Conversion Guideline
Vivaro [X82]

Part 2 - Chapter 4 - 6

Edition: March 2015

GME Engineering
Special Vehicle Development / Light Commercial Vehicles
Rüsselsheim / Germany

Conversion Guideline - Part 2

* = This chapter is new or was modified in this edition.

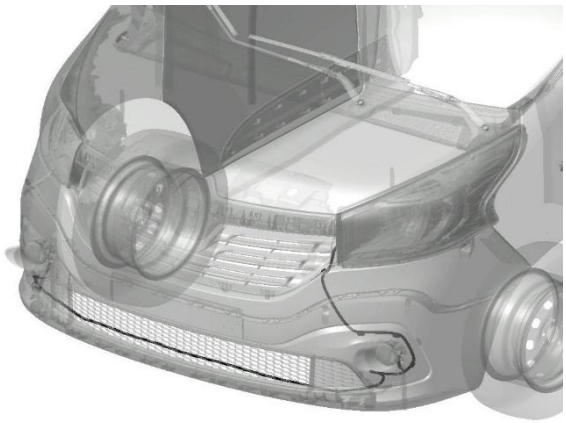
4. ELECTRICS / ELECTRONICS

4.1. LOCATION OF WIRING / GROUNDS / COMPONENTS

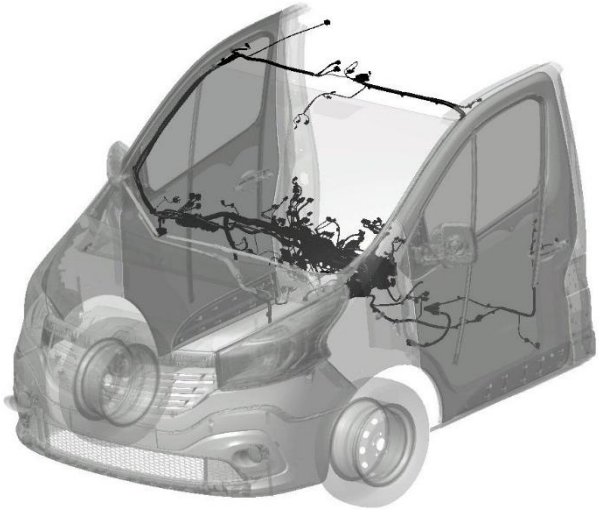
4.1.1. ELECTRICAL WIRING ROUTING

Engine wiring

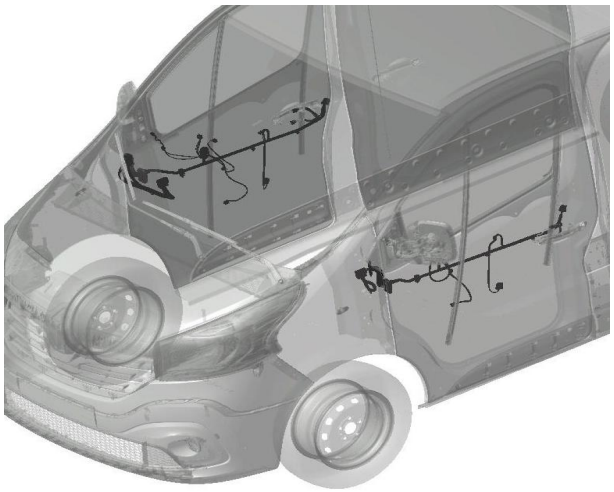
Front end wiring



Dashboard wiring



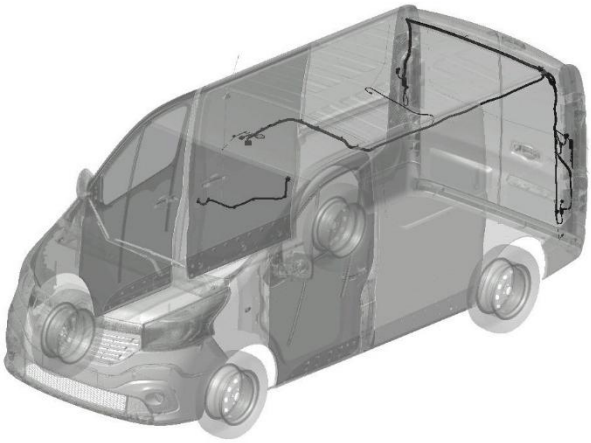
Front door wiring



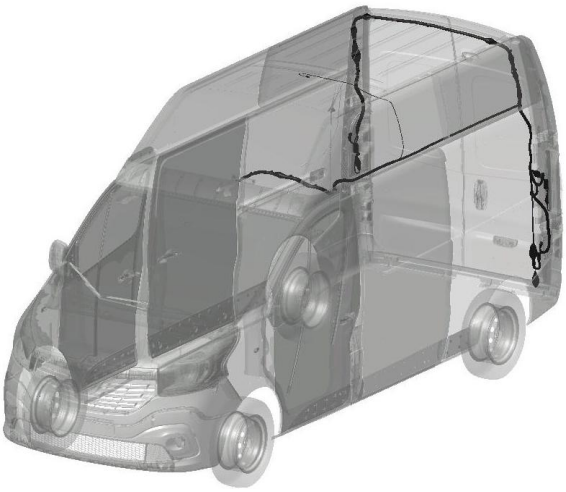
Sliding side door wiring and PANEL VAN mono-bloc wiring

Wiring on rear attachment ring protected by vertical duct

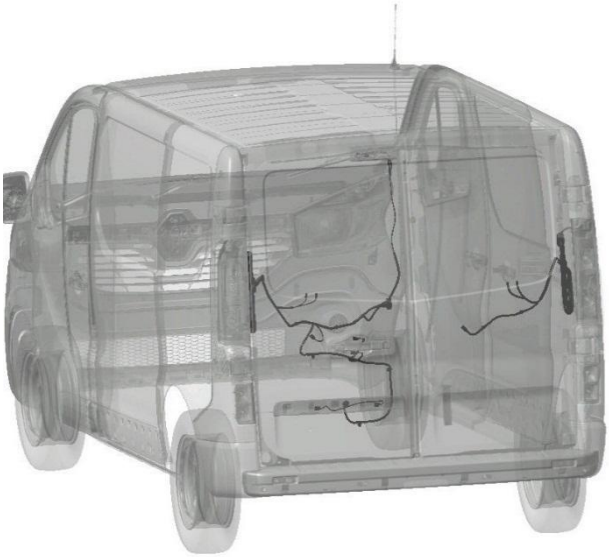
Mono-bloc wiringH1



Mono-bloc wiring H2

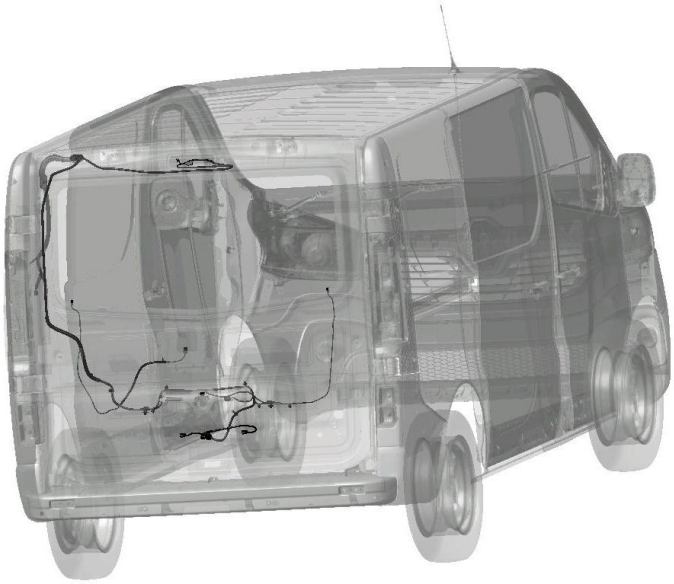


Hinged door wiring



Hinged door wiringH2

Tailgate wiring



Platform Cab Wiring

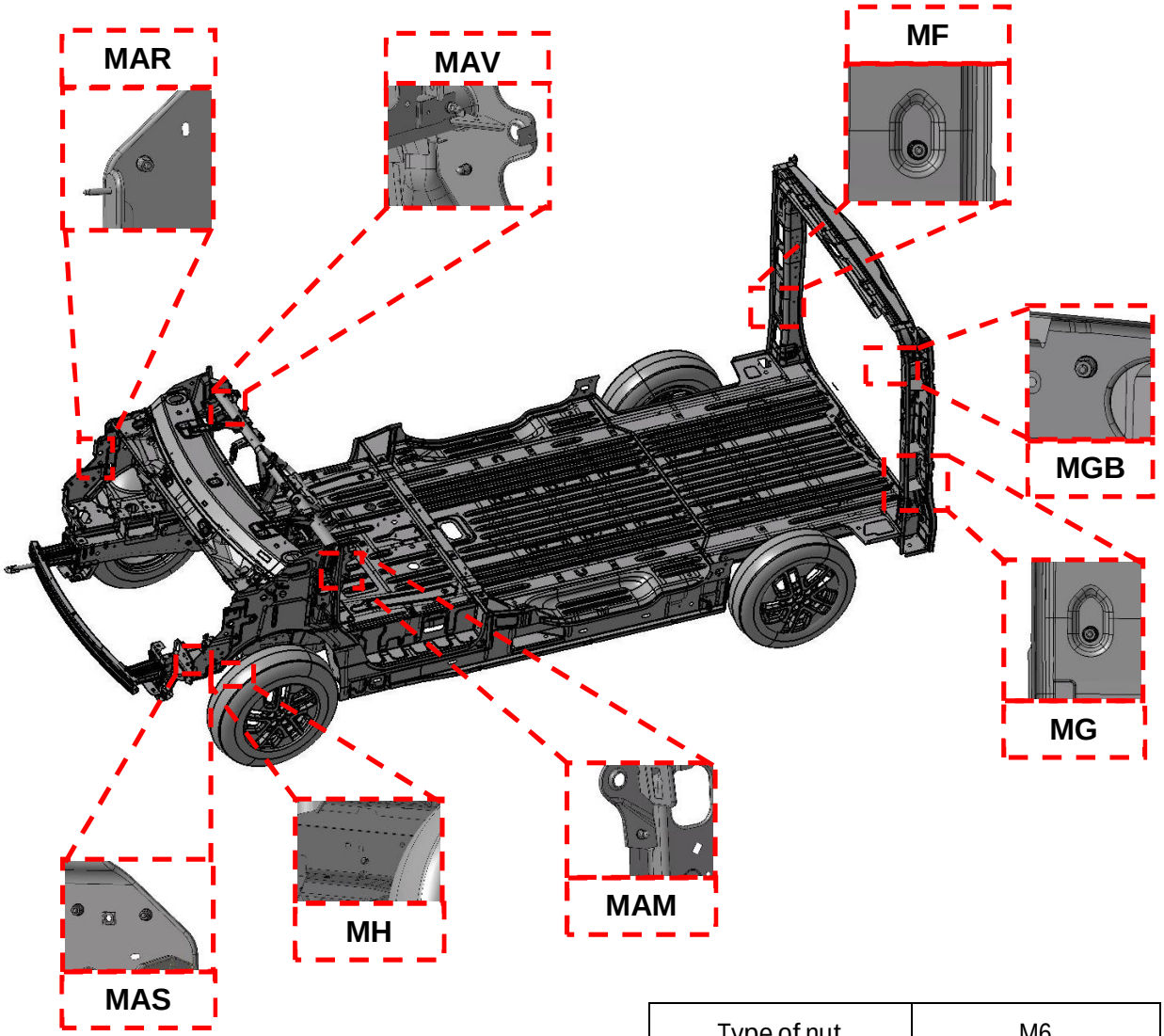
Note: *To obtain more specific diagrams, refer to the workshop repair manual using the type and serial number of the vehicle.*

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

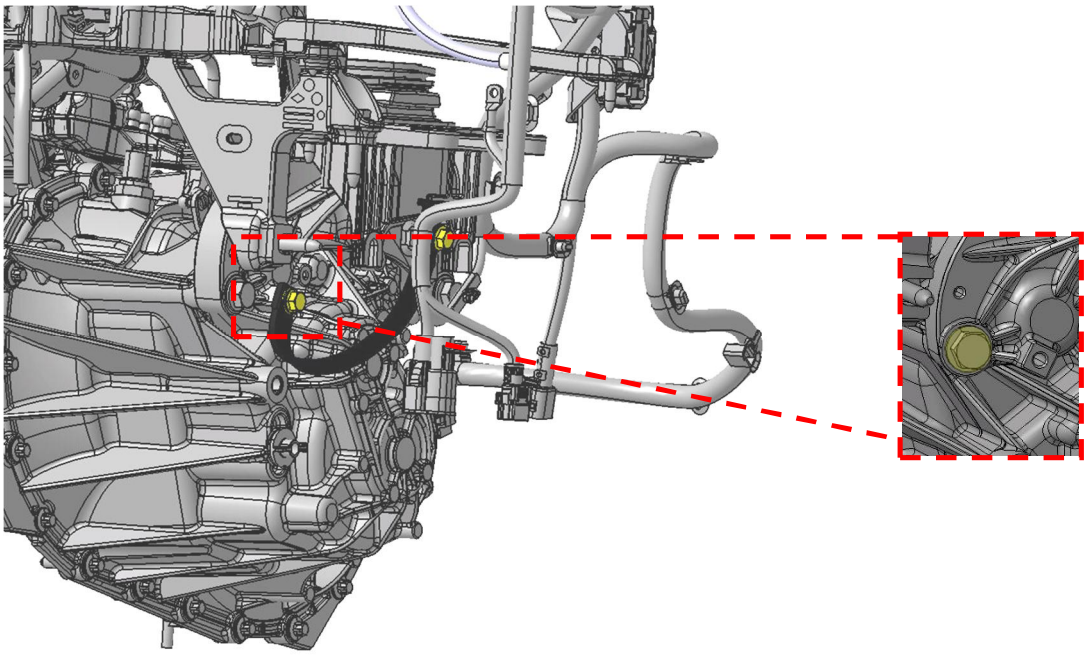


Type of nut	M6
Tightening torque	8Nm ±15%

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

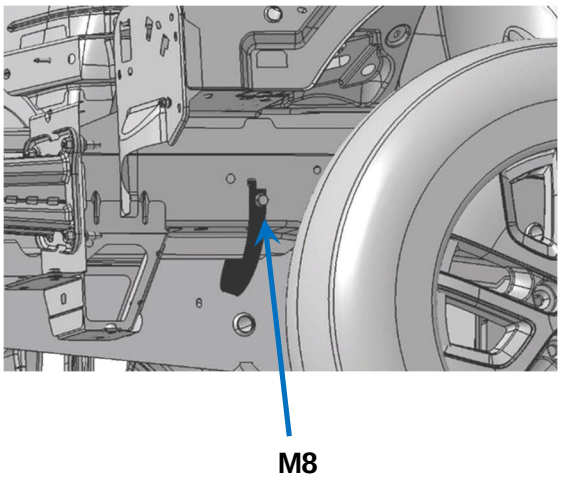
ENGINE COMPARTMENT GROUNDS

Gearbox

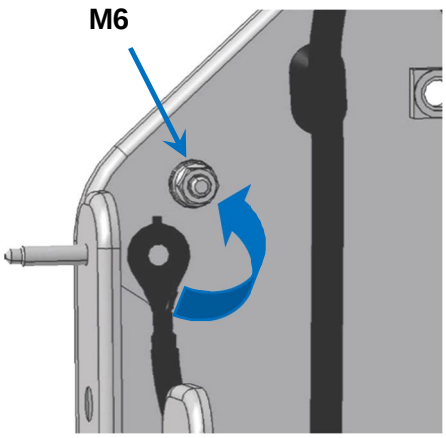


For gearbox: Tightening of the terminals must be done with an M8 self-tapping screw, part number 77 03 019 221 and a tightening torque of 21 Nm. (The tightening torque must be increased from 21 to 24 Nm for stacked terminals).

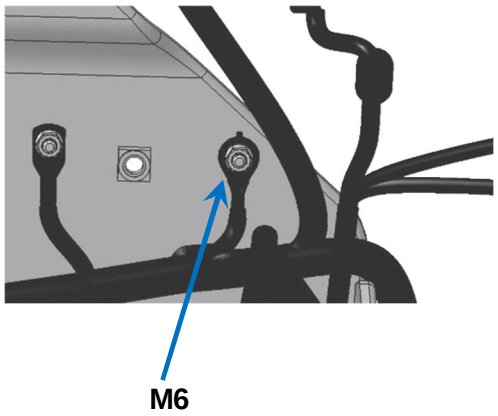
Gearbox/Side member: MH



Front right-hand pillar lining: MAR

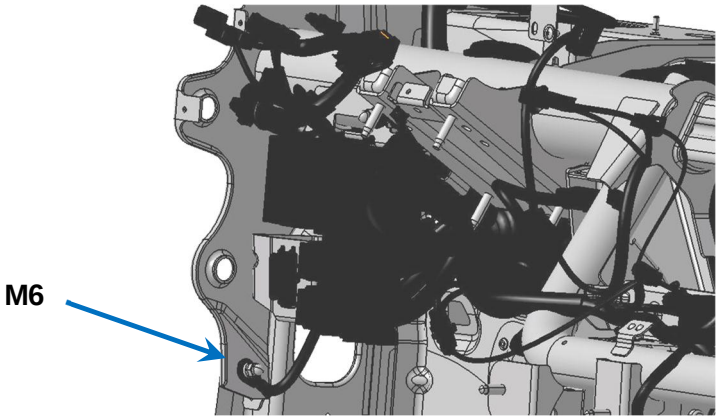


Front left-hand pillar lining: MAS

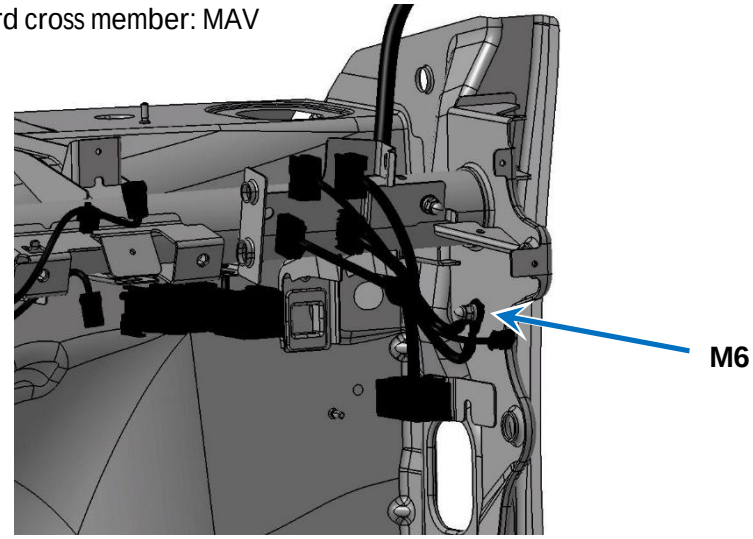


DASHBOARD GROUNDS

Left-hand dashboard cross member: MAM

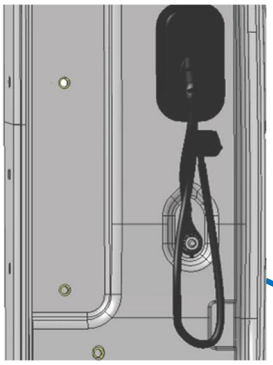


Right-hand dashboard cross member: MAV

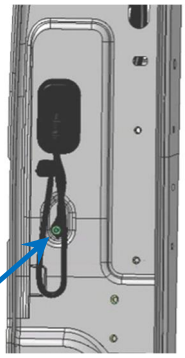


REAR AREA GROUNDS

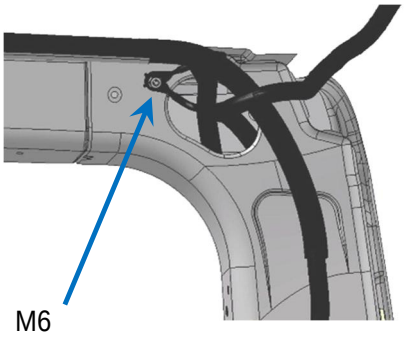
Right-hand: MF



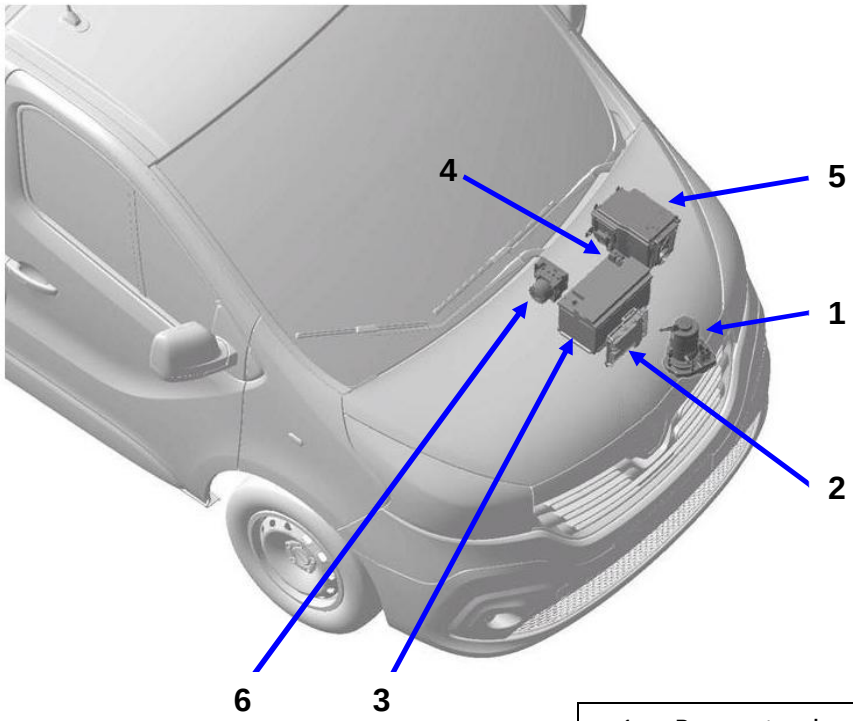
Left-hand side: MG



Left-hand side: MGB



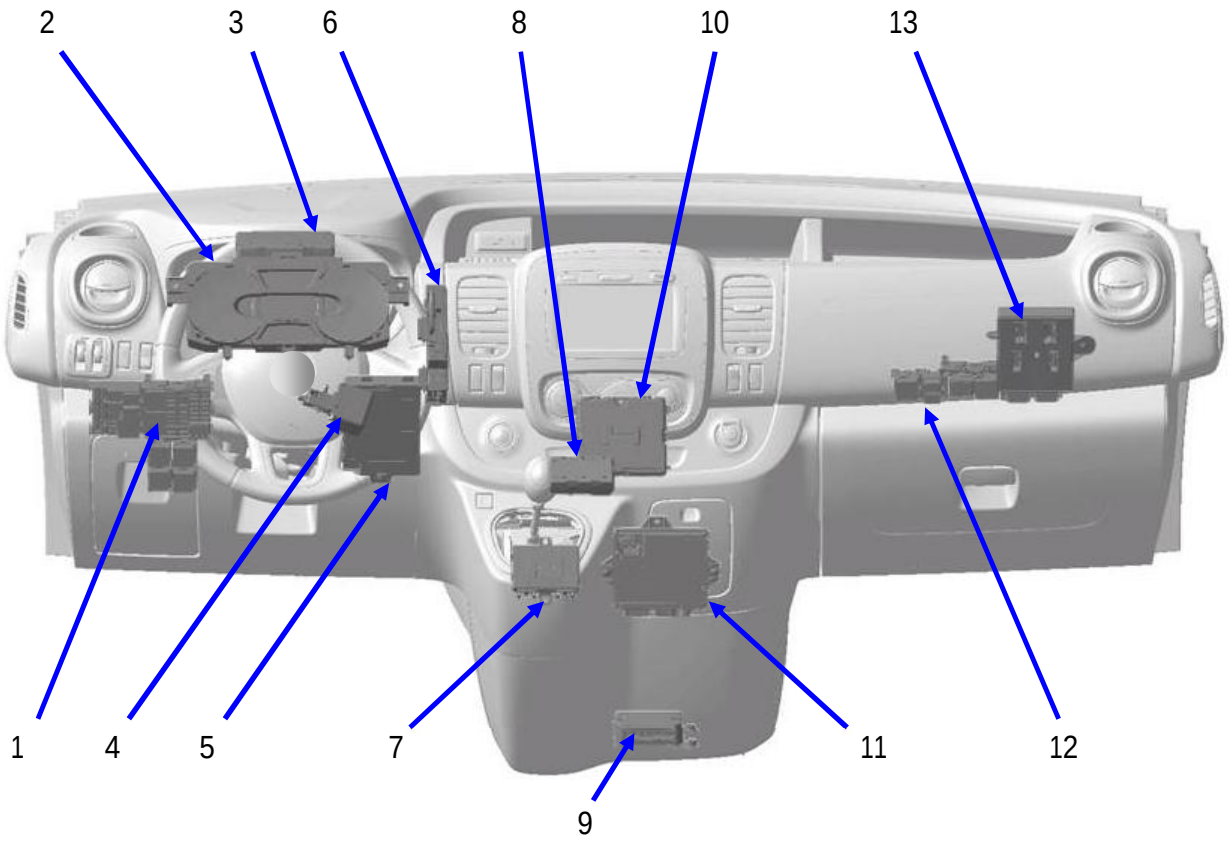
4.1.3 LOCATION OF ELECTRICAL COMPONENTS



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

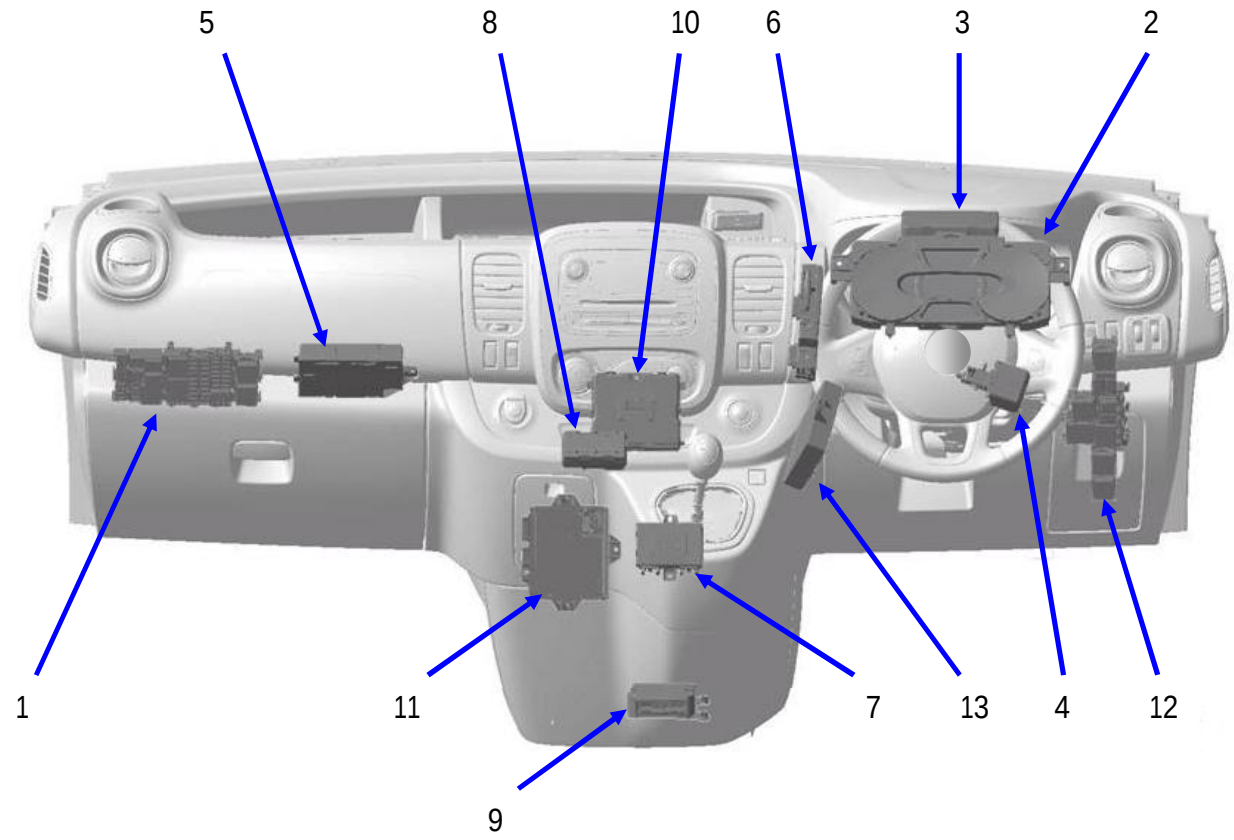
LEFT-HAND DRIVE DASHBOARD AREA



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



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12 :	BFRO: Optional Relay and Fuse Box
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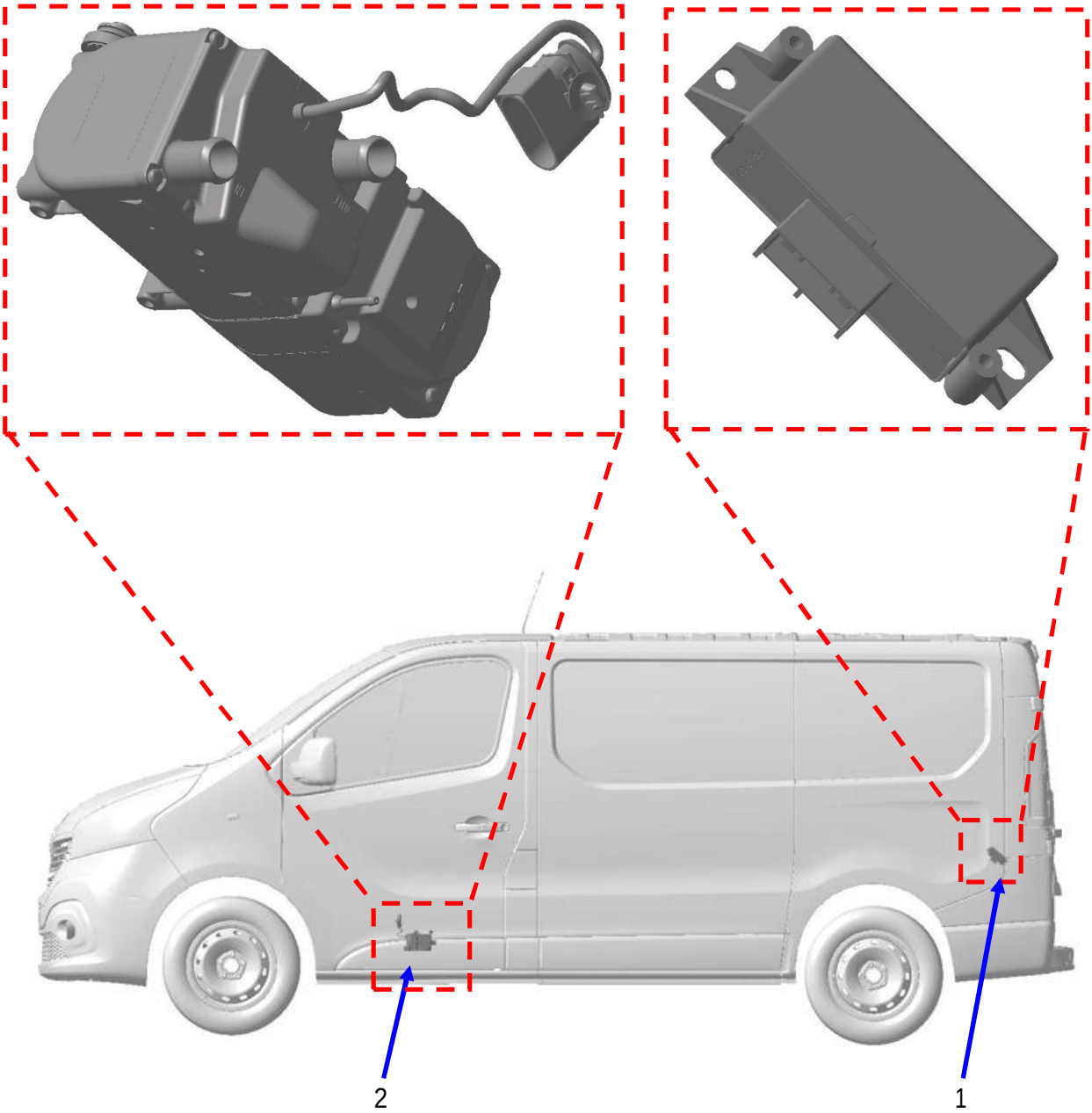
OTHER AREAS



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

4.2. RELAY / FUSE BOX: ENGINE COMPARTMENT CONNECTION UNIT

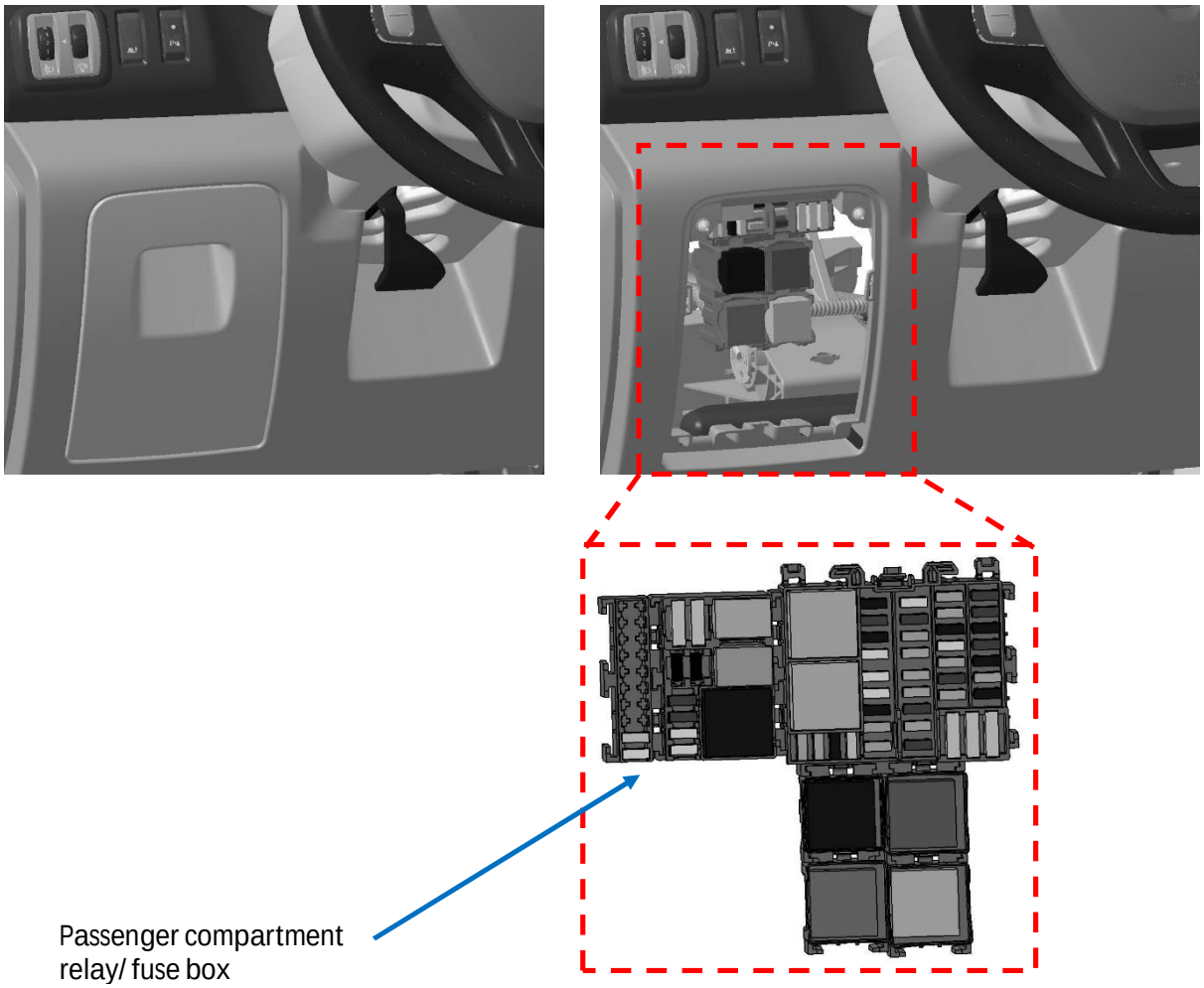
4.2.1. PASSENGER COMPARTMENT RELAY / FUSE BOX (BFR)

This unit, also known as the BFPCR (Passenger Compartment Relay/Fuse Box), is located under the dashboard, on the left. A second unit is located to the right of the dashboard.

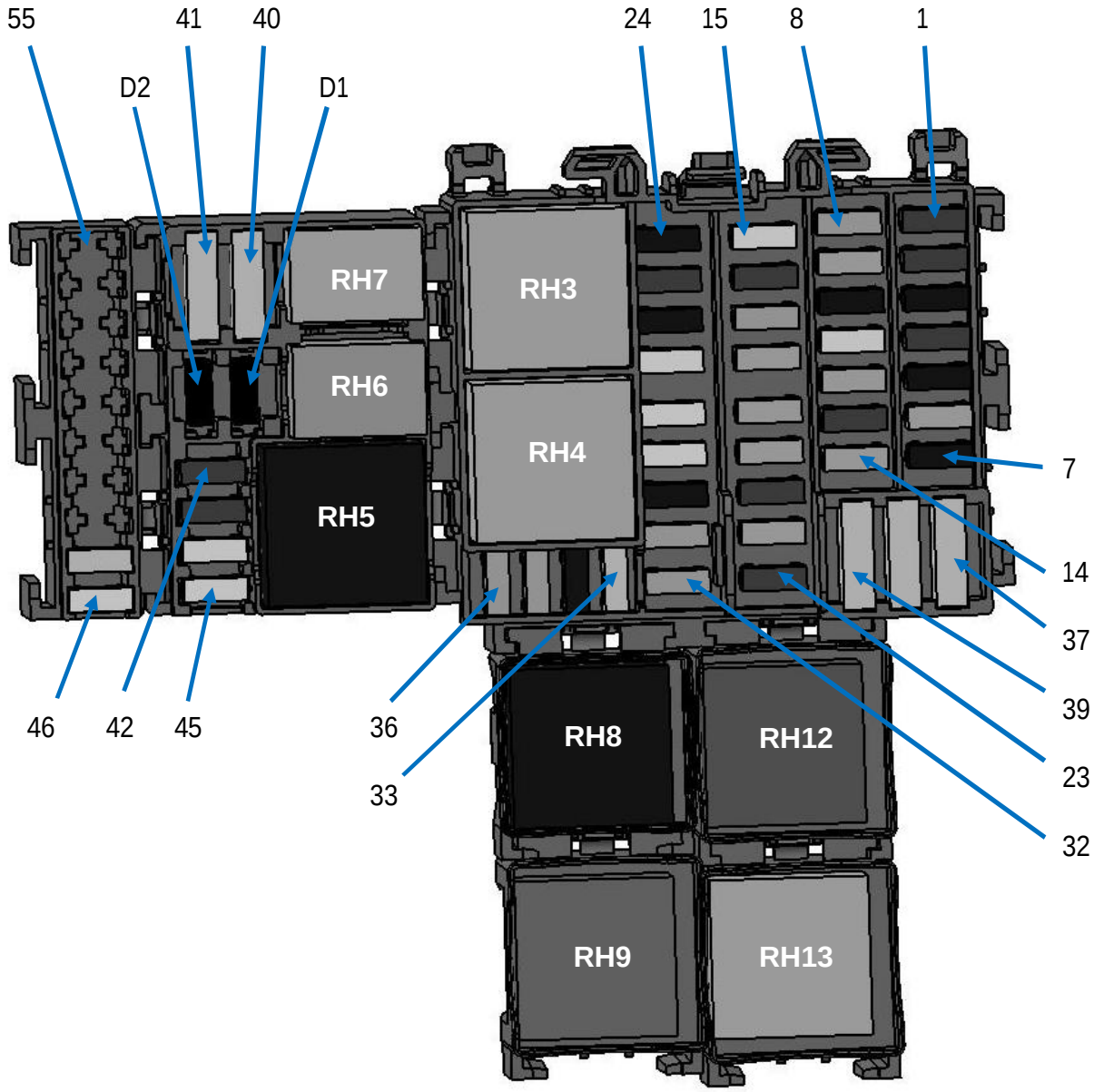
Depending on the equipment version and the options, some fuses or relays may not be present.

LOCATION OF PASSENGER COMPARTMENT RELAY / FUSE BOX ON LHD VEHICLES

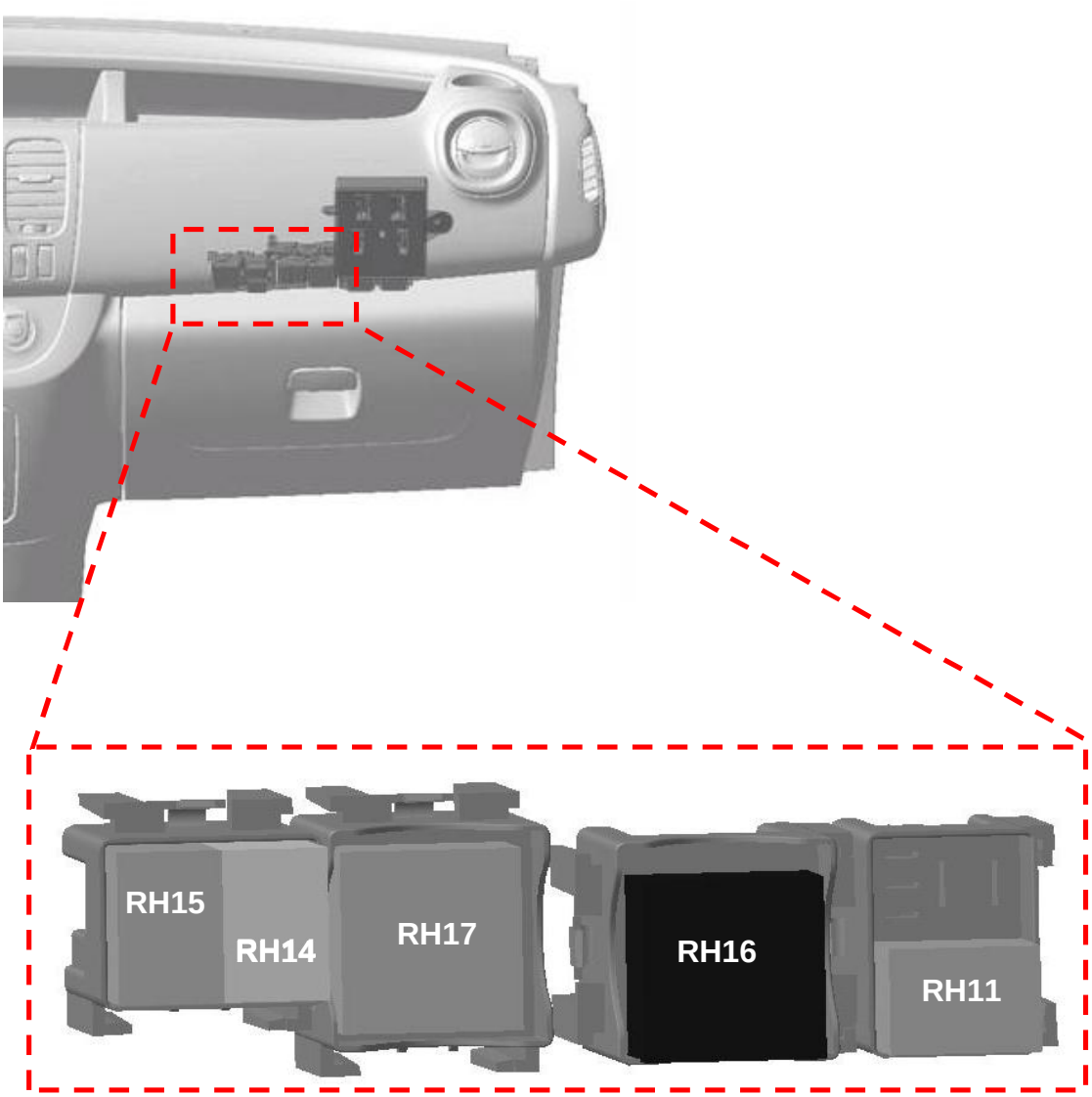
Driver's side



Detail of passenger compartment relay / fuse box on driver's side



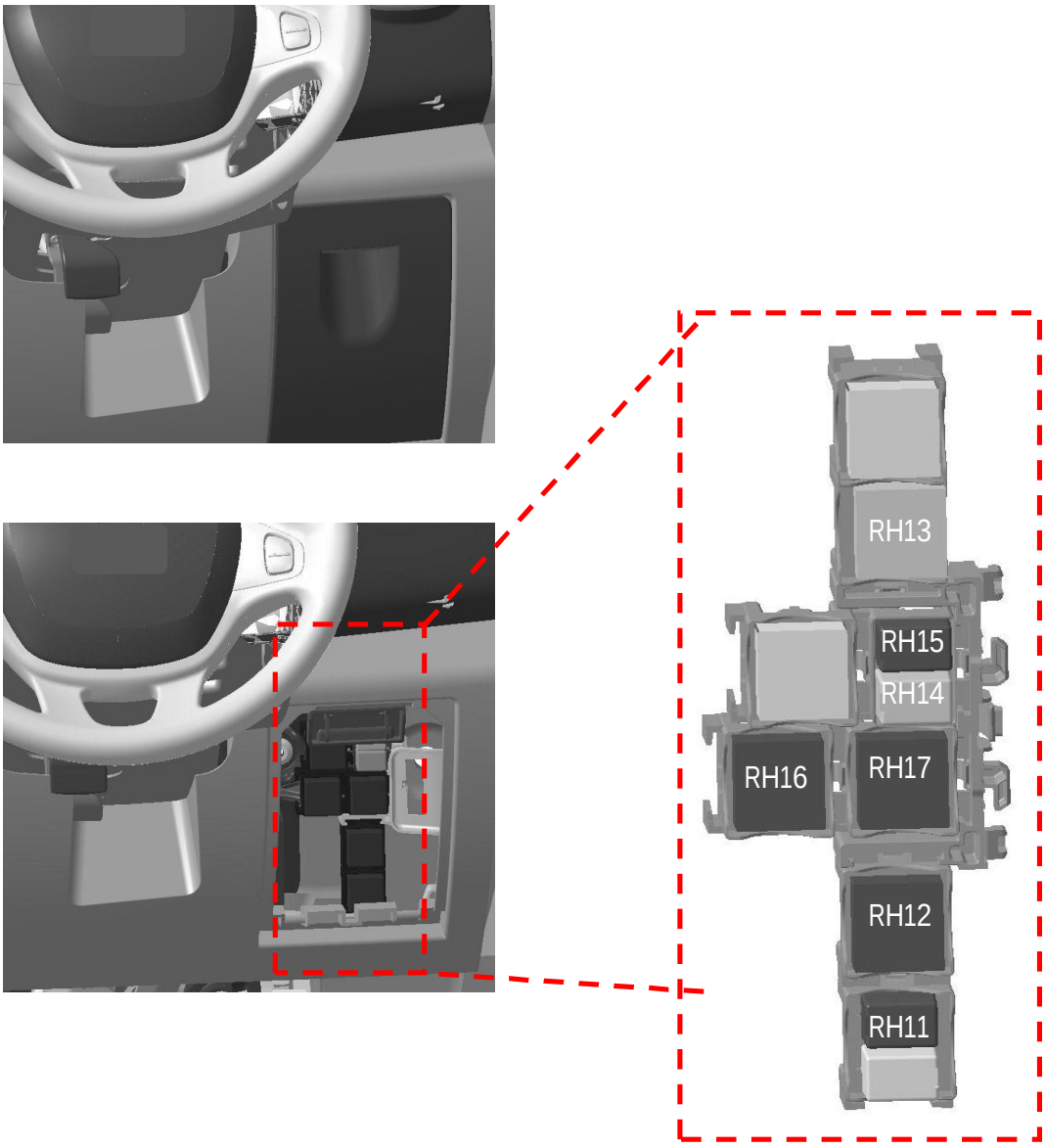
Passenger compartment relay / fuse box on passenger's side



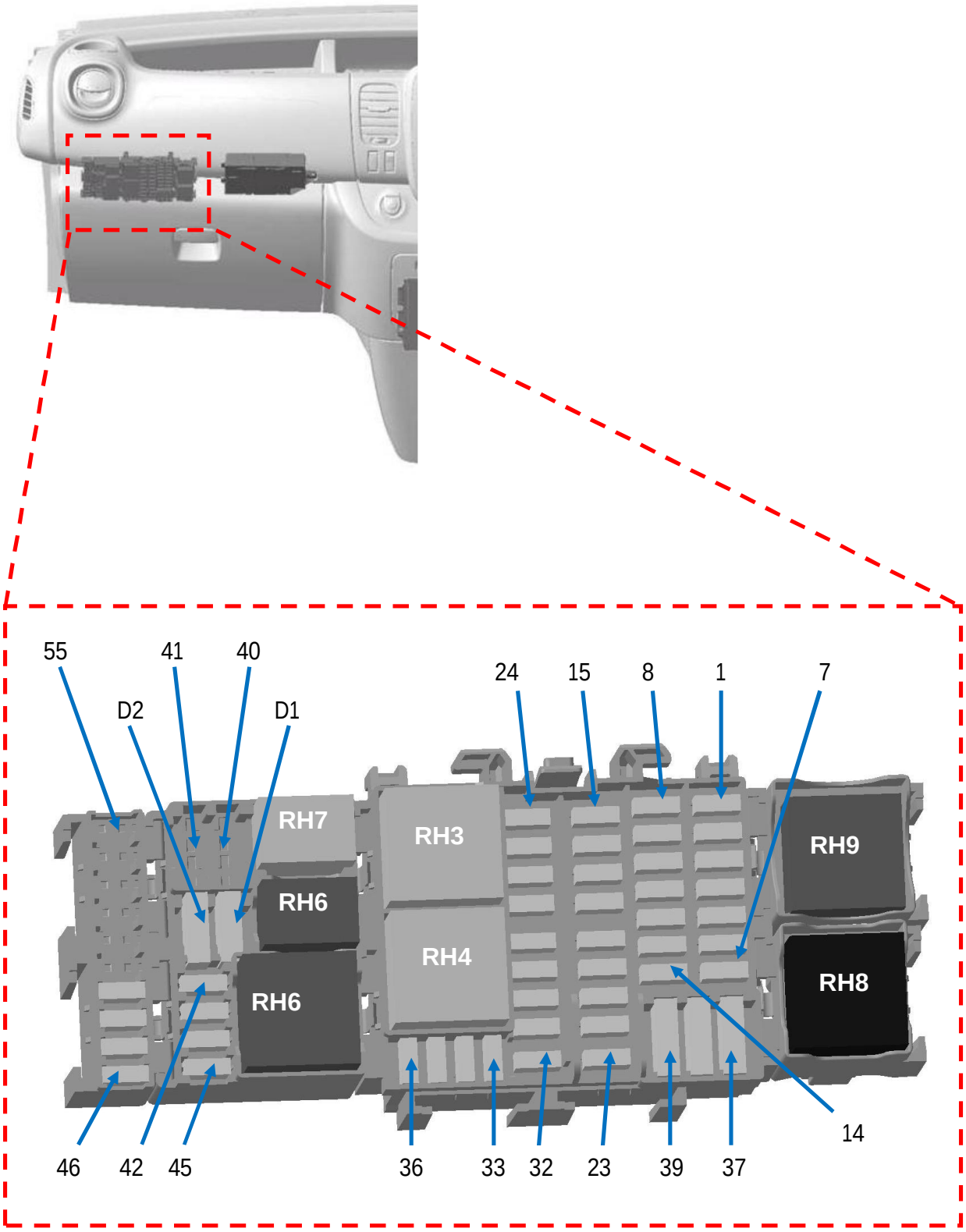
LOCATION OF PASSENGER COMPARTMENT RELAY/ FUSE BOX ON RHD VEHICLES

Driver's side

The box is located behind the flap



Detail of passenger compartment relay/ fuse box on passenger's side



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Definition of fuses

FUSE	TYPE	RATING	FUNCTION
F1	Mini fuse	30A	+ battery feed rear window wiper
F2	Mini fuse	10A	Main electromagnetic horn
F3	Mini fuse	15A	+ battery feed boot accessories socket
F4	Mini fuse	30A	+ battery feed driver's window lift motor time delay
F5	Mini fuse	15A	+ current distribution rear accessories socket
F6	Mini fuse	5A	BCM start-up +
F7	Mini fuse	15A	+ after ignition feed heated seats
F8	Mini fuse	5A	+ EMM battery feed (after ignition feed charge on VSC) AVS, AUO
	Mini fuse	15A	+ EMM battery feed (after ignition feed charge on VSC) SOP03C
F9	Mini fuse	5A	+ overall current distribution
F10	Mini fuse	15A	+ cigarette lighter socket or front accessory socket current distribution
F11	Mini fuse	25A	+ EMM battery feed (R daytime running lights, front position, R main beam headlights, L dipped beam headlights)
F12	Mini fuse	5A	+ timed battery feed brake lights, ABS, transponder
F13	Mini fuse	10A	+ timed battery feed interior lights and air conditioning
F14	Mini fuse	5A	+ timed battery feed steering wheel angle Stop and Start keyless vehicle
F15	Mini fuse	25A	+ After ignition feed rear window wiper, window washer pump, horn
F16	Mini fuse	10A	Overall + after ignition feed
F17	Mini fuse	5A	+ after ignition feed reverse gear lights
F18	Mini fuse	5A	+ after ignition feed stop switch
F19	Mini fuse	5A	+ after ignition feed injection, starter relay, BCM
F20	Mini fuse	5A	+ after ignition feed airbag, column lock
F21	Mini fuse	30A	+ after ignition feed passenger window lift switch
F22	Mini fuse	5A	+ after ignition feed power steering pump assembly

FUSE	TYPE	RATING	FUNCTION
F23	Mini fuse	10A	+ EMM battery feed brake lights
F24	Mini fuse	15A	+ battery feed BCM (+ timed battery feed)
F25	Mini fuse	10A	+ battery feed BCM, electronic calculation units tyre pressure monitoring system and keyless vehicle
F26	Mini fuse	15A	+ battery feed BCM for hazard warning and direction lights
F27	Mini fuse	25A	+ battery feed BCM for locking of opening elements
F28	Mini fuse	25A	+ EMM battery feed for L daytime running lights, rear position, L main beam headlights, R dipped beam headlights
F29	Mini fuse	25A	+ EMM battery feed number plate position, front and rear fog lights
F30	Mini fuse	15A	+ battery feed single lever, alarm, horn
F31	Mini fuse	5A	+ battery feed dashboard
F32	Mini fuse	5A	+ battery feed single lever,
F33	Mini fuse	20A	+ battery feed tow bar socket pre-equipment
F34	Mini fuse	15A	(supplied in tow bar kit)
F35	Mini fuse	5A	+ battery feed circuit breaker radio, multimedia, mirrors, fault finding socket
F36	Mini fuse	5A	+ feed mirror heater
F37	Ato fuse	10A	+ timed battery feed electric mirrors, additional adapter unit UCE
F38	Ato fuse	40A	+ battery feed circuit breaker tachygraphy
F39	Ato fuse	40A	+ battery feed windscreen wiper
F40	Ato fuse	20A	+ battery feed current distribution relay 1 (heating, air conditioning)
F41	Ato fuse	15A	+ current distribution feed pre-equipment additional adaptations
F42	Mini fuse	10A	+ battery feed heater
F43	Mini fuse	10A	+ feed engine running additional adaptation
F44	Mini fuse	25A	+ feed engine running heater
F45	Mini fuse	25A	+ after ignition feed additional air conditioning unit

FUSE	TYPE	RATING	FUNCTION
F46	Mini fuse	25A	+ after ignition feed relayed for keyless vehicle
F47	Mini fuse	20A	+ EMM battery feed for non-load shed current distribution relay
F48	Stock area		
F49	Stock area		
F50	Stock area		
F51	Stock area		
F52	Stock area		
F53	Stock area		
F54	Stock area		
F55	Stock area		

Relay definition

RELAYS	RATING	FUNCTION
RH3 -(1040)	40A	Windscreen wiper relay
RH4 - (315)	40A	Windscreen wiper 2nd speed relay
RH5 - (751)	40A	+ after ignition feed relay heating and rear air conditioning
RH6 - (599)	20A	Support relay water pump heater matrix
RH7 - (2342)	20A	Driver's door electrical unlocking relay (SDO)
RH8 - (1155)	70A	+ current distribution relay no. 1
RH9 - (1389)	40A	+ current distribution relay no. 2
RH11 - (471)	20A	Electric window lift relay
RH12 - (235)	40A	Mirrors + rear window heater relay
RH13 - (1041)	40A	Rear window wiper relay
RH14 - (2341)	20A	Door central locking relay
RH15 - (1762)	20A	Electric window lift relay

RELAYS	RATING	FUNCTION
RH16 - (752)	40A	After ignition feed relay no. 2 (hands-free card vehicles)
RH17 - (1615)	40A	Engine running + relay
RH18		*Stock area*
RH19		*Stock area*
RH20		*Stock area*

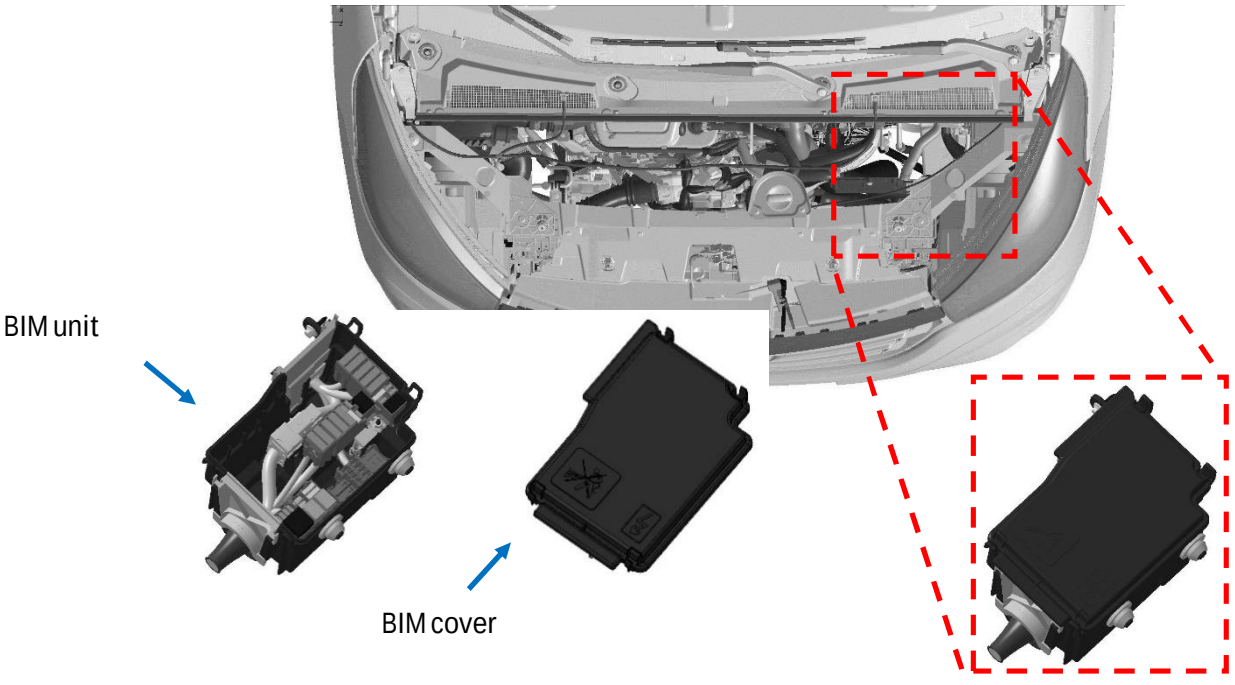
Diode definition

DIODE	RATING	FUNCTION
D1		*Stock area*
D2		*Stock area*

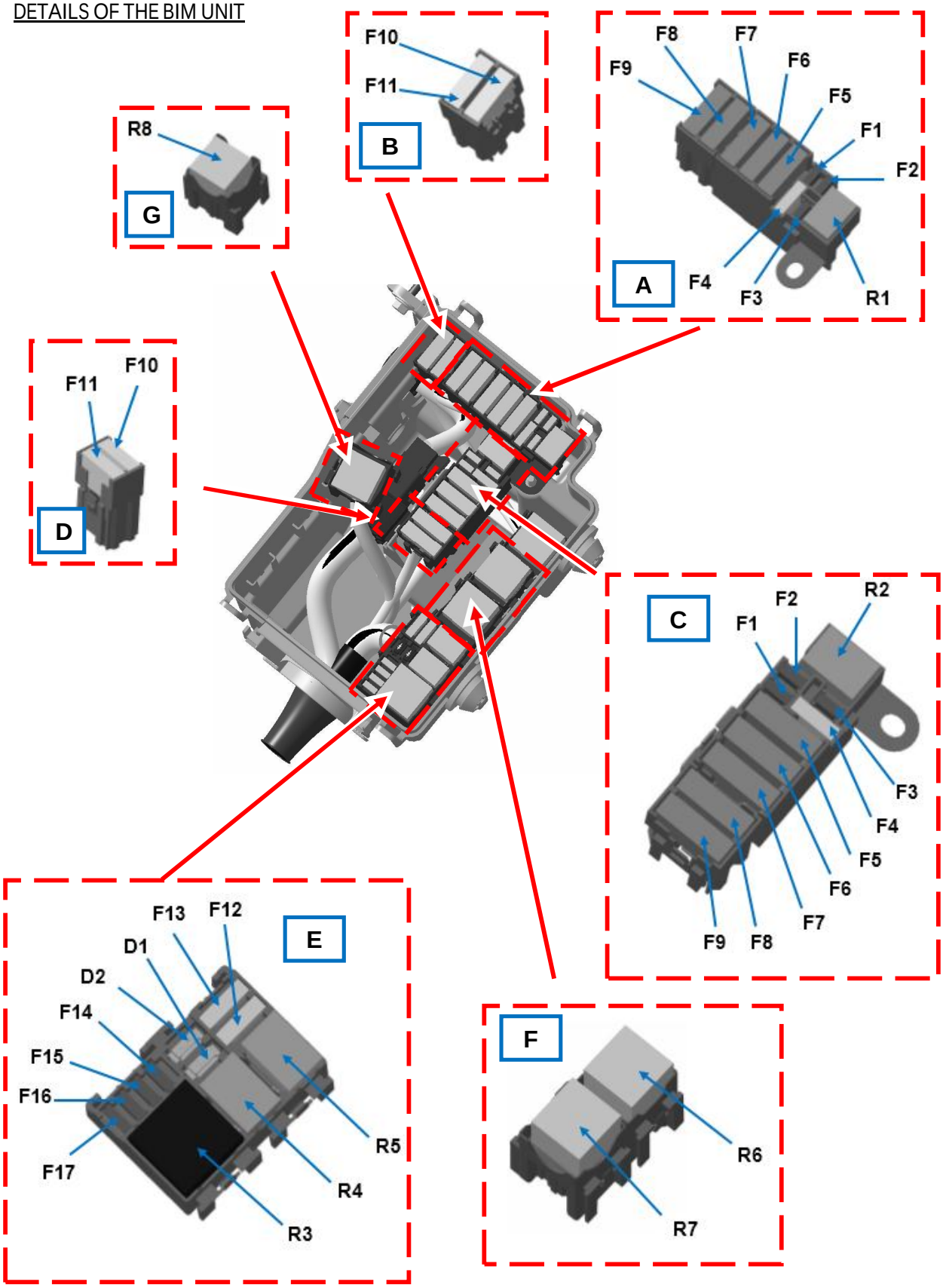
4.2.2. ENGINE COMPARTMENT CONNECTION UNIT

The engine compartment connection unit can be found to the left of the engine compartment in front of the shock absorber mounting. This unit contains the panels of the power supply fuses and relays.

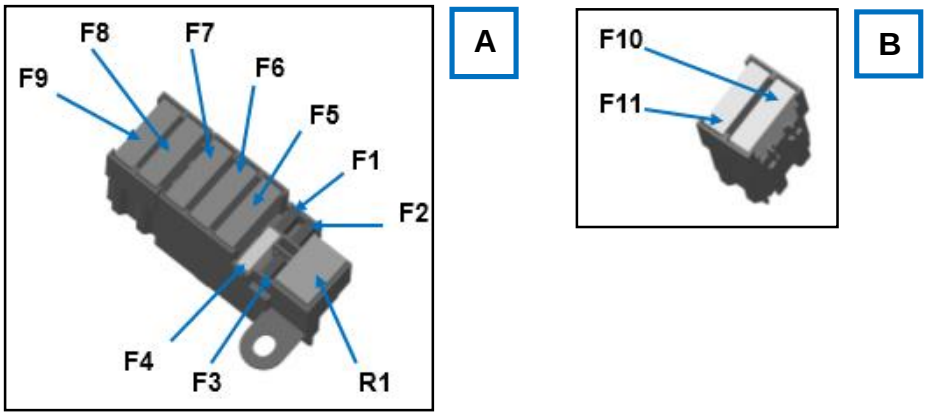
LOCATION OF THE BIM UNIT



DETAILS OF THE BIM UNIT



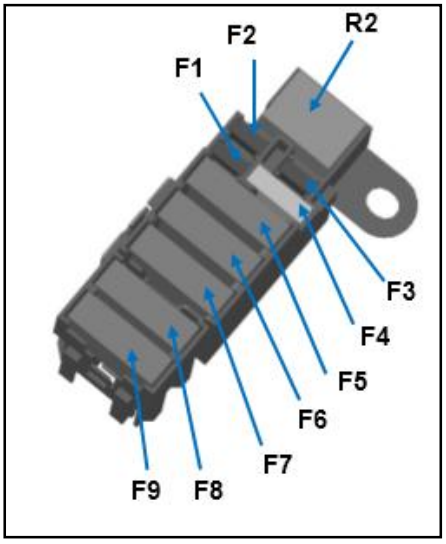
FUSE AND RELAY SUPPORT MODULES (A) AND (B)



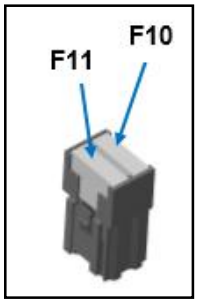
	Fuse	Type	Rating	Function
A	F1	*Mini fuse*		*Stock area*
	F2	*Mini fuse*		*Stock area*
	F3	Mini fuse	25A	ABR / ESP
	F4	Ato fuse	30A	Starter
	F5	Maxi fuse	70A	Passenger compartment 1
	F6	Mini fuse	70A	Passenger compartment 3
	F7	Mini fuse	50A	ABR / ESP
	F8	Mini fuse	60A	Passenger compartment 2
	F9	Mini fuse	20A	Mirrors heater
		Mini fuse	40A	Rear window + mirrors heater
B	F10	*Maxi fuse*		*Stock area*
	F11	*Maxi fuse*		*Stock area*

	Relay	Type	Rating	Function
	R1	Resistance micro-relays	20A	Starting

FUSE AND RELAY SUPPORT MODULES (C) AND (D)



C

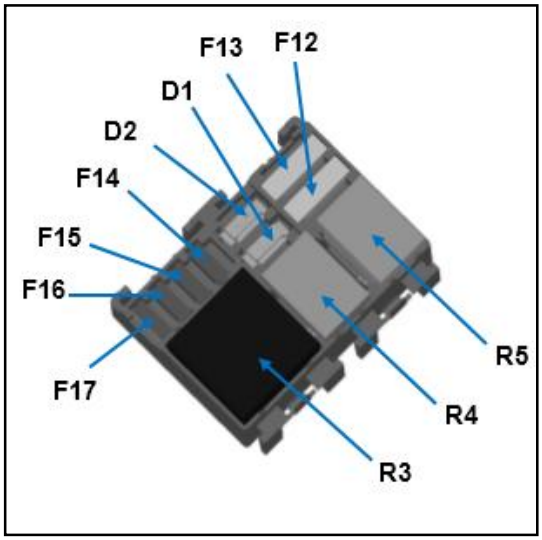


D

	Fuse	Type	Rating	Function
C	F1	*Mini fuse*		*Stock area*
	F2	*Mini fuse*		*Stock area*
	F3	Mini fuse	15A	+ battery feed air conditioning compressor
	F4	Ato fuse	15A	Fuel pump
	F5	Maxi fuse	70A	Heater control unit
	F6	Maxi fuse	60A	Heating element unit
	F7	Maxi fuse	60A	Heating element unit
	F8	Mini fuse	40A	Engine suffix *408 and air conditioning or 450 and heating Motor-driven fan assembly 1
		Mini fuse	50A	Engine suffix *408 and heating or 450 and air conditioning Motor-driven fan assembly 1
	F9	Mini fuse	40A	Engine suffix *408 and air conditioning or 450 Motor-driven fan assembly 2
D	F10	*Maxi fuse*		*Stock area*
	F11	*Maxi fuse*		*Stock area*

	Relay	Type	Rating	Function
C	R2	Micro relay	20A	Fuel pump relay

FUSE AND RELAY MODULES (E)



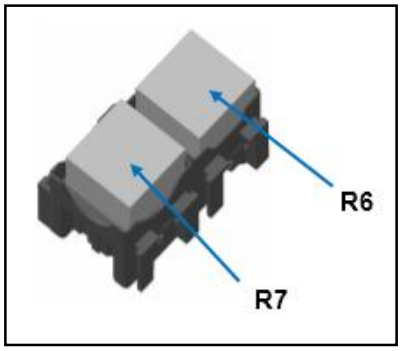
E

	Fuse	Type	Rating	Function
E	F12	*Ato fuse*		*Stock area*
	F13	*Ato fuse*		*Stock area*
	F14	*Mini fuse*		*Stock area*
	F15	Mini fuse	25A	Diesel heater
	F16	Mini fuse	20A	Engine injection system
	F17	Mini fuse	15A	Engine injection system

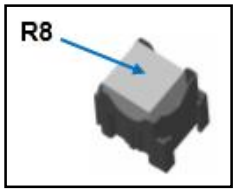
	Relay	Type	Rating	Function
E	R3	Relays ISO	40A	Injection supply relay
	R4	Micro relay	20A	Compressor control relay
	R5	*Micro relay*		*Stock area*

	Diodes	Type	Rating	Function
E	D1	Diode	1N 4004	Air conditioning compressor
	D2	*Diode*		*Stock area*

FUSE AND RELAY MODULES (F) AND (G)



F



G

	Relay	Type	Rating	Function
F	R6	ISO relay	70A	High speed (Motor-driven fan assembly 1)
	R7	ISO relay with rest switch	40A	Low speed (Motor-driven fan assembly)

	Relay	Type	Rating	Function
G	R8	ISO relay without rest switch	40A	High speed (Motor-driven fan assembly 2)

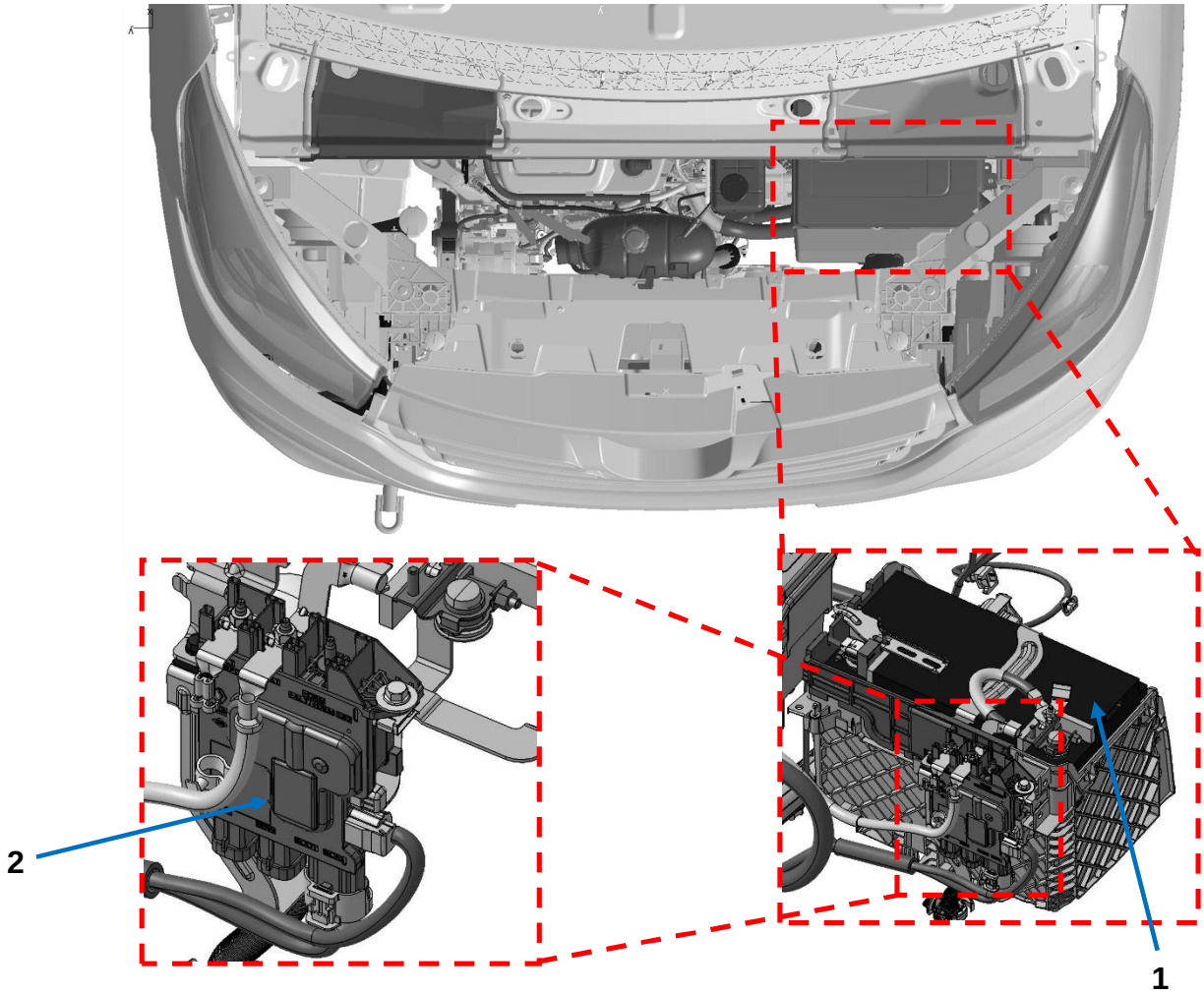
4.3. SERVICE BATTERY / POSITIVE TERMINAL (+) / NEGATIVE TERMINAL (–)

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.



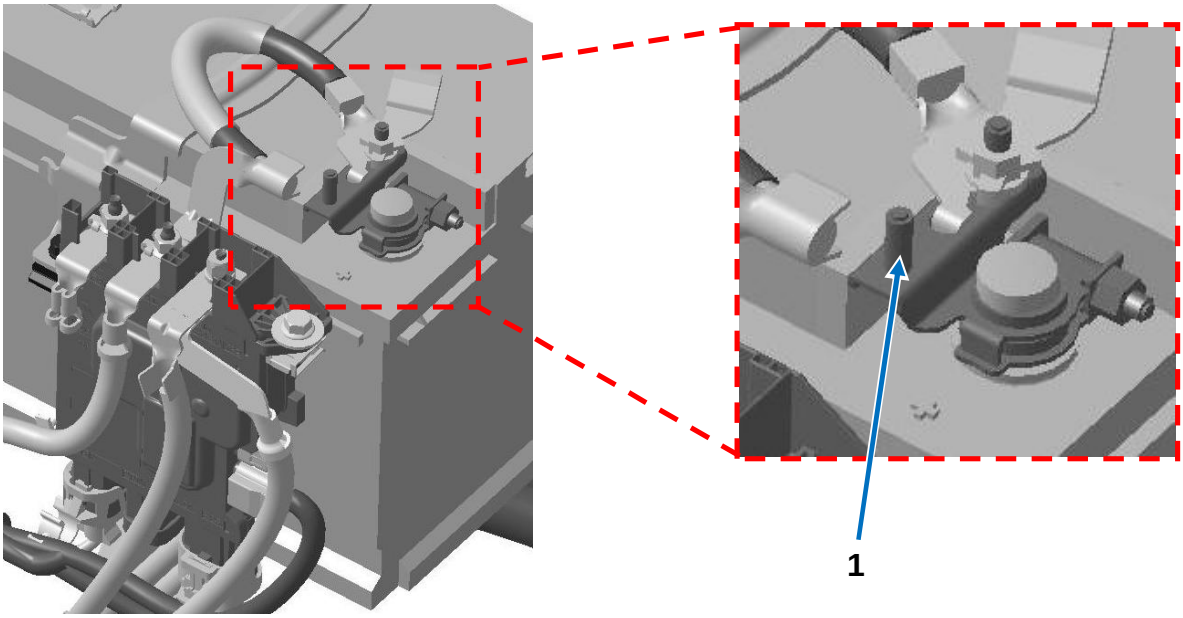
1 :	Battery
2 :	Electrical distribution unit

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 (+)

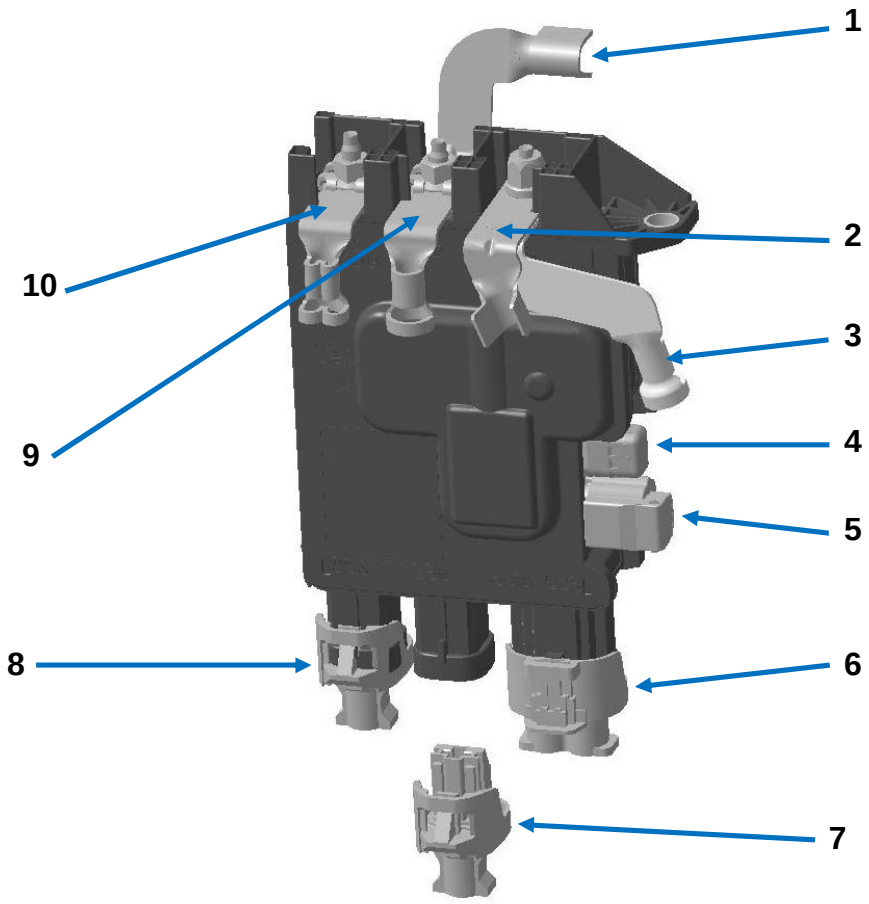
Presence of an electrical distribution unit called the "BDU" with built-in fuses.



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)



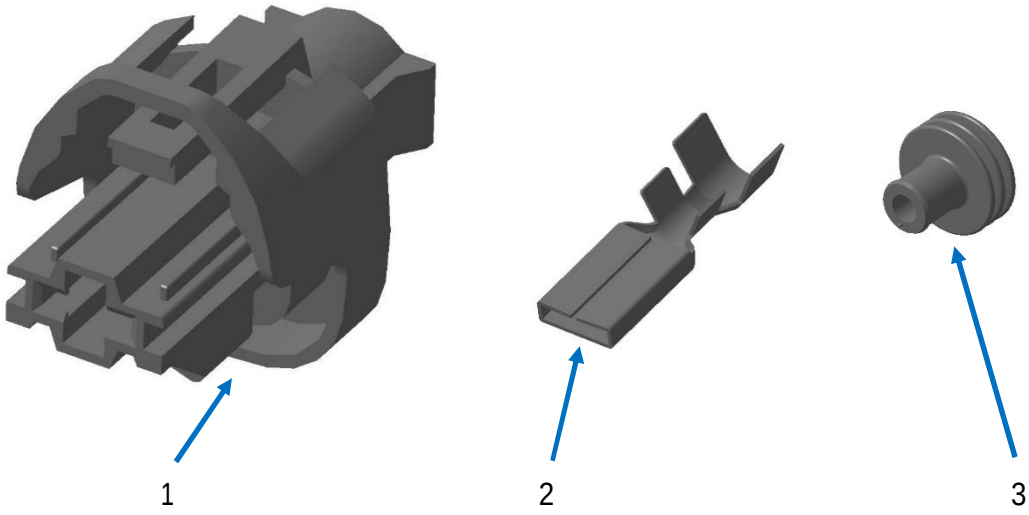
1 :	Battery protection supply wiring	
2 :	Engine wiring (Alternator)	300A
3 :	Engine wiring (starter motor)	300A
4 :	Mini fuse with cap (Start/Stop)	5A
5 :	Cab wiring (Start/Stop)	
6 :	Cab wiring (conversion KPD and KC6 options or trailer tow bar)	50A
7 :	*Reserved for purpose-body builder conversions,* Part No. 82 00 844 974	*
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)

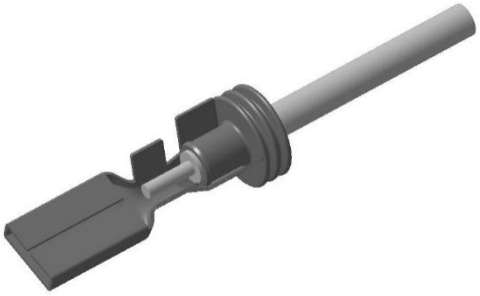
Details of bodybuilder connector (7)

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 8 MM NG1		1544227-1	Range 3 to 6 mm2
			1544228-1	Range 7 to 10 mm2
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			

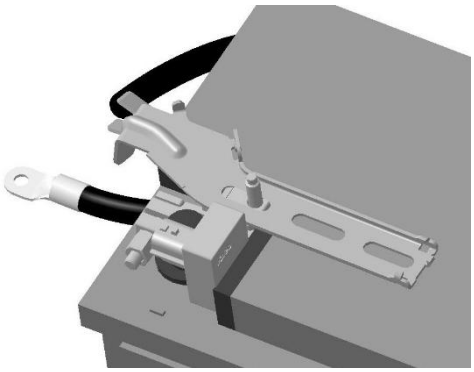
Detail before crimping the clip and seal



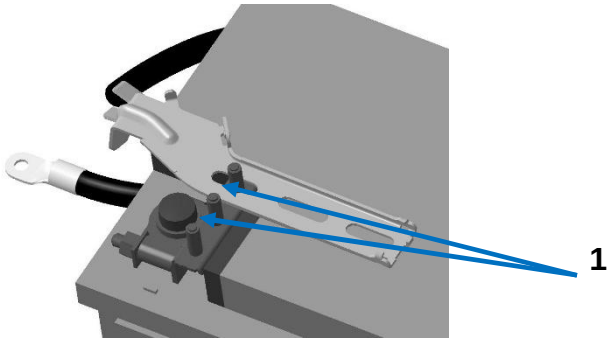
4.3.3. BATTERY NEGATIVE TERMINAL (-)

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.

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

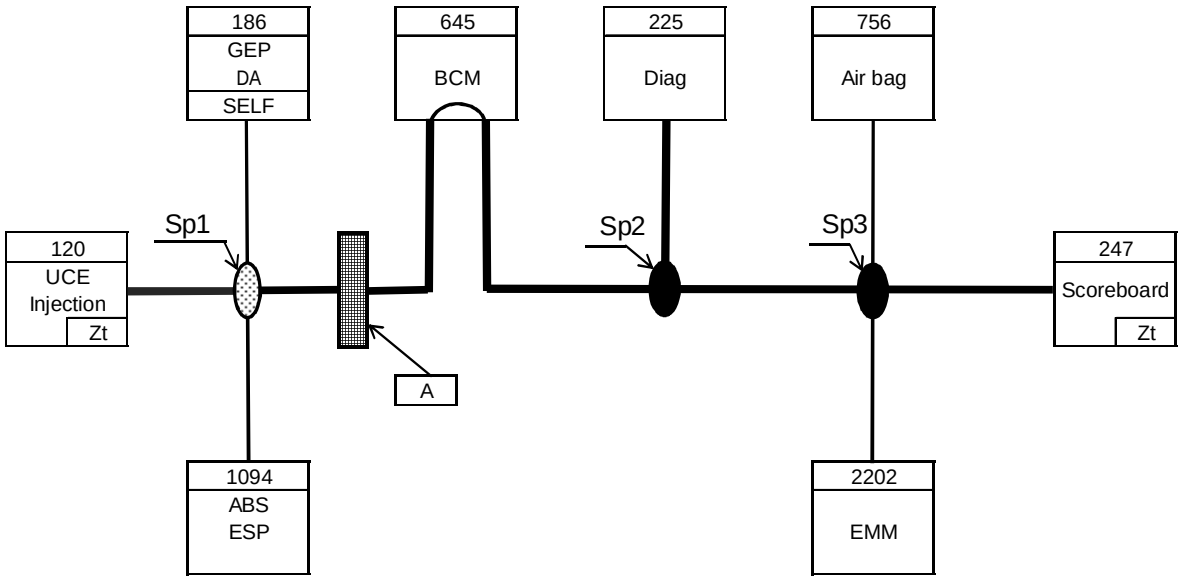
A CAN-BUS Interface modul for Conversion is available as an option on all versions. This module can be used to recover certain information that is available on the multiplexed network (see also Chapter 4.10)

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

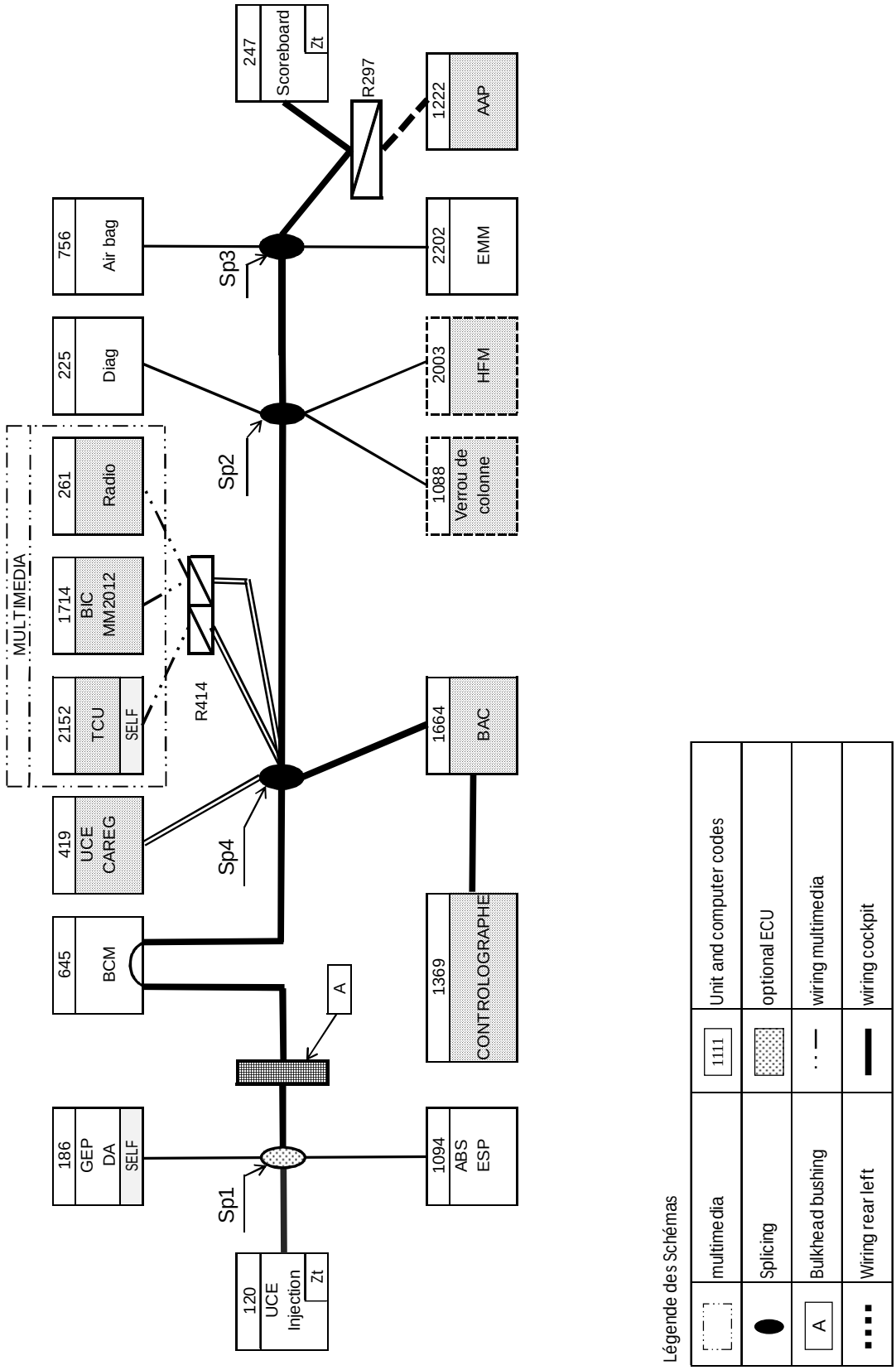
Entry level version



Légende des Schémas

	multimedia	1111	Unit and computer codes
	Splicing		optional ECU
A	Bulkhead bushing		wiring multimedia
	Wiring rear left		wiring cockpit

Top-of-the-range version



Legend of Components

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

- On all R9M GEN1 (Single Turbo) PANEL VANS

  On all R9M GEN2 (Twin Turbo) PANEL VANS equipped with a heater and therefore with the following options:

  - C60 & K08 Manual front air-conditioning + Auxiliary heater,
  - CJ5 & K08 Manual front/rear air-conditioning + Auxiliary heater,
  - C68 & K08 Regulated front air-conditioning + Auxiliary heater,
  - CJ4 & K08 Regulated front/rear air-conditioning + Auxiliary heater,
  - C41 & K08 Heater system, outside air, with fan + Auxiliary heater

Alternator 185A

- On all Combis

- On all R9M GEN2 (Twin Turbo) PANEL VANS not equipped with a heater and therefore without the options referred to above.

Note :

The heater allows the participation of the 4 thermo plungers to be reduced, hence its impact on the power balance and the alternator type.

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.

		Level	Engine / index	Emissions control	kW	Gearbox
TEMPERATE	Single Turbo [GEN1]	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
	Twin Turbo [GEN2]	D3	R9M/450	Euro5	103	PF6, 6-speed manual

Alternator 185A with ESM & START / STOP.

		Level	Engine / index	Emissions control	kW	Gearbox
EXTREME COLD	Single Turbo [GEN1]	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
	Twin Turbo [GEN2]	D3	R9M/450	Euro5	103	PF6, 6-speed manual

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.

Vehicle with 150 A alternator

Powertrain	Version	Without fast idle 900	With fast idle		
			1000	1100	1200
Single Turbo	Non AC	10A	17A	20A	27A
	AC				
Twin Turbo	Non AC	20A	27A	30A	37A
	AC				

Vehicle with 185 A alternator

Powertrain	Version	Without fast idle 900	With fast idle		
			1000	1100	1200
Single Turbo	Non AC	–	–	–	–
	AC				
Twin Turbo	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

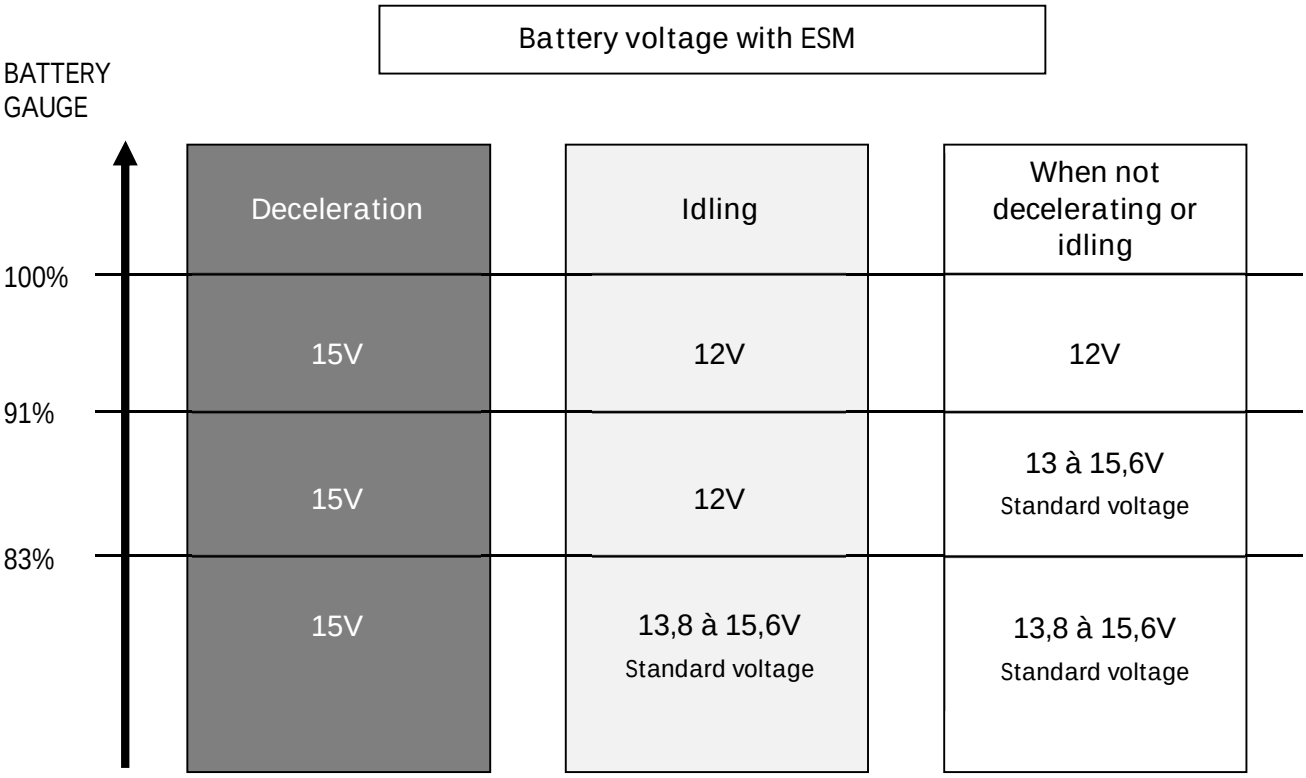
The voltage of the electrical network fluctuates between 13.5 V and 14,8 V during the engine running phases. This voltage management may be deactivated in the OPEL / VAUXHALL network via the Clip diagnostic tool.

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

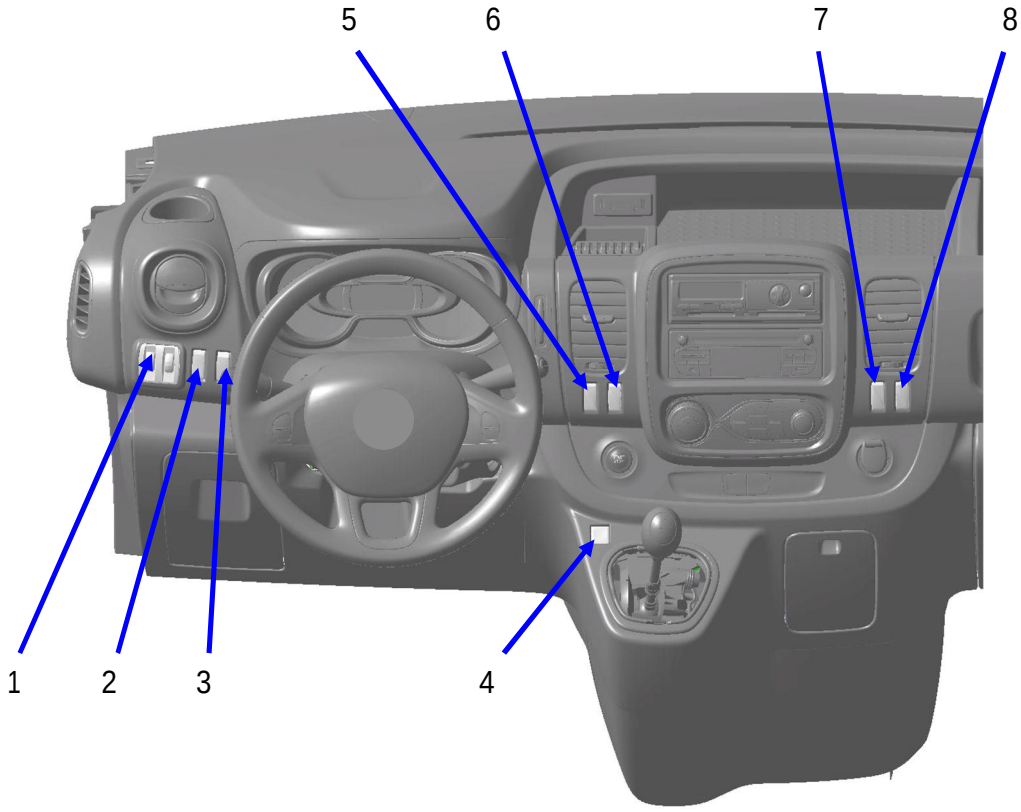
When the vehicle is started, the voltage can fall to 6.4 V. This should be considered by the bodybuilder when he is adding control units.



4.6. INSTALLATION OF SWITCHES

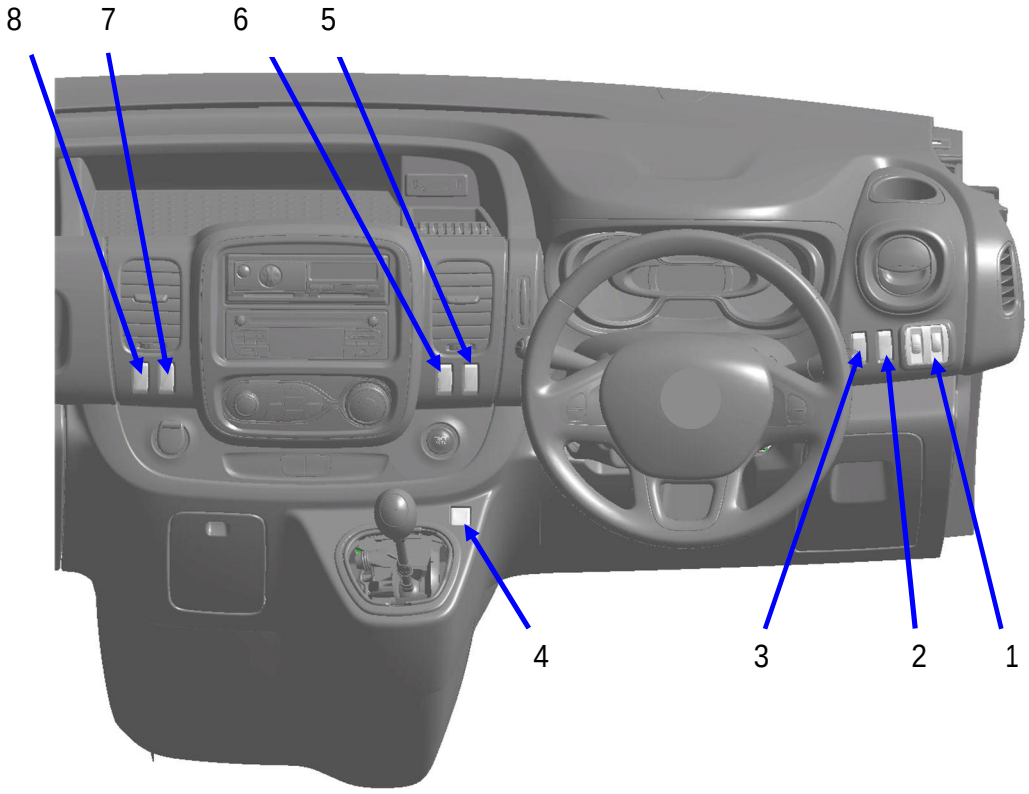
Depending on version, five spaces for switches may be provided on the dashboard.
Switch for parking distance control (3), switch for cruise control/speed limiter (5) switch to override Start/Stop (6) switch for rear de-icing (7) and switch for fast idle (8).

Switches on left-hand drive version



Reference	Function	Reference	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



Reference	Function	Reference	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 reduce emissions.

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.

When the engine is in auto Stop phase, activating fast idle does not restart the engine. See Fast Idle chapter 4.9 .

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 within external temperature range
- AND thermal comfort reached (only with Climate Control option)
- AND engine temperature reached
- AND driver on seat with seat belt fastened (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
- Failure detected in certain components (ABS, neutral, speed ....)
- Thermal comfort (automatically with a time delay)
- Battery charge status

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

Impacts related to the START/STOP system

Loss of function following too many frequent stops. If the battery is not sufficiently charged, the "START/STOP" deactivates itself.

The engine restarts automatically after an auto stop for safety reasons (to maintain brake assistance vacuum, battery charge level, etc.) or thermal comfort.

For key vehicles, if no driver door opening is detected, START/STOP is deactivated after 15 missions (Key On, Key Off), making it necessary to return to the dealership to reactivate the system.

Variation in the voltage supplied by the alternator (see data sheet No. 4.5 – Available currents)

CONVERSION RECOMMENDATIONS AND PROHIBITIONS

Vehicle servicing

Before carrying out any servicing on the vehicle, the battery must be disconnected (to prevent the Stop and Start 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.

Recommended vehicle versions

Whenever possible, it is recommended to take vehicles without the START/STOP option for conversions requiring constant energy (electrical or mechanical) from the vehicle, or for conversions with the addition or modification of opening elements through which the driver may leave the vehicle.

When the base vehicle comes with START/STOP, it is recommended to use the fast idle function for conversions requiring the engine to run during intermediate stops (traffic jams, traffic lights, stop signs, etc.).

On vehicles where conversions are only used with the vehicle stopped (e.g. rescue vehicles). Engine restarting will no longer be followed by an automatic Stop for as long as the vehicle remains stationary.

Conversion prohibition and obligations

It is forbidden to make contact between the control unit of the conversion and the base vehicle's Stop & Start activation/deactivation *(button on the dashboard), to restart the engine when required;*

Risk of engine automatically restarting while the driver has exited the vehicle during the auto Stop phase.

It is forbidden to consume additional current during the Auto Stop phase (engine not running) above the value given in 'available current' sheet 4.5

There is a risk of a fault occurring on the vehicle's computers if excess current is consumed during the engine start-up phase).

Conversions with modification or addition of opening elements

It is prohibited to remove the vehicle's opening element closure switches from the vehicle or to add additional opening elements through which the driver may get out and whose opening would not be recognised by the vehicle. *Risk of failure to detect the driver exiting the vehicle and automatic restarting of the engine after an automatic stop.*

The driver's door must remain the main way out of the vehicle for the driver so as not to disrupt operation of the START/STOP (see paragraph on "related impacts").

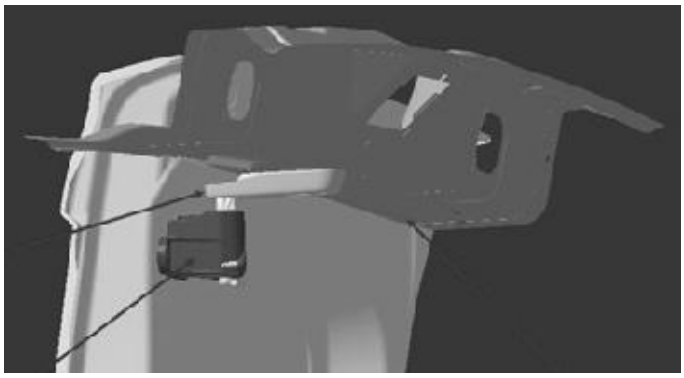
It is forbidden to remove the bonnet sensor (opening detection must remain operational).

Panel van vehicle (without partition)

If a side opening which can be used to exit the vehicle is added, it is necessary to take a base vehicle with a sliding side door, so as to maintain the door wiring and switch.

If the opening elements are modified, it is necessary to retain the electrical information of the opening element switch.

It is essential to remove the left-hand door retaining system for vehicle versions fitted with them.



Open vehicle (platform cab)

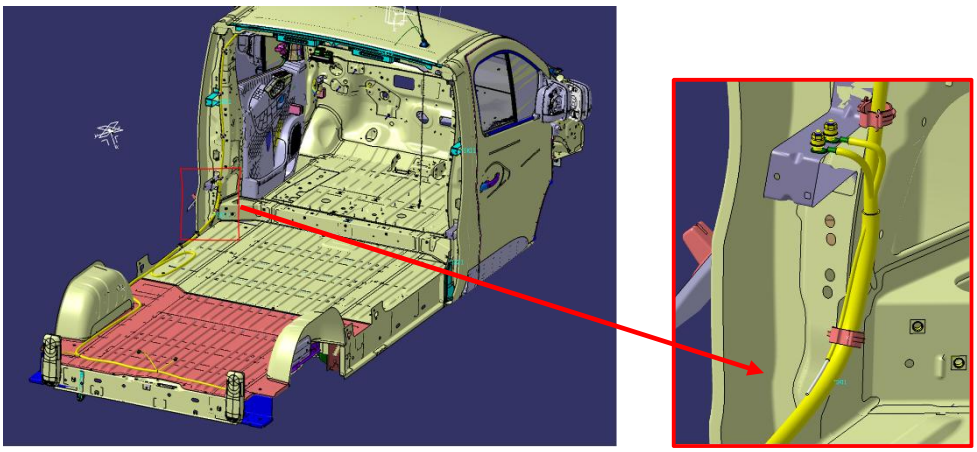
If an opening element which can be used to exit the vehicle is added, it is recommended to use original OPEL / VAUXHALL locks and the associated switches.

The spare wire (connection 87T) located near to the 2 earth terminals MFA-A and MGA is connected at its other end to the 36-pin connector 297-3A in the roof, via pin C8; it must be connected to the locking switch of the opening element that was added.

The earthing of the spare wire gives the information of an open opening element.

Where several opening elements are added, the related switches must be connected in series.

If the driver's door is modified, the basic vehicle's door switch information must be retained.



4.8. REAR DOOR CENTRAL LOCKING / PARKING BRAKE INFORMATION

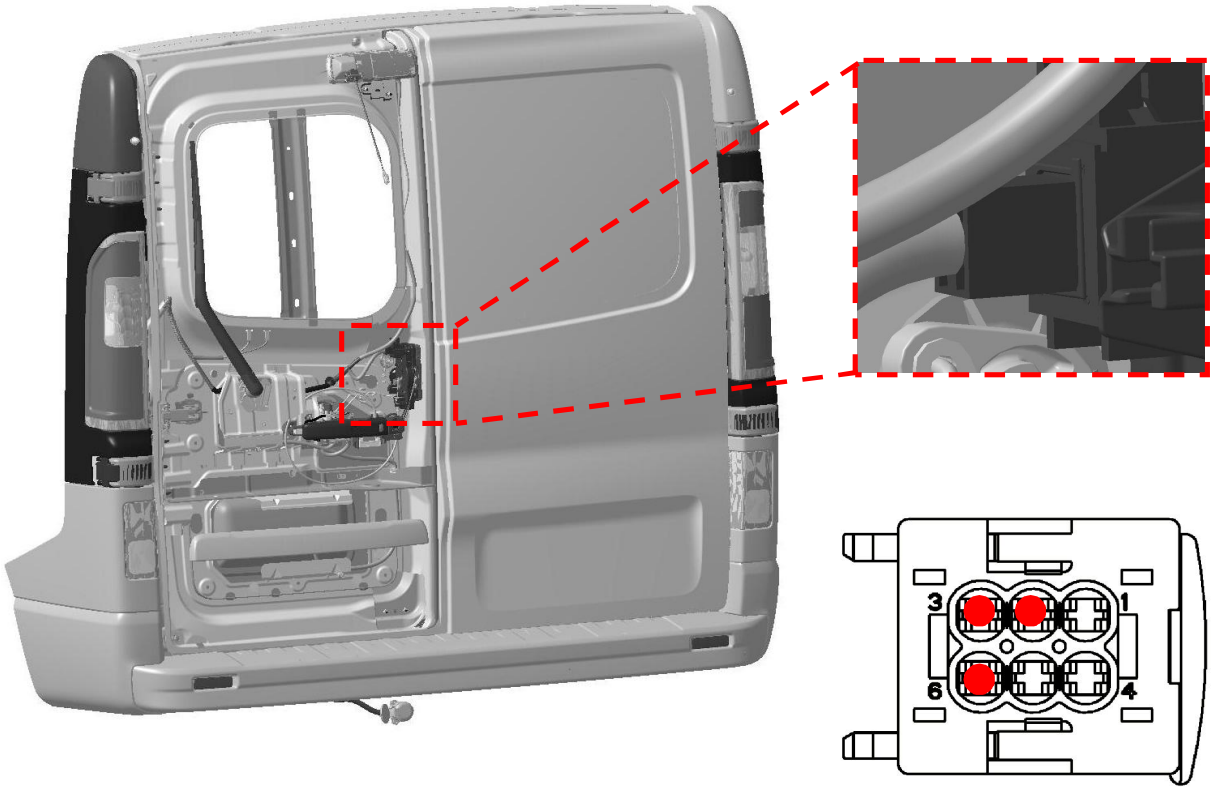
4.8.1. REAR DOOR CENTRAL LOCKING

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.*

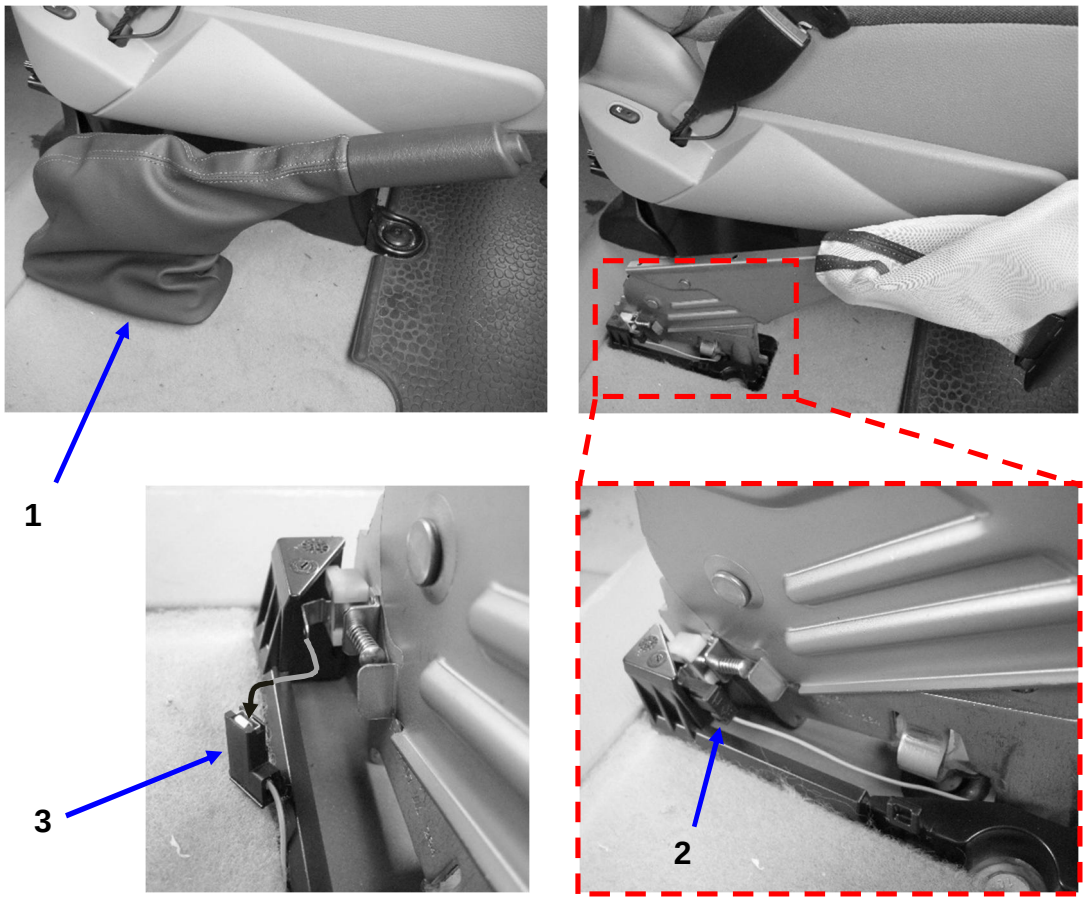
Left-hand hinged door, version



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.



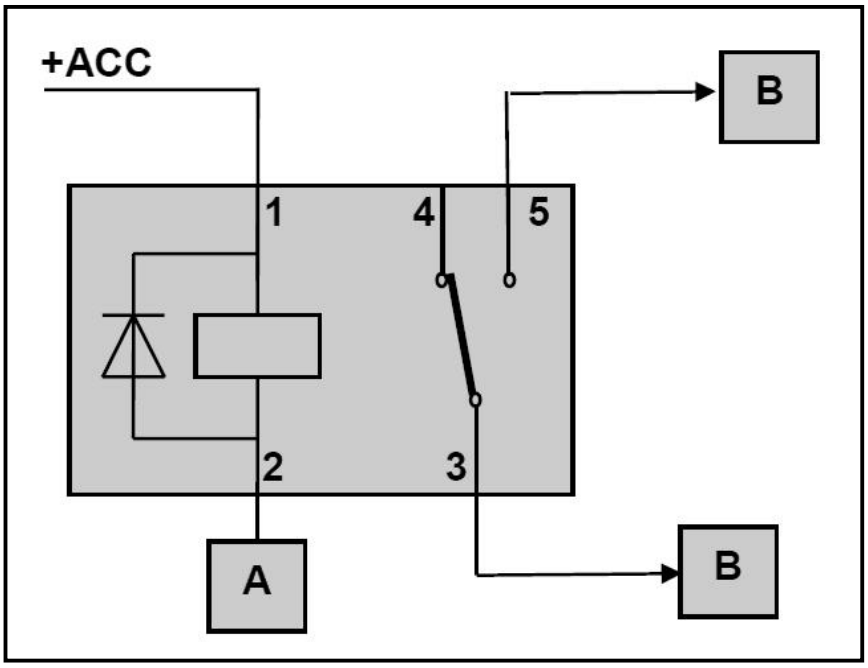
1 :	Hand brake
2 :	Hand brake wiring
3 :	Hand brake wiring disconnected

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, 1st 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 ''V66''

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

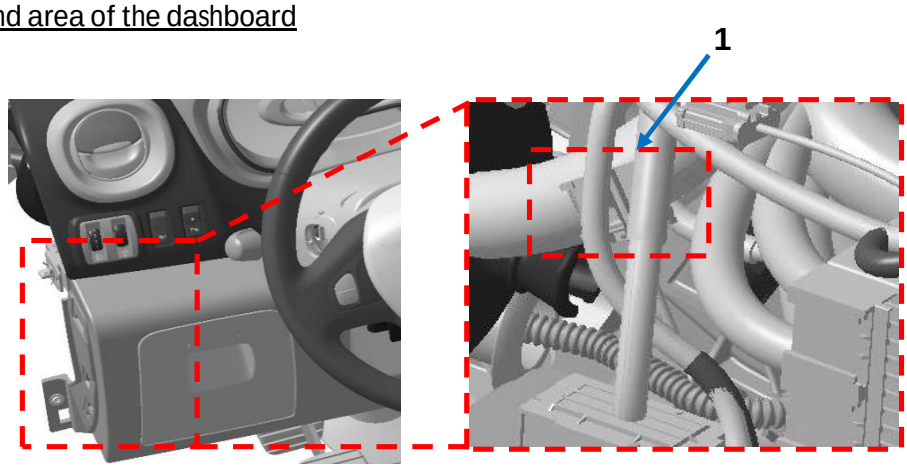
2-way Connector

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

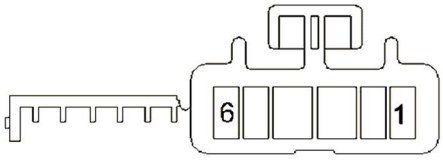
Location of the 6-way connector

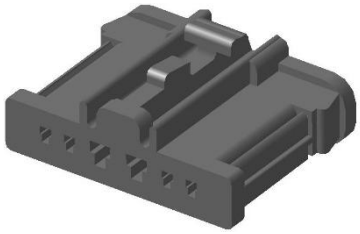
Left-hand area of the dashboard



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





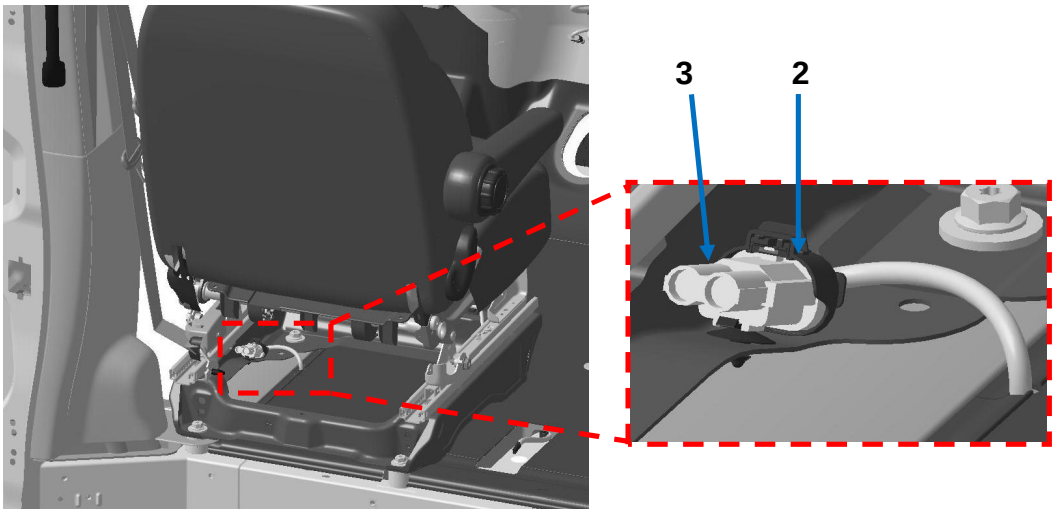
Ways	Connections	Allocations
1 :	BMT2	+ 12V "engine running" information (max. 8 A/wire section 1 mm²)
2 :	3ADA	Fast idle control (500 mA max. wire section 0.35 mm²)
3 :	SBP4	+12 V load shedding (max. 16 A/wire section 1.5 mm²)
4 :	LPH	+ 12 V Side lights (lamp) (max. 500 mA/wire section 0.35 mm²)
5 :	H1	"Ground" information with hand brake applied (max. 500 mA/wire section 0.35 mm²)
6 :	MAN	Ground (section large enough to adapt to the +12 V current distribution) (wire section 1.5 mm²)

The counterpart to this connector is available from the OPEL / VAUXHALL network under part number 4200773541.

CONNECTION KIT

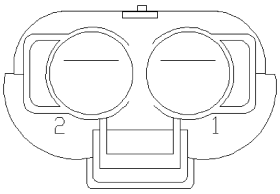
Location of the 2-way connector

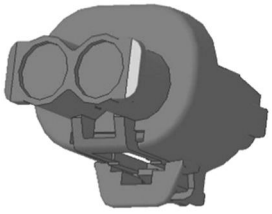
Left-hand area of floor panel underneath the seat (symmetrical for right-hand drive)



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) (Part No. 8200784203), but it is necessary to obtain the contacts

2-way Connector





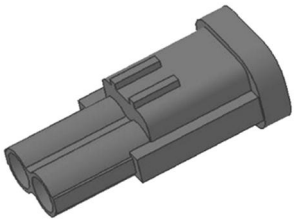
Way	Allocation
Way 1 (BP23)	+12 V direct battery power supply for maximum consumption of 40 A (wire section 7 mm²). Protected by a 50 A fuse,
Way 2 (MAN)	Ground (wire cross-section 7 mm² large enough to adapt to the battery +12 V current).

Note: *The maximum permanent current of this power supply must not exceed 40 A and should be shared with the AAM unit for vehicles with "KC6" or "VR2" option. (for info, the max. current needed for the tow bar is around 12A).*

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 No. 82 00 784 203			
Wire section		Supplier reference	Supplier
3 to 6 mm²		P790861	TYCO
7 to 10 mm²		P790862	TYCO

4.9.2. FAST IDLE OPTION ‘’V66’’

The fast idle function is not possible on a vehicle that does not have the option “V66 “ or option “ KPD” or option “KC6”

General information

The fast idle speed and PTO Provision are only available together.

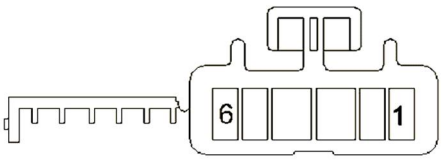
Fast idle function is used to increase the idle speed of the vehicle to provide more power and/or electrical energy.

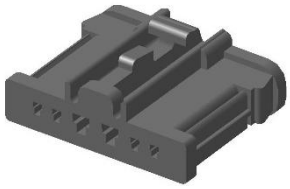
The standard vehicle idle speed is 850 rpm.

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 “V66” (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 mm²)
2 :	3ADA	Fast idle control (500 mA max. wire section 0.35 mm²)
3 :	SBP4	+12 V load shedding (max. 16 A/wire section 1.5 mm²)
4 :	LPH	+ 12 V Side lights (lamp) (max. 500 mA/wire section 0.35 mm²)
5 :	H1	"Ground" information with hand brake applied (max. 500 mA/wire section 0.35 mm²)
6 :	MAN	Ground (section large enough to adapt to the +12 V current distribution) (wire section 1.5 mm²)

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.

By default, the vehicle is configured with a deactivation speed of almost zero (around 0.5 km/h)

For a fast idle below 1,300 rpm, the deactivation speed can be set up to 30 km/h

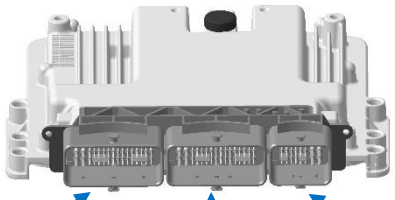
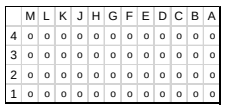
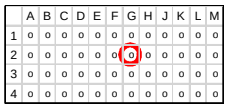
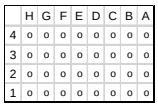
For a fast idle above 1,300 rpm, it is not possible to change the deactivation speed. The vehicle cannot drive with fast idle.

Pressing the clutch pedal deactivates the fast idle.

Injection computer (euro4 & 5)

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

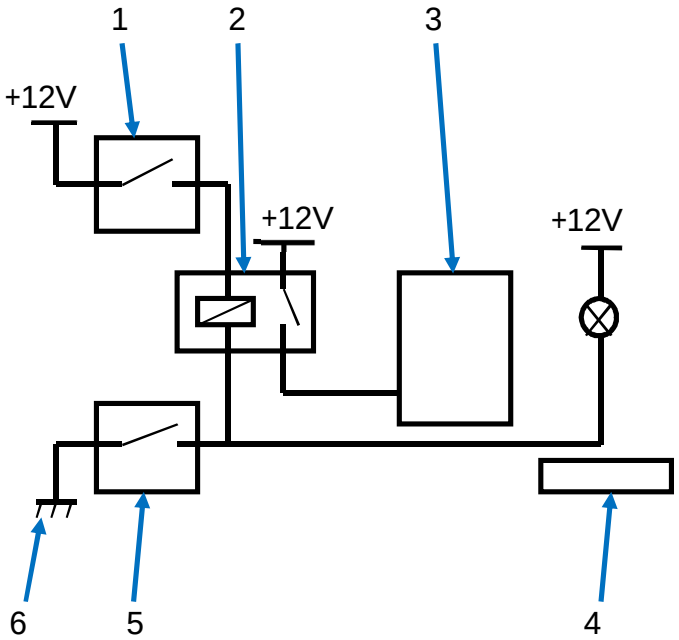
- Use of an injection computer input +12 V supply on the corresponding pin of connector B pin G2 (see table below)

PIN	B-G2		
Connector	B		
			
	Connector C	Connector B	Connector A
			

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:

<u>Fast idle diagram</u>

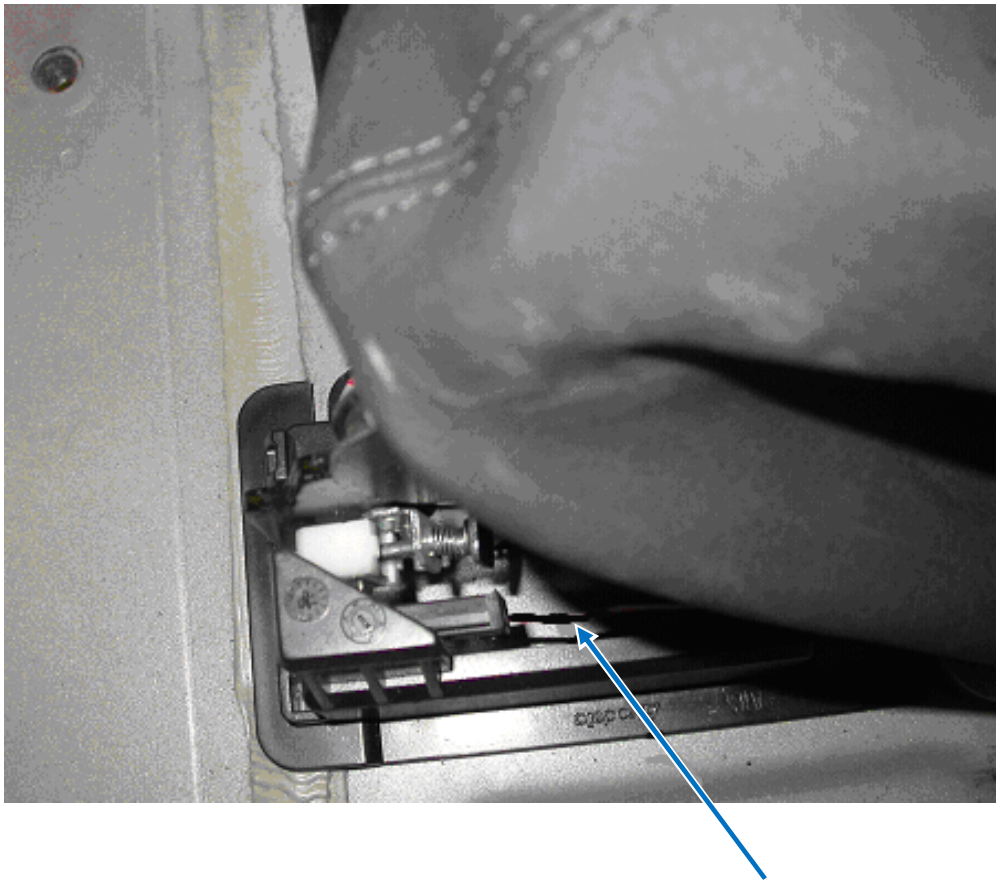


1:	Fast idle control
2:	Relay
3:	Injection computer
4:	Instrument panel warning light
5:	Hand brake switch
6:	Earth

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.



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.

Important: The use of output signals is entirely new

The Additional Adapter Unit is available as an option on all versions. This unit is used to retrieve certain information available on the multiplex network.

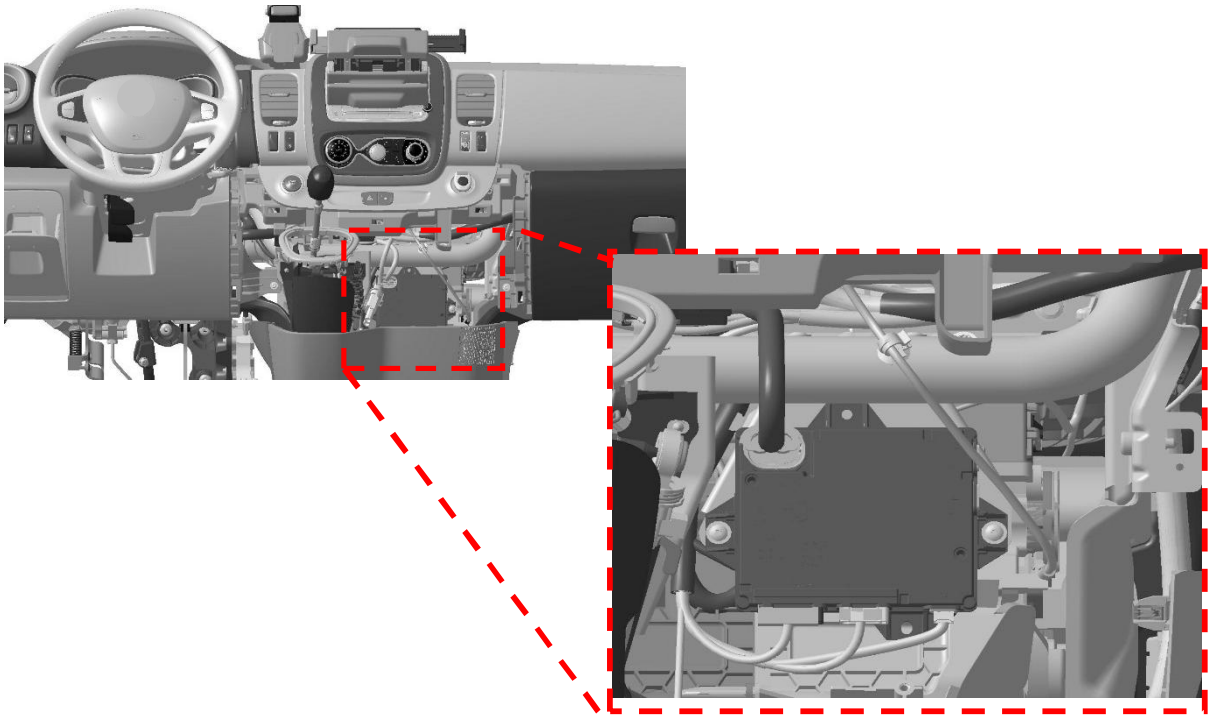
The unit is mounted on the dashboard cross member behind the centre console for both left-hand drive and right-hand drive vehicles.

Note: The unit cannot be fitted at post-equipment.

On vehicles without the KC6 option, this function is available:

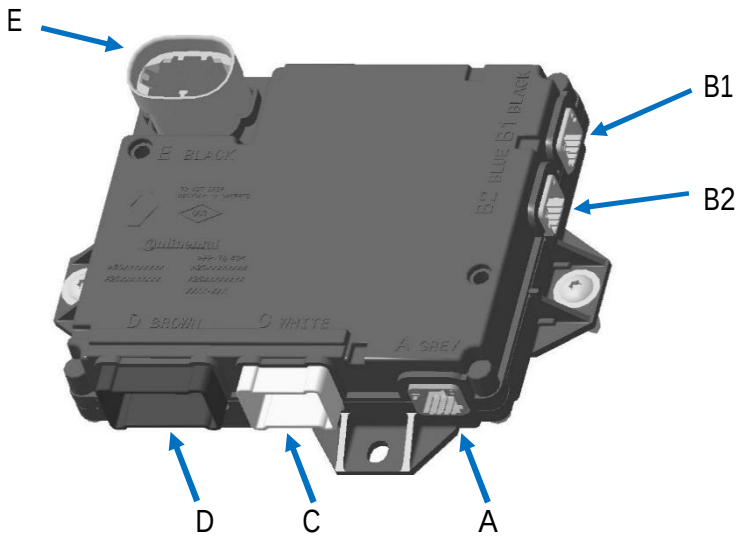
- *with the tow bar option (ATREM), provided the vehicle is taken to the Opel/Vauxhall network to activate the logical outputs.*
- *With the tachograph option, except speed info.*

Location CAN - bus interface

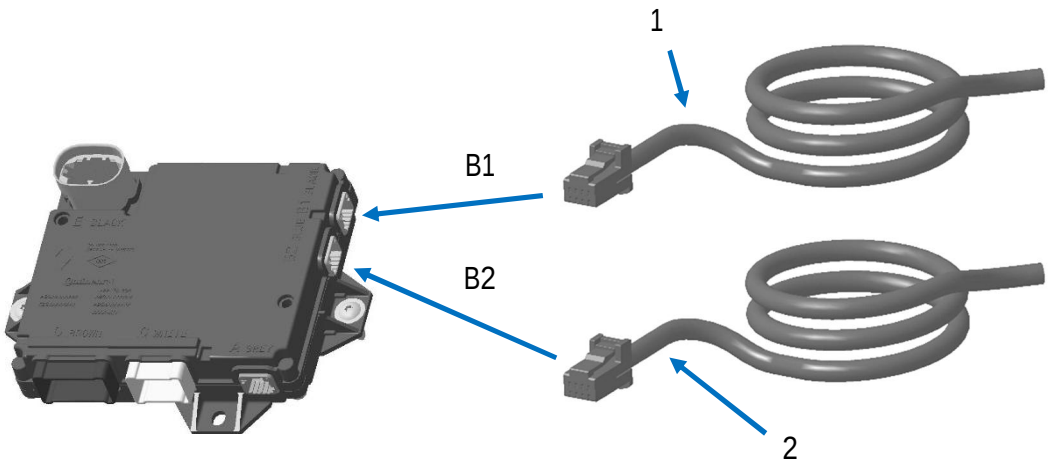


Details CAN - bus interface unit

Note: *Connectors "A", "C", "D" and “E” are strictly for OPEL / VAUXHALL use.*
Connectors "B1" and "B2" are specifically for converters (CAN and logic outputs).

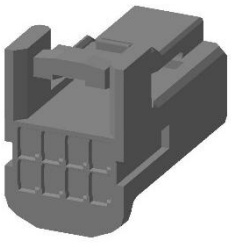


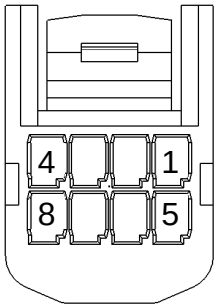
After-sales interface wiring



	Connector number	No. of pins	Connector colour	OPEL Part No.
1 :	B1	8	black	95 519 283
2 :	B2	8	Blue	95 519 284

Details of Black connectors B1 / 5 (8 way)





Connector	Part number	Function	Signal	Pins
B1 BLACK	TYCO 0-1379659-1	CAN ADAP2 500K	CANHS_L3	1
		CAN ADAP2 500K	CANHS_H3	5
		Brake position	O_LOG_1	4
		Engine running	O_LOG_2	7
		Clutch position	O_LOG_3	3
		Door opening/closing	O_LOG_6	6
		ABS regulation	O_LOG_7	2
		Not connected	NC1	8

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, 8 and 9).

Connector	Part number	Function	Signal	Pins
B2 BLUE	TYCO 0-137-9659-3	Ignition key position	O_LOG_4	4
		Door opening signal	O_LOG_5	3
		ESP regulation	O_LOG_8	7
		Neutral signal	O_LOG_9	2
		Hand brake switch	O_LOG_10	6
		Fast idle control	INTCNX_ADAP_VEH	8
		Vehicle speed	O_PWM_1	1
		Engine speed	O_PWM_2	5

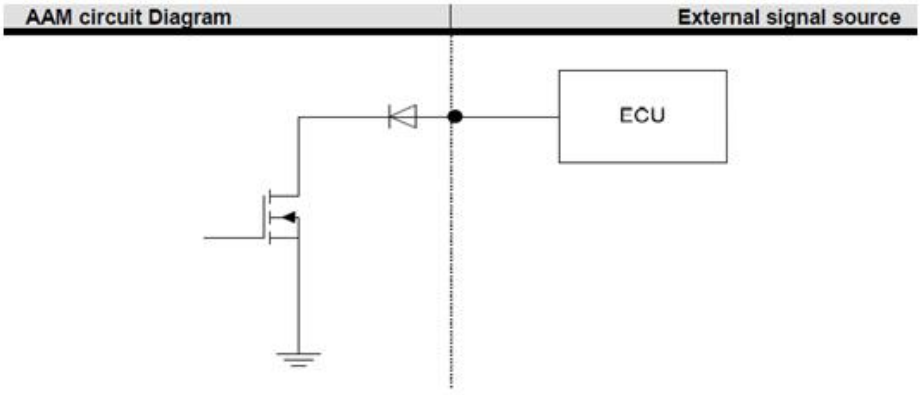
Note: *Pins 2, 3, 4, 6, and 7 are able to supply other information* via a reprogramming operation carried out within the OPEL/VAUXHALL network.*

** 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	

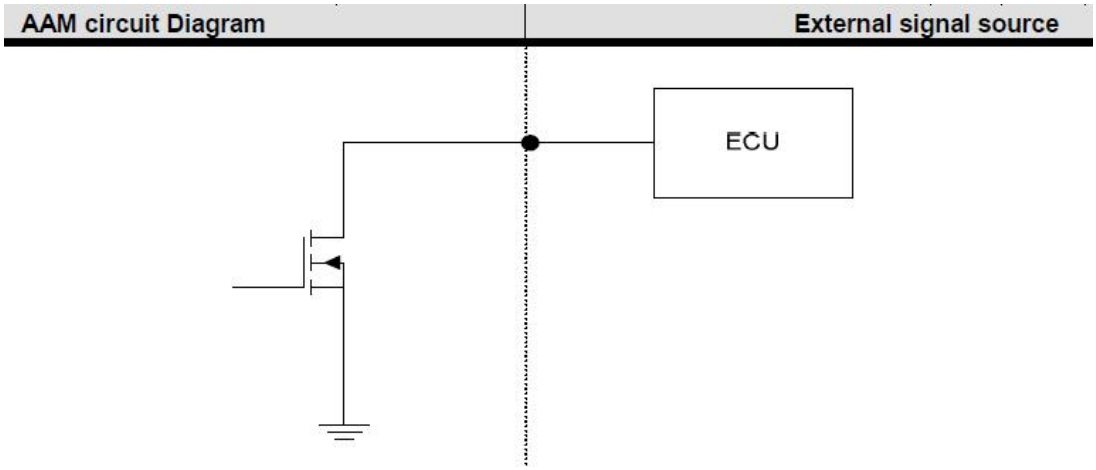
CURRENT TYPES

Logical outputs



LOGICAL OUTPUTS					
PARAMETERS		**MIN**	**Type**	**MAX**	**Unit**
Operating supply voltage	Vbat	8		16	V
Low level output voltage	VOL			1,25	V
Output operating current	IOL	500		950	mA
Current limitation	ILIM			950	mA
Open state leakage current	IOZH			0,1	mA
High level input current (ECU Vbat grounded)	IZL			0,1	mA
Low level input current (ECU GND connected to Vbat)	-IZL			0,015	mA
Clamping Voltage	VCUT	41		54	V
Demagnetisation energy	ECUT	13			mJ
Range of output frequency	FSO				Hz
Rise time	tr			100	µs
Fall time	tf			100	µs

PWM outputs



PWM OUTPUTS					
PARAMETERS		**MIN**	**Type**	**MAX**	**Unit**
Operating supply voltage	Vbat	6		16	V
Low level output voltage	VOL			0,3	V
Output operating current	IOL	500		950	mA
Current limitation	ILIM			950	mA
Open state leakage current	IOZH			0,015	mA
High level input current (ECU Vbat grounded)	IZL			0,015	mA
Low level input current (ECU GND connected to Vbat)	-IZL			Vbat/Ext Load	mA
Rise time	tr			100	µs
Fall time	tf			100	µs
Output capacitance	Clo		15	20,1	Hz

TABLE OF INFORMATIONS CAN :

INPUT				OUTPUT							Configuration (customization), Logical, Power and PWM Actions
				IMPORTANT: It is prohibited to activate the power outputs							
Information Part	**Information Needs**	**By Means of**	**CAN_V states**	**Frame Name**	**Parametres**	**Id (hex) Can ADAP2**	**MSB position**	**LSB position**	**Période CAN**	**Processing gateway from CANV parameters to CAN_ADAP2**	**Processing gateway from CANV parameters to logical, PWM and Power outputs parameters**
Engine *(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	Byte N° 3 - Bit N° 7	Byte N° 3 - Bit N° 0	40	**code on one byte**	
		CAN		ADAP_Base1	EngineCodantTemp	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	
Brakes *(Freinage)*	Speed information *(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 Vitesse in km/h
Engine *(Moteur)*	Engine running *(Moteur tournant)*	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 pedals *(Eclairage Pédalier)*	*brake lights* *brake pedal (Feux Stop Pédale de frein)*	CAN, log and Power	001 Brake pedal not pressed 010 Brake pedal pressed 100 Brake pedal confirmed pressed 111 unavailable	ADAP_Base2	BrakeSwitchEngine 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	
Air-Condition *(Clim)*	AC active *(AC actif)*	CAN, log and Power	0 Compressor clutch off 1 Compressor clutch on	ADAP_Base2	ACCompressorAuthorized	0E8	Byte N° 1 - Bit N° 5		40	If CAN V value = 0 Value = 0 If CAN V value = 1 then Value = 1	
Pedal *(Pédalier)*	Clutch *(embrayage)*	CAN, log and Power	00 Not used 01 Clutch pedal not pressed 10 Clutch pedal pressed at minimum 11 Unavailable	ADAP_Base2	ClutchSwitch	0E8	Byte N° 1 - Bit N° 4		40	If CAN V value = 10 then Value = 1 Else value = 0	
			00 Not used 01 Clutch pedal not pressed at maximum 10 Clutch pedal pressed at maximum 11 Unavailable								

Door *(Porte)*	Info open door *(Info porte ouverte)*	CAN, log and Power	00 Unvailable Value
			01 Driver door closed
			10 Driver 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	

			00 Unvailable Value 01 Passenger door closed 10 Passenger door open 11 Not Used								
			00 Unvailable Value 01 Rear Right door closed 10 Rear Right door open 11 Not Used								
			00 Unvailable Value 01 Tail Gate door closed 10 Tail gate door open 11 Not Used								
			00 Unvailable Value 01 Rear Left door closed 10 Rear Left door open 11 Not Used								

INPUT				OUTPUT						IMPORTANT: It is prohibited to activate the power outputs	Configuration (customization), Logical, Power and PWM Actions
Information Part	**Information Needs**	**By Means of**	**CAN_V states**	**Frame Name**	**Parametres**	**Id (hex) Can ADAP2**	**MSB position**	**LSB position**	**Période CAN**	**Processing gateway from CANV parameters to CAN_ADAP2**	**Processing gateway from CANV parameters to logical, PWM and Power outputs parameters**
vehicle state *(Etat véhicule)*	position of Ignition Switch *(position clé de contact (ACC, APC))*	CAN, log and Power	0000 Sleeping 0001 Technical Wakeup 0010 CutOffPending 0011 BatTempoLevel 0100 AccessoryLevel 0101 IgnitionLevel 0110 StartingInProgress 0111 EngineRunning 1000 AutoStart 1001 EngineSystemStop 1111 UnvailableValue	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	
Door *(Porte)*	Info locked doors *(Info conda/ déconda 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 Value = 1	
Lights *(Eclairage)*	direction indicator lamp left and right *(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	
Lights *(Eclairage)*	hazard warning system *(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	
******	******	******	******	ADAP_Base2	****** Fixed to zero *****	0E8	Byte N° 2- Bit N° 6	Byte N° 2- Bit N° 0	40	****** Fixed to zero *****	
vehicle state *(Etat véhicule)*	Stop AutoState	CAN, log and Power	0000 Sleeping 0001 Technical Wakeup 0010 CutOffPending 0011 BatTempoLevel 0100 AccessoryLevel 0101 IgnitionLevel 0110 StartingInProgress 0111 EngineRunning 1000 AutoStart 1001 EngineSystemStop 1111 UnvailableValue	ADAP_Base3	AutoStart	0E9	Byte N° 4 - Bit N° 6		100	If CAN V value = 1000 Driver value = 1 **else** Driver value = 0	
		CAN		ADAP_Base6	AIRBAGMalfunction	0EC	Byte N° 1 - Bit N° 0		100	copy CANV value into CAN_ADAP2 value	
		CAN		ADAP_Base6	DriverSafetyBeltReminder	0EC	Byte N° 1 - Bit N° 1	Byte N° 1 - Bit N° 2	100	copy CANV value into CAN_ADAP2 value	

INPUT				OUTPUT						IMPORTANT: It is prohibited to activate the power outputs	Configuration (customization), Logical, Power and PWM Actions
Information Part	**Information Needs**	**By Means of**	**CAN_V states**	**Frame Name**	**Parametres**	**Id (hex) Can ADAP2**	**MSB position**	**LSB position**	**Période CAN**	**Processing gateway from CANV parameters to CAN_ADAP2**	**Processing gateway from CANV parameters to logical, PWM and Power outputs parameters**
Lights - gearbox *(Eclairage - Boite de vitesse)*	Reversing lights and rear gear info *(Feux de recul - 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	
Gearbox *(Boite de vitesse)*	Neutral *(Point mort (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	
Gearbox *(Boite de vitesse)*	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_Level2FailureDisplay Request	0EC	Byte N° 2 - Bit N° 7		100	If CAN V value = 01 Value = 0 If CAN V value = 10 then Value = 1	
vehicle state *(Etat véhicule)*	Key / Keyless *(VAC/VSC)*	CAN	00 Keyless vehicle 01 Unavailable 10 Not used 11 Key vehicle	ADAP_Base6	KeyVehicle	0EC	Byte N° 2 - Bit N° 0	Byte N° 2 - Bit N° 1	100	copy CANV value into CAN_ADAP2 value	
Lights *(Eclairage)*	Position light *(Feux de position)*	CAN, log and Power	0 position lights display not requested 1 position lights display requested	ADAP_Base6	PositionLightsDisplay	0EC	Byte N° 2 - Bit N° 2		100	If CAN V value = 0 Driver value = 0 If CAN V value = 1 then Driver value = 1	
Lights *(Eclairage)*	High beam *(Feux de route)*	CAN, log and Power	0 High beam display not requested 1 High beam display requested	ADAP_Base6	HighBeamDisplay	0EC	Byte N° 2 - Bit N° 3		100	If CAN V value = 0 Driver value = 0 If CAN V value = 1 then Driver value = 1	
Lights *(Eclairage)*	Low beam *(Feux de croisement)*	CAN, log and Power	0 low beam display not requested 1 low beam display requested	ADAP_Base6	LowBeamDisplay	0EC	Byte N° 2 - Bit N° 4		100	If CAN V value = 0 Driver value = 0 If CAN V value = 1 then Driver value = 1	
Lights *(Eclairage)*	Fog lights *(Feux de brouillard)*	CAN, log and Power	0 front fog lights display not requested 1 ront fog lights display requested	ADAP_Base6	FrontFogLightsDisplayEMM	0EC	Byte N° 2 - Bit N° 5		100	If CAN V value = 0 Value = 0 If CAN V value = 1 then Value = 1	
Brakes *(Freinage)*	ESP on/off *(ESP actif inactif)*	CAN, log and Power	0 ESP desactivated 1 ESP activated	ADAP_Base6	ESPActivation StateFor Display	0EC	Byte N° 3 - Bit N° 7		100	If CAN V value = 0 Driver value = 0 If CAN V value = 1 then Driver value = 1	
		CAN		ADAP_Base6	FreeShift	0EC	Byte N° 3 - Bit N° 6	Byte N° 3 - Bit N° 5	100	copy CANV value into CAN_ADAP2 value	
Engine *(Moteur)*	Cruise Control *(Coupure RV/LV)*	CAN		ADAP_Base6	CruiseControl StatusDisplay	0EC	Byte N° 3 - Bit N° 0	Byte N° 3 - Bit N° 2	100	copy CANV value into CAN_ADAP2 value	
		CAN		ADAP_Base6	DieselFilter WaterDetection	0EC	Byte N° 3 - Bit N° 4	Byte N° 3 - Bit N° 4	100	copy CANV value into CAN_ADAP2 value	
		CAN		ADAP_Base6	EngineControl FailureLevel1	0EC	Byte N° 3 - Bit N° 3		100	copy CANV value into CAN_ADAP2 value	
		CAN		ADAP_Base6	EngineControl FailureLevel2	0EC	Byte N° 4 - Bit N° 7		100	copy CANV value into CAN_ADAP2 value	
		CAN		ADAP_Base6	WarningWaterTemp	0EC	Byte N° 4 - Bit N° 6		100	copy CANV value into CAN_ADAP2 value	
		CAN		ADAP_Base6	MILLamp	0EC	Byte N° 4 - Bit N° 1	Byte N° 4 - Bit N° 4	100	copy CANV value into CAN_ADAP2 value	

INPUT				OUTPUT						IMPORTANT: It is prohibited to activate the power outputs	Configuration (customization), Logical, Power and PWM Actions
Information Part	**Information Needs**	**By Means of**	**CAN_V states**	**Frame Name**	**Parametres**	**Id (hex) Can ADAP2**	**MSB position**	**LSB position**	**Période CAN**	**Processing gateway from CANV parameters to CAN_ADAP2**	**Processing gateway from CANV parameters to logical, PWM and Power outputs parameters**
Pedal *(Pédalier)*	Parking brake *(Frein de parking)*	CAN, log and Power	00 not used 01 parking brake not applied 10 parking brake applied 11 unavailable	ADAP_Base6	HandBrakeSwitch	0EC	Byte N° 5 - Bit N° 0		100	If CAN V value = 01 Value = 0 If CAN V value = 10 Value = 1	
Brakes *(Freinage)*	ABS control *(Régualtion ABS)*	CAN, log and Power	0 no ABS regulation 1 ABS in regulation	ADAP_Base6	ABSinRegulation	0EC	Byte N° 5 - Bit N° 2		100	If CAN V value = 0 Value = 0 If CAN V value = 1 then Value = 1	
Brakes *(Freinage)*	ABS Malfunction *(ABS en défaut)*	CAN, log and Power	0 no ABS malfunction 1 ABS malfunction	ADAP_Base6	ABSMalfunction	0EC	Byte N° 5 - Bit N° 3		100	If CAN V value = 0 Value = 0 If CAN V value = 1 then Value = 1	
		CAN		ADAP_Base6	MeanEffectiveTorque	0EC	Byte N° 6 - Bit N° 0	Byte N° 5 - Bit N° 4	100	copy CANV value into CAN_ADAP2 value	
		CAN		ADAP_Base7	ABS_WarningRequest	0ED	Byte N° 5 - Bit N° 0	Byte N° 5 - Bit N° 1	100	copy CANV value into CAN_ADAP2 value	
		CAN		ADAP_Base7	ASRinRegulation	0ED	Byte N° 1 - Bit N° 0		100	copy CANV value into CAN_ADAP2 value	
Brakes *(Freinage)*	ESP control *(Régulation ESP)*	CAN, log and Power	0 No AYC in regulation 1 AYC in regulation	ADAP_Base7	AYCinRegulation	0ED	Byte N° 1 - Bit N° 1		100	If CAN V value = 0 Value = 0 If CAN V value = 1 then Value = 1	
		CAN		ADAP_Base7	MSRinRegulation	0ED	Byte N° 1 - Bit N° 2		100	copy CANV value into CAN_ADAP2 value	
Brakes *(Freinage)*	ESP Malfunction *(ESP en défaut)*	CAN, log and Power	0 no AYC malfunction 1 AYC malfunction	ADAP_Base7	AYCMalfunction	0ED	Byte N° 1 - Bit N° 3		100	If CAN V value = 0 Driver value = 0 If CAN V value = 1 then Driver value = 1	
Gearbox *(Boite de vitesse)*	Info gearbox settings *(Information rapport engagé (BVR))*	CAN, log and Power	0000 declutched at rest 0001 1st range 0010 2nd range 0011 3rd range 0100 4th range 0101 5th range 0110 6th range 0111 7th range 1000 8th range 1001 reverse 1010 neutral or parking 1011 CVT in continuous mode 1111 AT in limphome	ADAP_Base7	TransmRangeEngaged Current	0ED	Byte N° 4 - Bit N° 1		100	If CAN V value = 0000 or 1010 or 1011 or 1111 Value = 0 If CAN V value ≥ 0001 and ≤ 1001 then Value = 1	
Brakes *(Freinage)*	Odometer *(odomètre)*	CAN		ADAP_Base8	DistanceTotalizer	'0EF	Byte N° 1 - Bit N° 0		100	copy CANV value into CAN_ADAP2 value	
		CAN		ADAP_Base8	DisplayedOilLevel	'0EF	Byte N° 5 - Bit N° 0		100	copy CANV value into CAN_ADAP2 value	
		CAN		ADAP_Base9	VehicleID	0F0	Byte N° 1 - Bit N° 0		100	copy CANV value into CAN_ADAP2 value	
		CAN		ADAP_Base9	VehicleSpeed	0F0	Byte N° 6 - Bit N° 1		100	copy CANV value into CAN_ADAP2 value	
Door *(Porte)*	Tailgate status *(cmd conda/déconda CPE AR)*	Log and Power	00 Unvailable Value 01 Tail Gate door closed 10 Tail gate door open 11 Not Used	ADAP_Base11	TailGateStatus	0F2	Byte N° 1 - Bit N° 0		100		If CAN V value = 01 Value = 1 else Value = 0

4.11. REAR LIGHTS / INTERIOR LIGHTING INFORMATION

4.11.1. REAR LIGHTS INFORMATION

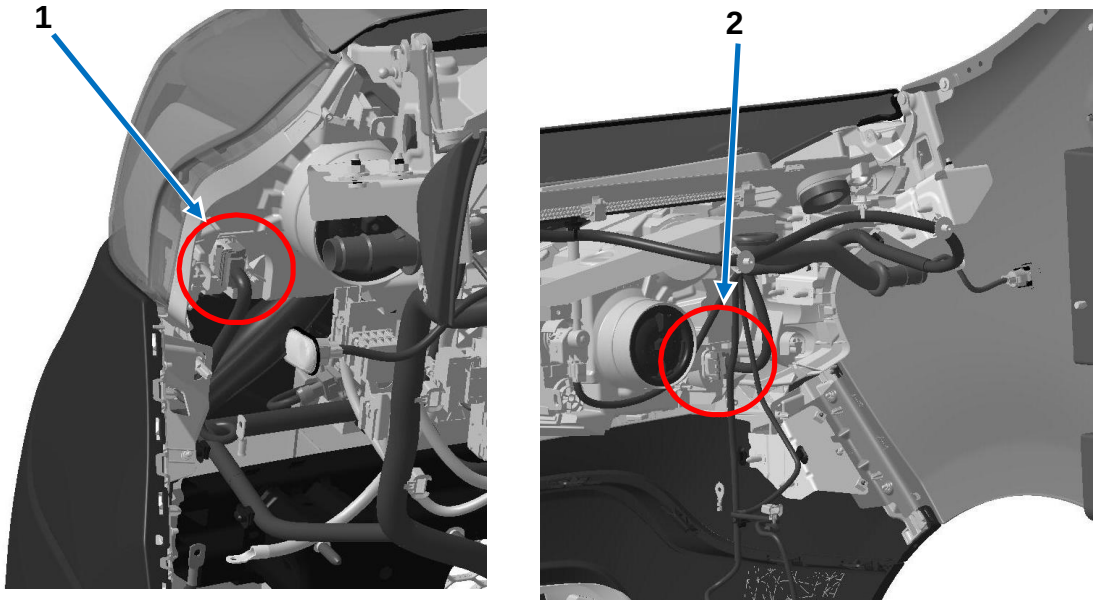
Important: *the vehicle electronic system is not authorised to supply power-consuming devices other than those fitted to the vehicle.*

This information is available at several locations on the vehicle:

- Engine compartment
- Cabin area
- Rear area

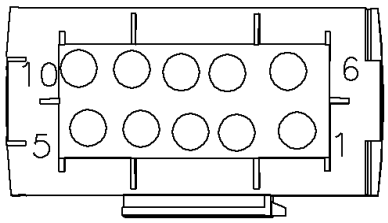
Engine compartment

Details of connector positions



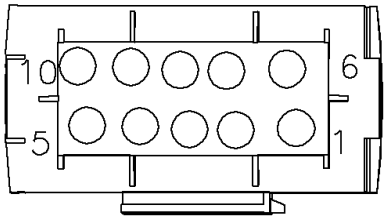
1: 10-way connector (left-hand side)	2 : 10-way connector (right-hand side)

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)

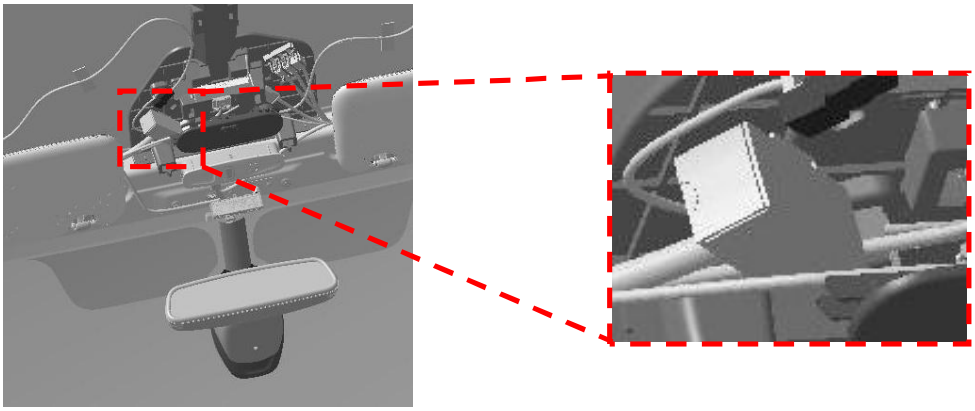


Way	Connections	Allocations
1 :	MAR	Ground
2 :	RPD	+ Right-hand main beam headlight
3 :	CPD	+ Right-hand dipped beam headlight
4 :		
5 :		
6 :	11S	+ Right-hand daytime running lights (DRL)
7 :	64D	+ Right-hand direction indicator
8 :	LPAV	+ Front side light
9 :		
10 :		

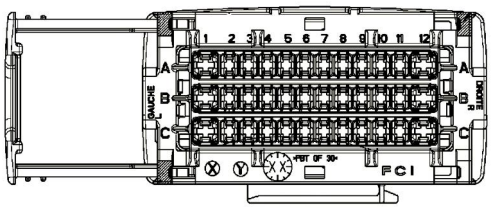
Cabin area

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



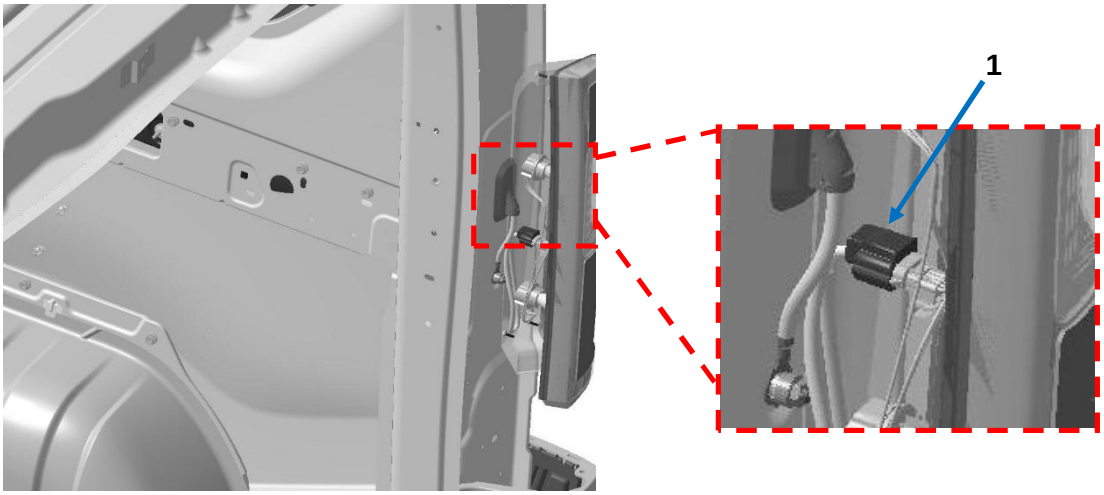
Details of the 36-way connector



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 :	13E	- 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.

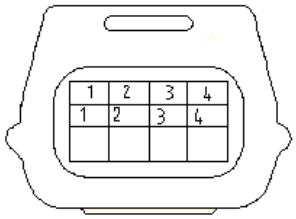
Rear upper section area

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



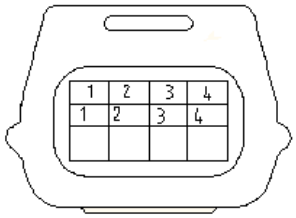
1 :	4-way connector (right-hand side)

Light connection rear right-hand upper section (1)



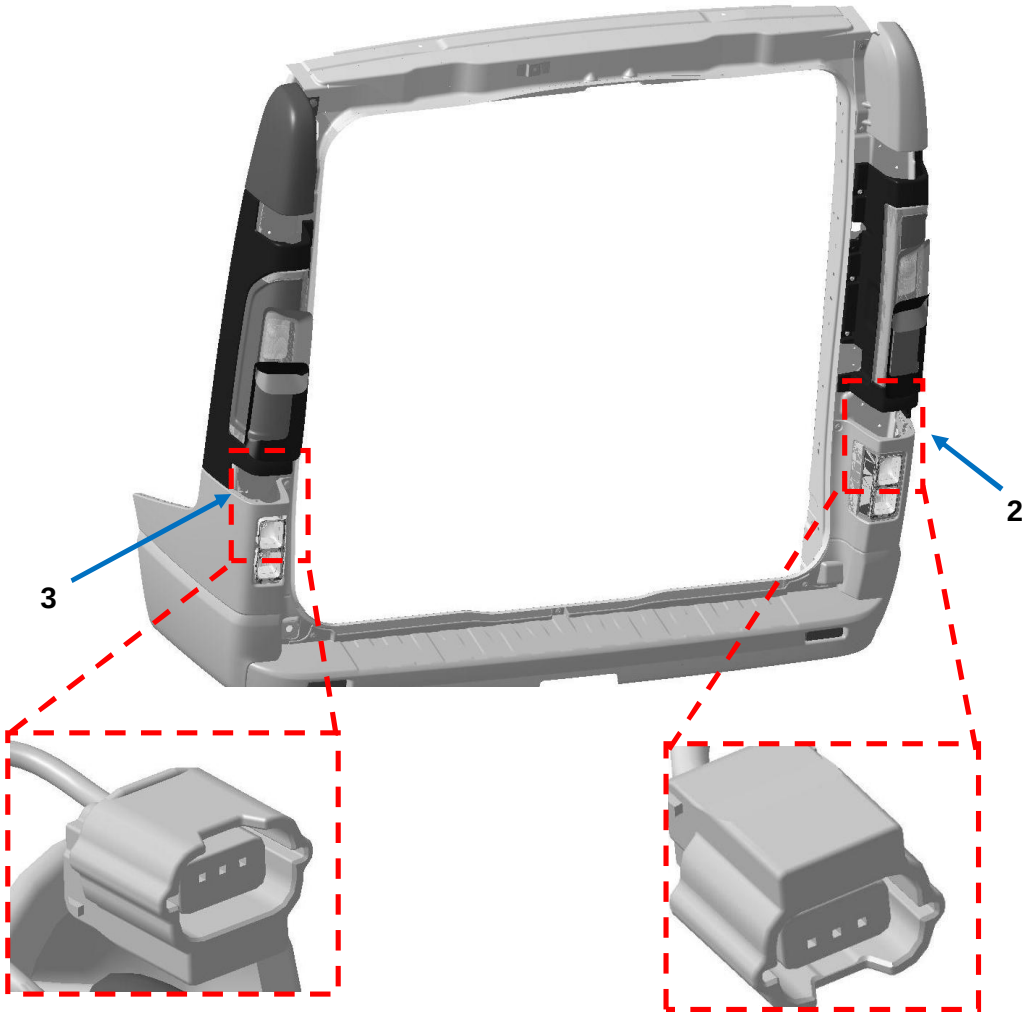
Way	Connection	Allocations
1 :	MF	Ground
2 :	LPAR	Side light
3 :	65G	Brake light
4 :	64D	Direction indicator lights

Light connection rear left-hand upper section (1)

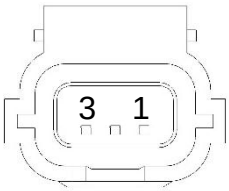


Way	Connection	Allocations
1 :	MG	Ground
2 :	LPAR	Side light
3 :	65G	Brake light
4 :	64D	Direction indicator lights

Rear lower section area

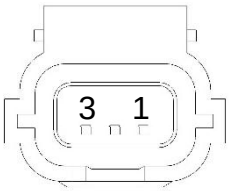


Lower rear right-hand light connection (2)



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

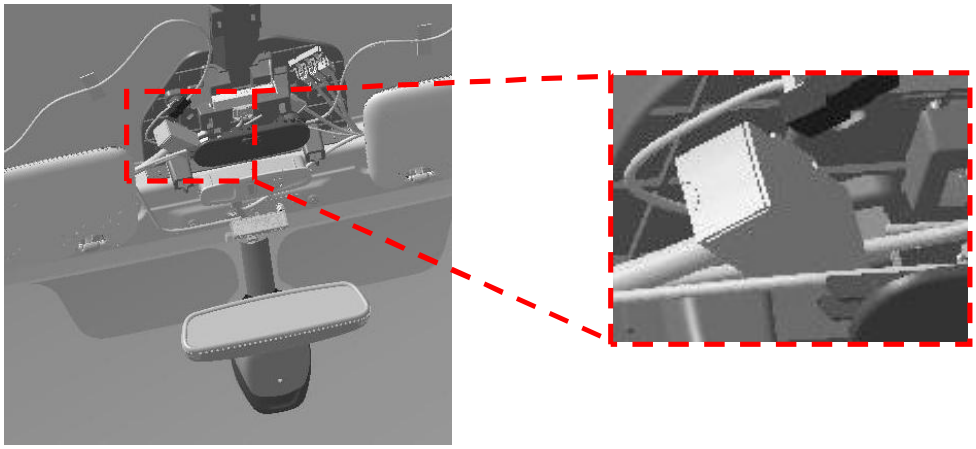
4.11.2. INTERIOR LIGHTING: ADDING OR MODIFYING

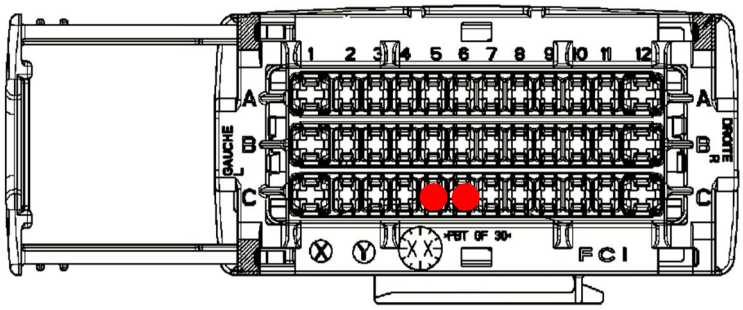
Energy recovery conditions

- 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.
- In the event of over-consumption exceeding 500 mA (6 W):
  - 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.

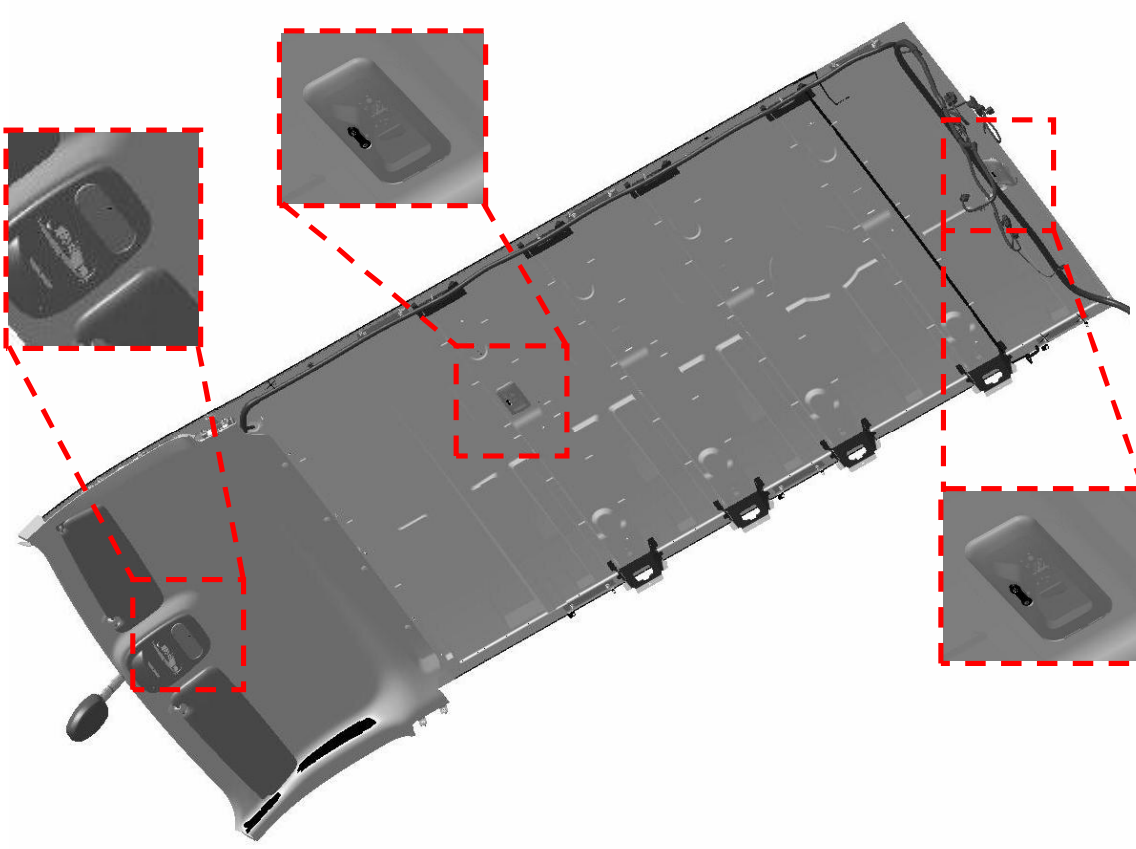




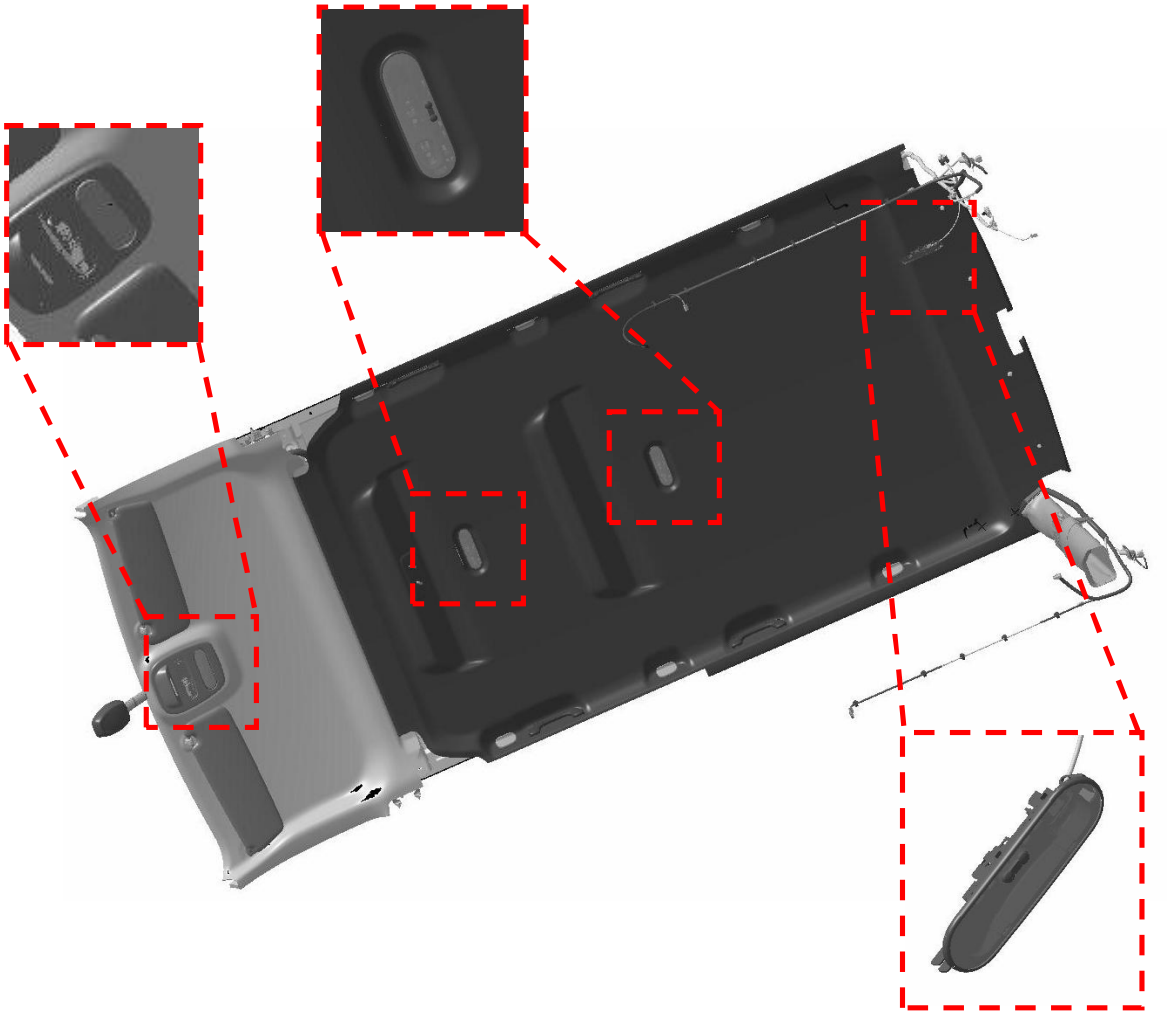
Way	Connection	Allocation
C5	13E	Progressive active ground when door opens and degressive when door closes or +APC.
C6	BPT2	+12V Timed

Distribution of ceiling lights

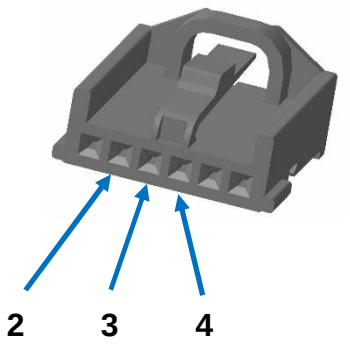
Panel Van



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

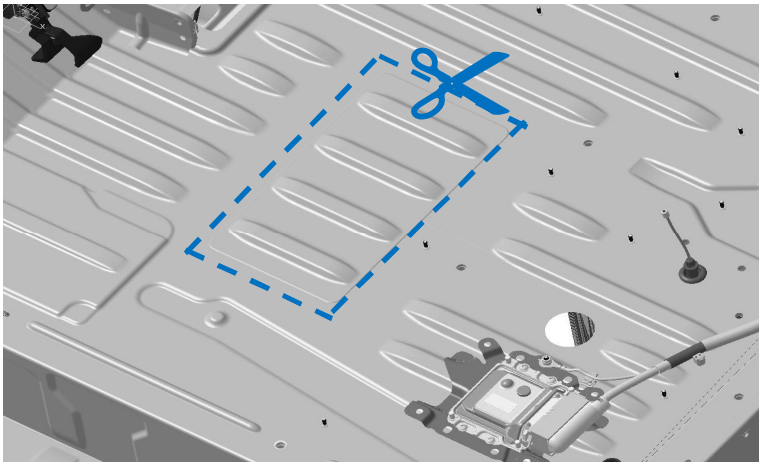
4.12. ADDITIONAL BATTERY

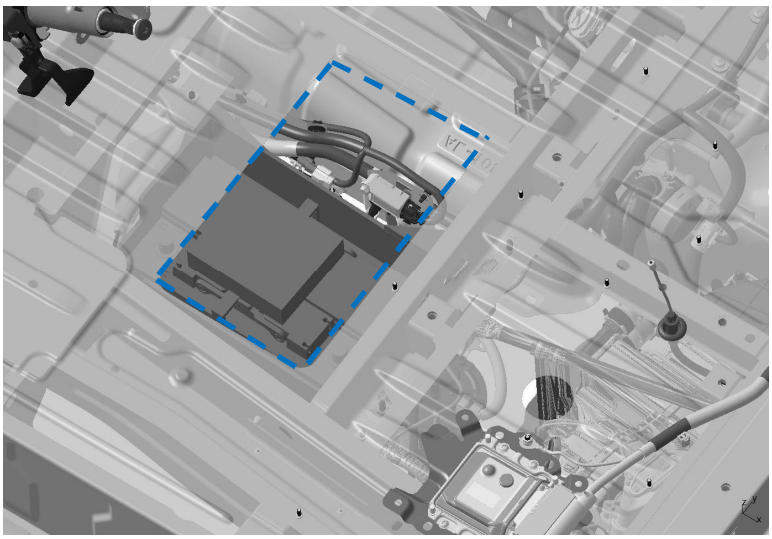
There is a space between the side panels underneath the driver's side floor panel on the left-hand drive version and underneath the passenger side floor panel on the right-hand-drive version to fit an additional battery (L4 maximum = 315 mm).

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.

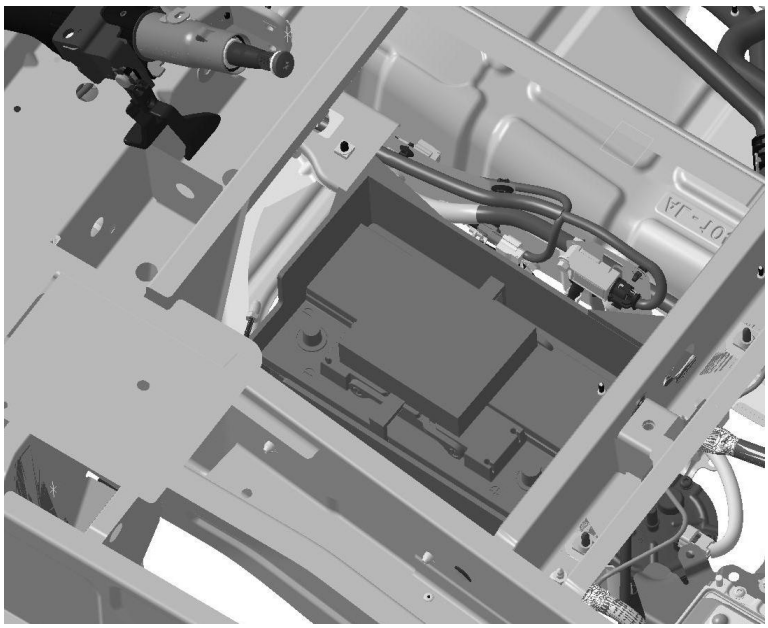




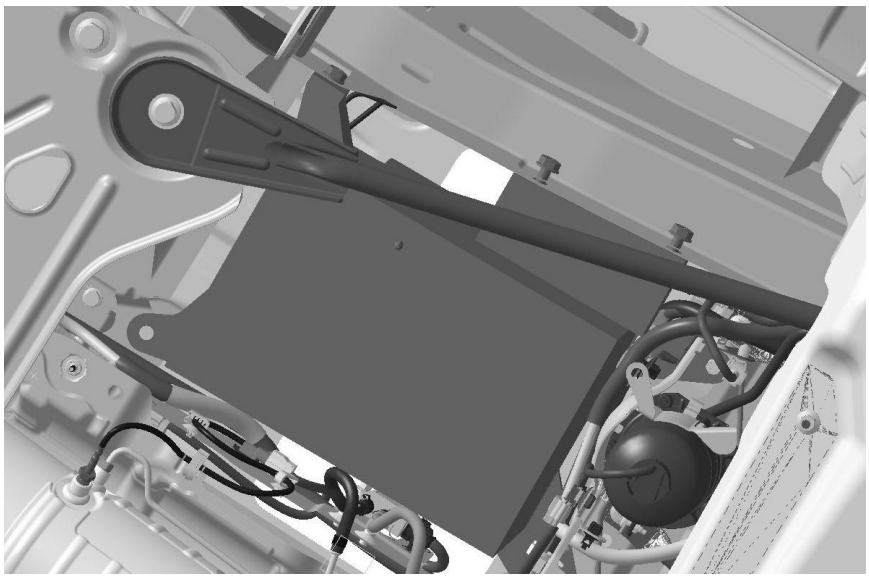
ADDITIONAL BATTERY POSITION

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

Floor panel view



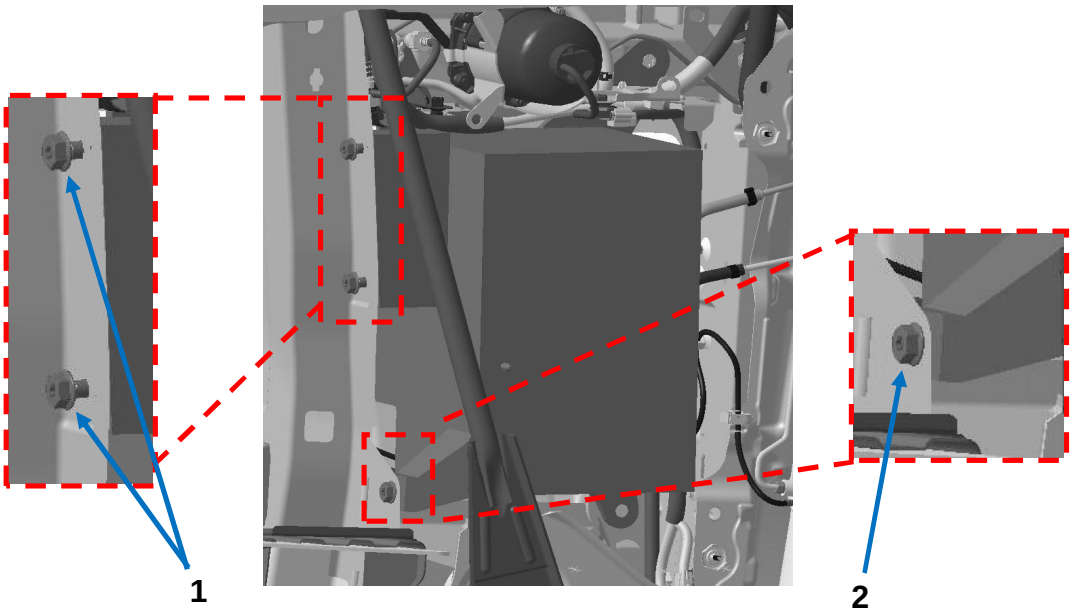
View from underneath the vehicle



ADDITIONAL BATTERY INTERFACES AND FIXINGS

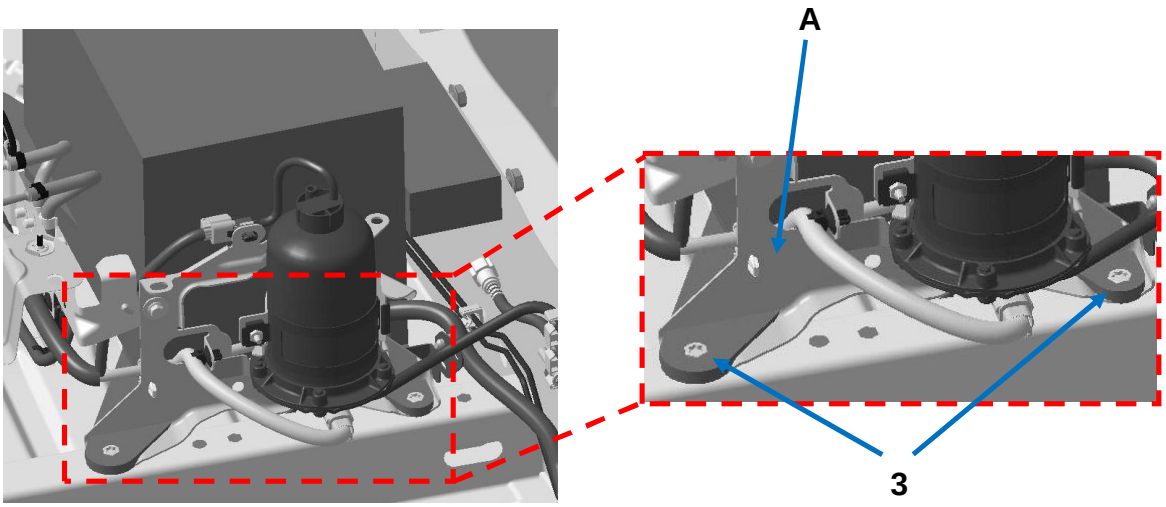
Shown below are various fixing points that can be used for making and securing an additional battery tray, given as an example.

Left-hand side member side



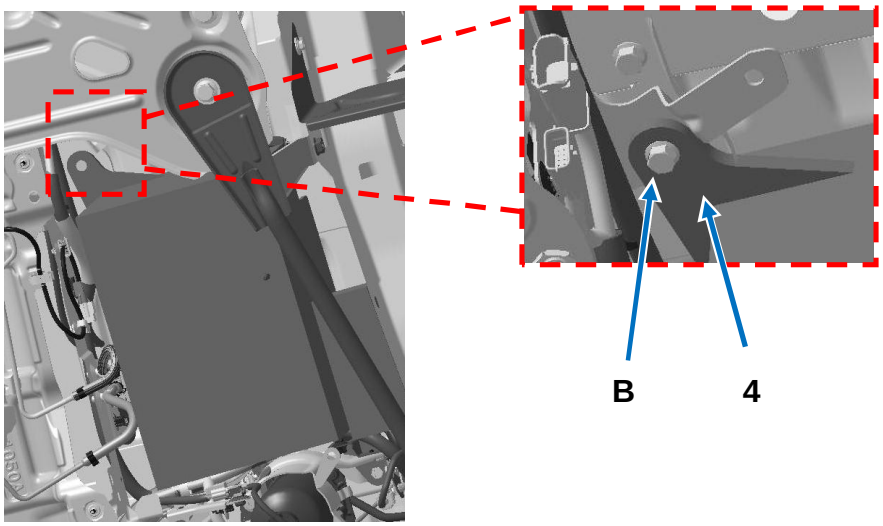
Fixing points (1) and (2) using the existing holes on the left-hand side member

Rear side on fuel filter bracket support



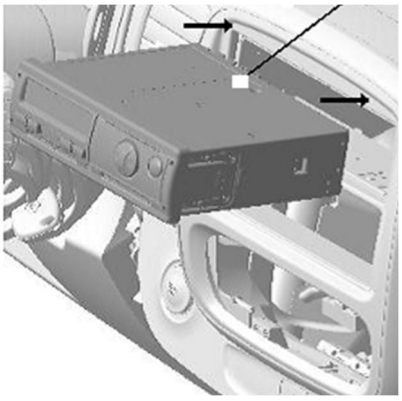
For these two fixings, it is necessary to remove the fuel filter support bracket (A) in order to sandwich-fit the battery tray fixings (3)

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)

4.13. TACHOGRAPH (TGP)



The tachograph is optionally available on all versions.

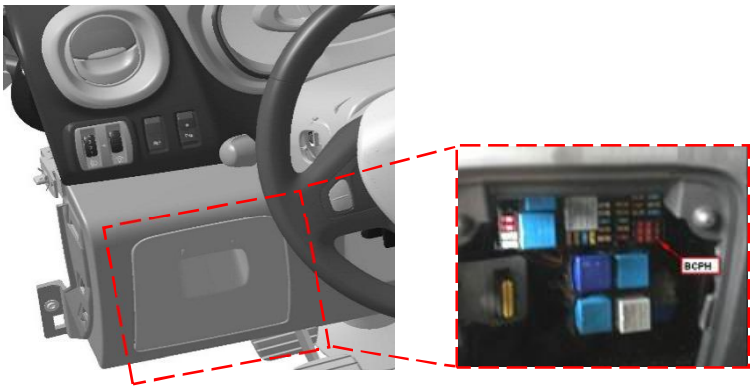
The retrofitting is not possible.

It is located in the center of the dashboard.

Note : the tachograph has a significant residual consumption (10mA); this can drain the battery when the vehicle is stationary for a long period.

From the factory, the CTL fuse is removed and placed in the glove compartment of the vehicle, glued to the inside of the fuse box.

During the preparation of the vehicle (before delivery), this fuse should be returned to its location in the fuse box located under the dashboard.



If the converter receives a vehicle with fuse, he should remove the fuse (red 10A) for the duration of the transformation. Before the delivery of the vehicle, the converter should insert the fuse again,

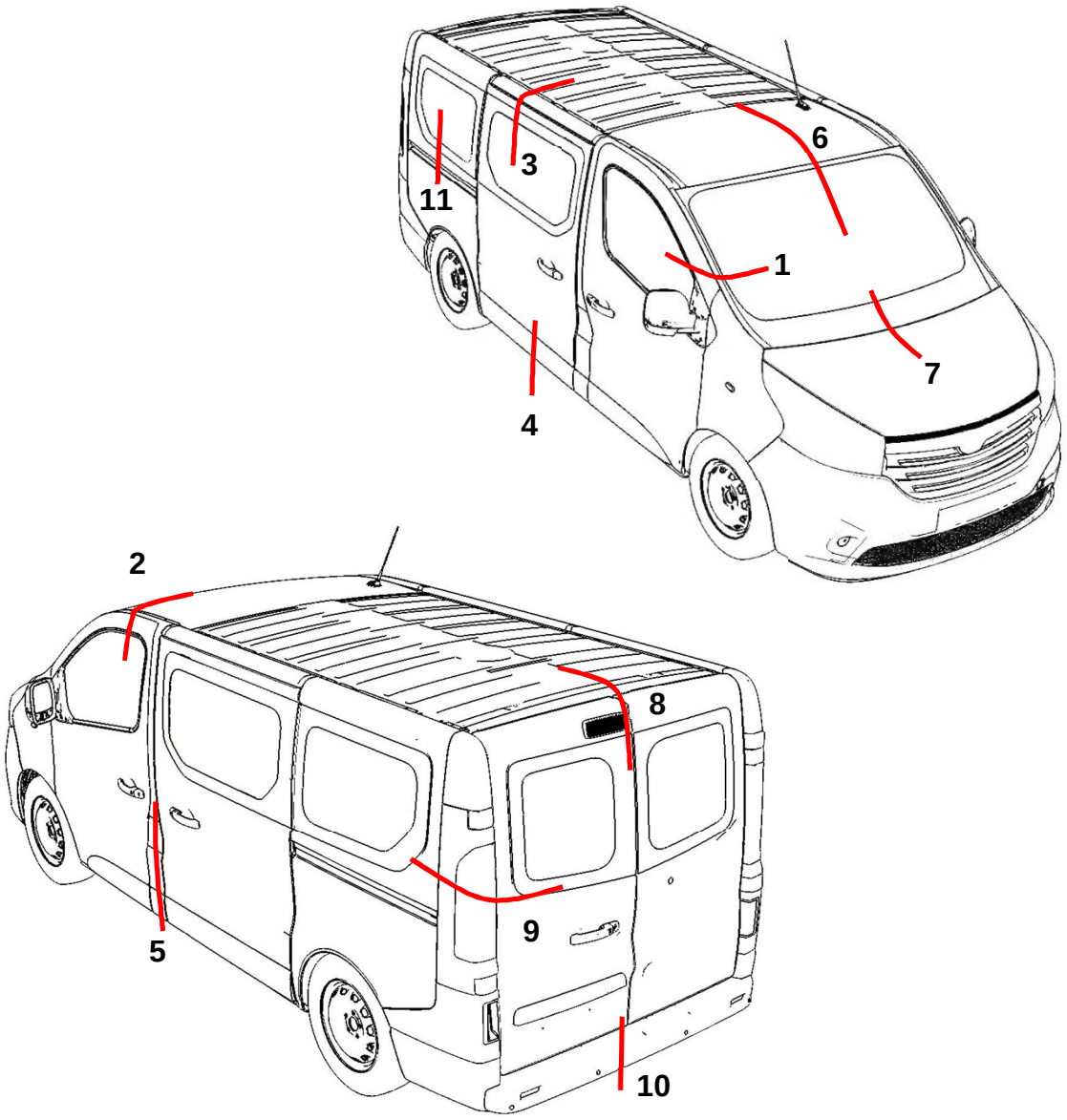
5. FOR BODYWORK CONVERSIONS

5.1. DESIGN STRUCTURE / GLAZED AND SOLID SIDE PANELS

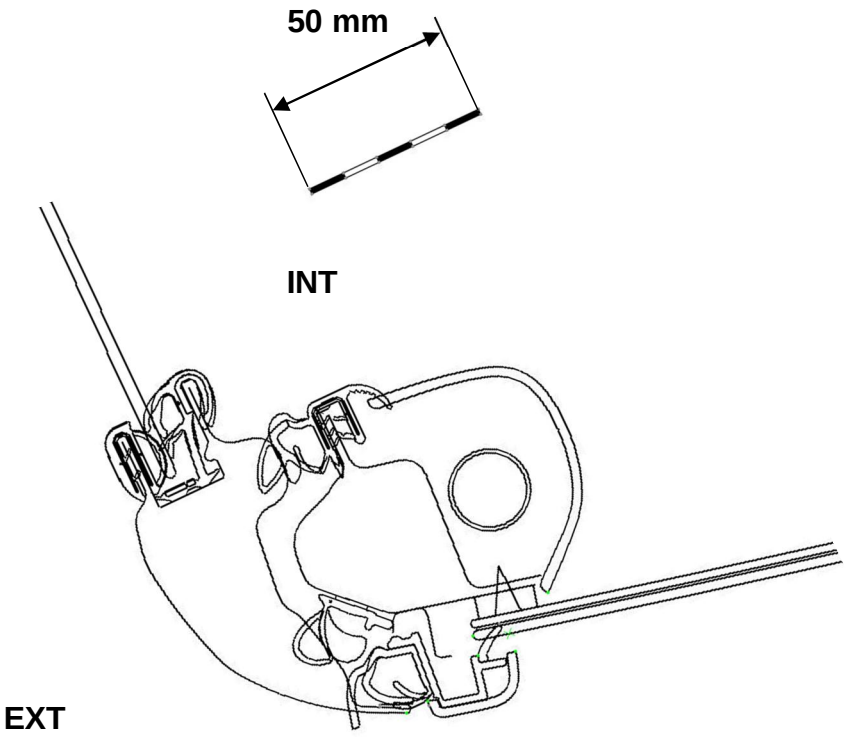
5.1.1. DESIGN STRUCTURE

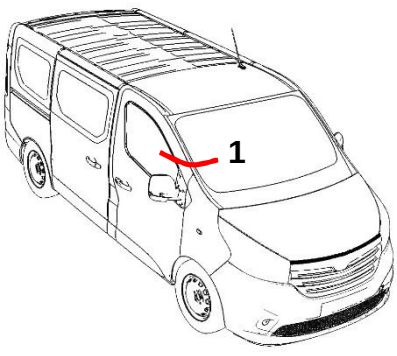
The various standard sections of the van are shown on the diagram below.

STANDARD SECTION OF BASIC PANEL VAN

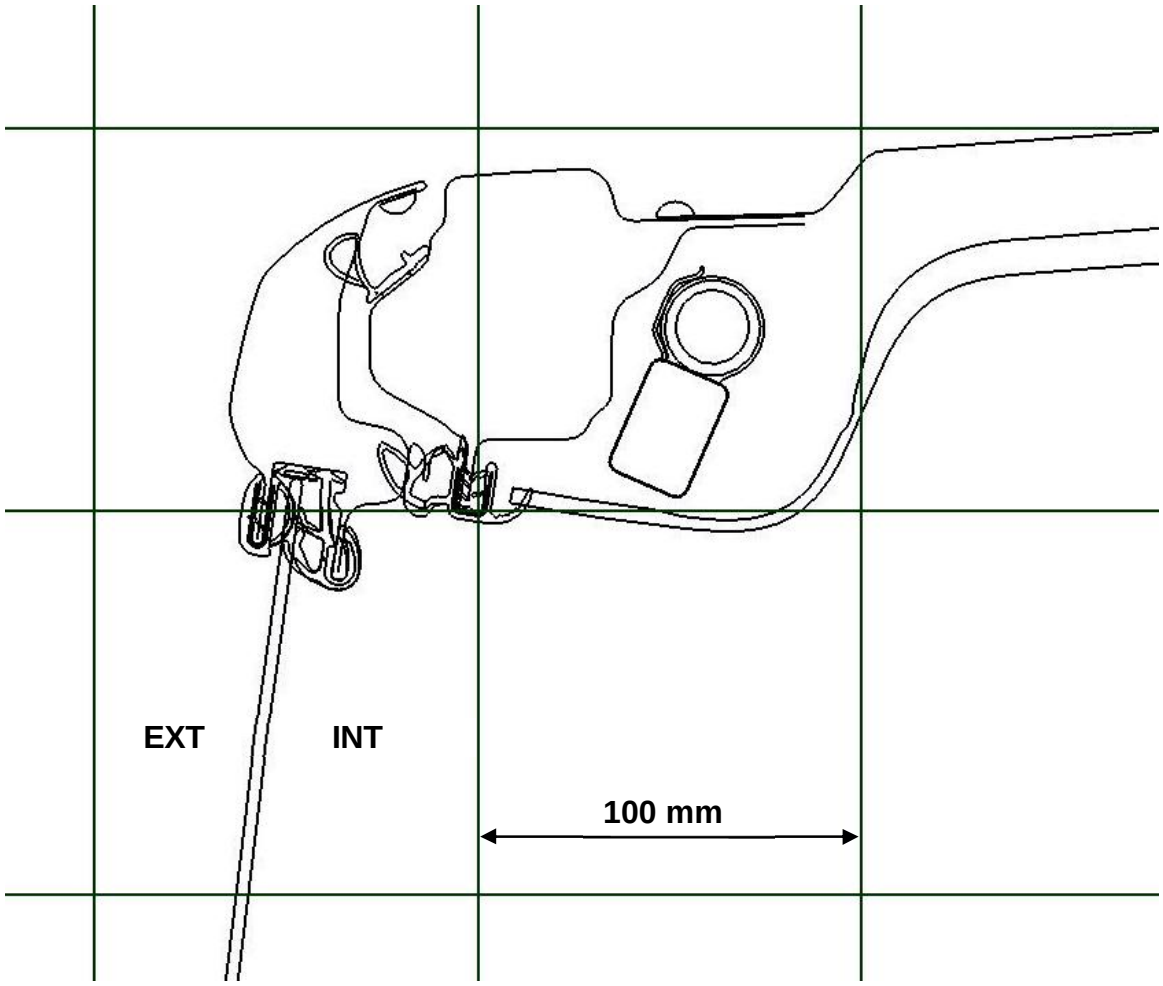


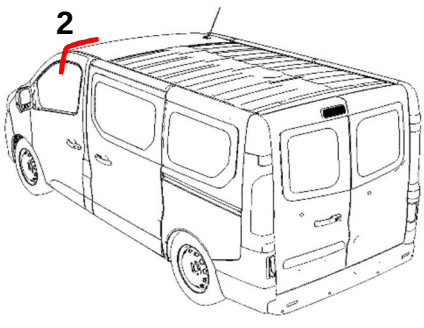
SECTION 1
"WINDSCREEN PILLAR"



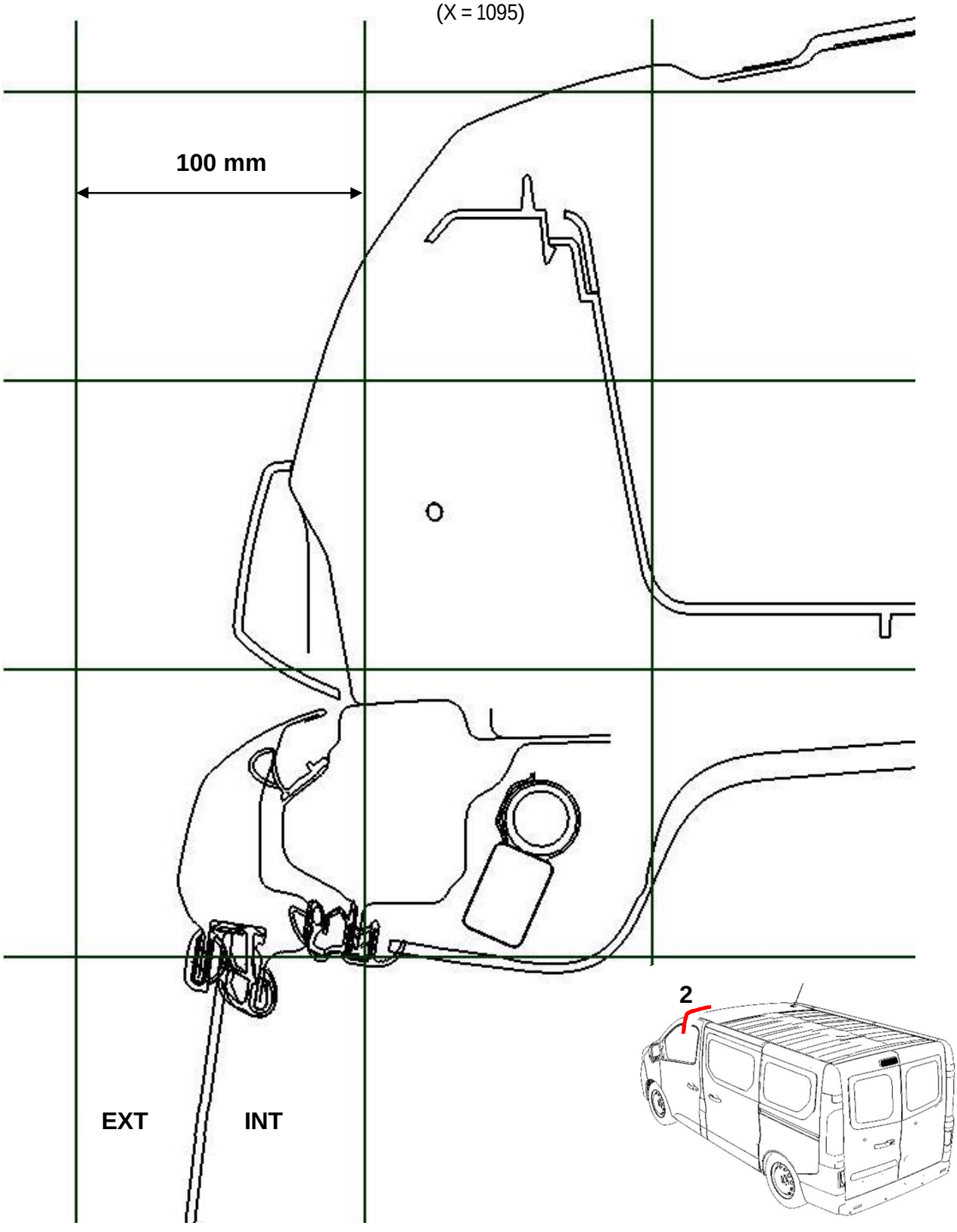


SECTION 2
"SIDE ROOF RAIL OF FRONT DOOR – VERSION H1"
(X = 1095)

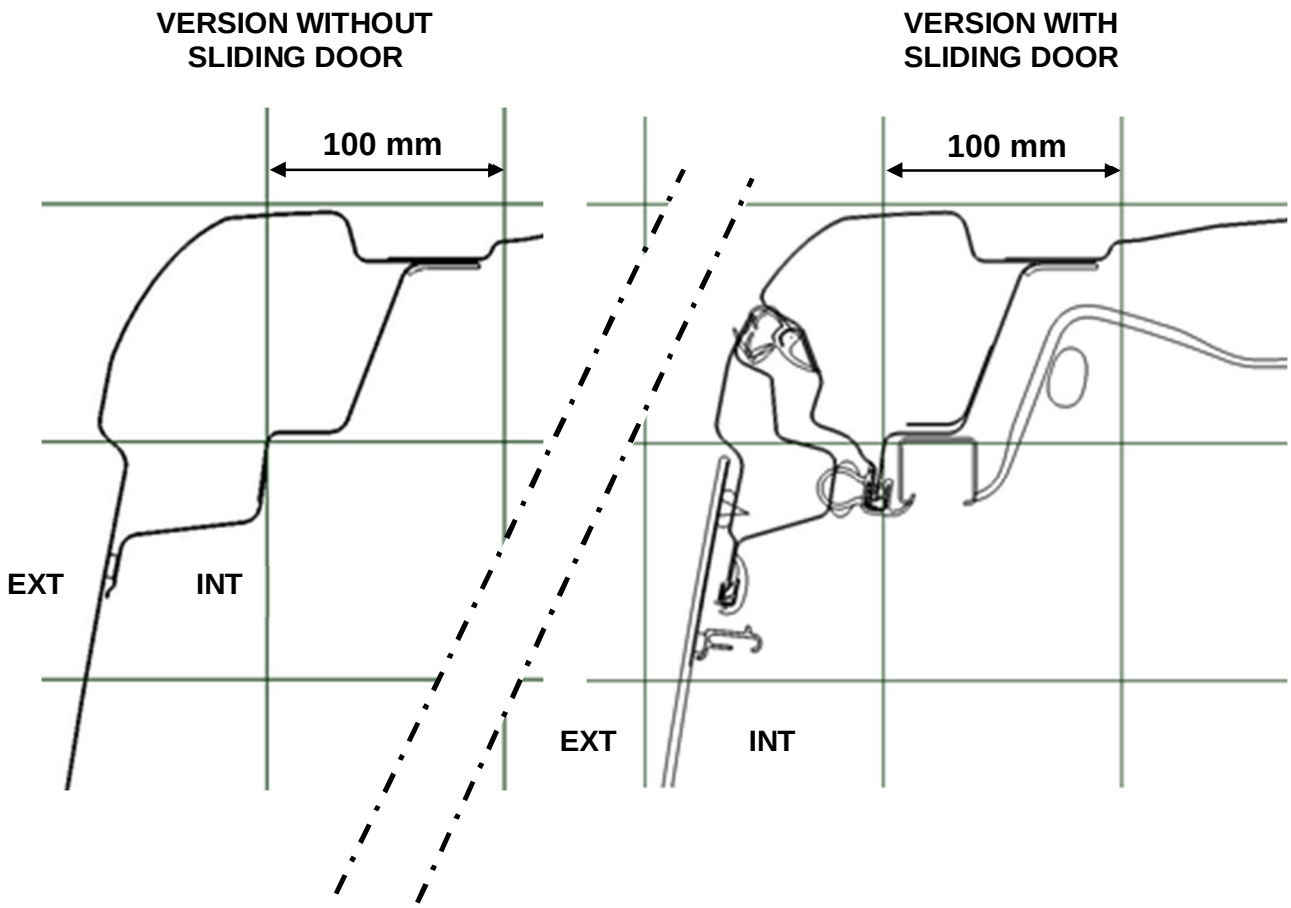


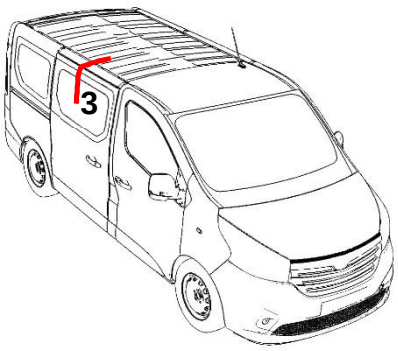


SECTION 2
"SIDE ROOF RAIL OF FRONT DOOR – VERSION H2"
(X = 1095)

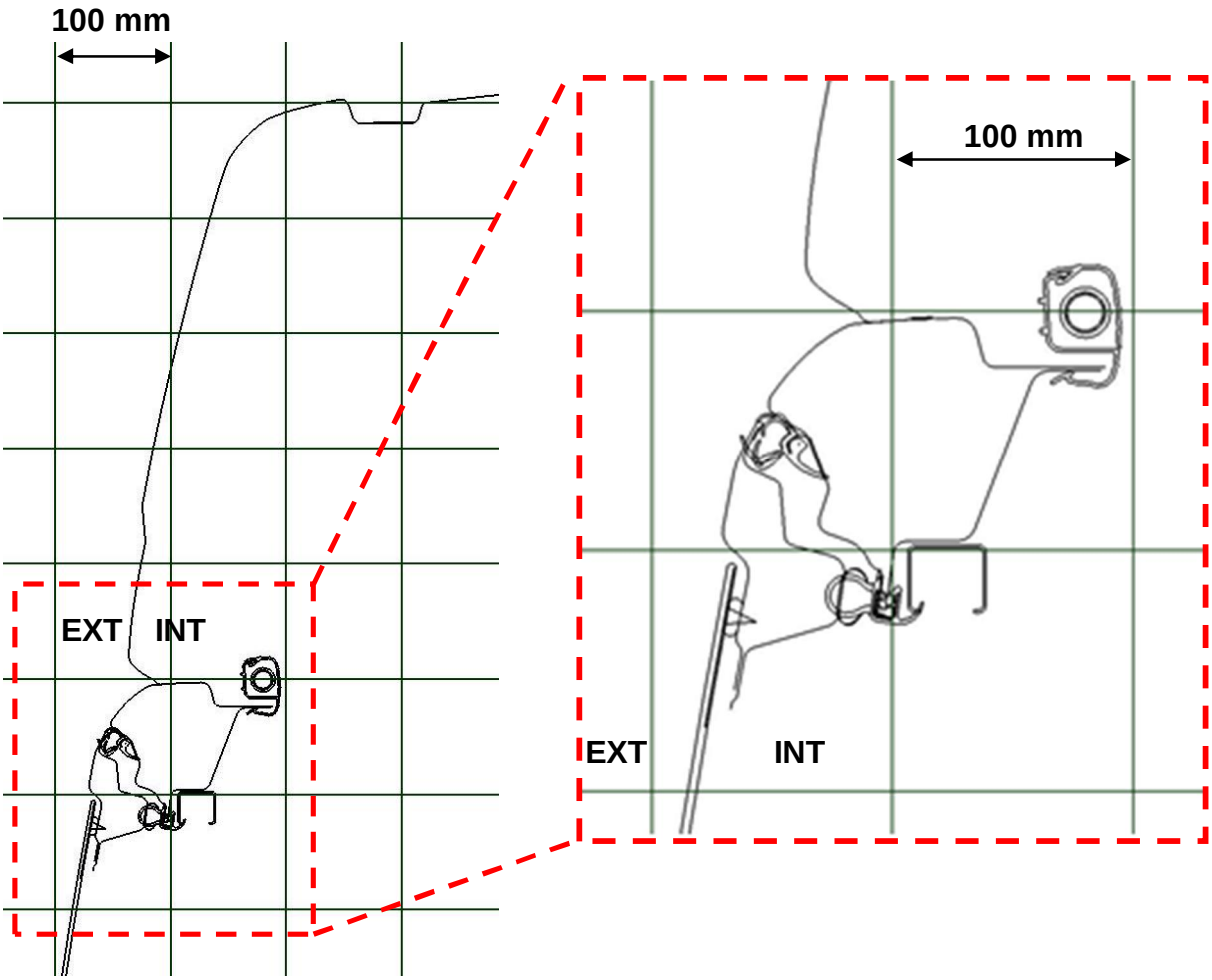


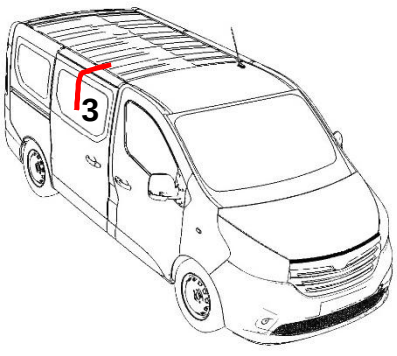
SECTION 3
"REAR SIDE ROOF RAIL – VERSION H1"
(X = 2056)



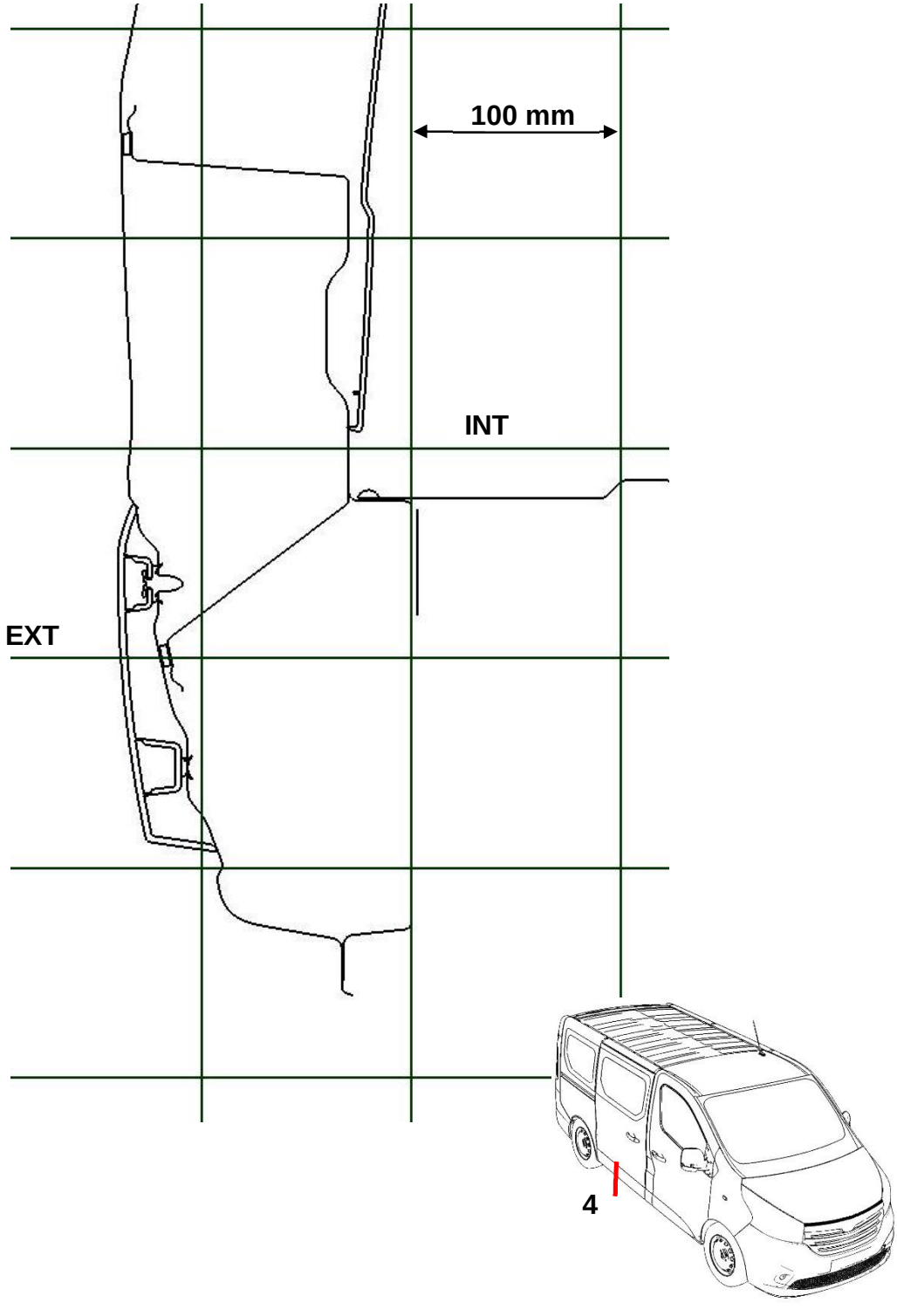


SECTION 3
"REAR SIDE ROOF RAIL – VERSION H2"
(X = 2056)

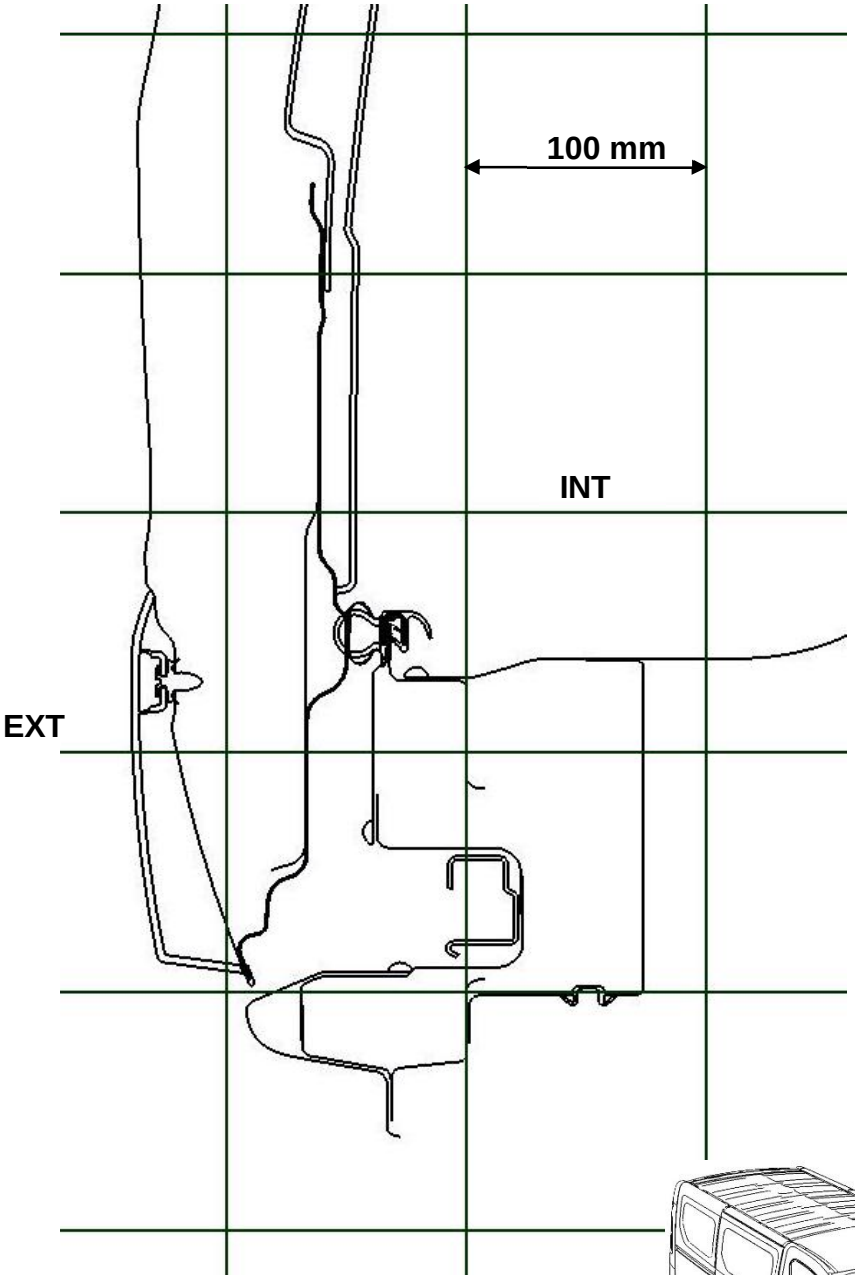


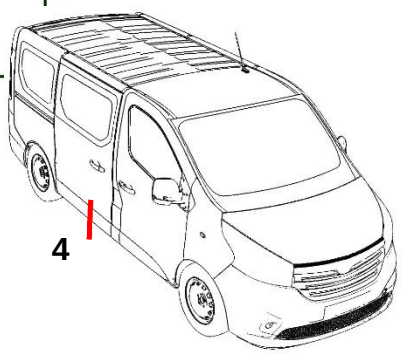


SECTION 4
"LOWER SIDE SILL, FIXED SIDE PANEL"
(X = 2075)

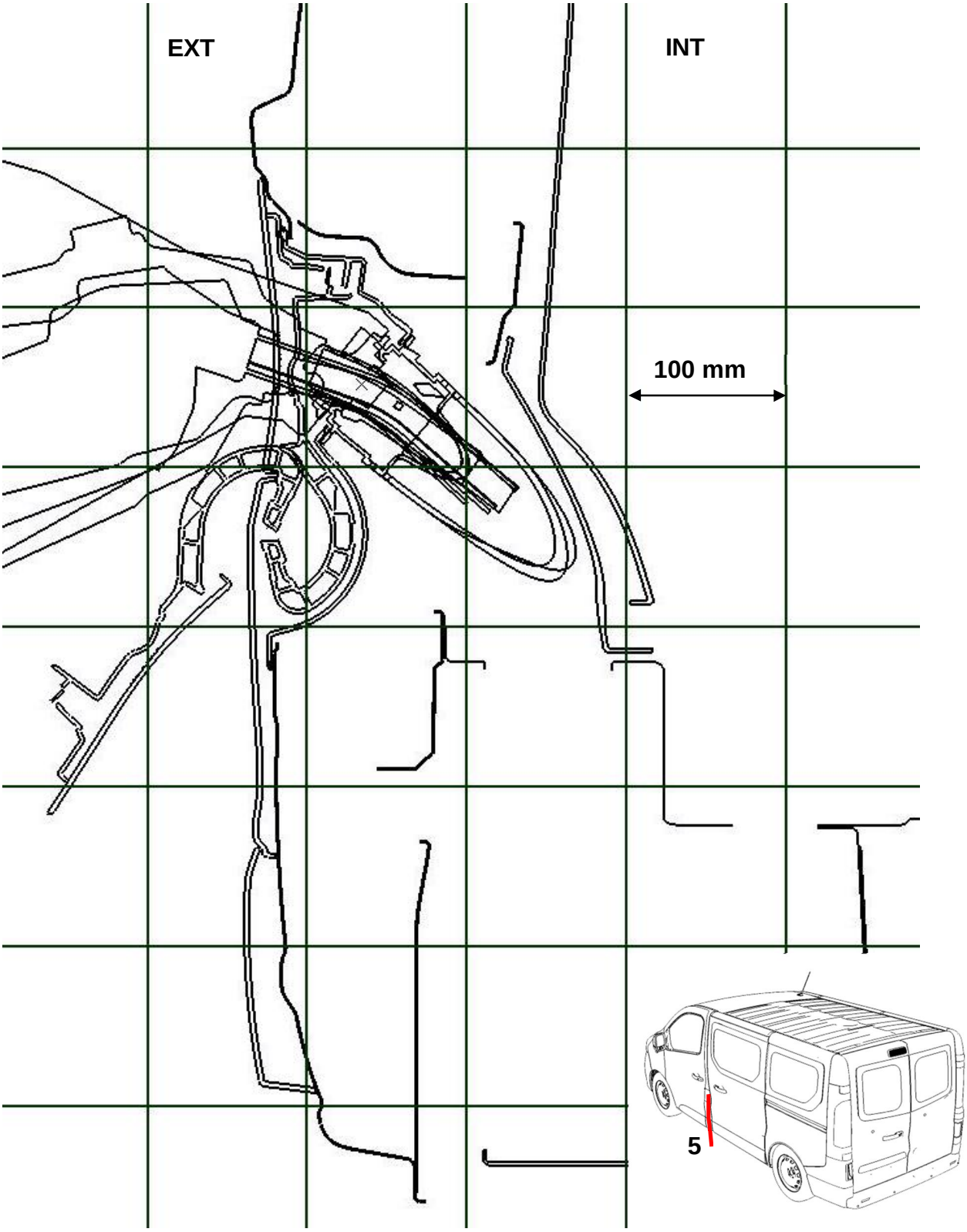


SECTION 4
"LOWER SIDE SILL, SLIDING SIDE DOOR"
(X = 1670)

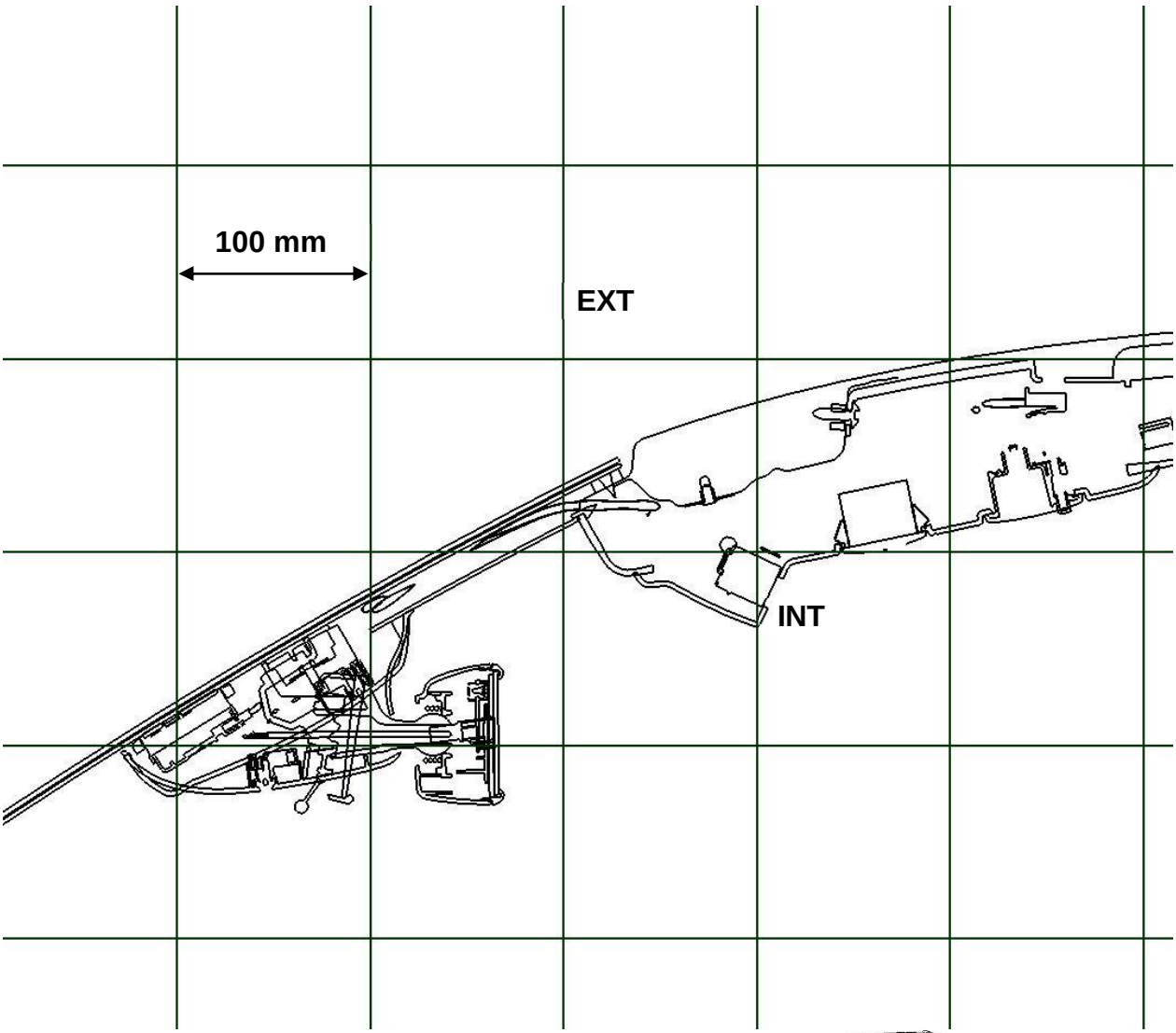


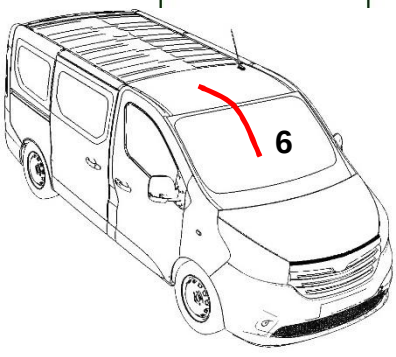


SECTION 5
"FUEL FILLER FLAP"
(X = 1388.1)

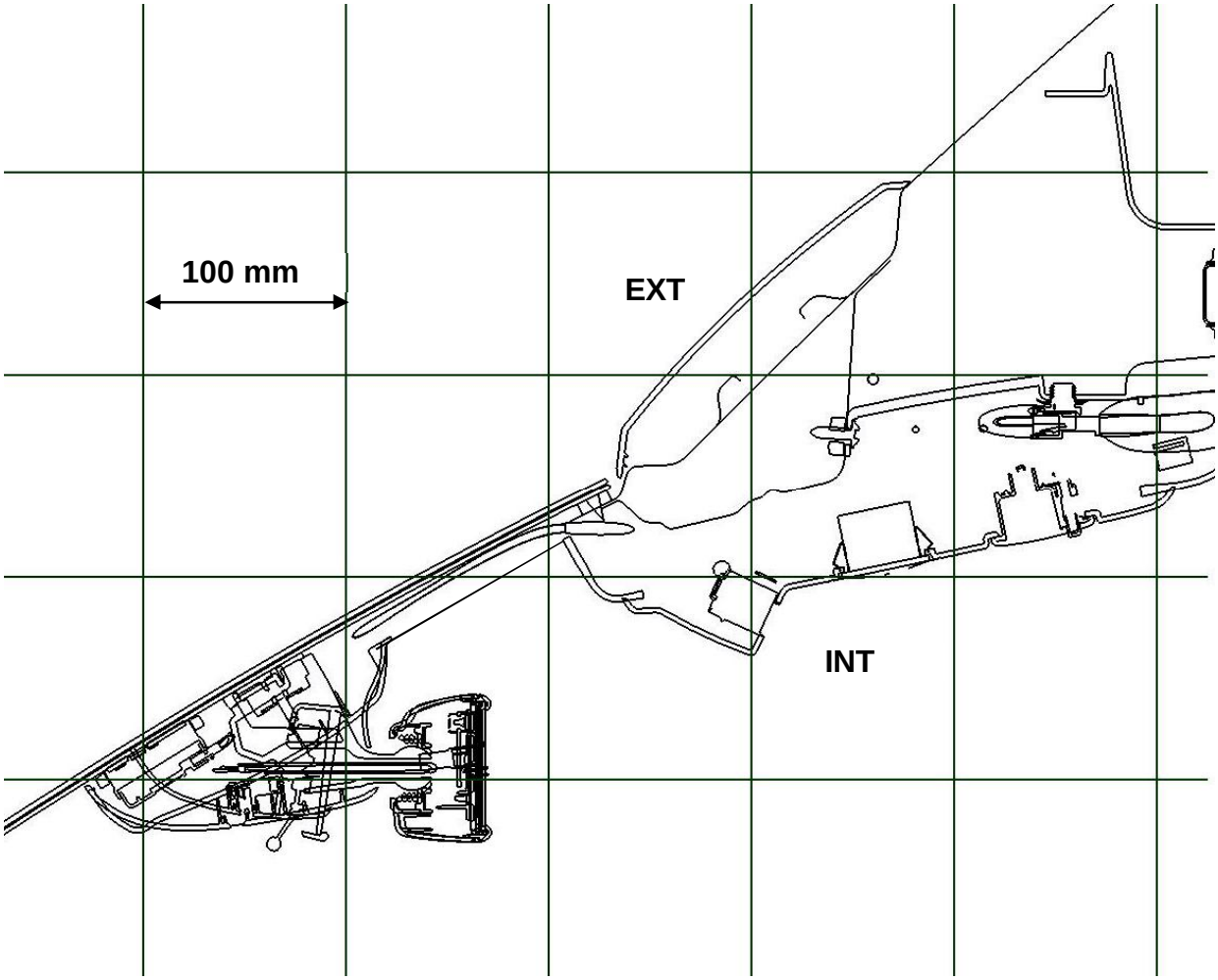


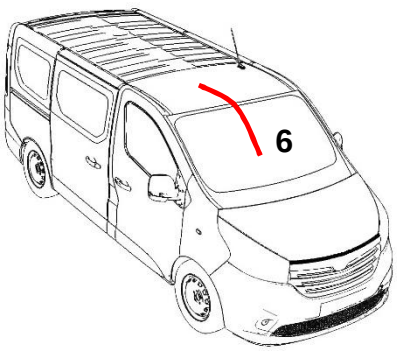
SECTION 6
"ROOF PANEL – VERSION H1"
(Y = 0)



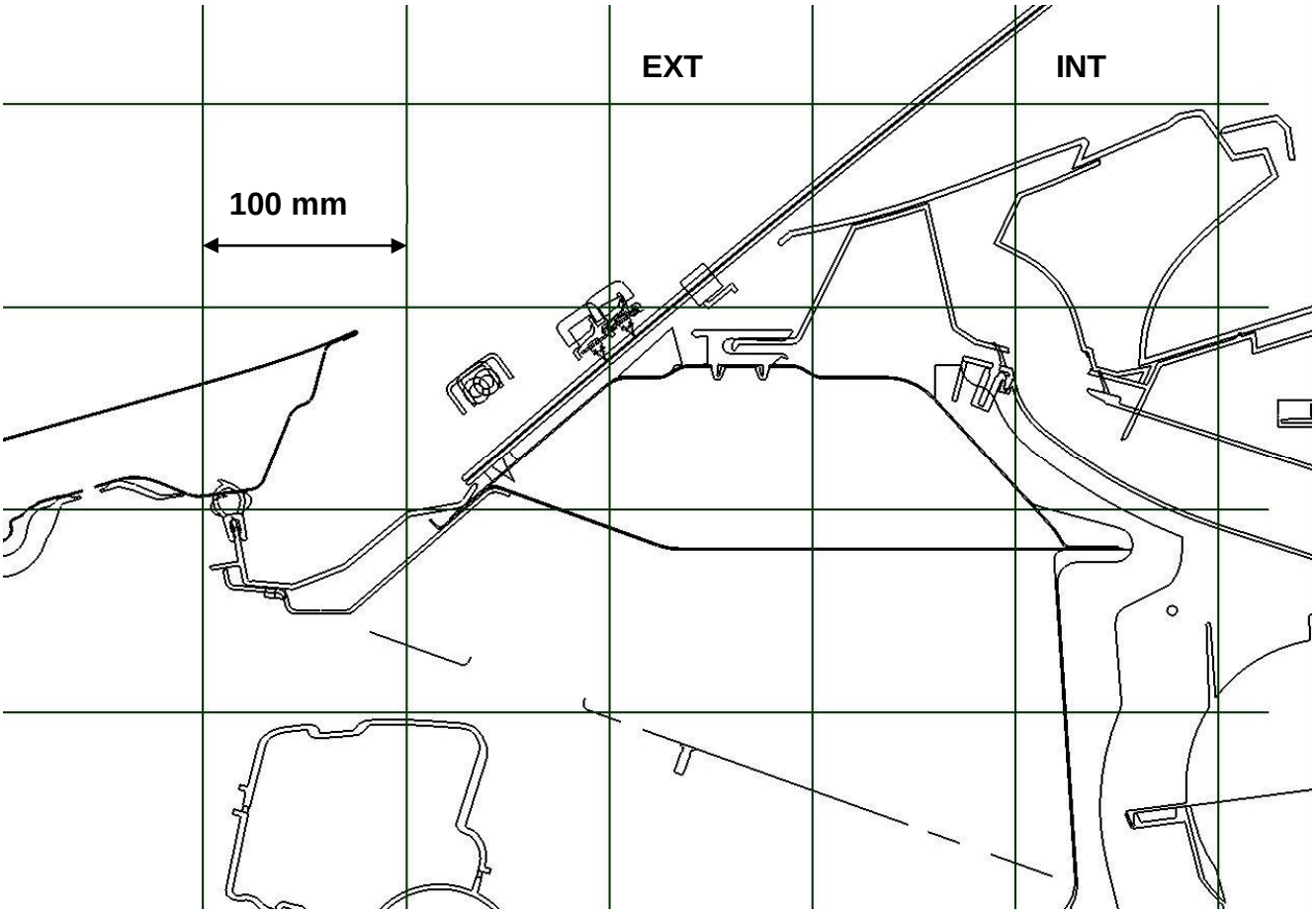


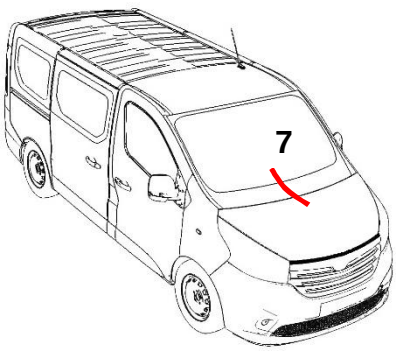
SECTION 6
"ROOF PANEL – VERSION H2"
(Y = 0)



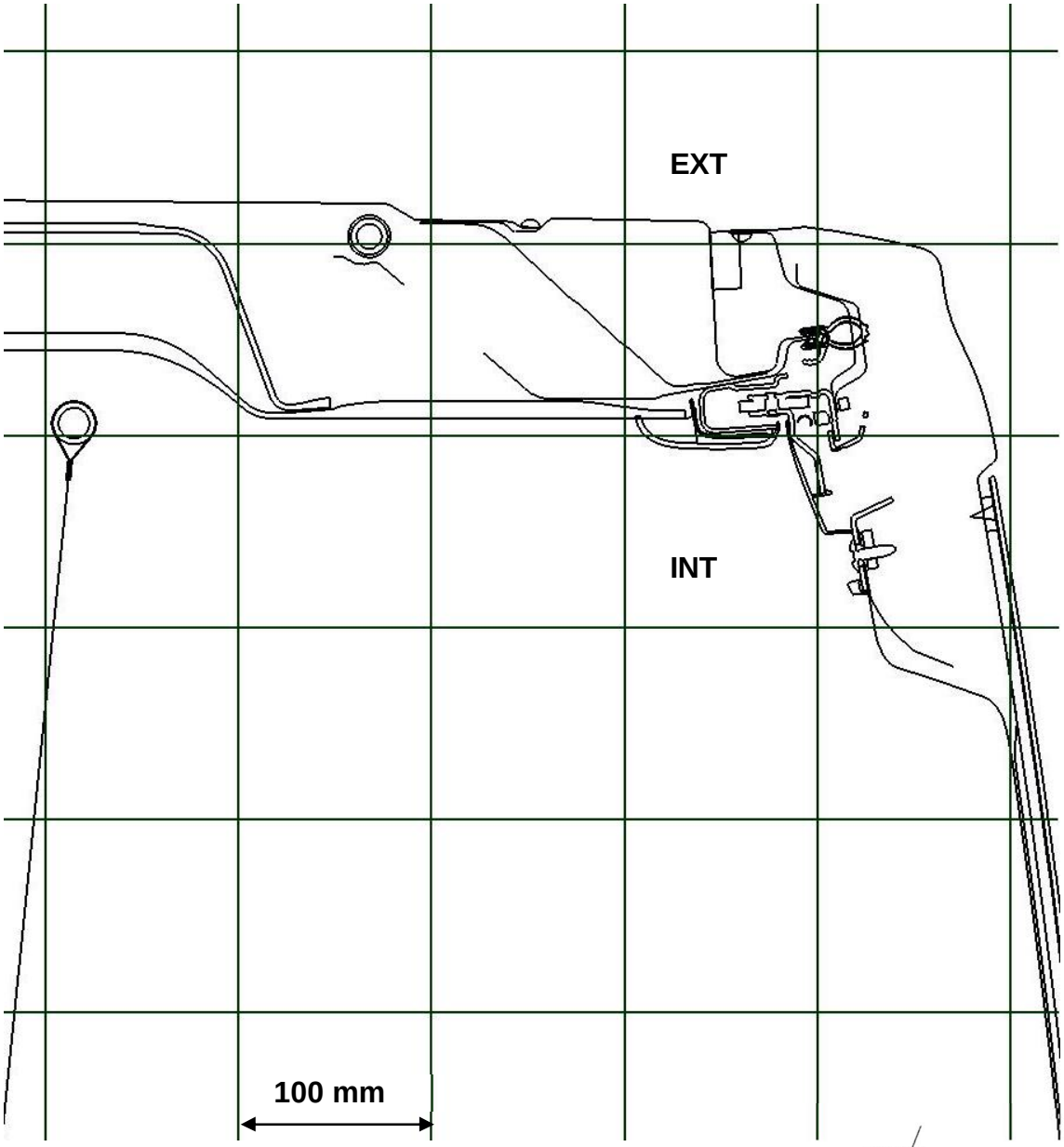


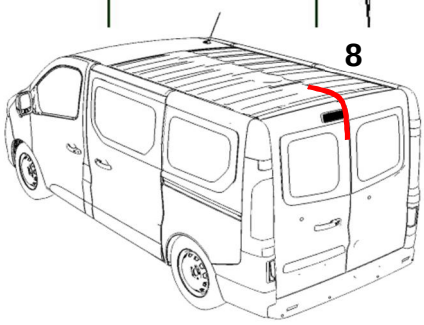
SECTION 7
"AREA BELOW WINDSCREEN"
(Y = 0)



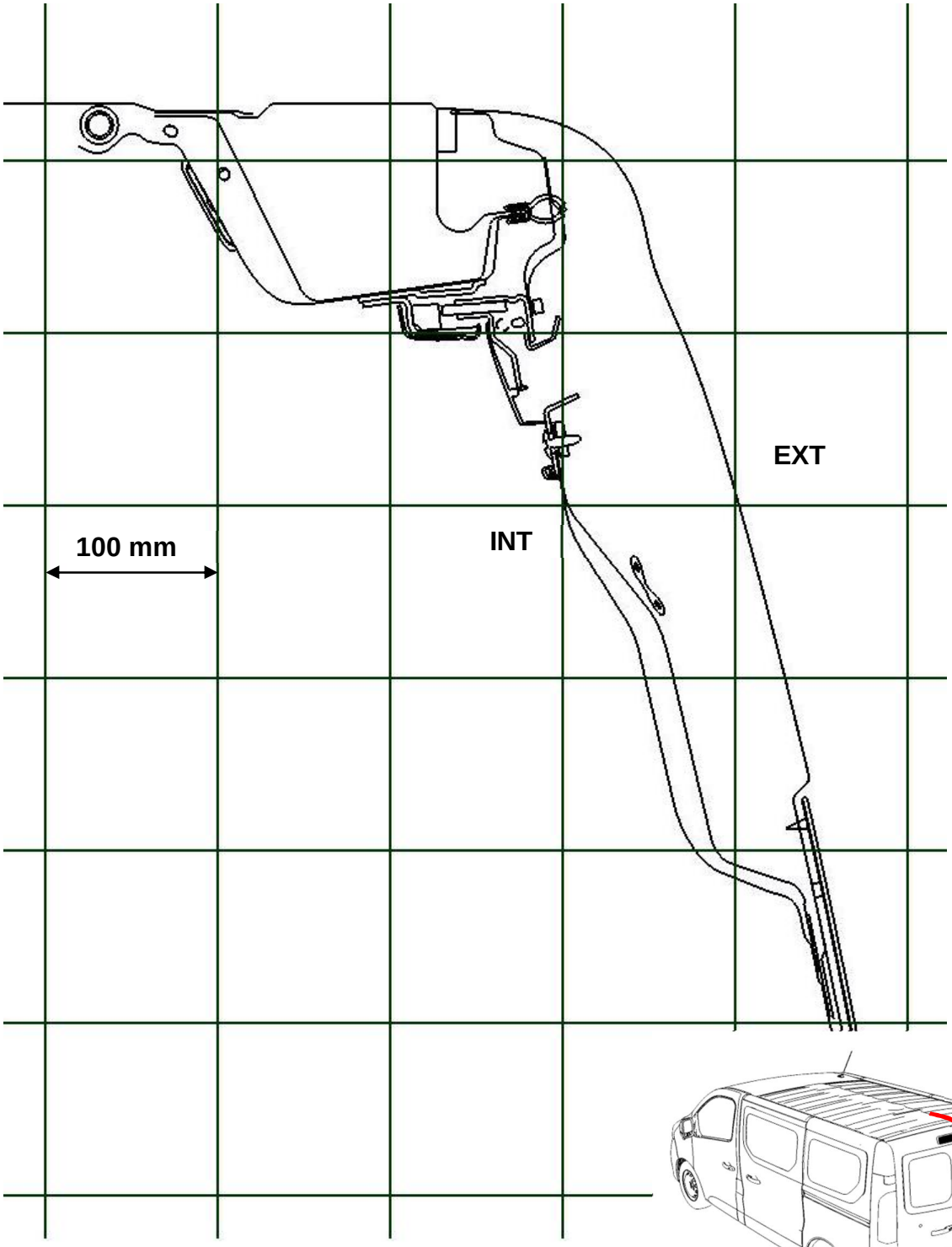


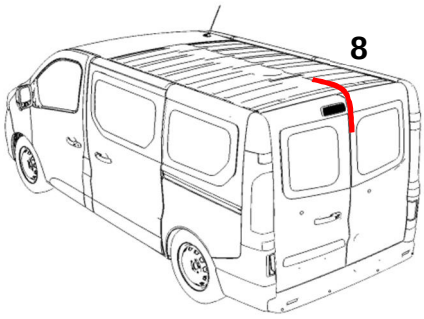
SECTION 8
"REAR UPPER CROSS MEMBER – VERSION H1"
(Y = 42)



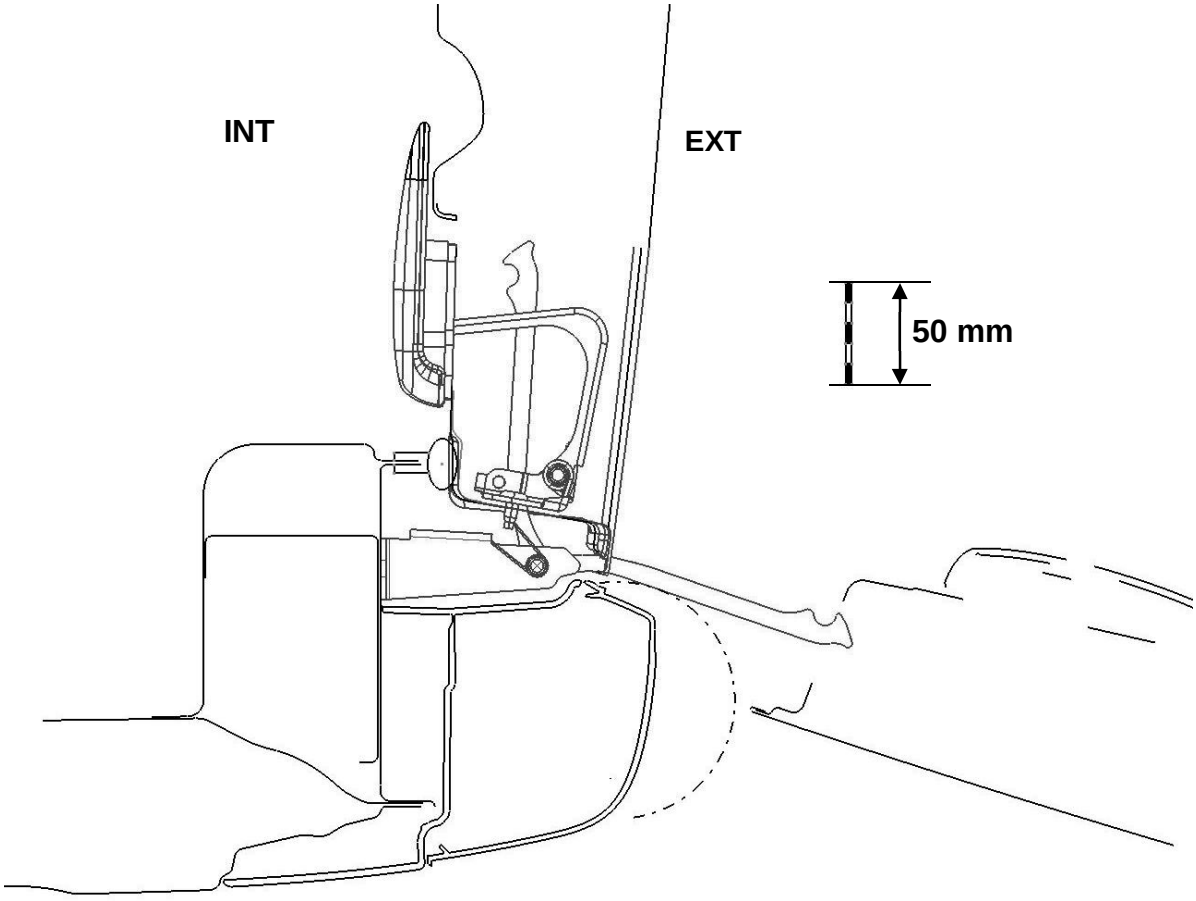


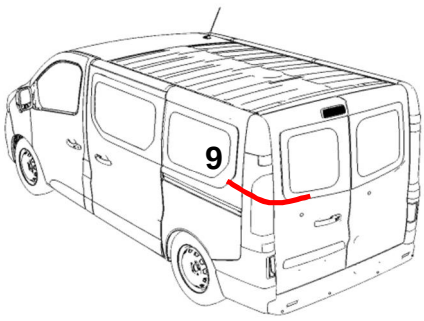
SECTION 8
"REAR UPPER CROSS MEMBER – Version H2"
(Y = 65)



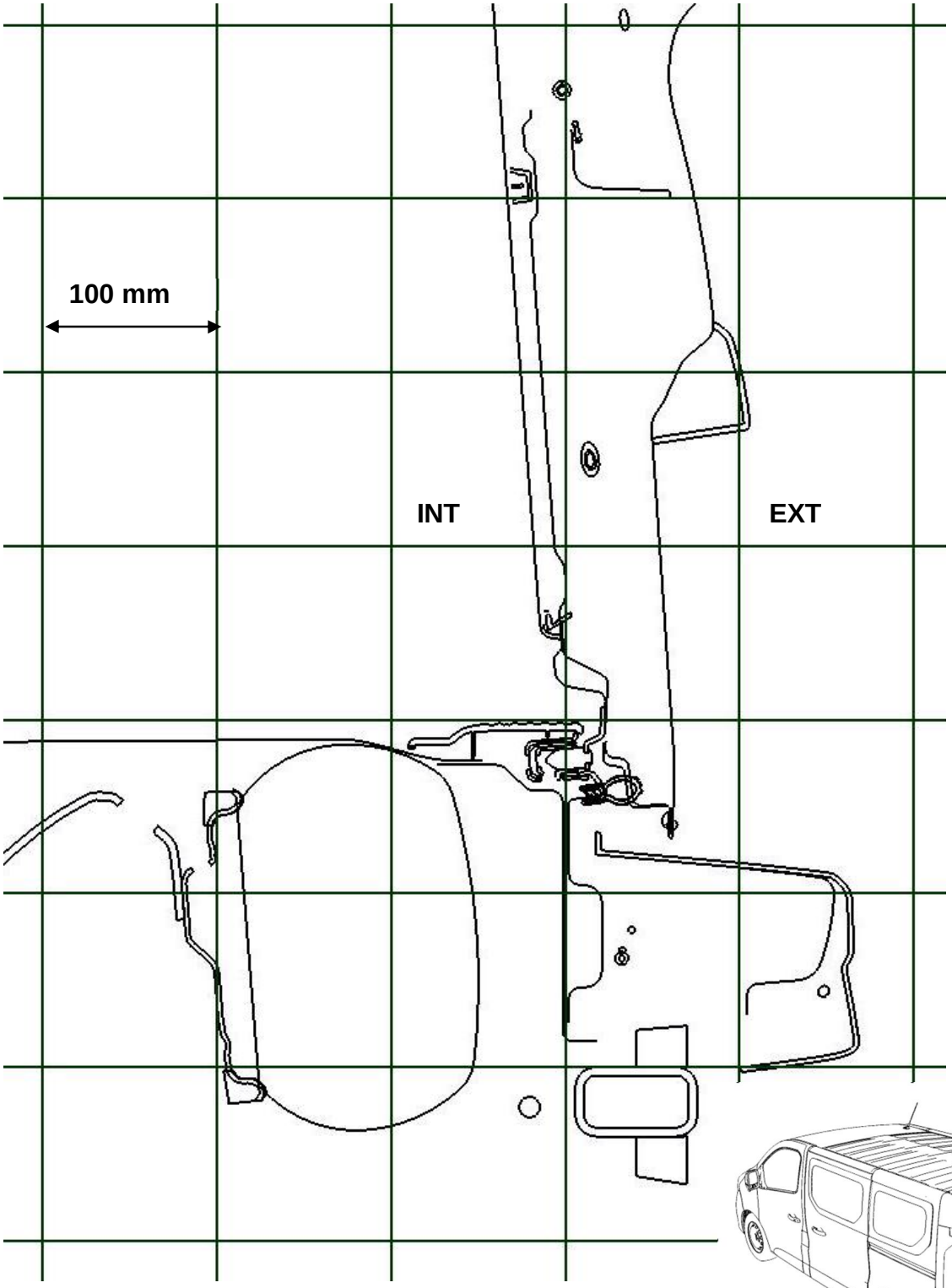


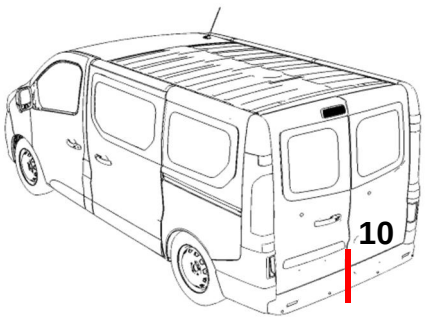
SECTION 9
"REAR LIGHT/DOOR STOP"



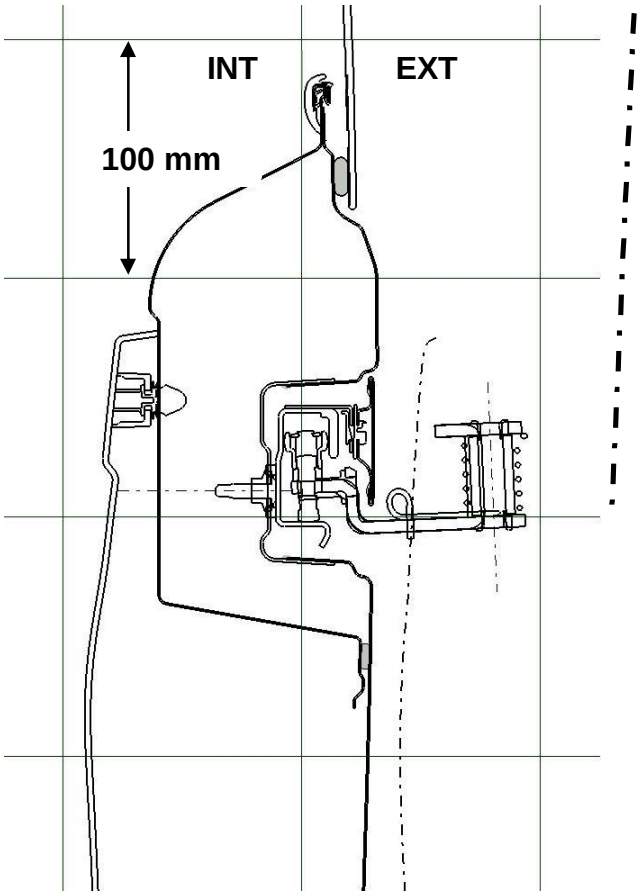


SECTION 10
"REAR LEFT-HAND DOOR LOWER DOOR STOP" (Y = -127)

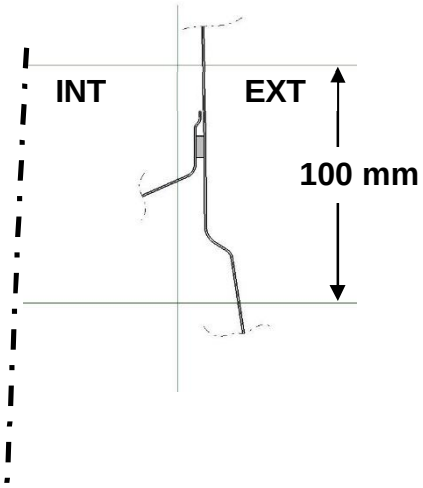




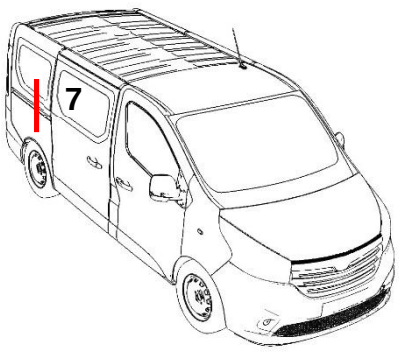
SECTION 11
"SLIDING SIDE DOOR CENTRE RAIL"
(X = 3101)



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:

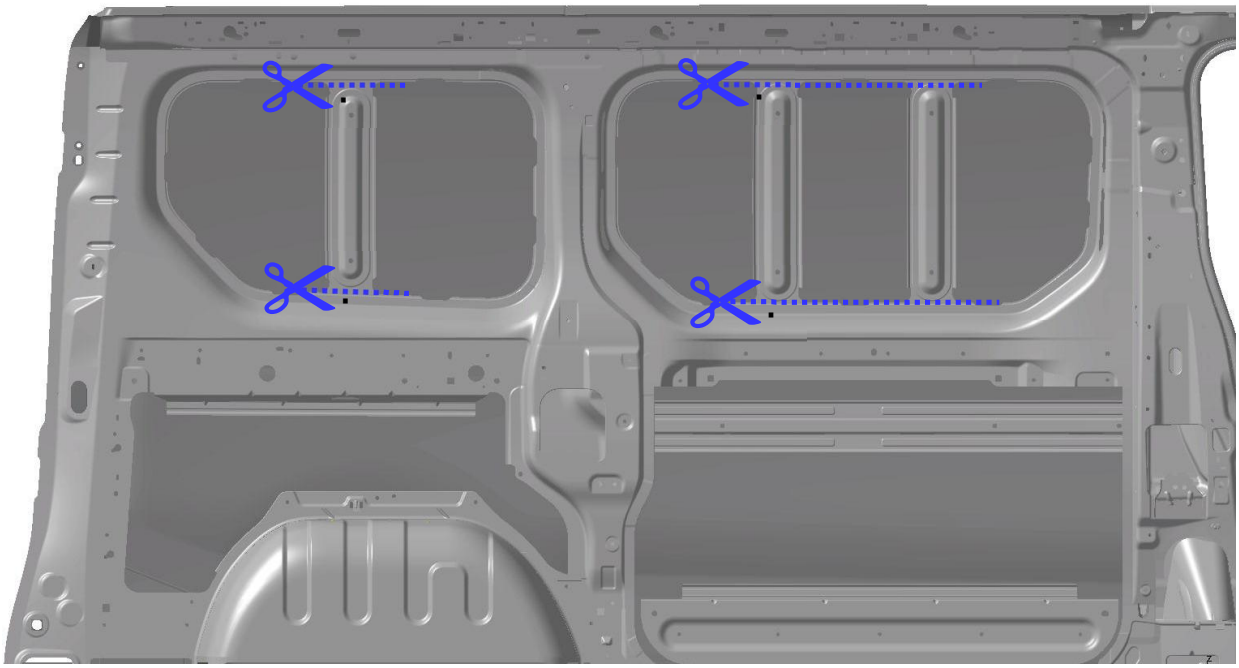
- cut out the vertical stiffeners,
- cut out an opening in the side panel in the shape of the glazed versions of the VIVARO for bonded glass panels or the shape of the glass panel for fitted windows.
- protect the cut-out sections from corrosion. Please refer to the "Anti-corrosion" data sheet

Local reinforcement of the frame structure may be required.

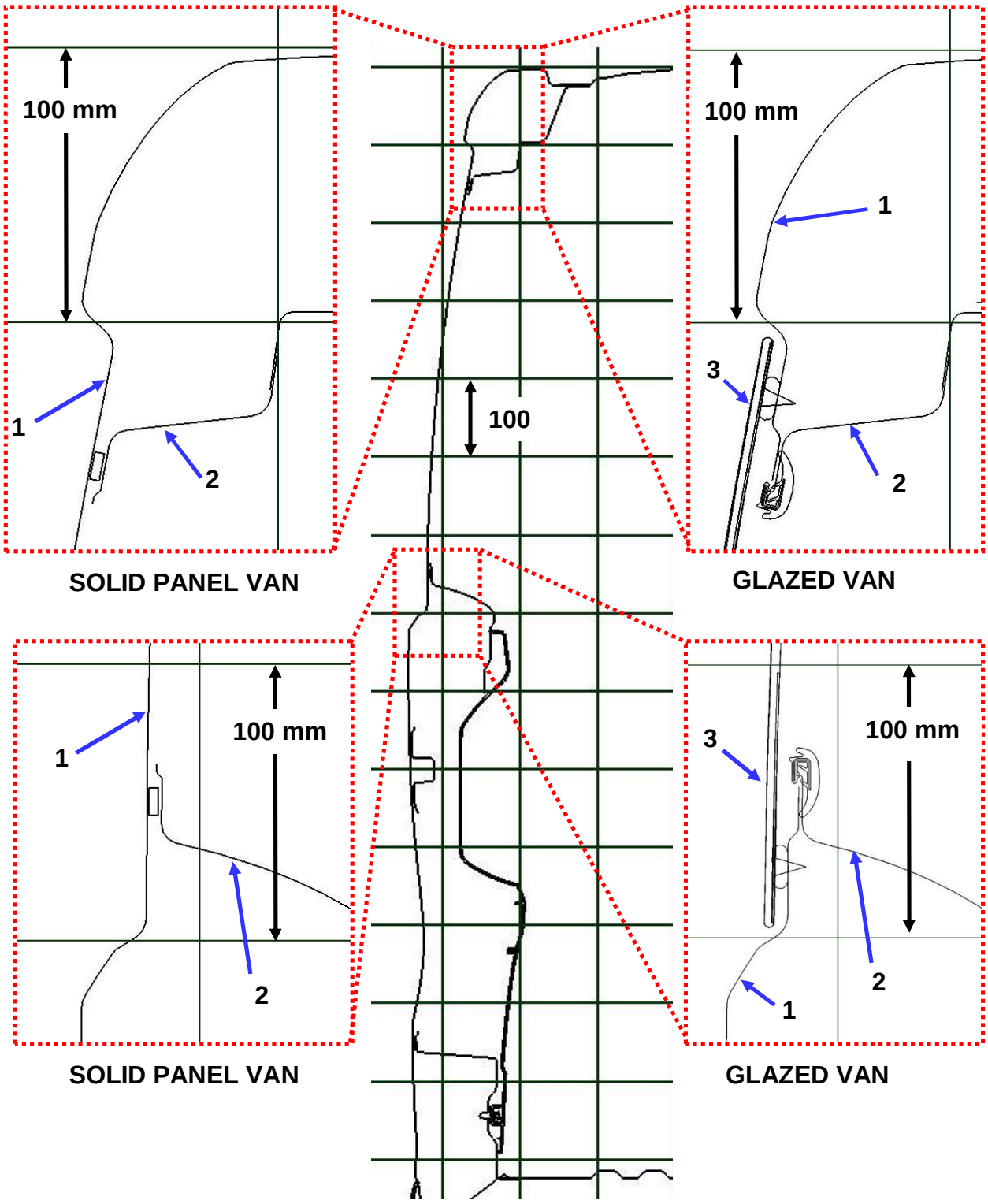
Warning:

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.*

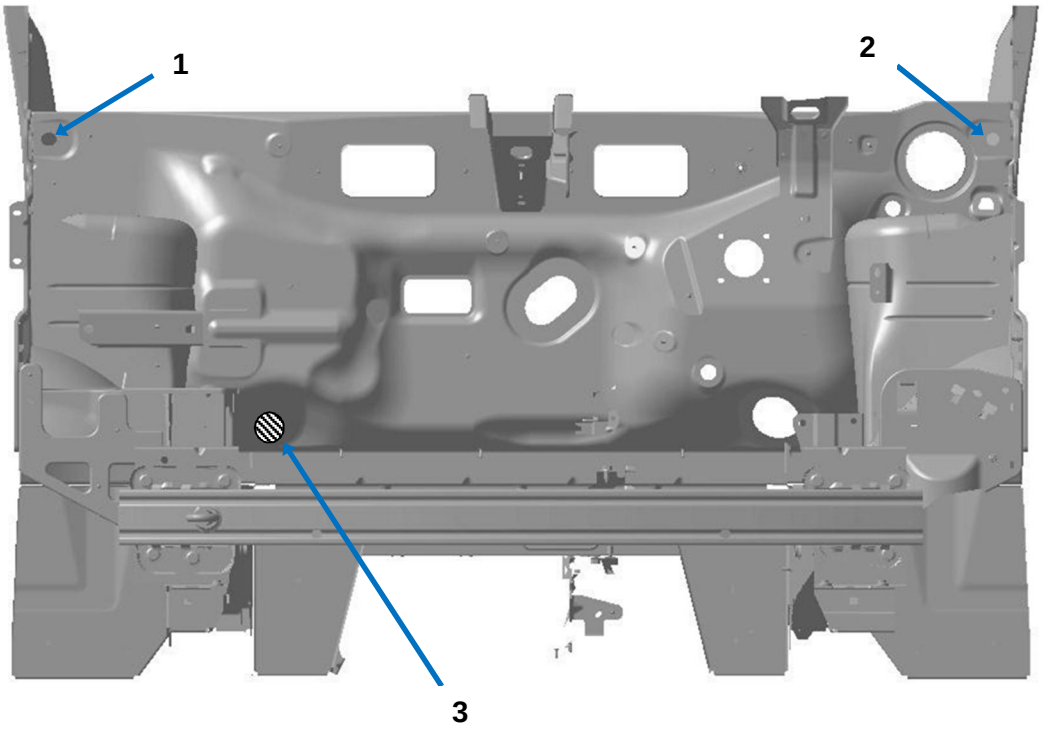
Location of areas on the bulkhead

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.

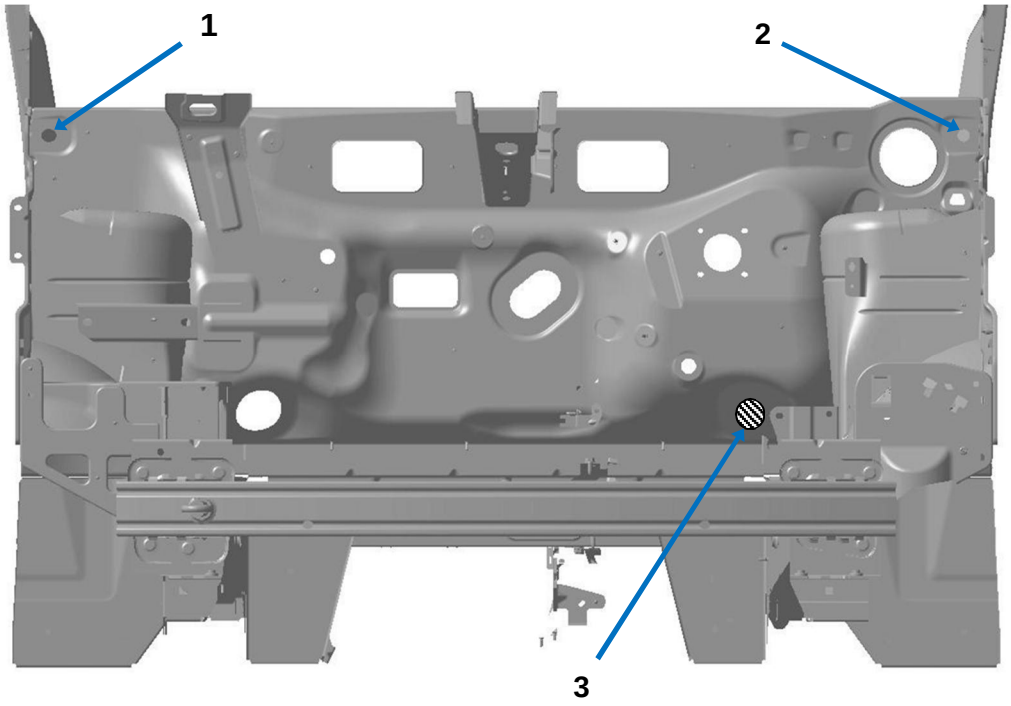
Left-hand drive (engine compartment side)



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

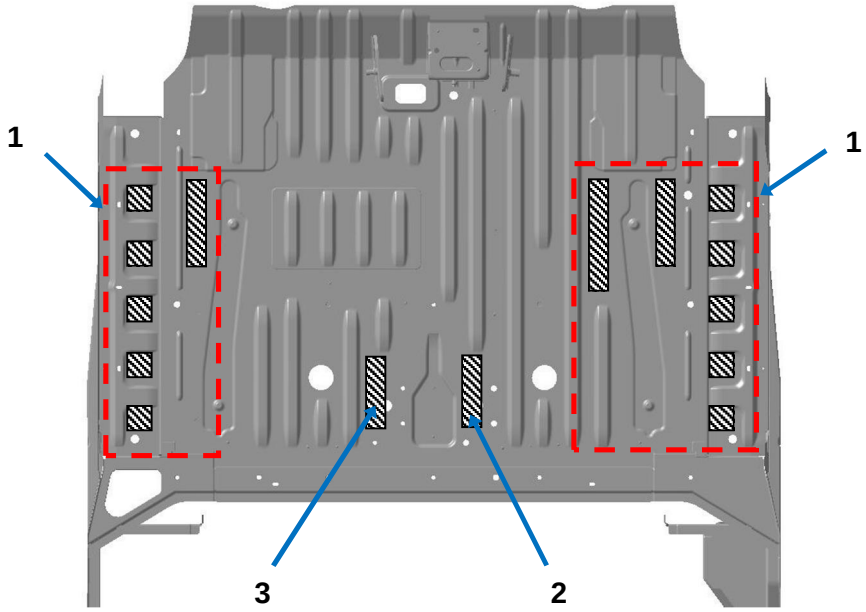
5.2.2. FLOOR PANEL DRILLING AREAS

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.



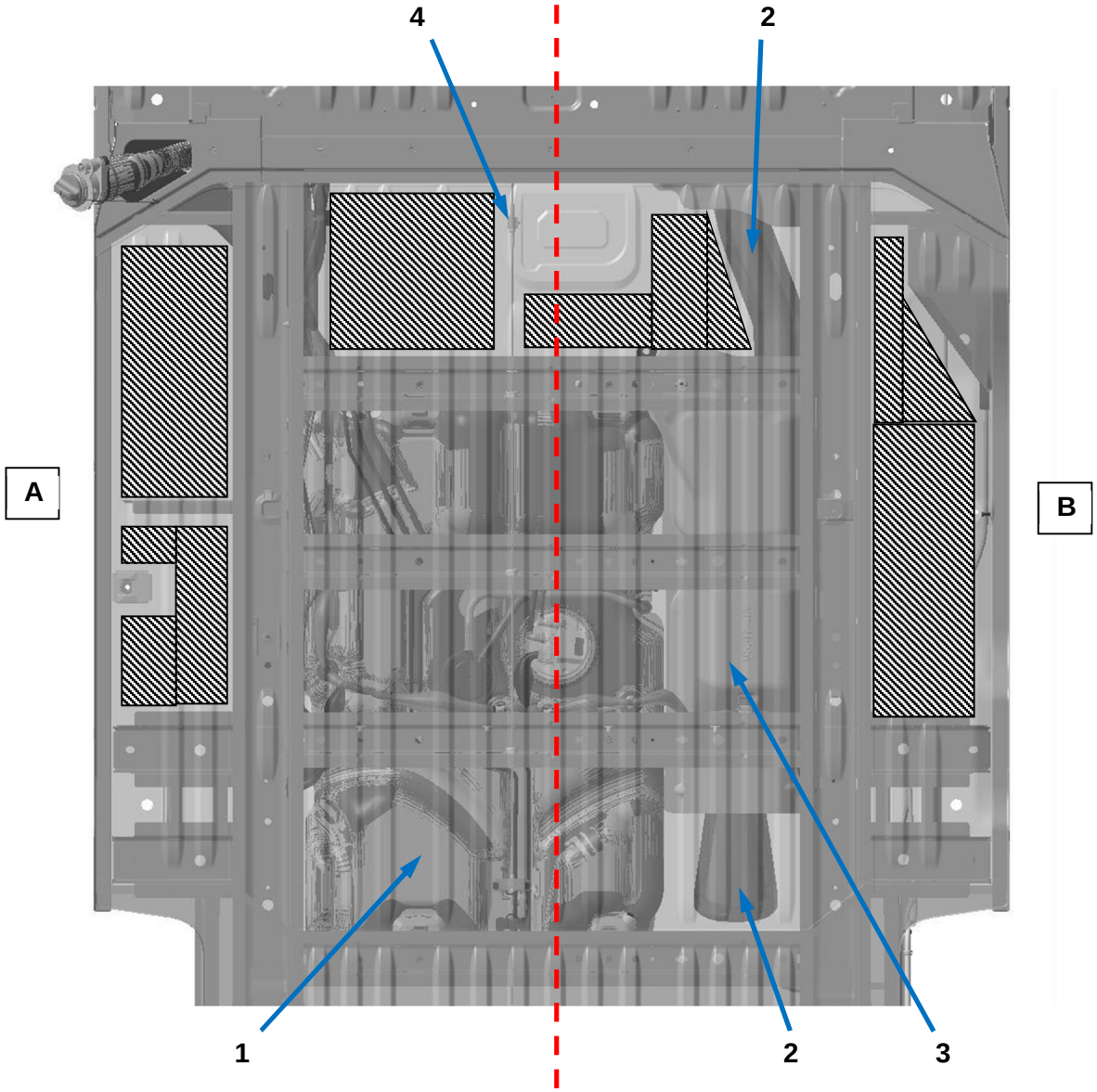
Recommended areas for routing wiring

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.

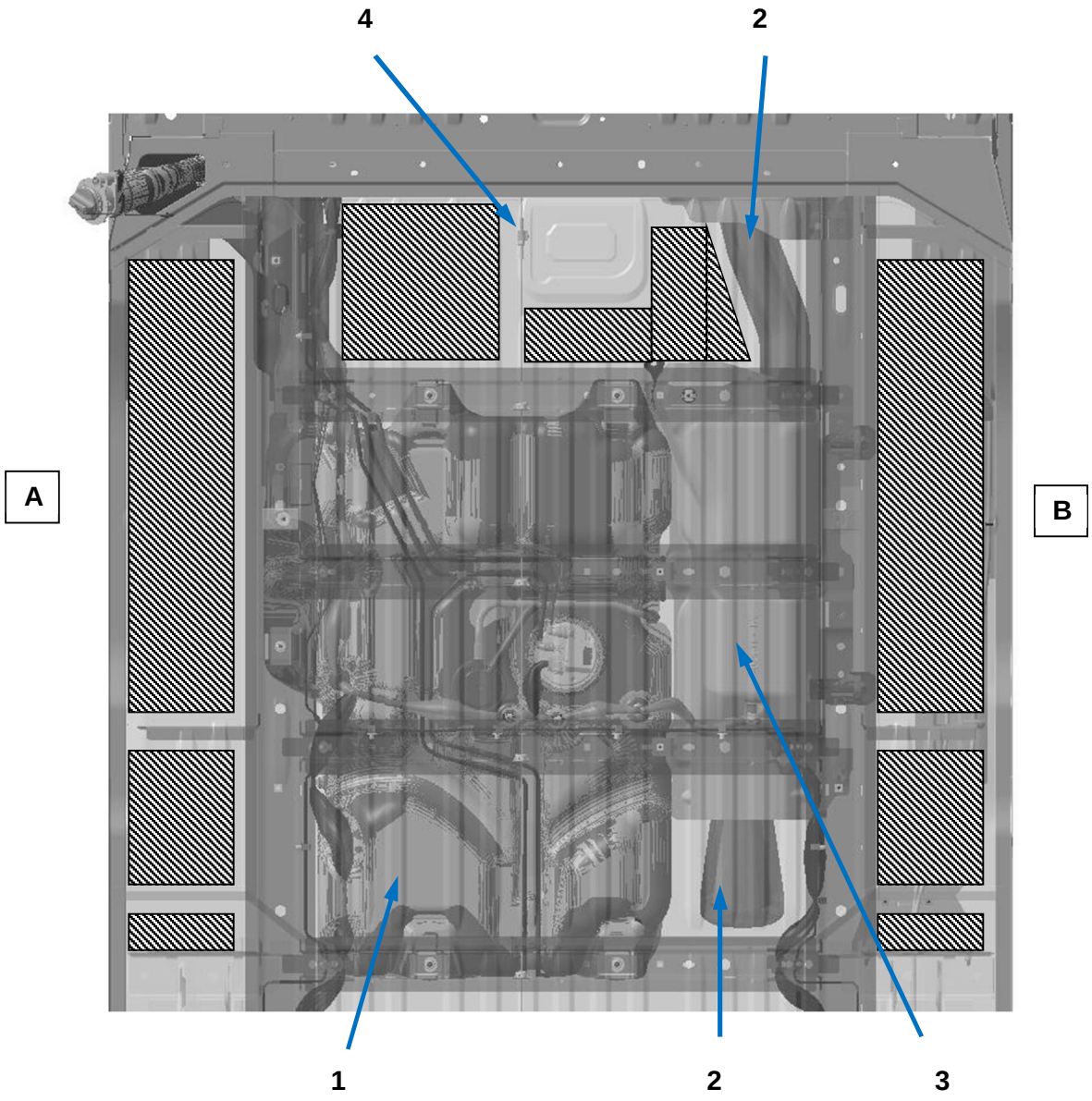
Version L1



Recommended areas for routing wiring

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



Recommended areas for routing wiring

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

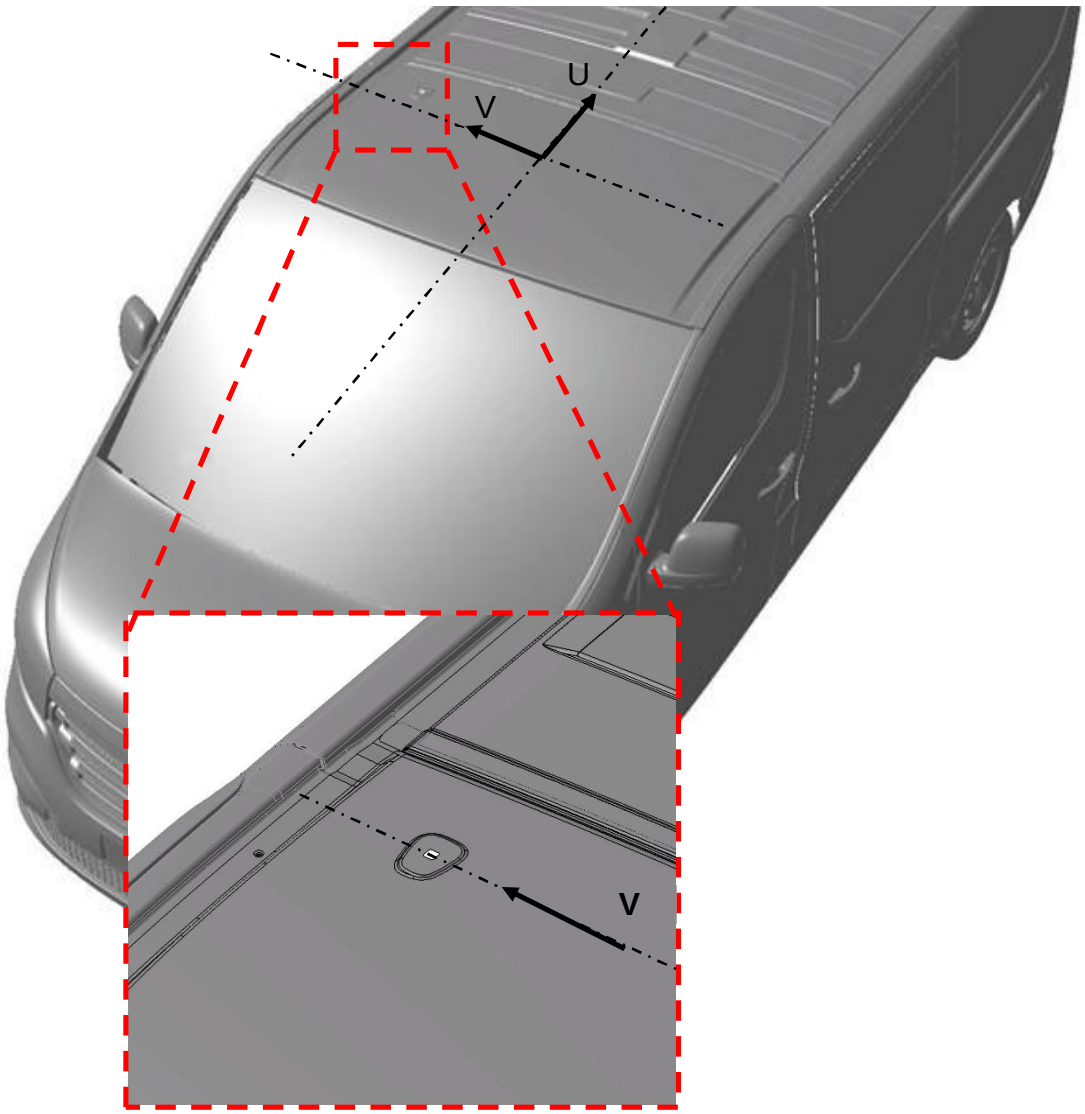
5.3. ROOF PANEL CUT-OUT

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

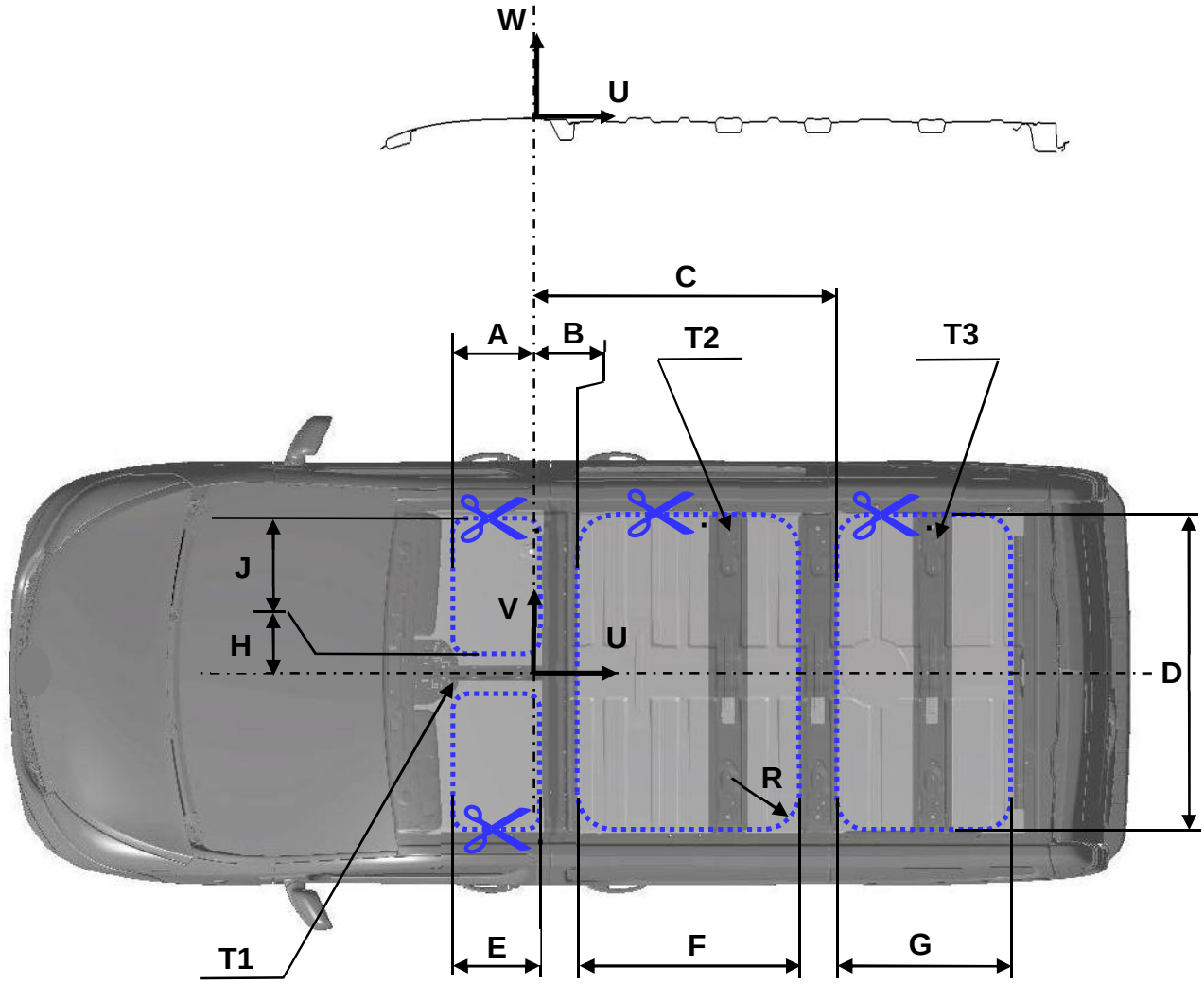
Important: *All cutting angles must be carried out with minimum radii of 75 mm.*

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.



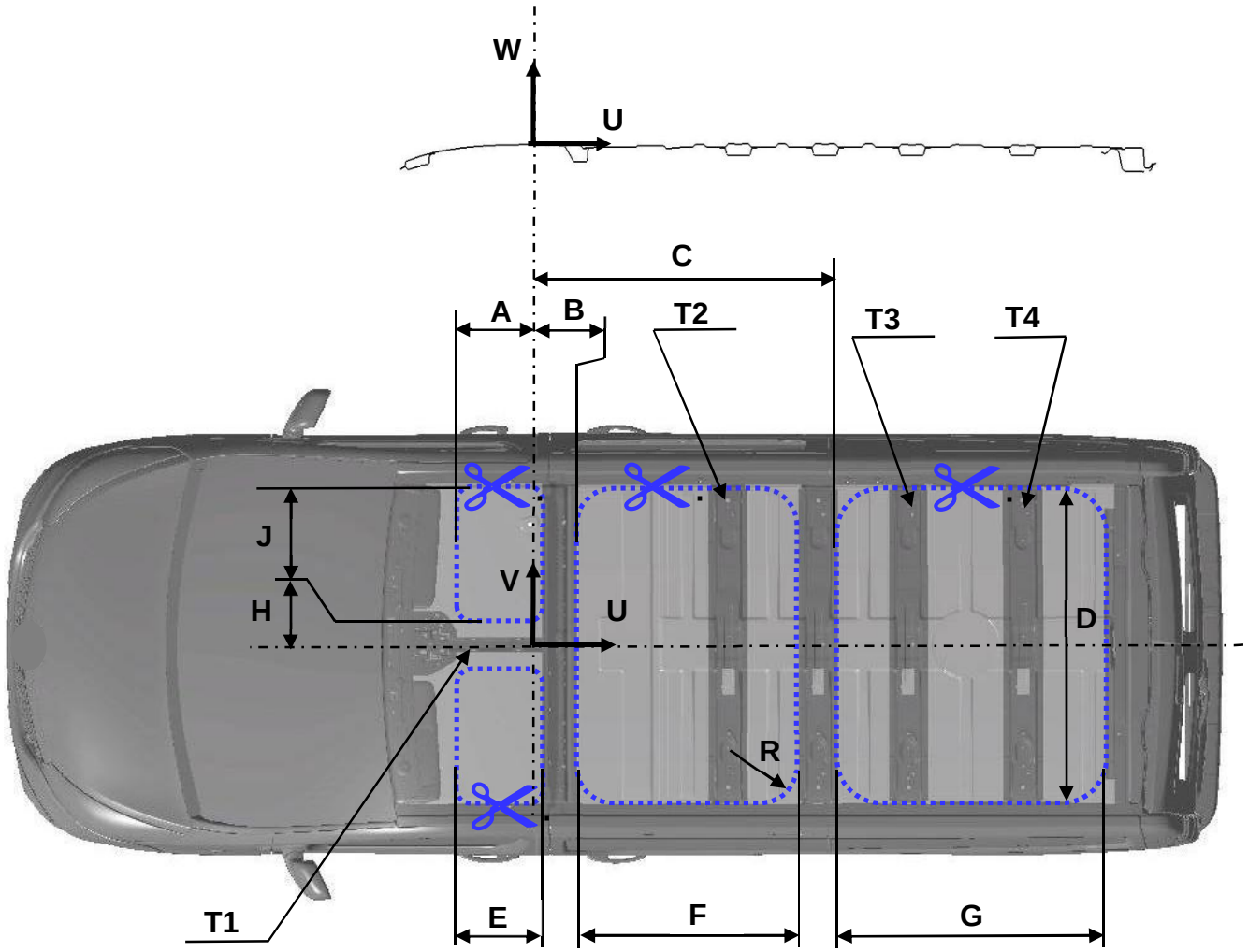
Version Van L1



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

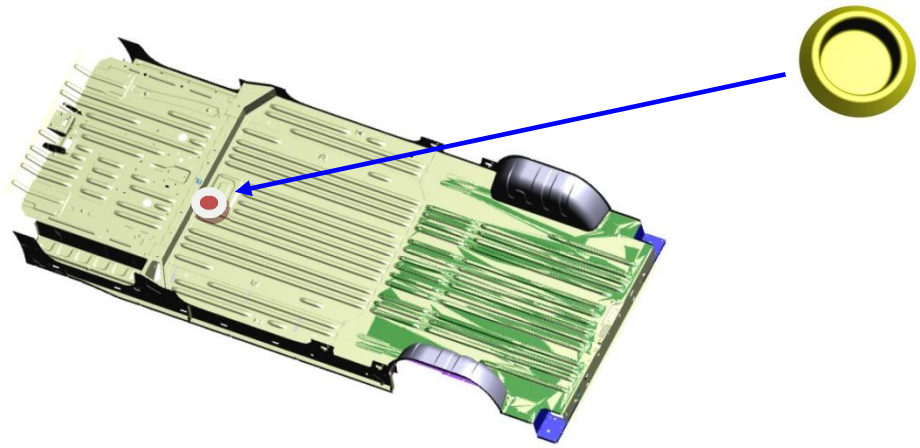
5.4. PLATFORM CAB

5.4.1. CONDITION ON DELIVERY

1- The vehicle is protected by a cowl (passenger compartment protection) which must be removed in order to carry out the conversion.

2- There is a hole in the rear floor (water drainage before conversion) which MUST be plugged; a plug is supplied in the "on-board kit bag" with the other equipment (aerial twig, wheel trims, etc.)

If it is lost, it can also be obtained from after-sales.



Note: for the electrical wiring (arranged in a harness for certain functions), see chapter 4.8 and 4.11

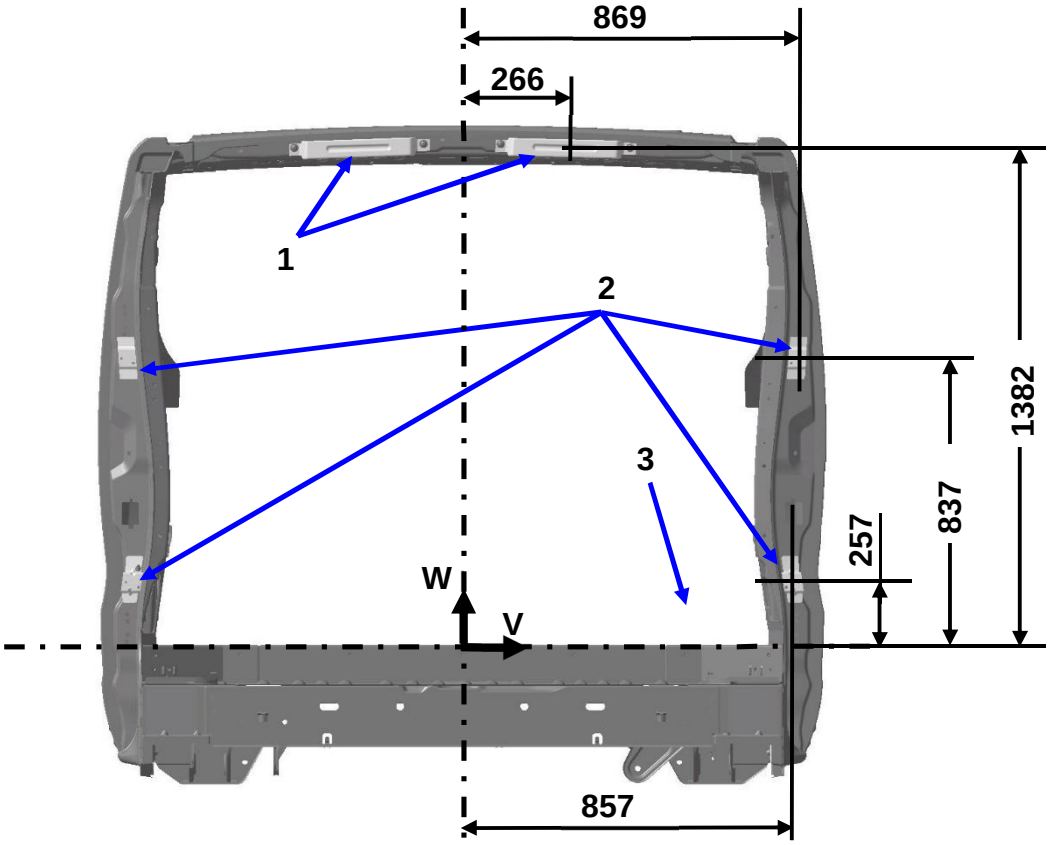
5.4.2. CONNECTION TO BODYWORK, POSITION OF BRACKETS

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.

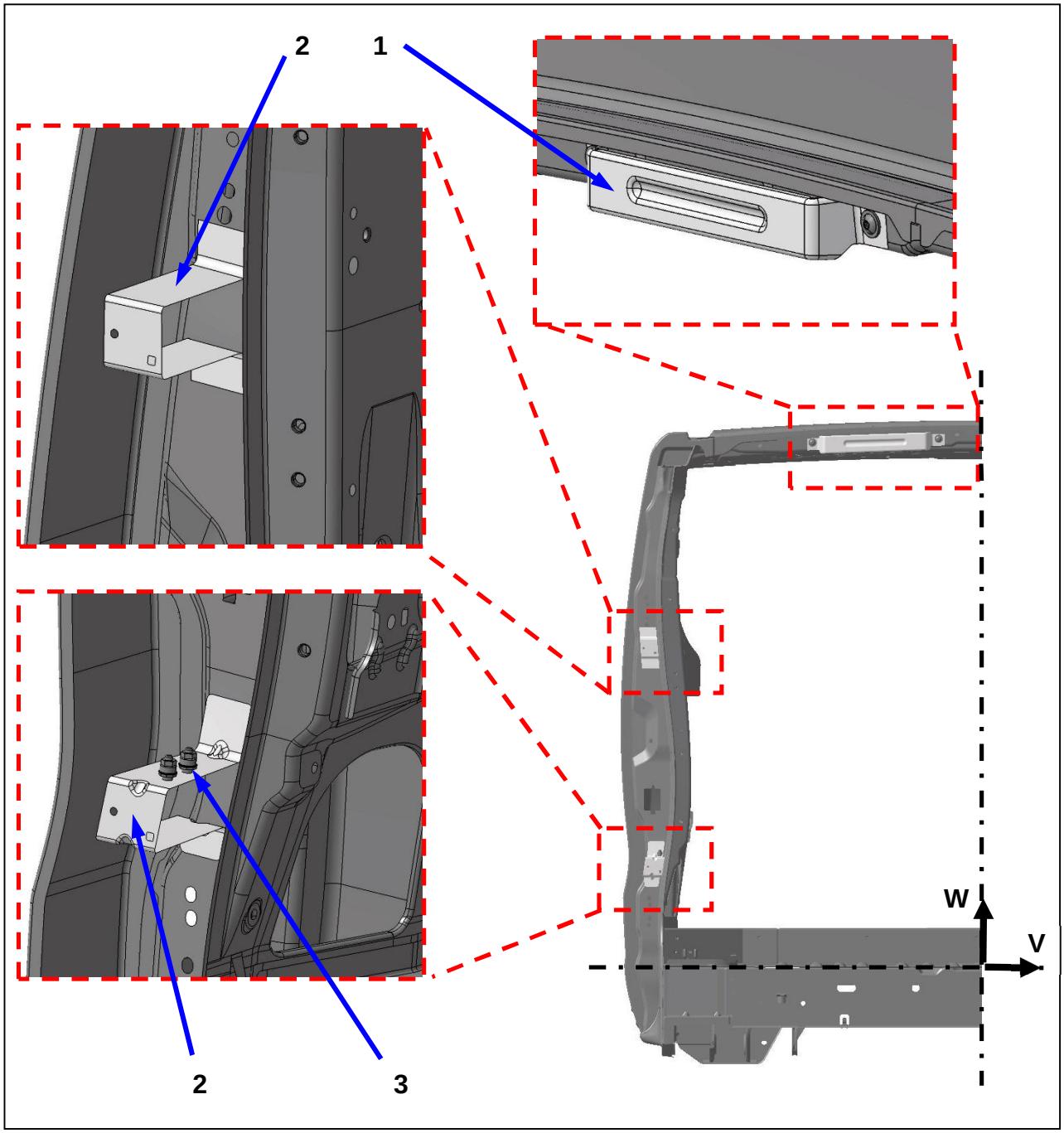
The body bracket positioning interval is +/- 3 mm. It would be prudent to test out any bodywork attachment in practice.

PLATFORM CAB REAR ATTACHMENT RING



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

5.4.3. CONVERSION LIMIT

For all conversions it is necessary to comply with:

1. The maximum and minimum weights on the axles ⇨ Data sheet no. 2.2
2. The constraints relating to the correct operation of the ESP ⇨ Data sheet 3.2
3. The permitted dimensions below
4. The recommendations for "Reconstruction of Opening Panels" ⇨ Data sheets 3.3 and 4.8

Any modification of the wheelbase (extension or reduction) is prohibited.

Modifying the overhang is acceptable under the conditions described below.

1. Modification of the rear overhang

   Modifying the rear overhang will significantly alter the load distribution on the vehicle axles.

   Full allowance must be made for this before the overhang is extended to ensure that the maximum loads per axle are not exceeded.

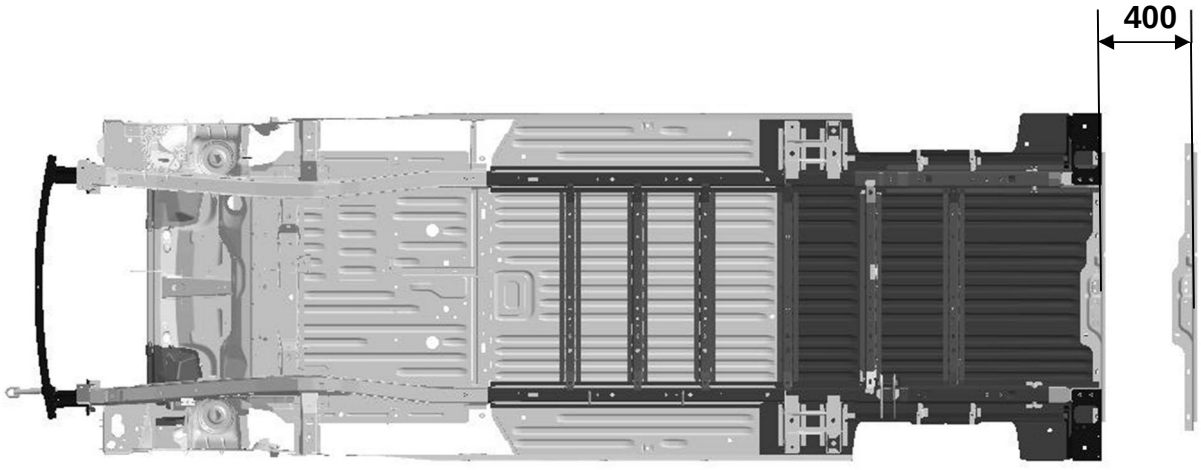
   Modification of the rear overhang must be done in such a way as to ensure continuity in the vehicle's structural stiffness and avoid concentrations of stress.

   The extension of the rear overhang (817 mm to begin with) may be a maximum of 400 mm, i.e. 1217 mm overall; values given in the dimensions table (appendix 1 of data sheet 2.1).

   A rear towing ring must be recreated, to comply with regulatory requirements.

   A tow-bar modified in this way must be submitted for approval.

   The spare wheel carrier securing points must be moved to maintain proper access to the spare wheel.



2. Maximum extended dimensions

		E 82 - L2	Comments
Rear overhang	Base	817	
	Maximum extension	1217	X83+110mm
Overall length	Base	5248	
	Maximum extension	5648	
Height	Base without accessories	1953	Vehicle in running order on average surface
	Maximum extension	2700	as X83
Width	Base without rear-view mirror	1956	
	Base with rear-view mirrors (long arm)	2283	
	Maximum extension	2150	

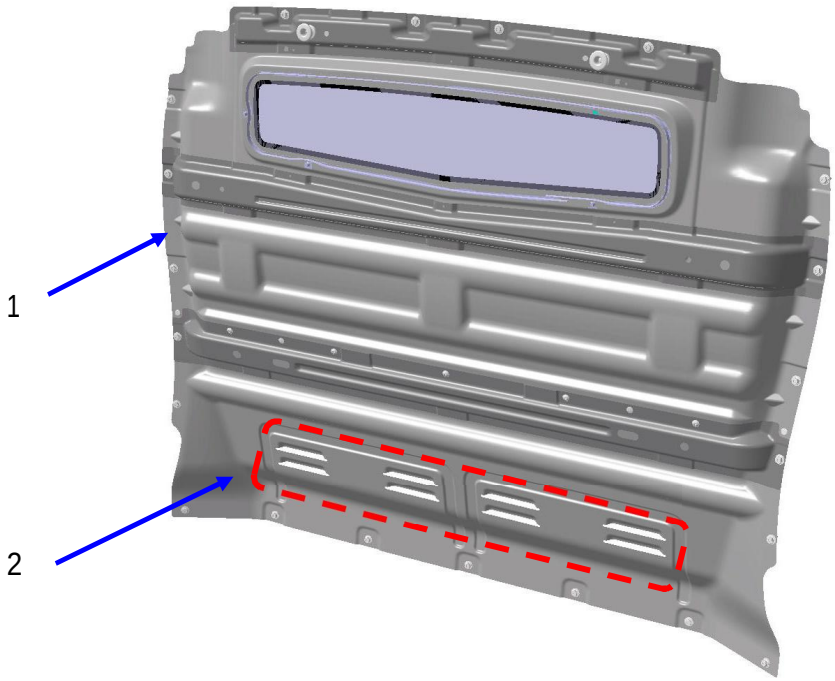
5.5. EXTRACTOR RECOMMENDATION

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 mm².

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

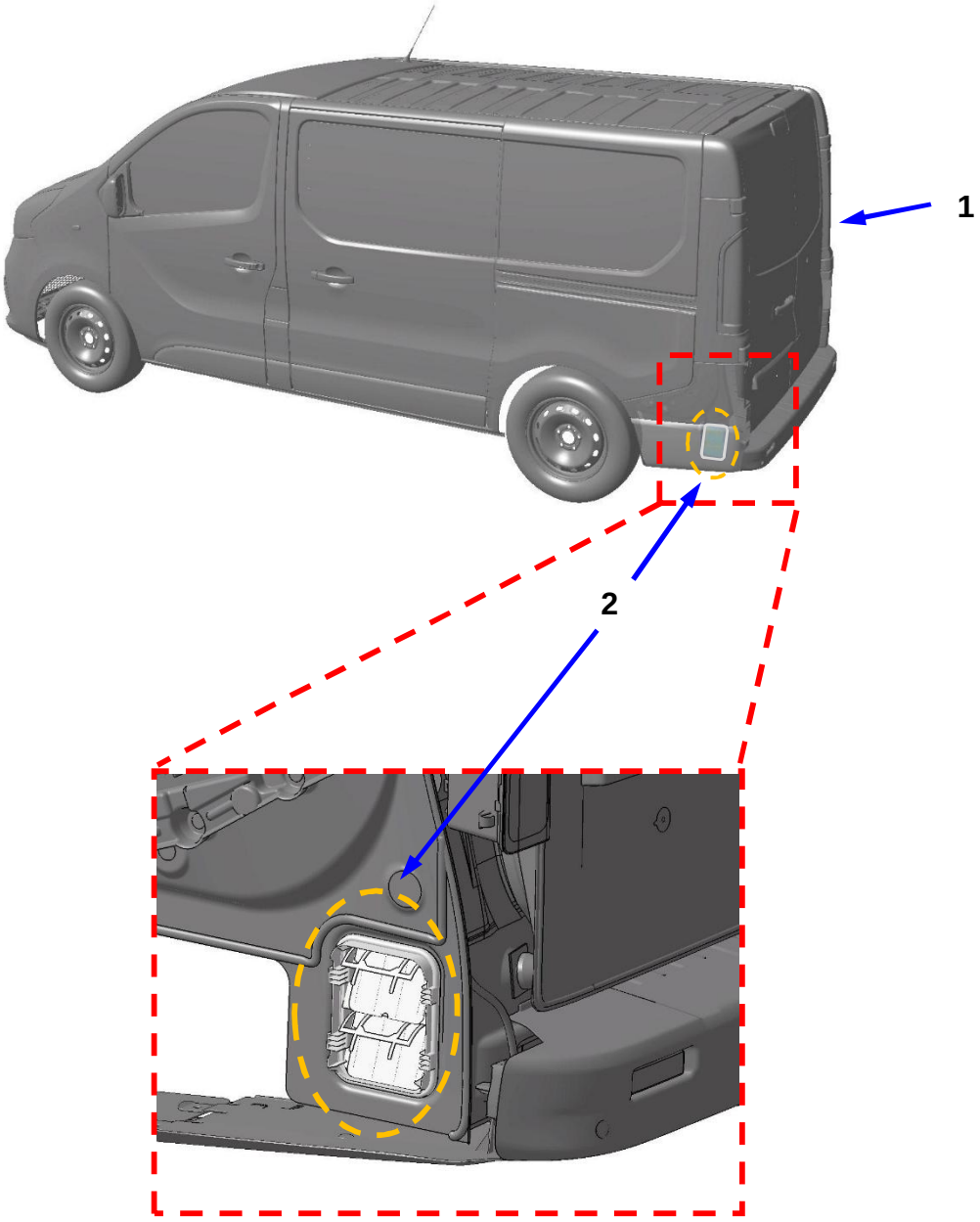
Van Area

Partition between cab and loading area



1 : Partition	2 : Openings area

Vehicle rear end



1 : Vehicle rear end	2 : Air extractor

Note: *The extractors are located symmetrically in relation to the vehicle axis.*

6. MECHANICAL CONVERSIONS

6.1. POWER TAKE OFF PROVISIONS, OPTION “V66”

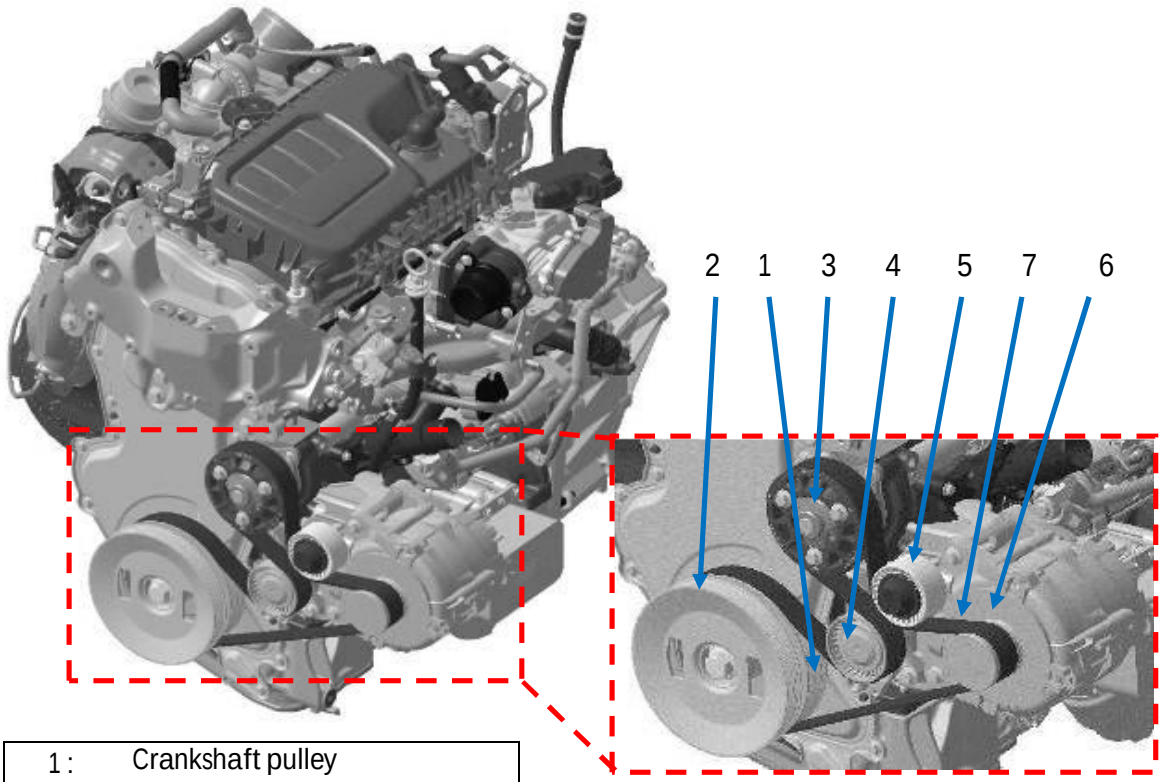
It is recommended to select an entry level vehicle without Start/Stop for vehicles having this type of conversion.

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.

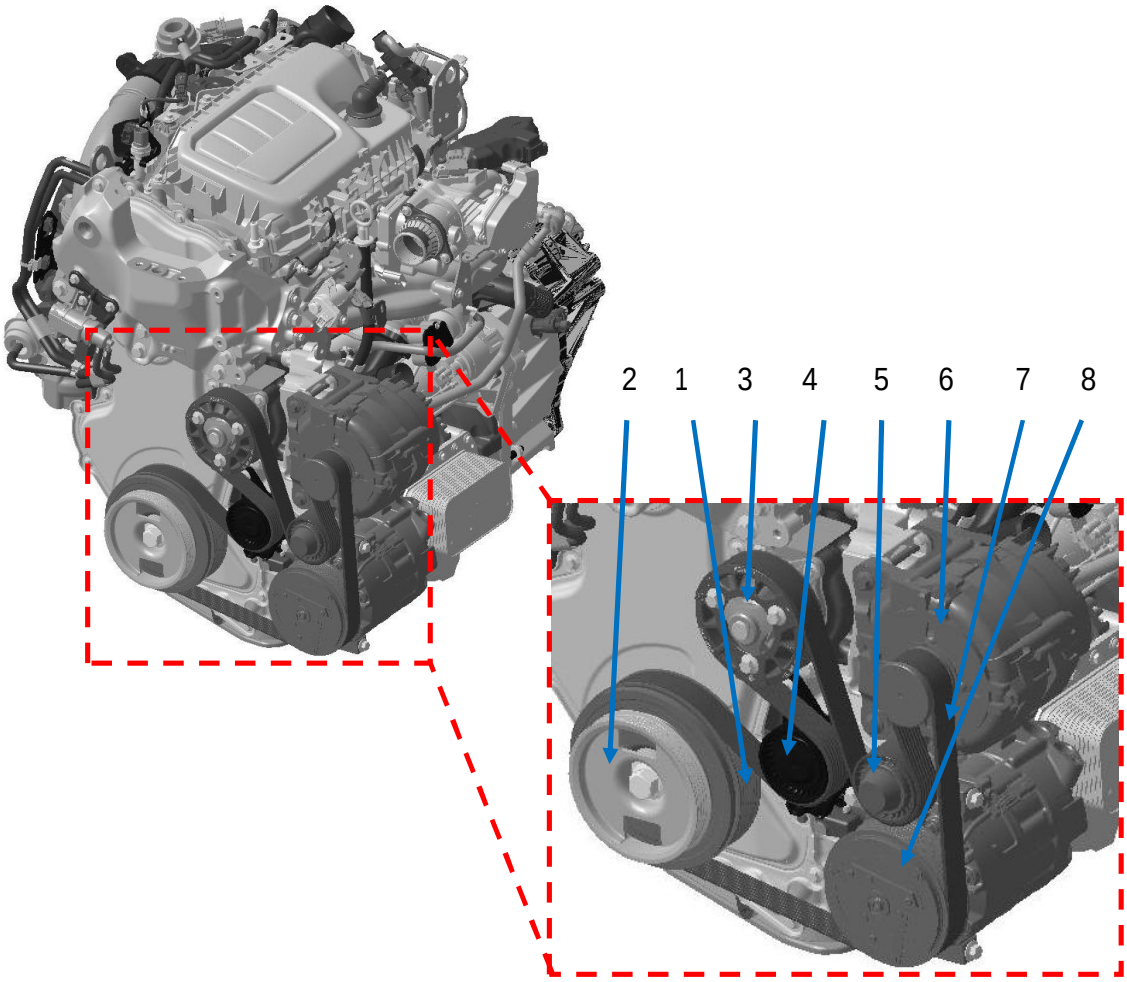
Note: *Component maximum power rating 8.3 kW with an engine running at 4500 rpm.*

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"



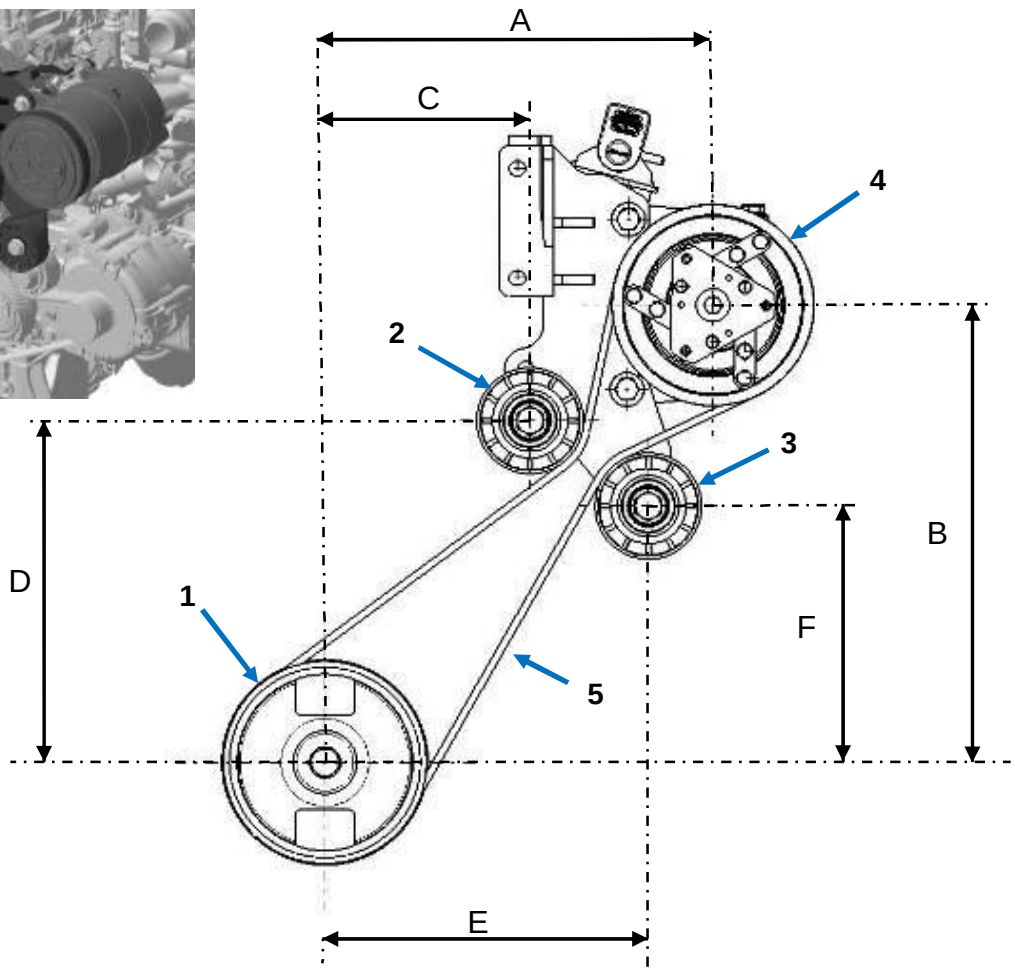
1 :	Crankshaft filtering pulley
2 :	V66 pulley (4V)
3 :	Water pump pulley
4 :	Dynamic tensioner
5 :	Retractor roller
6 :	Alternator pulley
7 :	Accessories belt (7V)
8 :	Air conditioning compressor

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.



1:	Ø119 Crankshaft pulley, 4V (adaptation)		
2:	Ø65 Retractor rollers		
3:	Ø65 Tensioning rollers (eccentric)	A : 236,7	D : 209,25
4:	Ø119 Component pulley	B : 280	E : 197,3
5:	Rubber belt, 4V	C : 125	F : 157

CHANGE DESCRIPTION - PART 2

Date	*Chapter*	*Major Changes*
01/2015	4.02	New chapter "RELAY / FUSE BOX: ENGINE COMPARTMENT CONNECTION UNIT"
01/2015	4.05	EXAMPLE OF ALTERNATOR APPLICATIONS chapter reworded GEN1 & GEN2 changed to SINGLE TURBO & TWIN TURBO
01/2015	4.06	References 8 updated in table
01/2015	4.07	Conversion specifications on Platform Cab added Engine running information and Rear doors switch - removal of platform cab elements added
01/2015	4.09	Connection kit (counterpart) added Info robotised gearbox deleted Option code changed from UF3 to V66
01/2015	4.10	General update of the chapter
01/2015	4.13	New chapter "TACHOGRAPH"
01/2015	6.01	changed numbering of « Component installation diagram" belt was elastic & Tensioning roller was retractor roller
03/2015	5.4	Change Titel of chapter to "PLATFORM CAB" Added Infos to 5.4.1. - CONDITION ON DELIVERY 5.4.3. - CONVERSION LIMIT