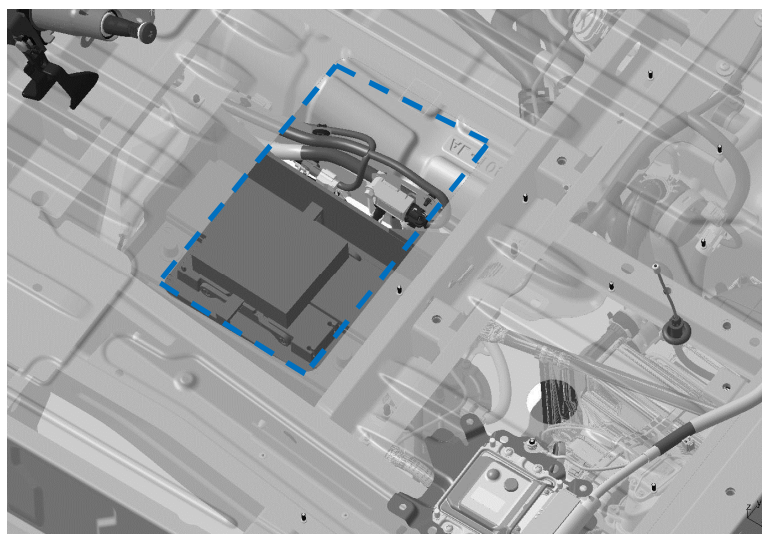
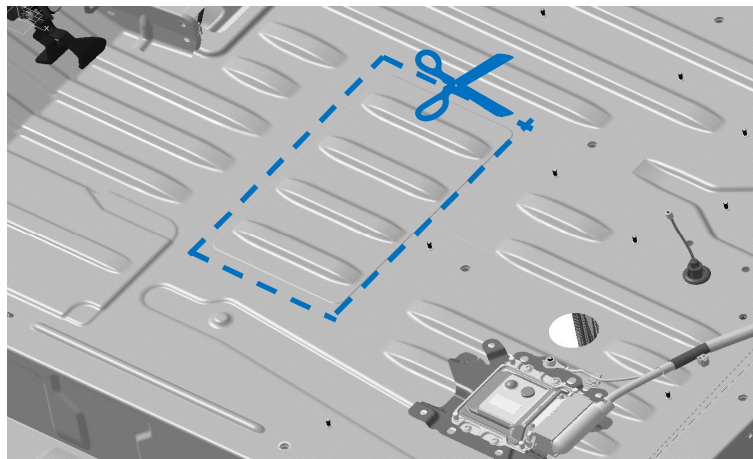
#### 4.12. ADDITIONAL BATTERY

There is a space between the side panels underneath the driver's side floor panel on the left-hand drive version and underneath the passenger side floor panel on the right-hand-drive version to fit an additional battery (L4 maximum = 315 mm).

#### ADDITIONAL BATTERY LOCATION

##### Cabin area

Cut out the floor panel in the flat area as shown and create a flap in the floor panel for access to the terminals of the additional battery.

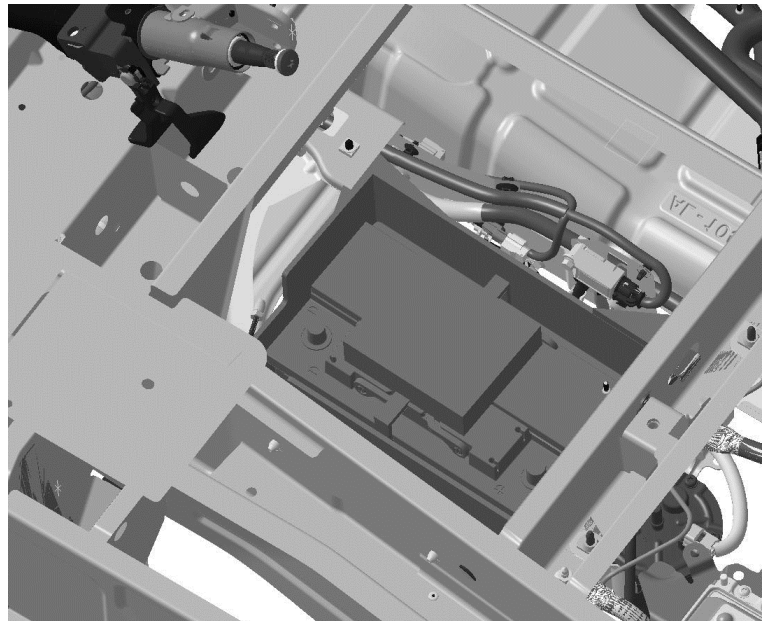




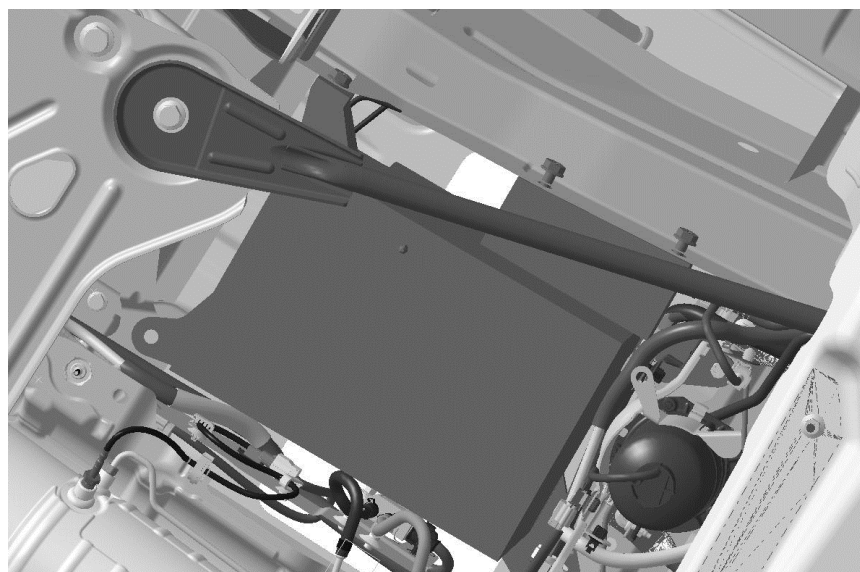
### ADDITIONAL BATTERY POSITION

The battery tray and its fixings are shown for example only and remain the responsibility of the bodybuilder.

Floor panel view



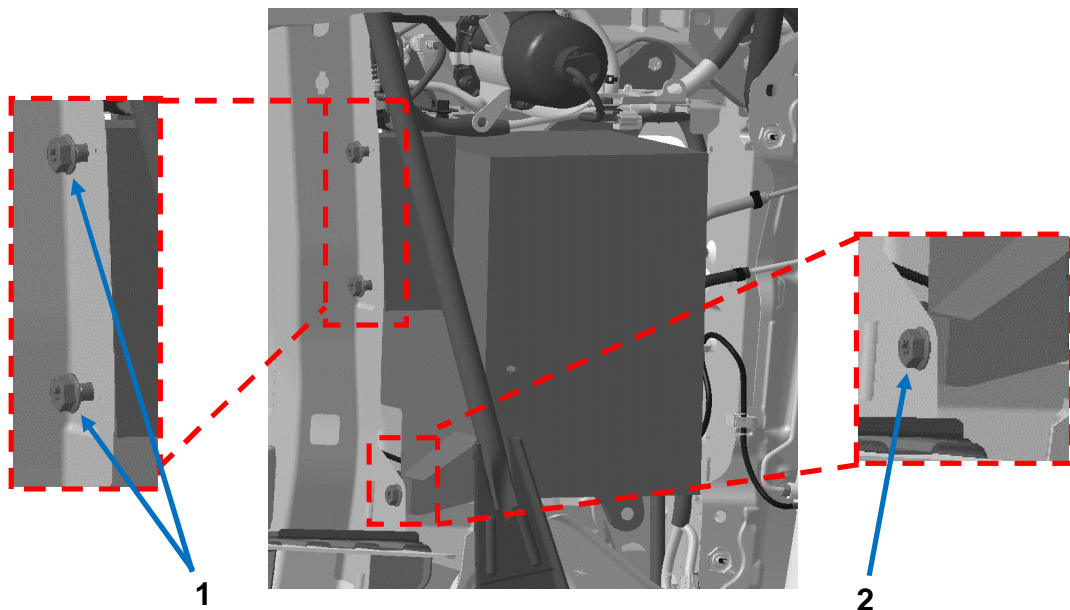
View from underneath the vehicle



### ADDITIONAL BATTERY INTERFACES AND FIXINGS

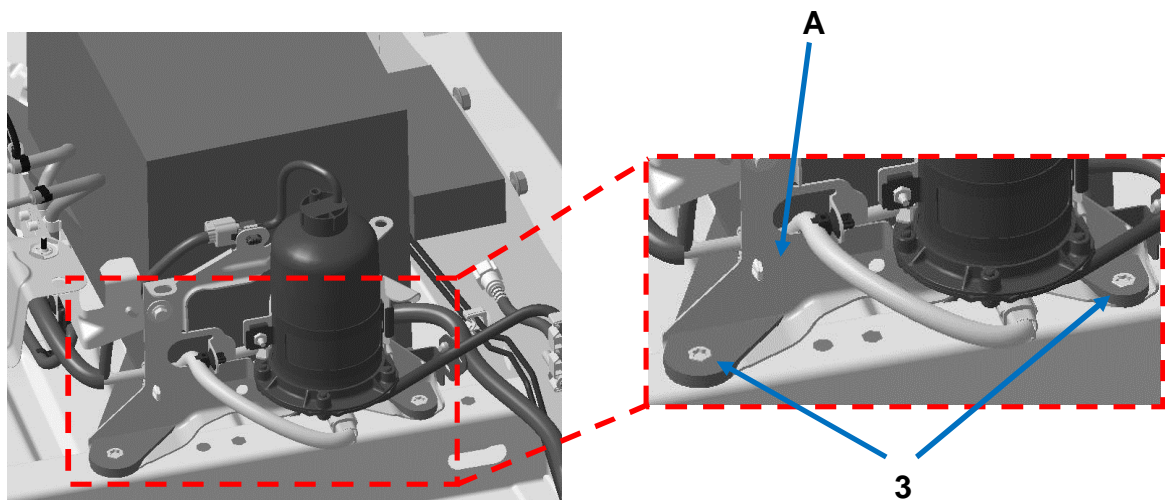
Shown below are various fixing points that can be used for making and securing an additional battery tray, given as an example.

Left-hand side member side



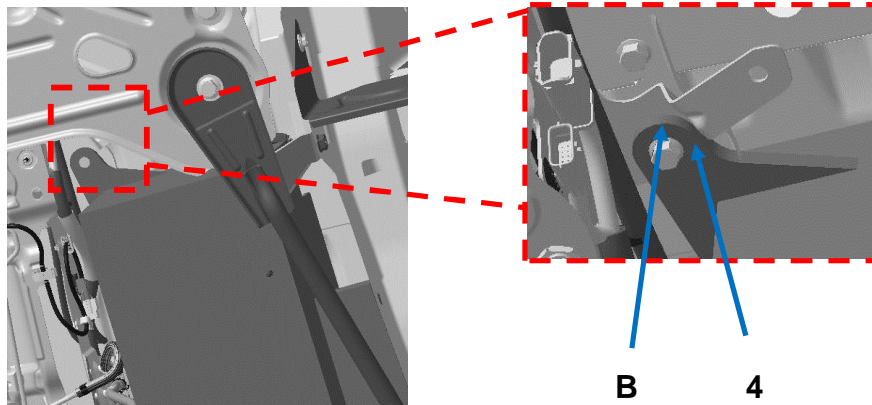
Fixing points (1) and (2) using the existing holes on the left-hand side member

Rear side on fuel filter bracket support



For these two fixings, it is necessary to remove the fuel filter support bracket (A) in order to sandwich-fit the battery tray fixings (3)

Front side on cross member



Remove the fixing (B) from the front left-hand heat shield support bracket to re-use the battery tray fixing (4)

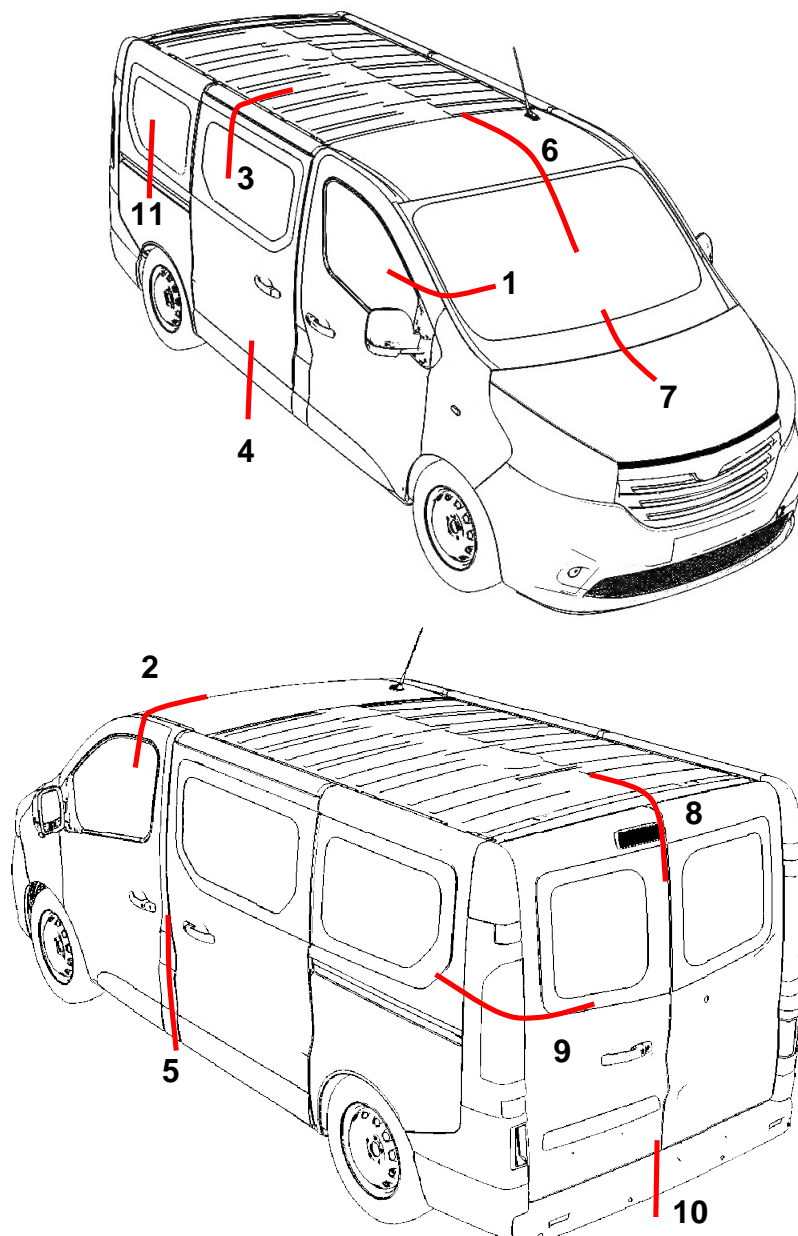
5. FOR BODYWORK CONVERSIONS

5.1. DESIGN STRUCTURE / GLAZED AND SOLID SIDE PANELS

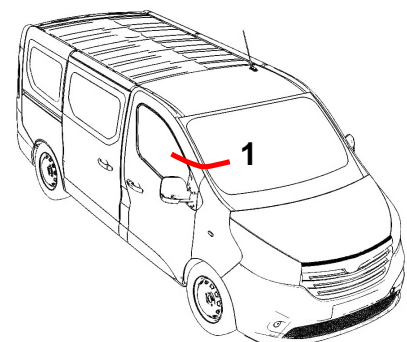
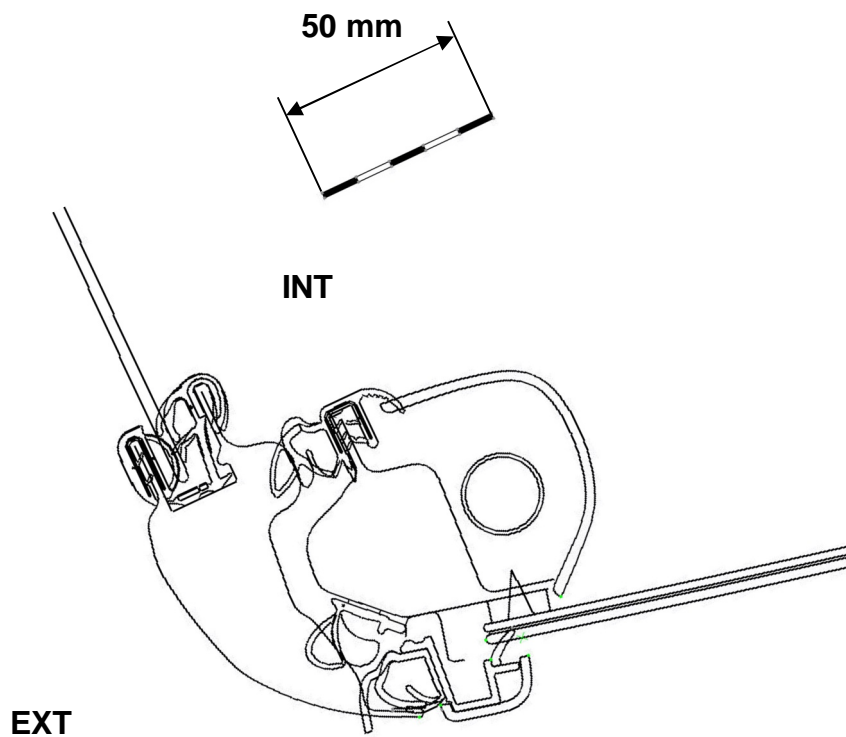
5.1.1. DESIGN STRUCTURE

The various standard sections of the van are shown on the diagram below.

STANDARD SECTION OF BASIC PANEL VAN

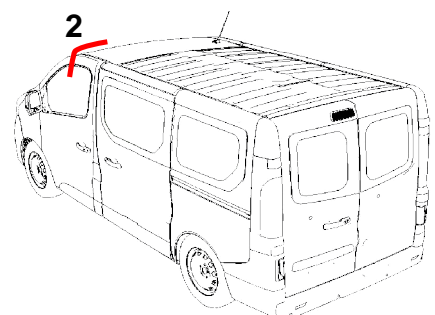
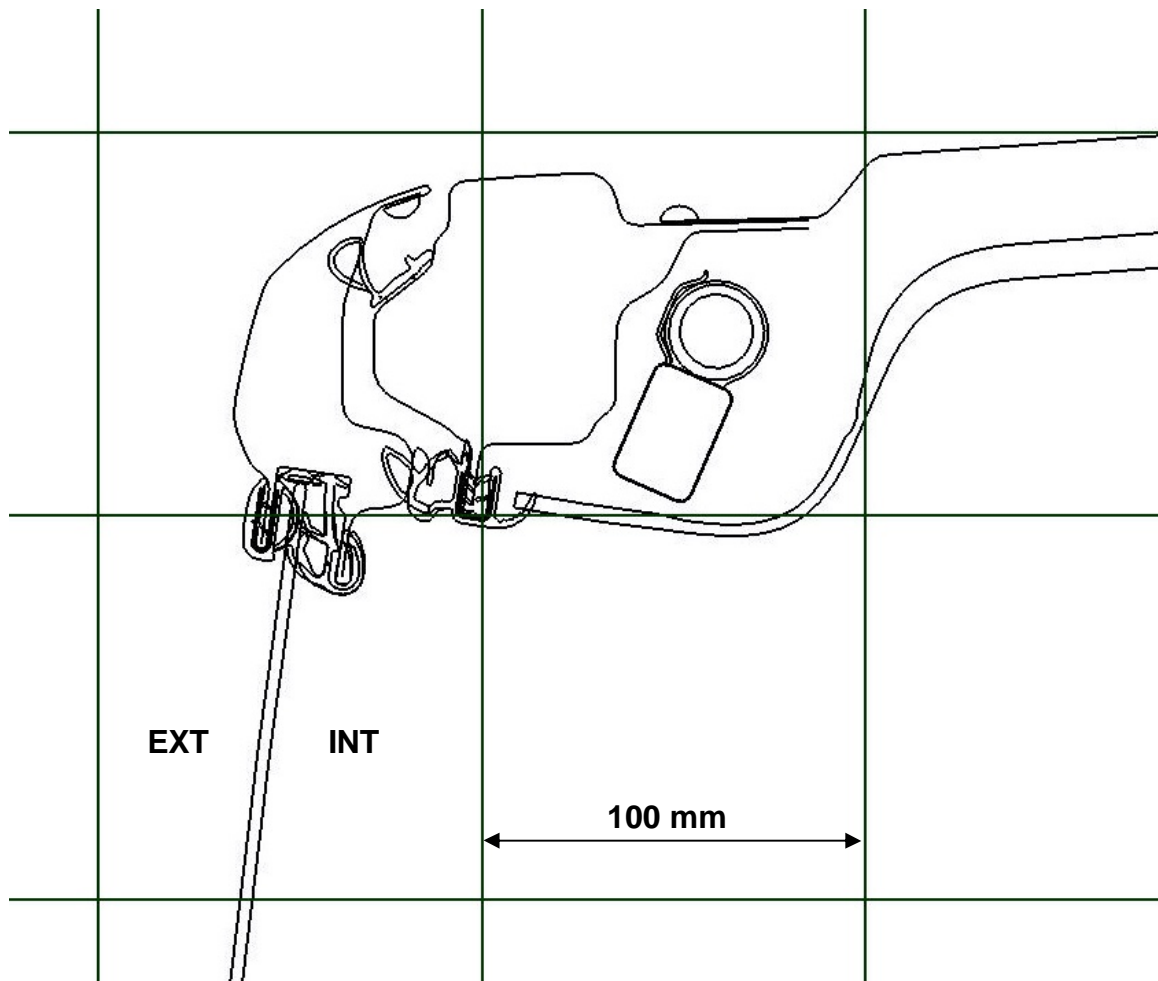


SECTION 1  
"WINDSCREEN PILLAR"

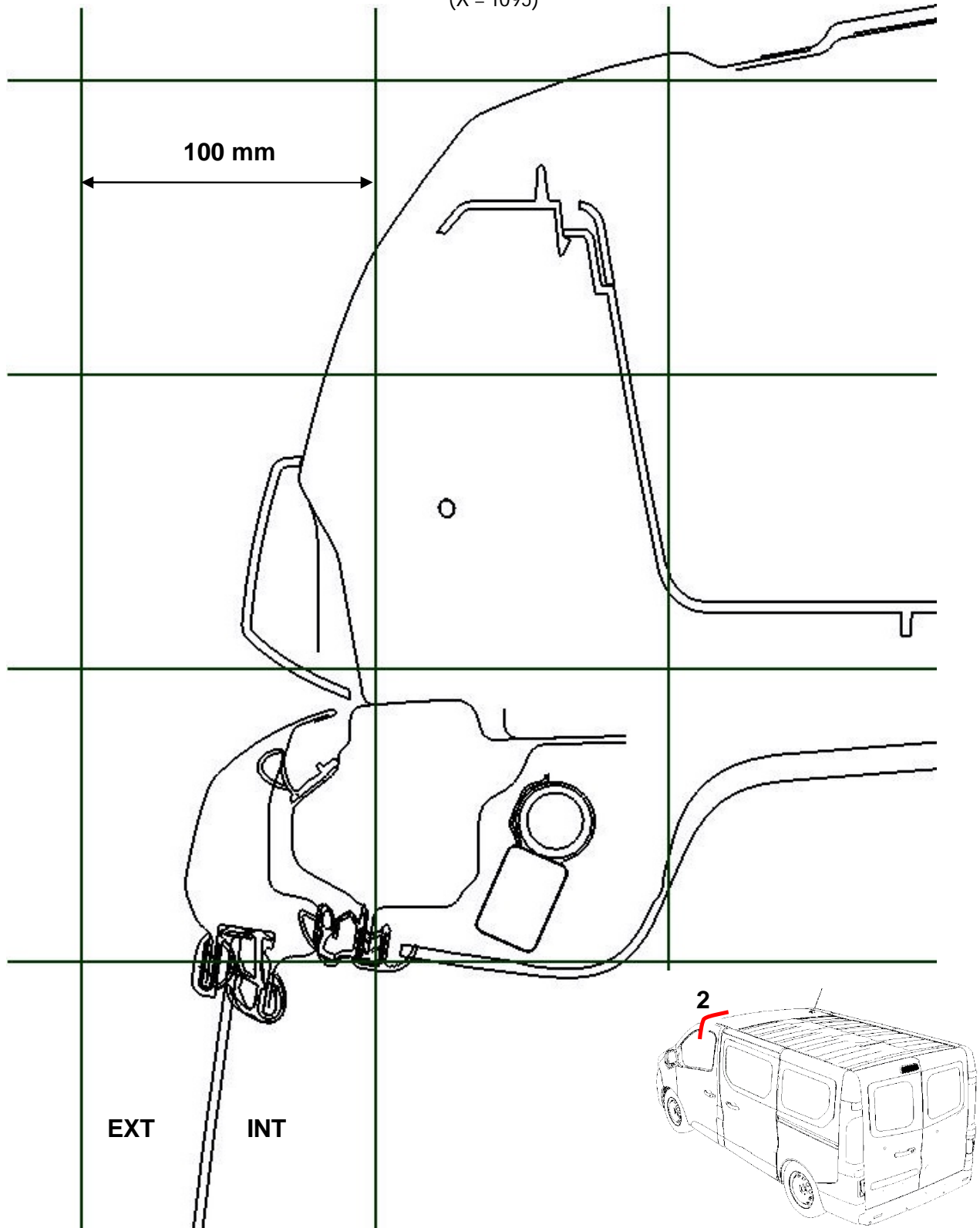




SECTION 2  
"SIDE ROOF RAIL OF FRONT DOOR – VERSION H1"  
(X = 1095)

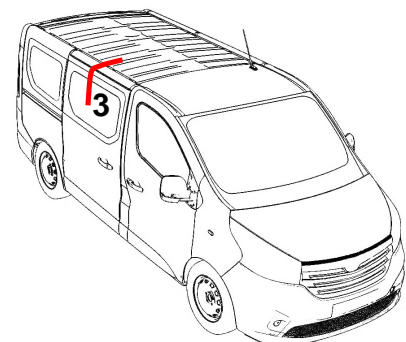
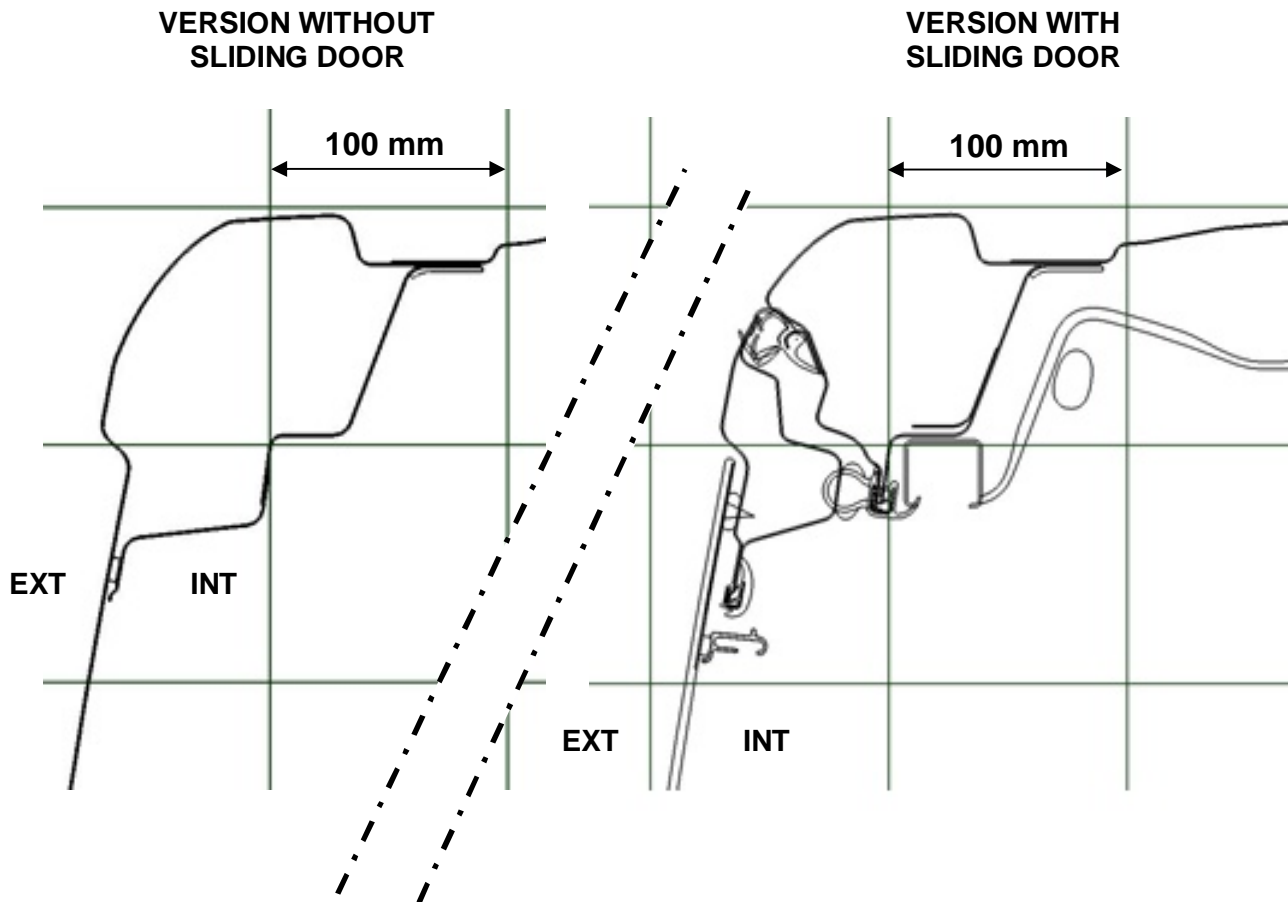


SECTION 2  
"SIDE ROOF RAIL OF FRONT DOOR – VERSION H2"  
(X = 1095)

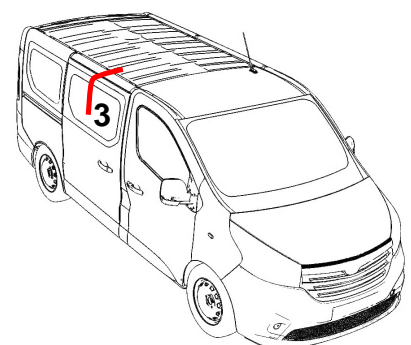
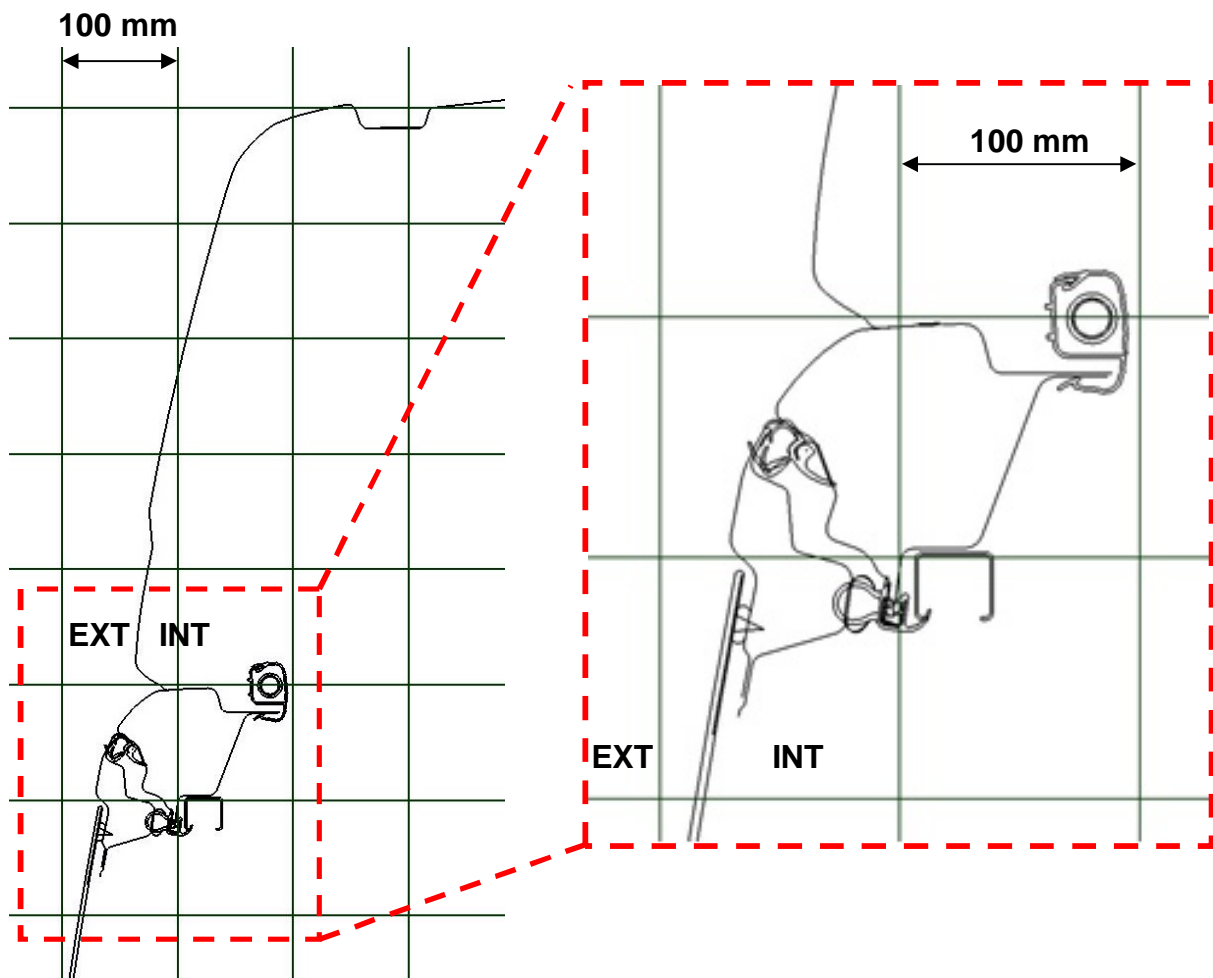




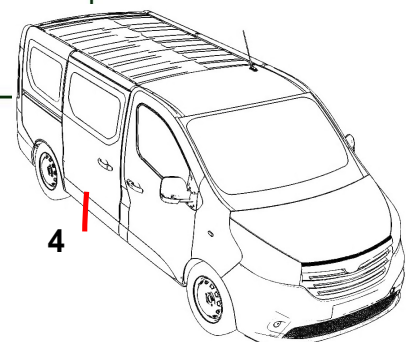
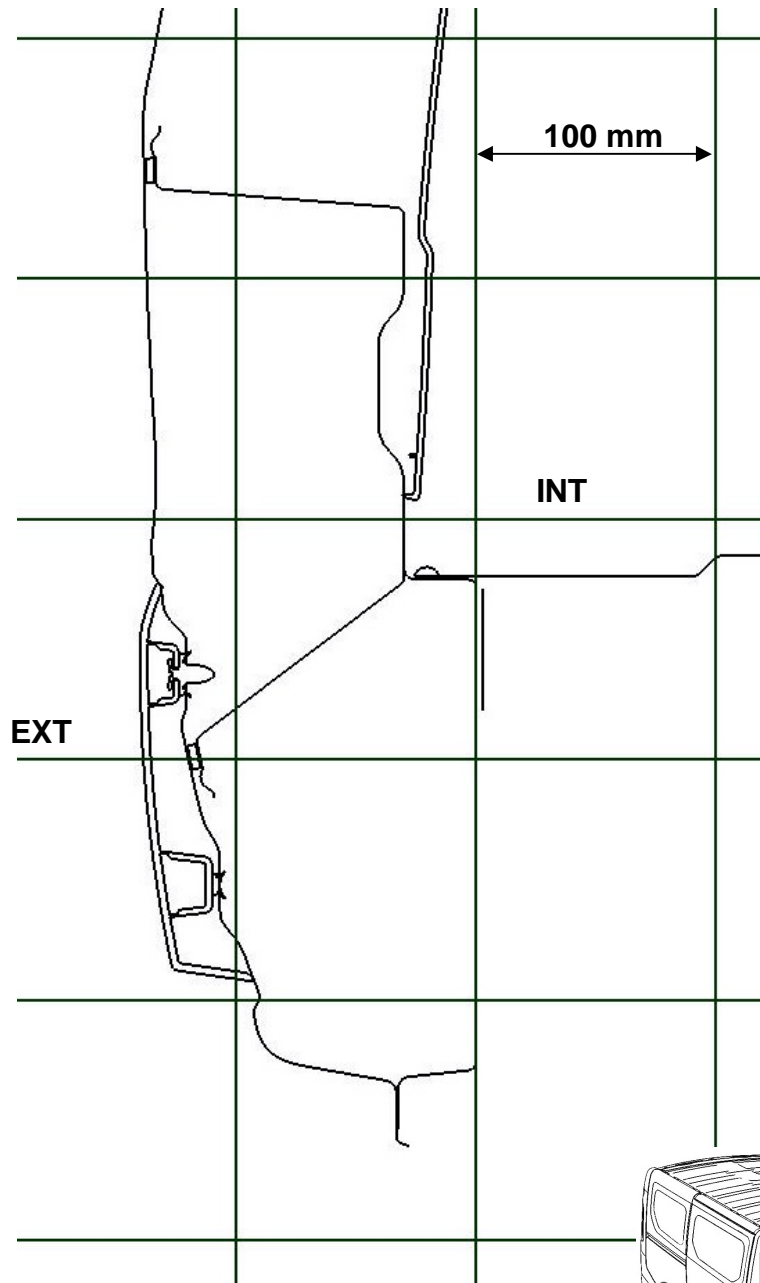
SECTION 3  
"REAR SIDE ROOF RAIL – VERSION H1"  
(X = 2056)



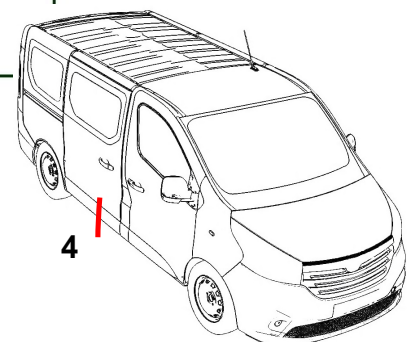
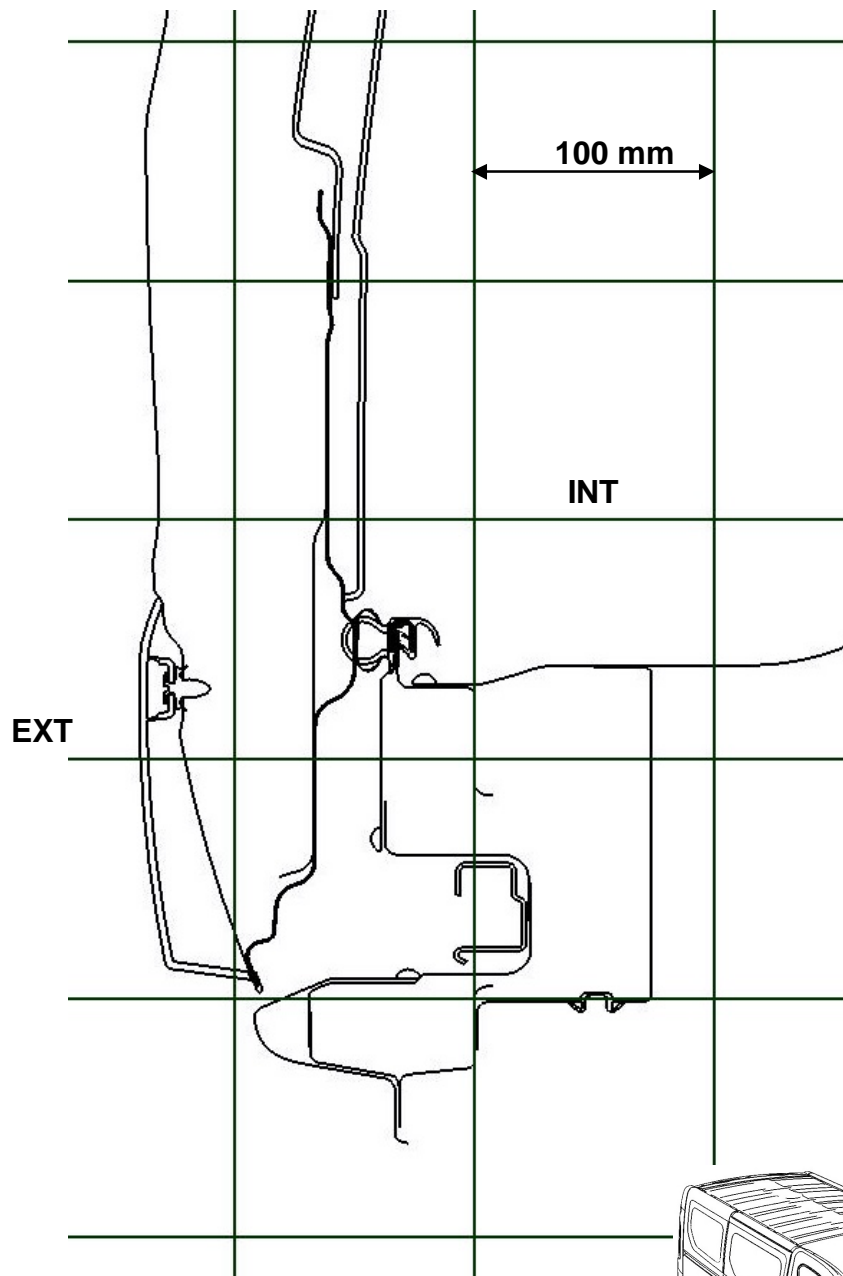
SECTION 3  
"REAR SIDE ROOF RAIL – VERSION H2"  
(X = 2056)



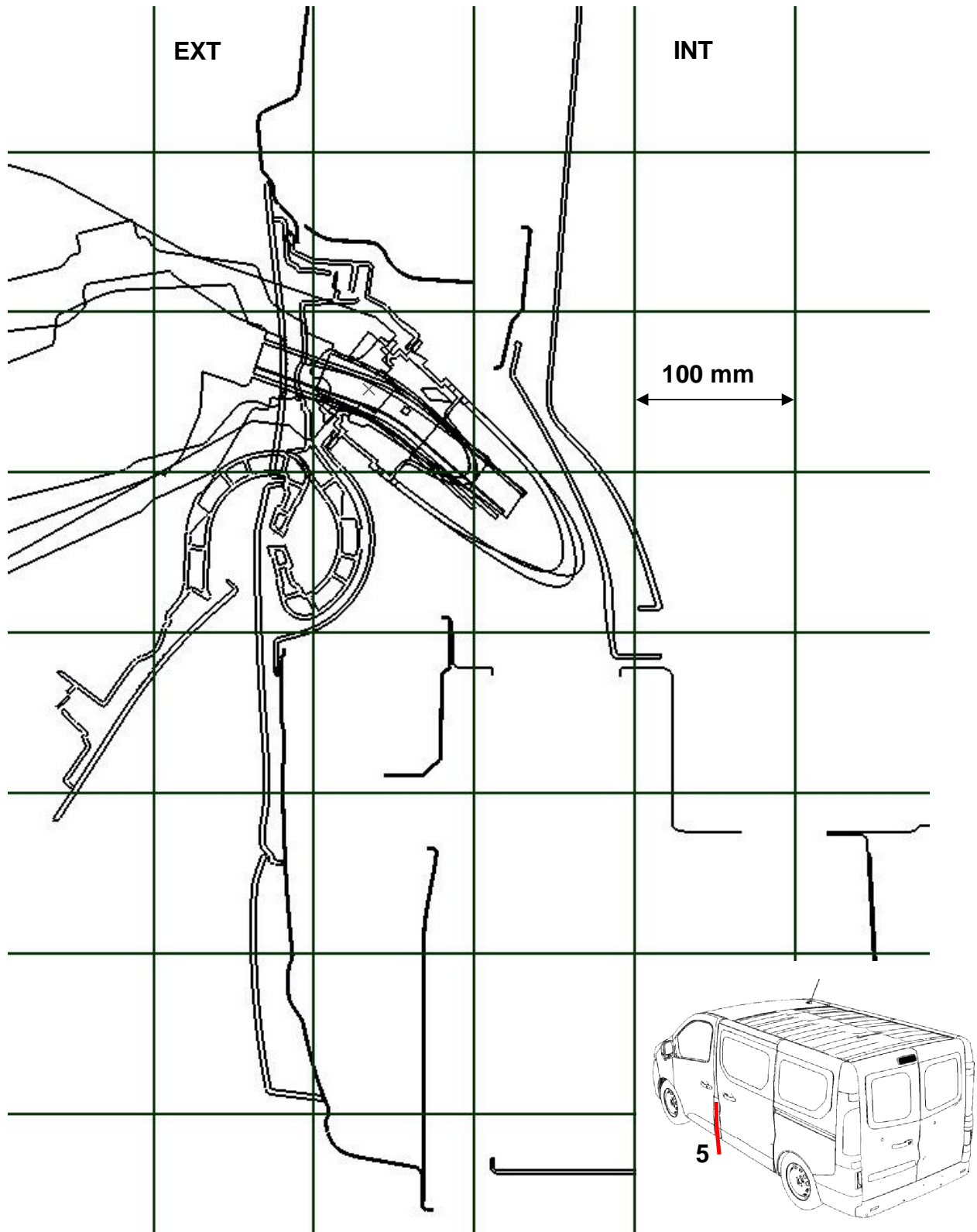
SECTION 4  
"LOWER SIDE SILL, FIXED SIDE PANEL"  
(X = 2075)



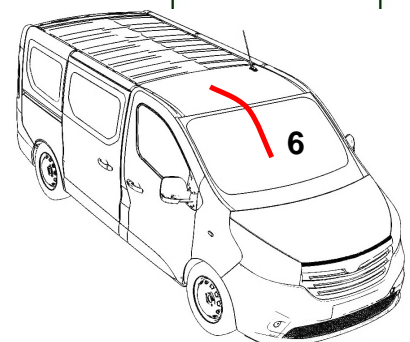
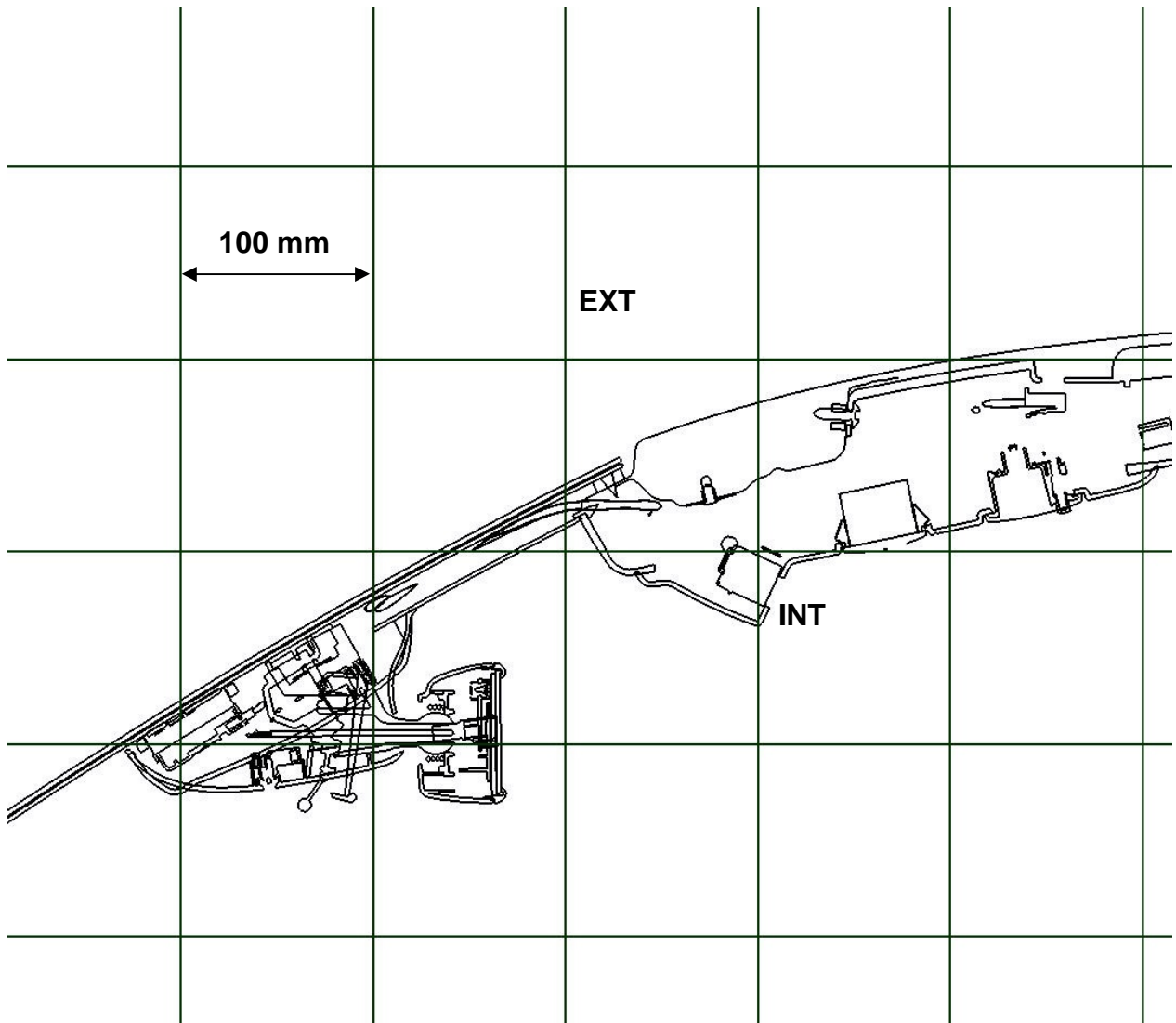
SECTION 4  
"LOWER SIDE SILL, SLIDING SIDE DOOR"  
(X = 1670)



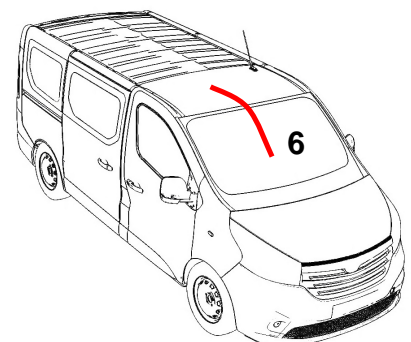
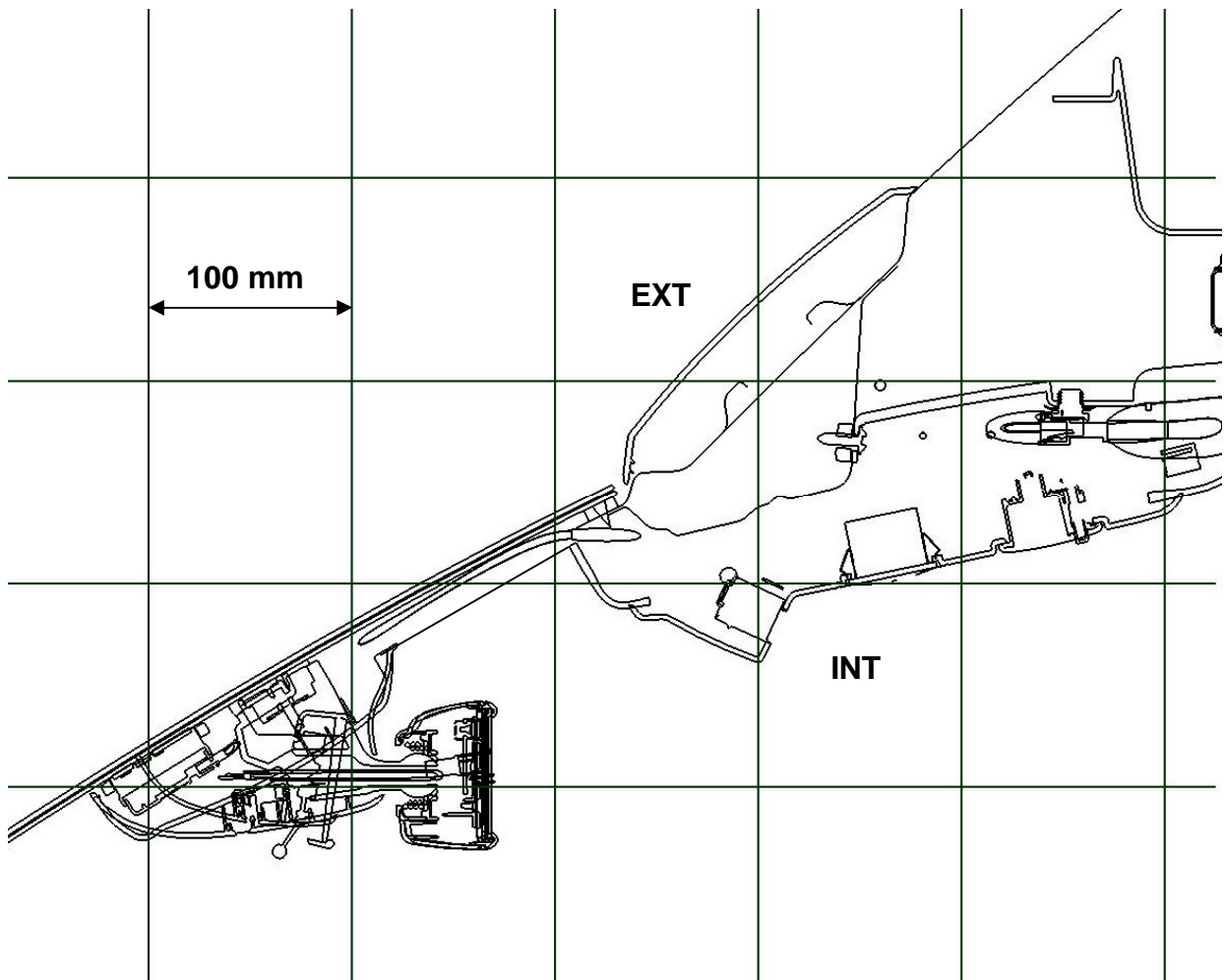
SECTION 5  
"FUEL FILLER FLAP"  
(X = 1388.1)



SECTION 6  
"ROOF PANEL – VERSION H1"  
(Y = 0)

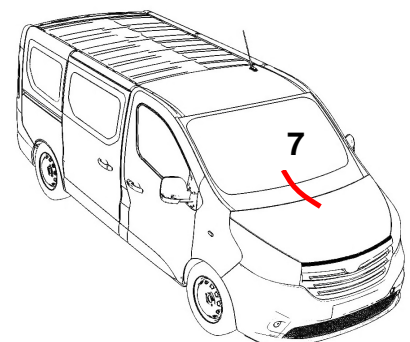
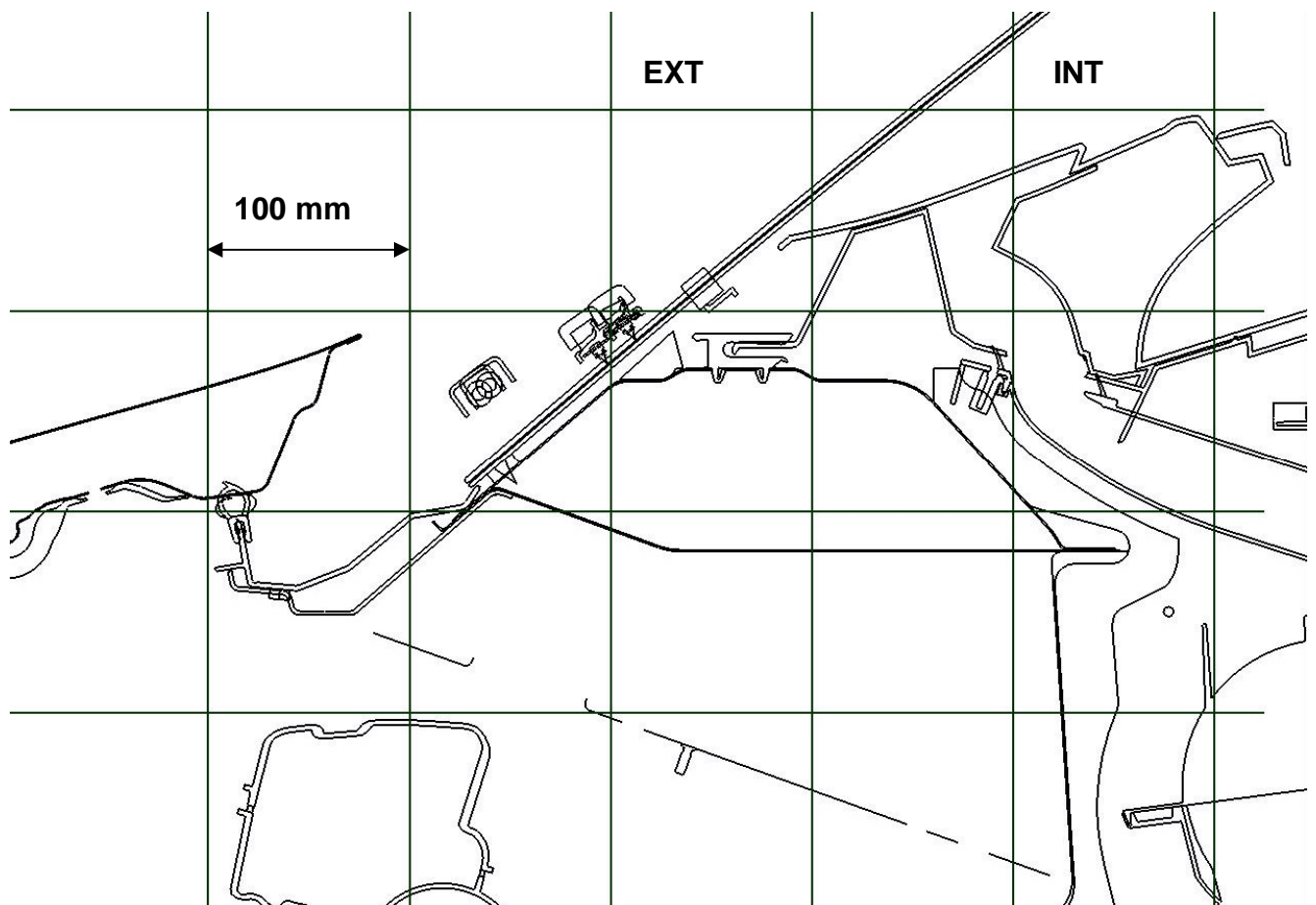


SECTION 6  
"ROOF PANEL – VERSION H2"  
(Y = 0)

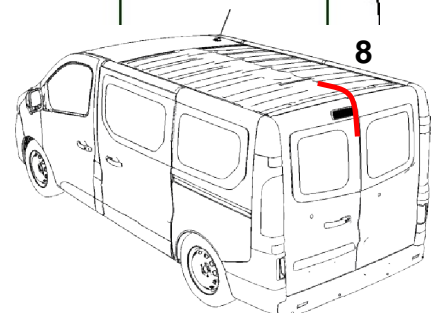
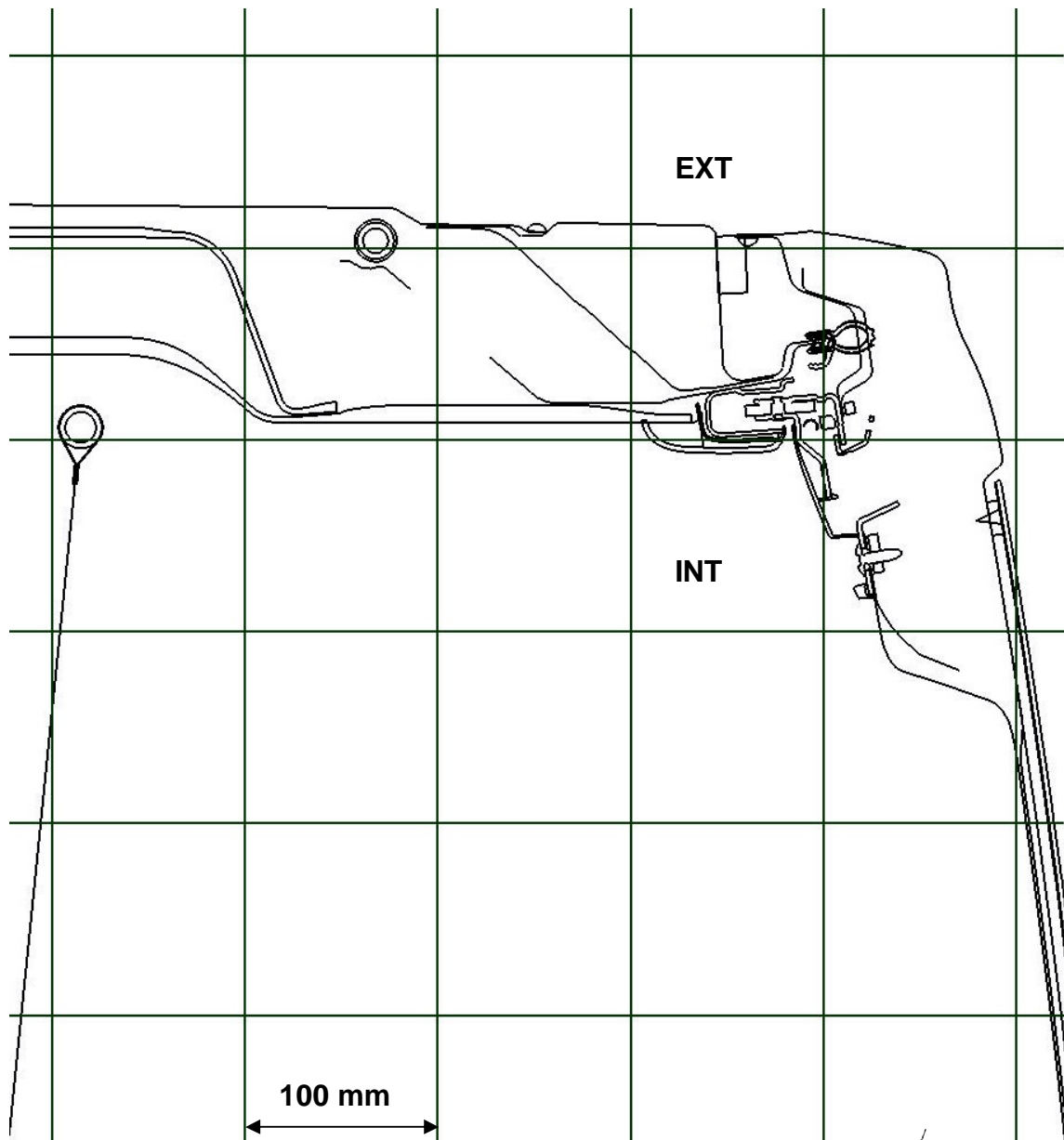




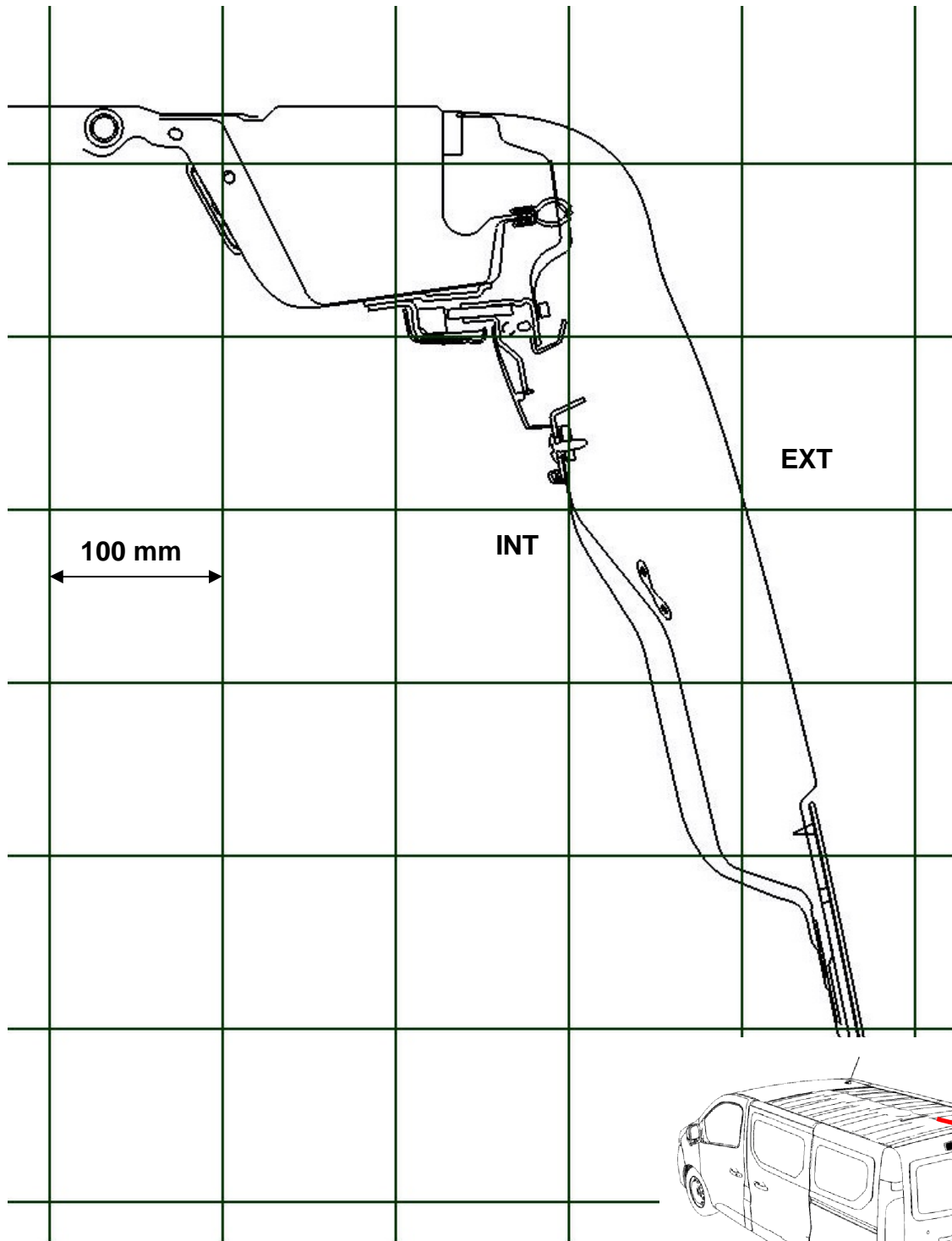
SECTION 7  
"AREA BELOW WINDSCREEN"  
(Y = 0)



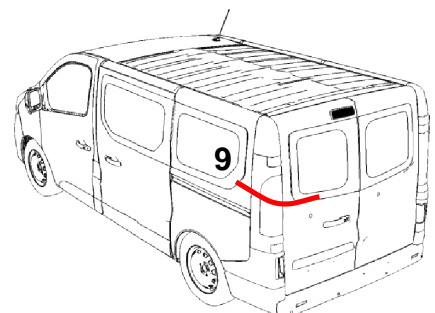
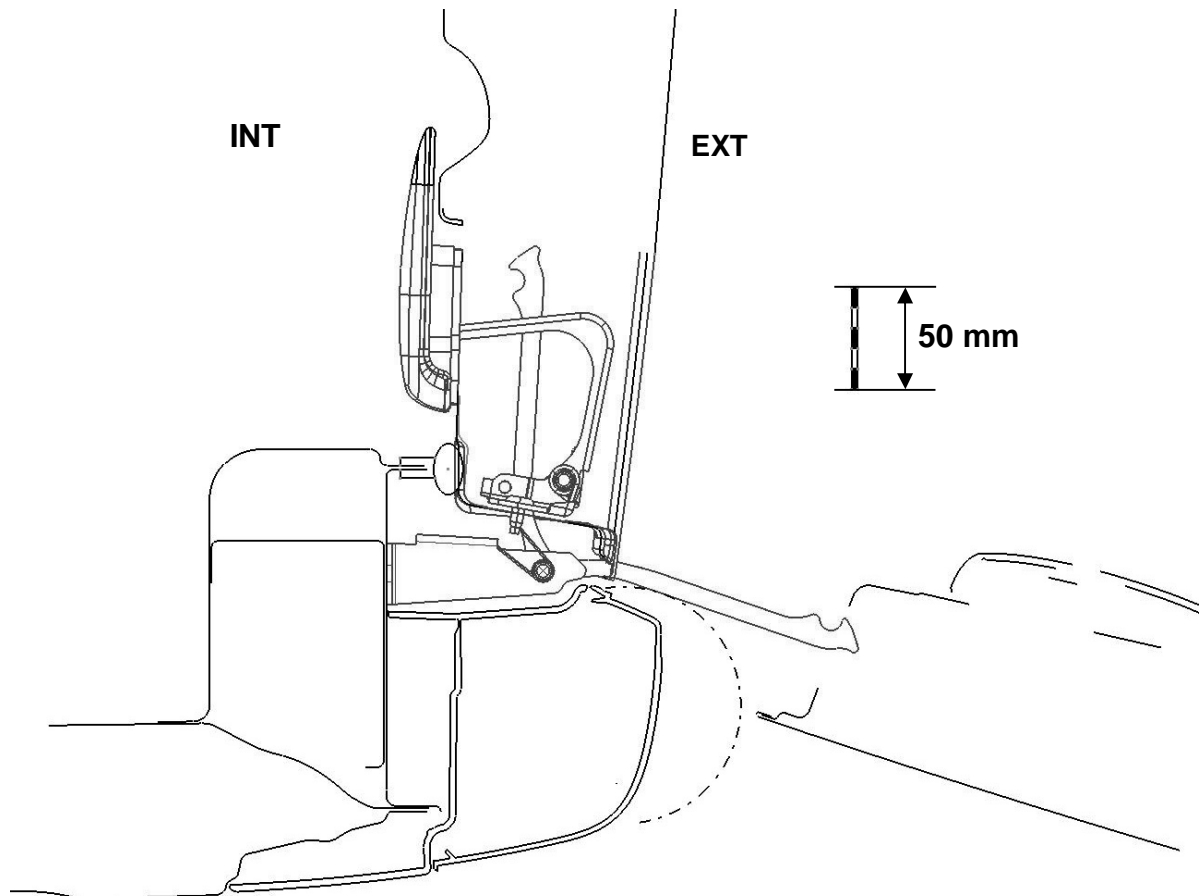
SECTION 8  
"REAR UPPER CROSS MEMBER – VERSION H1"  
(Y = 42)



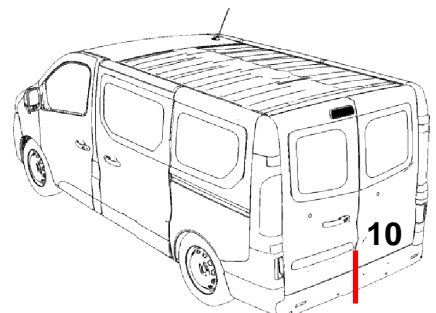
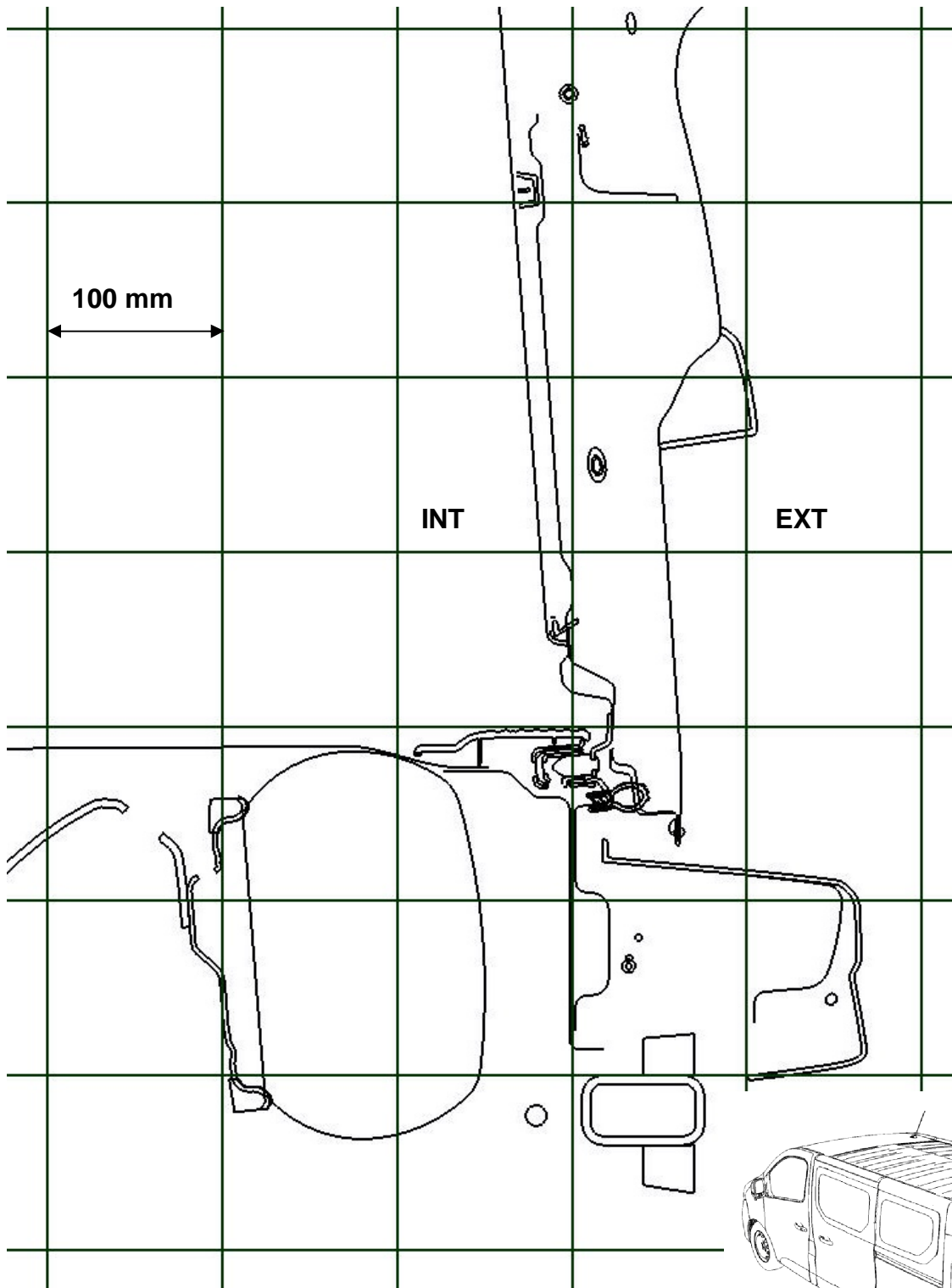
SECTION 8  
"REAR UPPER CROSS MEMBER – Version H2"  
(Y = 65)



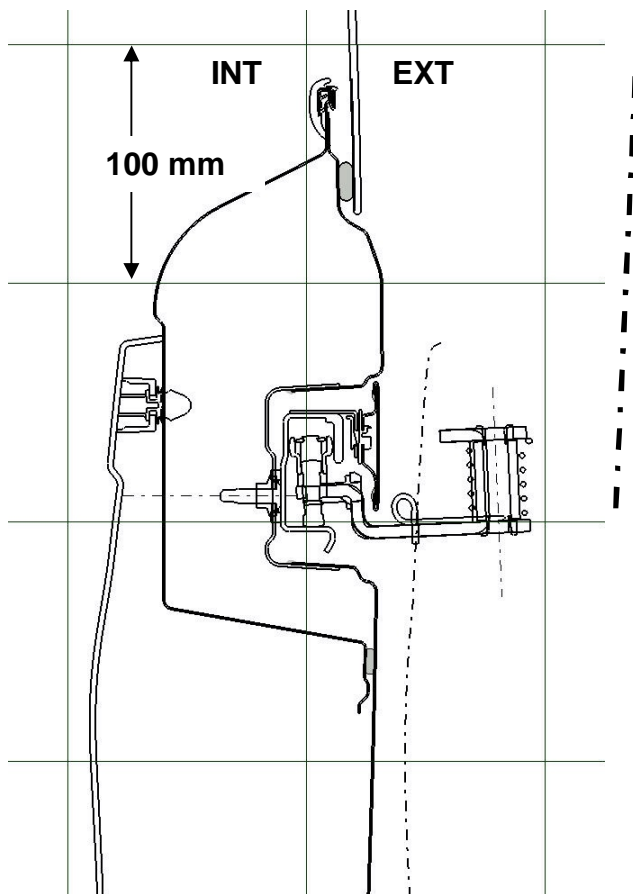
SECTION 9  
"REAR LIGHT/DOOR STOP"



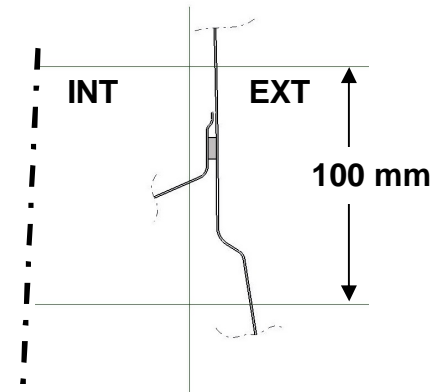
SECTION 10  
"REAR LEFT-HAND DOOR LOWER DOOR STOP" (Y = -127)



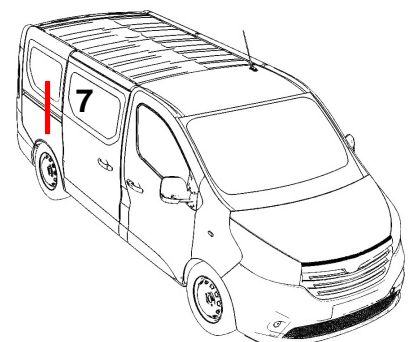
SECTION 11  
"SLIDING SIDE DOOR CENTRE RAIL"  
(X = 3101)



**VERSION GLAZED**



**VERSION SOLID PANEL**



### 5.1.2. GLAZED AND SOLID SIDE PANEL INSERTS

To add glass panels to a panel van, it is recommended to:

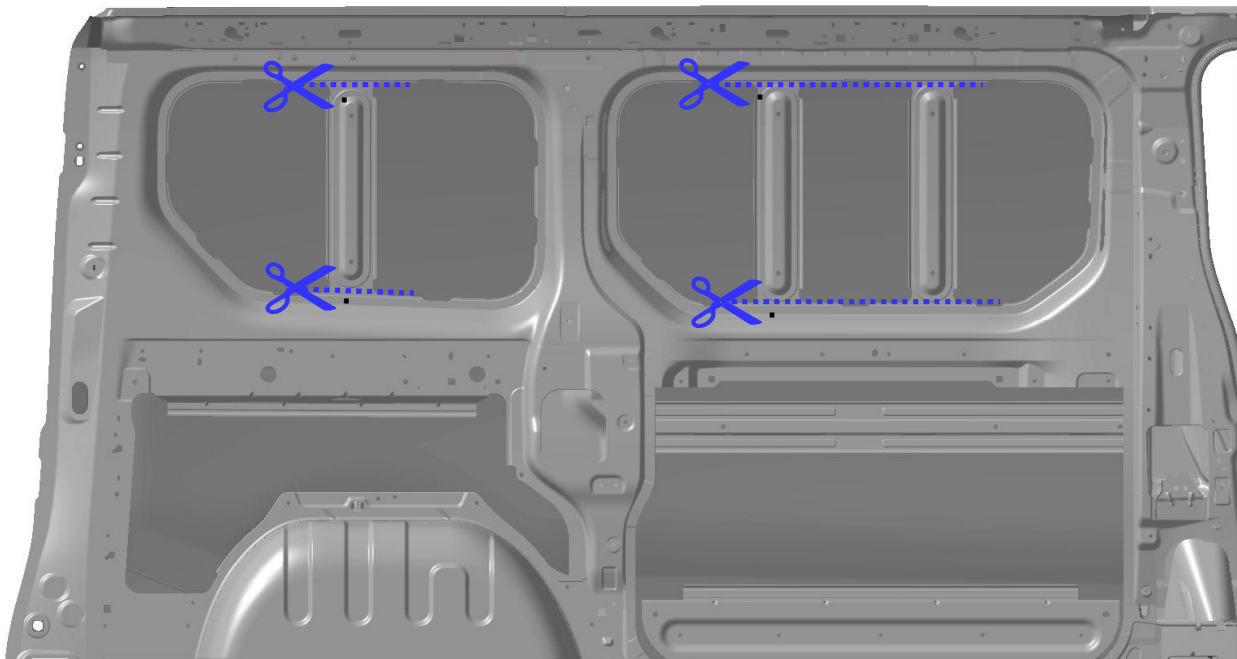
- cut out the vertical stiffeners,
- cut out an opening in the side panel in the shape of the glazed versions of the VIVARO for bonded glass panels or the shape of the glass panel for fitted windows.
- protect the cut-out sections from corrosion. Please refer to the "Anti-corrosion" data sheet

Local reinforcement of the frame structure may be required.

Warning:

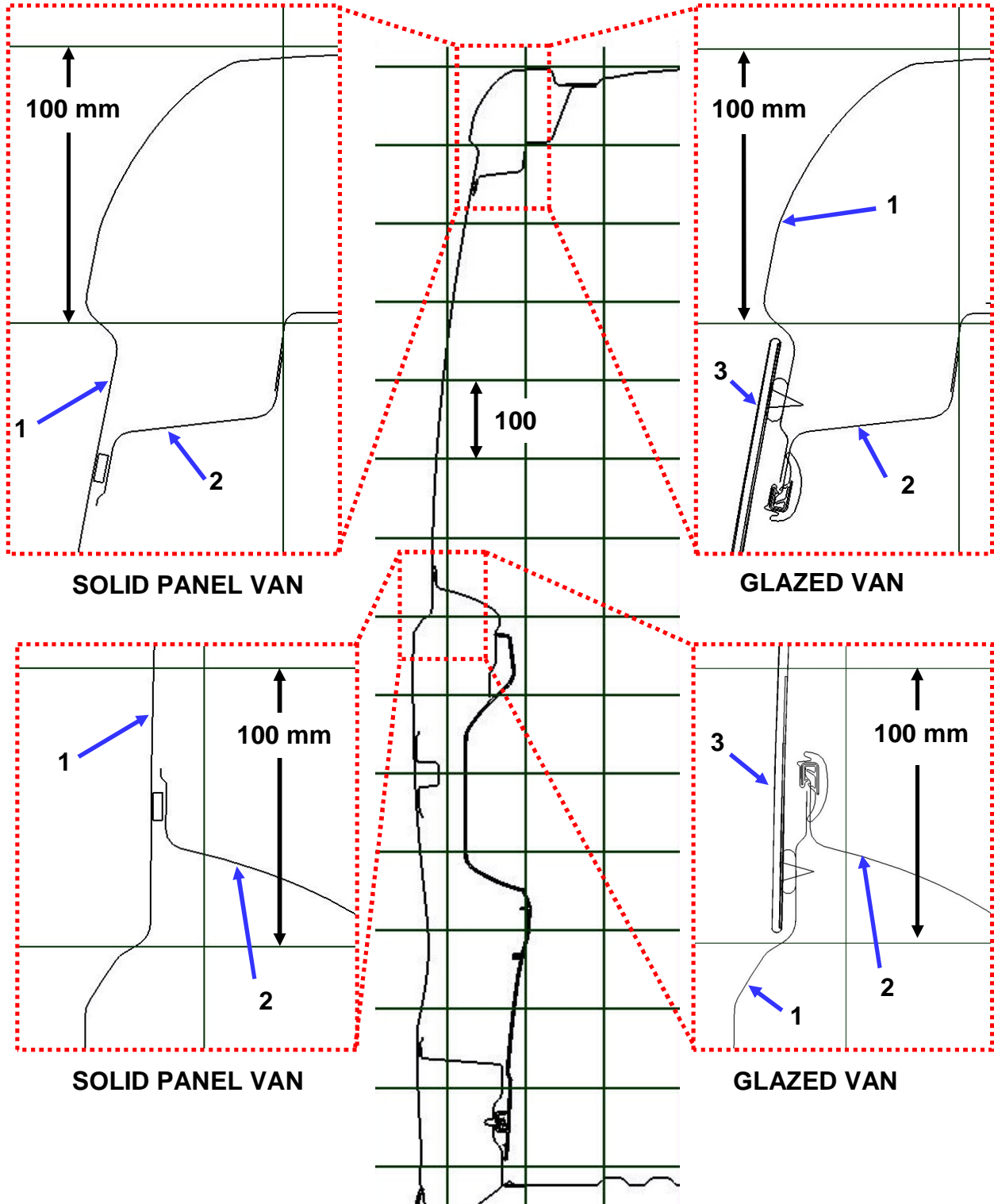
*Under no circumstances must the vertical seal of the side bodywork panels be cut out.*

#### LOCATION OF CUT-OUTS





SOLID PANEL VAN/GLAZED VAN CROSS-SECTIONS



1 :	Body side exterior panel
2 :	Body side exterior panel lining
3 :	Bonded glass panel

## 5.2. BULKHEAD DRILLING AREAS / FLOOR PANEL DRILLING AREAS

### 5.2.1. BULKHEAD DRILLING AREAS

***Important***

*Before any drilling is performed, take note of the various elements such as wiring, brake pipes, soundproofing, hand brake cables, etc.*

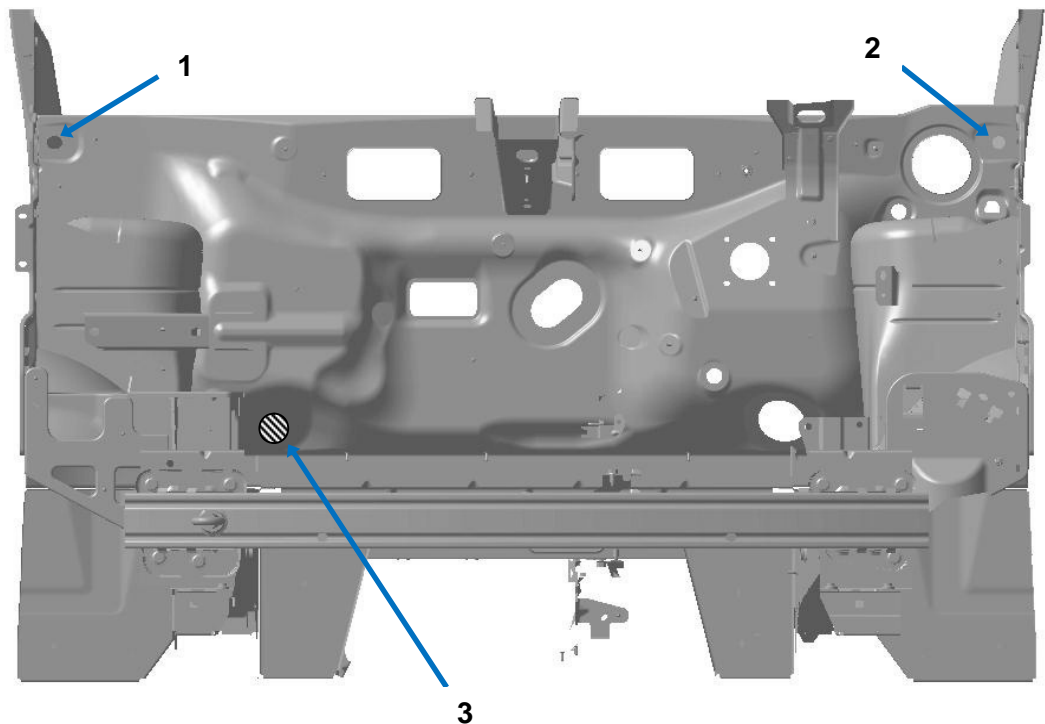
**Location of areas on the bulkhead**


The bulkhead cross member ring for routing wiring from the engine compartment area to the cab area does not allow the routing of another cable.

Consequently, it is strictly prohibited to drill into this bulkhead cross member ring. The locations shown below should be used (1, 2 and 3).

Sealing must always be ensured using a grommet and silicone seal, making sure that the routing of the wire(s) is thermally protected in areas where the temperature is high.

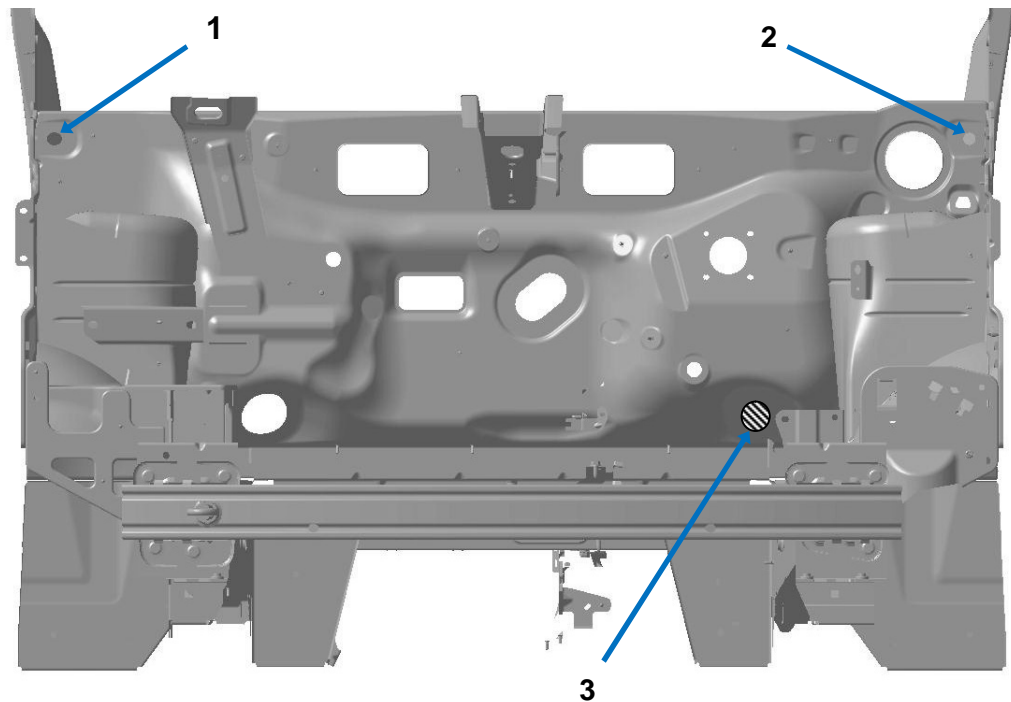
Left-hand drive (engine compartment side)




 Recommended areas for routing wiring

1 :	Sunroof routing area 24.5 mm x 20.5 mm (existing hole)
2 :	Routing area, maximum diameter 20.5 mm (existing hole)
3 :	Drilling area, maximum diameter 40 mm

Right-hand drive (engine compartment side)



 Recommended areas for routing wiring

1:	Sunroof routing area 24.5 mm x 20.5 mm (existing hole)
2:	Routing area, maximum diameter 20.5 mm (existing hole)
3:	Drilling area, maximum diameter 40 mm

### 5.2.2. FLOOR PANEL DRILLING AREAS

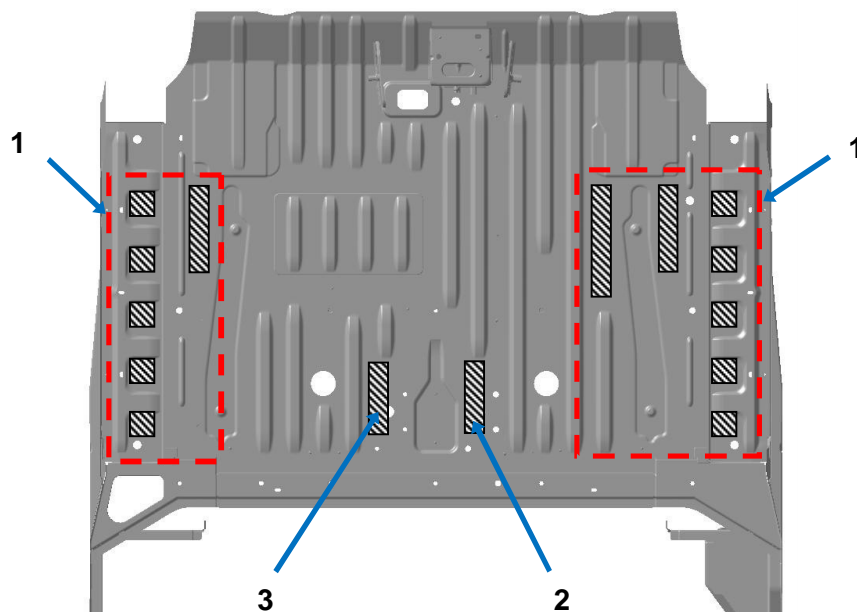
***Important:***


*Before any drilling is performed, take note of the various elements such as wiring, brake pipes, soundproofing, hand brake cables, etc.*

Location of areas on the cab floor panel

Spaces have been defined between the driver seat and the cab partition for left-hand and right-hand drive.

Sealing must always be ensured using a grommet and silicone seal, making sure that the routing of the wire(s) is thermally protected in areas where the temperature is high.



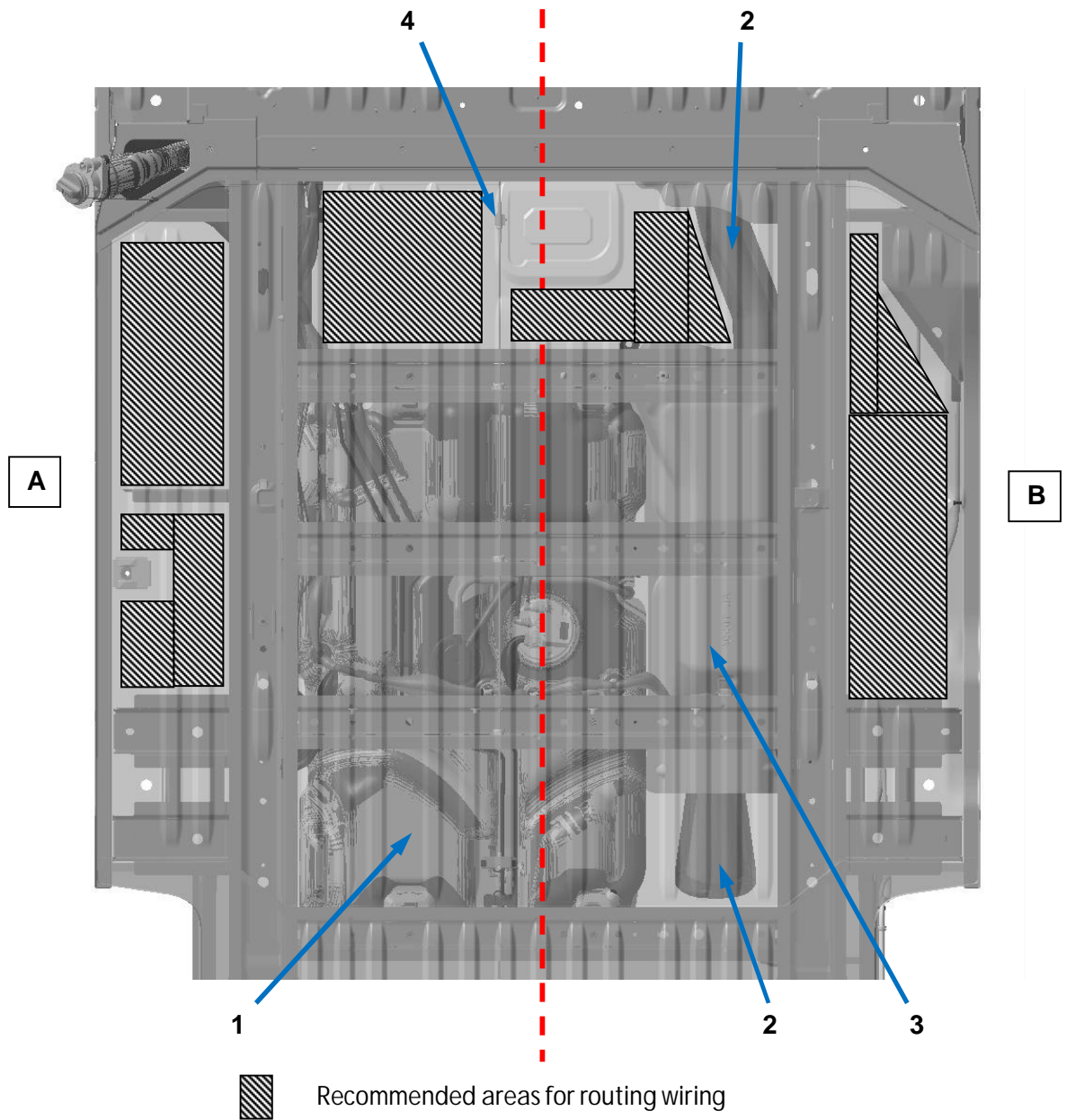
 Recommended areas for routing wiring

1:	All types
2:	Area valid for left-hand drive versions only
3:	Area valid for right-hand drive versions only

Location of areas on the panel van floor

Sealing must always be ensured using a grommet and silicone seal, making sure that the routing of the wire(s) is thermally protected in areas where the temperature is high.

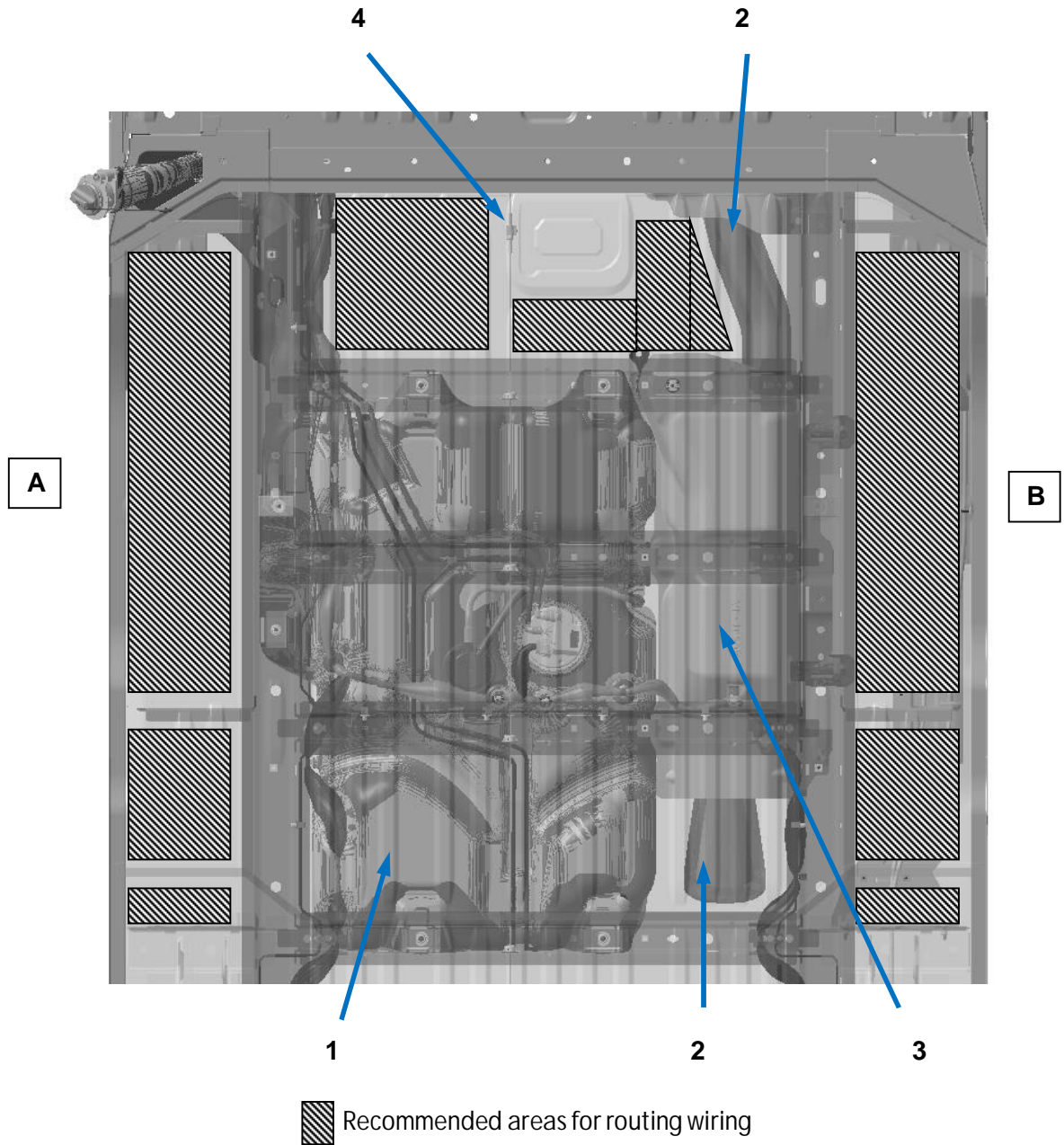
Version L1



A :	Area for version without side door	B :	Area for version with side door
1 :	Fuel tank	2 :	Exhaust system
3 :	Heat shield	4 :	Hand brake cable



Version L2



A :	Area for version without side door	B :	Area for version with side door
1 :	Fuel tank	2 :	Exhaust system
3 :	Heat shield	4 :	Hand brake cable



### 5.3. ROOF PANEL CUT-OUT

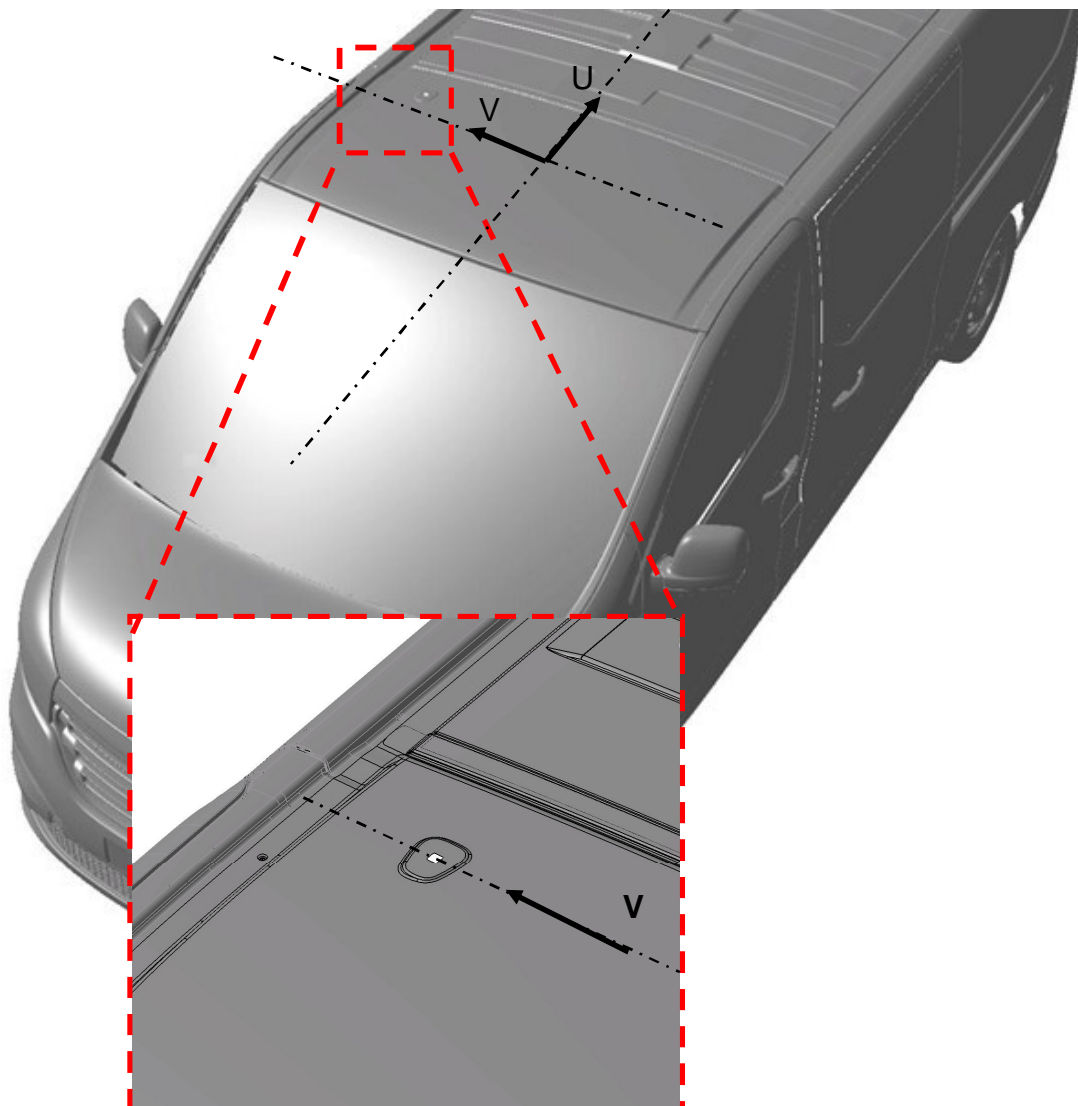
Roof panel cut-outs must be made by taking account of the maximum dimensions shown below and, if necessary, by adjusting the reinforcements

Important:

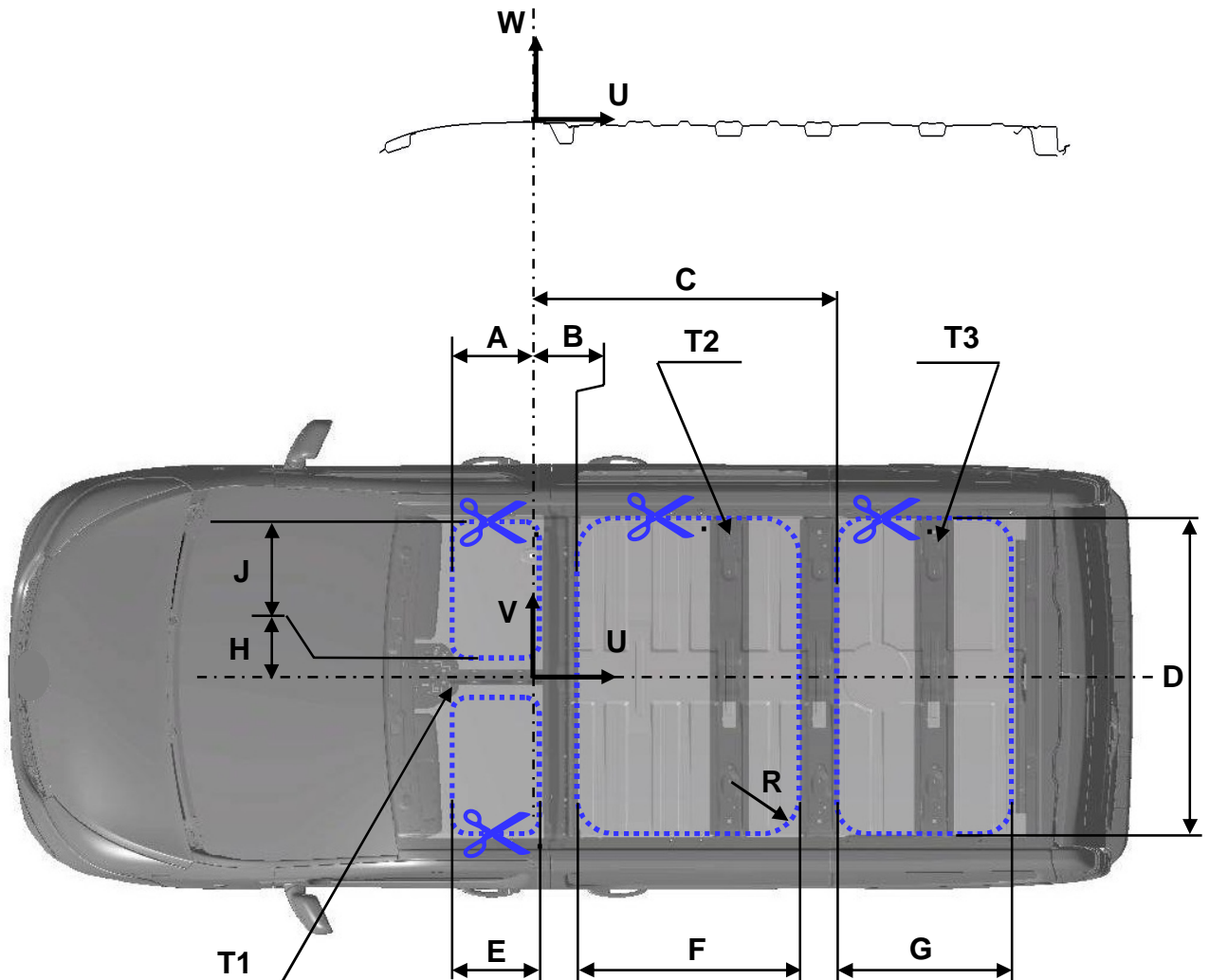
*All cutting angles must be carried out with minimum radii of 75 mm.*

Roof cut-out plan reference guide

All the cutting dimensions use the edge of the square aerial opening and the symmetrical axis of the vehicle as a starting reference.



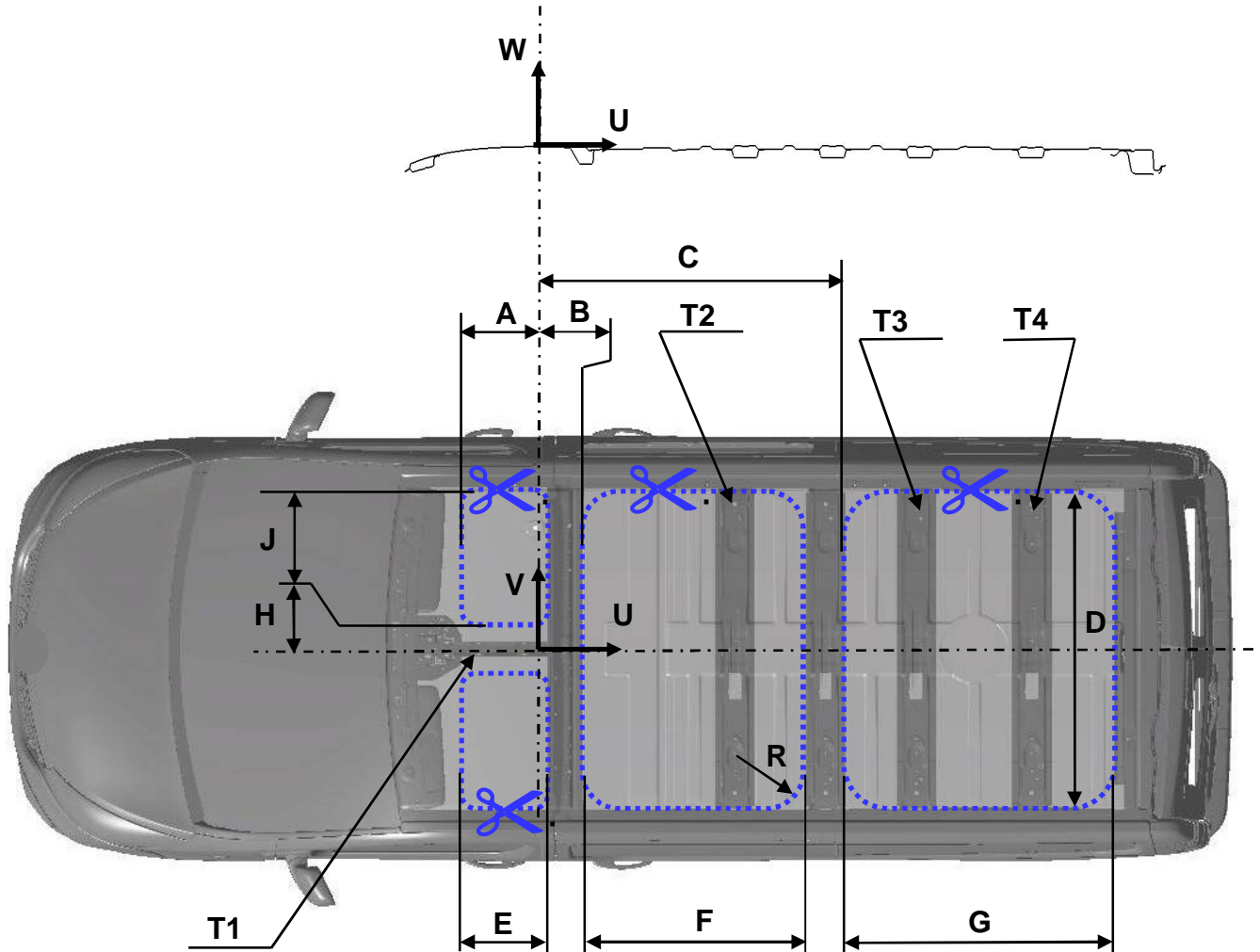
Version Van L1



VALUES					
A :	400	E :	440	J :	600
B :	202	F :	985	R :	75
C :	1361	G :	786		
D :	1420	H :	110		

CABLE DUCT AND CROSS MEMBERS	
T1 :	Cable duct to be retained
T2 :	Cross member to remove
T3 :	Cross member to remove

Version Van L2



VALUES					
A :	400	E :	440	J :	600
B :	202	F :	985	R :	75
C :	1361	G :	1186		
D :	1420	H :	110		

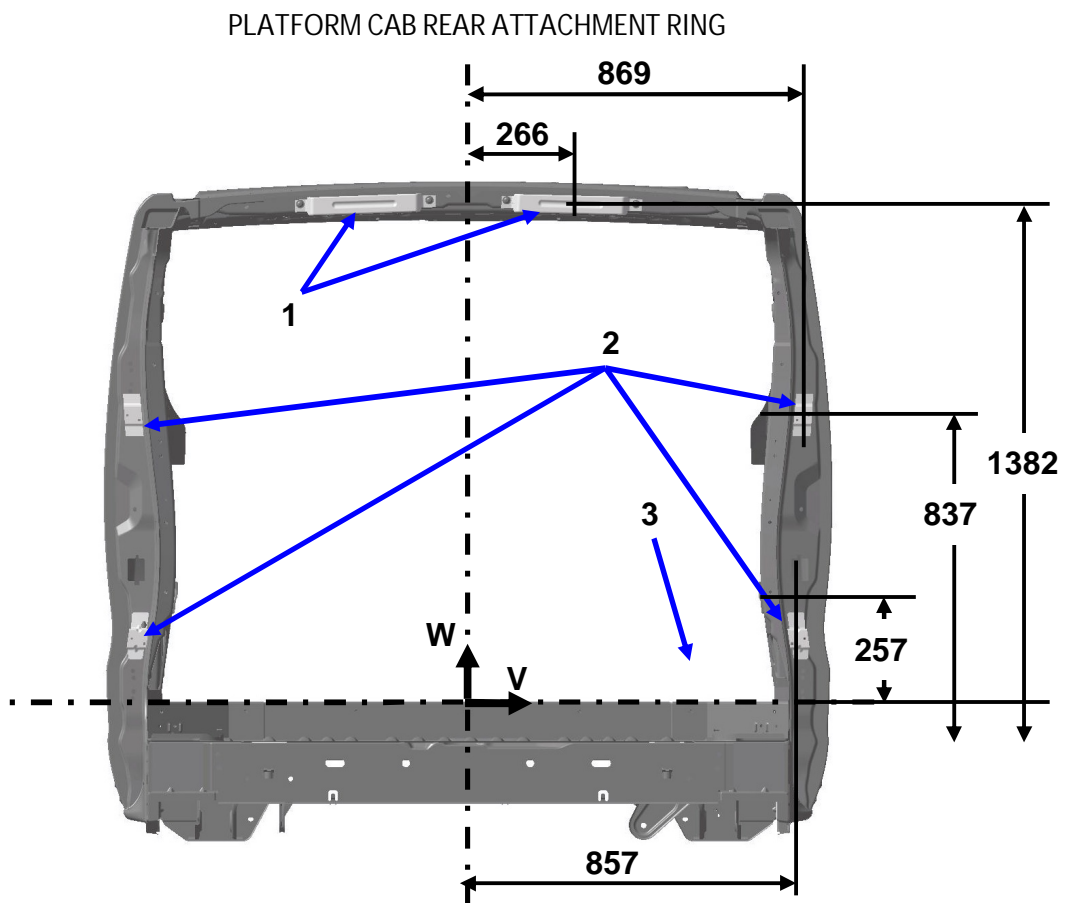
CABLE DUCT AND CROSS MEMBERS	
T1 :	Cable duct to be retained
T2 :	Cross member to remove
T3 :	Cross member to remove
T4 :	Cross member to remove

#### 5.4. BODY MOUNTING BRACKET POSITIONS ON PLATFORM CAB

Platform cabs are fitted with a body attachment ring as standard. Added to this ring are six body brackets: Four welded on the B posts and two screwed onto the roof panel centre cross member.

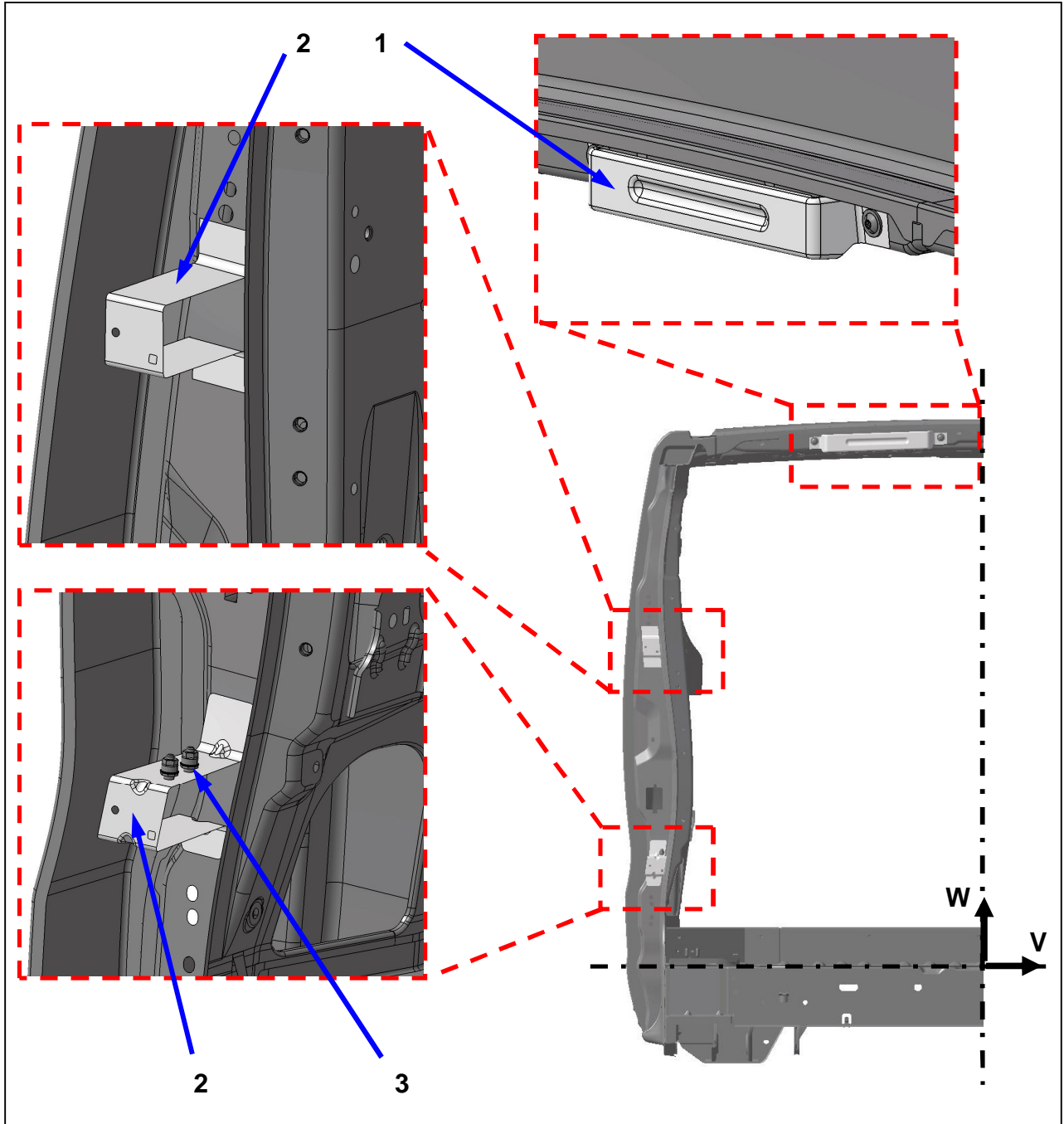
The six body brackets must be used. After drilling the body brackets, apply an anti-corrosion treatment product: refer to the "Specific Corrosion Guidelines" data sheet.

The body bracket positioning interval is +/- 3 mm. It would be prudent to test out any bodywork attachment in practice.



1 :	Upper body brackets(x2)
2 :	Side body brackets(x4)
3 :	Platform cab
V :	Reference guide: vehicle symmetrical axis
W :	Reference guide: load floor panel on ribs

DETAILS OF LEFT-HAND SIDE BODY BRACKETS



1 :	Upper body brackets(x2)
2 :	Side body brackets(x4)
3 :	Electrical earth pins on left-hand side only (x2)
V :	Reference guide: vehicle symmetrical axis
W :	Reference guide: load floor panel on ribs

## 5.5. EXTRACTOR RECOMMENDATION

Air must be extracted from the interior (cab, loading area, etc.) to achieve satisfactory performance when closing the doors (front, side, rear), activating the heating and ventilation systems and in airbag deployment.

After any modification to the extraction system, the air extraction surface area must be equivalent to the original system. The modified system must not let water, outside air, dust or mud in. It must also reduce noise levels. It must not compromise the integrity of the vehicle (where necessary, fit vent glass to prevent access to the door opening controls, etc.). It must be protected from potential impacts (stones thrown up from the road, etc.).

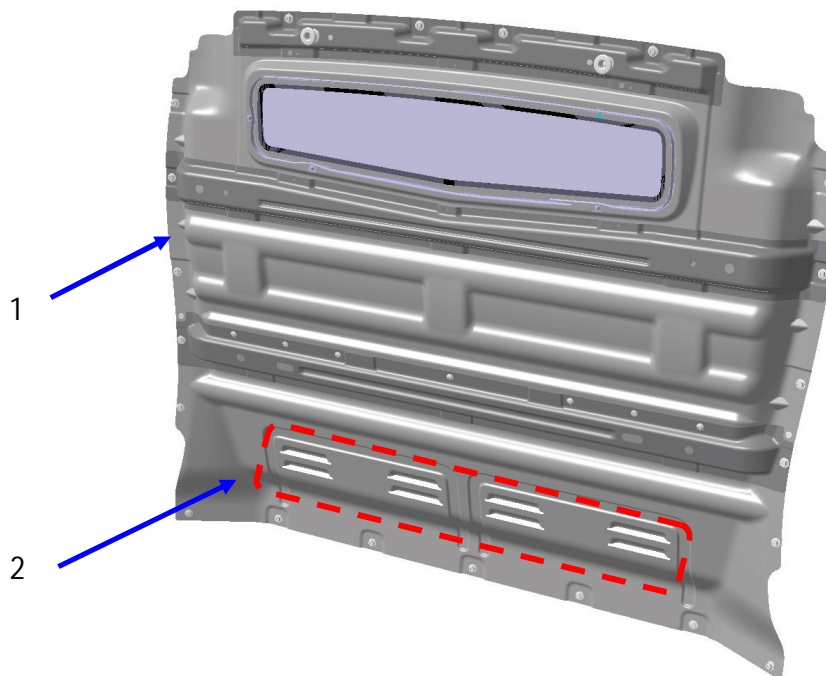
On the panel van version, the air extractors are located on either side of the rear bumper. The surface area of each air extractor is 9740 mm<sup>2</sup>.

### Note:

*Openings in the partition are provided to promote air circulation between the cab and the loading area.*

Van Area

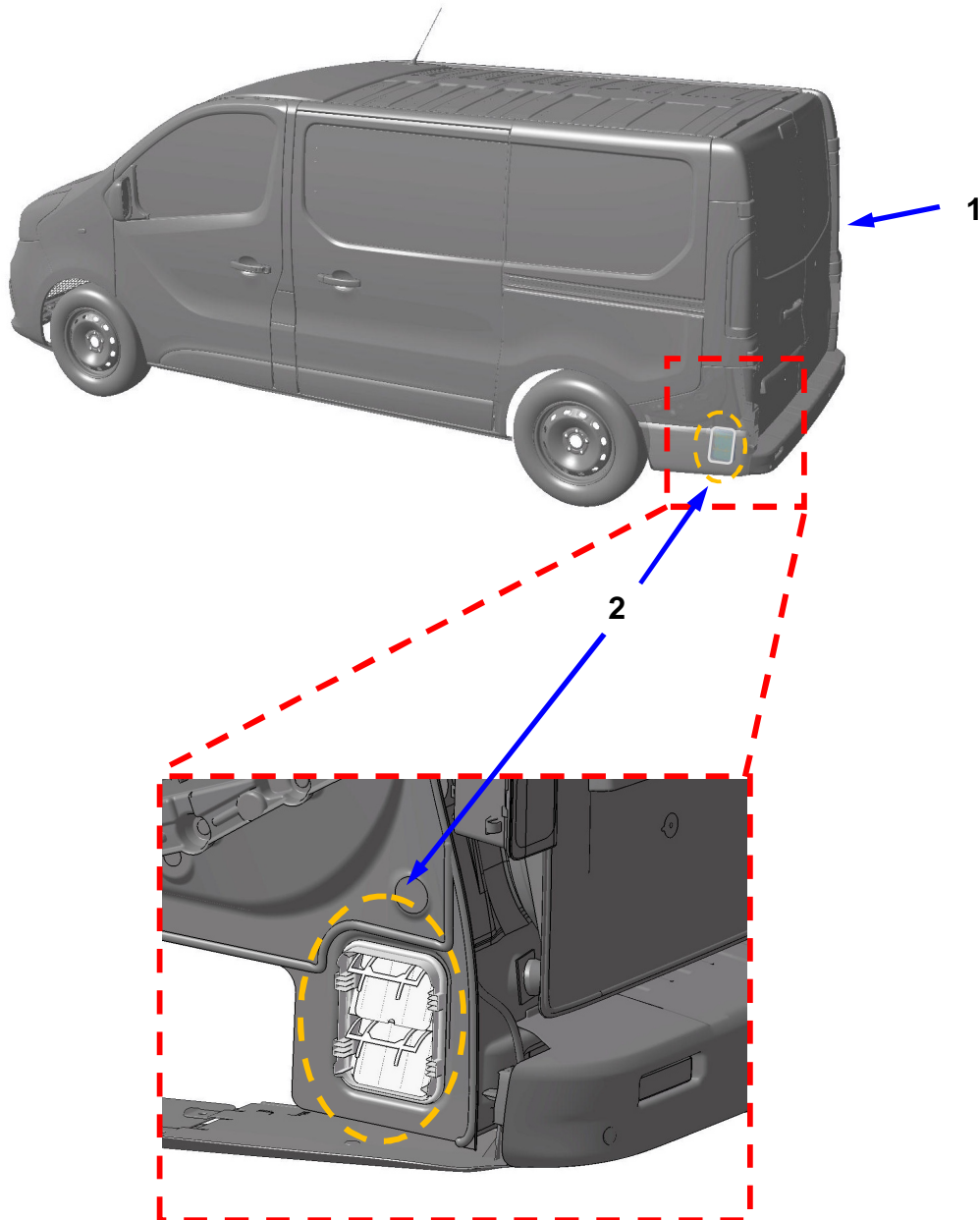
### Partition between cab and loading area



1:	Partition	2:	Openings area
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Vehicle rear end



1:	Vehicle rear end	2:	Air extractor
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Note: *The extractors are located symmetrically in relation to the vehicle axis.*

## 6. MECHANICAL CONVERSIONS

### 6.1. POWER TAKE OFF PROVISIONS, OPTION "V66"

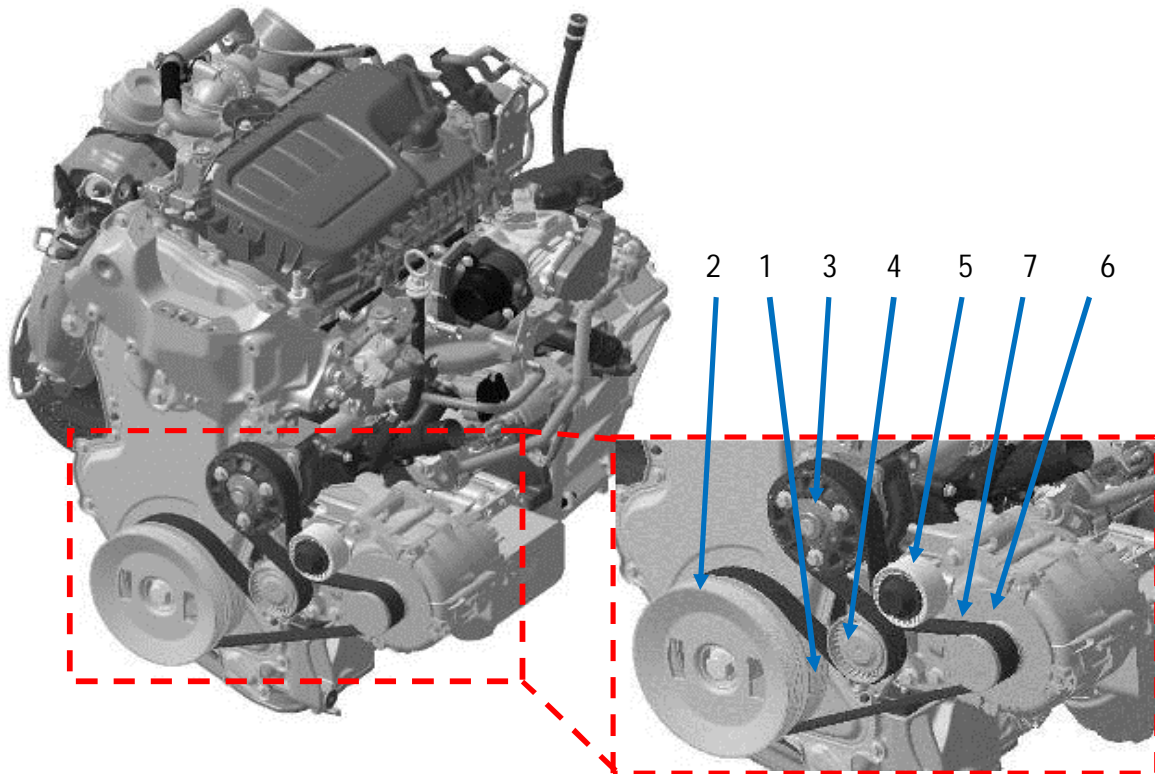
It is recommended to select an entry level vehicle without Start/Stop for vehicles having this type of conversion.

However, with Start/Stop vehicles, conversion is possible subject to activating a fast idle, controlled by the conversion activation (see chapter 4.7 - "START/STOP" and chapter 4.9 "FAST IDLE").

The V66 option (4PK pulley on crankshaft pulley) with or without air conditioning offers the possibility of driving a refrigeration compressor-type component or other components using a rubber belt, etc.

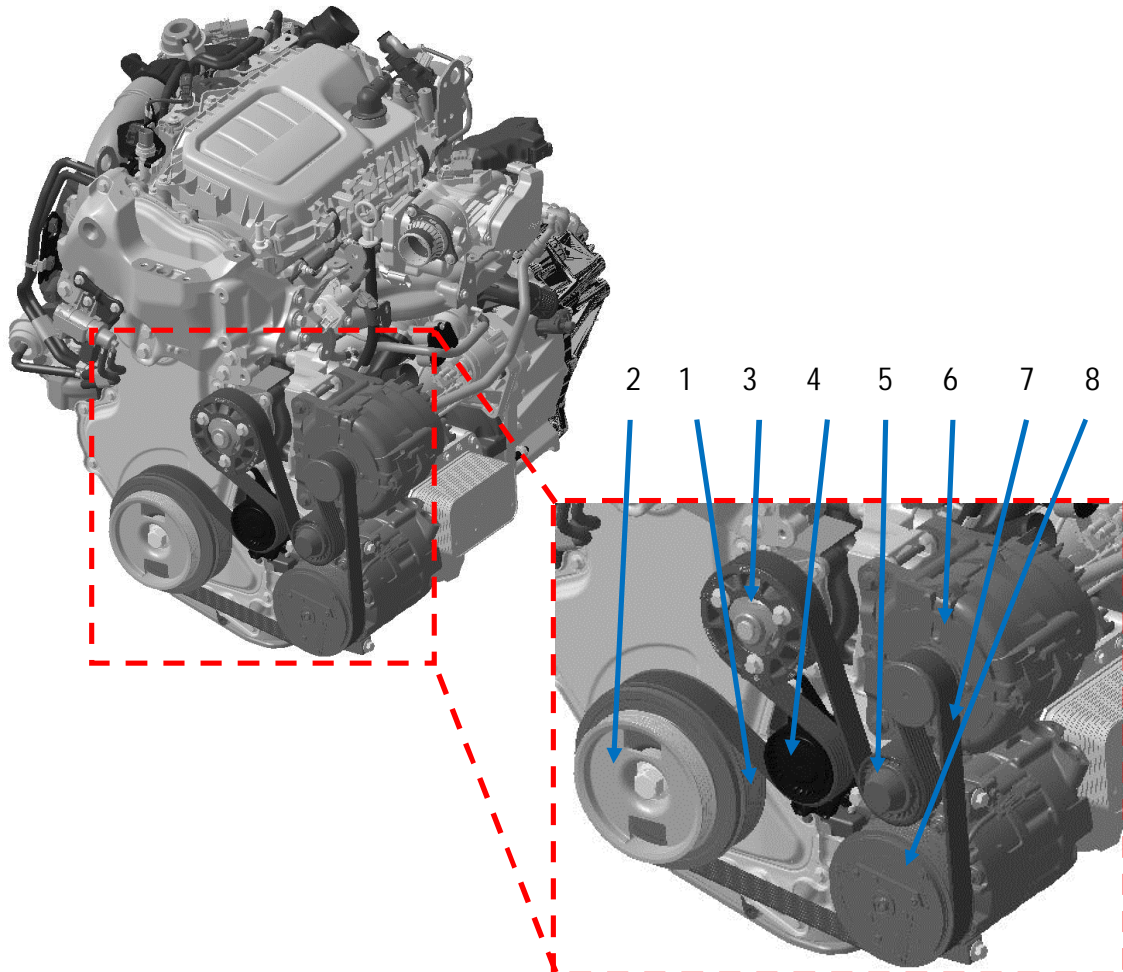
Note: *Component maximum power rating 8.3 kW with an engine running at 4500 rpm.*

R9M engine with V66 option and "without air conditioning"



1:	Crankshaft pulley
2:	V66 pulley (4 V)
3:	Water pump pulley
4:	Dynamic tensioner
5:	Retractor roller
6:	Alternator pulley
7:	Accessories belt (7 V)

R9M engine with V66 option and "with air conditioning"



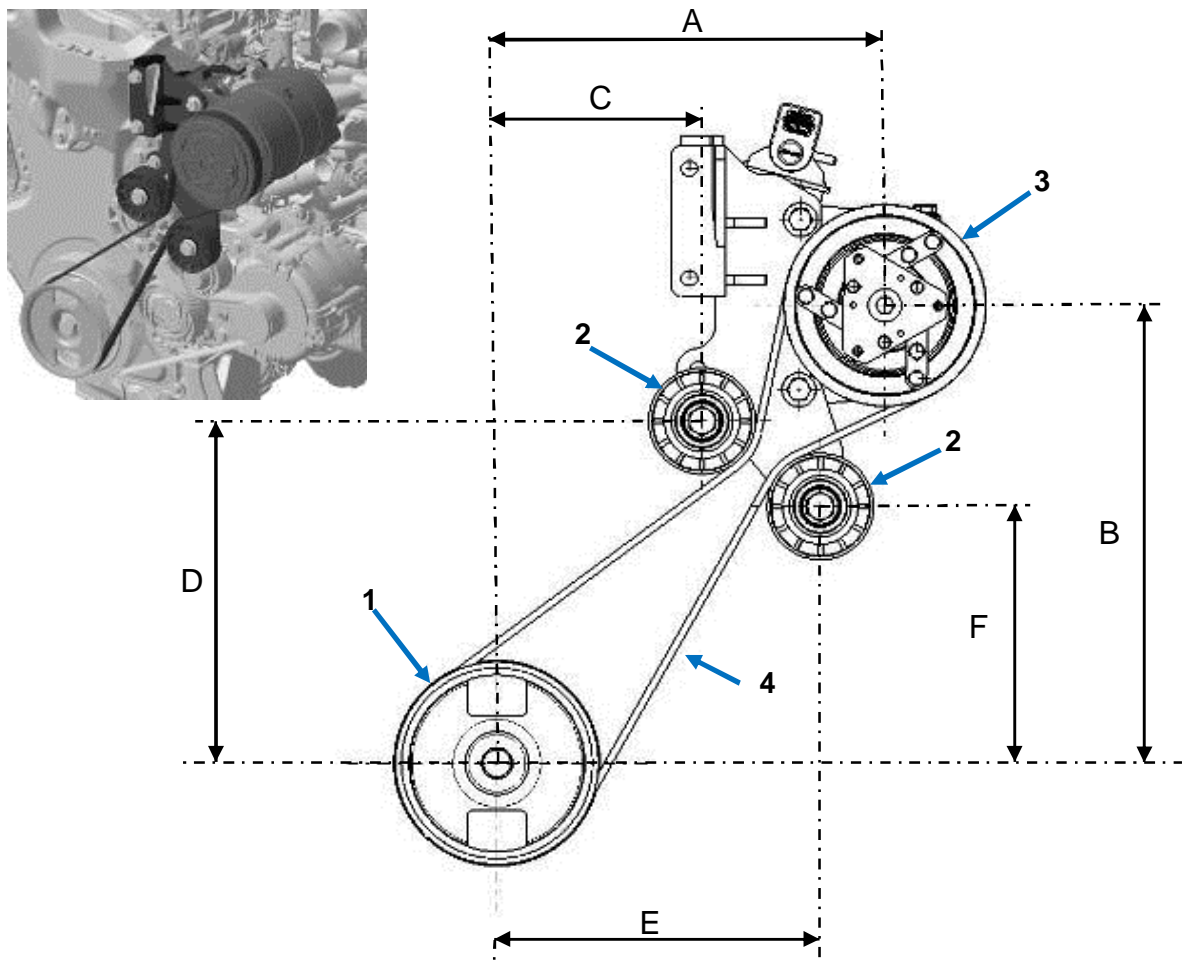
1 :	Crankshaft filtering pulley
2 :	V66 pulley (4V)
3 :	Water pump pulley
4 :	Dynamic tensioner
5 :	Retractor roller
6 :	Alternator pulley
7 :	Accessories belt (7V)
8 :	Air conditioning compressor

Component installation diagram

Warning:

The following points must be scrupulously complied with by bodybuilders who wish to avoid the need for technical approval and who wish to carry out an assembly without affecting engine reliability.

- The pitch diameter of the accessory drive pulley (3) is calculated based on maximum engine speed.
- The position dimensions of the various drive components must approach or match those in the table below.
- Alignment of the belt ridges between the crankshaft pulley and the component pulley.



A :	236,7	D :	209,25
B :	280	E :	197,3
C :	125	F :	157

1 :	Ø119 Crankshaft pulley, 4V (adaptation)
2 :	Ø65 Retractor rollers
3 :	Ø119 Component pulley
4 :	Rubber belt, 4V

