Conversion Guideline
Vivaro [X82]

PART 1 - 3

Edition: April 2017

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

Conversion Guideline - Part 1 - 3

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

1. GENERAL VEHICULES INFORMATION

1.1. BODYWORK RANGE

	Vivaro		L1		L2	
			Body side panels	Rear openings	Body side panels	Rear openings
F	2 or 3 seats	VU H1 H2	0/1/2 PLC T/V CS T/V	PBT PBV H	0/1/2 PLC T/V CS T/V	PBT PBV H
	2 or 6 seats	VU H1 CABAPRO	1/2 PLC V CS T	PBT PBV H	1/2 PLC V CS T	PBT PBV H
J	5 to 9 seats	VP M1 H1	1/2 PLC V CS V	PBV H	1/2 PLC V CS V	PBV H
	2 to 6 seats	VU N1 H1	1 PLC V CS V	PBV H	1 PLC V CS V	PBV H
E	2 to 3 seats	LCV H1			without	without

Explanation:

F	Panel van
J	Combi
E	Platform Cab
CABAPRO	Crew Cab
CS T/V	Body side, with window / without window
H	Tailgate (glazed)
H1	roof normal
H2	roof high
LCV	Light Commercial Vehicle
N1	Homologation as a truck
M1	Homologation as a passenger car
PLC T/V	Sliding Side Door, with window / without window
PBT	Solid Hinged Doors
PBV	Glazed Hinged Doors

1.2. ENGINE-GEARBOX RANGE

1.2.1. From start to September 2015

	Depol	Level	Generation	Engine suffix	KW	N1 (H1 panel van)		N1 (H2 panel van and Platform cab		M1 (combi H1)	
	Stop/ Start					with	without	with	without	with	without
R9M PF6	Euro 5R	D1	GEN1	408	66	X	X			X	X
		D2-	GEN1		85		X				X
		D2+	GEN2	450	88	X		X	X	X	
		D3	GEN2		103	X	X	X	X	X	
	Euro 4A	D2	GEN2		88		X		X		X

1.2.2. From September 2015 to September 2016

Note: arrival of Euro6b for M1 versions

	Depol	Level	Generation	Engine suffix	KW	N1 (H1 panel van)		N1 (H2 panel van and Platform cab)		M1 (combi H1)	
	Stop/ Start					with	without	with	without	with	without
R9M PF6	Euro6b	D1	GEN1	413	70					X	
		D2-	GEN1		88						
		D2+	GEN2	452	92					X	
		D3	GEN2		107					X	
	Euro 5R	D1	GEN1	408	66	X	X				
		D2-	GEN1		85		X				X
		D2+	GEN2	450	88	X		X	X	X	
		D3	GEN2		103	X	X	X	X	X	
	Euro 4A	D2	GEN2		88		X		X		X

1.2.2. Starting in September 2016

Note: *Euro6b will apply to N1 versions*

	Depol	Level	Generation	Engine suffix	KW	N1 (H1 panel van)		N1 (H2 panel van and Platform cab)		M1 (combi H1)	
	Stop/ Start					with	without	with	without	with	without
R9M PF6	Euro6b	D1	GEN1	413	70	X	X			X	X
		D2-	GEN1		88		X				X
		D2+	GEN2	452	92	X		X		X	
		D3	GEN2		107	X		X		X	
	Euro5R	D2-	GEN1		85		X				X
		D2+	GEN2	450	88	X			X	X	
		D3	GEN2		103					X	
	Euro 4A	D2	GEN2		88		X		X		X

Explanation:

GEN1	Single turbo
GEN2	Twin turbo
H1	roof standard
H2	roof high
PF6	manual transmission, 6-speed
N1	Homologation as a truck
M1	Homologation as a passenger car

1.3. VEHICLE IDENTIFICATION (VIN, oval plate)

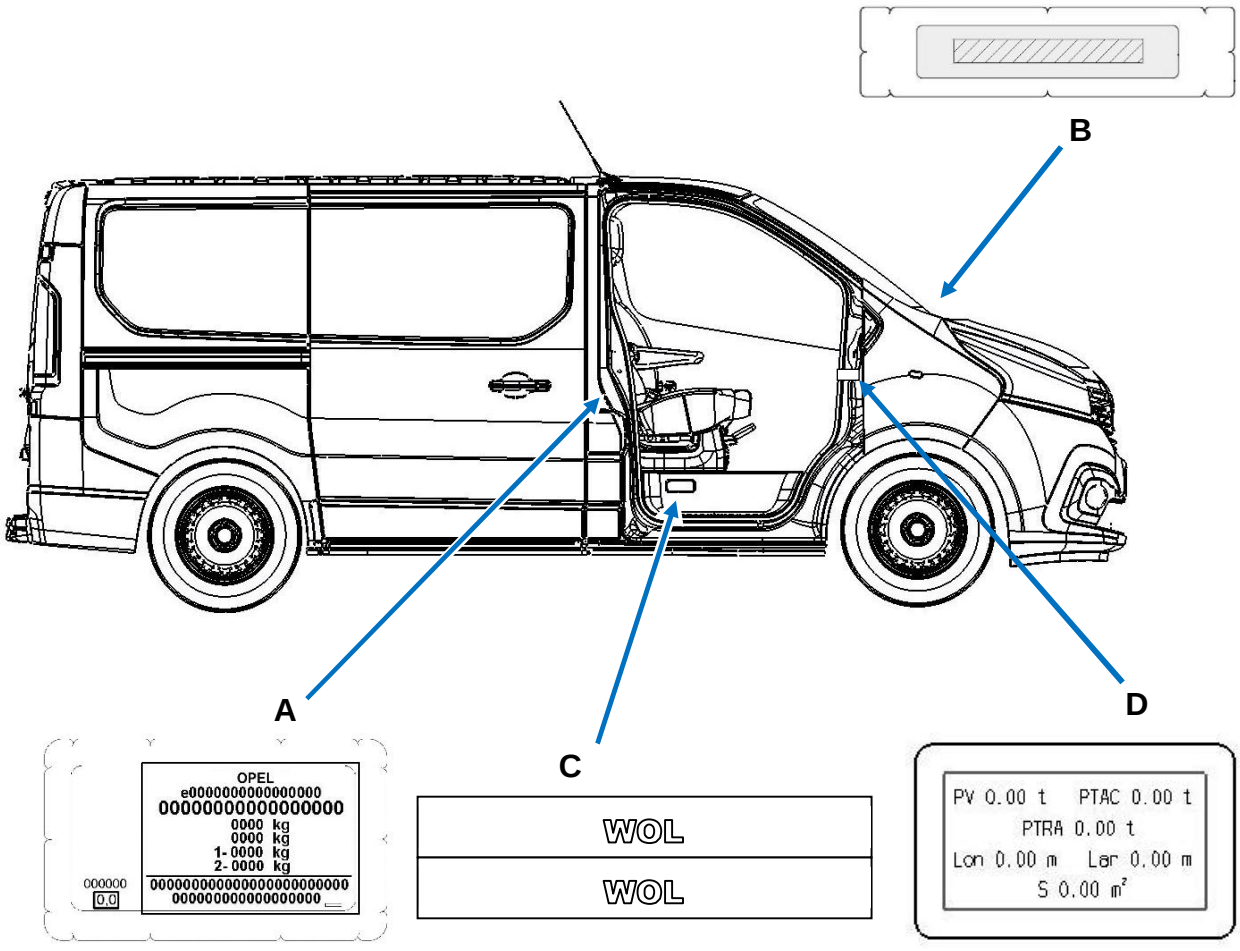
POSITION OF MARKINGS AND PLATES

The manufacturer's plate is located on the cab right-hand door frame, on the B-pillar (A).

The weights and dimensions label is located on the front right-hand wing panel (D).

The VIN number label is located at the base of the windscreen (B).

The chassis number marking can be seen by using a tool (e.g. screwdriver) to lift the viewing window located at the top of the cab right-hand step. (C).

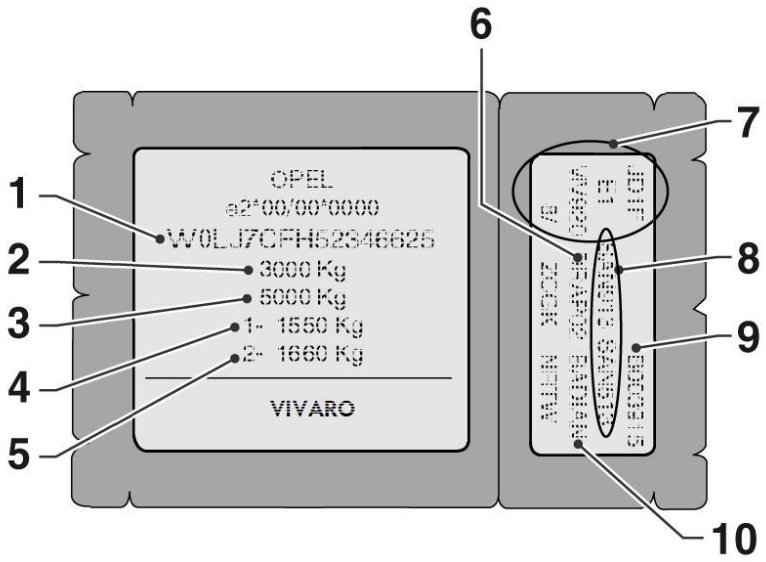


The vehicle manufacturer's plate must be replaced if it is damaged or moved, which is inevitable during conversion. This means you will have to order a new plate.

This request should be sent to the Quality/Service/After-Sales Service departments of the particular country.

DETAILS OF INSCRIPTIONS

A) MANUFACTURER'S PLATE



Information on identification plate[1]):

1 : Vehicle identification number

2 : Permissible gross vehicle weight rating

3 : Permissible gross combination weight

4 : Maximum permissible front axle load

5 : Maximum permissible rear axle load

6 : Trim code

7 : Technical specifications of vehicle, including: Vehicle paint code, equipment level and vehicle type

8 : Additional equipment specification

9 : Fabrication number

10 : Interior trim code

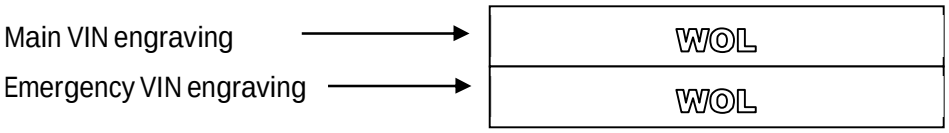
[1]) The VIN plate on your vehicle may differ from the illustration shown.

B) VIN label on windscreen

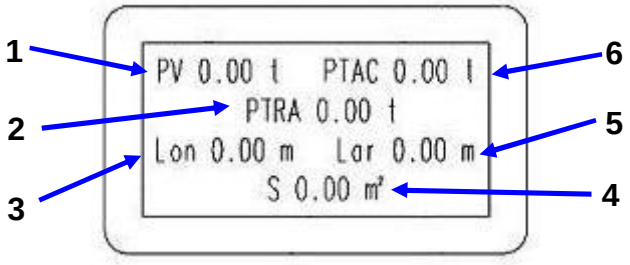
The Vehicle Identification Number is visible through the windscreen.

The VIN is also displayed behind a removable plastic cover on the right hand side door step.

C) VIN MARKING



D) WEIGHTS AND DIMENSIONS LABEL



1 : Kerb weight (kg)

2 : Gross train weight (GTW)

3 : Vehicle length

4 : Vehicle surface area

5 : Vehicle width

6 : Maximum permissible laden weight (GVW)

1.4. CAB SEPARATING PARTITIONS

Panel vans may be fitted with different separating partitions, as standard or as an option depending on the vehicle equipment level.

There is only one height for the H1 type partition, which is solid with or without a window and with or without a hatch.

If a partition is to be built, refer chapter 1.5 “Sliding side door accessibility” for the construction constraints (rail volume and driver's seat travel).

There are two types of solid or glazed partitions.

These solid partitions are not sealed but comply with standard DIN 75410-3 (anti-intrusion) and other country requirements.

The partitions are attached to the body using bolts and two rivets to make them theft-resistant.

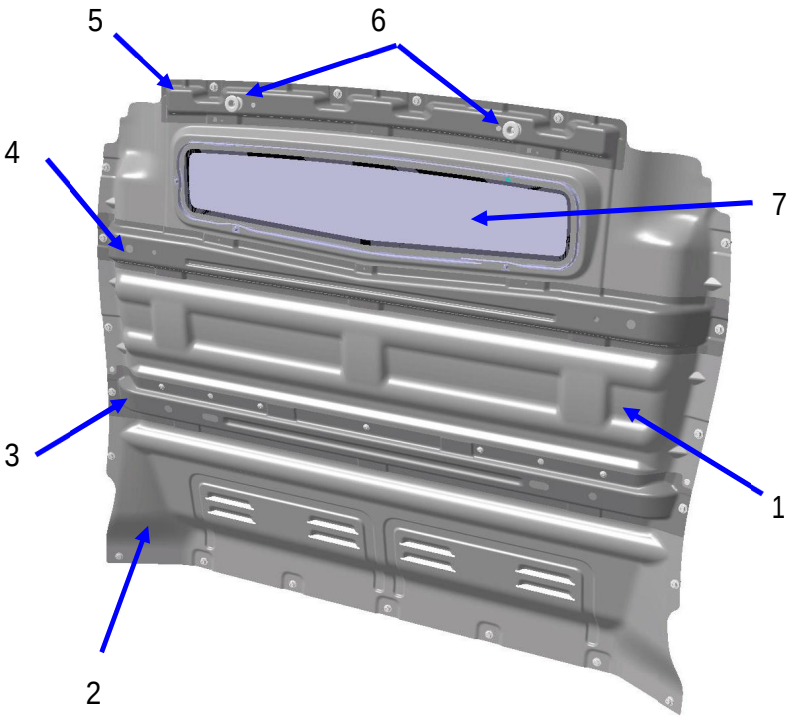
Their rigidity is provided by three welded reinforcements. Two reinforcements welded onto the upper partition and one reinforcement welded onto the lower partition.

These partitions are available with a window (as an option) onto which a protective grille can be fitted. They may be fitted (as an option) with a hatch in the bottom section for loading long objects.

There are two coat hangers located on the loading side of the partition.

GLAZED PARTITION WITHOUT HATCH, LEFT-HAND DRIVE/RIGHT-HAND DRIVE

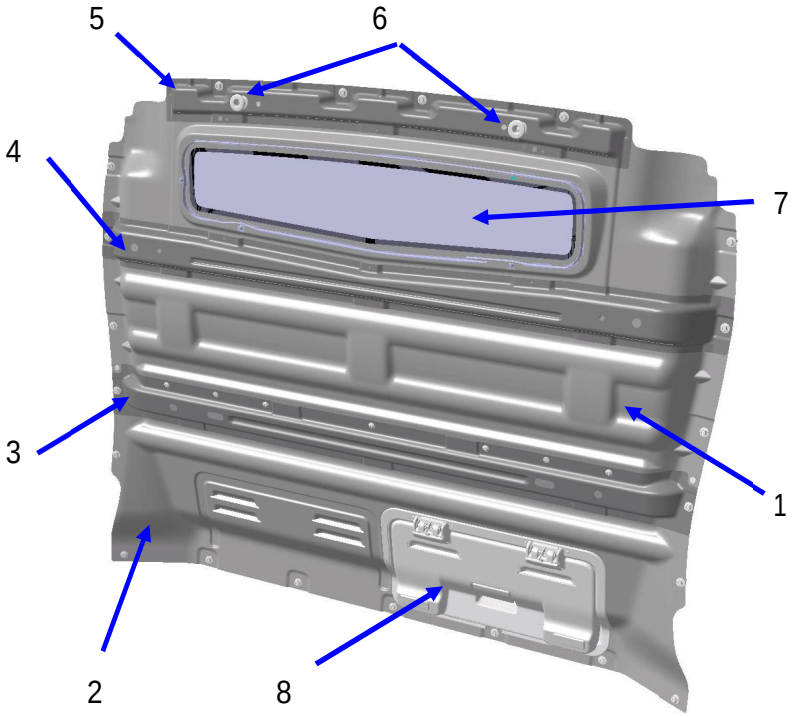
1 : Partition upper section
2 : Partition lower section
3 : Lower reinforcement
4 : Lower reinforcement insert
5 : Upper reinforcement insert
6 : Coat hangers
7 : Window



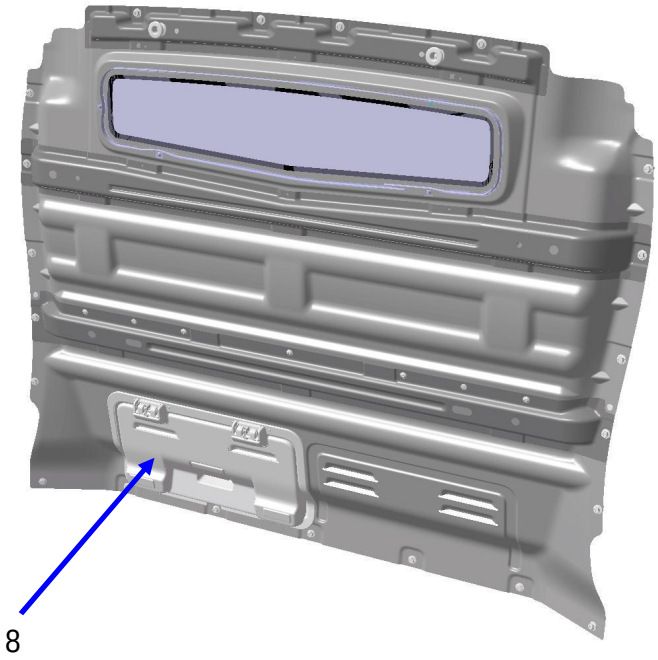
SOLID PARTITION WITHOUT HATCH, LEFT-HAND DRIVE/RIGHT-HAND DRIVE

GLAZED PARTITION WITH HATCH, LEFT-HAND DRIVE

1 : Partition upper section
2 : Partition lower section
3 : Lower reinforcement
4 : Lower reinforcement insert
5 : Upper reinforcement insert
6 : Coat hangers
7 : Window
8 : Hatch for long loads

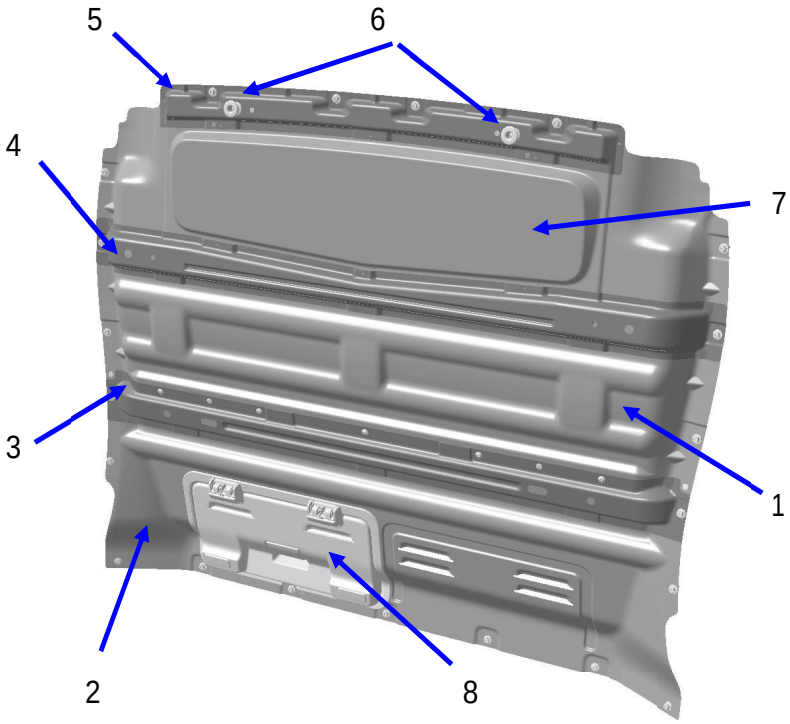


GLAZED PARTITION WITH HATCH, RIGHT-HAND DRIVE

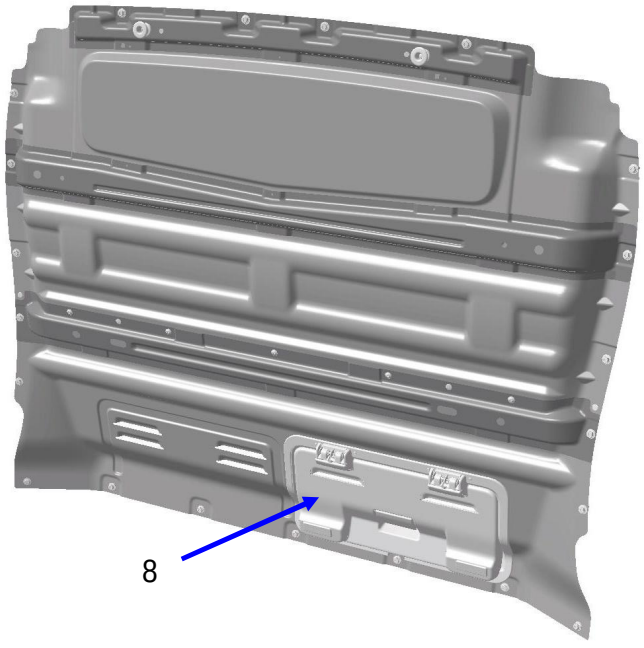


SOLID PARTITION WITH HATCH, RIGHT-HAND DRIVE

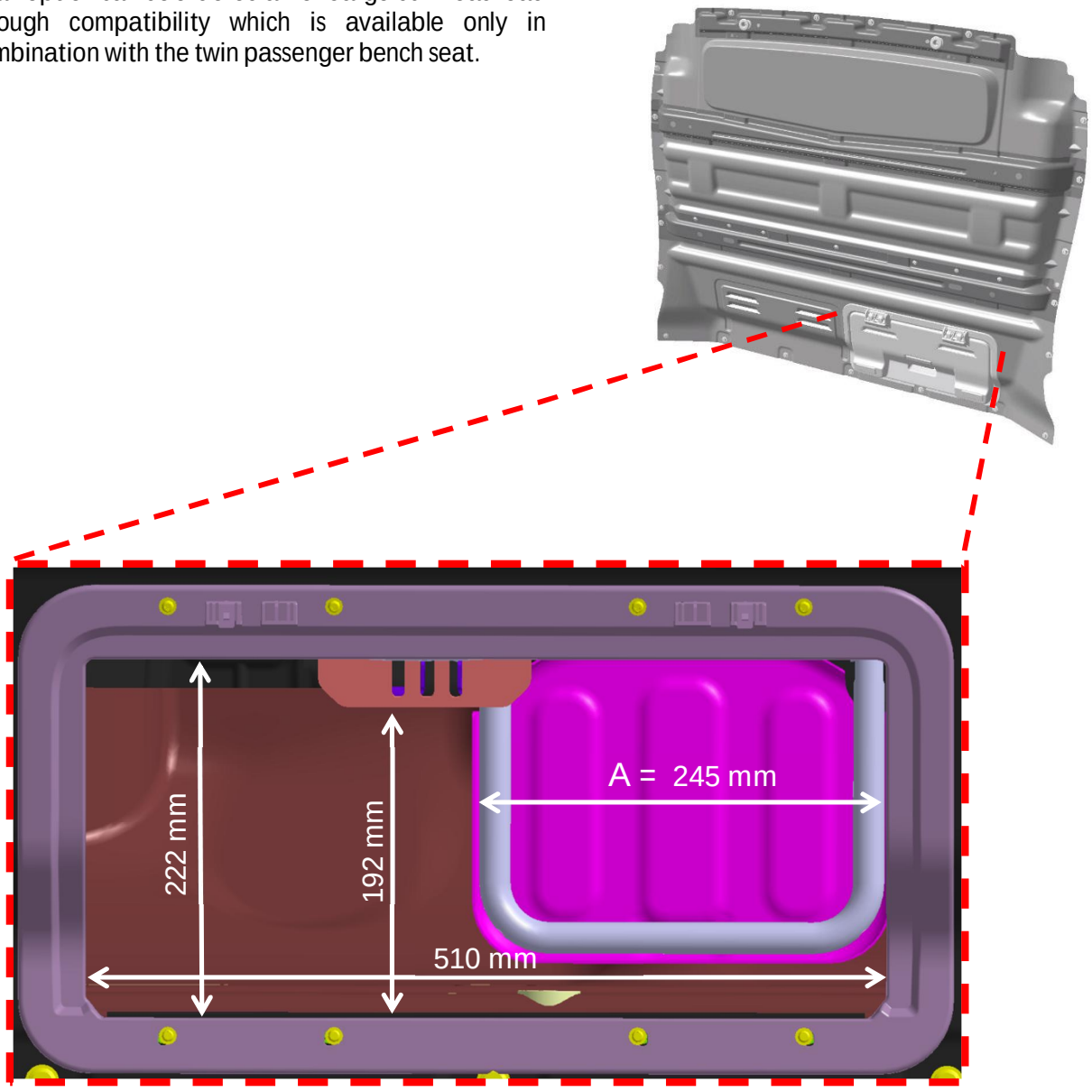
1 : Partition upper section
2 : Partition lower section
3 : Lower reinforcement
4 : Lower reinforcement insert
5 : Upper reinforcement insert
6 : Coat hangers
7 : Without Window
8 : Hatch for long loads



SOLID PARTITION WITH HATCH, LEFT-HAND DRIVE



As an option can be ordered a FlexCargo bulkhead load through compatibility which is available only in combination with the twin passenger bench seat.



Max load length with FlexCargo bulkhead:

- Wheelbase L1 3 m to under bench seat / 3.75m to front footwell
- Wheelbase L2 3.4 m to under bench seat / 4.15m to front footwell

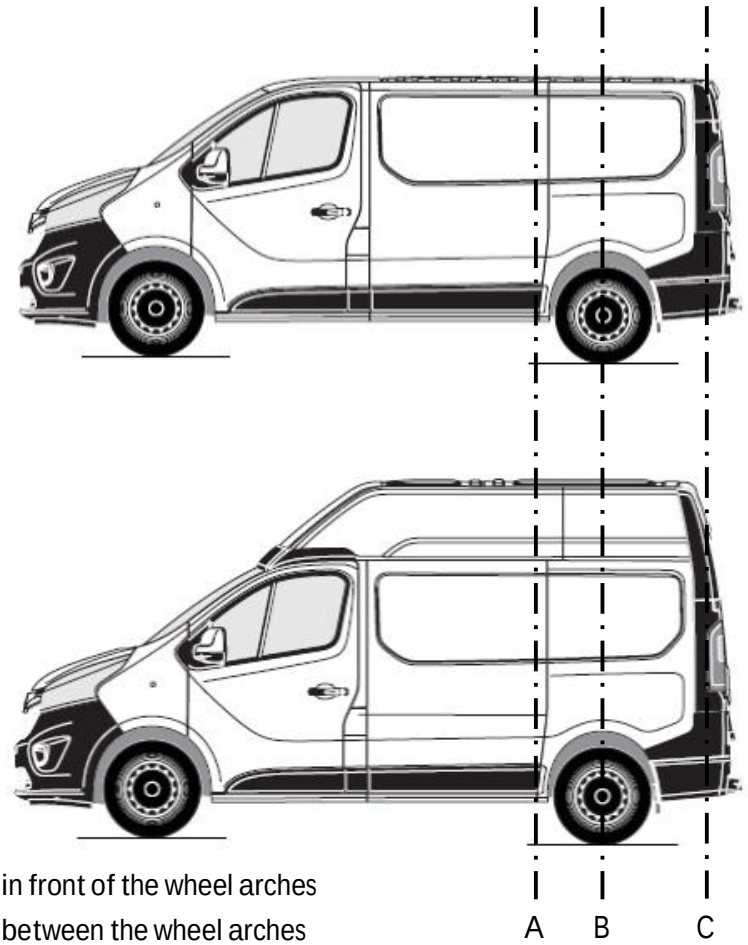
1.5. LOADING AREA / OPENING ELEMENTS ACCESSIBILITY

1.5.1. LOADING AREA SECTIONS

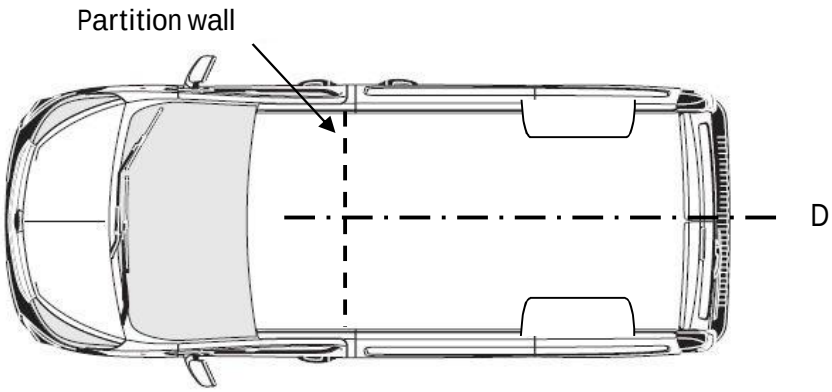
The main dimensions of the loading area (heights H1 and H2) are given in the form of superimposed sections. Details of the wheel arches are also given.

Panel Van H1

Panel Van H2

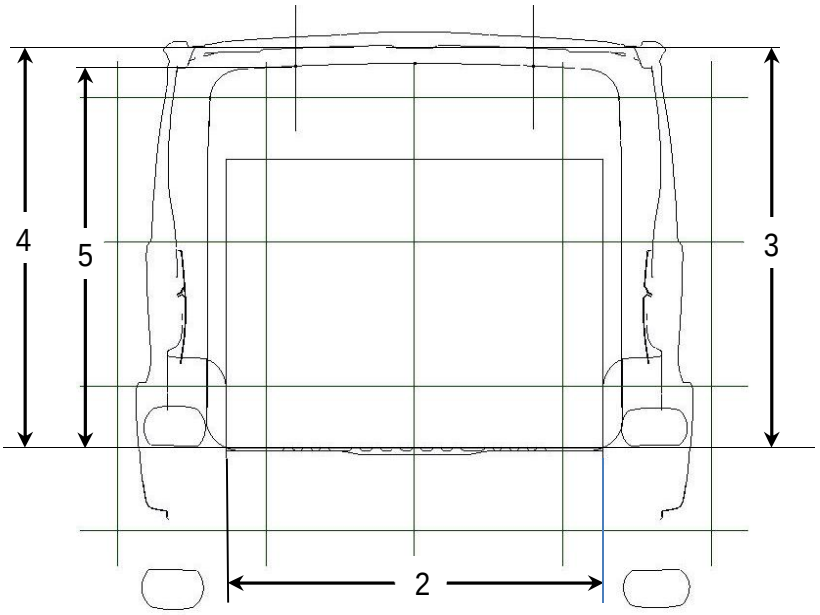


A: Section Y loading area in front of the wheel arches
B: Section Y loading area between the wheel arches
C: Section rear attachment ring
D: Section longitudinal of the loading area

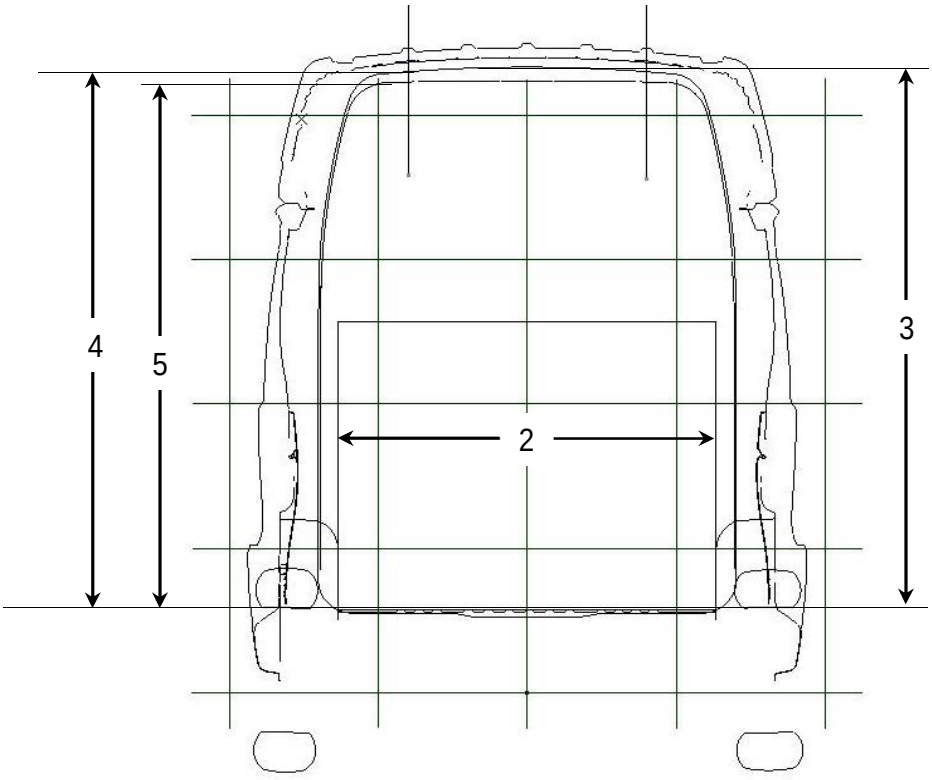


Section A, B and C – Y loading area

Transverse section H1

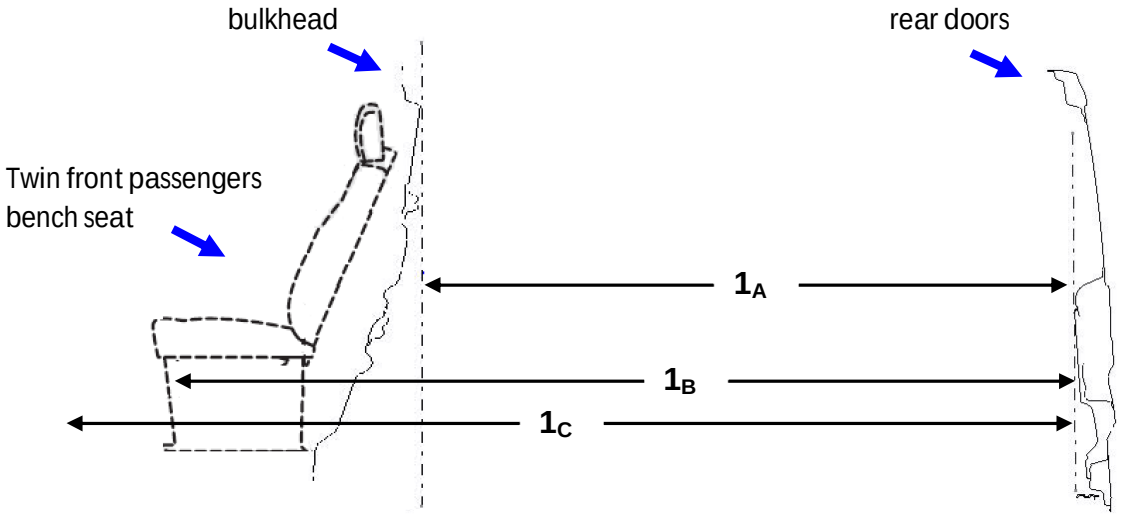


Transverse section H2



Section D – longitudinal loading area

Dimension 1_B and 1_C only together with load-through hatches in the bulkhead (FlexCargo) and twin passengers bench seat.

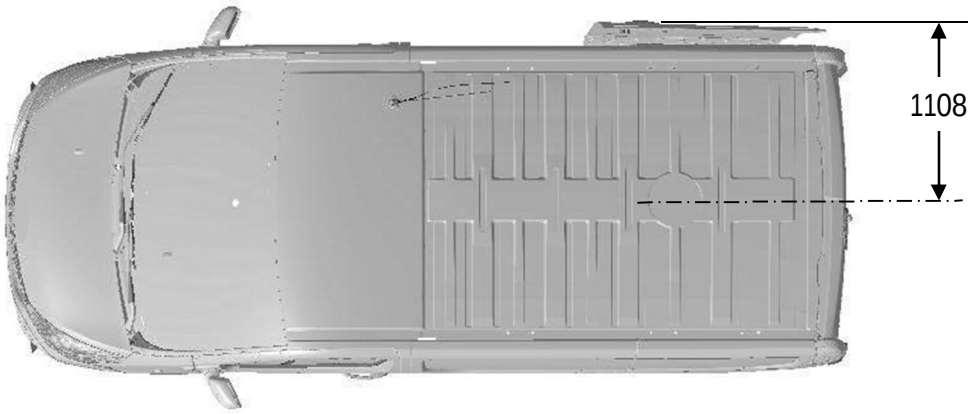


Vehicle Type	Item	Dimension details	Position dimensions	Dimensions (mm)
USEFUL LOADING LENGTH				
L1	1_A	Partition/rear doors	Y+/- 400	2207
L2				2607
L1	1_B	Under bench seat to rear doors (limited space, see also Chapter 1.4)		3000
L2				3400
L1	1_C	Front footwell to rear doors (limited space, see also Chapter 1.4)		3750
L2				4150
USEFUL LOADING WIDTH				
All	2	Between wheel arches	Rear wheel shaft	1268
USEFUL LOADING HEIGHT				
H1	3	Floor panel / Roof cross member	Cross member / Y0	1331
H2				1828
H1	4	Floor panel / Roof cross member	Cross member / Y+/- 400	1387
H2				1898
H1	5	Loading entry	Y+/- 400	1314
H2				1847

1.5.2. ACCESSIBILITY BY OPENING

Access via the sliding side door, its clearance and its position along the side of the body are given as overall dimensions.

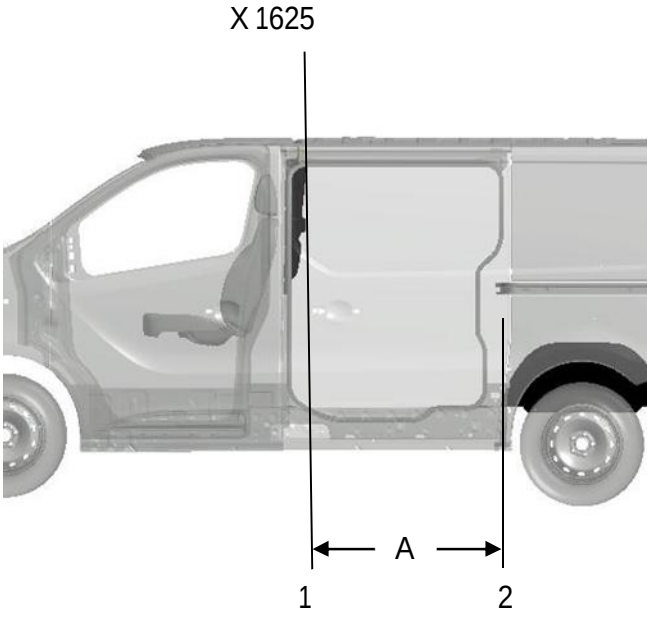
Side door dimensions



Where a partition is fitted, the diagram below defines the longitudinal travel of the driver's seat. It should be noted that this partition should comply with legislation in the country where the vehicle is marketed.
It is highly recommended, in case of attack or impact from the rear loading area, to add protection to the partition glazed area.

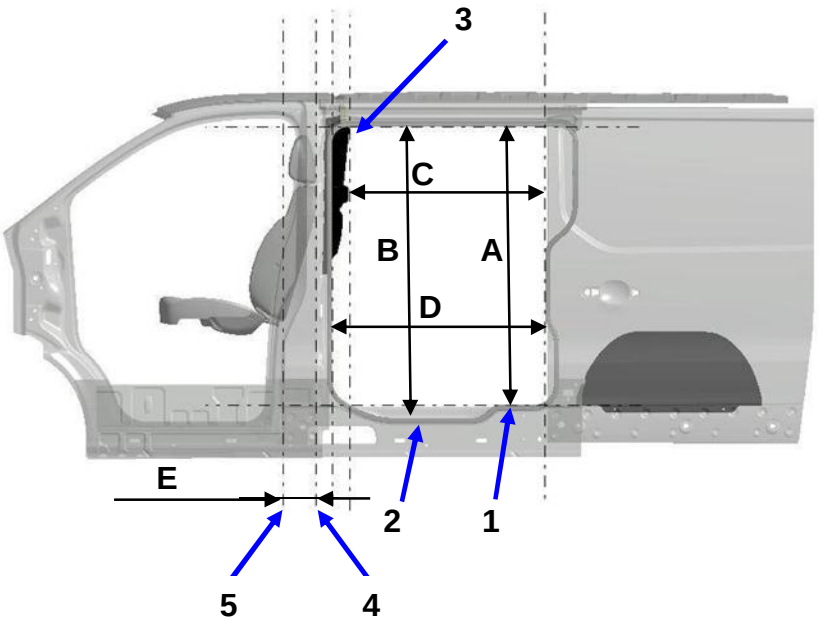
"Piano" dimension

Minimum distance between cab partition (1) and the front of the rear wheel arch (2).



Wheelbase (mm)	A (mm)
L1	1073
L2	1473

Sliding door opening



Item	Detail	(mm)
A :	Useful height of sliding side door entry	1284
B :	Useful height of sliding side door entry with step	1340
C :	Useful width of sliding side door entry	907
D :	Useful width of sliding side door entry at 1100 mm / Floor panel	988
E :	Maximum offset of seat backrest/Seat rear mounting	152

1 :	Loading floor
2 :	Door entry with step
3 :	Solid partition
4 :	Position of seat backrest as far back as possible
5 :	Rear seat mounting

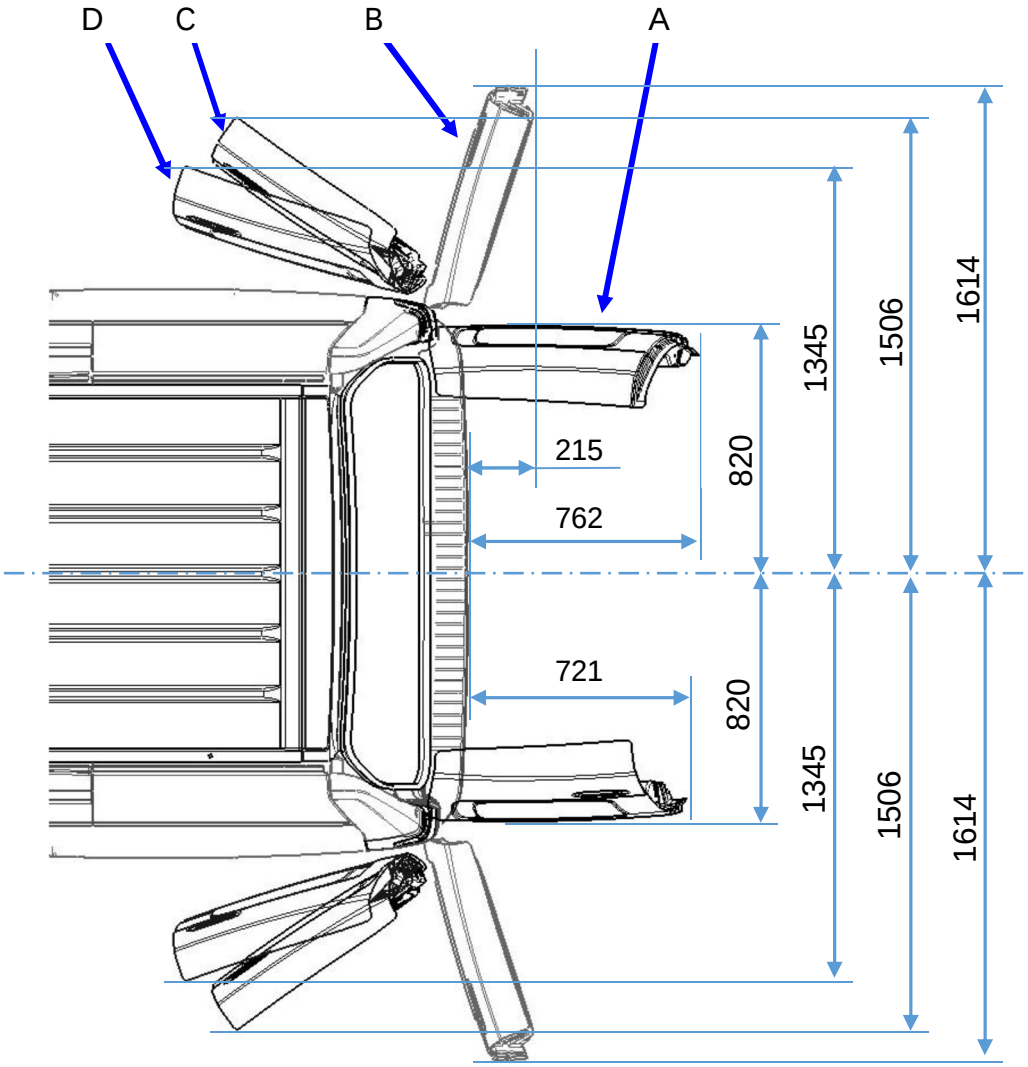
Swivelling range and dimensions of rear doors

The Swivelling range and position along the side of the body are given as overall dimensions and at different heights.

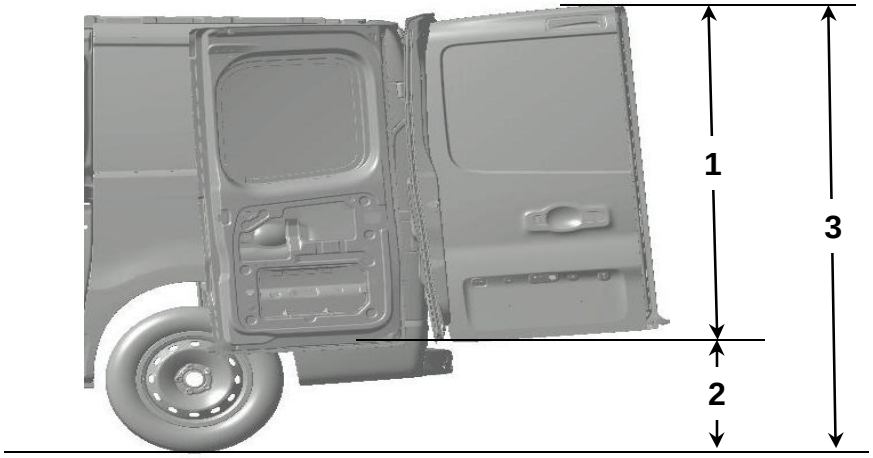
There are four opening angles for the hinged doors:

- ✓ Standard: The opening angle of the doors extends from 85° (A) to 160° (B).
- ✓ Option: The opening angle is
  255° (D) for the door facing the sliding door and
  233° (C) on the side of the sliding door ➔ *ON WHEELBASE L2 ONLY*

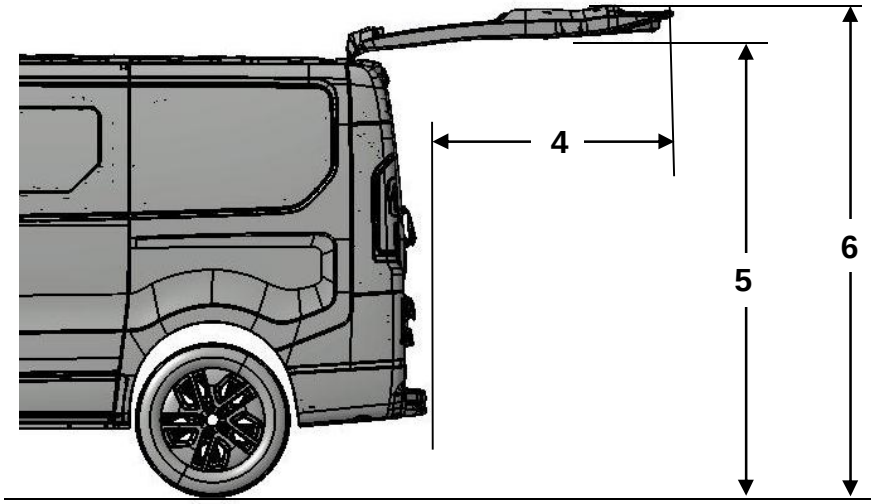
H2 rear hinged doors



Dimensions of rear doors

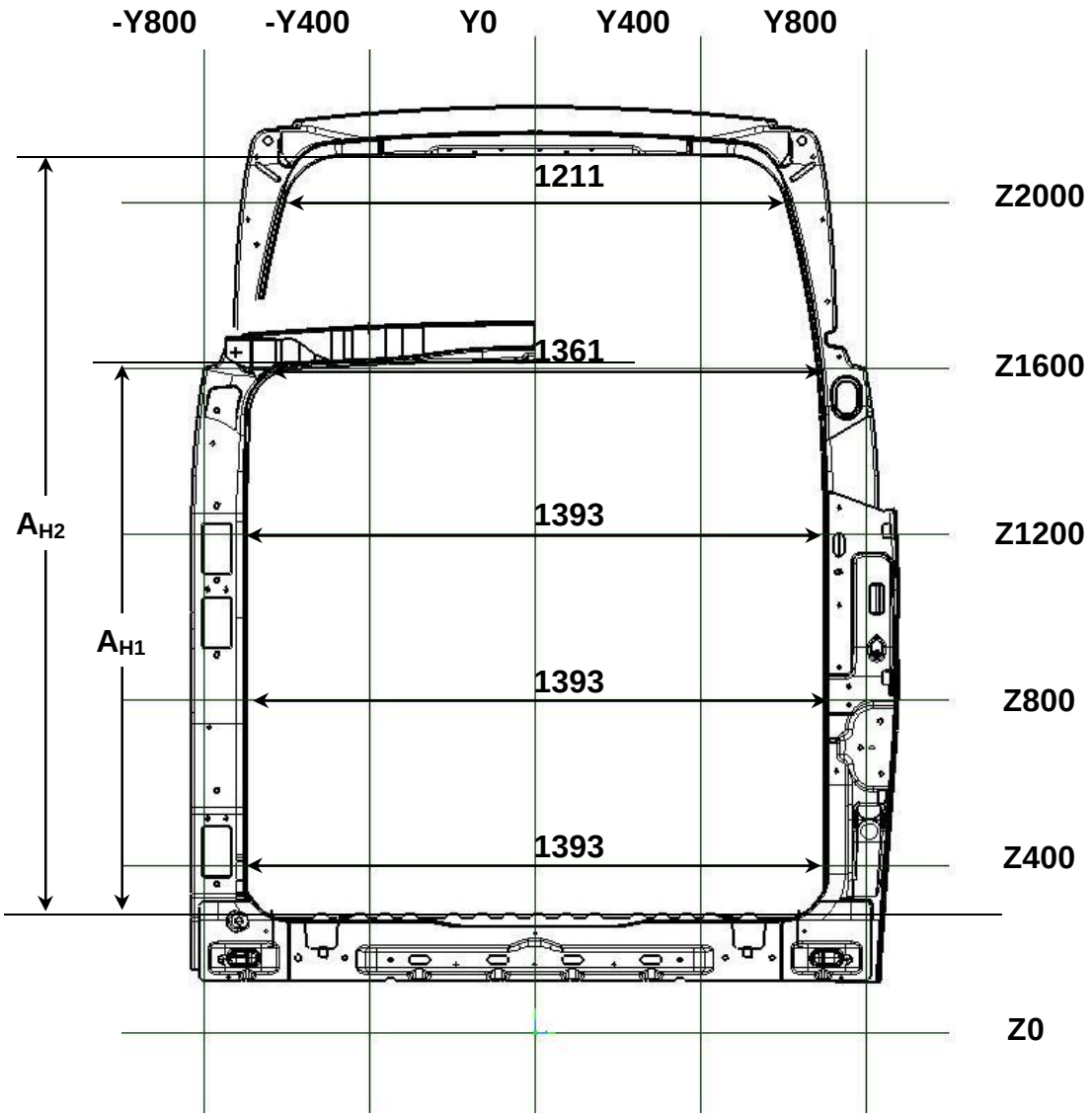


Tailgate dimensions



			L1H1		L1H2	L2H1	L2H2
	Payload	[kg]	1000	1200			
	Maximum permissible laden weight (GVW)	[kg]	2740	2900	2920	2970	2980
1 :	Door height	[mm]	1536		2163	1536	2163
2 :	Min. height at GVW	[mm]	373			431	
3 :	Max. height at kerb weight	[mm]	2053		2568	2046	2568
4 :	Tailgate exterior offset	[mm]	1130		--	1130	--
5 :	Min. height at GVW	[mm]	2093		--	2088	--
6 :	Max. height at kerb weight	[mm]	2182		--	2180	--

Section C – Access via the rear attachment ring from the origin of the reference guide



	Panel Van H1	Panel Van H2
A :	1314	1847

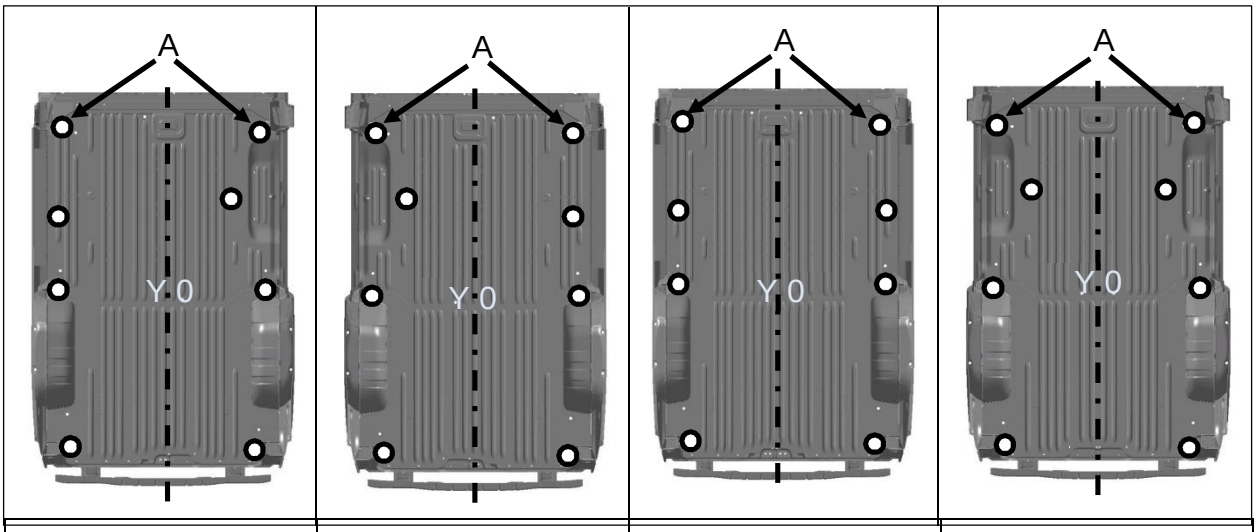
1.6 LOAD-SECURING POINTS / ANCHORAGE POINTS IN LOADING AREA

1.6.1. LOAD-SECURING POINTS ON FLOOR

On the panel van version, the number of load-securing points varies:

- Eight tie-down points on the floor panel and bottom area of the body side for van lengths 1 (L1). See points A to D, in area 1.
- Ten tie-down points on the floor panel and bottom area of the body side for van lengths 2 (L2). See points A to F, in area 1.
- As an option, it is possible to have 10 tie-down points on the body sides regardless of the vehicle length. See points J to N, in area 2.

Their positioning is symmetrical to the body axis (Y = 0). Only the tie-down point between the B-pillar and C-pillar differs depending on whether or not there is a sliding side door (SSD). Their distribution on version L1 is as follows:



Version with SSD, right-hand drive	Version with SSD, left-hand drive	Version without SSD	Version with 2 SSD

On the combi version, there are six tie-down points on the floor panel on L1 wheelbase and eight tie-down points on L2 wheelbase.

The rings are attached to the body using M8x125 mounting bolts. The tightening torque is 21 Nm.

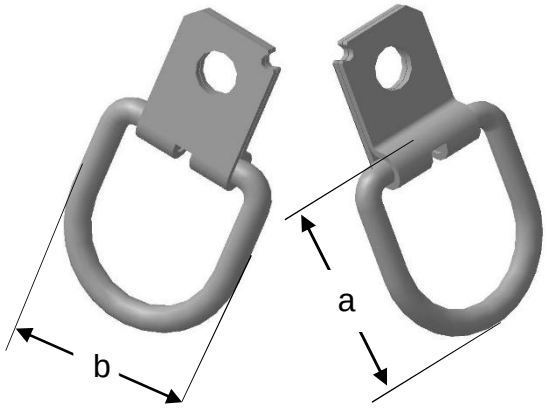
These tie-down points comply with the requirements of standard DIN 75410. Any conversion of the assembly is likely to affect this compliance.

Note: *A panel van length L2 = a panel van length L1+400 mm.*
A Combi still has at least one sliding side door on the right-hand side.
Tie-down point (A) will serve as the reference for the location of the other points.

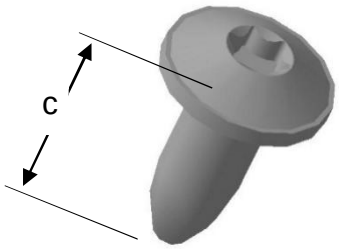
Details of attachments and tie-down points

	Bottom area (1)	Top area (2)
Ring	Part No. 93861156	
Bolts + Washer	Part No. 93451984 + 93455552 Vis RLX M8x125-26.5	
Resistance	500 daN	50 daN
a (mm)	43	
b (mm)	40	
c (mm)	26.5	

RING
Part No. 93861156

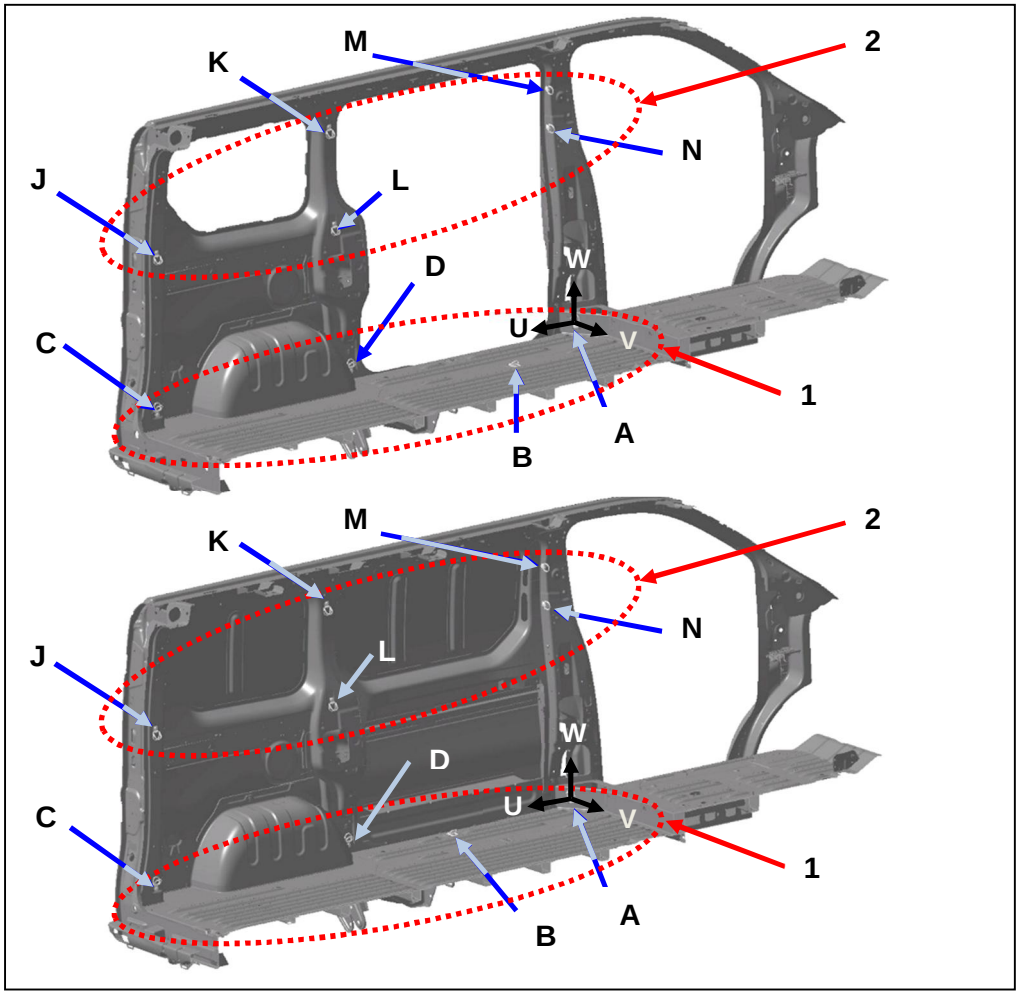


BOLT
Part No. 93451984



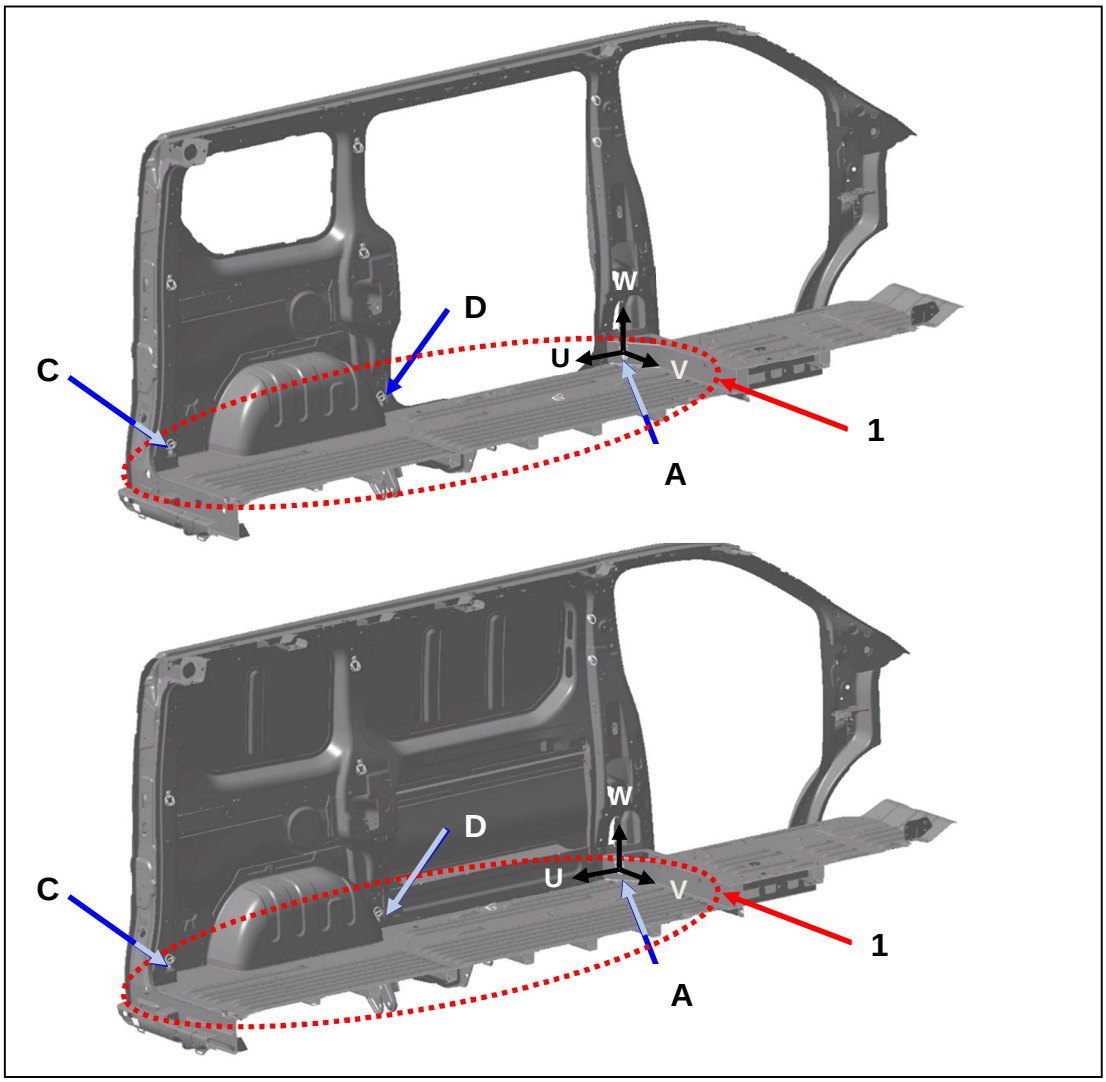
1.6.2. LOAD-SECURING POINTS AT SIDE PANELS

Panel van version L1 with and without sliding side door



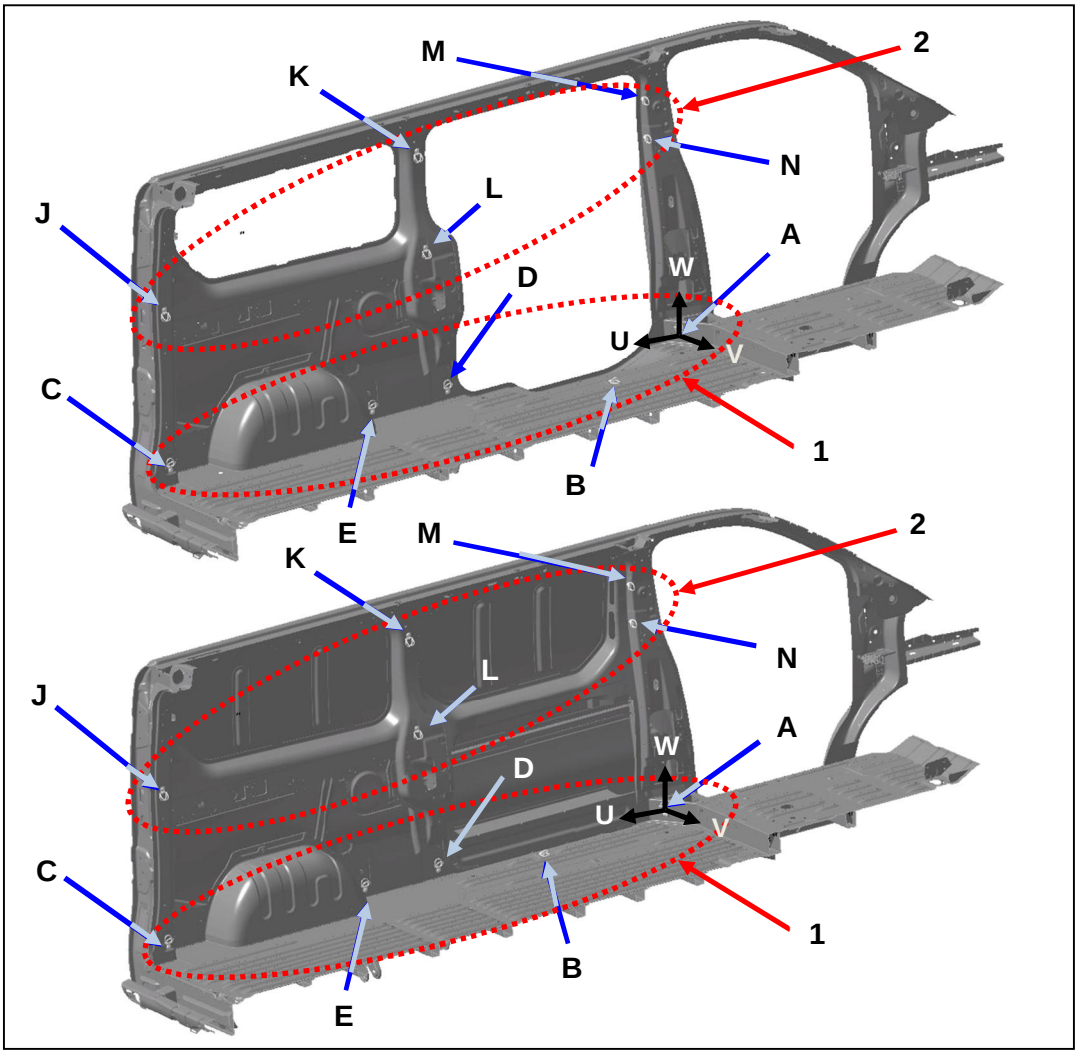
	Pts	U	V	W	Observation
1	A	0	0	0	Version with/without sliding side door
	B	532.8	250	40	Version with sliding side door
		675.8	-11	40	Version without sliding side door
	C	2353.8	56.5	30	Version with/without sliding side door
	D	1197.2	-70.5	-4	Version with/without sliding side door
2	J	2326.7	63.5	789	Version with/without sliding side door
	K	1272.8	-55.8	1162.8	Version with/without sliding side door
	L	1279.1	-45.3	708.6	Version with/without sliding side door
	M	72.6	-44.8	1121.2	Version with/without sliding side door
	N	71.6	-53.8	937	Version with/without sliding side door

Combi L1 version with 1 or 2 sliding side doors



	Pts	U	V	W	Observation
1	A	0	0	0	Version with/without sliding side door
	C	2353.8	56.5	30	Version with/without sliding side door
	D	1197.2	-70.5	-4	Version with/without sliding side door

Panel van version L2 with and without sliding side door



	Pts	U	V	W	Observation
1	A	0	0	0	Version with/without sliding side door
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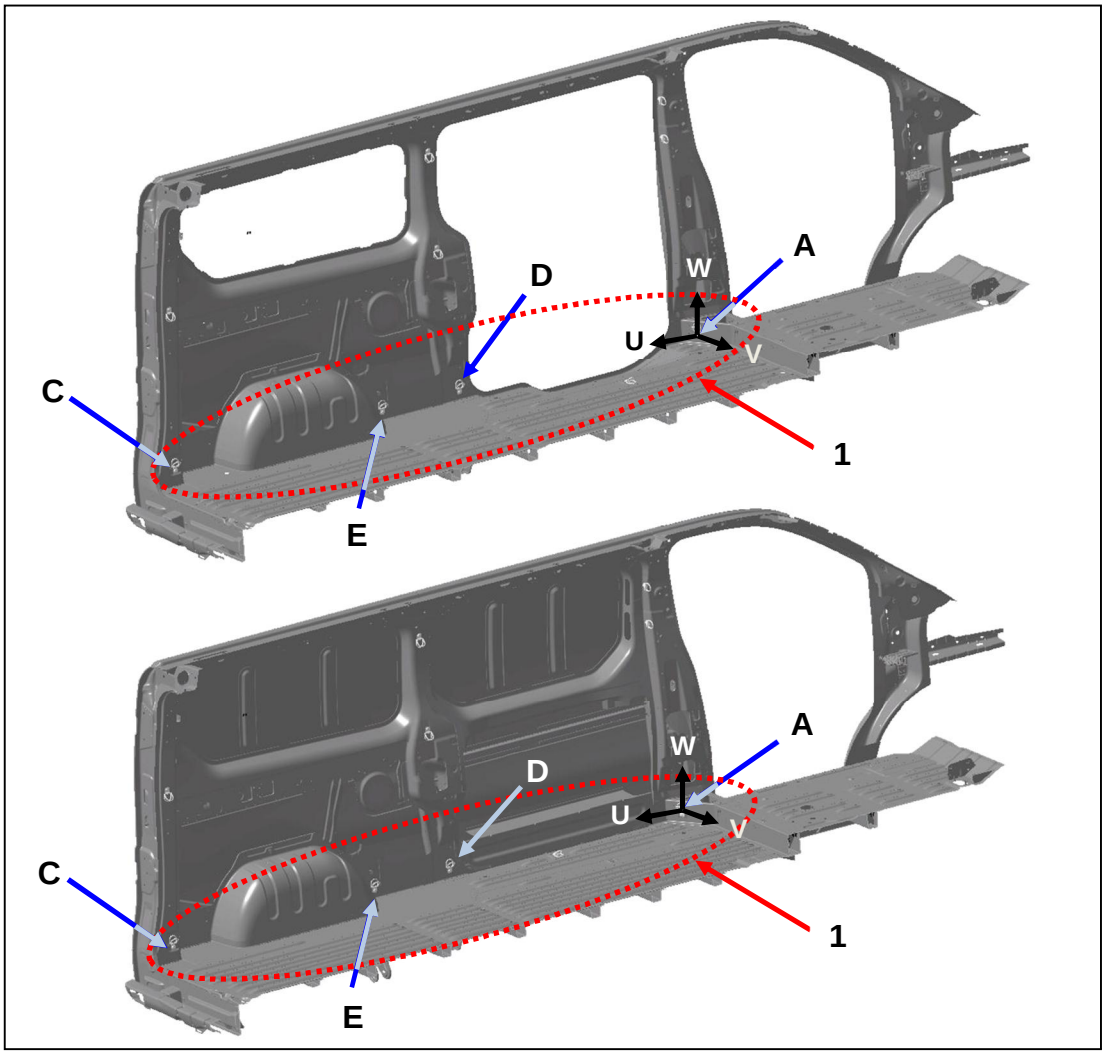
	C	2753.8	56.5	30	Version with/without sliding side door
	D	1197.2	-70.5	-4	Version with/without sliding side door
	E	1597.2	-70.5	-4	Version with/without sliding side door
2	J	2726.7	63.5	789	Version with/without sliding side door
	K	1272.8	-55.8	1162.8	Version with/without sliding side door
	L	1279.1	-45.3	708.6	Version with/without sliding side door
	M	72.6	-44.8	1121.2	Version with/without sliding side door
	N	71.6	-53.8	937	Version with/without sliding side door

Combi version L2 with and without sliding side door

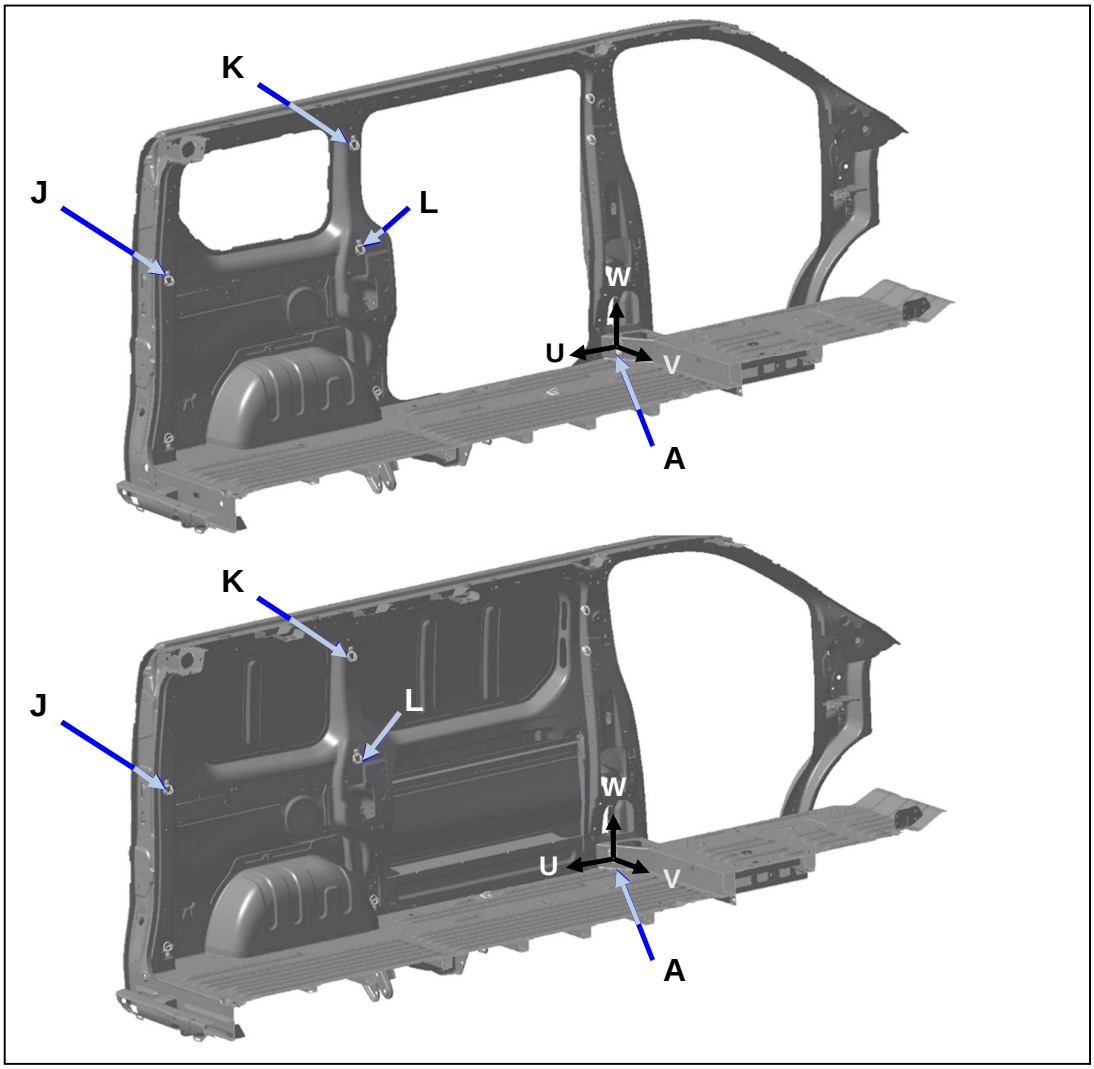


	Pts	U	V	W	Observation
1	A	0	0	0	Version with/without sliding side door
	C	2753.8	56.5	30	Version with/without sliding side door
	D	1197.2	-70.5	-4	Version with/without sliding side door
	E	1597.2	-70.5	-4	Version with/without sliding side door

1.6.3. ANCHORAGE POINT IN LOADING AREA

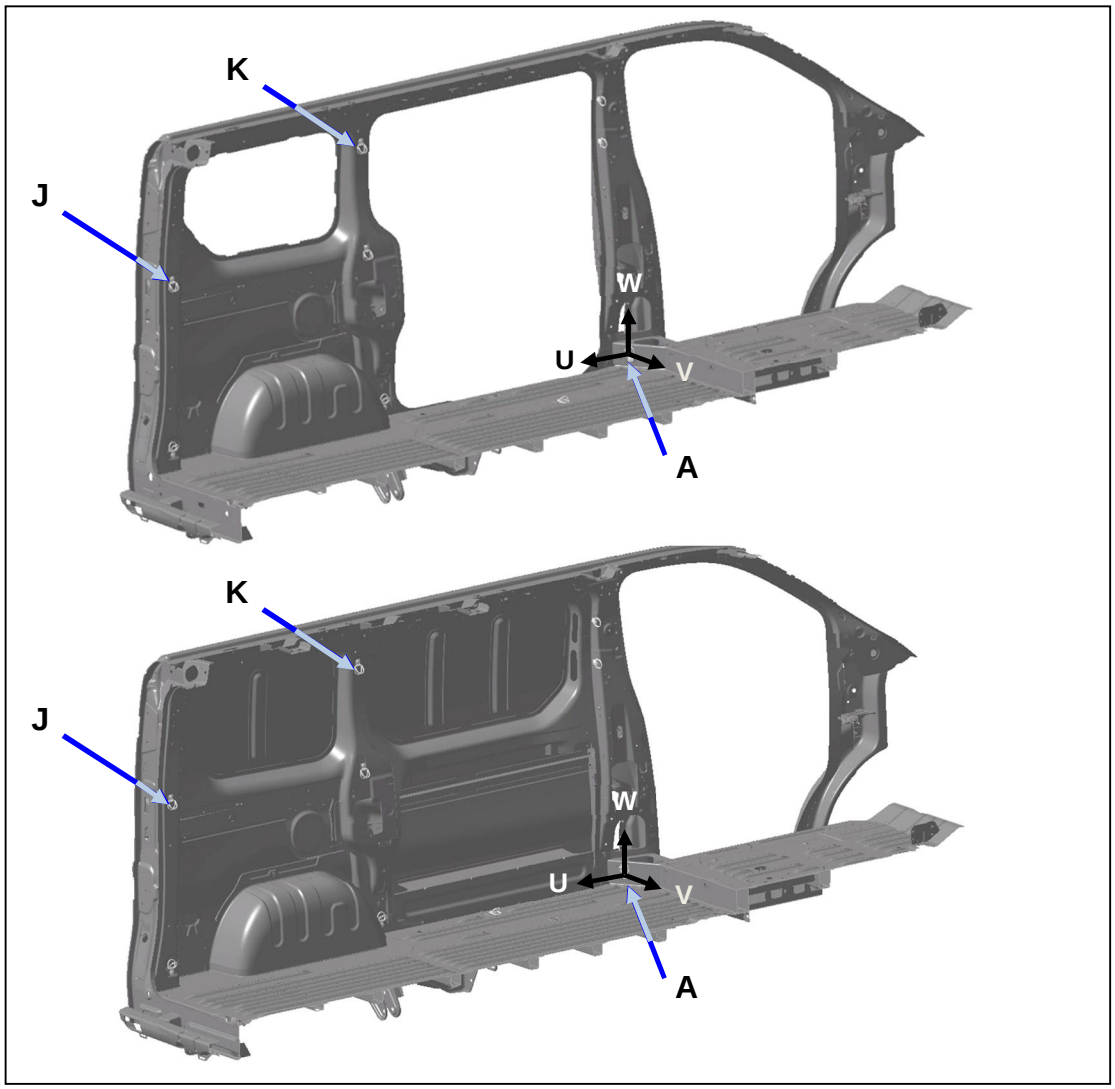
It is possible to use the welded nuts (M8x125) originally provided to attach the optional tie-down points. There are six of these (3 per side) on the panel van and four (2 per side) on the Combi. The maximum force to be applied is 50 daN

Panel van version L1 with and without sliding side door



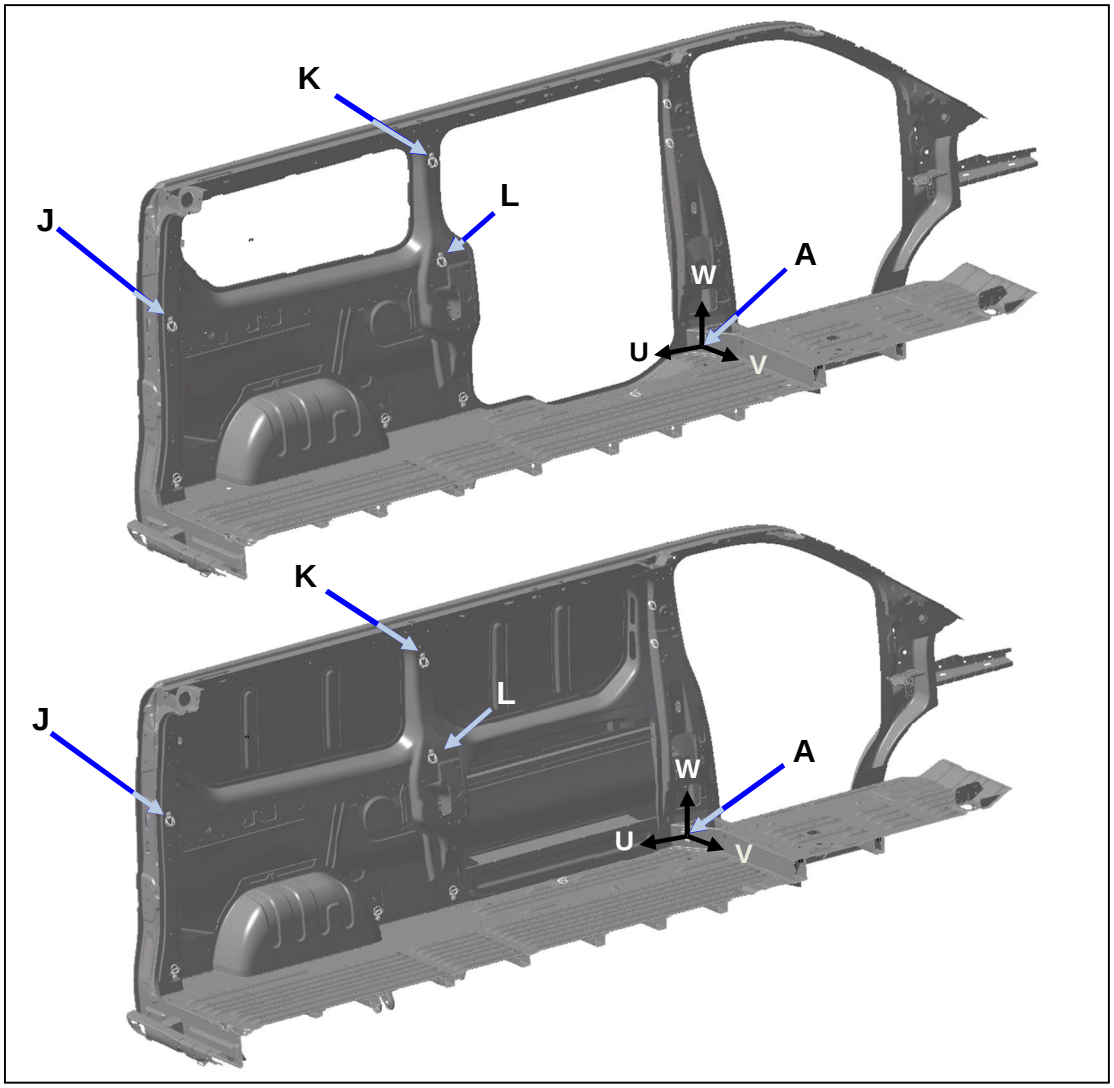
Pts	U	V	W	Observation
A	0	0	0	Reference guide
J	2326.7	63.5	789	Version with/without sliding side door
K	1272.8	-55.8	1162.8	Version with/without sliding side door
L	1279.1	-45.3	708.6	Version with/without sliding side door

Combi version L1 with and without sliding side door



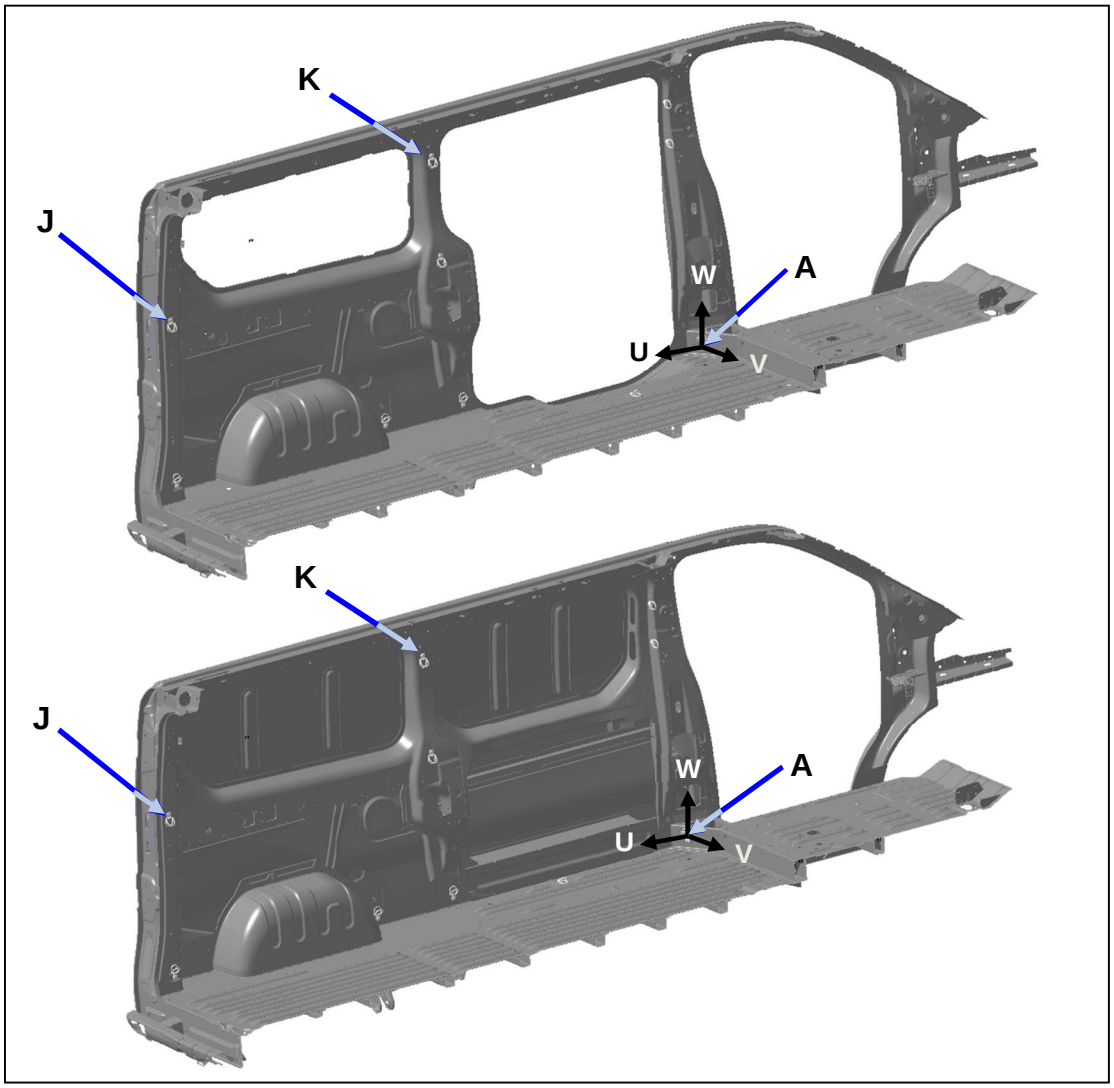
Pts	U	V	W	Observation
A	0	0	0	Reference guide
J	2326.7	63.5	789	Version with/without sliding side door
K	1272.8	-55.8	1162.8	Version with/without sliding side door

Panel van version L2 with and without sliding side door (SSD)



Pts	U	V	W	Observation
A	0	0	0	Reference guide
J	2726.7	63.5	789	Version with/without sliding side door
K	1272.8	-55.8	1162.8	Version with/without sliding side door
L	1279.1	-45.3	708.6	Version with/without sliding side door

Combi version L2 with and without sliding side door



Pts	U	V	W	Observation
A	0	0	0	Reference guide
J	2726.7	63.5	789	Version with/without sliding side door
K	1272.8	-55.8	1162.8	Version with/without sliding side door

1.7. ROOF RACK AND ROOF BARS / LADDERS ON HINGED DOORS

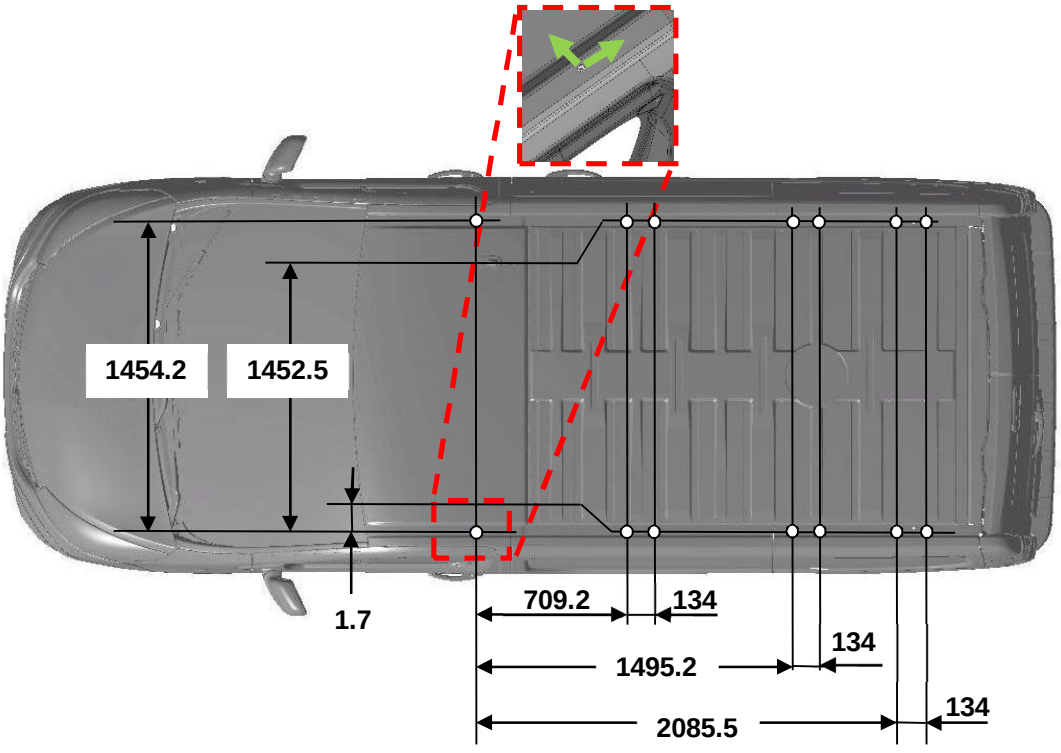
For safety reasons and to avoid damage to the roof, the vehicle approved roof rack system is recommended. Follow the installation instructions and remove the roof rack when not in use. Driving with a roof load increases the sensitivity of the vehicle to cross-winds and has a detrimental effect on vehicle handling due to the vehicle's higher centre of gravity. Distribute the load evenly and secure it properly with retaining straps. Adjust the tyre pressure and vehicle speed according to the load conditions.

N.B: For passenger transport vehicles fitted with emergency exits in the roof, it is forbidden to block or even partially obstruct these openings when installing roof racks or roof bars.

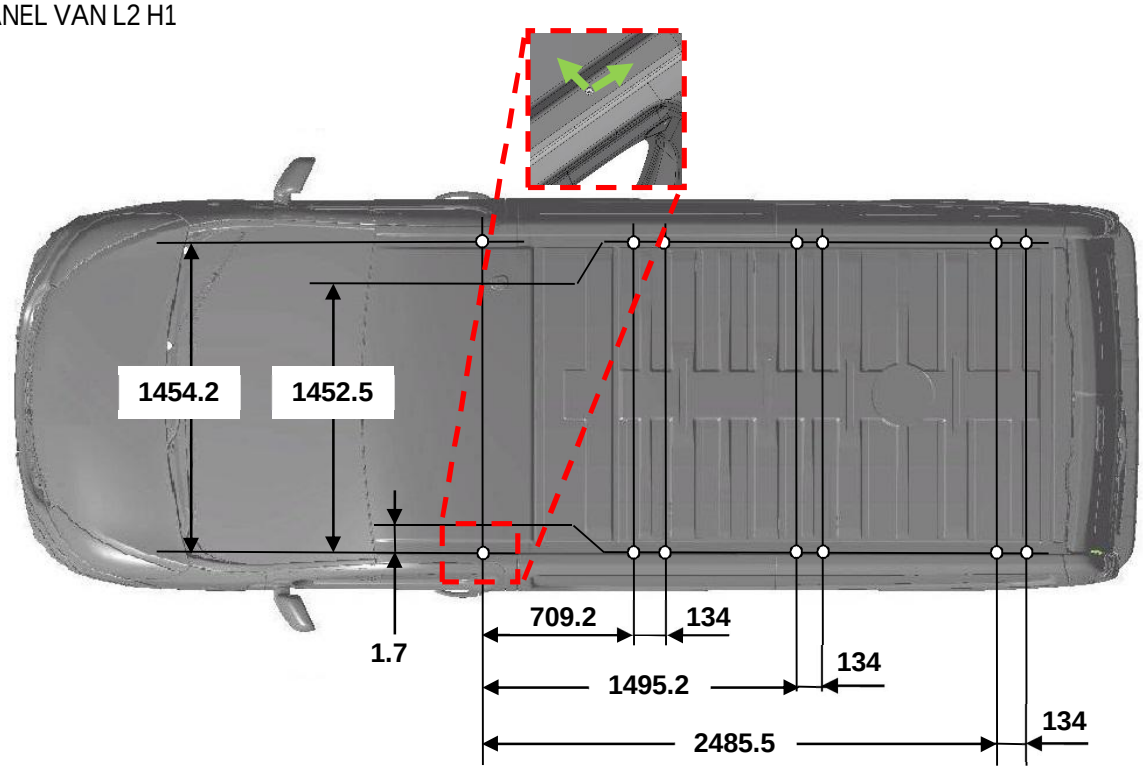
1.7.1. ROOF RACK AND ROOF BARS

PANEL VAN L1 H1

Mounting: 14 x M6 nuts welded or crimped onto the roof panel.

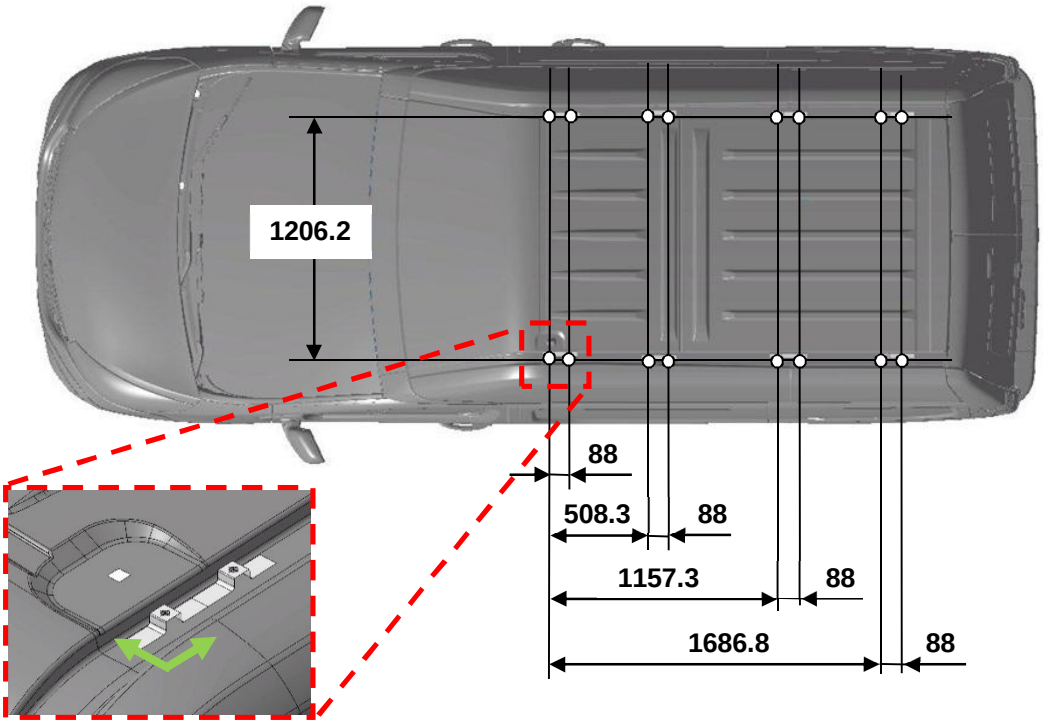


PANEL VAN L2 H1

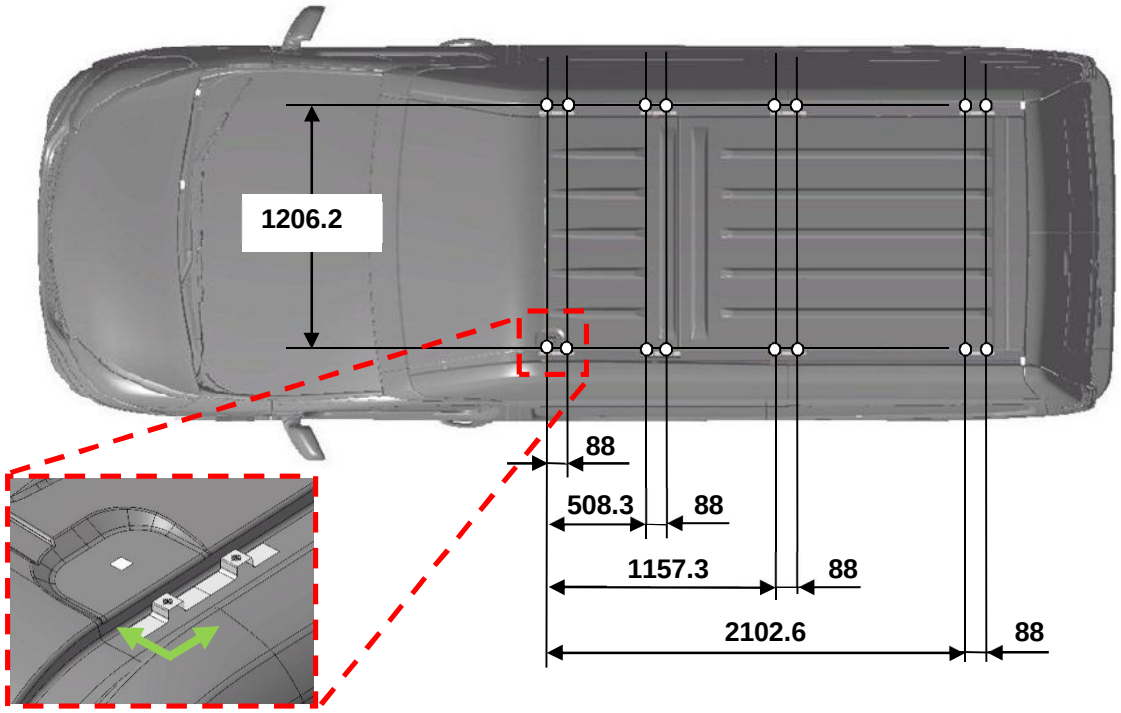


PANEL VAN L1 H2

Mounting: 16 x M6 panel nuts to slide into 8 x body brackets welded onto the roof panel.



PANEL VAN L2 H2



Summary of roof racks

- The maximum permissible weight including roof rack.
  - on the H1 roof is 200 kg.
  - on the H2 roof is 150 kg.

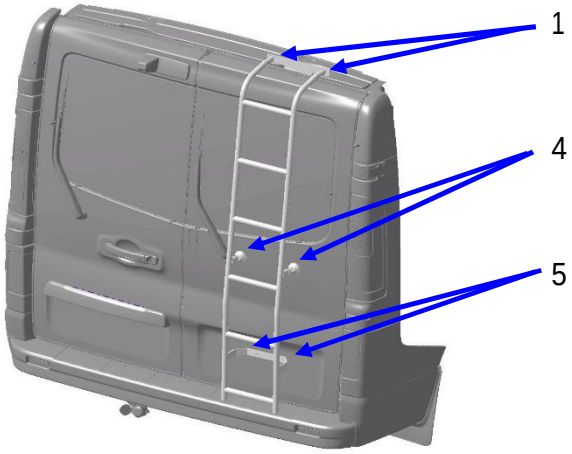
Summary of roof bars

- The maximum permissible weight per bar on the roof is 50 kg.
- The maximum permissible weight including roof bar.
  - on the H1 roof is 200 kg.
  - on the H2 roof is 150 kg.

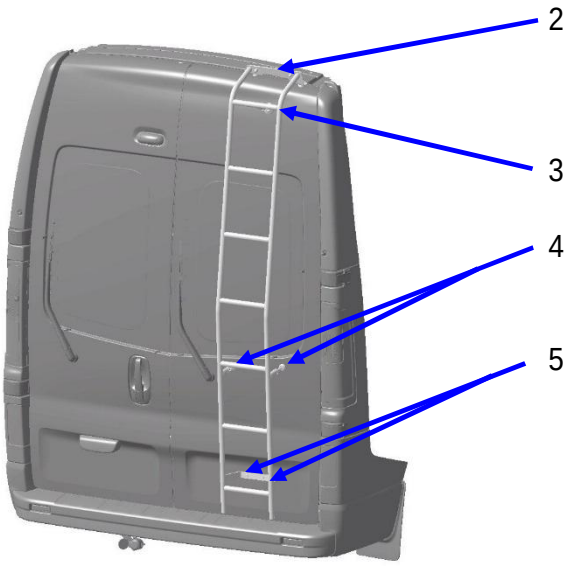
1.7.2. LADDER ON HINGED DOOR

A ladder for access to the roof can be fitted to the roof rack.

Version H1



Version H2



1:	2 x M8 upper mountings
2:	1 x upper hook
3:	1 x upper support
4:	2 x lower supports
5:	2 x M8 lower mountings

1.8. TOW BAR

The vehicles are capable of towing a 750 kg unbraked trailer and a 2000 kg braked trailer.
The mounting positions are shown below. These mounting points must be used.

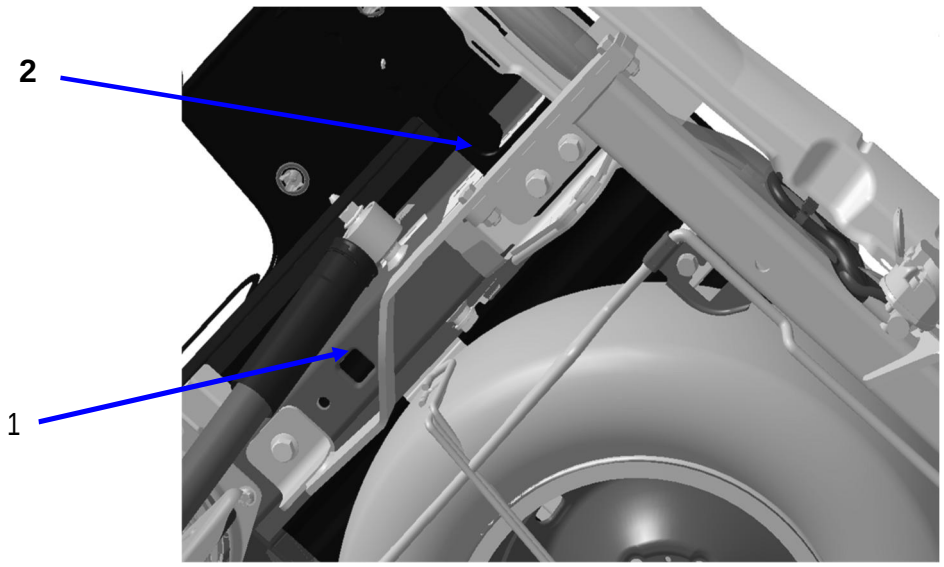
A tow bar is available as an option for all versions. A tow bar can also be obtained as an accessory through the OPEL / VAUXHALL sales network. These tow bars have the advantage of the TSA function (trailer stability assistance). Any other tow bar will not benefit from this.

The wiring diagram for these tow bars is given by way of information in the "Electrics" section. The “VR2” option (tow bar) requires the AAM unit to be fitted under the "KC6" criterion.

The maximum nose weight is 80 kg (permissible vertical force on the towing ball/towing system).

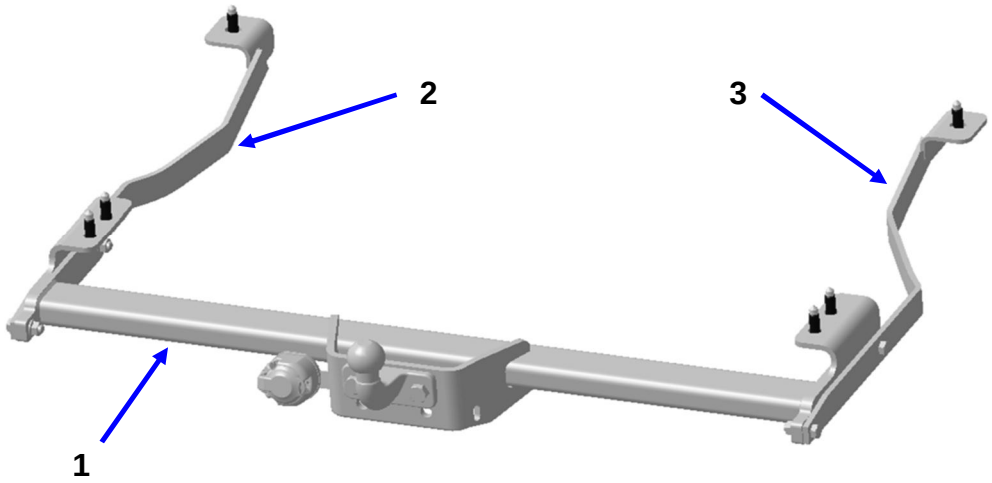
The fitted tow bar must comply with Standard 94/20

Tow bar mountings on the vehicle



1 : Rear side member
2 : Towing ring reinforcement

Tow bar assembly available as an option



1 : Tow bar
2 : Left-hand strut
3 : Right-hand strut

Electrical currents available for the rear lights

Important: *Before carrying out servicing, see § 4.11.1 REAR LIGHTS INFORMATION*

- Vehicles with towing socket: each of these connections must be used to control a single relay (no power available).
- Vehicles without towing socket: to each of the connections it is possible to connect a consumer unit whose power is equal to the bulbs on the hitched device, i.e.:

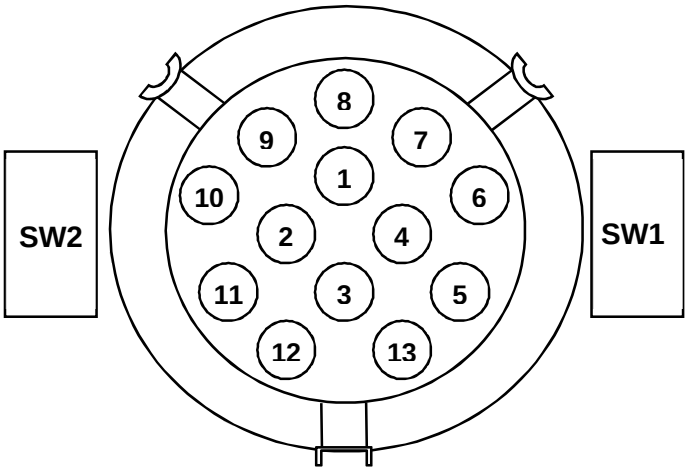
➢ Left-hand position light connection:	1 x 5 W consumer
➢ Right-hand position light:	1 x 5 W consumer
➢ Brake light connection:	2 x 21 W (or 1 x 42 W) consumers
➢ Reversing light connection:	1 x 21 W consumer
➢ Left-hand direction indicator	1 x 21 W consumer
➢ Right-hand direction indicator	1 x 21 W consumer
➢ Fog light:	1 x 21 W consumer

Tow bar socket specifications

The tow bar electrical socket, supplied as first-fit is a 13-pin socket (see below). This plug is also available in after-sales.

Two electrical switches are built into the socket. These are activated when opening and closing the cover of the tow bar socket.

ASSIGNMENT OF CONNECTOR TRACKS



Way N°	Assignment
Way 1	Left-hand direction indicator
Way 2	Rear fog light
Way 3	Earth (Max. 10 A)
Way 4	Right-hand direction indicator
Way 5	Right-hand position light
Way 6	Brake lights
Way 7	Left-hand position light
Way 8	Reversing light
Way 9	Not wired
Way 10	Not wired
Way 11	Not wired
Way 12	Not wired
Way 13	Not wired (Max. 10 A earth)
SW1	Trailer present
SW2	Rear fog light disconnection

PLATFORM CAB TOW BAR

The electrical characteristics for after-market fitting will be communicated at a later date.

1.9. TYRES / TURNING CIRCLE DIAMETER / SPARE WHEEL

1.9.1. TYRES

ESP on the basic vehicle is not compatible with a modification to the tyre sizes. (see chapter 3 - VEHICLE CONVERSION LIMITS AND CALCULATIONS)

The list of recommended tyres is given in the following table:

Vehicle	Description	Tire size	Load index	Speed index	Comment
X82 – L1H1 & X82 – L2H1	MICHELIN	215/65 R16	106/104	T	STEEL rim
	GOODYEAR	205/65 R16 215/65 R16	107/105 106/104	T T	
	CONTINENTAL	205/65 R16 215/65 R16	107/105 109/107	T R	
	GOODYEAR *(CARGO VECTOR 2)*	205/65 R16	107/105	T	All-weather tyre
	GOODYEAR	215/60 R17	109/107	T	ALLOY rim
	CONTINENTAL	195/75 R16	107/105	R	GEX tyres

All tyres can be fitted with 12-inch snow chains except tyre dimension 215/60 R17 (17-inch ALLOY wheels).

1.9.2. TURNING CIRCLE DIAMETER

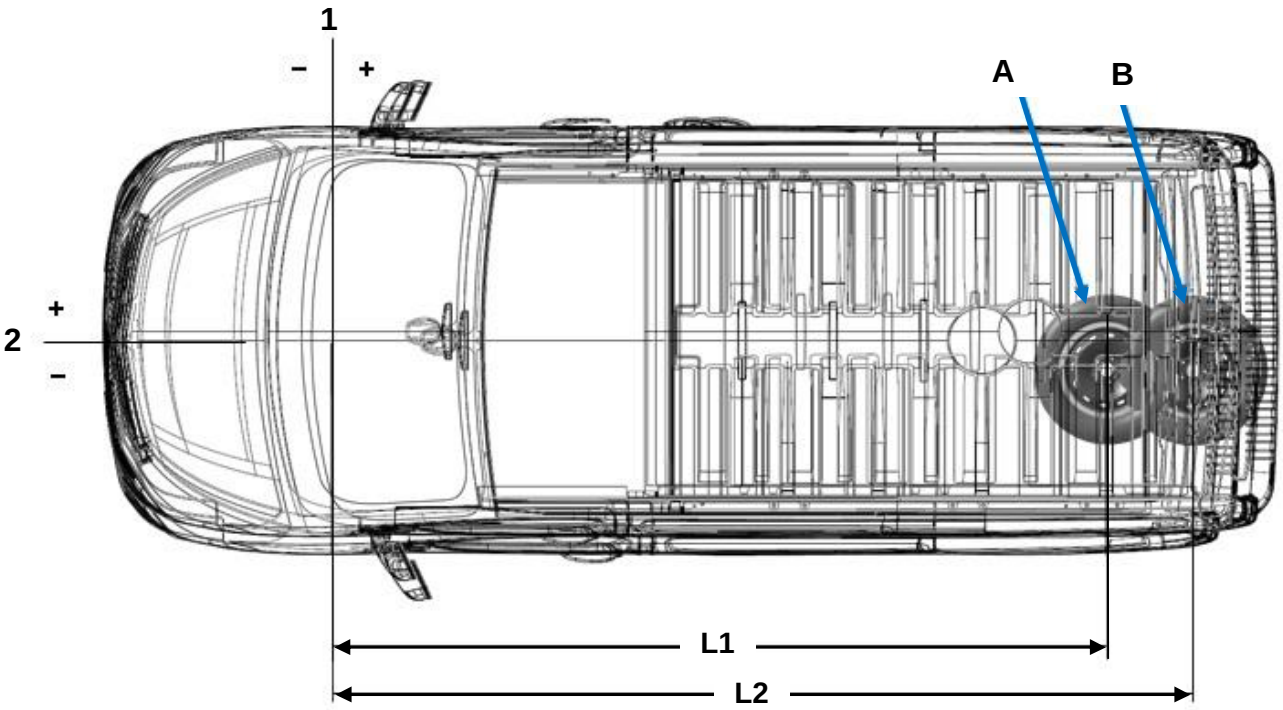
Distances between kerbs and between walls are given for both wheelbase versions L1 & L2 for turning manoeuvres.

	L1	L2
Wheelbase	3098 mm	3498 mm
Distance between kerbs	12,12 m	13,37 m
Distance between walls	12,82 m	13,97 m

1.9.3. SPARE WHEEL

Location of the spare wheel

The spare wheel is located underneath the loading floor in a carrier designed for this purpose. In all cases where there is an extension or modification to the overhang, the spare wheel remains in this position.

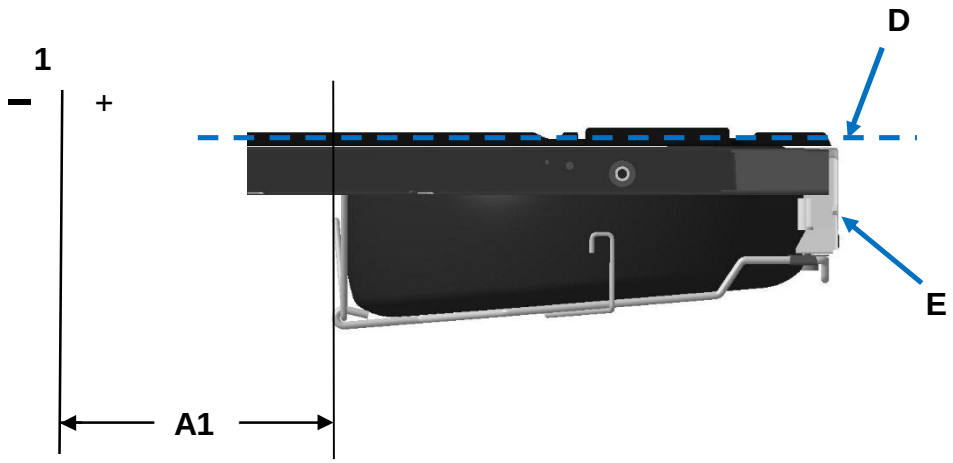


1 : Front wheel axle

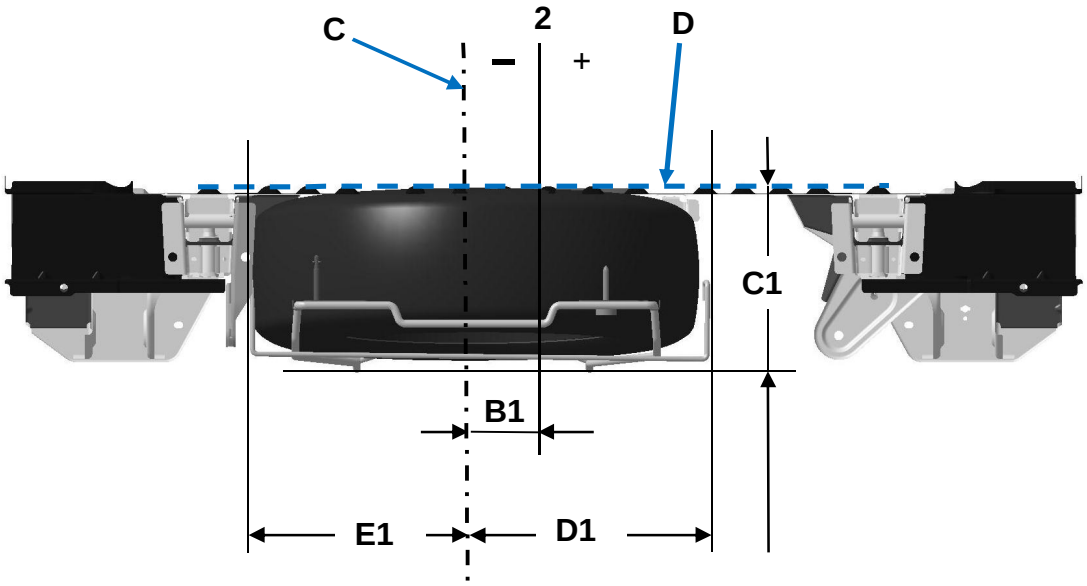
2 : Body symmetrical axis

	Distance from Front wheel axle (1)	Distance from Body symmetrical axis (2)	Position spare wheel
L1 :	3495 mm	-107 mm	A
L2 :	3895 mm	-107 mm	B

Spare wheel dimensions - all types



View from rear of the vehicle



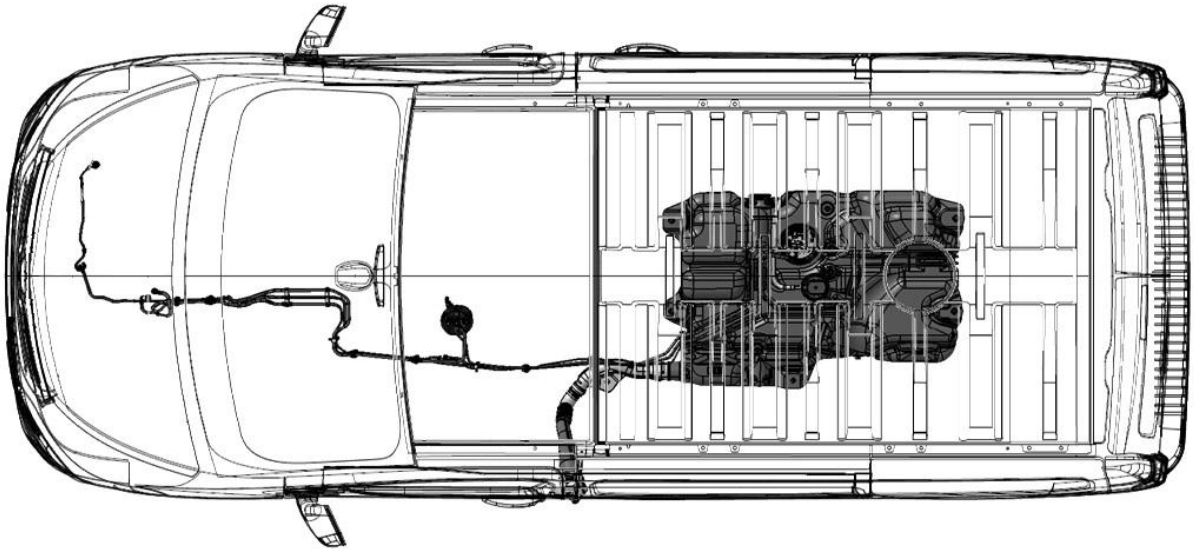
C :	Wheel centre
D :	Loading floor
E :	Rear floor end panel
A1 :	3136 mm
B1 :	-107,3 mm
C1 :	286 mm
D1 :	363 mm
E1 :	345 mm

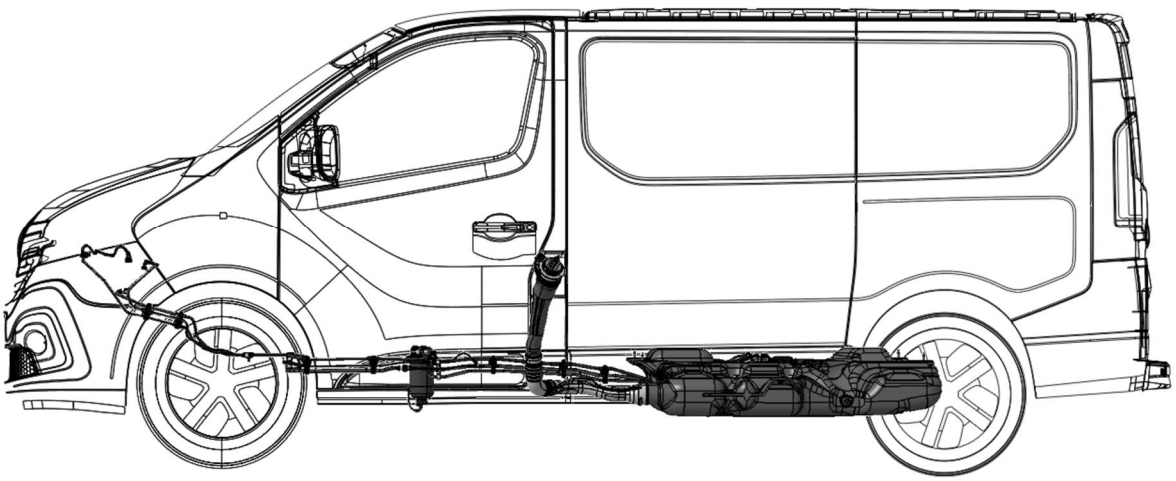
1.10. FUEL SUPPLY SYSTEM / ADDITIONAL HEATER / AIR CONDITION / EXHAUST SYSTEMS

1.10.1. FUEL SUPPLY SYSTEM

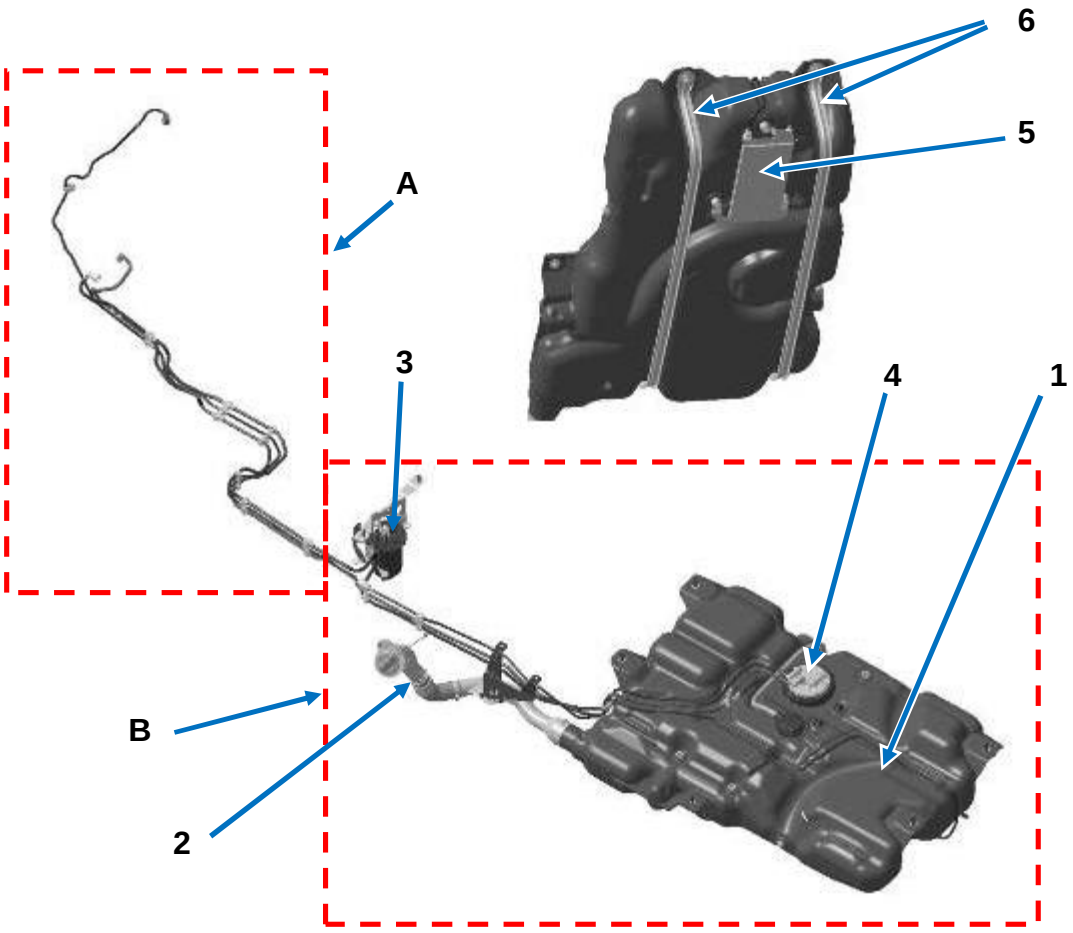
Fuel tank

The standard production vehicle is supplied with one 80-litre fuel tank.
It is not possible to modify the fuel tank capacity.
Any modification to the fuel tank will require the bodybuilder to apply for a new type approval.





Fuel system without heater (Version without SCR)



A : Engine compartment area to fuel filter

B : Fuel filter area to fuel tank

1 : Fitted fuel tank (80 litres)

2 : Filler pipe

3 : Fuel filter

4 : Intake assembly

5 : Fuel cooler for TWIN TURBO

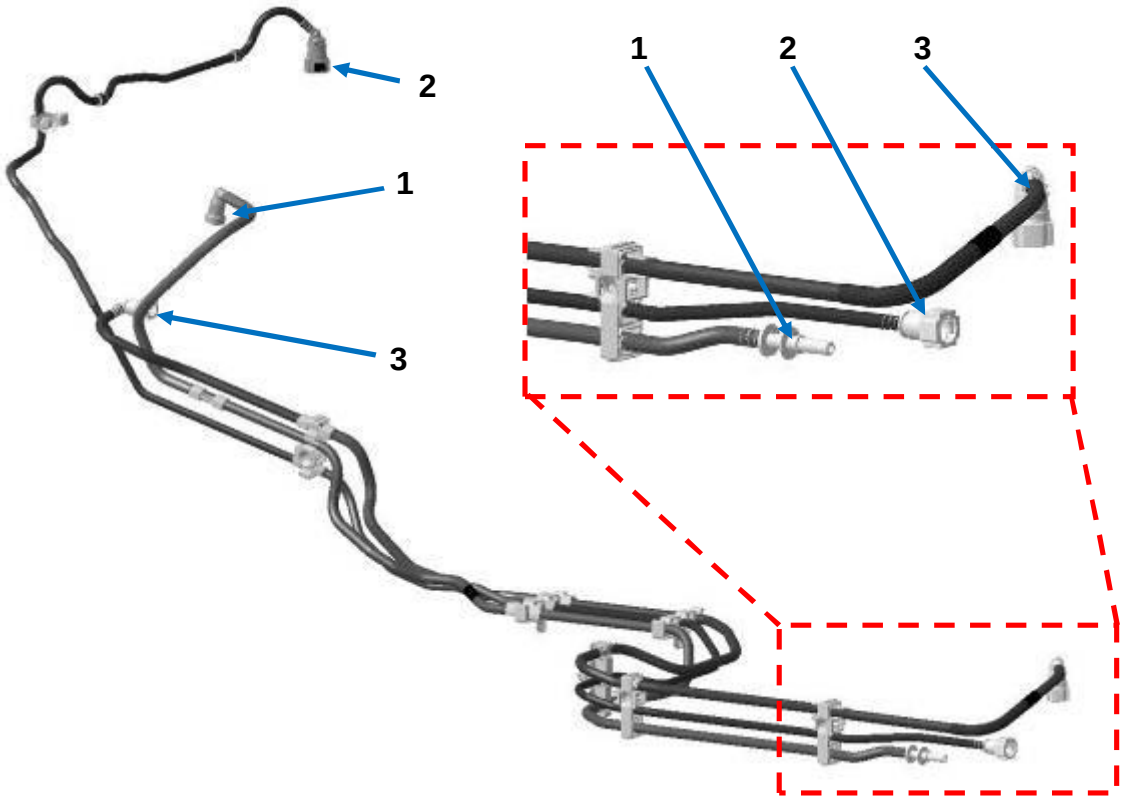
6 : Fuel tank securing straps

Note:

Only the TWIN TURBO fuel tank is fitted with a fuel cooler.

Area details (A)

The fuel system pipes for area (A) are identical for SINGLE TURBO and TWIN TURBO engines.

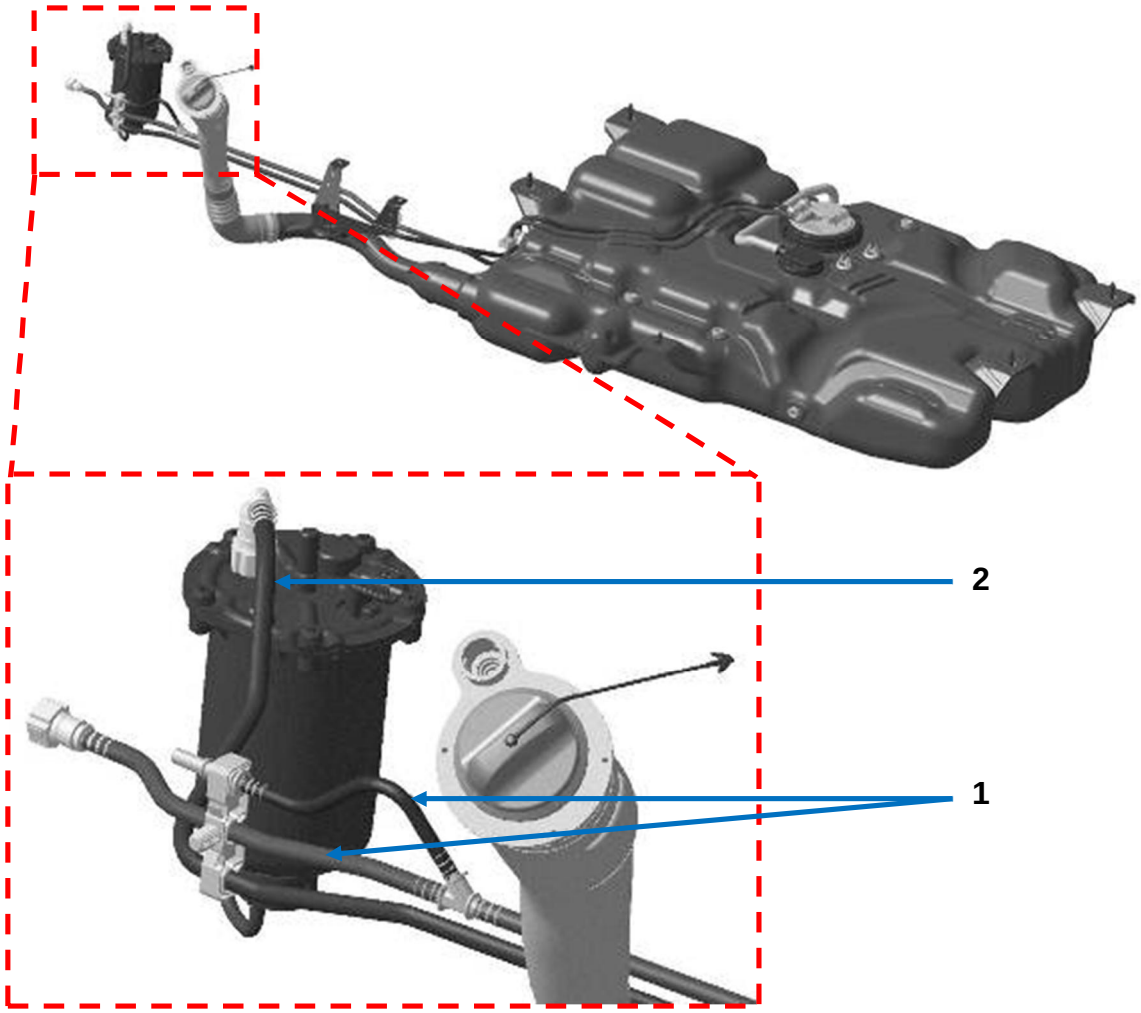


1 : Fuel return pipe

2 : Fuel return pipe

3 : Fuel supply pipe

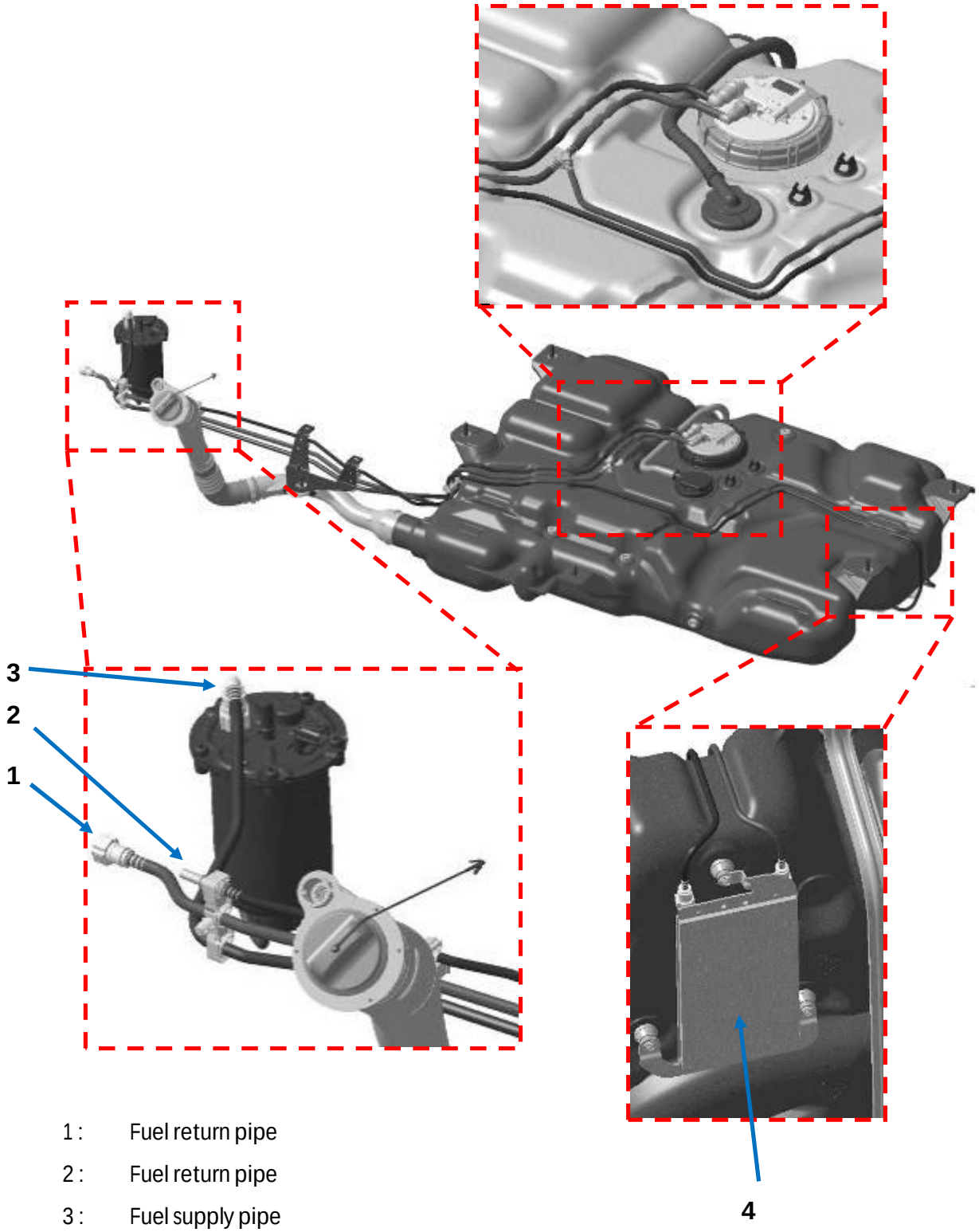
Area details (B) SINGLE TURBO (Version without SCR)



1 : Fuel return pipe

2 : Fuel supply pipe

Area details (B) TWIN TURBO (Version without SCR)



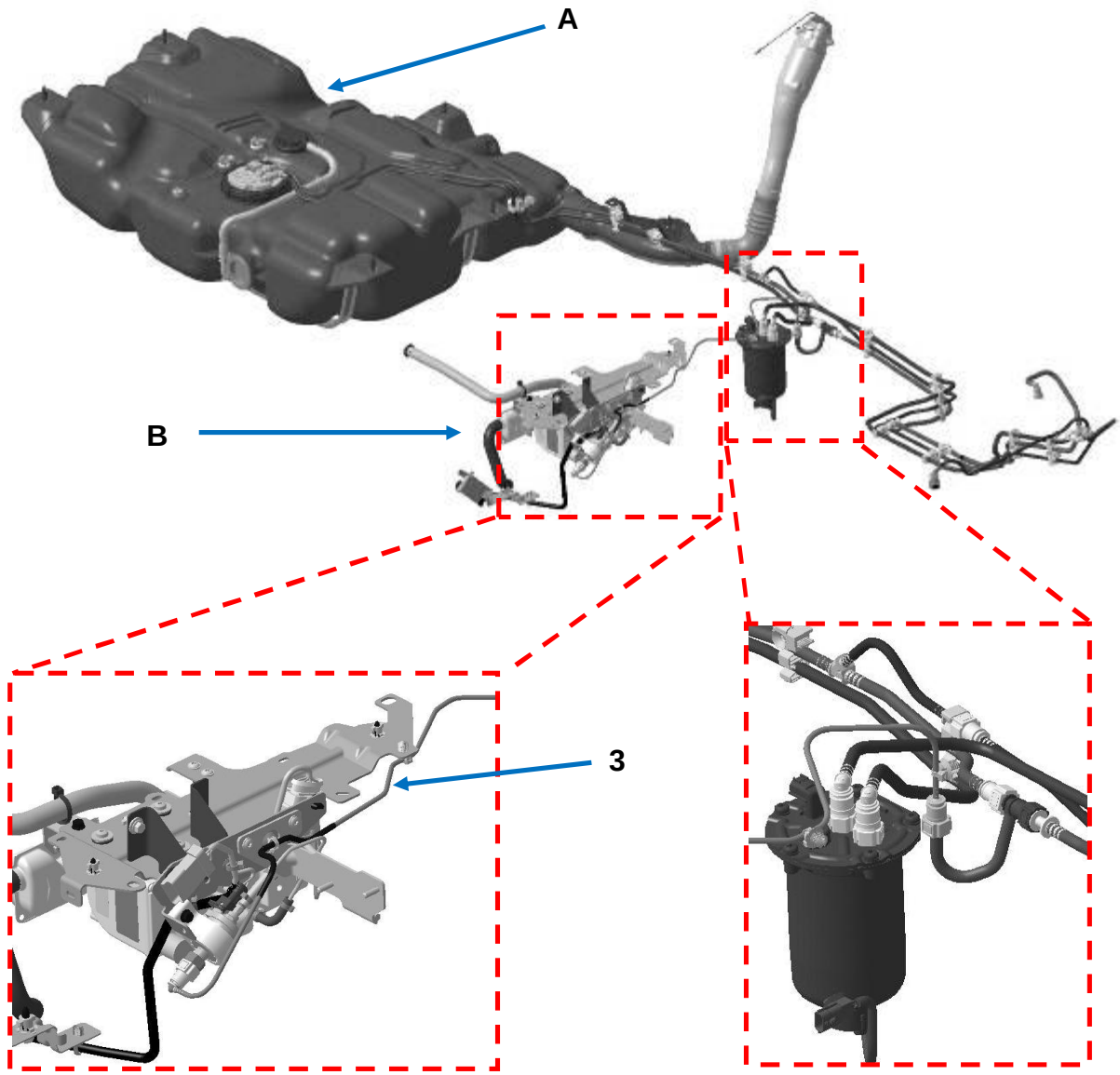
1 : Fuel return pipe

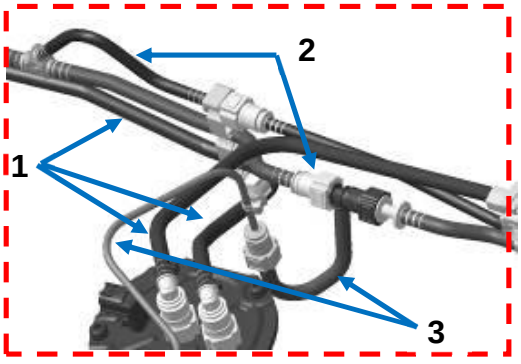
2 : Fuel return pipe

3 : Fuel supply pipe

4 : Fuel cooler

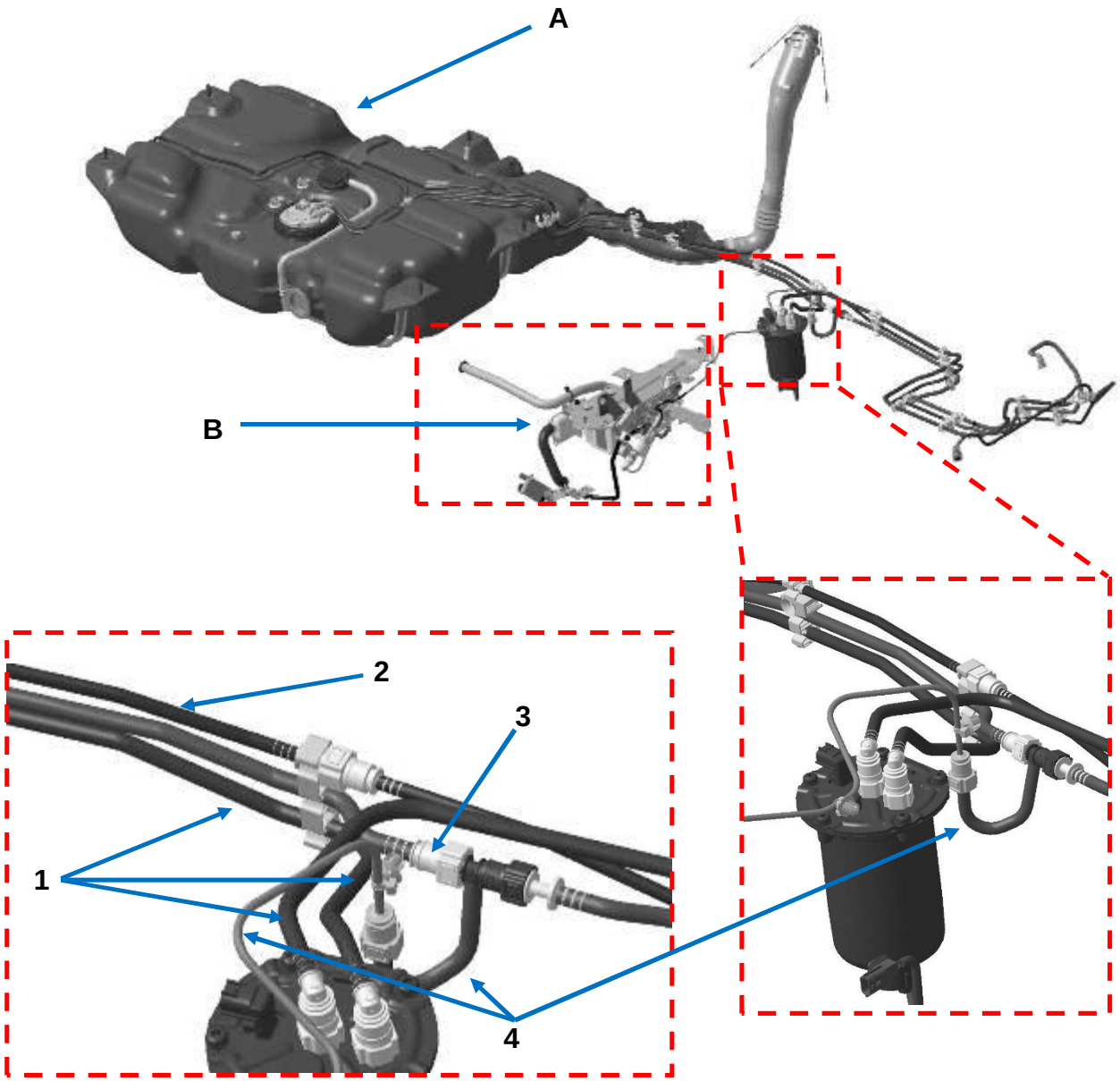
Fuel system with additional heater SINGLE TURBO (Version without SCR)





A : Fuel tank
B : Additional heater
1 : Supply pipes
2 : Return pipe
3 : Heater supply pipe

Fuel system with additional heater TWIN TURBO (Version without SCR)



A : Fuel tank

B : Additional heater

1 : Supply pipes

2 : Return pipe

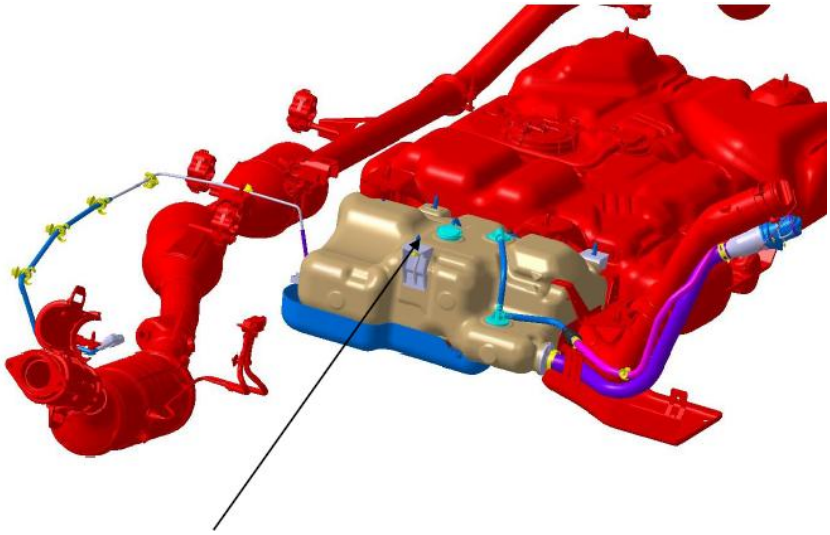
3 : Return pipe

4: Heater supply pipe

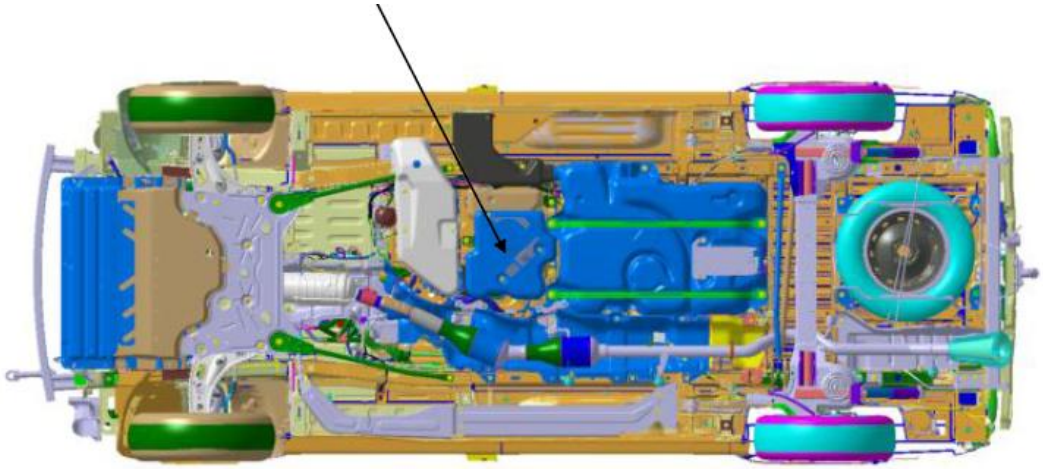
Version with SCR

Emission control system = SCR (Selective Catalytic Reduction) is used to reduce nitrogen oxide emissions.

- On 1 September 2015: Þ ADBLUE versions (EURO 6b and VI b) for M1 versions
- On 1 September 2016: Þ ADBLUE versions (EURO VI b) for N1 or N2 versions



Urea tank or ADBLUE



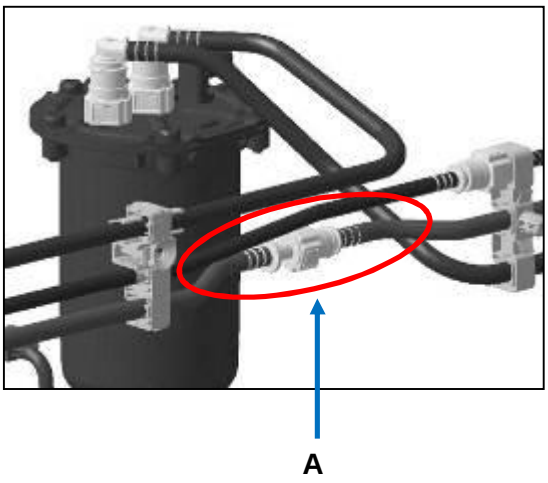
Note:

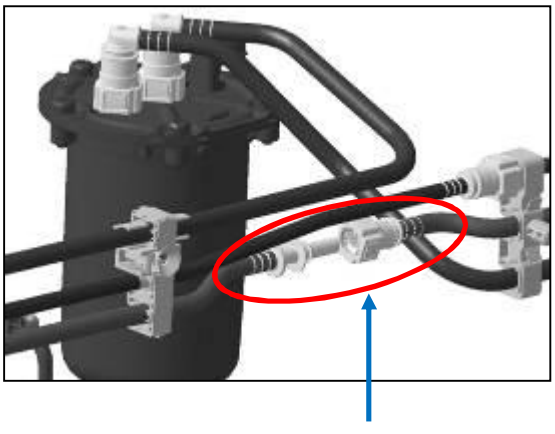
For further information about SCR Tank system see chapter 1.15

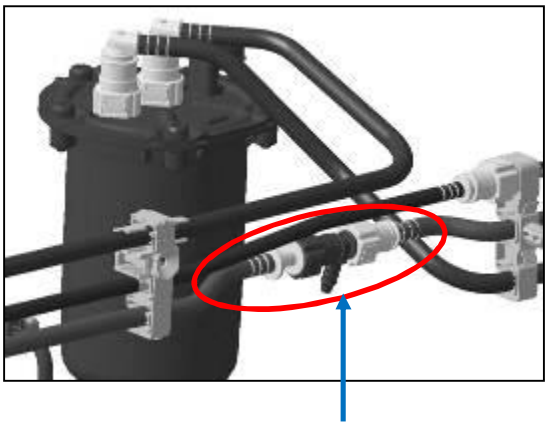
1.10.2. RECOMMENDATION FOR ADDITIONAL EQUIPMENT (BODYBUILDER)

Fuel supply

The heater supply is delivered via the fuel return connections (A) on the right-hand side of the fuel filter. Disconnect connections (B) and insert a T-piece connector (C).

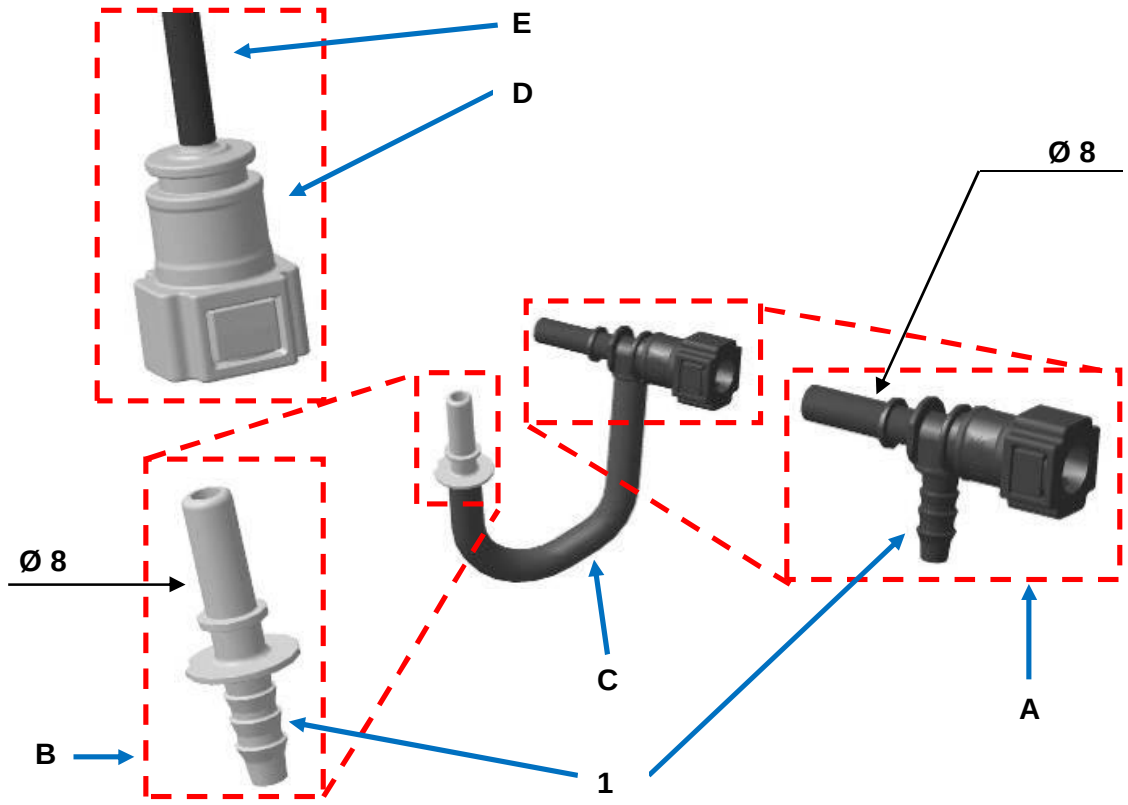






Pipe and connections details

- Definition of the snap-fit T-piece connection (A) which is inserted between the front and rear pipes of the pump fuel return.
- Definition of the snap-fit straight connection (B) which is fitted to the fuel supply pipe connector of the additional heater.
- Definition of the connecting pipe (C) between connections (A) and (B) via the "fir tree" fittings (1) (Ø10 x 8).(derived from the additional heater standard production option.)
- Items (B, C, D and E) are shown for information, they remain the initiative of the bodybuilder. (The pipe fitted with connections is standard for the additional heater option)



<u>For information:</u> *The various snap-fit connections used are from the companies RAYMOND or LEGRIS.*

Fuel system.

With the engine running, the pressure inside the pump return system is high (about 0.5 bar), it may be necessary to add a pressure reduction device to the heater supply system (after the T-piece connection).

- Ø It is prohibited to drill the fuel tank.
- Ø Only connect to the return pipes designed for this purpose; see chapter 5.1
- Ø For all types of connection, the bodybuilder must check that the device is able to withstand a pressure four times the operating pressure (or approximately 4 bar).
- Ø The device must be able to withstand a temperature of between 70 and 80°.

Note: for heating in idle mode

Fuel is sucked from the bottom of the fuel tank, so there is a risk of emptying the tank when on reserve.

Fuel consumption by the additional heater is not taken into consideration by the on-board computer. Which can make the information displayed (consumption and driving range) inconsistent.

The electrical consumption of a heater in idle mode can flatten the battery with prolonged use.

The converter must fit:

- *an additional battery*
- *or an L4VRLA battery (heavy duty battery option), with additional battery protection (battery charge status monitoring or delay).*

Attention:

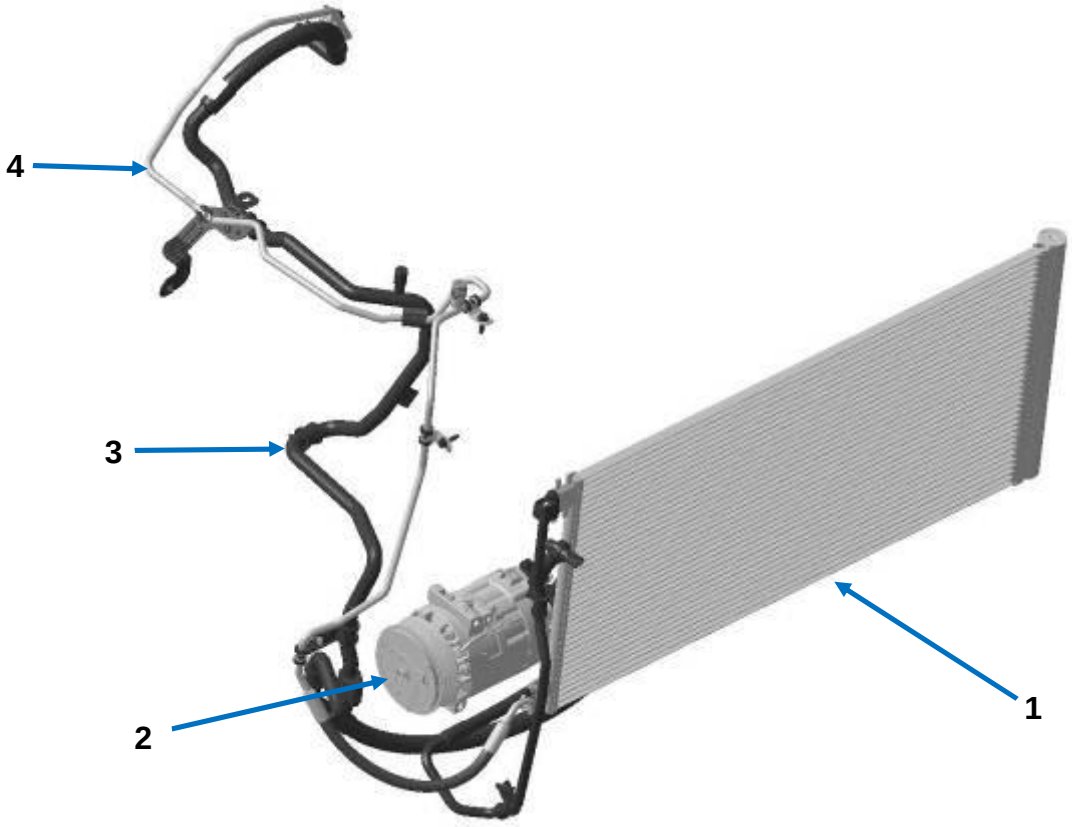
- Only adding an additional heater is not permitted.
- The assembly of an additional heater must be combined with an additional boiler.
- The water flow rate required for operating the heaters is 600 to 700 Liters/Hour

1.10.3. AIR CONDITIONING SYSTEMDIAGRAM

The vehicle range offers two types of air conditioning system depending on the vehicle. These are described below:

- Air conditioning system for Panel Van (F82)
- Air conditioning system for Combi (J82)

Panel van air conditioning system



1 : Condenser

2 : Compressor

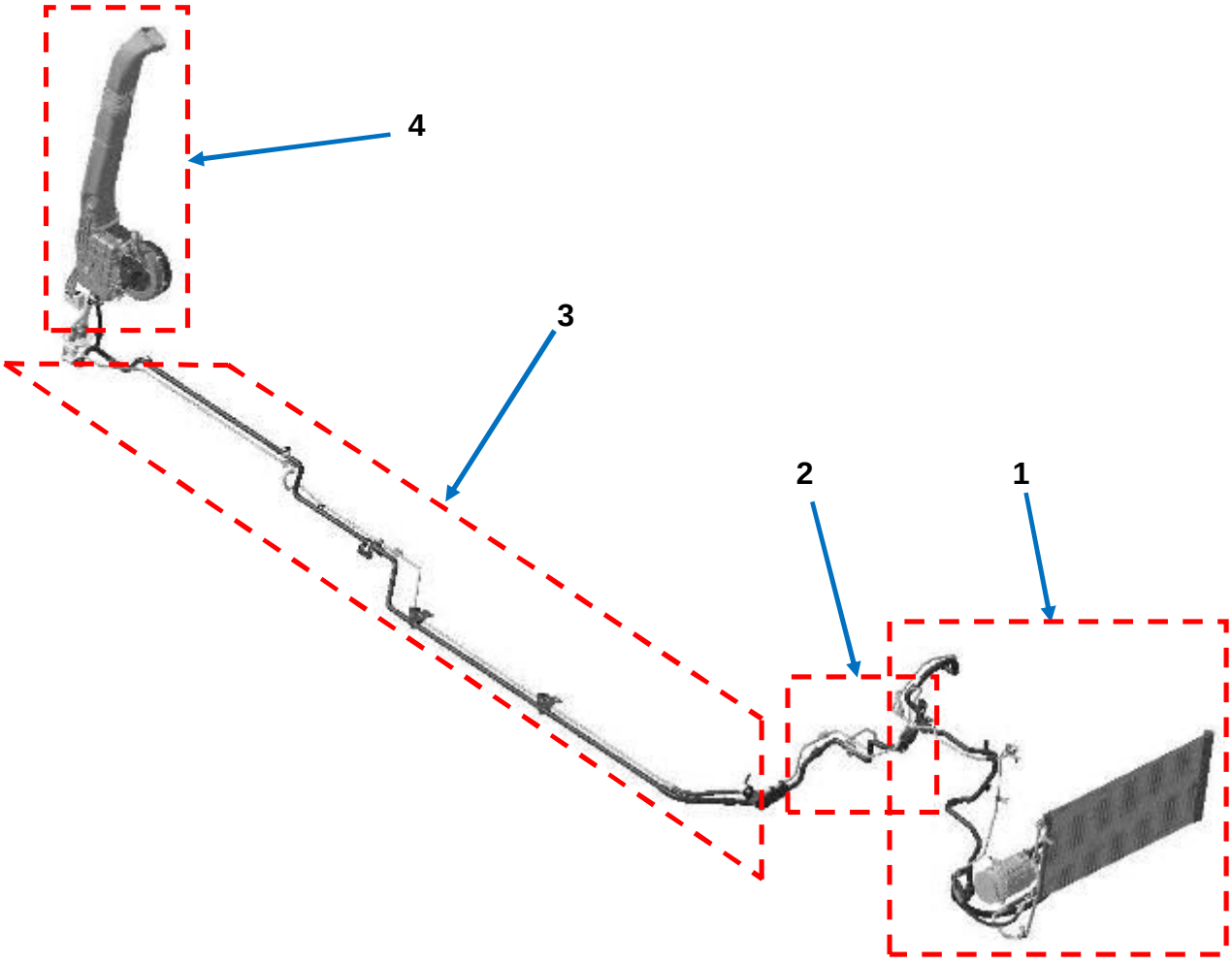
3 : Low-pressure pipe

4 : High-pressure pipe

Note:

Option of fitting an additional air conditioning system using the Combi pipes from the engine compartment (see details of A below)

Combi additional air conditioning system



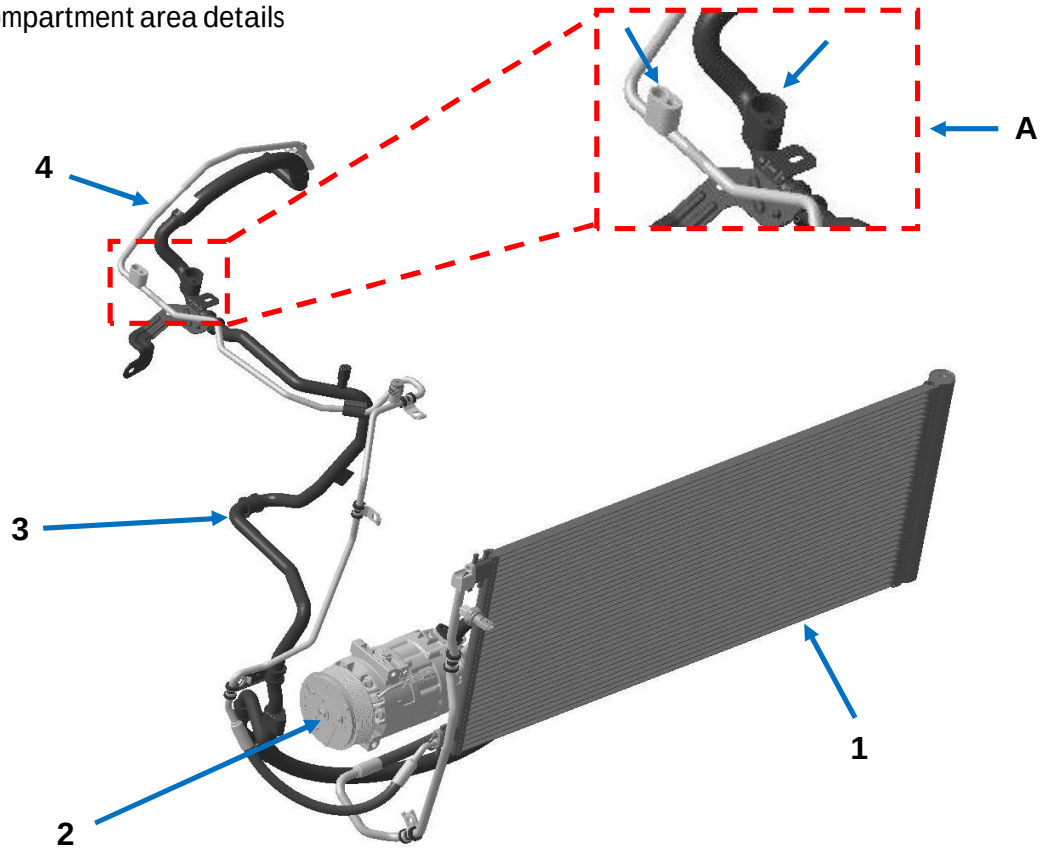
1 : Engine compartment area

2 : Engine compartment/underbody area

3 : Underbody area

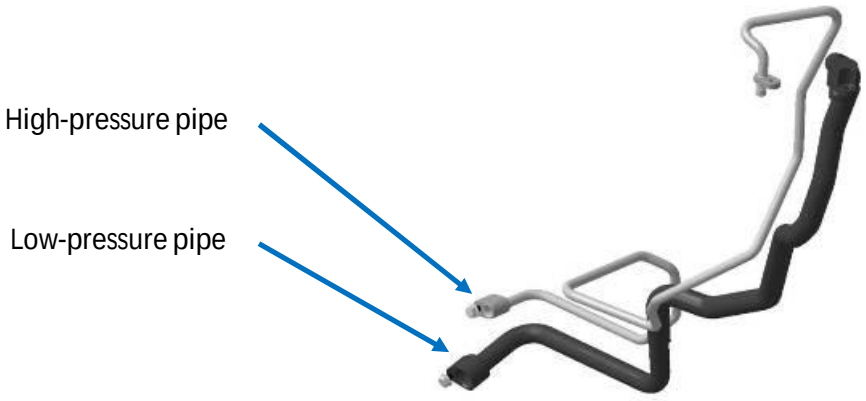
4 : Rear attachment ring area

Engine compartment area details

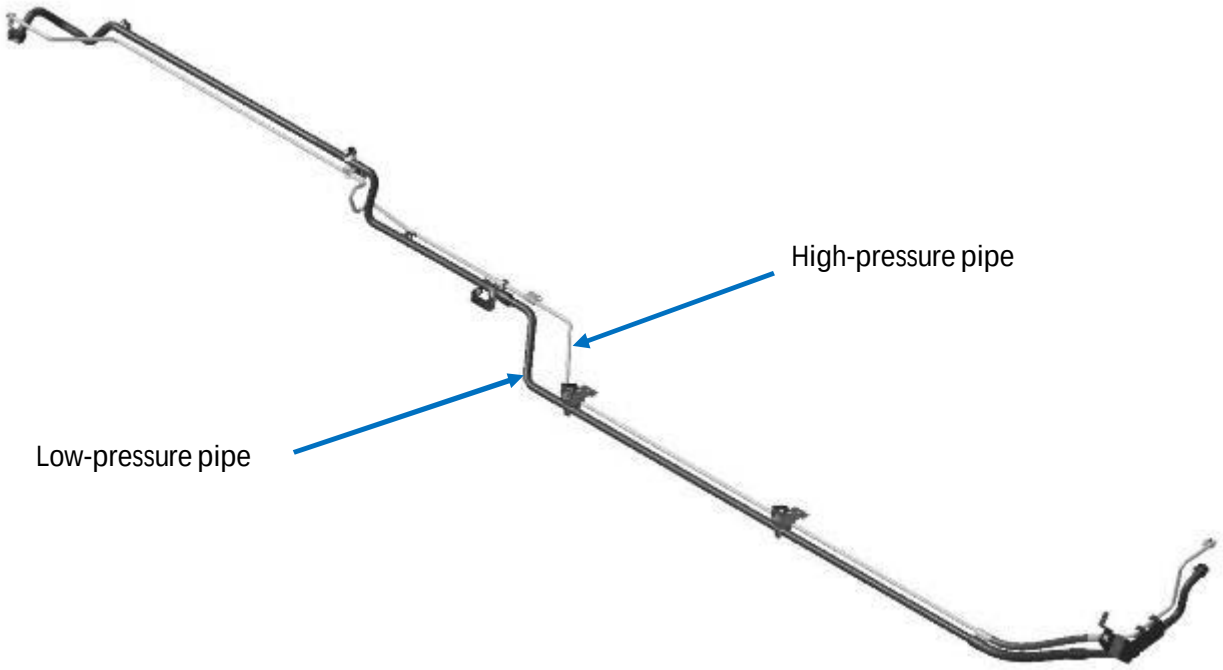


1 : Condenser
2 : Compressor
3 : Low-pressure pipe
4 : High-pressure pipe
A: Additional air conditioning interfaces

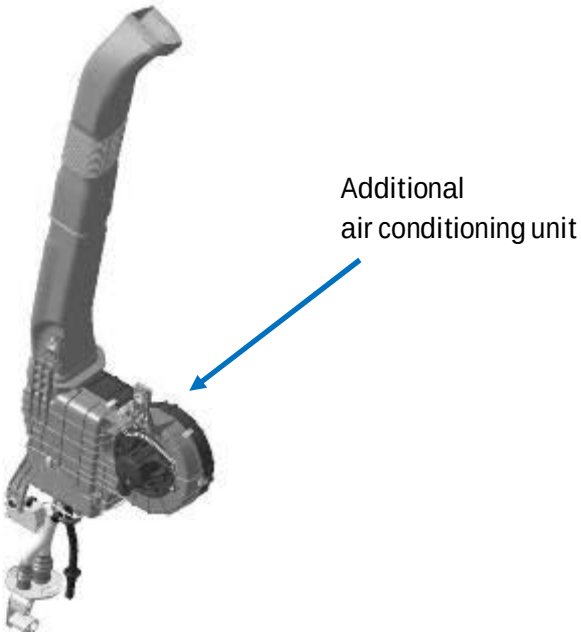
Engine compartment and underbody area details



Underbody area details



Rear attachment ring area details



1.10.4. EXHAUST SYSTEMS – EURO 5 ENGINE

When dismantling an exhaust system, the fitting recommendations in the general guidelines (exhaust system) must be followed to avoid generating residual constraints detrimental to acoustics and reliability.

Note:

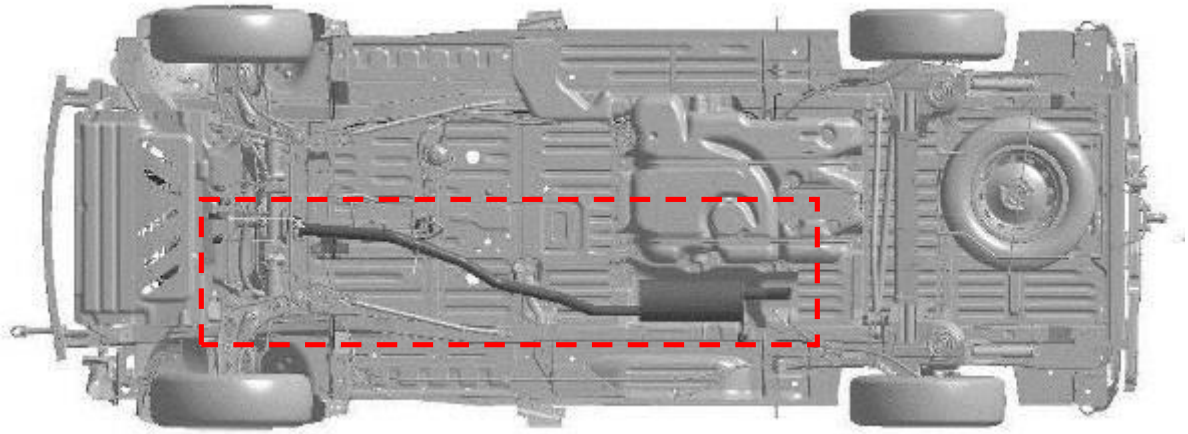
Any modification may alter the vehicle type approval (engine power rating, noise or exhaust emissions). This action is taken at the sole responsibility of the converter.

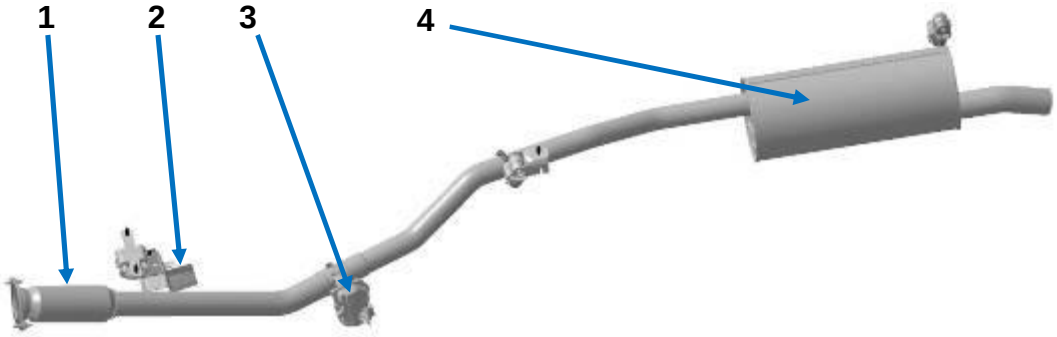
General Information

The vehicles are equipped with various types of exhaust systems which differ in Euro 5 and Euro 6 engines as follows:

Single Turbo type exhaust: for engine suffix 408

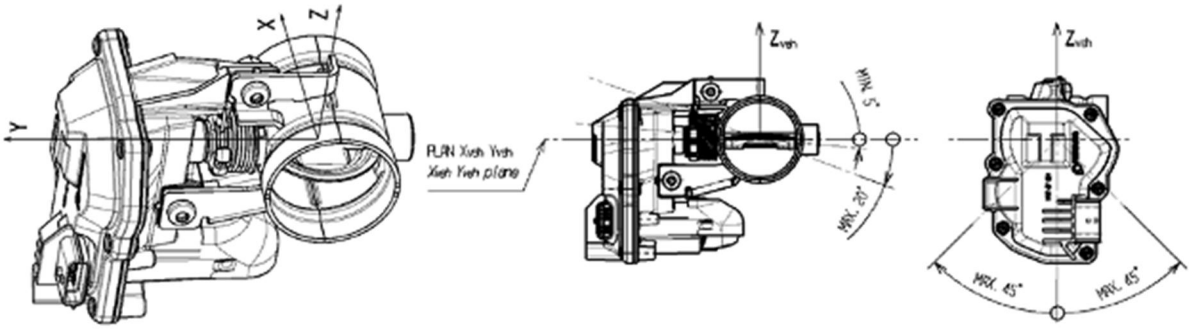
The catalytic converter is built into the engine (single turbo) and is located in the engine compartment.





1 : Flexible
2 : Damper (with or without)
3 : EGR valve
4 : Silencer

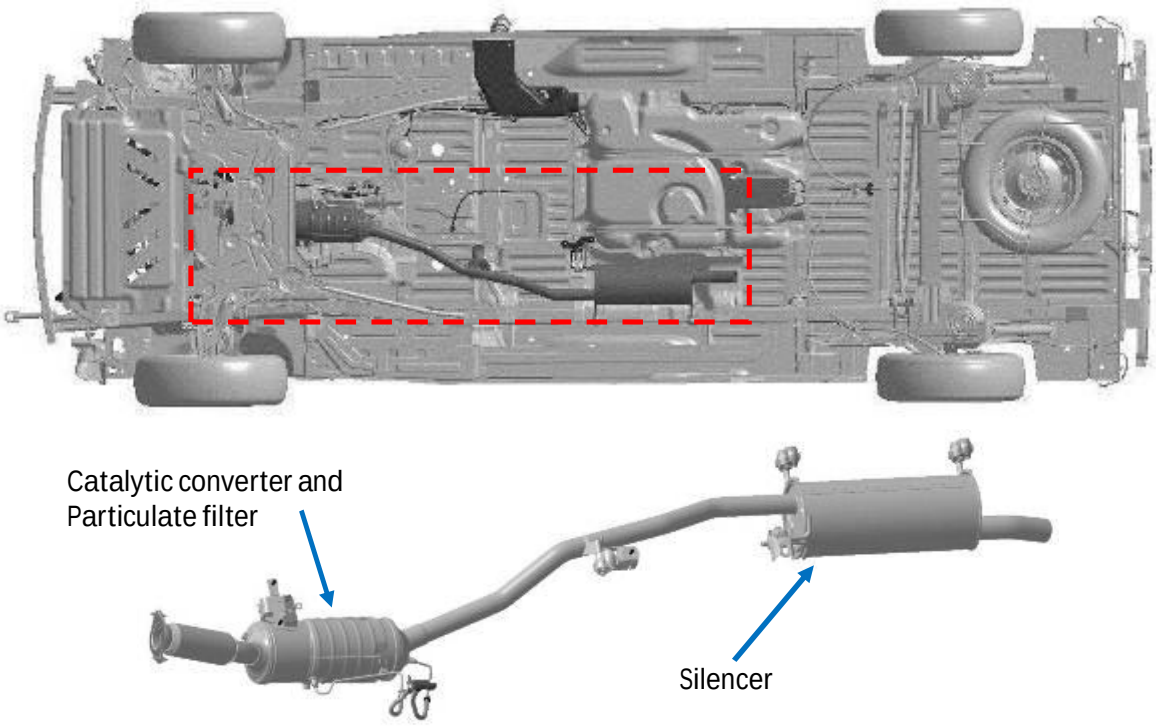
EGR valve (3) and damper (2)



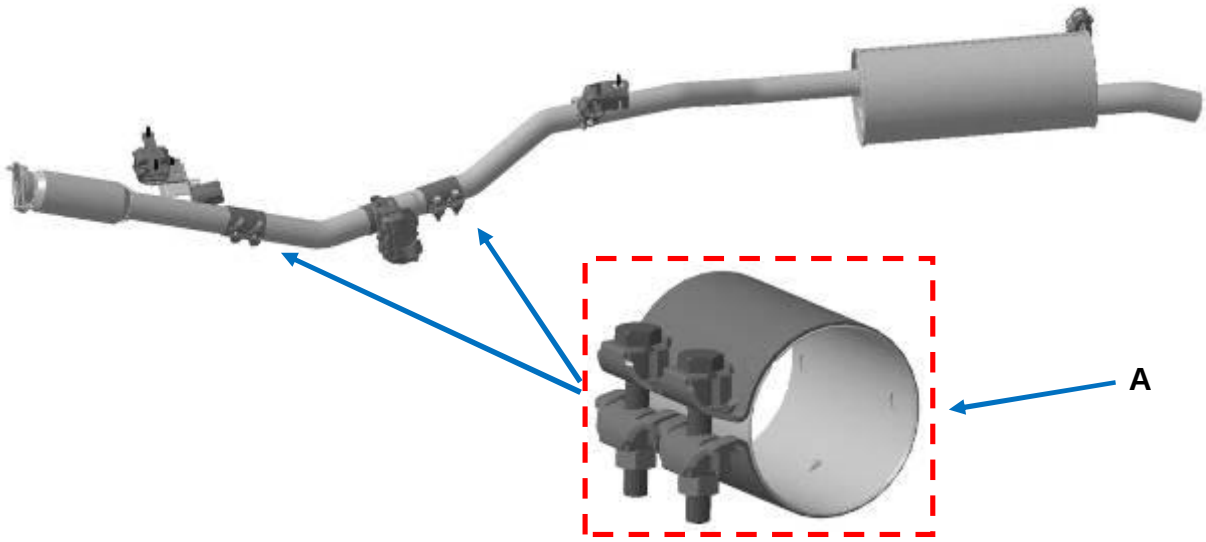
Use in a configuration other than the preferred may cause operational damage. In such cases, the customer must obtain approval by means of vehicle testing specific to the application.

Twin turbo type exhaust: engine suffix 450

The catalytic converter and particulate filter are suspended underneath the sub-frame (floor panel) of the vehicle (twin turbo engine).



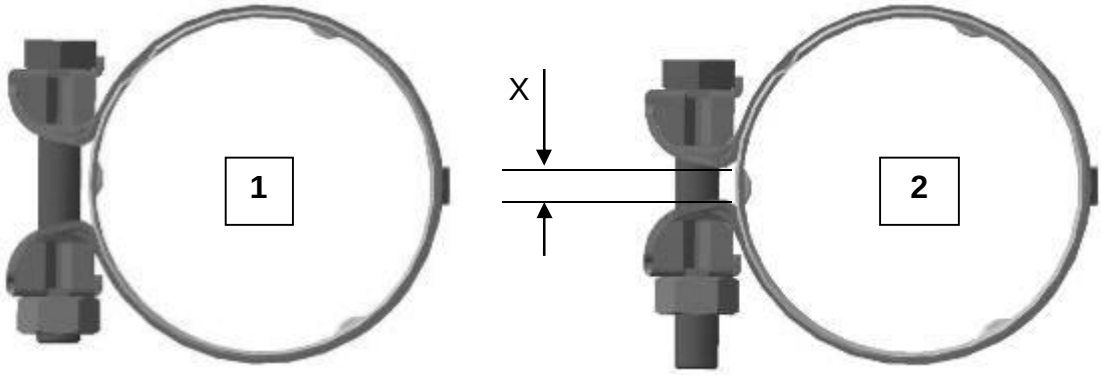
Recommendation for exhaust pipe cutting



Use the exhaust clamp (A), available in After-Sales, when changing components on the exhaust system.

Apply the following procedure, depending on the tooling used to tighten the connection clamp:

- Use an automatic screwdriver (factory type tool and not impact), to torque tighten to 21 Nm.
- During manual tightening, this should be carried out as straight and as smoothly as possible.



1 : Open

2 : Closed

Tightening stops when the clearance X between the ends of the clamp is between 3 to 9 mm (corresponding to a torque of about 18 Nm).

1.10.5. EXHAUST SYSTEMS – EURO 6 ENGINE

The SCR-Technology (SCR = Selective Catalytic Reduction) is required for a NOx treatment on the exhaust system. The technical solution is the catalytic treatment with SCR type urea injection (Selective Catalytic Reduction). For further information about SCR exhaust system see chapter 1.15

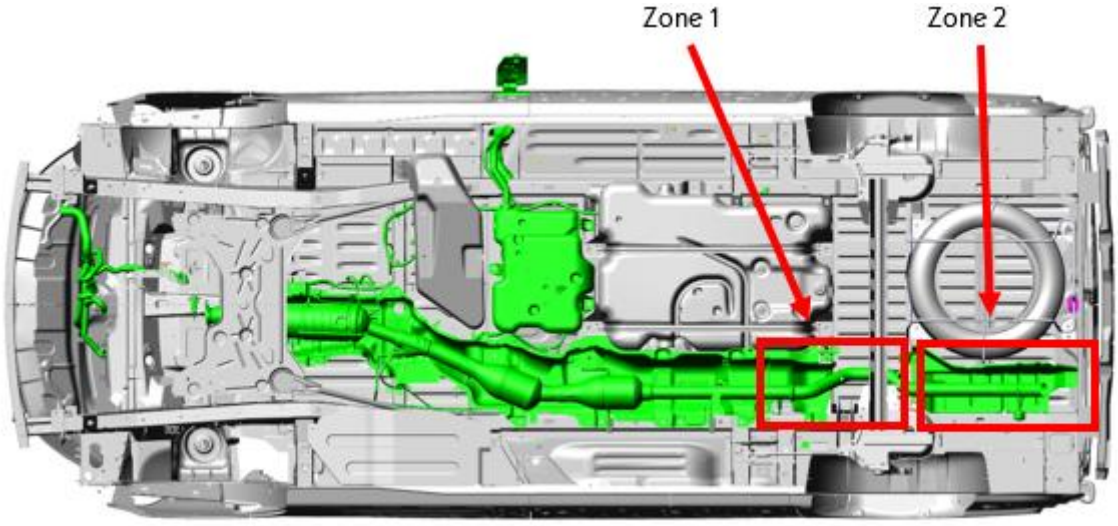
This implies the following technical changes:

- The filler neck for AdBlue is on the left side of the vehicle behind the fuel filler flap (addition to the filler pipe of the fuel tank)
- A tank AdBlue with an injection circuit and an associated computer
- An exhaust line with the SCR catalyst.
- Extension of the exhaust pipe up to the rear

Attention:

- The SCR system (urea tank, filler tube, injection) may not be changed. If any change of the system is necessary, a new homologation by the bodybuilder is mandatory.
- The bodybuilder must ensure protection against water rising in the tube because of NOX sensor and ensure thermal protection of the underbody elements

Position of Exhaust + urea tank for Euro 6 engines



Note:

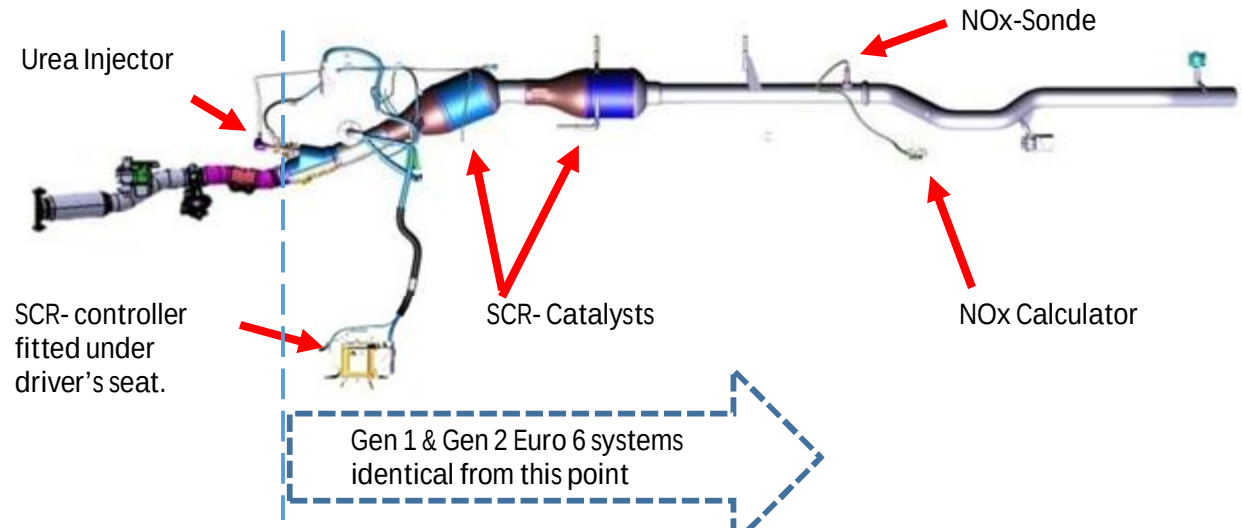
Zone 1: the position of the NOX sensor and the attachment of the Exhaust system prohibits cutting of the Exhaust tube close to the rear axle

Zone 2: The various proximities with the Spare wheel (spare wheel thermal protection) and the risk of water rising on the NoX sensor forces the length to be reduced

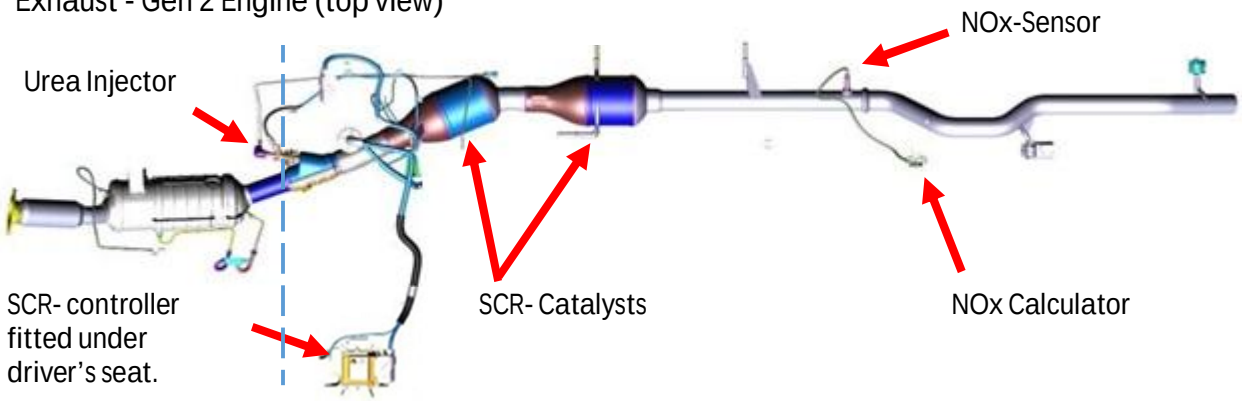
Differences of exhaust systems depending on the motor

	Gen1 - Engine - Single Turbo	Gen 2 Engine - Twin Turbo
Low Power	70 kW	92 kW
High Power	88 kW	107 kW

Exhaust - Gen 1 Engine (top view)



Exhaust - Gen 2 Engine (top view)



Note:

- Exhaust system extends for whole length of vehicle (unlike Euro 5 version). The exhaust has be designed in order to prevent the water rising on Nox sensor
- Tailpipe section specific for LWB / SWB

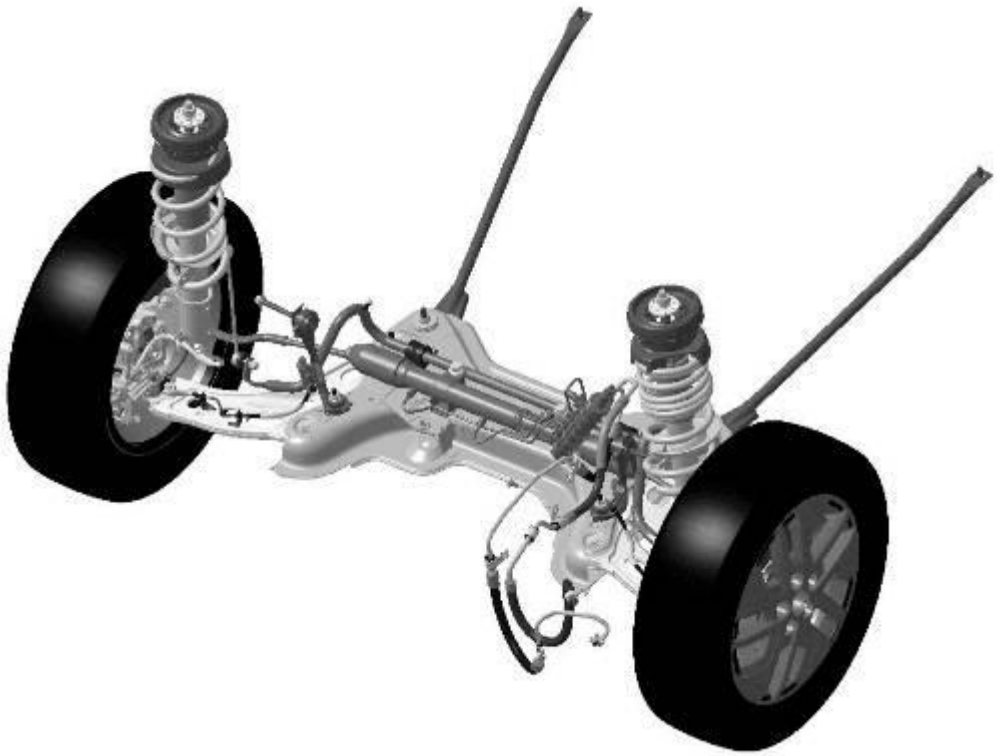
1.11. FRONT & REAR SUSPENSION / BRAKES

1.11.1. SUSPENSION

Note : *ESP on the basic vehicle is not compatible with a modification to the suspension. (see also chapter 3.2 CONVERSION LIMITS WITH ESP)*

FRONT SUSPENSION

The front suspension is a Macpherson strut type suspension. It has an anti-roll bar. The coil-type spring stiffener varies according to the vehicle type and kerb weight. Several different springs are available based on their stiffness (45.6 to 64 N/mm.)

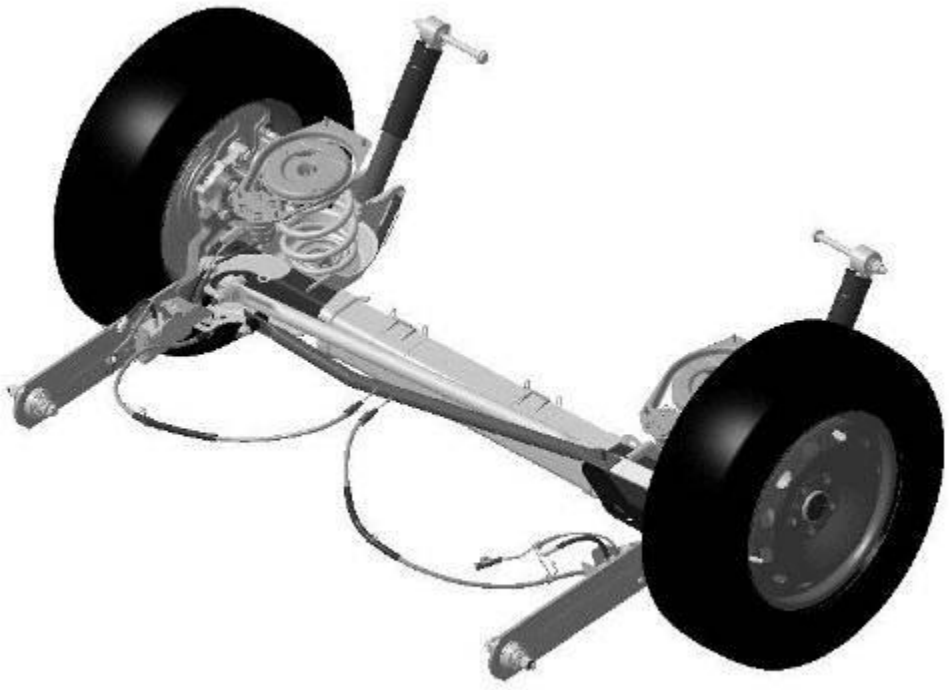


REAR SUSPENSION

The rear suspension is a Panhard bar type.
Three different bi-tilt springs are available. Their stiffness varies depending on the vehicle:

Allocation of springs	Stiffness	Vehicle type	Maximum load on rear axle
Spring 1	31/ 70 N/mm	Combi LCV 1,000 kg good road	1,550 kg
Spring 2	28/ 74.8 N/mm	Standard panel van Combi bad road Combi LCV 1,200 kg Double cab versions	1,650 kg
Spring 3* (CMB option only)	56/ 93.75 N/mm	Panel van L2 and platform cab L2 reinforced suspension	1,735 kg

*** The use of spring 3 on vehicles which have not been converted is prohibited**
(a minimum load on the rear axle of 1100kg is absolutely essential); see data sheet 2.2



1.11.2. BRAKE SYSTEM DIAGRAM

The vehicles are all fitted with ABS and ESP as standard.

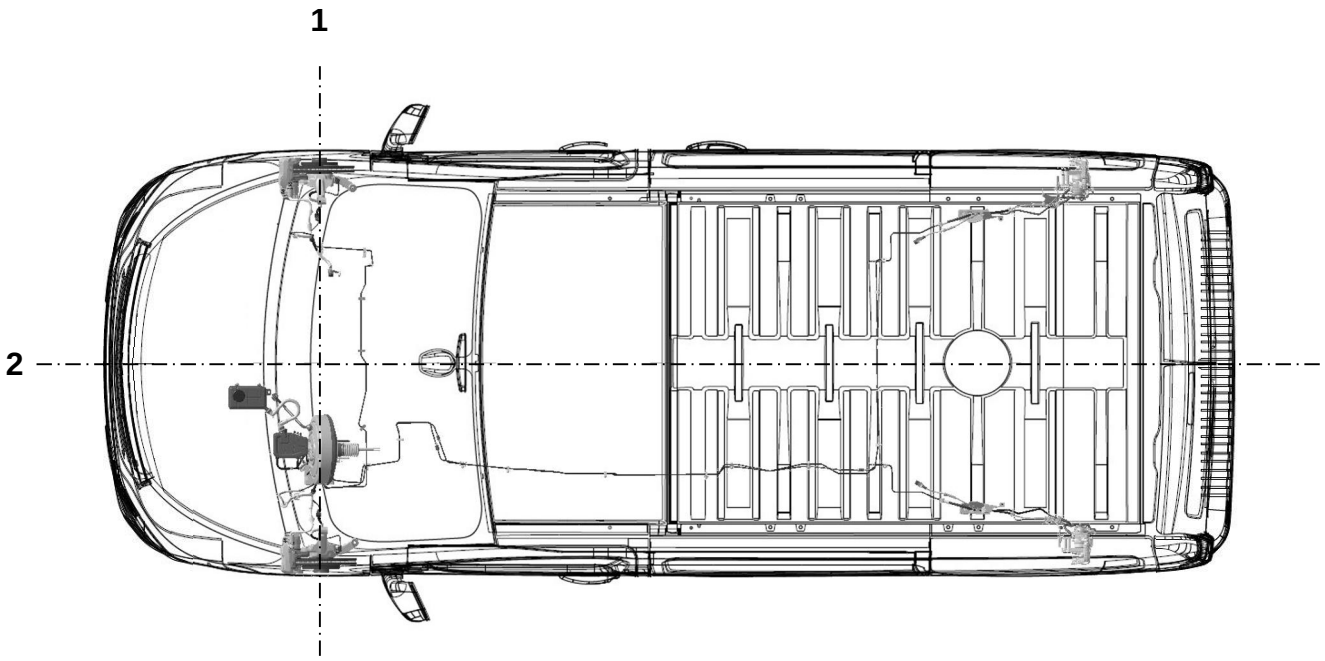
ABS: Anti-lock Braking System.
ESP: Electronic Stability Program (Traction control).

The brake servo remains located on the left-hand side of the vehicle, whether the vehicle is right hand drive or left-hand drive.

Note :

ESP on the basic vehicle is not compatible with a modification to the brake system (see also chapter 3 - VEHICLE CONVERSION LIMITS AND CALCULATIONS).

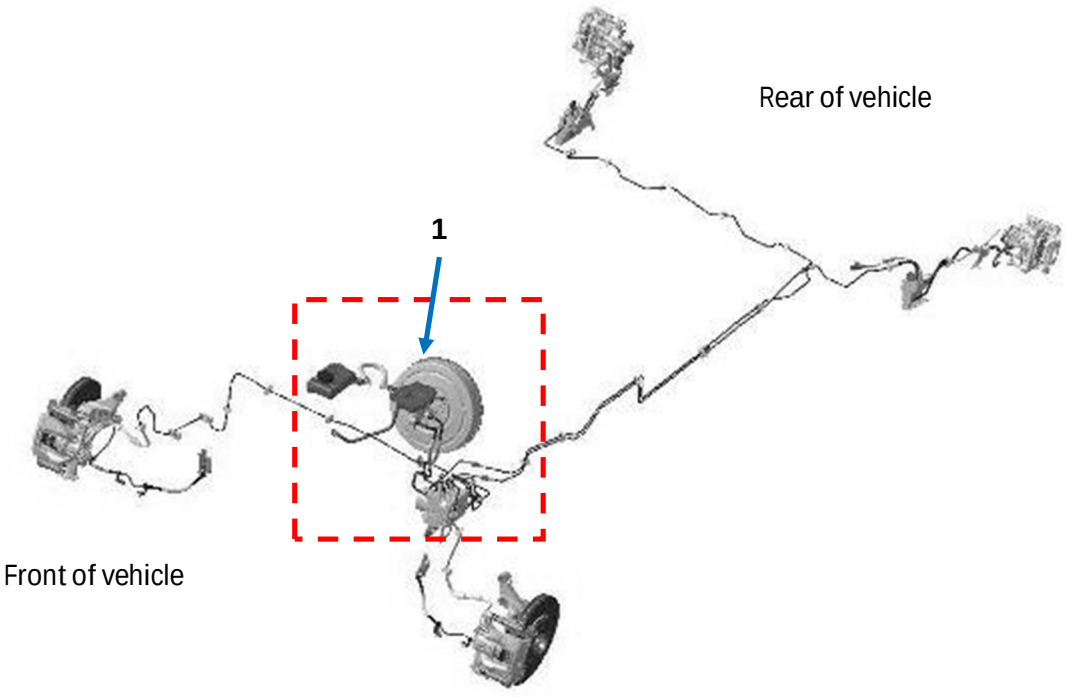
Brake system installation



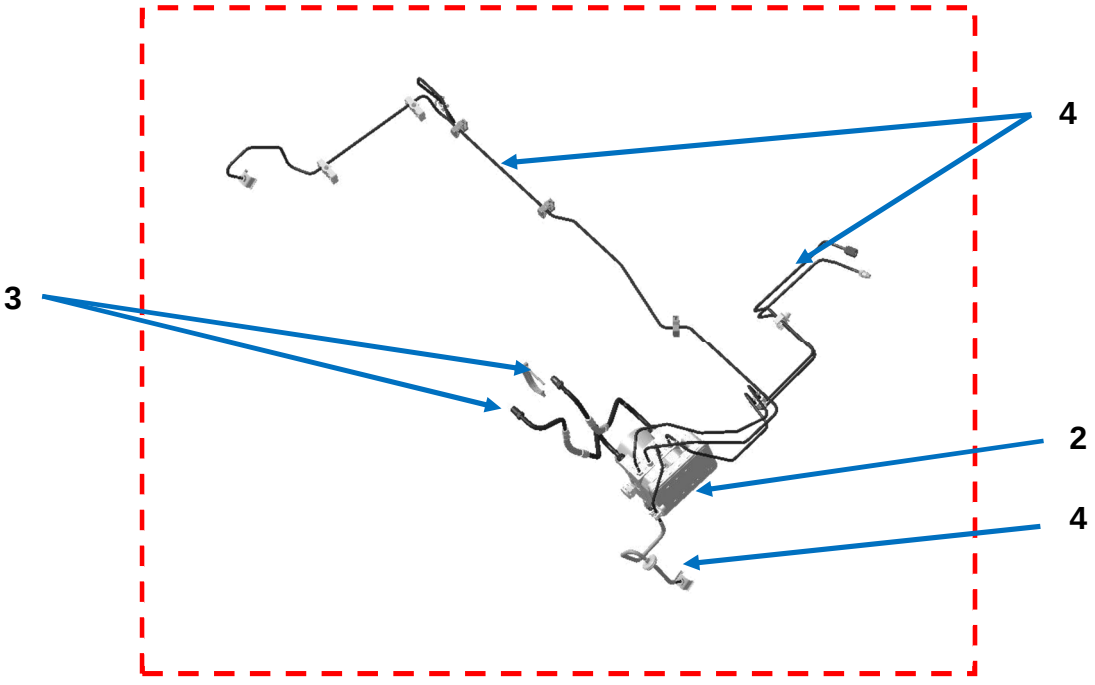
1 : Front wheel shaft

2 : Body axis

Brake system details

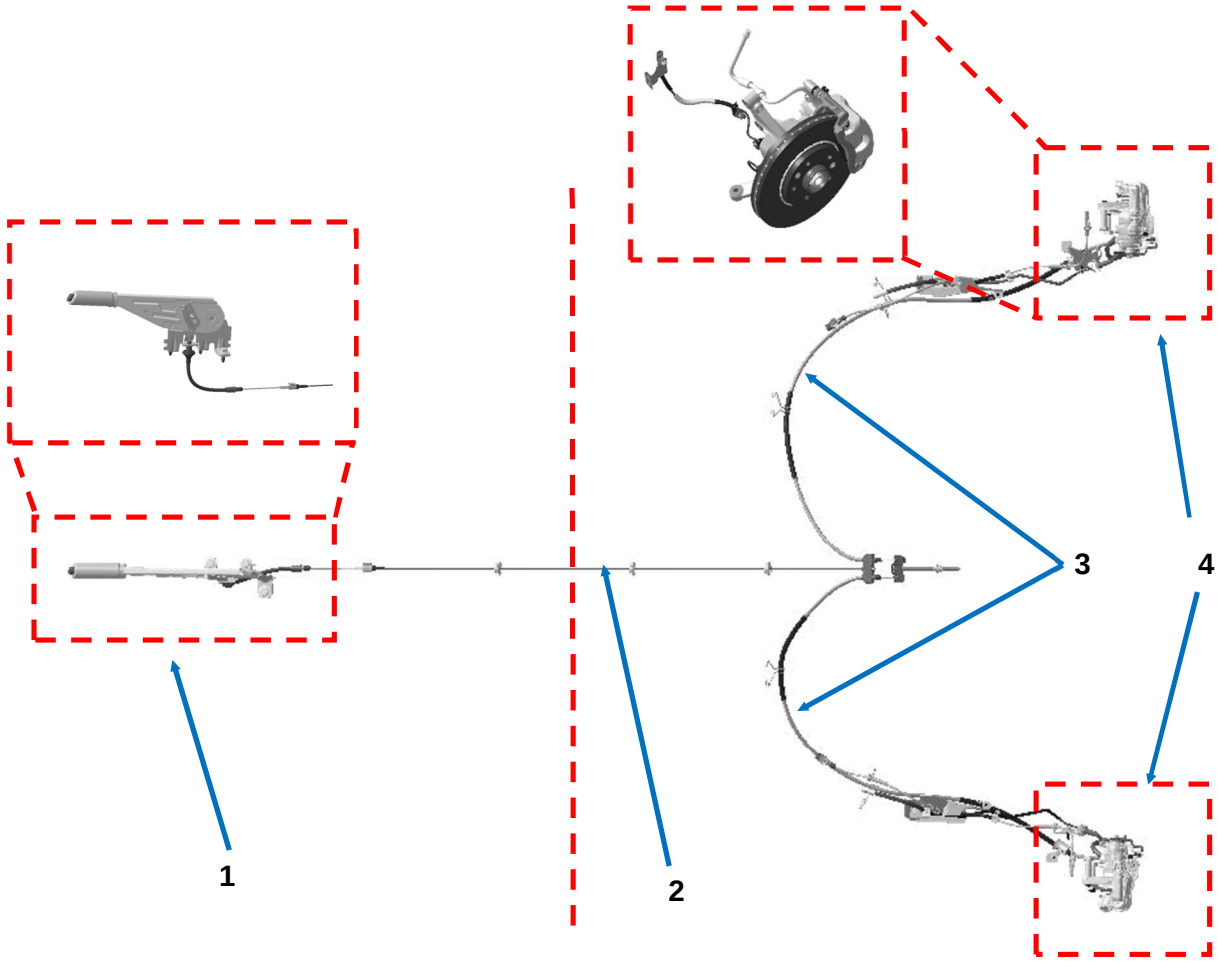


1 : Brake servo
2 : ABS/ASR/ESP hydraulic unit
3 : ESP hybrid brake pipes
4 : Rigid brake pipes



Depending on the vehicle length (L1, L2), only the length of the underbody pipes and underbody cable change.

Parking brake:



1 : Hand brake lever

2 : Parking brake primary cable

3 : Parking brake secondary cables

4 : Disc brakes

Attention: *After any operations on the hand brake cable (modification of routing, extension, removal), it is essential to have the hand brake adjusted by an OPEL / VAUXHALL dealer.*

1.12. SEATS / SEAT BELTS

1.12.1.SEATS

When a conversion requires removal of the seat or seat belts, it is prohibited to fit other components into the original assembly during reassembly.

All the operations must be carried out with the ignition switched off, the battery disconnected and the airbag computer locked (using the diagnostic tool).

Any contact with the conductive parts of the pyrotechnical components should be avoided (airbag or seat belt pre-tensioners) due to static electricity.

The seats must be refitted using a torque wrench, in compliance with the tightening torque values given below.

The front and rear brackets of seats in rows 2 and 3 may be removed, but it is prohibited to dismantle the components of these seats.

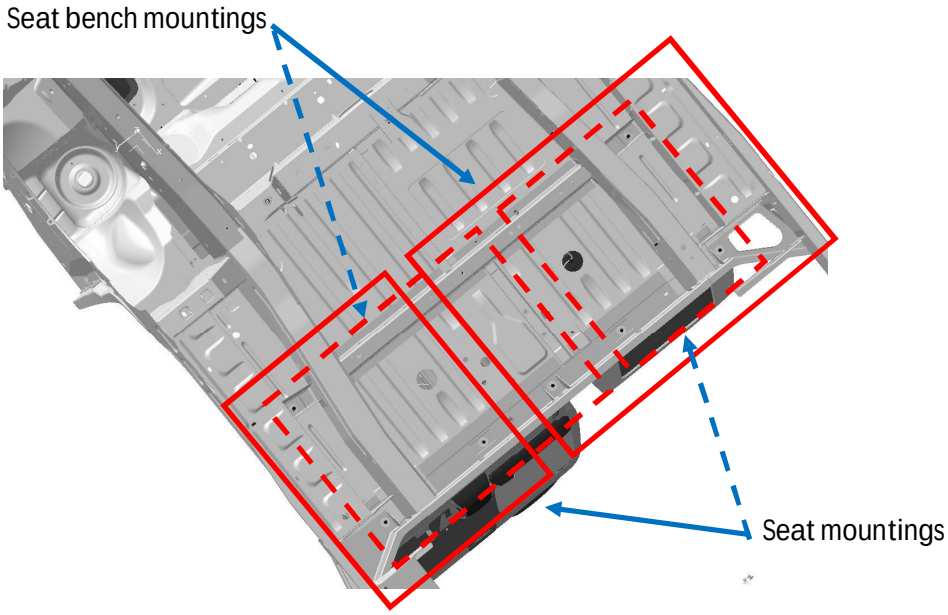
Note: For keyless vehicles with Start/Stop, the driver's seat has a seat pad designed to register entry and exit from the vehicle.
If the driver's seat is changed, it is essential to re-use the same seat pad (company IEE) and to retain the seat belt fastening detection system.

	Company IEE
Occupant detection pad	*004869*

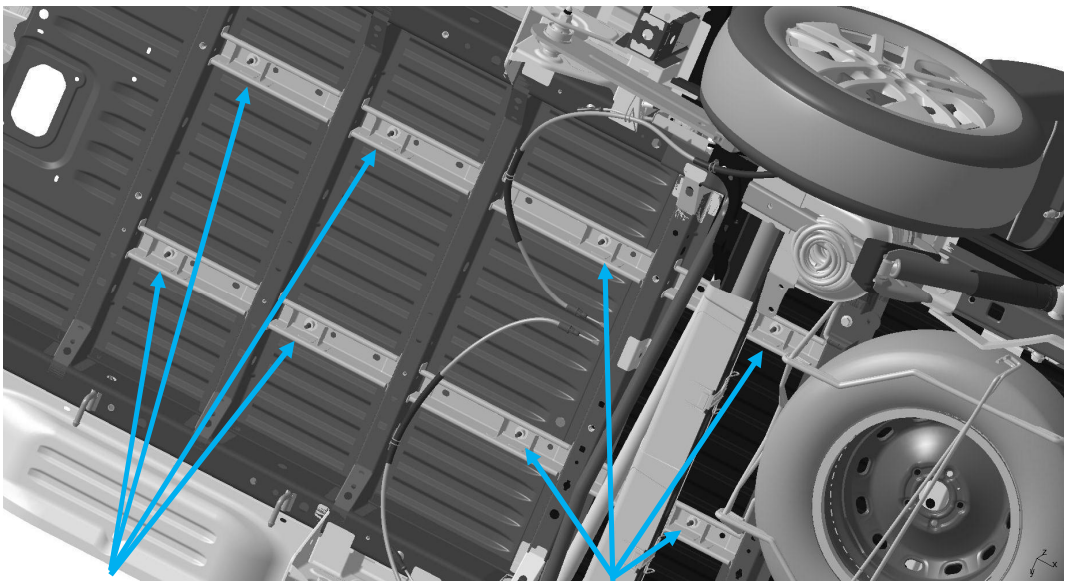
It is prohibited to use the bolts again once they have been removed. The bolts must be replaced with new bolts.

Floor panel

The front floor panel is unique for all vehicle versions. In addition, a seat bench or seat can be fitted on the passenger side whether the vehicle is left-hand or right-hand drive.



On Combi, the centre and rear floor panels are specific. Seat bench can be fitted.



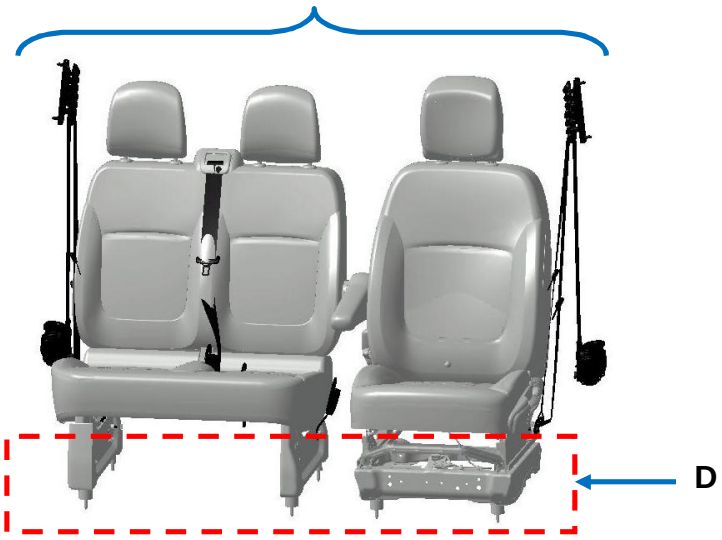
fixing part
seat bench, 2nd row

fixing part
seat bench, 3rd row

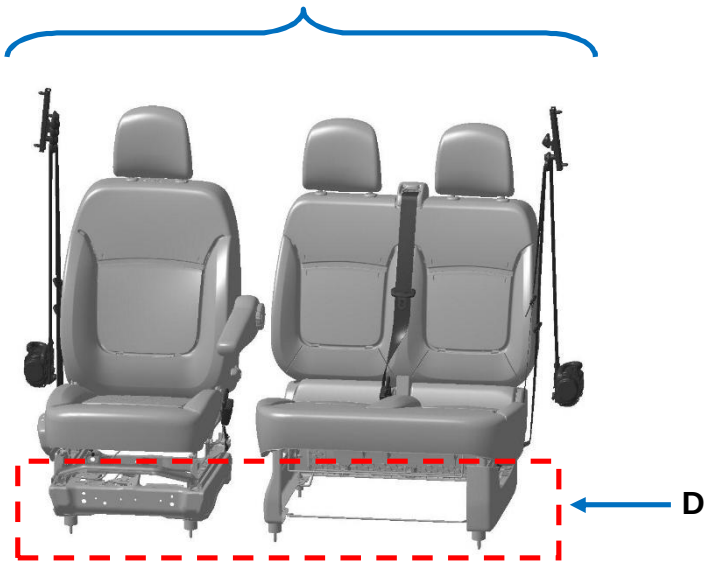
Version with seat ROW 1

Panel van and Combi (1 driver + 2 passengers)

Left-hand drive



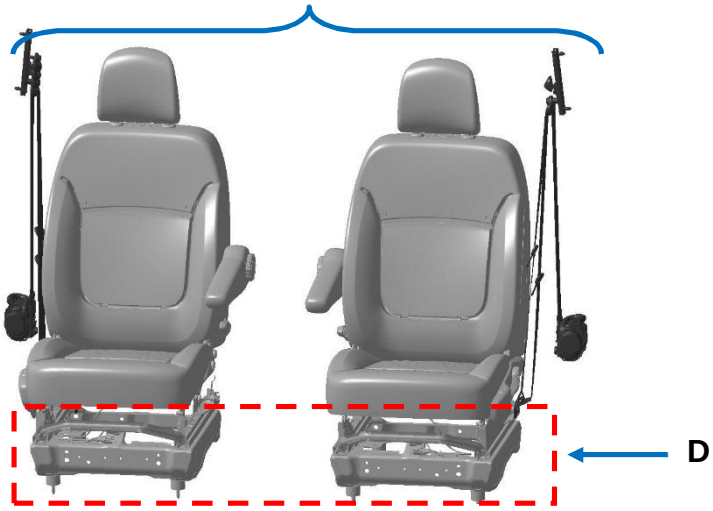
Right-hand drive



	Tightening torques	Mounting part
D	44 Nm ± 15%	8 Vis H EMBASE RDL-M10x70-50

Panel van and Combi (1 driver + 1 passenger)

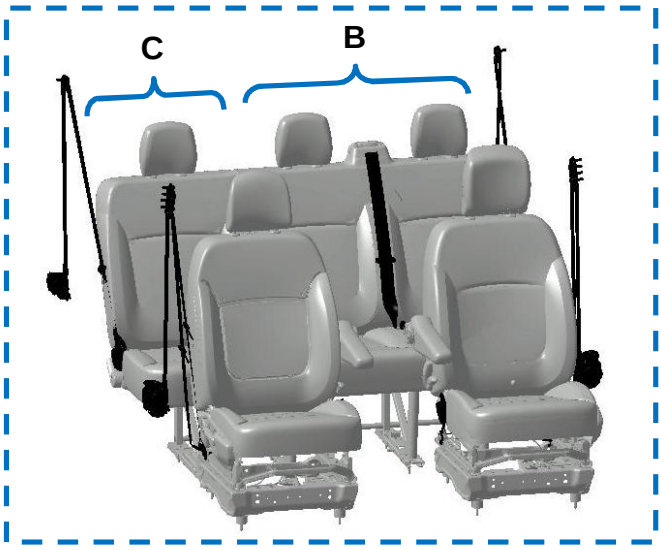
Left-hand drive and right-hand drive



	Tightening torques	Mounting part
D	44 Nm ± 15%	8 Vis H EMBASE RDL-M10x70-50

Version with seat ROW 1 and 2

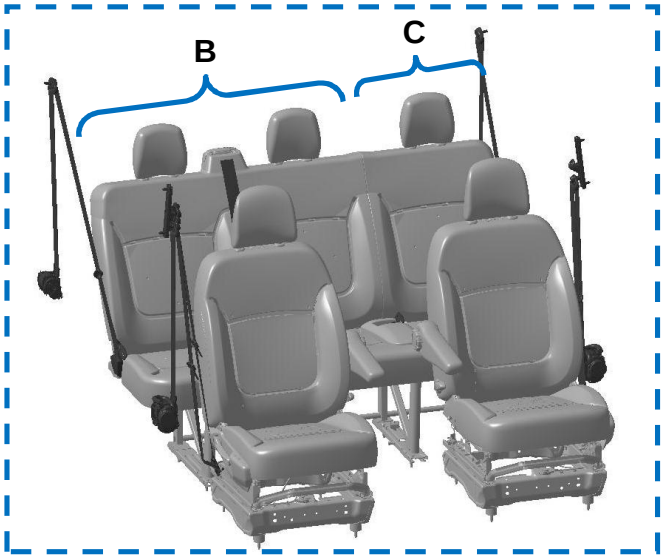
Left-hand drive



B : 2/3 seat bench

C : 1/3 seat bench

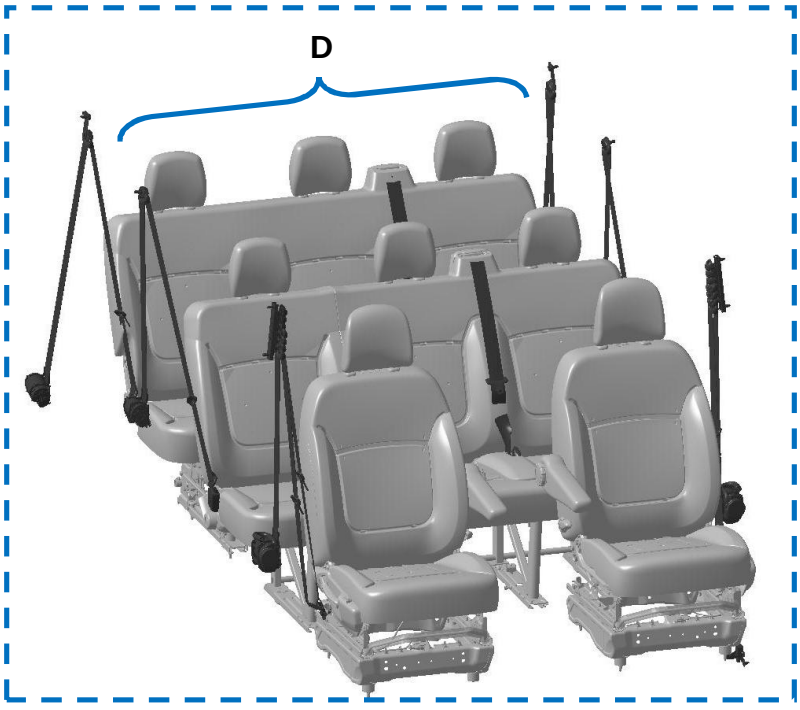
Right-hand drive



B : 2/3 seat bench
C : 1/3 seat bench

Version COMBI ROW 3

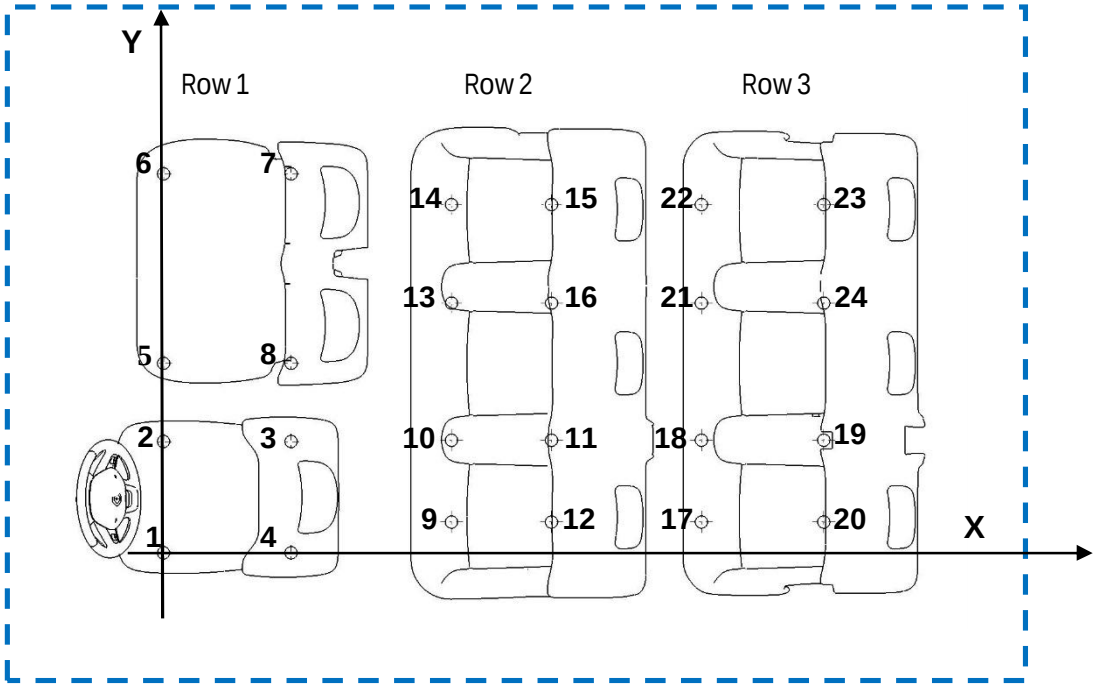
Left-hand drive and right-hand drive



D : 3-place seat bench

Seat and seat bench mountings

Left-hand drive (version with passenger bench seat in row 1)



Passagers 1st row

Pos	X	Y
1	0	0
2	0	362
3	414	362
4	414	0

Pos	X	Y
5	0	616
6	0	1232
7	414	1232
8	414	616

Passagers 2nd row

9	935	100
10	935	366
11	1260	366
12	1260	100

13	935	558
14	935	882
15	1260	882
16	1260	558

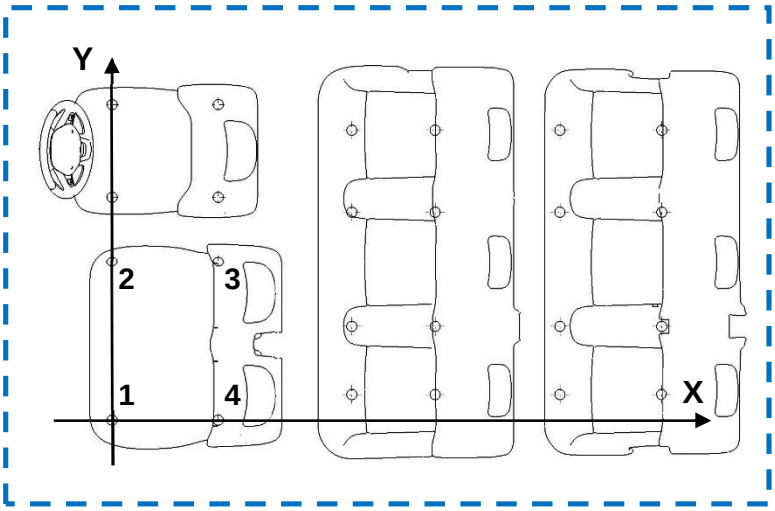
Passagers 3rd row

17	1746,5	100
18	1746,5	366
19	2144	366
20	2144	100

21	1746,5	558
22	1746,5	882
23	2144	882
24	2144	558

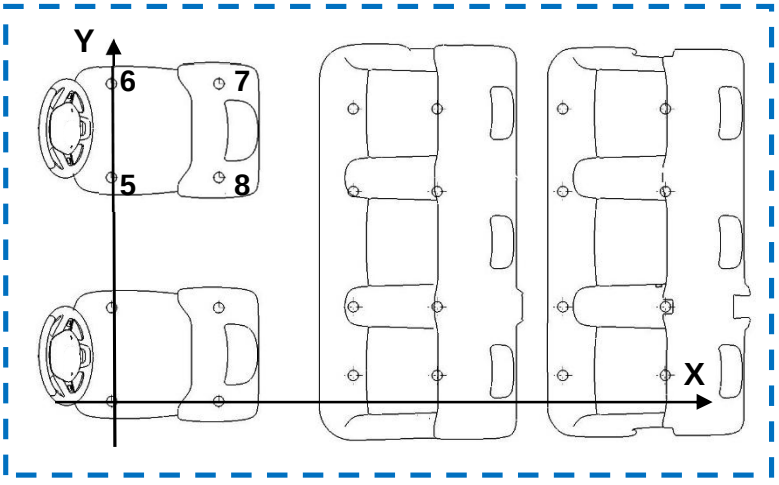
Right-hand drive (version with passenger bench seat in row 1)

Pos.	X	Y
1	0	0
2	0	616
3	414	616
4	414	0

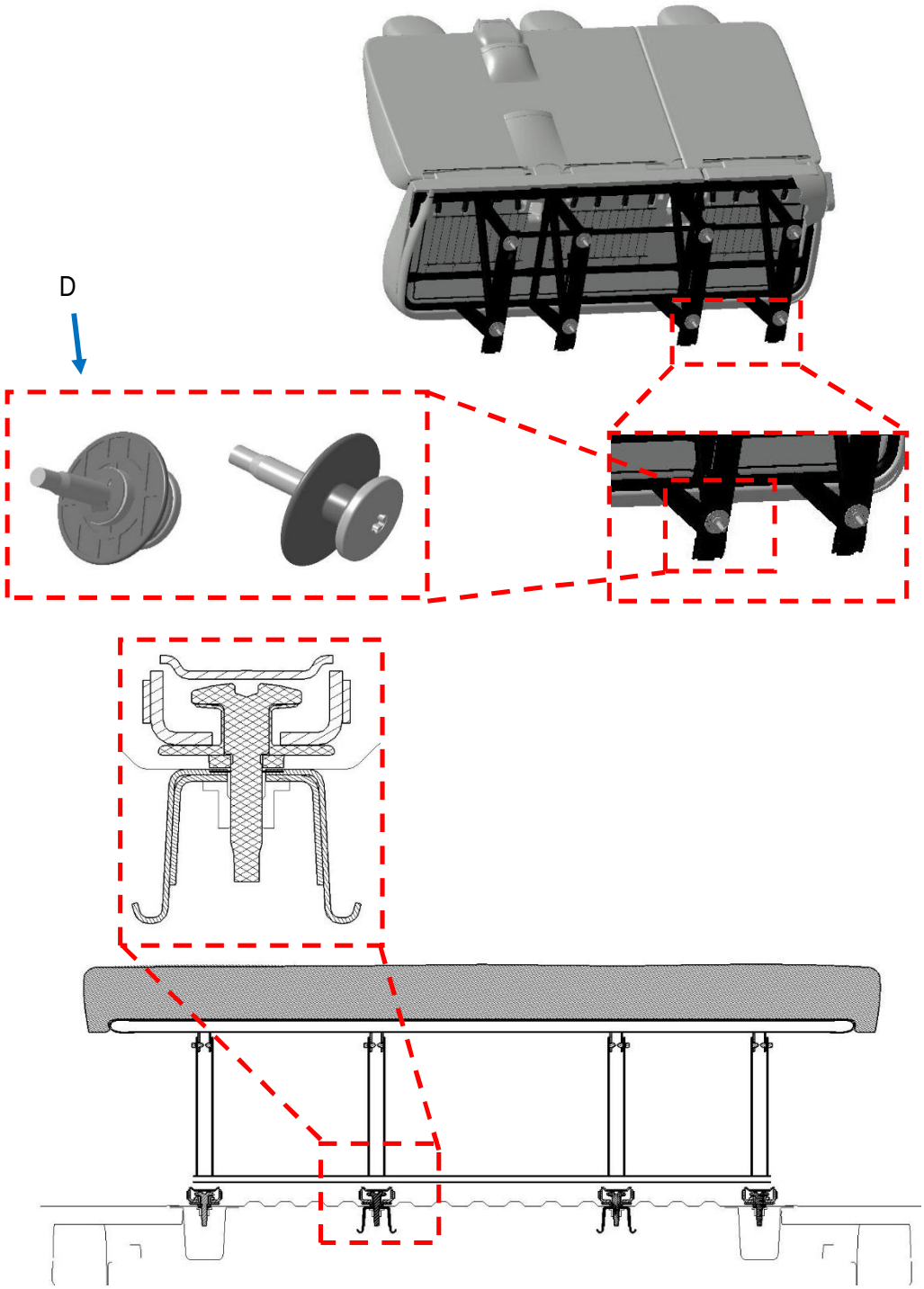


Left-hand drive and Right-hand drive (version with passenger single seat in row 1)

Pos.	X	Y
5	0	870
6	0	1232
7	414	1232
8	414	870



Seat bench mountings ROW 2 and 3



	Tightening torque	Mounting part
D	44 Nm ± 15%	8 bench seat mounting bolts

1.12.2. SEAT BELTS

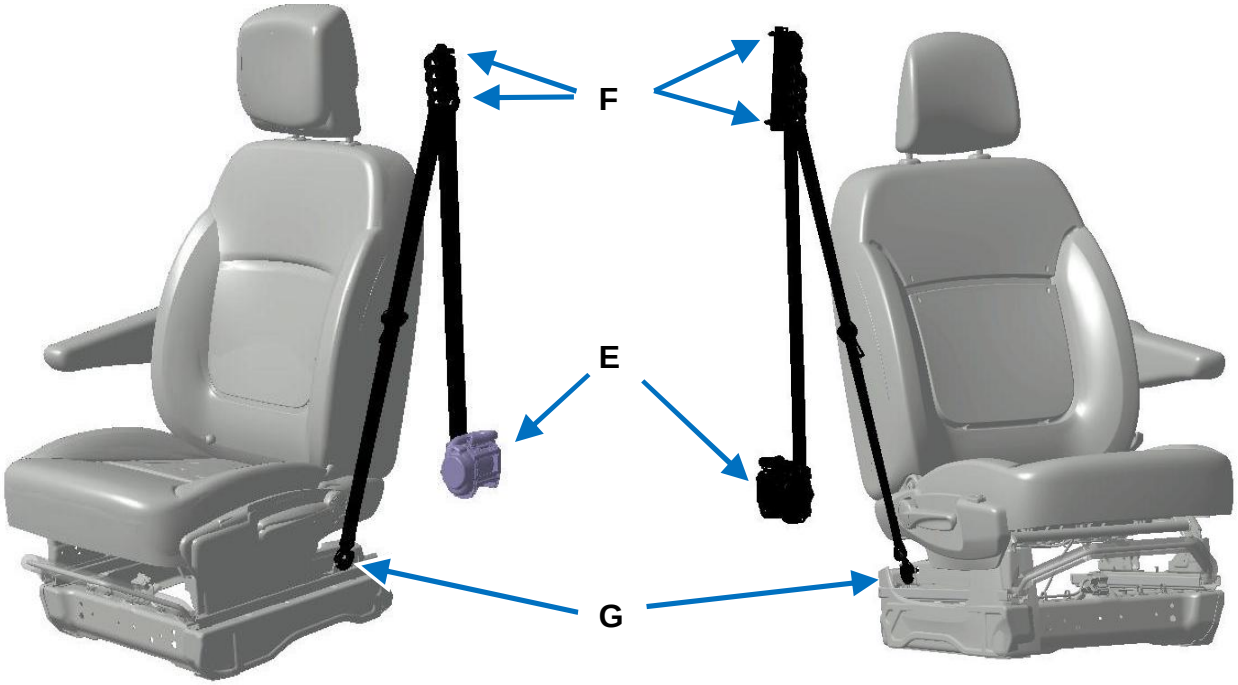
No modification to the seat belt is permitted.

Recommendation for refitting the seat belt retractor.

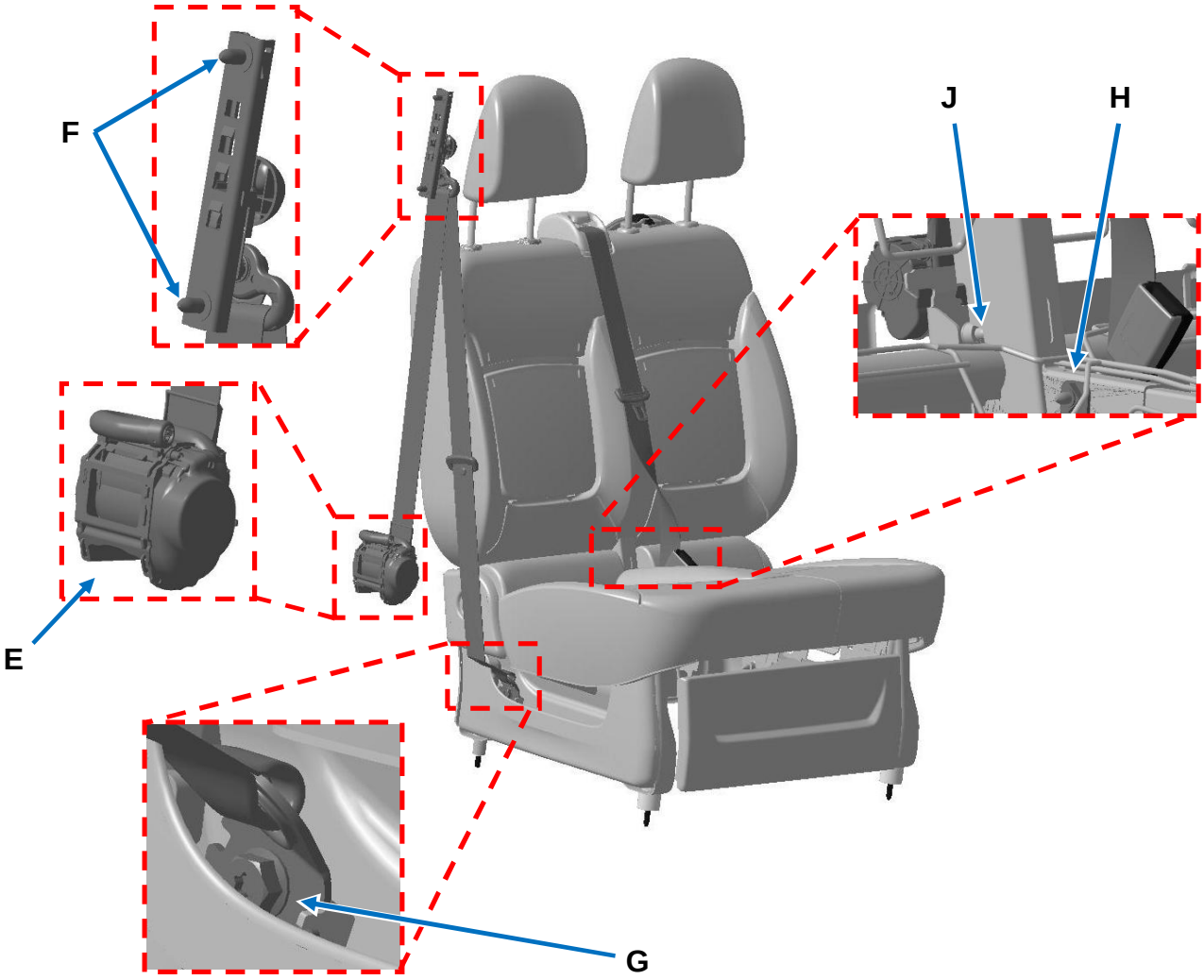
- Check that the retractor indexing is in the correct position before attaching.
- Check that there is no twisting of the belt between the retractor and the final anchorage point.
- Check that no foreign body comes into contact with the belt.
- Do not alter the belt via the vehicle conversion.

Version front seat

driver side passenger side



Version with front passenger seat bench



Tightening torque 21 Nm ± 15%			
E	Seat belt retractor on body.	H flange bolt M10X150-25	The bolt must not be used again once it is removed. It must be replaced by a new one.
F	Belt height adjusting mechanism on body.	It is not possible to change the bolt during assembly.	Bolt pre-assembled on the seat belt mechanism.
G	Anchorage fitting on seat.	H flange bolt M10X150-25	The bolt must not be used again once it is removed. It must be replaced by a new one.
H	Anchorage fitting on seat.	It is not possible to change the bolt during assembly.	
J	Seat belt retractor on seat.		

1.13. EXTERNAL REAR-VIEW MIRROR

Panel vans and platform cabs are supplied with external rear-view mirrors as standard.

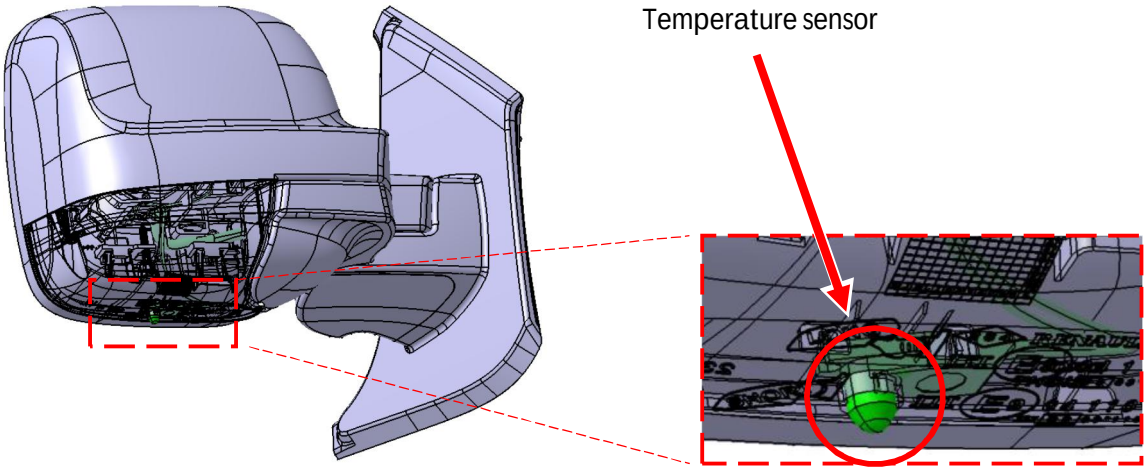
On the platform cab, "long arm" rear-view mirrors can be ordered as an option.

All vehicles that comply with the standard Euro6 or Euro VI (fitted with adblue type emission control system) are fitted with external temperature sensors in the door mirror.

Note:

- For details of maximum body option widths with standard and long arm rear-view mirrors, see Section 2.1: "Main views and Dimensions"
- The casing of the right-hand rear-view mirror is pre-equipped to receive a radio aerial wire.
- The temperature sensors is fitted in the right-hand door mirror. In addition to the sensor, the exterior mirrors are fitted with an electric defrosting system.

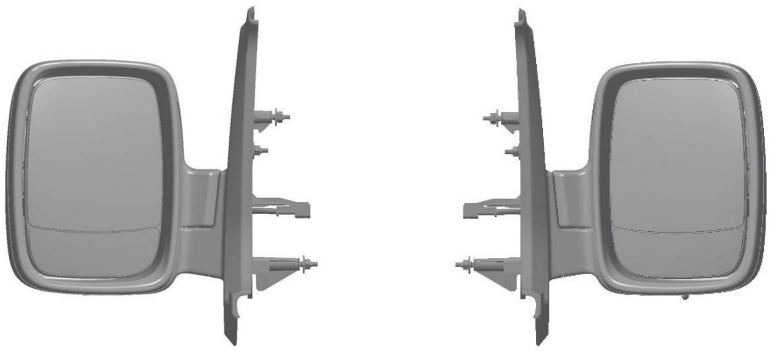
Location of the temperature sensor



Attention:

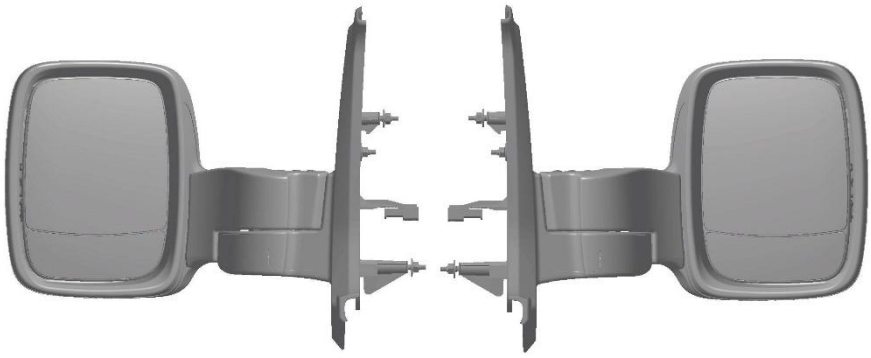
- The external temperature information (sensor in the right-hand door mirror) is taken into account by the SCR-control unit that manages the injection of urea for the emission control. It is forbidden to remove the sensor to separate or to replace it with another sensor, because in these cases, the warning lights are activated or the vehicle can be decommissioned.

Standard rear-view mirrors
Max. permitted width for body conversion “G2= 1995 mm”



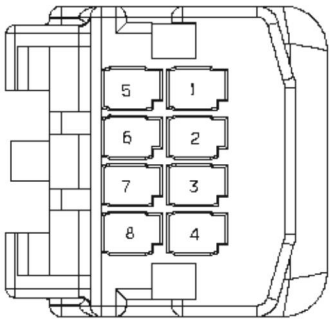
TYPE	OPTION CODE
Manual without mirror heating	DBI
Electric with mirror heating	DL8

Long arm rear-view mirrors
Max. permitted width for body conversion “G2 = 2150 mm”



TYPE	OPTION CODE
Electric without mirror heating	DB5

Electric door mirror wiring



LEFT-HAND FRONT door connector

Number	Name	Wiring colour
1	L/R direction motor terminal	Green
2	Shared motor terminal	Blue
3	Up/down direction motor terminal	Yellow
4	De-icing (+)	Brown
5	De-icer earth (-)	Brown
6	Not used	
7	Not used	
8	Not used	

RIGHT-HAND FRONT door connector

Number	Name	Wiring colour
1	L/R direction motor terminal	Green
2	Shared motor terminal	Blue
3	Up/down direction motor terminal	Yellow
4	De-icing (+)	Brown
5	De-icer earth (-)	Brown
6	Not used	
7	Temperature sensor (+)	Black
8	Temperature sensor earth	Black

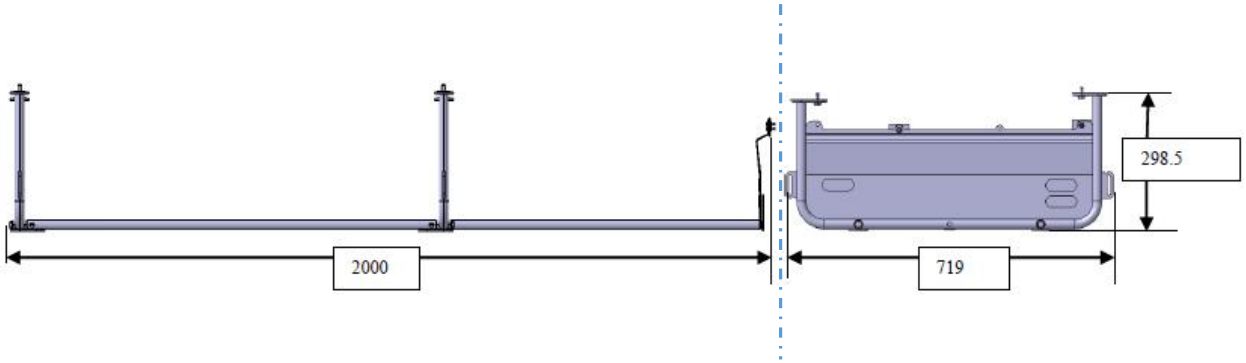
1.14. INTERIOR ROOF RACK

An interior roof rack (part no. 95599431) offered for the panel van L1H1 as retrofitting.

Optimal use of normally unused space under the roof to safely store bulky items such as ladders, pipes and boards.

- Maximum load: 12 kg
- Made of steel, incl. Load Stops
- For installation on the existing fixing points in the roof
- Suitable for vehicles with right or left sliding door

INTERIOR ROOF RACK Specifications



MAXIMUM loading capacity: 13 kg distributed over all of the 6 mountings.

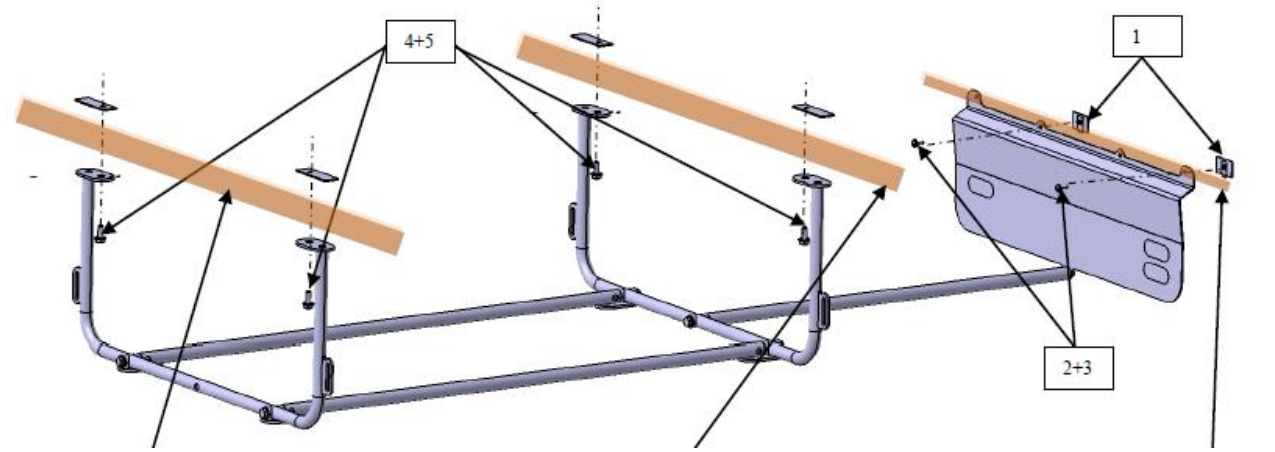
Interior roof rack weight: 7 kg

Length: 2 m

Width: 71.9 cm

Height: 29.85 cm

INTERIOR ROOF RACK Mounting

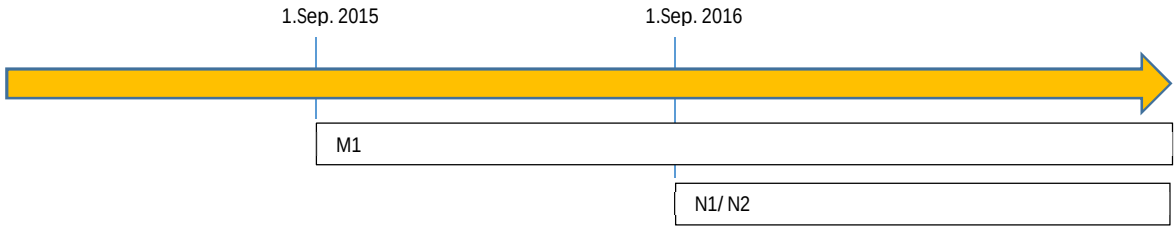


1.15. ADBLUE (Urea) emission control system

Emission control system = SCR (Selective Catalytic Reduction) is used to reduce nitrogen oxide emissions.

The regulatory application of Euro standards (5; 6b; VI b) will occur based on the following schedule:

Before 1 September 2015 à Definition of Euro 5 (therefore without ADBLUE).



1.15.1. General information

This standard requires a NOx treatment system on the exhaust. The technical solution retained is the SCR (Selective Catalytic Reduction) type treatment by catalyst with urea injection. The use of an additive reduces the exhaust gases by transforming pollutants into steam and nitrogen. The available additive is found in a dedicated tank (called "urea tank"). The urea filler flap is located in the side of left-hand body.

This involves the following technical changes:

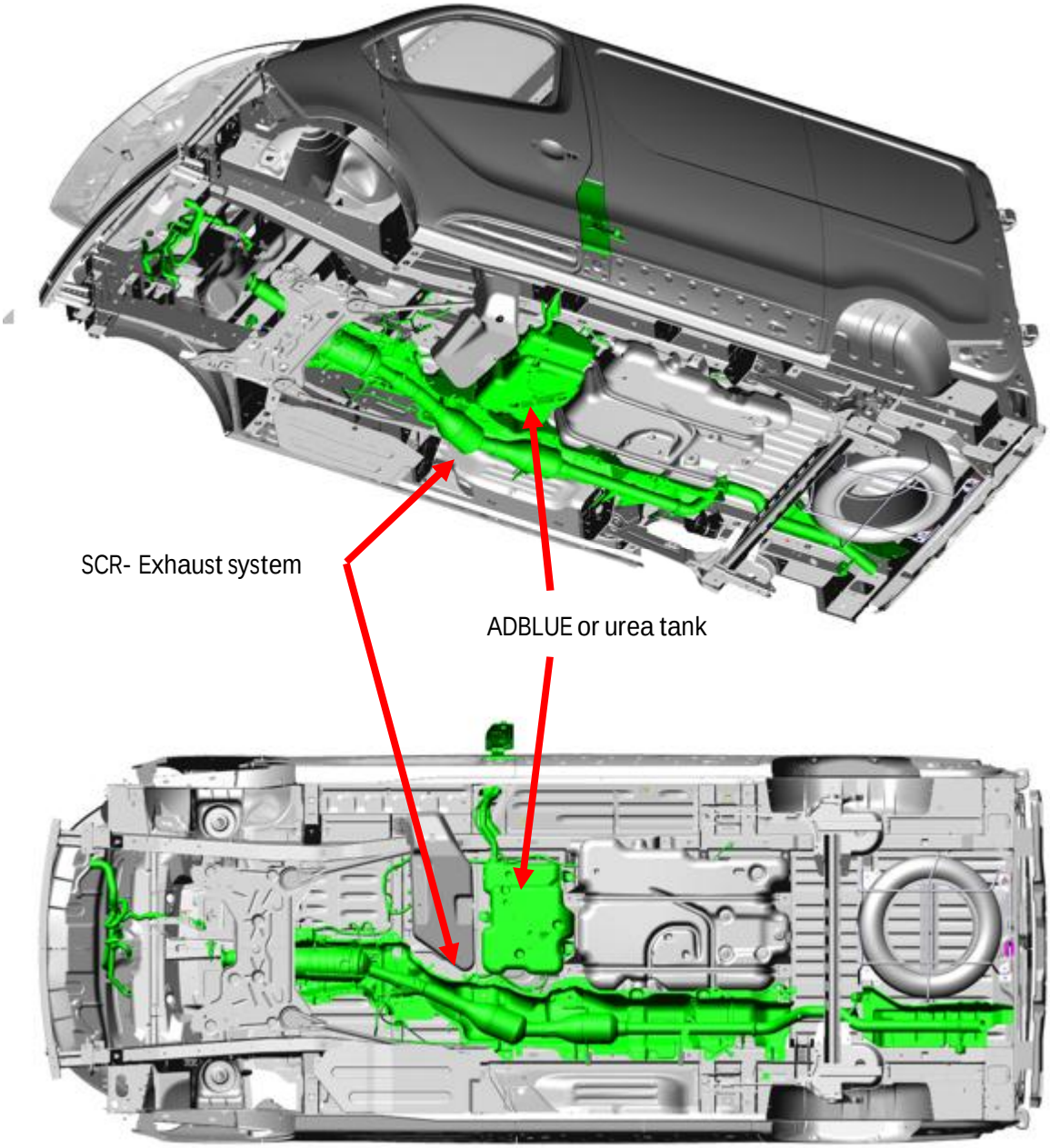
- Adblue filling located in the fuel filler flap area
- an Adblue tank with an injection system and associated computer
- an exhaust system with the SCR catalytic converter

Attention:

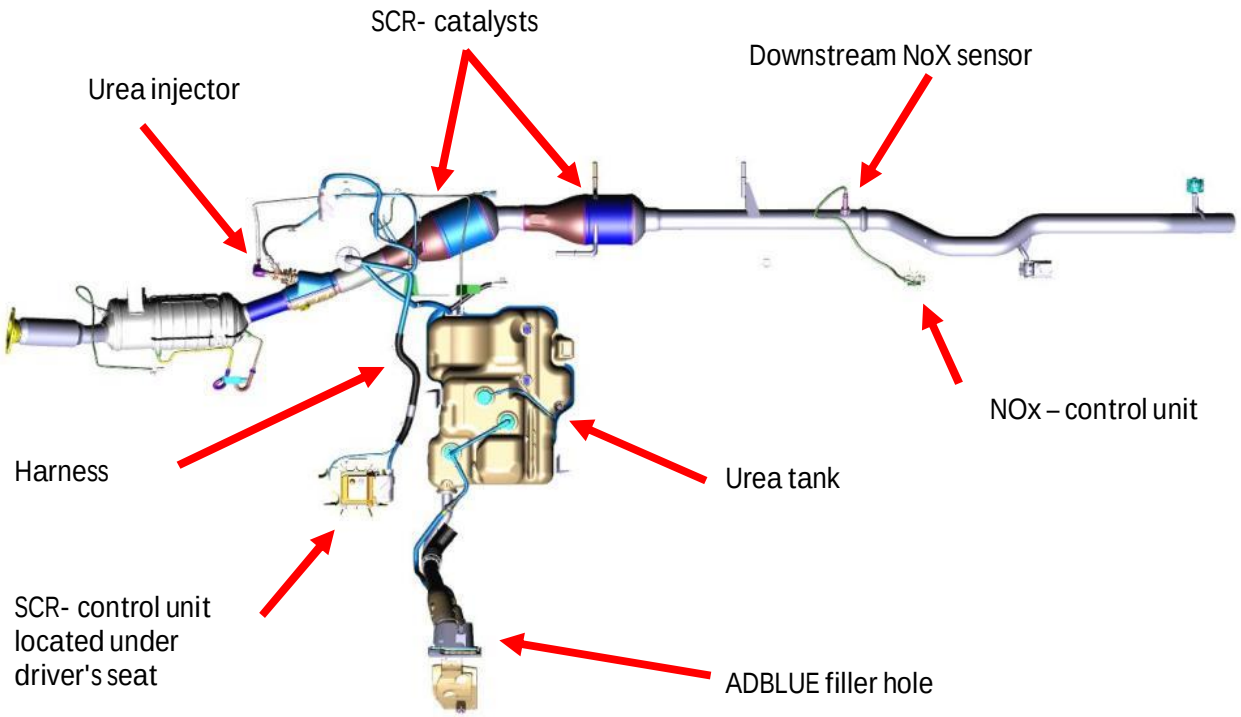
The urea tank, filler pipe and urea circuit (including the gauge module) must not be modified. However, if the system must be modified, this will require the coach builder to apply for a new type approval.

For changes of the exhaust tailpipe the converter need to make sure that no water can penetrate into the exhaust pipe (for NOx sensor) and guarantee the thermal protection for the surrounding components at the underbody.

1.15.2. ELEMENTS THAT CONSTITUE THE SCR SYSTEM (Bottom View)



SCR-System (Top view)

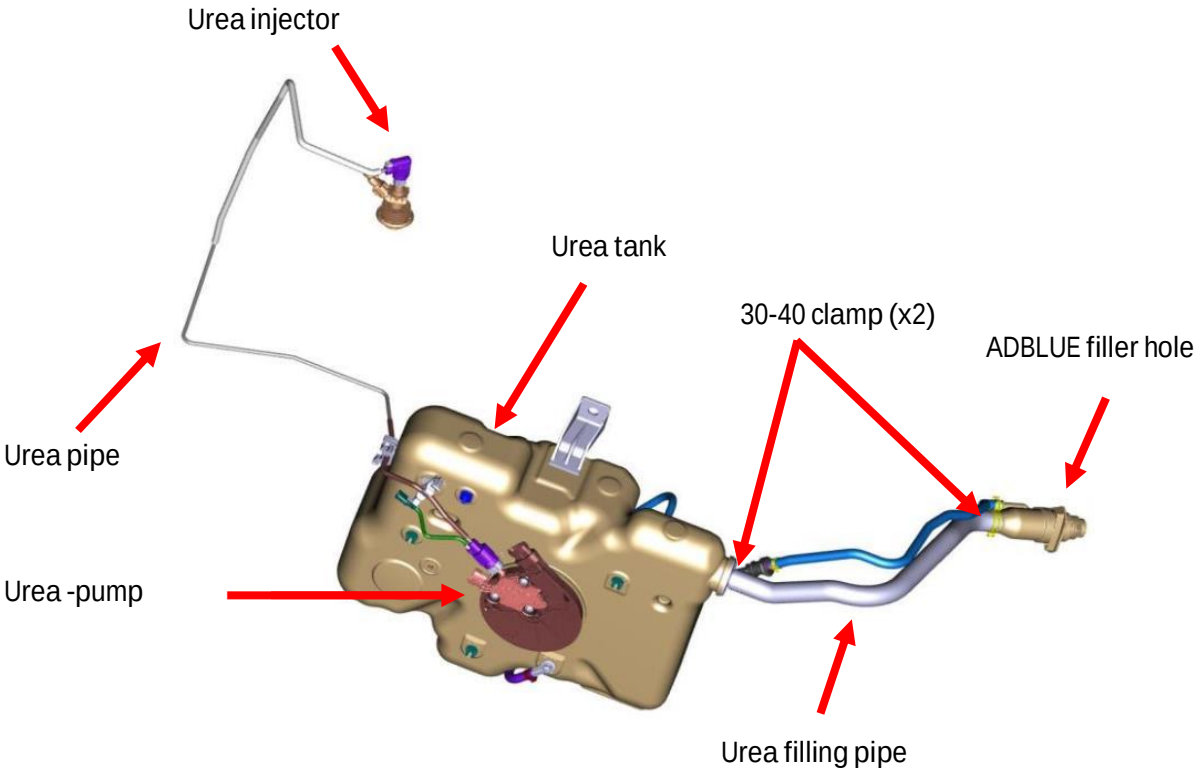


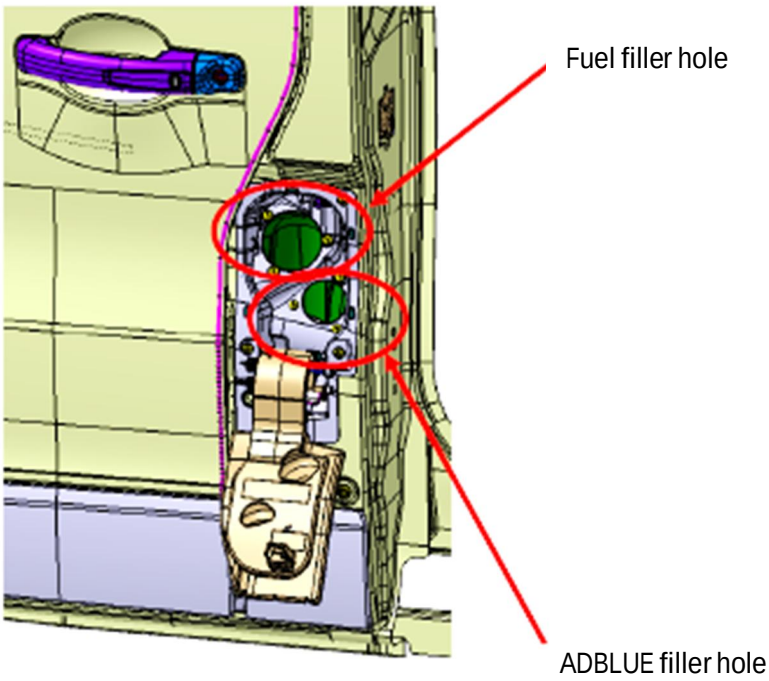
Note:

The urea tank has a capacity of 22.4 liters

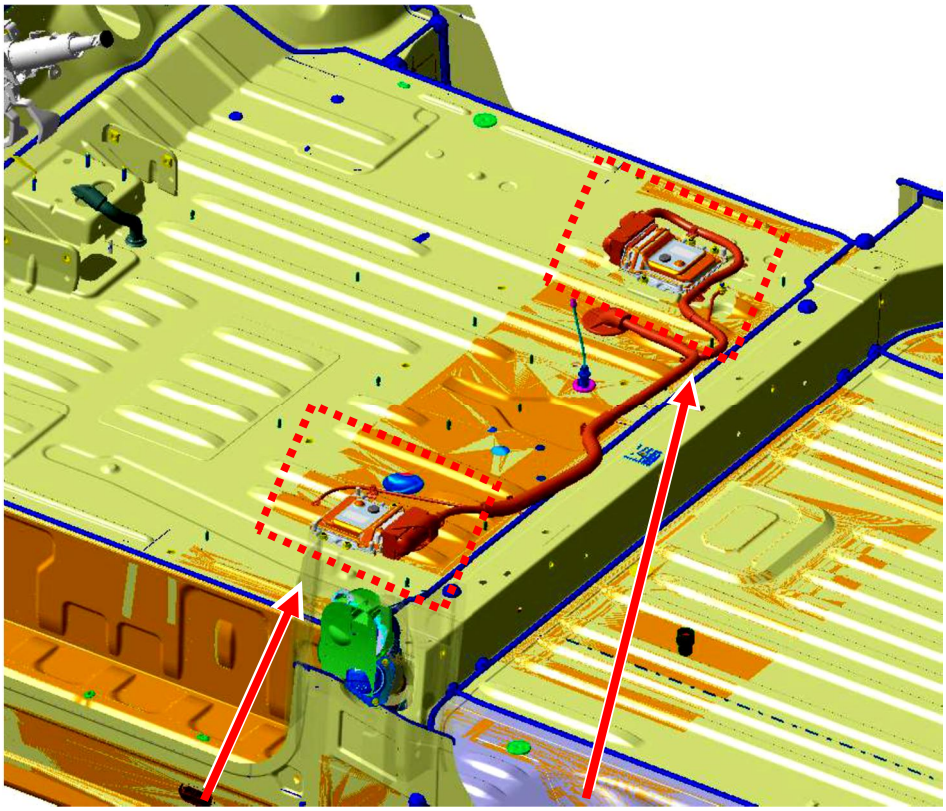
For more information about the exhaust system see also Chapter 1.10.5

1.15.3. Components of the urea tank system





1.15.4. Position of SCR-Control Unit



SCR-control unit
For LHD

SCR- control unit
for RHD

The definition of the DCU computer software depends on the position of the tank and the definition of the tank/injector pipes (length and elbow).

The computer is located on the platform cab UNDER the driver's seat. The SCR computer's wiring therefore passes through the platform.

The computer is protected by a cover fixed to the floor with 3 screws.

No element must be resting on the computer or its cover

1.15.5. Disassembly/ reassembly recommendation

During possible disassembly/reassembly of the SCR system, the system's absolute integrity must be guaranteed.

Note:

The urea tank, filler pipe and urea circuit (including the gauge module) must not be modified.

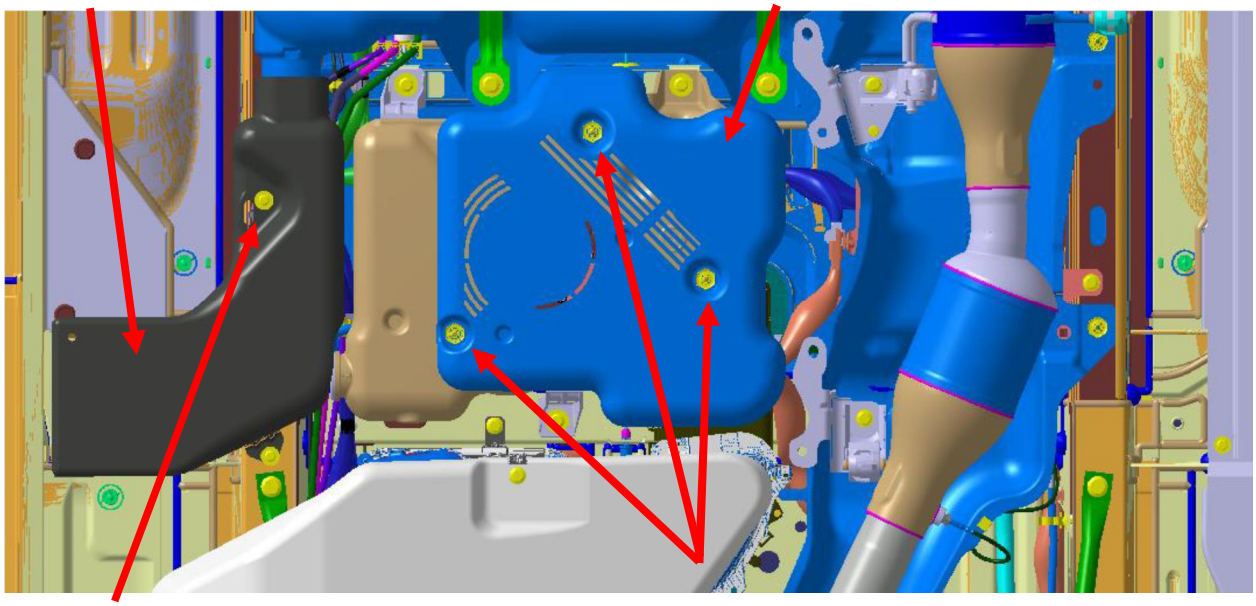
If the tank is drained; the SCR (Selective Catalytic Reduction) must be reset after reassembling and filling in the Opel/Vauxhall network.

The tank will be disassembled in the following order:

1. Mounting of the filler pipe guard.
2. Mounting of the urea tank guard
3. Mounting of the urea tank

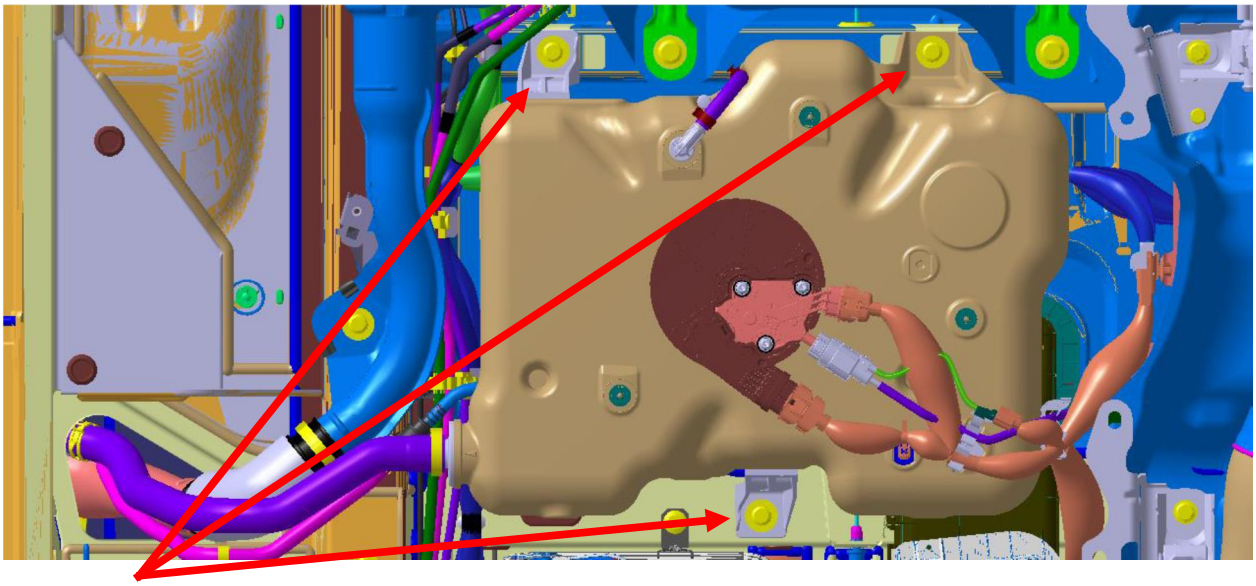
filler pipe protection

urea tank protection



Fastening of the filler pipe protection

Fastening of the urea tank protection



Fastening of the urea tank

Note:

The SCR system will be reassembled in the following order with the corresponding torque values:

- Mounting of the urea tank (Torque: 21 Nm)
- Mounting of the urea tank guard (Torque: 2 Nm)
- Mounting of the filler pipe guard. (Torque: 2 Nm)

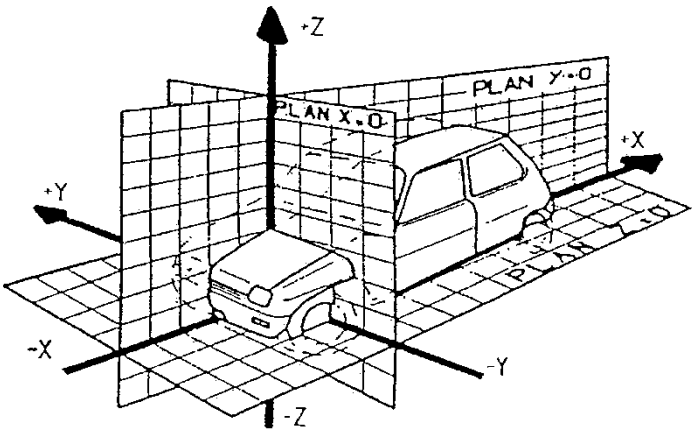
2. WEIGHTS AND DIMENSIONS

2.1. REFERENCE GUIDE/MAIN VIEWS AND USEFUL DIMENSIONS

2.1.1. REFERENCE GUIDE

In general, dimensions are expressed as absolute (dimension between two points) and positions as relative (location in the OPEL / VAUXHALL reference guide). The origin of this reference guide is a point located on the front wheel shaft, at the centre of the vehicle, as illustrated in the view below.

The front wheel shaft is set at 3 mm along the X-axis, +/- 1 mm, between an unladen vehicle and a laden vehicle.

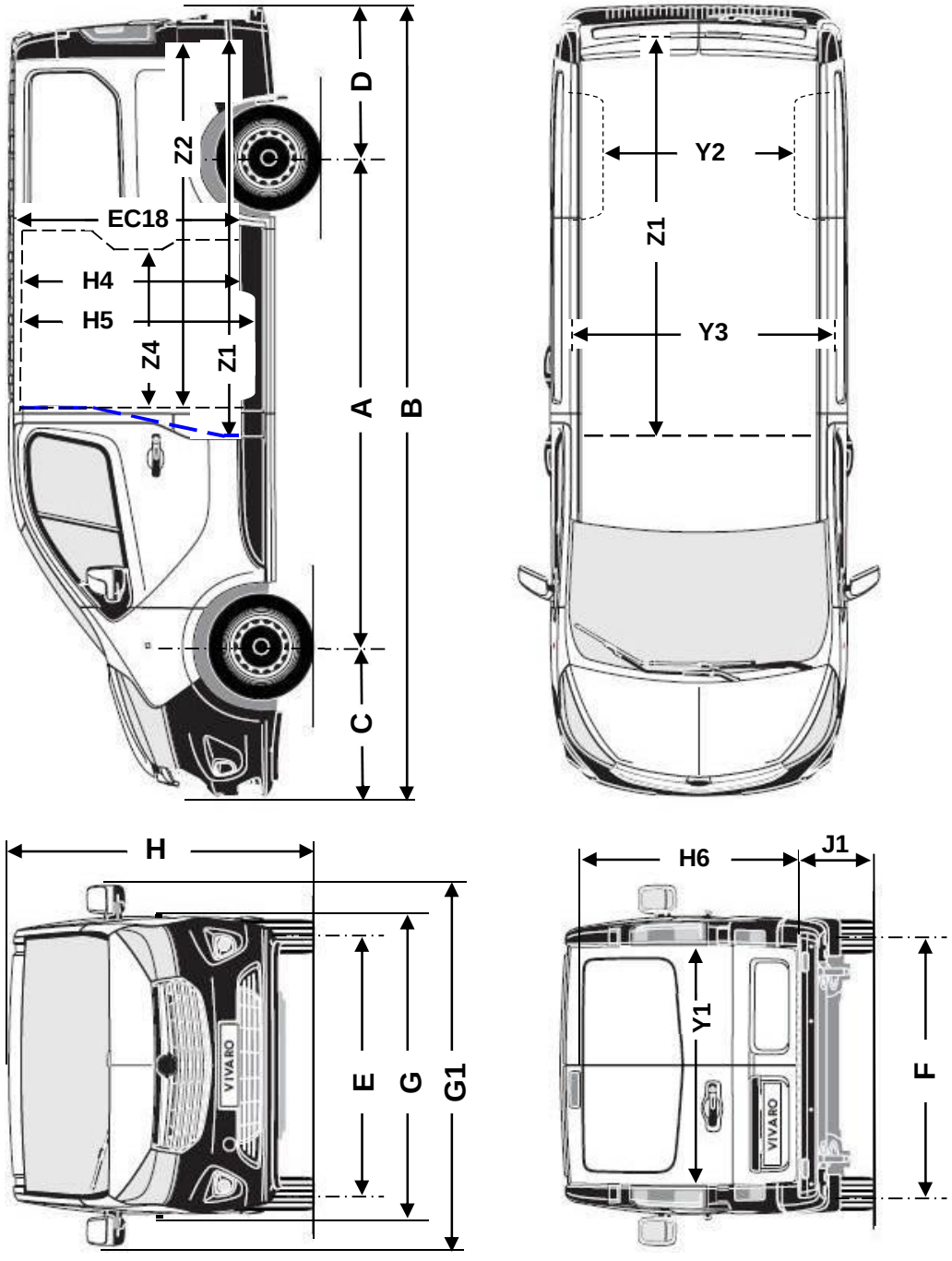


NORME N° 0100112

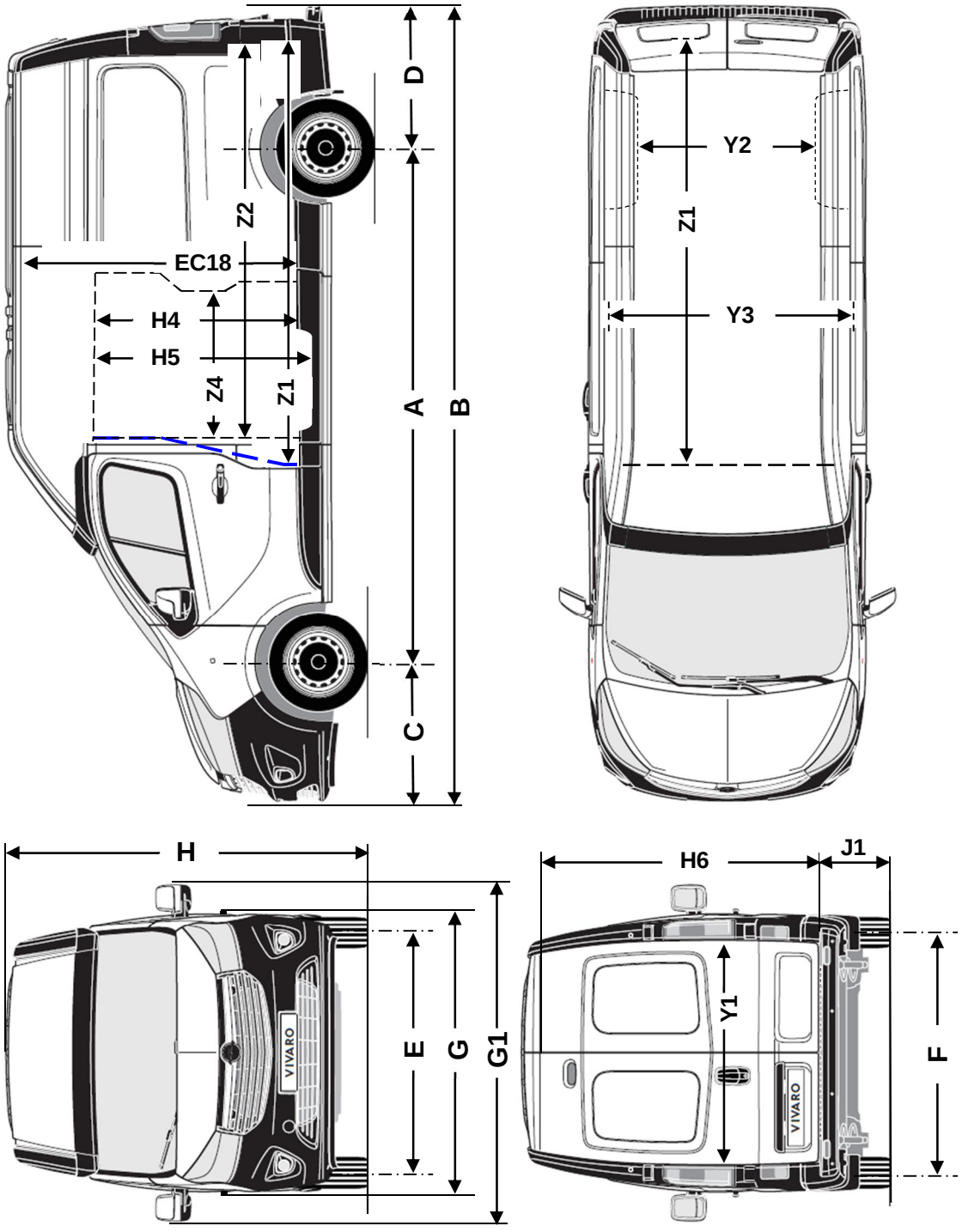
2.1.2. MAIN VIEWS AND USEFUL DIMENSIONS

The figures below show the different versions of the Vivaro.
The main dimensions are given in the tables.

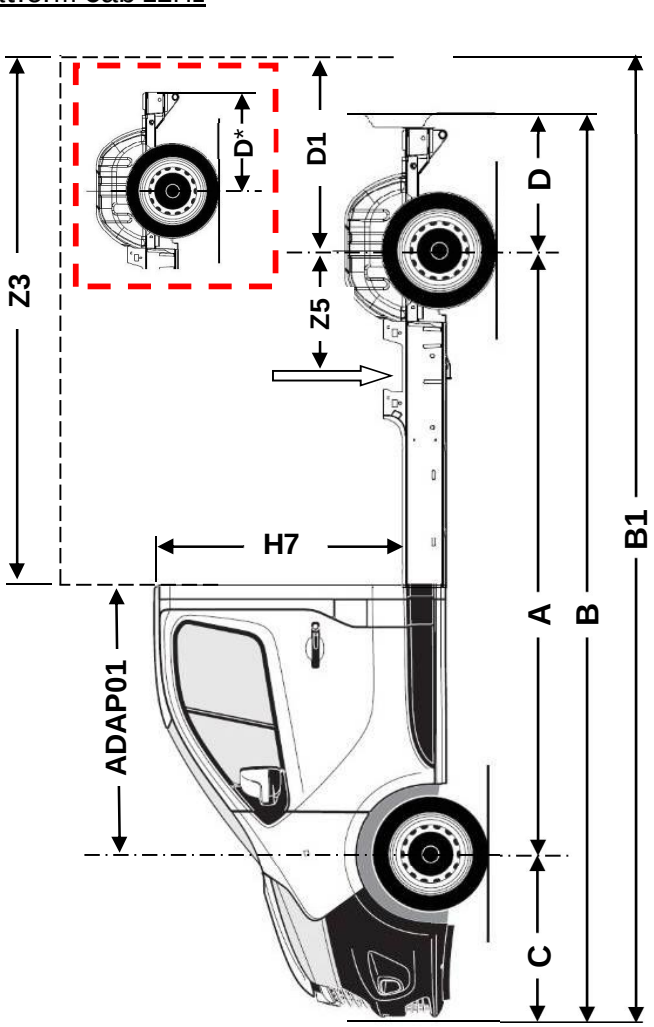
Panel Van L1H1

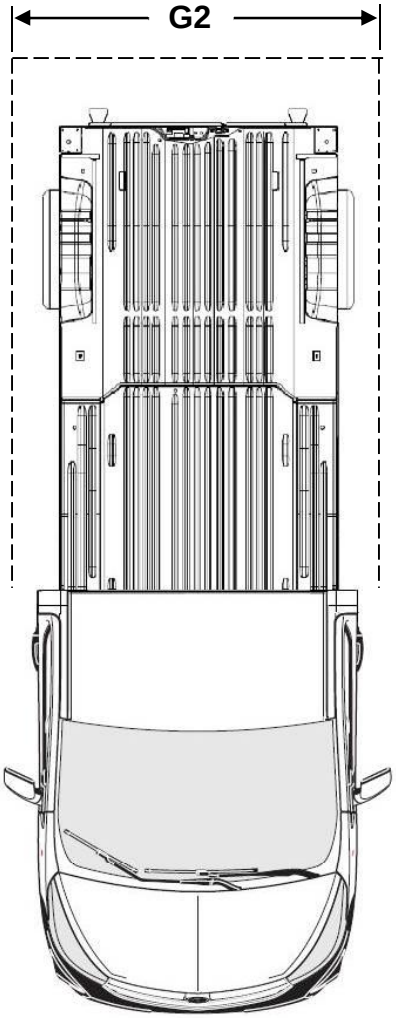


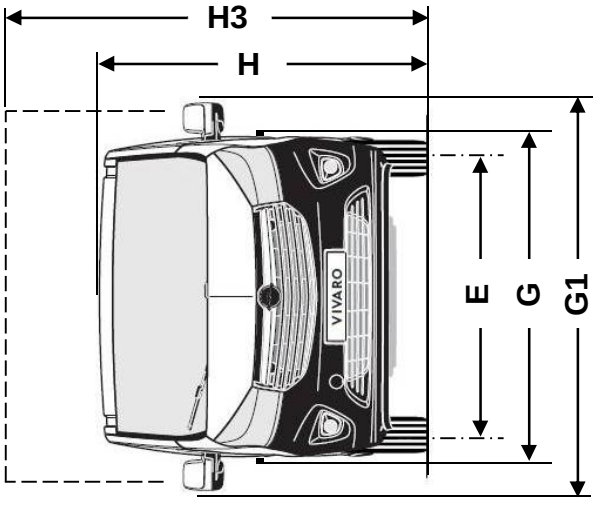
Panel Van L2H2

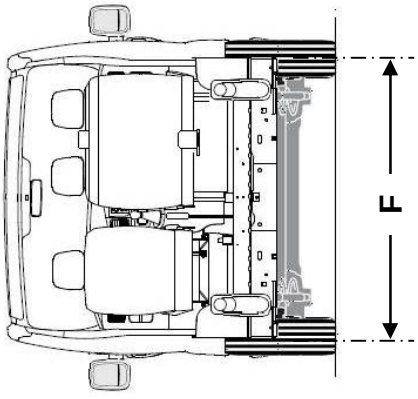


Platform Cab L2H1





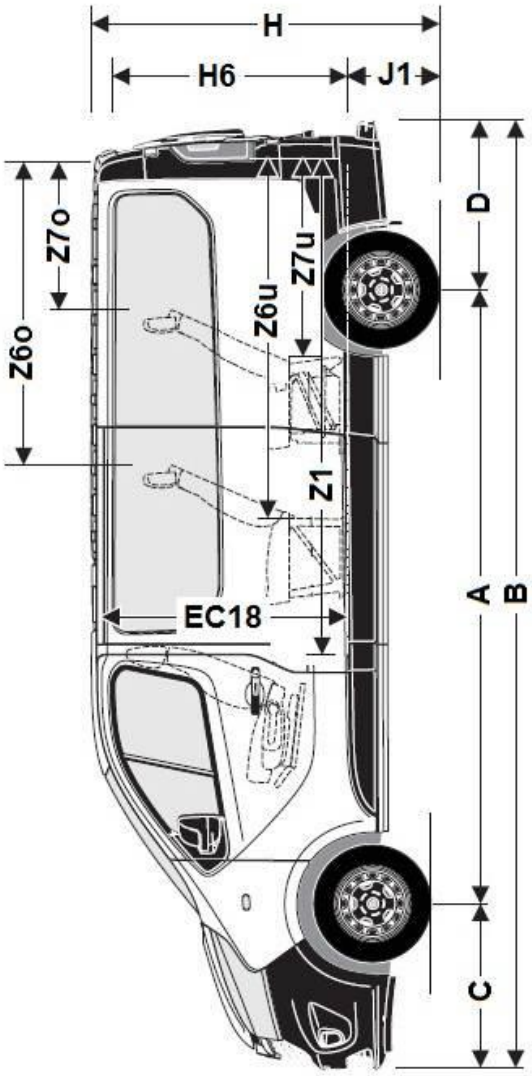


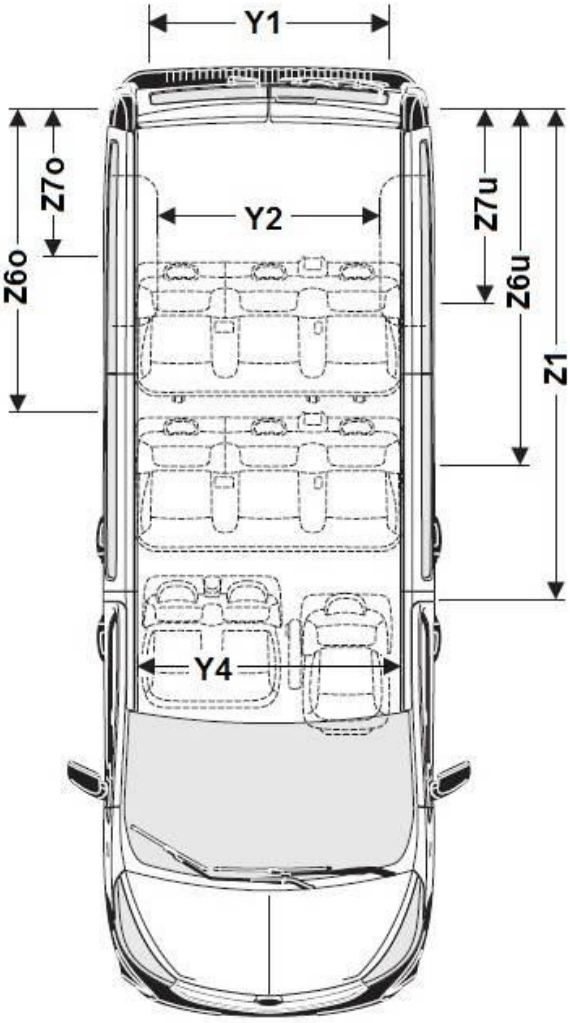


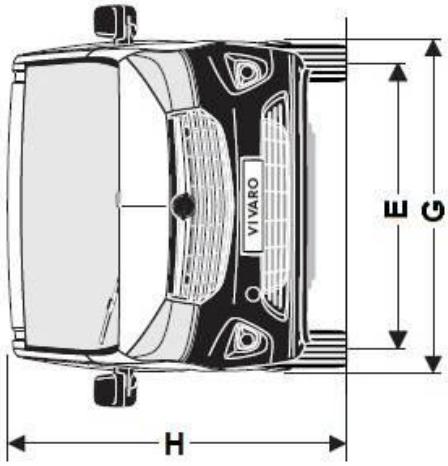
Version		Panel Van				Platform Cab
Wheelbase length						L2
Roof	H1 = standard H2 = high	H1	H2	H1	H2	H1
A		3098	3098	3498	3498	3498
B		4999	4999	5399	5399	5248
B1		–	–	–	–	5648
C		933	933	933	933	933
D / D*		968	968	968	968	882 / 817*
D1		–	–	–	–	1217
E		1615	1615	1615	1615	1615
F		1628	1628	1628	1628	1628
G		1956	1956	1956	1956	1956
G1	Min / Max	2283 / 2494	2283 / 2494	2283 / 2494	2283 / 2494	2283 / 2494
G2	** Max	–	–	–	–	1995 / 2150 **
H	Kerb weight	1971	2493	1971	2493	1953
H3		–	–	–	–	2700
H4		1284	1284	1284	1284	–
H5		1340	1340	1340	1340	–
H6	Y +/- 400	1314	1847	1314	1847	–
H7		–	–	–	–	1443
J1	GVW	552	552	552	552	N.A.
K	GVW	160	160	160	160	160
ADAP01		–	–	–	–	1615
EC18		1387	1898	1387	1898	–
V	[m³]	5,2	7,2	6,0	8,6	–
Y1		1391	1391	1391	1391	–
Y2		1268	1268	1268	1268	1268
Y3		1662	1662	1662	1662	–
Y4		1624	1624	1624	1624	1624
Z1		2537	2537	2937	2937	–
Z2	Y +/- 0	2210	2210	2610	2610	–
Z3		–	–	–	–	3100
Z4	Min / Max	907/ 1030	907/ 1030	907/ 1030	907/ 1030	–
Z5		–	–	–	–	N.A.

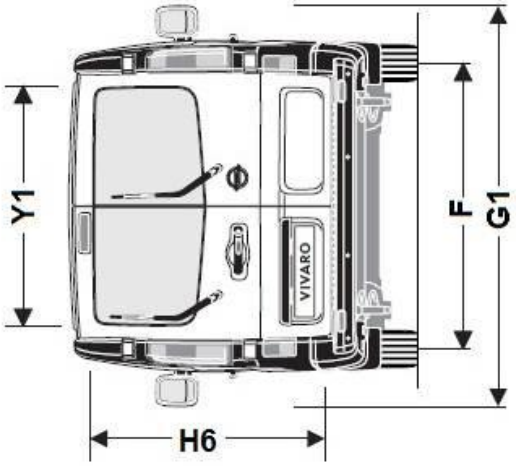
* Dimension for panel, without lighting, special feature for "camping-car" conversion.
** max width for mirror with short arm / mirror with long Arm

Combi


H
H6
J1
D
Z7o
Z7u
Z6u
Z6o
Z1
EC18
A
B
C


Y1
Z7o
Y2
Z7u
Z6o
Z6u
Z1
Y4


VIVARO
E
G
H


Y1
VIVARO
F
G1
H6

Version			Combi	
Wheelbase length			L1	L2
Roof	H1 = normal		H1	H1
A			3098	3498
B			4999	5399
B2			6129	6529
C			933	933
D			968	968
E			1615	1615
F			1628	1628
G			1956	1956
G1			2283	2283
H		at kerb weight	1971	1971
H4			1284	1284
H5			1340	1340
H6			1295	1295
J1		at kerb weight	552	552
K		at GVW	160	160
EC18			1369	1369
V ***		cargo volume up to roof/ with folded last seat bench / without last seat bench [m³]	1 / 2.5 / 3.2	1,8 / 3.4 / 4.1
Y1		Min / Max	1368 / 1391	1368 / 1391
Y2			1268	1268
Y3			1662	1662
Y4			1624	1624
Z1 ***	Cargo area length on floor without seat benches		2537	2937
Z6o ***	second seat row, up		1350	1750
Z6u ***	second seat row, bottom		1679	2079
Z7o ***	third seat row, up		452	852
Z7u ***	third seat row, bottom	with tailgate / with rear doors	734 / 765	1134 / 1165
Z4		Min / Max	907/ 1030	907/ 1030

*** = Dimensions especially at Combi

Legend		
A	=	Wheelbase
B	=	Overall length
B1	=	Maximum overall length of the vehicle (B1 = C+A+D1)
B2	=	Overall length with the tailgate open
C	=	Front overhang
D	=	Rear overhang
D*	=	Rear overhang without rear lamps (Platform Cab only)
D1	=	Maximum extension of rear overhang
E	=	Front Track
F	=	Rear Track
G	=	Overall width (without rear view mirrors)
G1	=	Overall width with rear view mirrors standard arm / long arm (option)
G2	=	Maximum overall cargo area width
H	=	Overall height of the vehicle
H3	=	Maximum overall height of the vehicle
H4	=	Sliding door sill height
H5	=	Sliding door sill height with step
H6	=	Rear door sill height (reference guide at Y = +/- 400)
H7	=	Distance from the cabin roof - cargo floor
J1	=	Loading sill height (GVW)
K	=	Ground clearance
ADAP01	=	Horizontal distance between front wheel and rear panel of the Cabin
EC18	=	Maximal headroom in cargo area
V	=	Max. cargo volume [m³]
Y1	=	Rear door sill width
Y2	=	Width between wheel arches
Y3	=	Maximum Cargo area width
Y4	=	Elbows wide, front
Z1	=	Cargo area length on floor
Z2	=	Minimum cargo area length between partition and rear doors
Z3	=	Maximum overall conversion body length
Z4	=	Sliding door sill width
Z5	=	Distance Load application to rear axle

Legend		
Z6o	=	Loading length to the seatback of the second seat row. (Combi only)
Z6u	=	Loading length at the floor to the second row seat. (Combi only
Z7o	=	Loading length to the seatback of the third seat row. (Combi only)
Z7u	=	Load length at the floor to the third seat row. (Combi only)

2.2. WEIGHTS

2.2.1 WEIGHTS for versions without SCR

F82 - L1H1 PANEL VAN									
Engine / gearbox			R9M/ PF6						
Engine suffix			408		450		408		450
Depollution			EU5		EU4&5		EU5		EU4&5
Number of seats			2				3		
Payload [kg]			1000	1200	1000	1200	1000	1200	1000	1200
Maximum load on axle [kg]		Front	1585						
		Rear	1650						
Kerb weight (without driver) [kg]	min. option	Front	1063		1066		1064		1081
		Rear	598		595		601		602
		Total	1661		1661		1665		1683
	max. option	Front	1156		1174		1160		1176
		Rear	774		775		769		779
		Total	1930		1949		1929		1955
GVWR [kg]		Front	1355	1379	1370	1394	1395	1419	1410	1434
		Rear	1385	1521	1370	1506	1345	1481	1350	1486
		Total	2740	2900	2740	2900	2740	2900	2760	2920

F82 - L2H1 PANEL VAN								
Engine / gearbox			R9M/ PF6					
Engine suffix			408	450	408	450	450	
Emissions			EU5	EU4&5	EU5	EU4&5	EU4&5	
Number of seats			2		3		2	3
Payload [kg]			1200				>1200	
Rear suspension type			normal				heavy duty	
Maximum load on axle [kg]		Front	1585					
		Rear	1650				1735	
Minimum load on axle after conversion [kg]		Rear					1100	
Kerb weight (without driver) [kg]	min. option	Front	1085	1103	1102	1120	1103	1120
		Rear	606	607	615	616	607	616
		Total	1691	1710	1717	1736	1710	1736
	max. option	Front	1204	1207	1208	1216	1221	1216
		Rear	785	783	789	784	786	790
		Total	1989	2000	1997	2000	2007	2016
GVWR [kg]		Front	1466	1483	1510	1528	1562	1565
		Rear	1494	1497	1480	1481	1448	1475
		Total	2960	2980	2990	3010	3010	3040

F82 - L2H2 PANEL VAN						
Engine, gearbox			R9M/ PF6			
Engine suffix			450			
Depollution			EU4&5			
Number of seats			2	3	2	3
Type of rear suspension			normal		heavy duty	
Maximum load on axle [kg]		Front	1585			
		Rear	1650		1735	
Minimum load on axle after conversion [kg]		Rear			1100	
Kerb weight (without driver) [kg]	min. option	Front	1103	1118	1103	1118
		Rear	683	686	683	686
		Total	1786	1804	1786	1804
	max. option	Front	1226	1232	1226	1232
		Rear	856	861	856	861
		Total	2082	2093	2082	2093
GVWR [kg]		Front	1434	1483	1528	1534
		Rear	1546	1547	1502	1516
		Total	2980	3030	3030	3050

E82 - L2H1 cab floor						
Engine / gearbox			R9M/ PF6			
Engine suffix			450			
Depollution			EU4&5			
Number of seats			2	3	2	3
Type of rear suspension			Normal		heavy duty	
Maximum load on axle [kg]		Front	1585			
		Rear	1650		1735	
Minimum load on axle after conversion [kg]		Front	1112			
		Rear	592		1100	
Kerb weight (without driver) [kg]	min. option	Front	1098	1114	1098	1114
		Rear	382	391	382	391
		Total	1480	1505	1480	1505
	max. option	Front	1174	1177	1174	1177
		Rear	430	432	430	432
		Total	1604	1609	1604	1609
GVWR [kg]		Front	1527	1531	1528	1531
		Rear	1433	1459	1462	1489
		Total	2960	2990	2990	3020

J82 - COMBI L1H1 – N1									
Engine / gearbox			R9M/ PF6						
Engine suffix			408		450		408		450
Depollution			EU5		EU4&5		EU5		EU4&5
Number of seats			5 (2 seater option)				6 (3 seater option)		
Payload [kg]			1000	1200	1000	1200	1000	1200	1000	1200
Maximum load on axle [kg]		Front	1585						
		Rear	1650						
Kerb weight (without driver) [kg]	min. option	Front	1096		1101		1096		
		Rear	675		670		675		
		Total	1771		1771		1771		
	max. option	Front	1170		1186	1187	1170		1186	1187
		Rear	825		826	832	825		826	832
		Total	1995		2012	2019	1995		2012	2019
GVWR [kg]		Front	1357	1328	1343	1345	1373	1373	1389	1390
		Rear	1483	1562	1517	1565	1467	1517	1471	1520
		Total	2840	2890	2860	2910	2840	2890	2860	2910

J82 - COMBI L2H1 – N1						
Engine / gearbox			R9M/ PF6			
Engine suffix			408	450	408	450
Depollution			EU5	EU4&5	EU5	EU4&5
Number of seats			5 (3 seater option)		6 (3 seater option)	
Maximum load on axle [kg]		Front	1585			
		Rear	1650			
Kerb weight (without driver) [kg]	min. option	Front	1115	1130	1115	1133
		Rear	670	670	670	671
		Total	1785	1800	1785	1804
	max. option	Front	1210	1233	1210	1227
		Rear	835	831	835	836
		Total	2045	2064	2045	2063
GVWR [kg]		Front	1422	1445	1467	1483
		Rear	1578	1565	1533	1527
		Total	3000	3010	3000	3010

J82 - COMBI L1H1 – M1									
Engine / gearbox			R9M/ PF6						
Engine suffix			408		450		408		450
Depollution			EU5		EU4&5		EU5		EU4&5
Number of seats			8 (5 seater option)				9 (6 seater option)		
Payload [kg]			1000	1200	1000	1200	1000	1200	1000	1200
Maximum load on axle [kg]		Front	1585						
		Rear	1550	1650	1550	1650	1550	1650	1550	1650
Kerb weight (without driver) [kg]	min. option	Front	1112		1119		1112		1119	
		Rear	789		782		789		782	
		Total	1901		1901		1901		1901	
	max. option	Front	1170		1187		1170		1187	
		Rear	885		887		885		887	
		Total	2055		2074		2055		2074	
GVWR [kg]		Front	1352	1338	1370	1357	1397	1386	1413	1404
		Rear	1388	1512	1380	1503	1388	1504	1387	1496
		Total	2740	2850	2750	2860	2785	2890	2800	2900

J82 - COMBI L2H1 – M1									
Engine / gearbox			R9M/ PF6						
Engine suffix			408		450		408		450
Depollution			EU5		EU4&5		EU5		EU4&5
Number of seats			8 (5 seater option)				9 (6 seater option)		
Payload [kg]			1000	1200	1000	1200	1000	1200	1000	1200
Maximum load on axle [kg]		Front	1585						
		Rear	1550	1650	1550	1650	1550	1650	1550	1650
Kerb weight (without driver) [kg]	min. option	Front	1155	1155	1160	1160	1155	1155	1160	1160
		Rear	746	746	741	741	746	746	741	741
		Total	1901	1901	1901	1901	1901	1901	1901	1901
	max. option	Front	1215	1215	1224	1224	1215	1215	1224	1224
		Rear	885	885	885	885	885	885	885	885
		Total	2100	2100	2109	2109	2100	2100	2109	2109
GVWR [kg]		Front	1447	1441	1456	1450	1495	1489	1504	1498
		Rear	1398	1509	1394	1510	1395	1511	1391	1512
		Total	2845	2950	2850	2960	2890	3000	2895	3010

2.2.2. WEIGHTS for SCR versions (Euro6b)

	Length	Increased kerb weight (kg) of basic vehicle / version without SCR		
		Front	Rear	TOTAL
X82 all versions	L1	+ 19	+ 21	+ 40
	L2	+ 21	+ 19	+ 40

Note: Euro6b will apply from September 2015 for M1 versions and from September 2016 for N1 versions. The technical maximums for the front and rear axles will be unchanged and the GVWRs adjusted according to the version.

2.2.3 WEIGHTS of options

Reference vehicle: F82 L1H1

Option code	Description	Front weight	Rear weight
RHD	RIGHT-HAND DRIVE	5.0	0.3
-	EXTREME COLD	3.6	0.5
K34	CRUISE CONTROL	0.1	0.0
C60	MANUAL FRONT A/C	15.8	-1.5
C60 + K08	MANUAL FRONT A/C / HEATER	22.5	1.0
C68	ADJ FRONT A/C	16.5	-1.4
C68 + K08	ADL FRONT A/C / HEATER	23.2	1.1
C41 + K08	COMP. HEATING / HEATER	7.6	2.5
UV8	PRE-EQUIPMENT SMARTPHONE	0.4	0.1
C25	REAR WINDOW WIPER	-0.6	3.5
-	EQPT. LEVEL E1	0.7	0.1
-	EQPT. LEVEL E2	0.7	0.1
UTK	SUPER DRIV.ELEC.DOOR	0.1	0.1
DL8	EXT ELEC REAR VIEW MIRRORS	-0.2	0.0
T3U	FOG LIGHTS	1.3	-0.3
RSB	17" Alloy Wheels	6.5	6.5
AYW	FlexCargo PARTITION METAL + load-through hatches	0.4	0.3
AX9	PARTITION WITH WINDOW	1.5	1.5
AYV	FlexCargo PARTITION WITH WINDOW + load-through hatches	1.9	1.8
AA0	NO PARTITION	-8.4	-8.1
TGP	DIGITAL TACHOGRPAH	1.3	0.2
AK5	DRIVER + PASSENGER AIRBAG	1.2	0.2
-	LEFT SIDE SLIDING METAL DOOR	10.3	18.1
-	LEFT SIDE SLIDING DOOR WITH NON-OPENING WINDOW	11.0	20.0
-	LEFT SIDE SLIDING DOOR WITH OPENING WINDOW	11.6	21.4

Reference vehicle: F82 L1H1

Option code	Description	Front weight	Rear weight
-	LEFT SIDE LAT. PANEL + NON-OPENING WINDOW	0.9	1.7
-	LEFT SIDE LAT. PANEL + OPENING WINDOW	1.3	3.3
-	RIGHT SIDE SLIDING DOOR WITH NON-OPENING WINDOW	0.8	1.8
-	RIGHT SIDE SLIDING DOOR WITH OPENING WINDOW	1.3	3.3
-	RIGHT SIDE METAL PANEL	-9.4	-17.3
UJO	TYRE PRESSURE DETECT.	0.1	0.1
BIW	WOOD FLOOR	4.3	23.5
QP9	COVER WHEEL, FULL	0.7	0.7
AYO	FRONT SIDE AIRBAG + CURTAIN AIRBAG	1.2	0.8
UD7	REVERSING RADAR	0.0	0.2
UDS	REVERSING RADAR + CAMERA	0.3	0.7
5BT	AUTOMATIC HEADLIGHTS AND WIPER CONTROL	0.3	0.1
NY2	WITH UNDERBODY PROTECTION	0.4	1.1
TVC	TYPE OF ROAD HEIGHT ADJUSTER	13.1	-0.5
AXG	POWER WINDOW ONE TOUCH	0.1	0.1
WTC	PUNCTURE REPAIR KIT	2.4	-30.4
B48	MID HEIGHT INTERIOR SIDE TRIM	0.6	4.2
A6M	DRIVER SEAT HEIGHT ADJUSTMENT+ ARMREST	0.8	0.5
ATM	PASSENGER BENCH FOLDABLE, w storage under	3.8	3.0
AGE	FIXED STORAGE PASSENGER BENCH ST	2.2	1.5
-	PASSENGER SEAT HEIGHT ADJUSTMNET	-0.6	-1.5
AGD	PASSENGER SEAT HEIGHT ADJUSTMENT AND ARMREST	0.2	-1.0
APL	NO PASSENGER SEAT	-15.3	-10.3
-	VAUXHALL NAME	-0.2	-0.1
J1U	GLASS TAILGATE	1.4	-6.6
J1X	DOOR RR 180 GLAZED	-1.0	4.7
2L5	Navi 80 IntelliLink, 2DIN	1.7	0.4
UN1	Navi 50 Media Nav, 2DIN	2.1	0.4
2L4	Radio R16 BT USB, 1DIN	2.1	0.4
2L0	Radio CD18 BT USB, 2DIN	2.0	0.5
2L3	Navi 80 IntelliLink DAB+, 2DIN	1.7	0.4
2L1	Radio R16 BT USB DAB, 1DIN	2.1	0.4
2L2	Radio CD 18 BT USB DAB+, 2DIN	2.0	0.5
V66	WITH ENGINE POWER TAKE-OFF	0.1	0.0
A10	FIXED WINDOWS ON SIDE PANEL	-0.1	3.4
-	BODY-COLOURED BUMPERS	0.2	0.0
DT4	WITH ACCS. FOR SMOKERS	0.1	0.0
VR2	TOWBAR	-5.5	27.0

Reference vehicle: F82 L2H1

Option code	Description	Front weight	Rear weight
RHD	RIGHT-HAND DRIVE	5.0	0.3
-	EXTREME COLD	3.6	0.5
K34	CRUISE CONTROL	0.1	0.0
C60	MANUAL FRONT A/C	15.6	-1.3
C60 + K08	MANUAL FRONT A/C / HEATER	22.6	0.9
C68	ADJ FRONT A/C	16.3	-1.2
C68 + K08	ADL FRONT A/C + AUXILIAR HEATER	23.3	1.0
C41 + K08	COMP. HEATING / HEATER	7.9	2.2
UV8	PRE-EQUIPMENT SMARTPHONE	0.4	0.1
C25	REAR WINDOW WIPER	-0.5	3.4
-	EQPT. LEVEL E1	0.7	0.1
-	EQPT. LEVEL E2	0.7	0.1
UTK	SUPER DRIV.ELEC.DOOR	0.1	0.2
DL8	EXT ELEC REAR VIEW MIRRORS	-0.2	0.0
T3U	FOG LIGHTS	1.3	-0.2
RSB	17" Alloy Wheels	6.5	6.5
AYW	FlexCargo PARTITION METAL + load-through hatches	0.4	0.3
AX9	PARTITION WITH WINDOW	1.7	1.3
AYV	FlexCargo PARTITION WITH WINDOW + load-through hatches	2.1	1.6
AA0	NO PARTITION	-9.3	-7.2
TGP	DIGITAL TACHOGRPAH	1.3	0.2
AK5	DRIVER + PASSENGER AIRBAG	1.2	0.2
-	LEFT SIDE SLIDING METAL DOOR	12.3	16.1
-	LEFT SIDE SLIDING DOOR WITH NON-OPENING WINDOW	13.3	17.7
-	LEFT SIDE SLIDING DOOR WITH OPENING WINDOW	14.0	19.0
-	LEFT SIDE LAT. PANEL + NON-OPENING WINDOW	1.1	1.5
-	LEFT SIDE LAT. PANEL + OPENING WINDOW	1.7	2.9
-	RIGHT SIDE SLIDING DOOR WITH NON-OPENING WINDOW	1.0	1.6
-	RIGHT SIDE SLIDING DOOR WITH OPENING WINDOW	1.7	2.9
-	RIGHT SIDE METAL PANEL	-11.4	-15.3
UJO	TYRE PRESSURE DETECT.	0.1	0.1
BIW	WOOD FLOOR	6.5	26.9
QP9	COVER WHEEL, FULL	0.7	0.7
AYO	FRONT SIDE AIRBAG + CURTAIN AIRBAG	1.3	0.7
UD7	REVERSING RADAR	0.0	0.2
UDS	REVERSING RADAR + CAMERA	0.3	0.7
NY2	WITH UNDERBODY PROTECTION	0.6	1.0
TVC	TYPE OF ROAD HEIGHT ADJUSTER	13.0	-0.4
AXG	POWER WINDOW ONE TOUCH (AXG)	0.1	0.1
WTC	PUNCTURE REPAIR KIT	1.9	-29.9
B48	MID HEIGHT INTERIOR SIDE TRIM	1.0	5.2
A6M	DRIVER SEAT HEIGHT ADJUSTMENT+ ARMREST	0.9	0.4
ATM	PASSENGER BENCH FOLDABLE, w storage under	4.2	2.6
AGE	FIXED STORAGE PASSENGER BENCH ST	2.4	1.3

Reference vehicle: F82 L2H1

Option code	Description	Front weight	Rear weight
-	PASSENGER SEAT HEIGHT ADJUSTMNET	-0.7	-1.3
AGD	PASSENGER SEAT HEIGHT ADJUSTMENT AND ARMREST	0.2	-0.9
APL	NO PASSENGER SEAT	-16.5	-9.1
J1U	GLASS TAILGATE	1.3	-6.5
J1X	DOOR RR 180° GLAZED	-1.0	4.7
J1T	DOOR RR 270° GLAZED	-1.1	5.4
7U4	DOOR RR 270° UNGLAZED	-0.1	0.7
2L5	Navi 80 IntelliLink, 2DIN	1.7	0.4
UN1	Navi 50 Media Nav, 2DIN	2.1	0.4
2L4	Radio R16 BT USB, 1DIN	2.1	0.4
2L0	Radio CD18 BT USB, 2DIN	2.0	0.5
2L3	Navi 80 IntelliLink DAB+, 2DIN	1.7	0.4
2L1	Radio R16 BT USB DAB, 1DIN	2.1	0.4
2L2	Radio CD 18 BT USB DAB+, 2DIN	2.0	0.5
V66	WITH ENGINE POWER TAKE-OFF	0.1	0.0
A10	FIXED WINDOWS ON SIDE PANEL	0.2	4.0
-	BODY-COLOURED BUMPERS	0.2	0.0
DT4	WITH ACCS. FOR SMOKERS	0.1	0.0
VR2	TOWBAR	-4.9	26.4

3 VEHICLE CONVERSION LIMITS AND CALCULATIONS

3.1. DETERMINING THE CENTRE OF GRAVITY

The vehicle's centre of gravity is determined at the converted vehicles without load. The height of the centre of gravity must be kept as low as possible.

The vehicle's centre of gravity after conversion can be determined:

- ✓ by measurement
- ✓ by calculation.

The measurement requires the following precautions to be taken:

- ✓ No moving fluids → completely empty or completely full fill all fluid containers (fuel tank, washer fluid reservoir, if applicable, hydraulic tank, water tank etc.).
- ✓ Tires overinflated to the maximum permitted level (to minimize loaded radius variations).
- ✓ Ensure that no objects inside the vehicle can move during the measurements.
- ✓ Front and rear suspensions locked.
- ✓ The brakes (service and handbrake) MUST NOT be applied, and place chocks at sufficient distance from the wheels, if necessary.
- ✓ To reduce measuring errors, several individual measurements should be made in the axle load calculation for each axle. The average value for each axle should be calculated from the several measurements for a state.

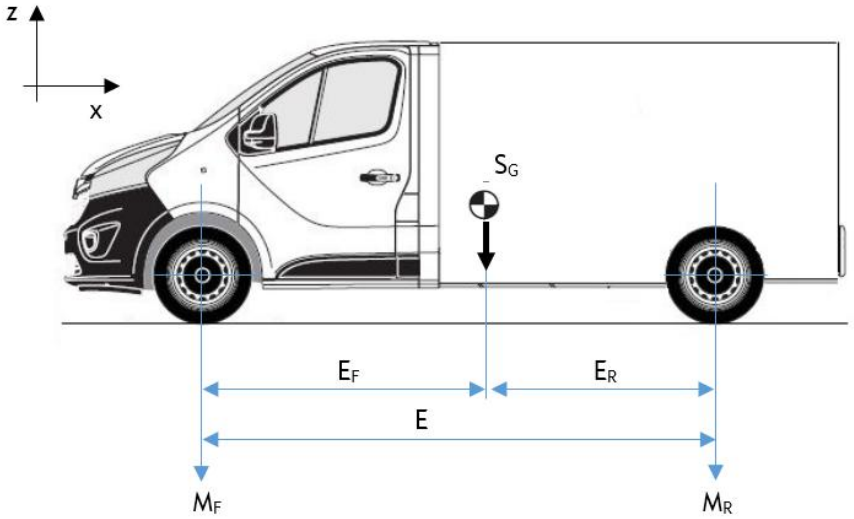
For a measurement when the vehicle is inclined at an angle, additional precautions should be taken to the already mentioned:

- ✓ In order to obtain a reliable measurement, the vehicle must be lifted at an angle of at least 20° and place chocks at sufficient distance from the wheels, if necessary.
- ✓ When raising to the required lifting height, no part of the vehicle may touch the ground.
- ✓ Either the front or rear axle may be lifted.

X and Y position

The x and y position of the centre of gravity is determined by measuring the mass on each wheel and calculating the barycentre.

The vehicle must be standing horizontal and level for weighing.



M_{tot} = Gross vehicle weight

M_F = Front axle load of empty vehicle

M_R = Rear axle load of empty vehicle

E = Wheelbase

E_F = Distance from the total weight centre of gravity to the front axle

E_R = Distance from the total weight centre of gravity to the rear axle

S_G = Overall centre of gravity

Calculation of centre of gravity in x-direction

$$M_{tot} = M_V + M_R$$

$$E_V = \frac{M_R \bullet E}{M_{tot}}$$

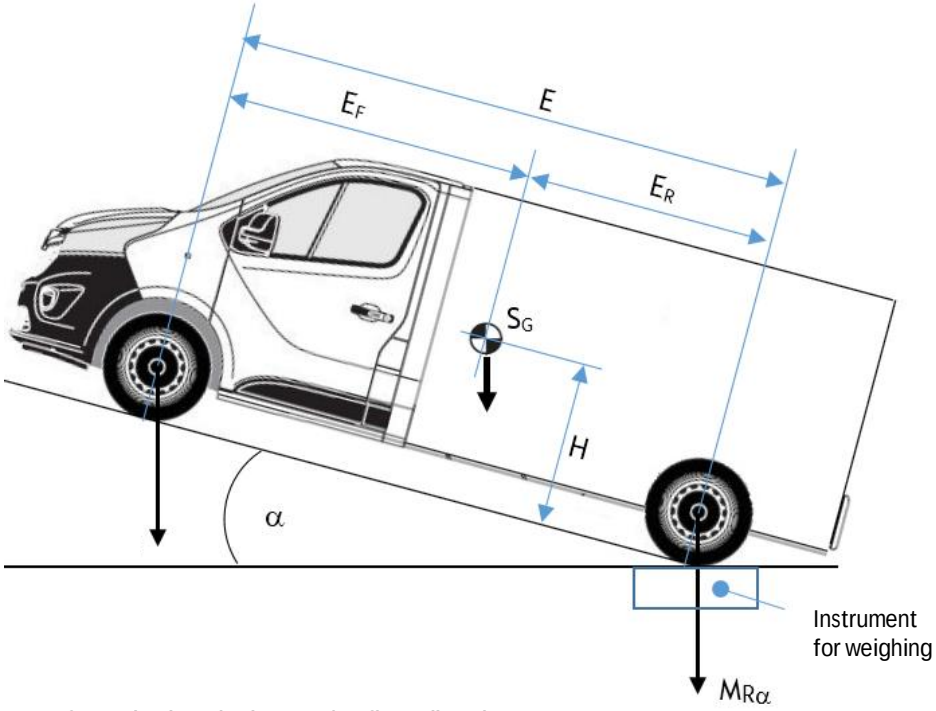
$$E = E_V + E_R$$

$$E_R = \frac{M_V \bullet E}{M_{tot}}$$

Z position

The Z position of the centre of gravity is determined by measuring the variation in mass on one axle. The vehicle is weighed horizontally, then inclined at an angle α.

For example:



H = Height of the centre of gravity in relation to the floor (in m).

Rsc = Loaded radius of the tyre, axle not raised (in m)

E = Wheelbase (in m)

ΔM = Radial force variation measured on the axle (in kg)

$M_{F\alpha}$ = Front axle load when vehicle raised at rear (in kg).

$M_{R\alpha}$ = Rear axle load when vehicle raised at front (in kg).

M_{tot} = Gross vehicle weight (in kg)

α = Vehicle lift angle (in rad)

Calculation of centre of gravity in z-direction

$$H = \frac{E \bullet \Delta M}{M_{tot} \bullet \tan \alpha} + Rsc$$

When vehicle is raised at front:

$$\Delta M = M_{R\alpha} - M_R$$

When vehicle is raised at rear:

$$\Delta M = M_{F\alpha} - M_F$$

3.2. CONVERSION LIMITS WITH ESP

Vivaro vehicles are now fitted with ESP as standard. As a result, there are a number of instructions which must be complied with.

In the event where conversion is likely to modify one of the following items:

Modification	Details	ESP Off	Comments
Weights	Position of the centre of gravity	X	Outside zone "V": see next page.
Structure	Wheelbase	X	
	Body stiffness	X	Maximum 30% reduction in body torsional stiffness along the X axis (measured between the two axles) pre- and post-conversion
	Track	X	
Chassis	Front axle	X	Deterioration of the anti-skid function
	All modifications to the suspension and REAR axle	X	Anything that changes the stiffness and/or elasto-kinematics of the suspension.
	Assembled wheels, steering wheel, steering	X	
	Brake system	X	Modification to a component of the braking system
Powertrain	Engine, gearbox, calibrations	X	
Electromagnetic retarder		X	
The sensors connected to the ESP (steering-wheel angle, wheel speed, lateral acceleration, yaw angle)	Displacement and modification of the installation	X	
CAN Bus		X	
Roof rack		X	Comply with the permissible load on the standard production version
Trailer unit (semi-trailer)		X	

è *Calibration of the ESP unit will need to be modified.*

Wheel side:

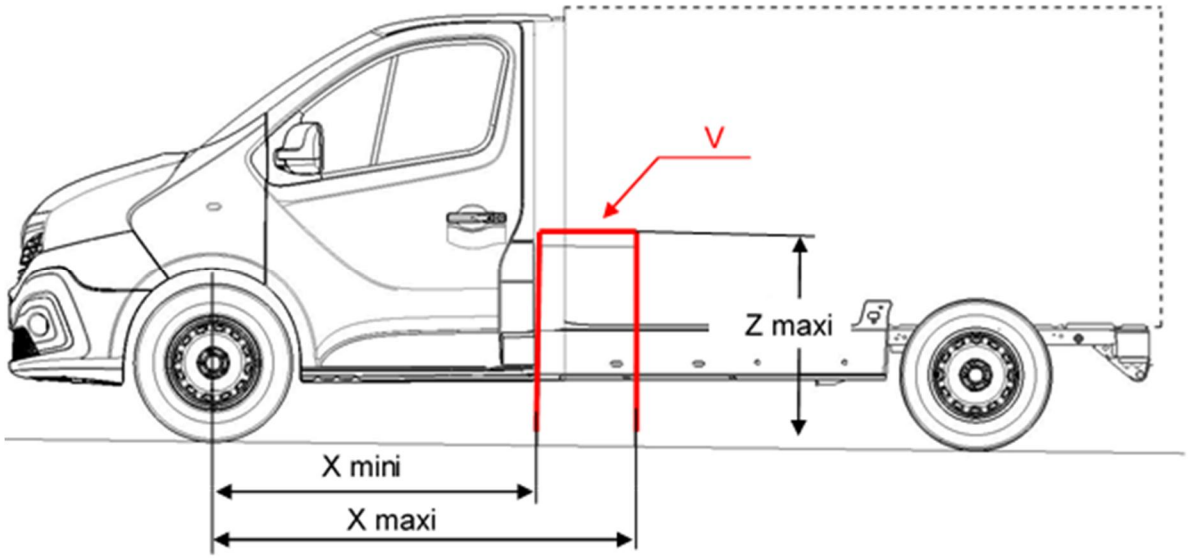
In all events, it is necessary to maintain the ABS targets or to adapt them to the new wheel diameter to retain the right wheel speed information.

3.2.1 CENTRE-OF-GRAVITY POSITION OF THE CONVERTED VEHICLE

The centre of gravity

- The longitudinal centre of gravity (X) of the converted vehicle must be calculated when the vehicle is laden = GVW
- The vertical centre of gravity (Z) of the converted vehicle must be calculated regardless of the load situation

To ensure that the ESP functions properly, the centre of gravity position of the converted vehicle must remain within the limits of point V.



Version	min./max. X (mm)	Y (mm)	max. Z (mm)
L1/H1 - Normal suspension	1,498/ 1,741	Y ± 85	820
L1/H2 - Normal suspension	1,499/ 1,727		920
L2/H1 - Normal suspension	1,710/ 1,944		820
L2/H2 - Normal suspension	1,692/ 1,924		920
L2/H1, L2/H2 - Reinforced suspension	1,692/ 1,924		920

Note:

For the calculation of the centre of gravity and its position on the basic vehicle, see chapter 3.1.

- The X dimensions are given in relation to the centre of the FRONT wheel
- The Y dimensions are given in relation to the centreline of the vehicle
- The Z dimensions are measured

3.2.2 'ESP / OFF' CALIBRATION

The "ESP Off" calibrations have been developed with the aim of deactivating certain functions while retaining others:

The deactivated functions are:

- ü Trajectory control (VDC),
- ü Roll-over protection (ROM/RMF)
- ü Trailer sway control (TSM)

The functions retained are:

- ü ABS,
- ü Traction control (TCS/ASR),
- ü Extended Grip,
- ü Hill Start Assist.

It is recommended to apply "ESP Off" calibration for all modifications to the rear axle.

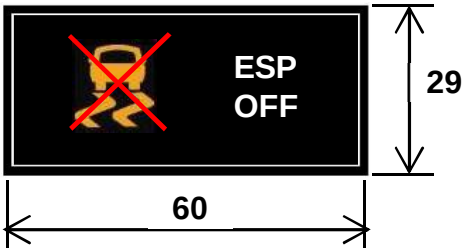
Attention:

When the standard calibration is replaced by an "ESP Off" calibration, this renders null and void approval, as indicated in appendix 9 of regulation ECE13H.

An ESP / Off calibration warning label must be affixed to the centre of the dashboard and visible to the driver.

The label is to be designed and put in place by the converter.

LABEL



3.2.3 OPERATING CONDITOINS OF THE ESP OPTION

Compliance with the conditions referred to in the table on page 1

If the conversion does not affect the operation of the ESP, the converted vehicle is compatible with the standard ESP with no additional validation required.

Non-compliance with the conditions referred to in the table on page 1

In this case, the operation of the ESP is significantly affected.

The converter, who is solely liable, must ensure that the ESP functions properly by his or her own means.

In terms of liability, refer to the general recommendations.

For low-volume production type approval (< 1,000 vehicles a year), it is possible to limit the trajectory control function.

Note:

The vehicles also need to meet the EC guidelines and the national laws after the modifications have been made.

3.2.4. CALIBRATION TABLE (Euro5)

The ESP off calibration references to be configured in the OPEL / VAUXHALL network can be consulted in the table below. Table for Euro 6 engines is not available at the time of publication.

Versions			ESP off calibration references **
VAN F82	L1H1	R9M*408 GEN1 - 66 KW (dCi 90) - Manual Gearbox	0282001B036A
		R9M*408 GEN2 - 85 KW (dCi 115) - Manual Gearbox	0282002B037A
		R9M*450 GEN2 - 88 KW (dCi 120) - Manual Gearbox	0282003B038A
		R9M*450 GEN2 - 103 KW (dCi 140) - Manual Gearbox	0282005B040A
	L1H2	R9M*450 GEN2 - 88 KW (dCi 120) - Manual Gearbox	0282008A038A
		R9M*450 GEN2 - 103 KW (dCi 140) - Manual Gearbox	0282010A040A
	L2H1	R9M*408 GEN1 - 66 KW (dCi 90) - Manual Gearbox	0282016A036A
		R9M*408 GEN1 - 85 KW (dCi 115) - Manual Gearbox	0282017A037A
		R9M*450 GEN2 - 88 KW (dCi 120) - Manual Gearbox	0282018A038A
		R9M*450 GEN2 - 103 KW (dCi 140) - Manual Gearbox	0282020A040A
	L2H2	R9M*450 GEN2 - 88 KW (dCi 120) - Manual Gearbox	0282023A038A
		R9M*450 GEN2 - 103 KW (dCi 140) - Manual Gearbox	0282025A040A
COMBI J82	L1H1	R9M*408 GEN1 - 66 KW (dCi 90) - Manual Gearbox	0282011B036A
		R9M*408 GEN1 - 85 KW (dCi 115) - Manual Gearbox	0282012B037A
		R9M*450 GEN2 - 88 KW (dCi 120) - Manual Gearbox	0282013B038A
		R9M*450 GEN2 - 103 KW (dCi 140) - Manual Gearbox	0282015B040A
	L2H1	R9M*408 GEN1 - 66 KW (dCi 90) - Manual Gearbox	0282026A036A
		R9M*408 GEN1 - 85 KW (dCi 115) - Manual Gearbox	0282027A037A
		R9M*450 GEN2 - 88 KW (dCi 120) - Manual Gearbox	0282028A038A
		R9M*450 GEN2 - 103 KW (dCi 140) - Manual Gearbox	0282030A040A
PLATFORM CAB E82	L2H1	R9M*408 GEN1 - 66 KW (dCi 90) - Manual Gearbox	0282031B036A
		R9M*408 GEN1 - 85 KW (dCi 115) - Manual Gearbox	0282032B037A
		R9M*450 GEN2 - 88 KW (dCi 120) - Manual Gearbox	0282033B038A
		R9M*450 GEN2 - 103 KW (dCi 140) - Manual Gearbox	0282035B040A

Key: GEN1 = Single Turbo and GEN2 = Twin Turbo
** ID of the conversion rule

3.2.5 REQUEST TO RECALIBRATE THE ESP OPTION – *23.03.2015*

A converter wishing to recalibrate the ESP must fill in the attached form.

1/ è contact Opel/Vauxhall Dealer for the request for recalibration

2/ è Send a copy to coc.data@de.opel.com

OPEL / VAUXHALL Model
(EEC type: XXX, Version Variant Type: XXXXXX)
and
Chassis no.: WOLXXXXXXXXXXXXXX

I, the undersigned, _____ certify that I am the designer of the vehicle conversion:

(Specify the type of bodywork or layout)

- Type-mines declaration to the DRIRE: MOD MINE TYPE
- Description of the conversion (give a brief description and the characteristics of the conversion)

Observe the recommendations permitted by the entire profession and more particularly the technical and quality specifications defined by Adam Opel GmbH/ Vauxhall, set out below:

ü Observe the recommendations defined in the technical guides available on Opel webpage/ Vauxhall Conversion webpage.

ü Have had all of the tests, inspections and validations conducted to identify the position of the centre of gravity.

ü Have verified the impact of the conversion on the correct handling of the vehicle.

To this end:

I acknowledge that I am explicitly requesting recalibration of the ESP and solely responsible in the event of a design, information or manufacturing defect, failure to observe the Adam Opel GmbH/ Vauxhall recommendations, and/or non-compliance of the conversion for any damage occurring on the name vehicle or to any other goods, likewise for any material, immaterial and/or personal injury occurring to any individual whomsoever, indirect damage being expressly excluded.

Converter confirms the following:

1. For purposes of a Conversion of the vehicle referred to above, Converter intends to modify the programming of the ESP system.
2. Converter has accurately defined the position of the centre of gravity of the vehicle. Converter is fully aware of the effects caused to the vehicle driving behaviour by the Conversion and the modified programming of the ESP system.
3. Neither Adam Opel GmbH/ Vauxhall nor its affiliates have performed a technical review of the Conversion.
4. Converter agrees to fully indemnify and hold Adam Opel GmbH/ Vauxhall and General Motors LLC as well as their respective subsidiaries, affiliates, officers, directors, employees and authorized distributors and repairers harmless of any claims raised by third parties which are by any means directly or indirectly attributable to the Conversion and/or the modified programming of the ESP system. This indemnification includes, but is not limited to, any product liability claims.

If the conversion applied to the vehicle takes the vehicle's centre of gravity outside the capacity volume defined in the Conversion Manual**, optimal operation of the ESP can no longer be guaranteed.

In this case, it is recommended to replace the existing calibration with an "ESP Off" calibration. If this is not done, the ESP will not correct trajectory deviation or they system may operate in an unpredictable manner.

***see article 3.2.1 in this chapter*

Warning:

When the standard calibration is replaced by an "ESP Off" calibration, this renders null and void approval, as indicated in appendix 9 of regulation ECE13H.

1) Identification of the technical vehicle parameters

Vehicle Type	X*	Wheelbase + Height	X*	Engine	X*
Panel van		L1H1		Start / Stop	
Platform cab		L1H2		66kW / 85kW [GEN1; Euro 5]	
Combi		L2H1		88kW / 103kW [GEN2; Euro 5]	
		L2H2		70kW / 88kW [GEN1; Euro 6]	
				92kW / 107kW [GEN2; Euro 6]	

2) dentification of the parameters affecting the ESP's operation

CONVERSION TYPE	X*	CONVERSION TYPE	X*
Wheelbase modification		Modification of wheel assembly	
Track modification		Modification of rear brakes (callipers, discs, pads and brake hoses)	
Ground clearance modification		Body stiffness modification	
Modification of the front shock absorber characteristics		Modification of the power steering	
Modification of the rear shock absorber characteristics		Modification of the steering wheel	
Modification of the front axle (including springs, stops, technology type)		Modification of the engine calibration	
Modification of the rear axle (including springs, stops, technology type)		Positioning of the centre of gravity outside the defined volume	
Other conversion (please specify)			

X = Check the box corresponding to the type of conversion made to the vehicle*

3) Calibration requested:

Enter the VIN(s) of the vehicle(s) with the requested calibration reference. See calibration references table on paragraph 3.2.4 above.

§ Type of calibration requested: ESP off __ / ABS only __

Vehicle Identification Number (VIN)	ESP off calibration reference requested (if available)

Completed at _____, on _____

The convertor: Coach builder

(signature and stamp)

3.3. OPENING ELEMENTS RECOMMENDATIONS

Sliding side door

Any modifications to and conversion of the doors must not affect their kinematics

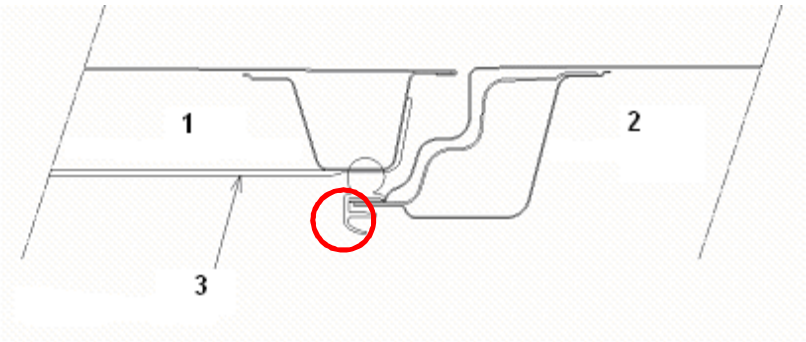
Body option recommendations

To ensure that the sliding side door operates correctly and has a sufficiently long lifetime, it is essential to comply with the following instructions:

- Do not remove the door to carry out the conversion. For situations where this is just not possible, it is mandatory, during refitting, to comply with the adjustments given in the workshop repair manual,
- Do not use the possible door adjustments for any purpose other than to adjust the panel alignment and to ensure that the door locks,
- No modification should come into contact with the internal part of the door seal. (minimum clearance: 3 mm). See section B-B
- Any modification to the original door seal and air gap/body is likely to have a detrimental effect on door closure and the life span of this function.

It is prohibited to modify the original mechanisms or to add stops to the inside of the rails. The original stop support areas must be retained

SECTION B- B (minimum clearance: 3mm)



1 : Sliding side door

2 : Rear panel

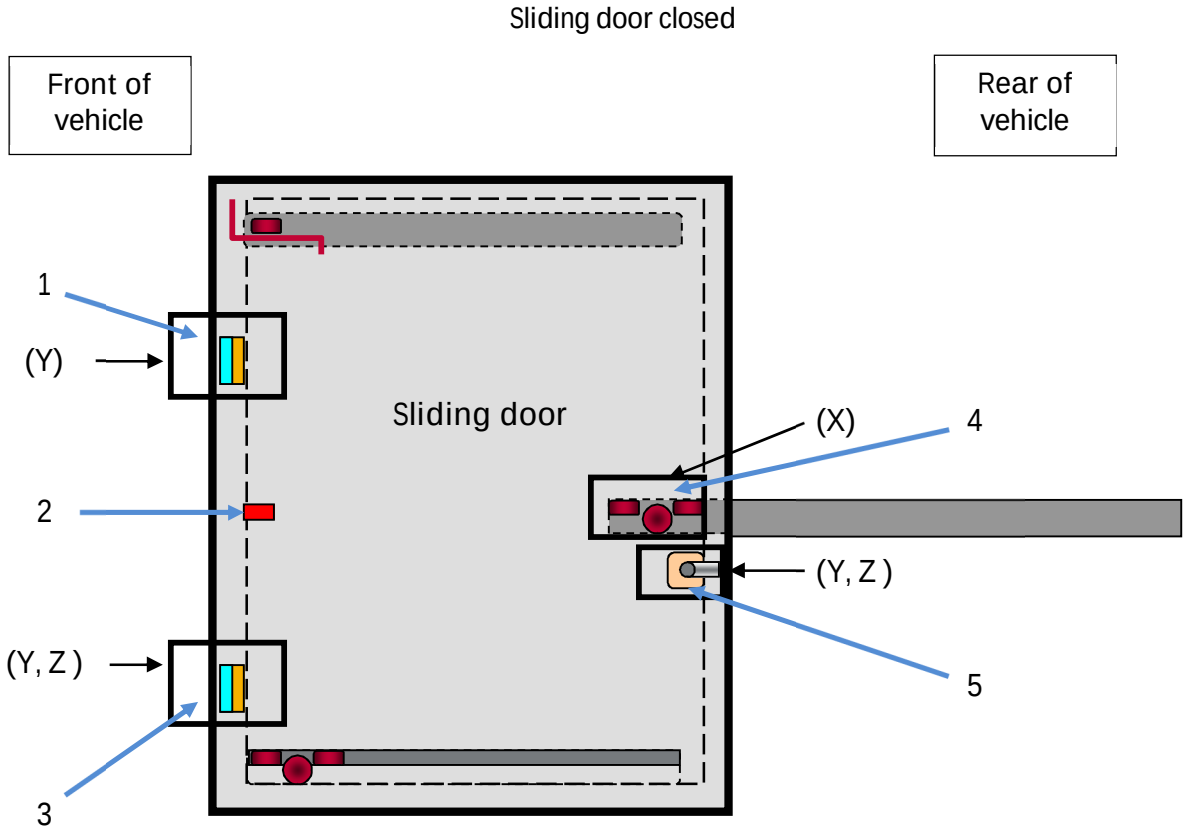
3 : Insulated lining (for example)

Possible additional weight

- Load distributed over the surface of the panelled opening element.
  - o 10kg after removal of fittings

Geometry and kinematics

Alignment of the sliding side door depends on two isostatic points (vehicle marks X, Y, Z):



1 : Upper centring device

2 : Crash pin

3 : Lower centring device

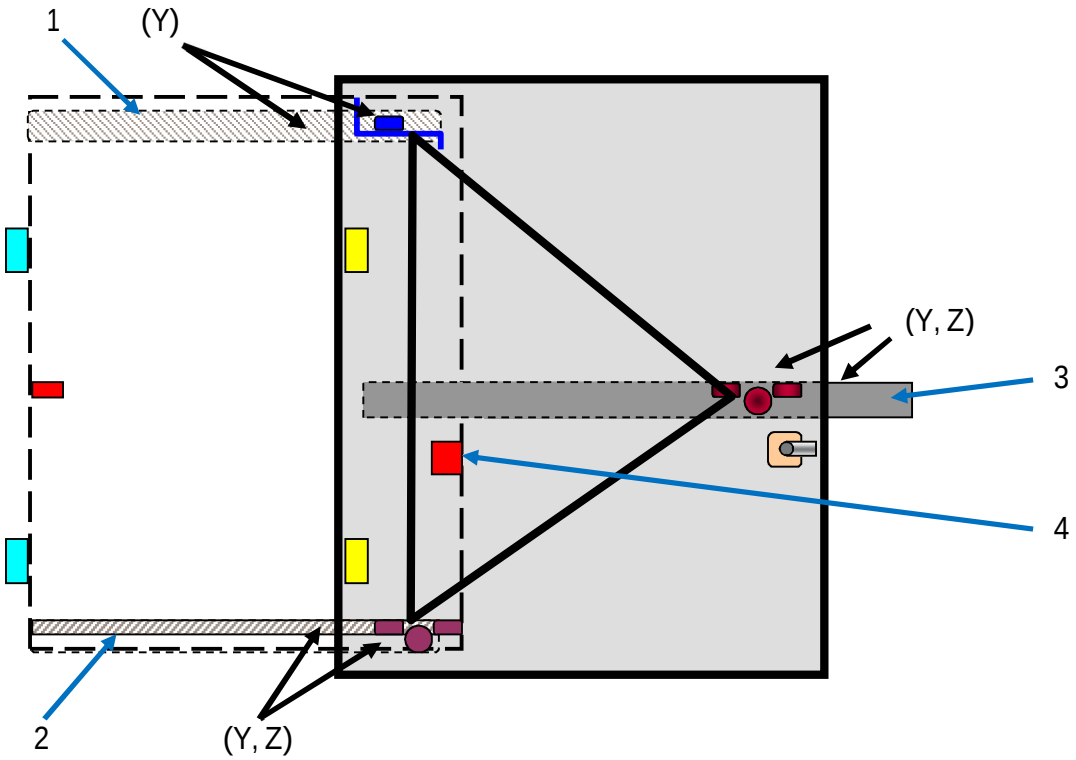
4 : Centre carrier

5 : Lock/Striker

Sliding door open

Front of vehicle

Rear of vehicle



1 : Rail guide

2 : Carrier rail and guide

3 : Carrier rail and guide

4 : Main stop

- Lower rail: centring device/rail/carrier (Y and Z; carrier and guide)
- Centre rail: lock/carrier/rail (Y and Z; carrier and guide)
- Upper rail: centring device/rail/carrier (Y; guide))

Function of the door stops

It is prohibited to add end of travel stops in the sliding side door rails.
It is recommended to keep the stop support areas the same as the original.
Otherwise, a complete study must be made (kinematics, sizing)

- No end of travel stop on the lower rail
- No end of travel stop on the upper rail

Crash pin

It is prohibited to remove the crash pin

Rear hinged doors

Any modifications to and conversion of the doors must not affect their kinematics

Body option recommendations

To ensure that the sliding side door operates correctly and has a sufficiently long lifetime, it is essential to comply with the following instructions:

- Do not remove the hinged doors to make modifications. For situations where this is just not possible, it is mandatory, during refitting, to comply with the adjustments given in the workshop repair manual,
- You must maintain free access for removing and adjusting the locks.
- Do not remove door mechanisms. The original geometry of the mechanisms must be retained (striker plate, end stop, latch) to ensure their correct operation.
- Keep the original seal on the rear attachment ring.

Possible additional weight

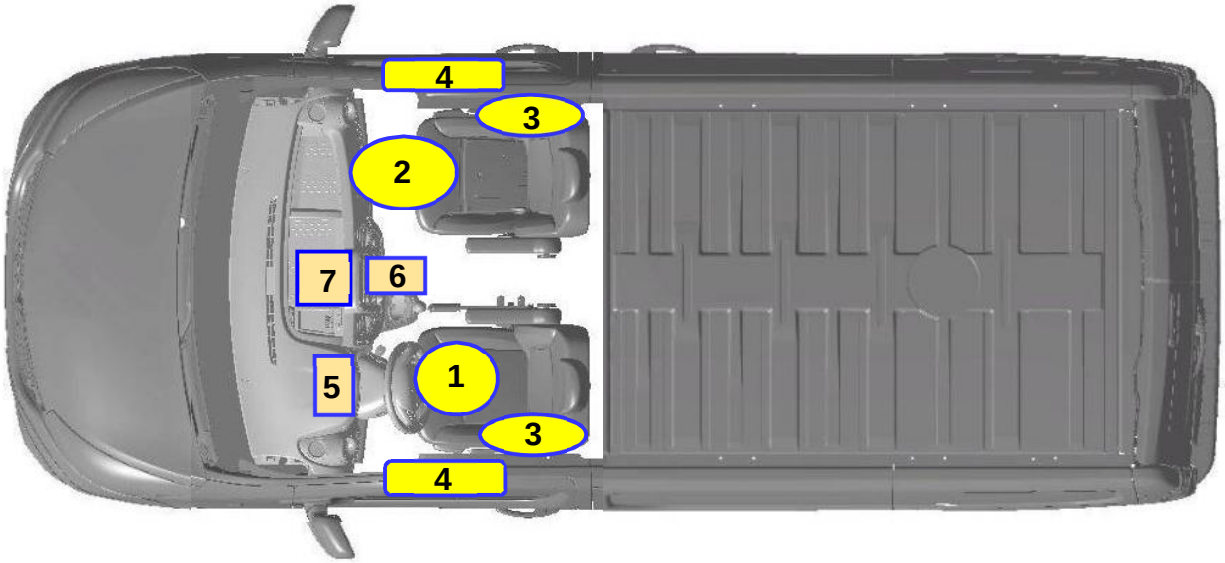
- Load distributed over the surface of the panelled opening element.
  - 10kg after removal of fittings

3.4. AIRBAG COMPATIBILITY

The type and number of airbags depends on the equipment level. The driver airbag is always standard. All other airbags (passenger, thorax and curtain airbags) are available as optional equipment. For the co-driver seat bench there is no thorax airbag available.

Attention:

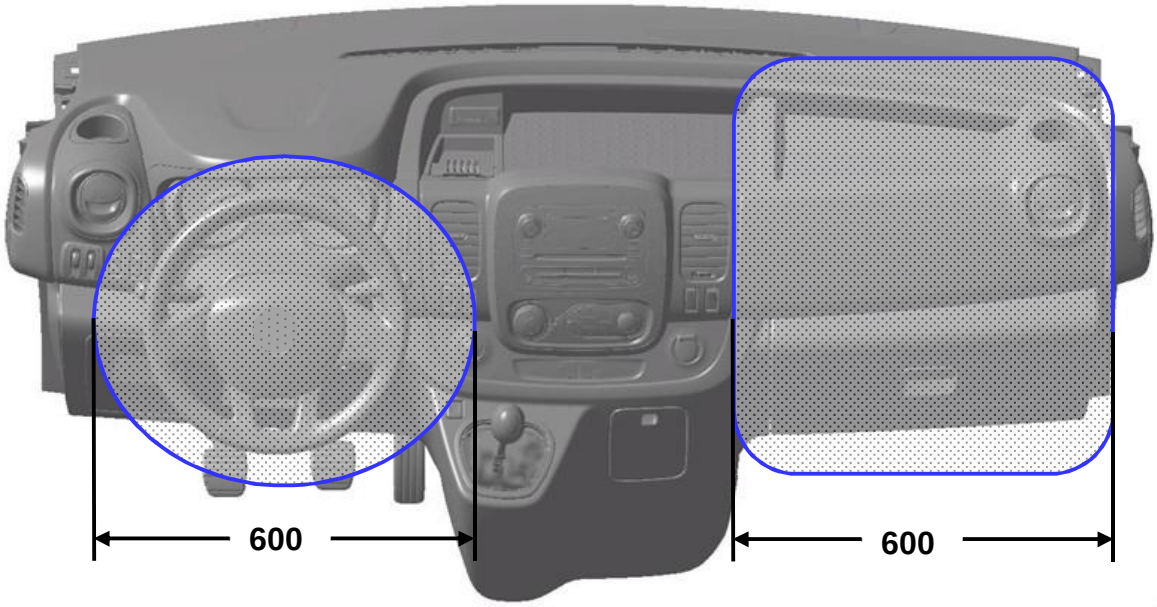
- Before carrying out any work on the airbag system or restraint system the safety regulations must be observed.
- It is essential to consult the workshop repair manual for all work to be carried on the airbags.
- If handled improperly the airbag systems can be triggered in an explosive manner.
- Keep the area in which the airbag inflates clear of obstructions. Do not stick anything on the airbag covers and do not cover them with other materials.
- On no account may any modifications be made to the airbag system or the belt tensioner system. Modifications to or work incorrectly carried out on a restraint system (seat belt and seat belt anchorages, belt tensioner or airbag) or its wiring, can cause the restraint systems to stop functioning correctly, e.g. the airbags or belt tensioners could be triggered inadvertently or could fail in accidents.
- Vehicle parts that create vibrations must not be secured in the proximity of the airbag control unit or sensor installation locations, nor may modifications be made to the floor structure in the proximity of the airbag control unit or the satellite sensors. Reliable operation of the front airbag, side airbag and belt tensioners is otherwise no longer guaranteed.
- The dimensions of deployed airbags are for guidance only.



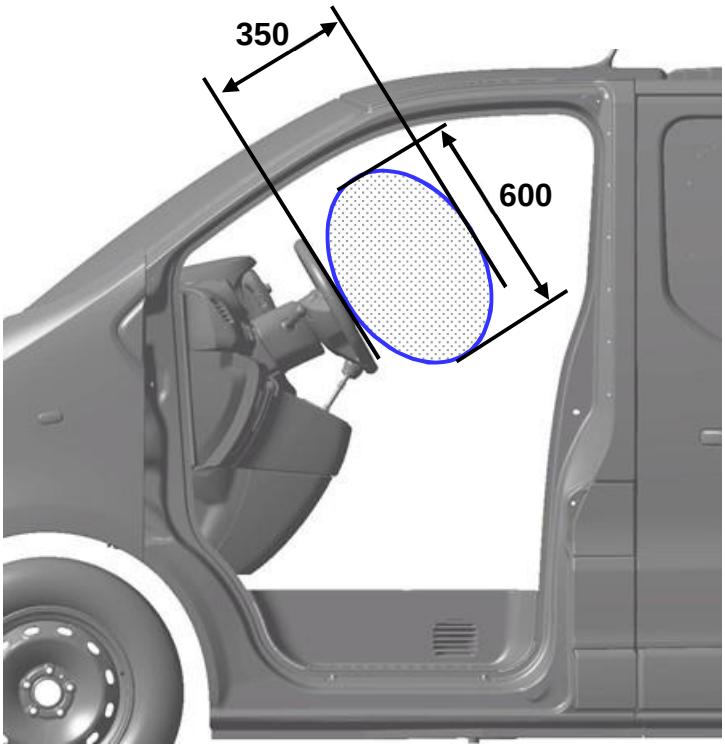
1 : Driver's airbag in the steering wheel
2 : Passenger airbag in the dashboard
3 : Thorax airbag in the seats
4 : Curtain airbag in the roof rails
5 : Fault warning light on instrument panel
6 : Air bag deactivation indicator light on roof
7 : Airbag control unit

FRONT AIRBAGS

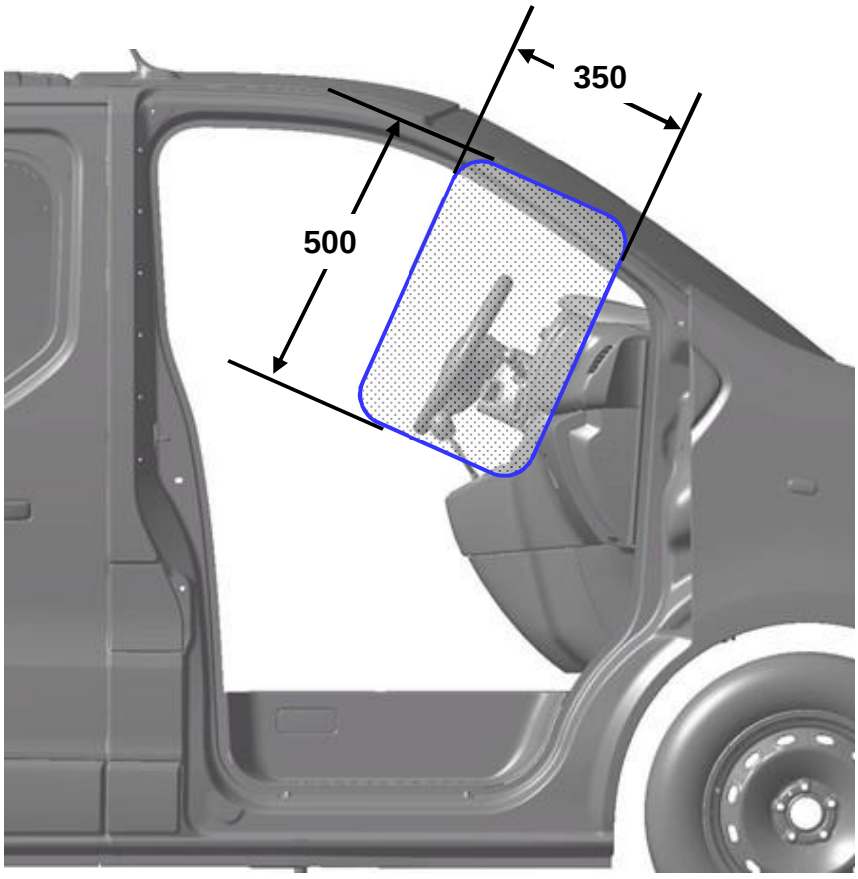
DRIVER AND PASSENGER AIRBAGS

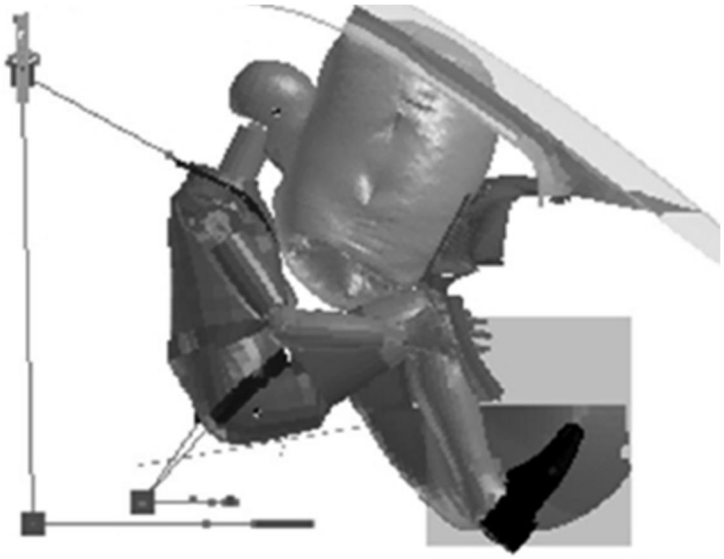


DRIVER'S AIRBAG



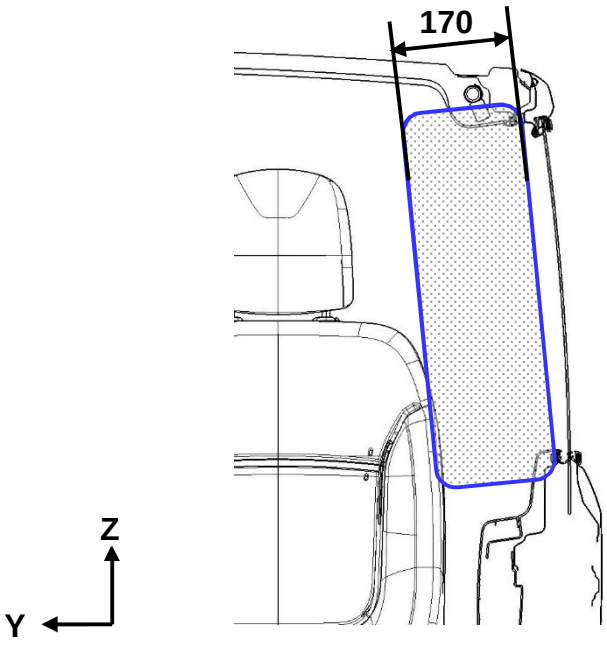
PASSENGER AIRBAG

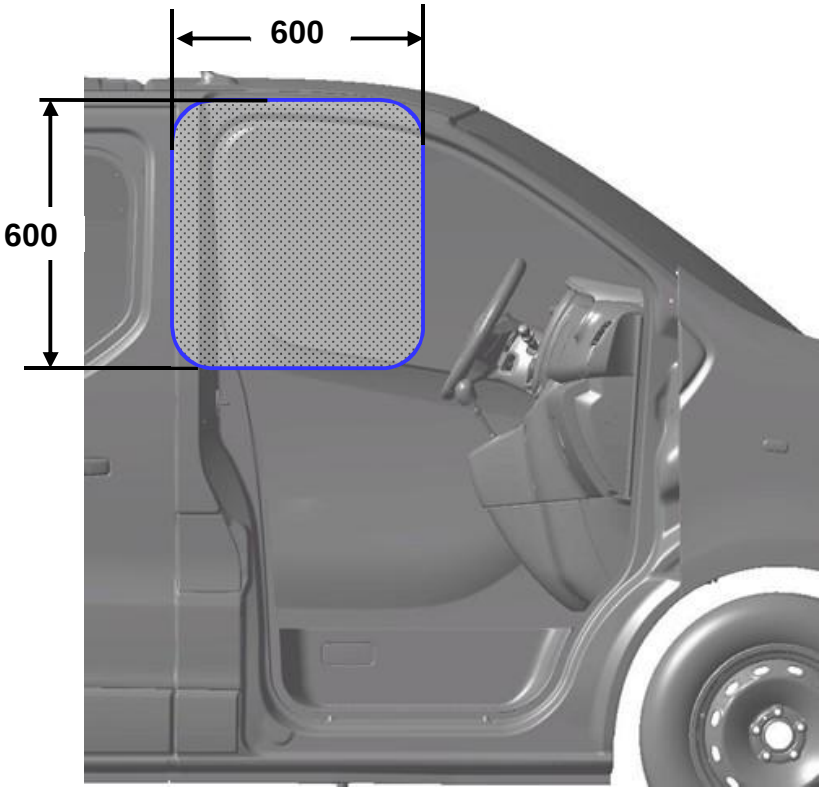




CURTAIN AIRBAGS

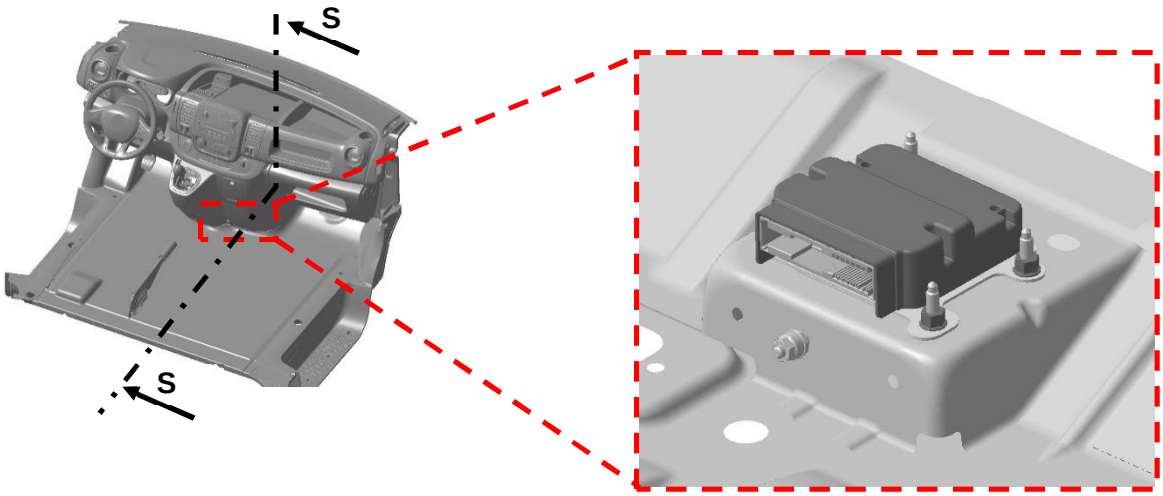
DRIVER AND PASSENGER CURTAIN AIRBAGS



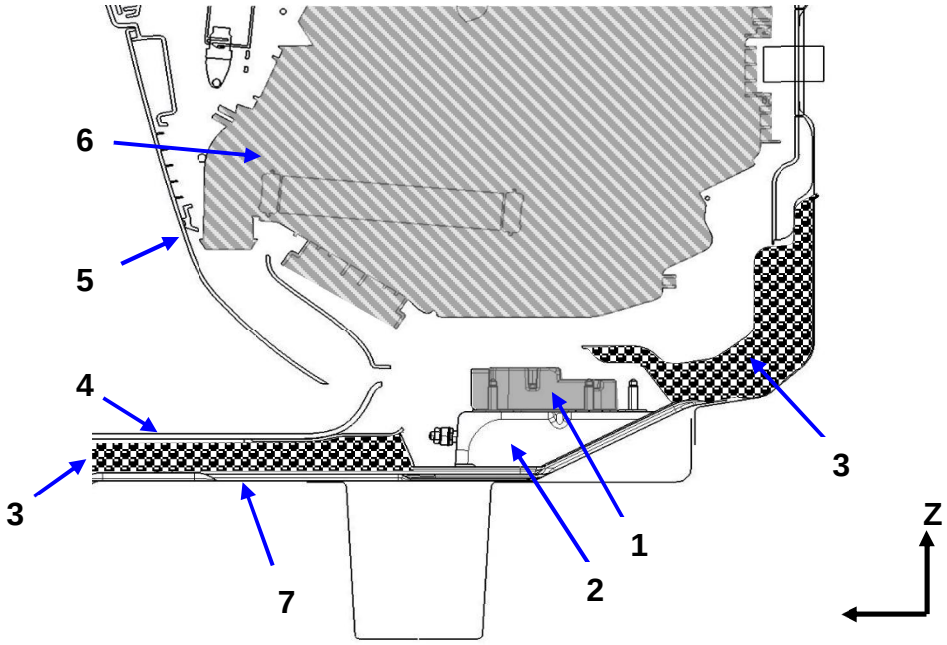


AIRBAG CONTROL UNIT (ECU)

The ECU is in the same position for both left- and right-hand drive vehicles



SECTION S-S



1 : ECU
2 : ECU bracket
3 : Soundproofing
4 : Floor mat
5 : Gear lever console
6 : HVAC : Heating Ventilation and Air-Conditioning
7 : Floor panel

CHANGE DESCRIPTION

Date	Chapter	Major Changes
01/2015	0.00	Overall table of contents updated
01/2015	1.04	Added, Dimensions of load through compatibility in FlexCargo bulkhead.
01/2015	1.05	Dimensions updated Length and height of cargo area 'piano' dimensions Opening angles for hinged doors
01/2015	1.06	1.6.1 - Part No. of the tie down ring and bolt 1.6.3 - Four tie-down points (2 per side) on the Combi.
01/2015	1.08	Added, see Chapter 4.11.1 REAR LIGHTS INFORMATION Info for retrofit TOW BAR on platform cab will be communicated at a later date.
01/2015	1.12	Changes in the numbering and distances for "Fixings points of single seats and seat benches"
01/2015	1.13	Added maximum permitted vehicle width "G2" depending on mirrors used. G2 = 1995 / 2150
01/2015	2.01.2	Dimensions updated • Platform Cab à (B / B1 / D1 / G2 / H / H3 / K / Y4 / Z3) • Van à (H6 / J1 / K / EC18 / V / Y1 / Y3 / Y4 / Z1 / Z2 / Z4) • Combi à completely NEW
01/2015	3.01	>> NEW << Chapter "DETERMINING THE CENTRE OF GRAVITY"
01/2015	3.03	Title and possible additional weights changed
03/2015	1.02	Completely NEW
03/2015	1.10	GEN1 & GEN2 changed to SINGLE TURBO & TWIN TURBO Added 1.10.2 a note: for heating in idle mode
03/2015	1.11	Rear suspension spring, variants/vehicle type added Chapter removed and transferred to 3.2 CONVERSION LIMITS
03/2015	2.02	Completely NEW
03/2015	3.02	>> NEW << Chapter "CONVERSION LIMITS WITH ESP"
07/2015	3.02.	3.2.5 REQUEST TO RECALIBRATE THE ESP OPTION Error in E-mail address correctly à wolfgang.dikoff@de.opel.com
06/2016	1.10.5.	>> NEW << Chapter "EXHAUST SYSTEMS – EURO 6 ENGINE"
06/2016	1.13	Information added to EURO 6 / outside temperature sensor / plug Electr. Mirror
06/2016	1.14	>> NEW << Chapter "INTERIOR ROOF RACK "
06/2016	1.15	>> NEW << Chapter "SCR EXHAUST SYSTEM FOR EURO 6 - ENGINES "
06/2016	2.01	Dimensions "H7" added for platform cab

Date	Chapter	Major Changes
06/2016	3.02	Changes in table to effects on the operation of the ESP
06/2016	3.02.5	New email address for Request to Recalibrate the ESP. Send request to coc.data@de.opel.com from now. Cost may be charged for any request!
04/2017	3.02.5	Name changed from the Opel AG to the Opel GmbH