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1 Design of the Vivaro Range

- Overview

The Vivaro range is based on a front-wheel drive platform with a self-supporting body and a transverse engine. The main versions include vans, platform vans and vehicles for passenger transport (minibuses, etc.). Depending on the format, vehicles are available in a choice of two different TPWs (total permissible weights), two different wheel bases and four different engines. Three turbocharged diesel (F9Q eco, F9Q and G9U) and one petrol engine (F4R) are available.

Wheelbase		[m]	3,098		3,498		Category
Length (total / loading space)		[m]	4,78 / 2,41		5,18 / 2,81		
Height (total / loading space)		[m]	1,96 / 1,38	2,49 / 1,91	1,96 / 1,38	2,49 / 1,91	
Volume (Van loading space)		[m³]	5	7	6	8,4	
Body Version			L1H1	L1H2	L2H1	L2H2	
Van	TPW 2700 kg						N1
	TPW 2900 - 2990 kg						N1
Platform Chassis	TPW 2940 kg						N1
Combi	TPW 2760 kg						M1
	TPW 2900 - 2960 kg						M1
Tour	TPW 2760 kg						M1

H1 = Normal roof

H2 = high roof

TPW = Total Permissible Weight

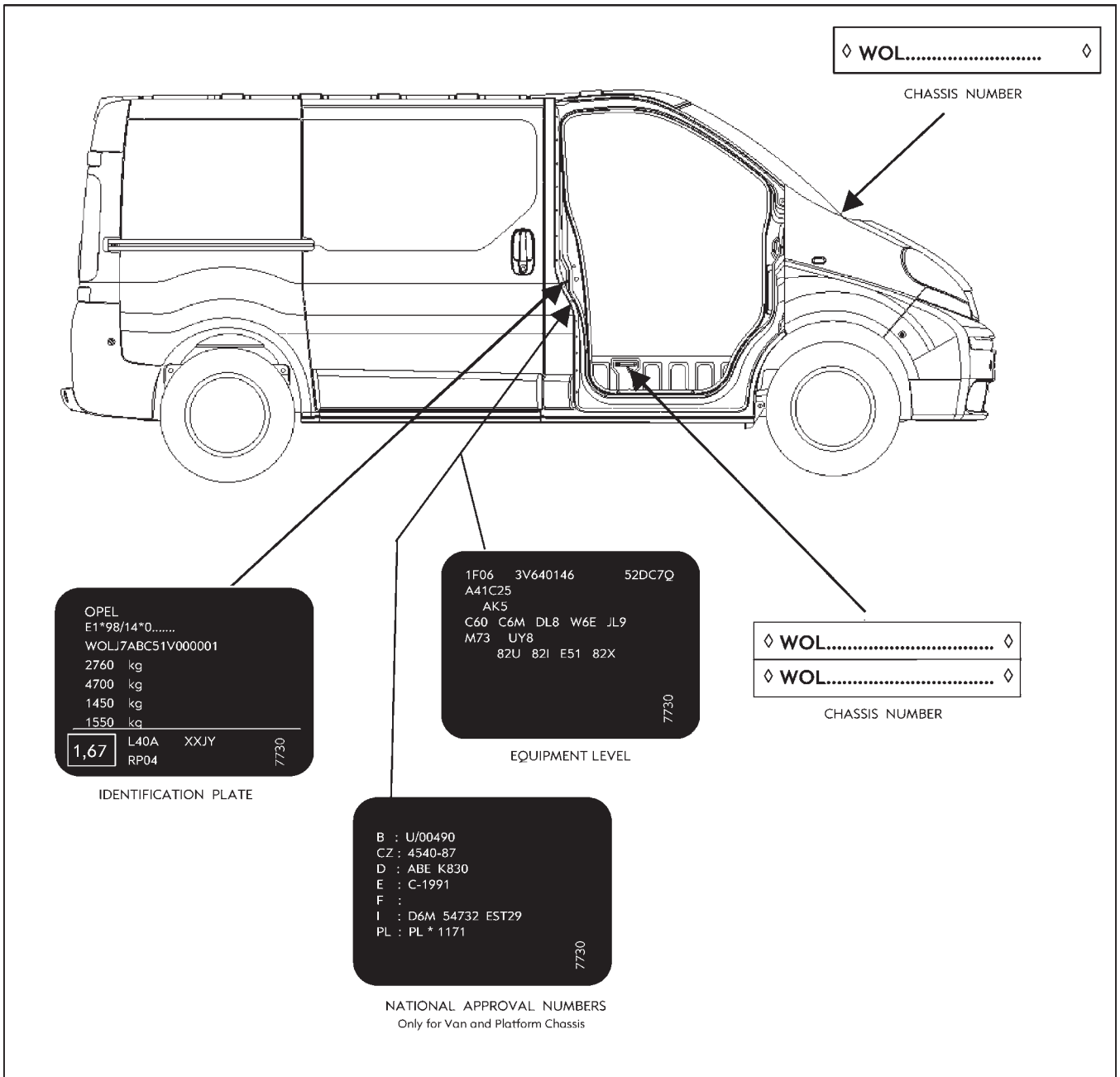


2 Chassis number and identification plate

The chassis number can be viewed by levering up one of the two flaps located above the right-hand cab foot board using a suitable tool (e. g. a screwdriver).

The identification plate is located on the right-hand cab door frame.

Data interpretation details are outlined on the following pages.





Identification plate

- Line 1: Manufacturer →
- Line 2: Approval number →
- Line 3: Chassis number →
- Line 4: Total permissible weight →
- Line 5: Perm. gross towing weight →
- Line 6: Max. perm. front axle load →
- Line 7: Max. perm. rear axle load →
- Colour code →
- Country-specific information (if avail.) →

OPEL
 E1*98/14*0.....
 WOLJ7ABC51V000001
 2760 kg
 4700 kg
 1450 kg
 1550 kg

1,67	L40A	XXJY	7730
	RP04		

Equipment Level →

}

1F06 3V640146 52DC7Q
 A41C25
 AK5
 C60 C6M DL8 W6E JL9
 M73 UY8
 82U 82I E51 82X

7730

National approval numbers

Only for Van and Platform Chassis

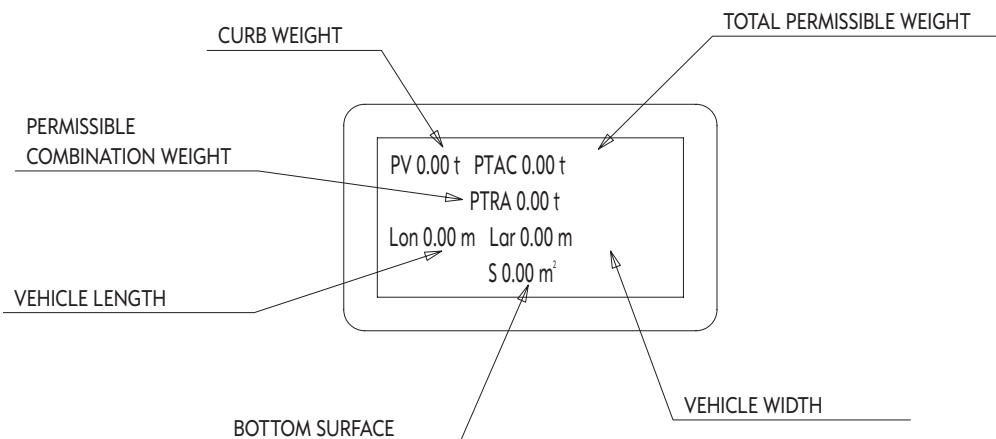
- Belgium →
- Czechoslovakia →
- Germany →
- Spain →
- France →
- Italy →
- Poland →

B : U/00490
 CZ : 4540-87
 D : ABE K830
 E : C-1991
 F :
 I : D6M 54732 EST29
 PL : PL * 1171

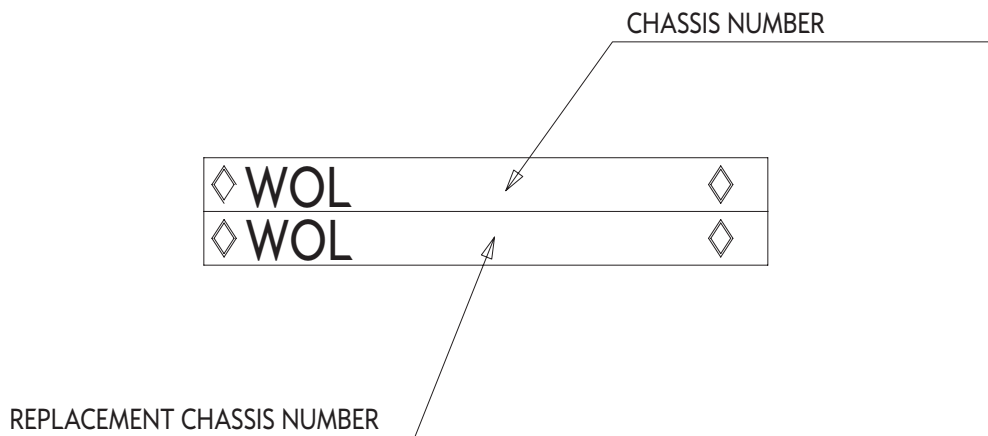
7730



Weights and dimensions



Chassis number

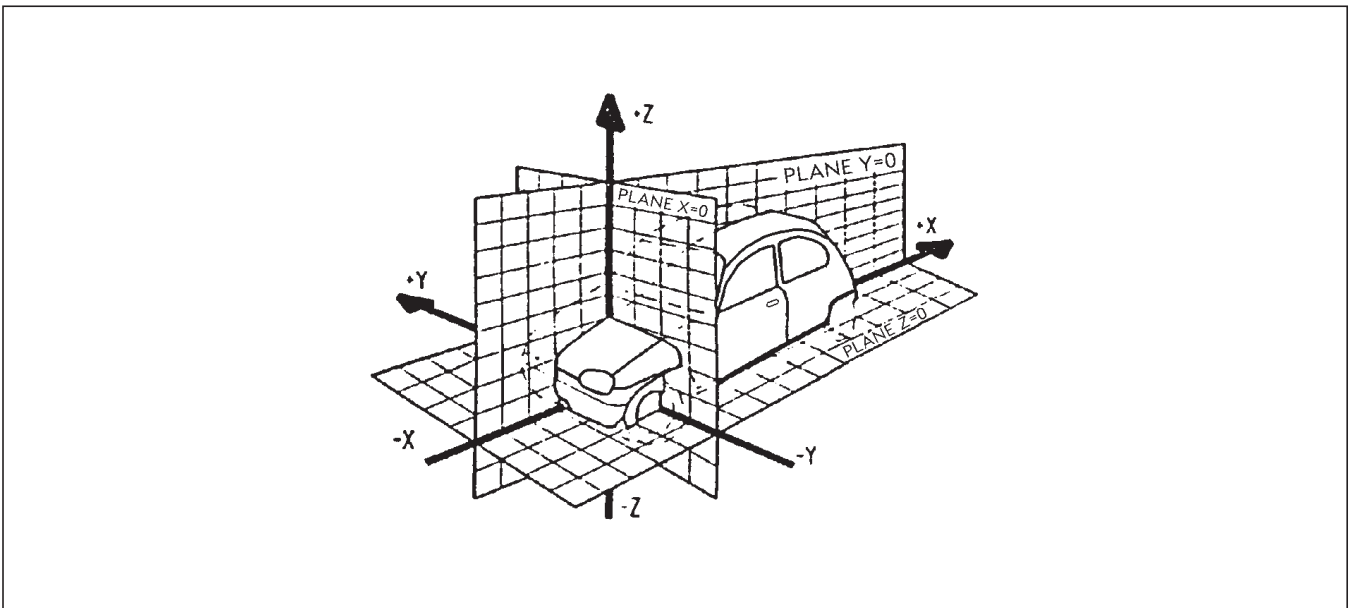




3 Body frame plans and sectional drawings of the Vivaro

- **Reference system and interpretation of dimensions**

In general, the dimensions are expressed as absolute values (distance between two points) and the positions as relative values (determination of position within the reference system). The origin of the reference system is the centre of the front axle, as shown in the diagram below. The position of the front axle is constant with a deviation of ± 1 mm along the X-axis between unladen and laden conditions.



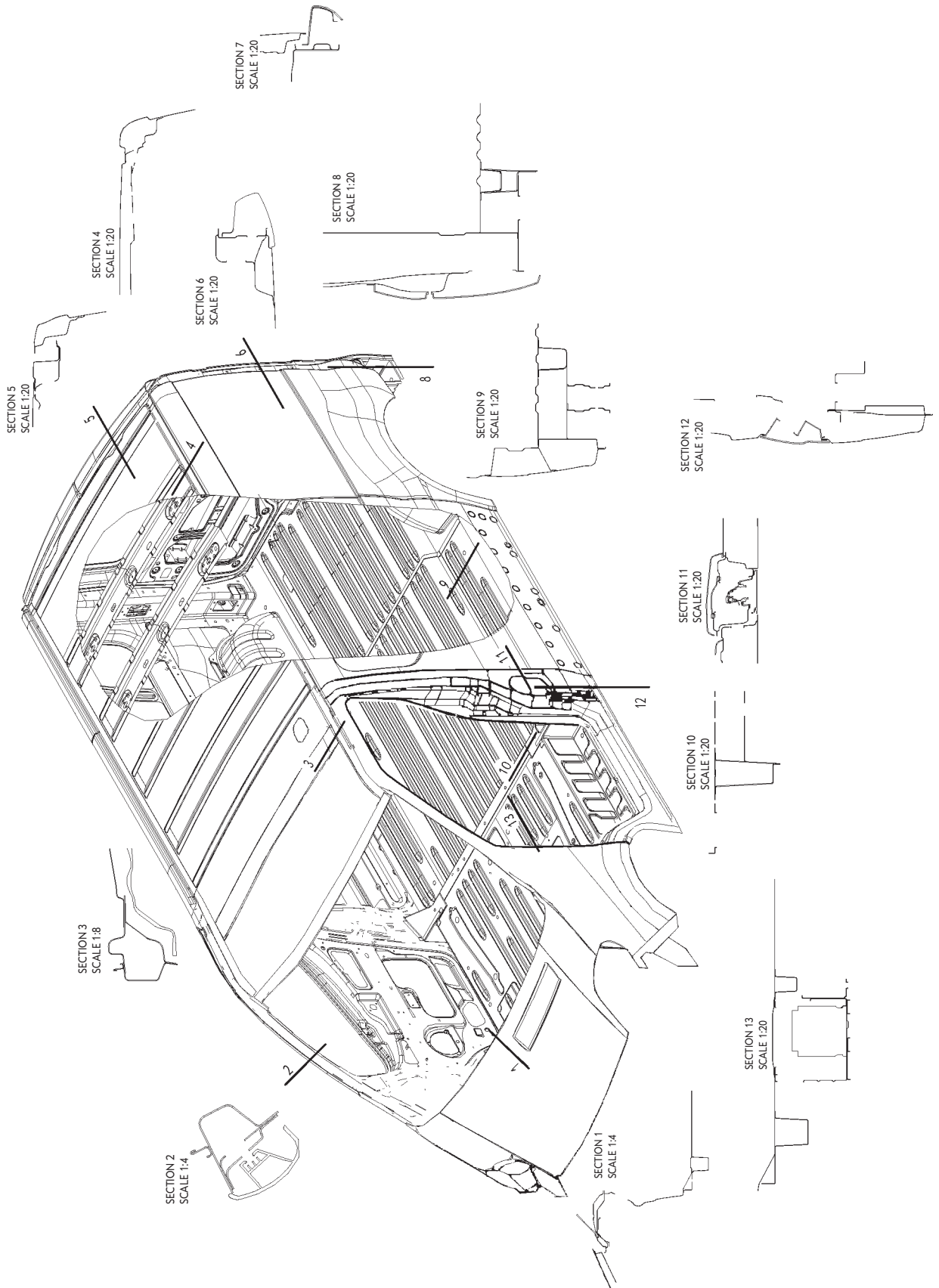
Van

- **Superstructure**

The main sections for the Vivaro are indicated in the diagram overleaf.



Body sections





• **Installation of windows or sheet-metal panels in the vehicle sides**

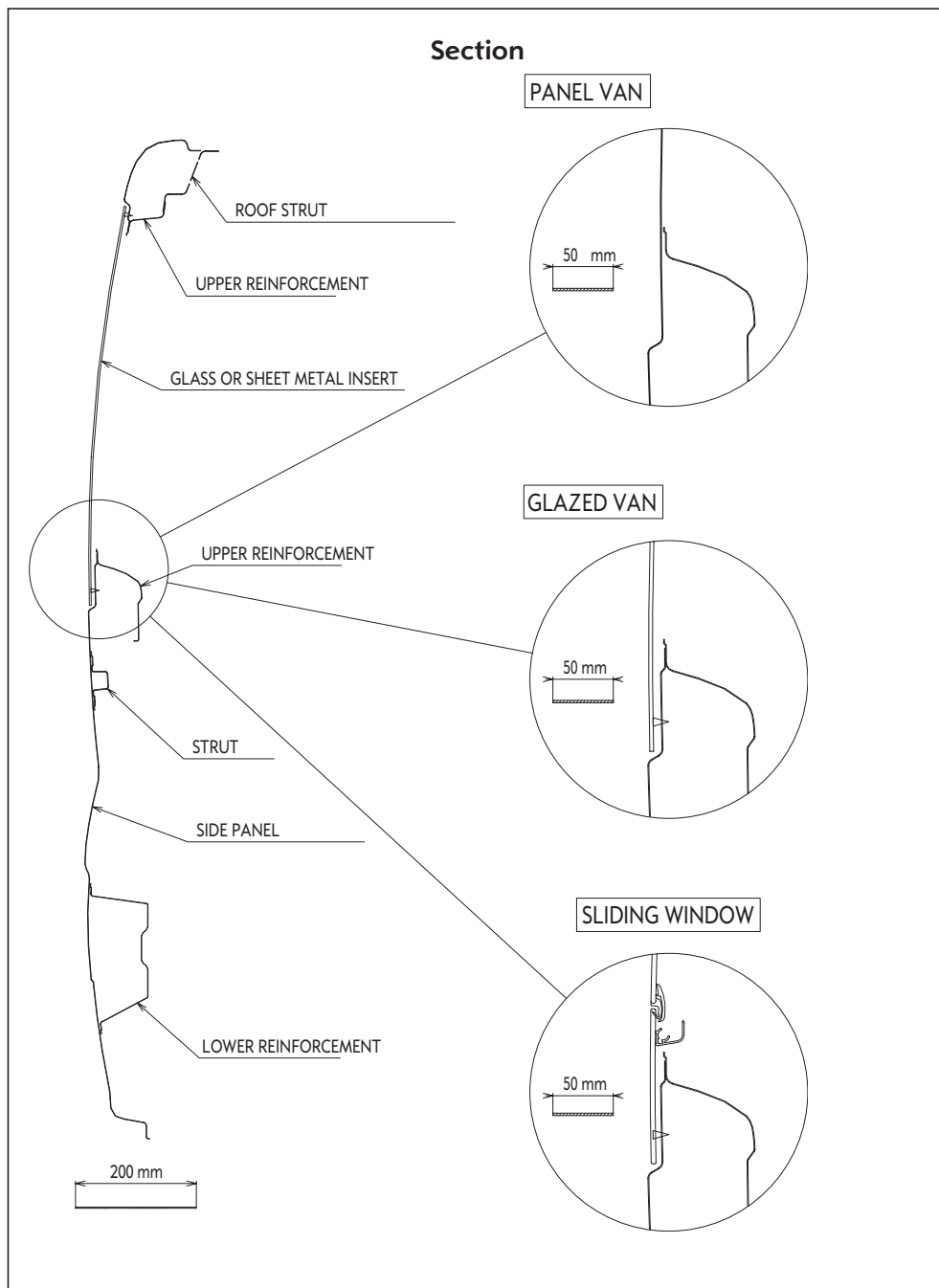
It is recommended that a glazed version of the Vivaro is used as the basis for conversion.

If this is not possible, the following method is recommended:

- Cut out the panel along the contours
- Attach the panel and reinforcement with water-tight rivets (distance between rivets: 120 mm)
- Bond in standard windows (use special seal provided).

• **Rear doors**

The procedure is the same as for side panels.



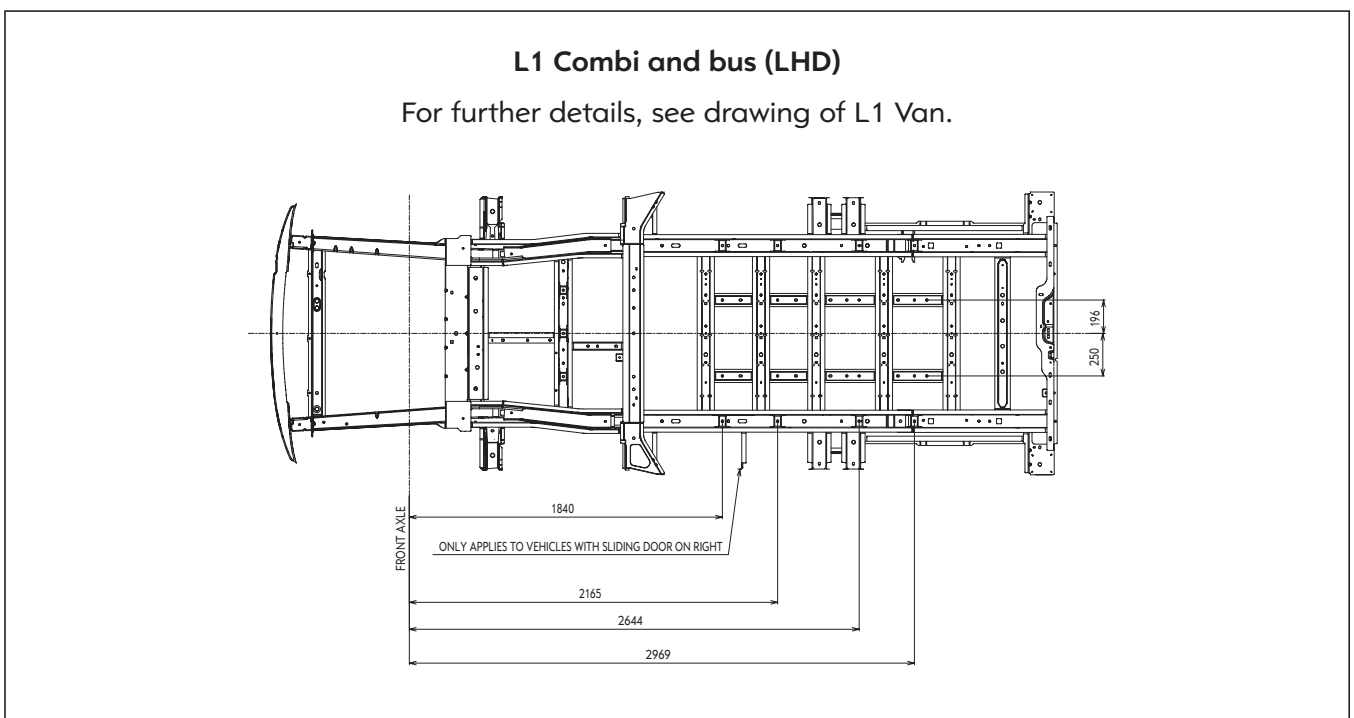
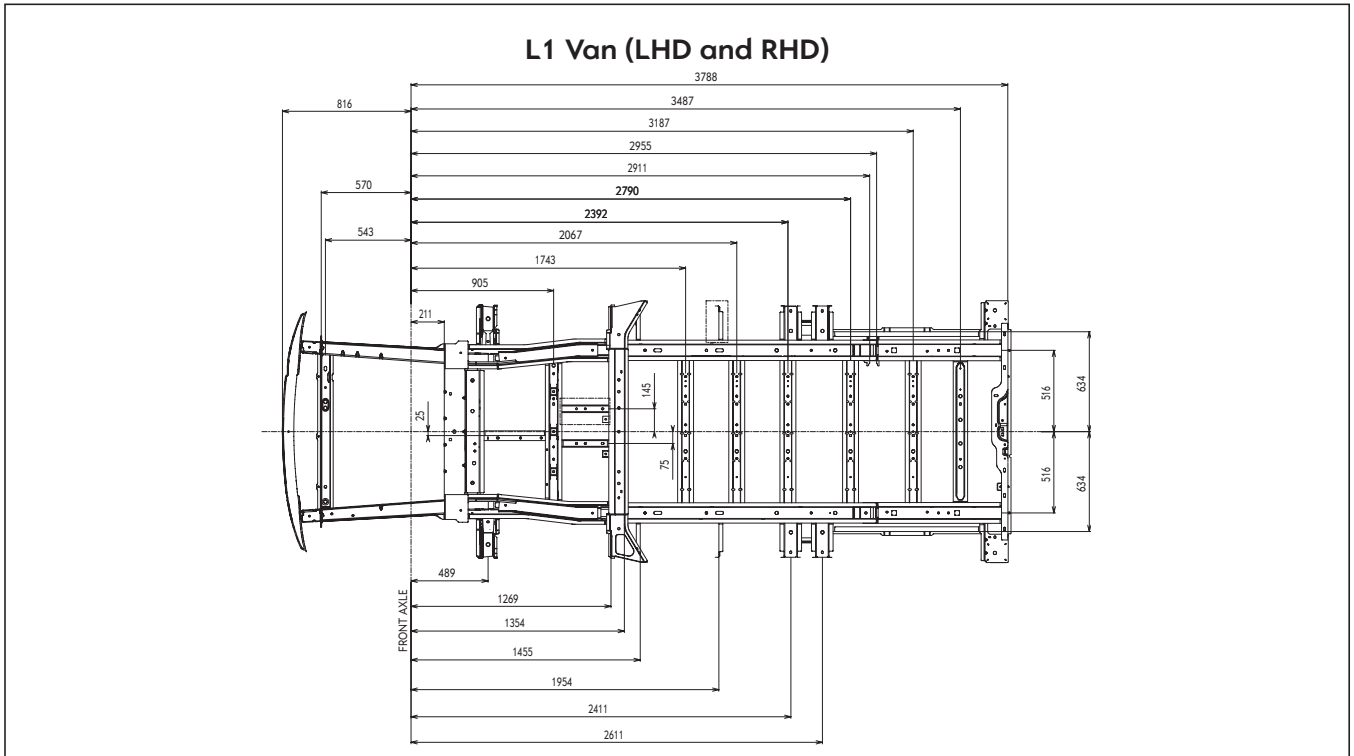


- **Floor group – main sections**

See also platform chassis

- **Position of crossmembers**

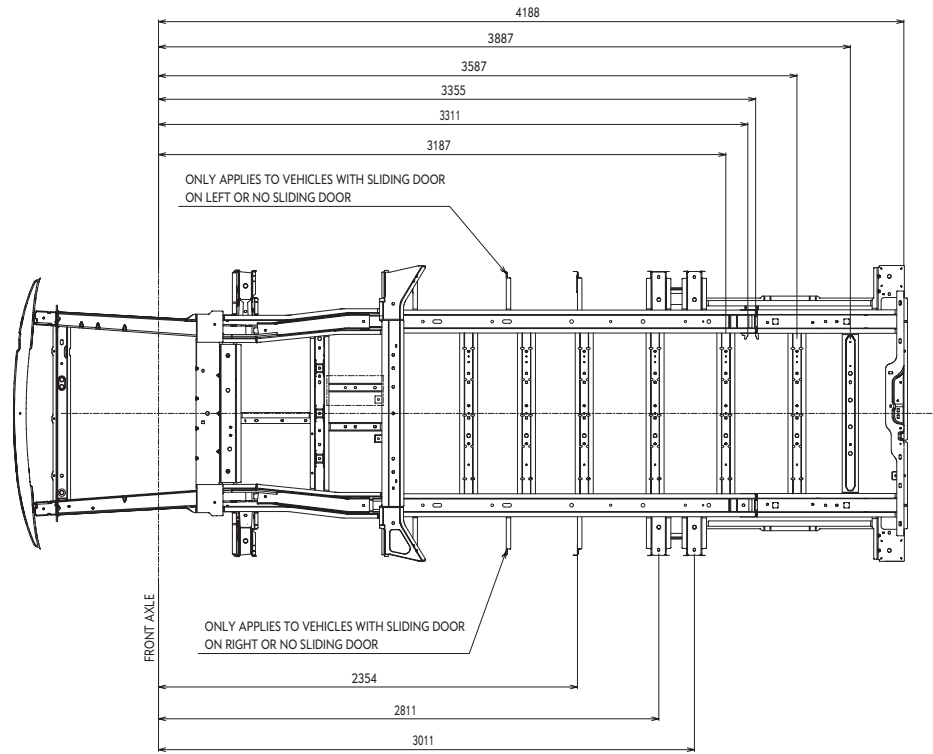
The following drawings are plan views (without floor panel). The positions of the side members and crossmembers for vans, combis and buses are illustrated (L1, L2, RHD and LHD).





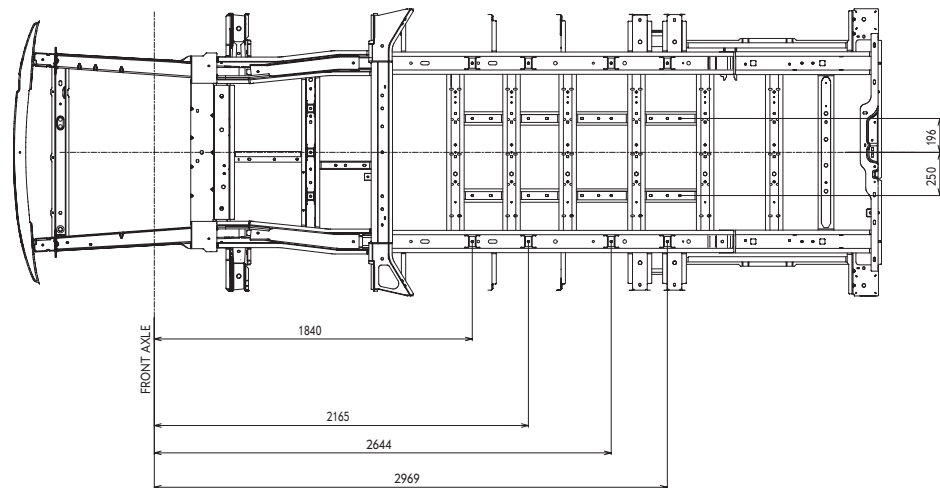
L2 Van (LHD and RHD)

For further details, see drawing of L1 Van.



L2 Combi and bus (LHD)

For further details, see drawing of L1 Van.





- **Partition between cab and load compartment**

Vans and platform chassis can be supplied with a partition (as standard in some models).

The following partitions are available:

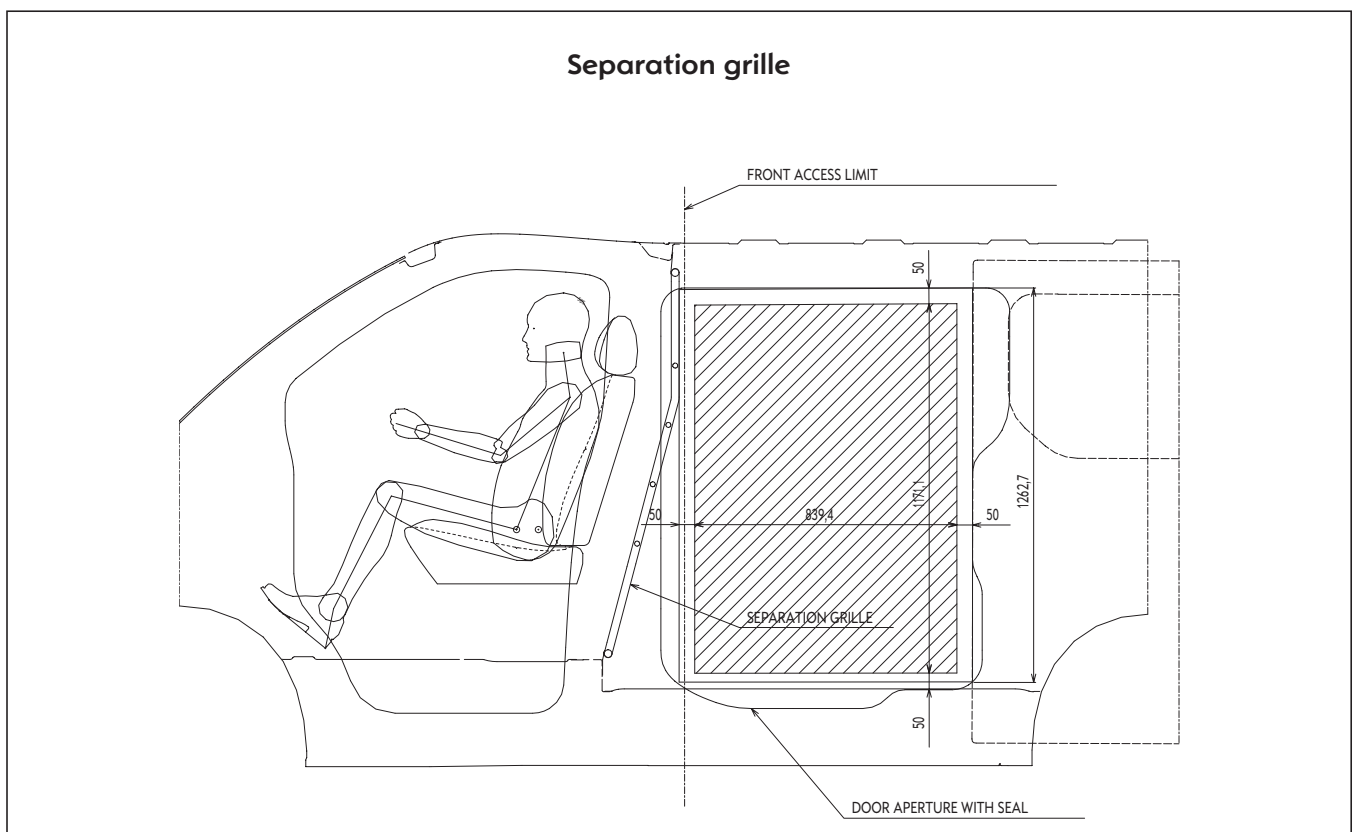
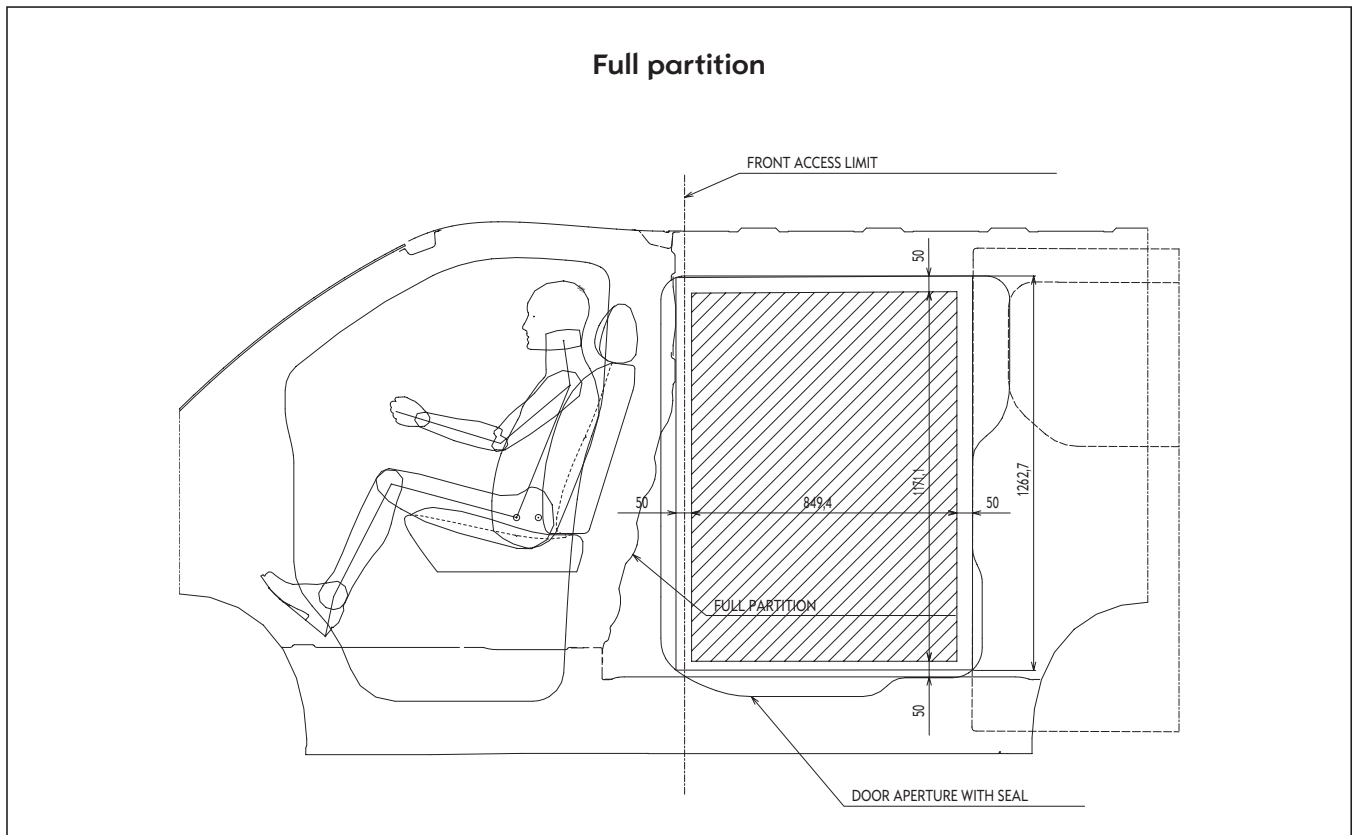
- One third separation grille on right or left side, depending on whether the vehicle is RHD or LHD (not available for platform chassis)
- Sheet metal partition with window
- Sheet metal partition without window

The partitions are attached with bolts and rivets, but are not completely sealed.

Vehicle converters installing partitions should refer to diagrams on the following pages, which show the ideal installation position taking account the driver's seat suspension, cab ergonomics and the pallet loading through the side door (pallet dimensions 800 mm x 1000 mm x 1000 mm).

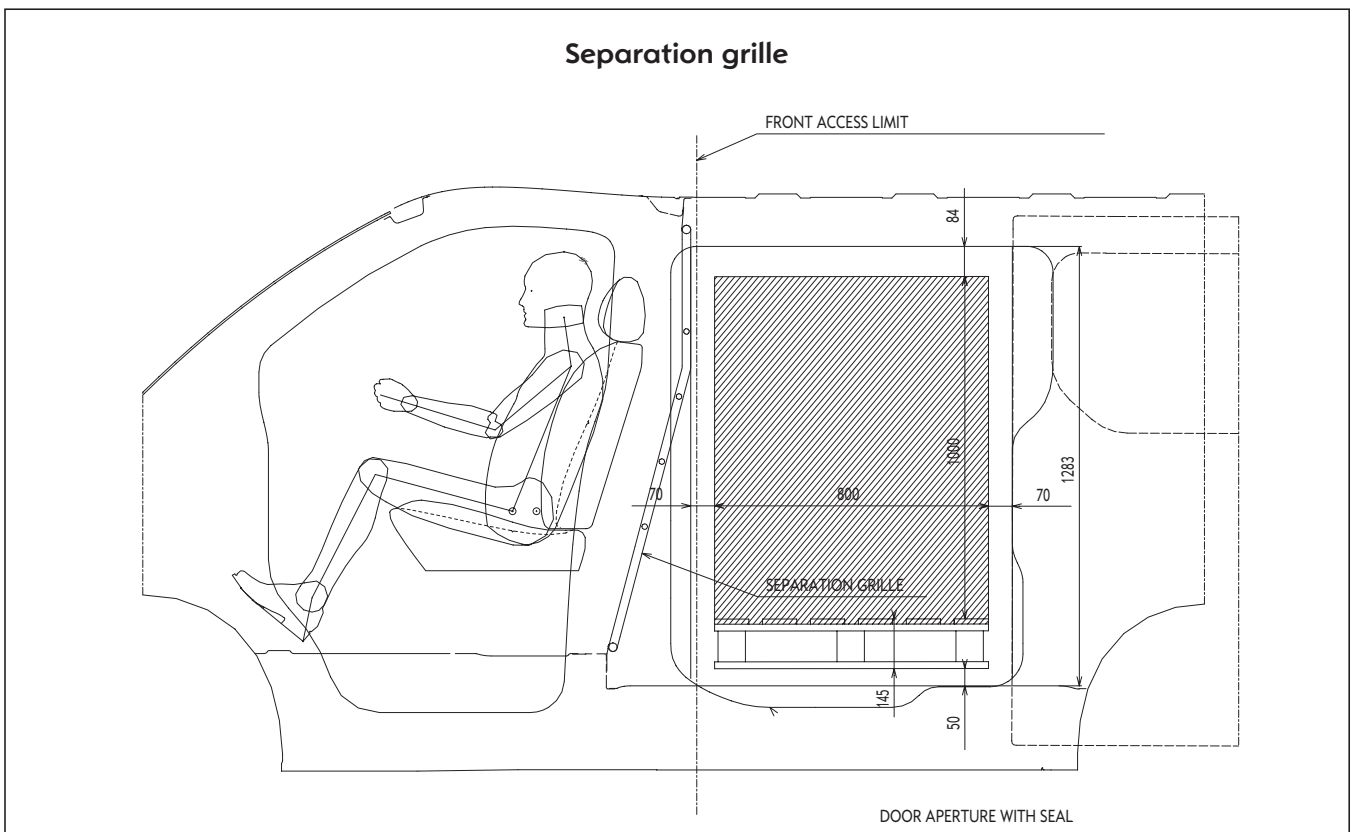
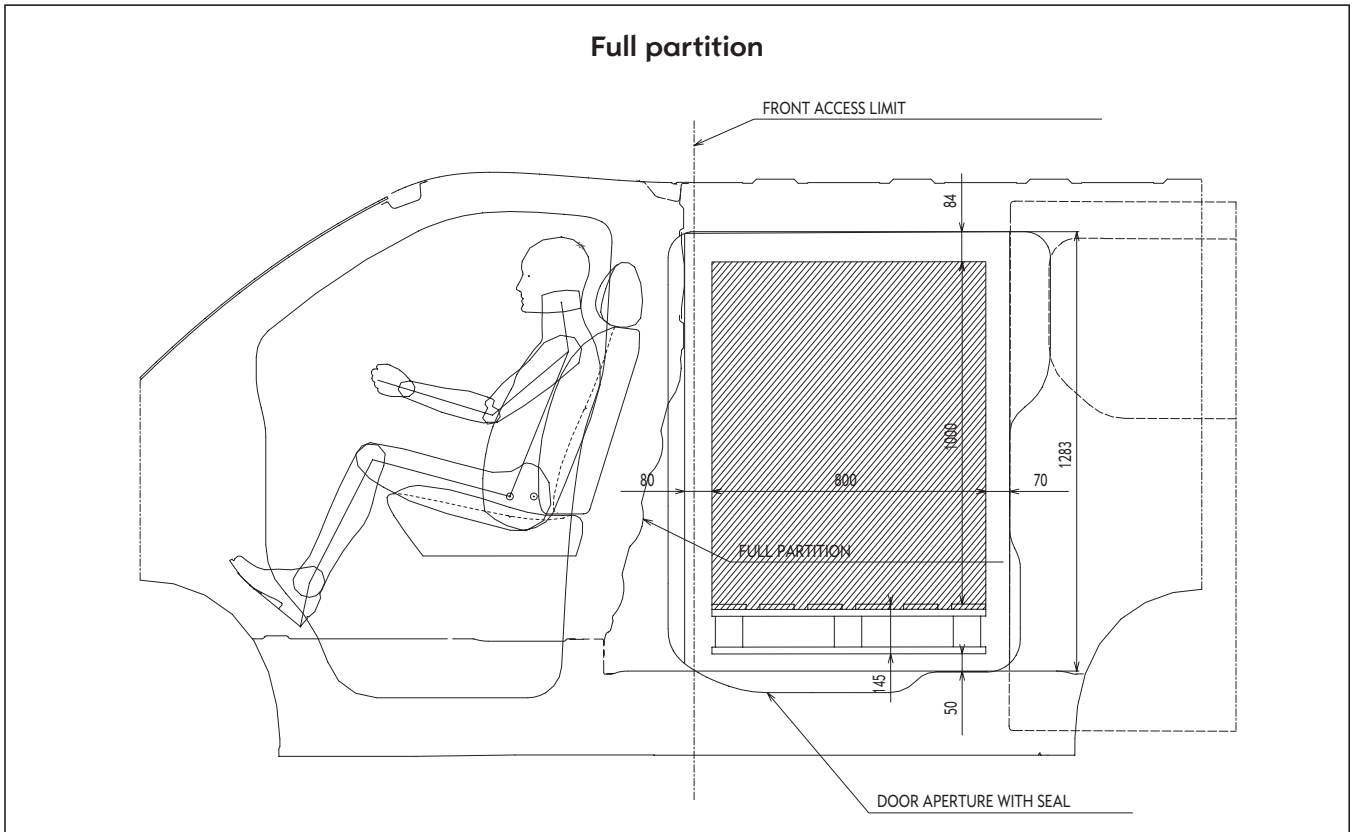


- Access to load compartment via side sliding door





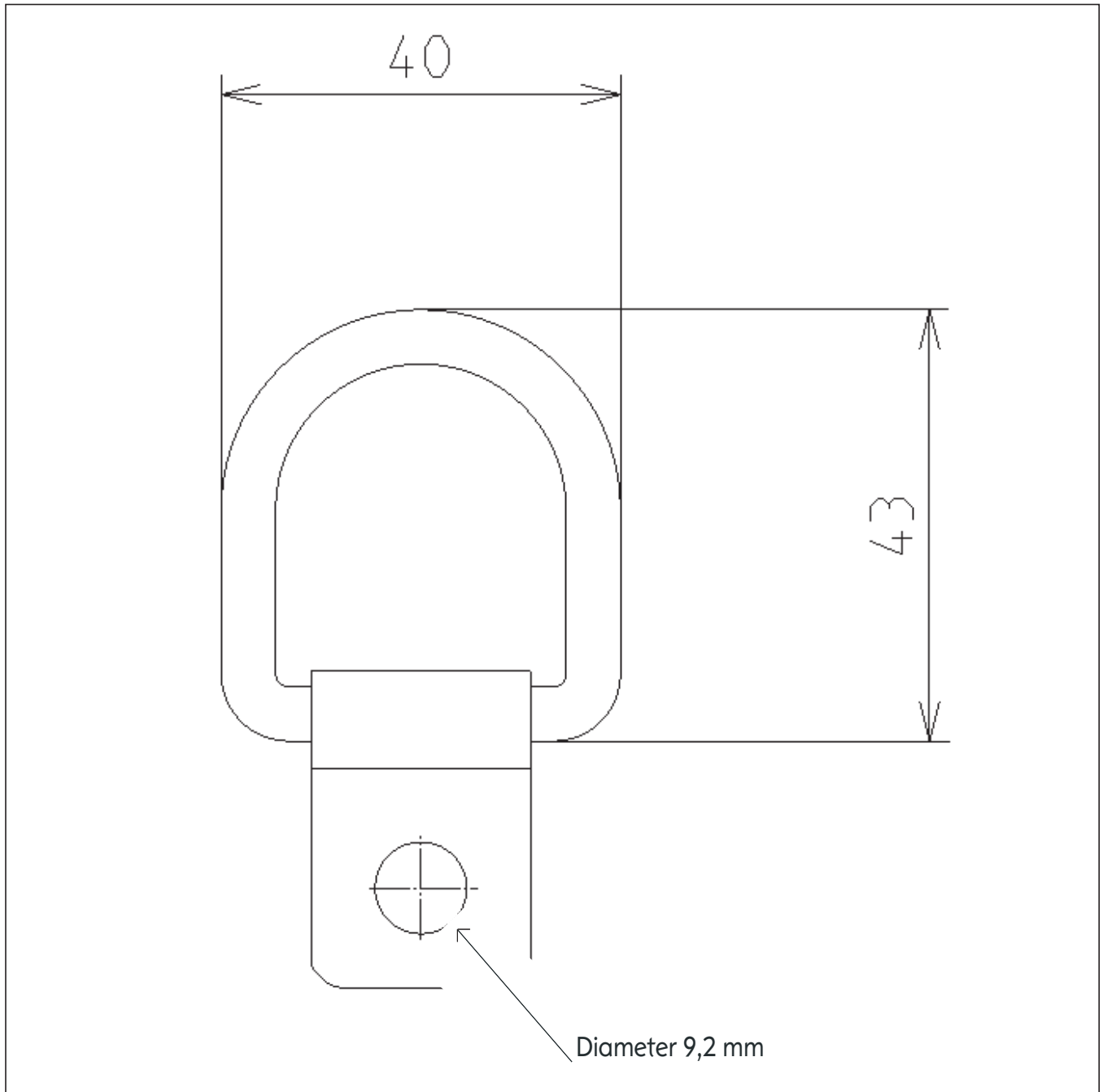
- Loading a europallet





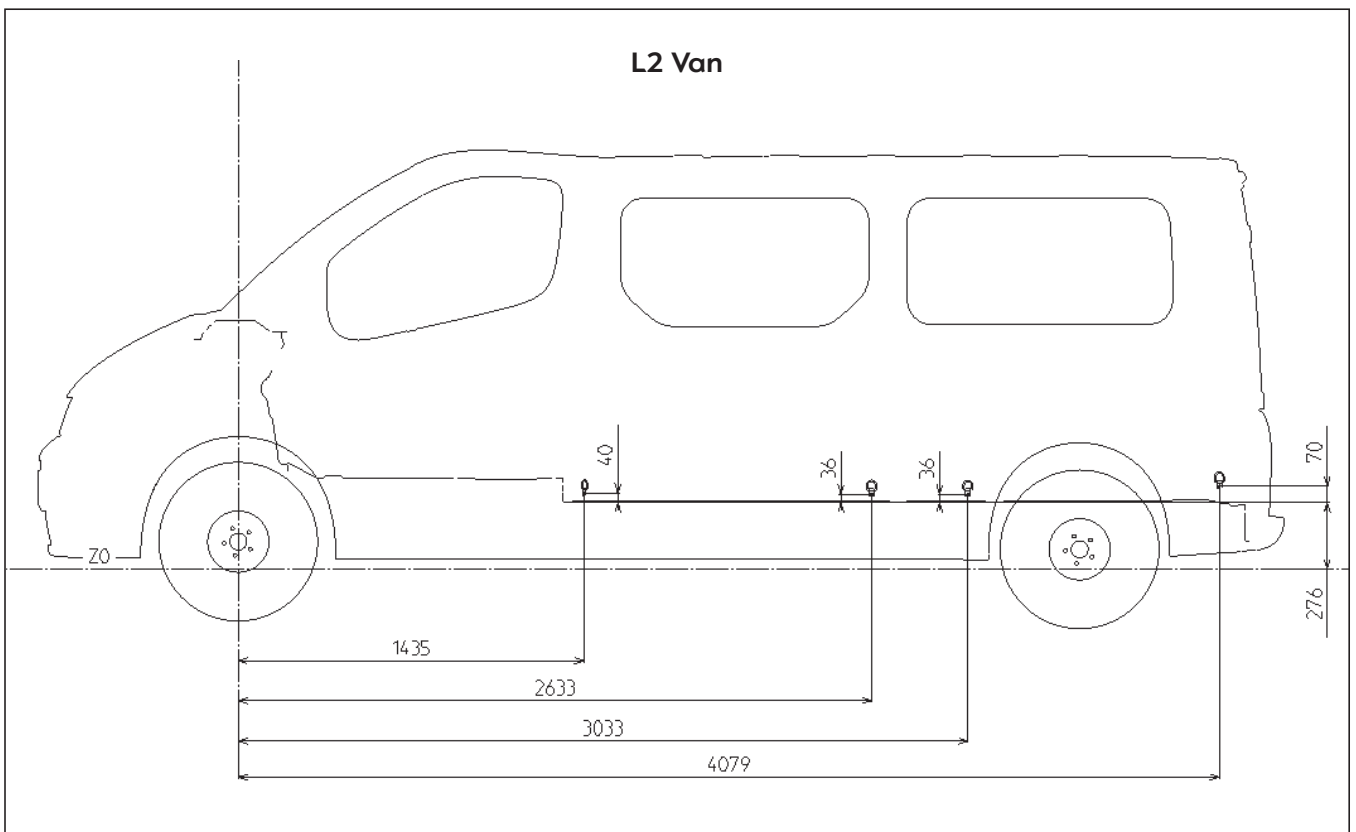
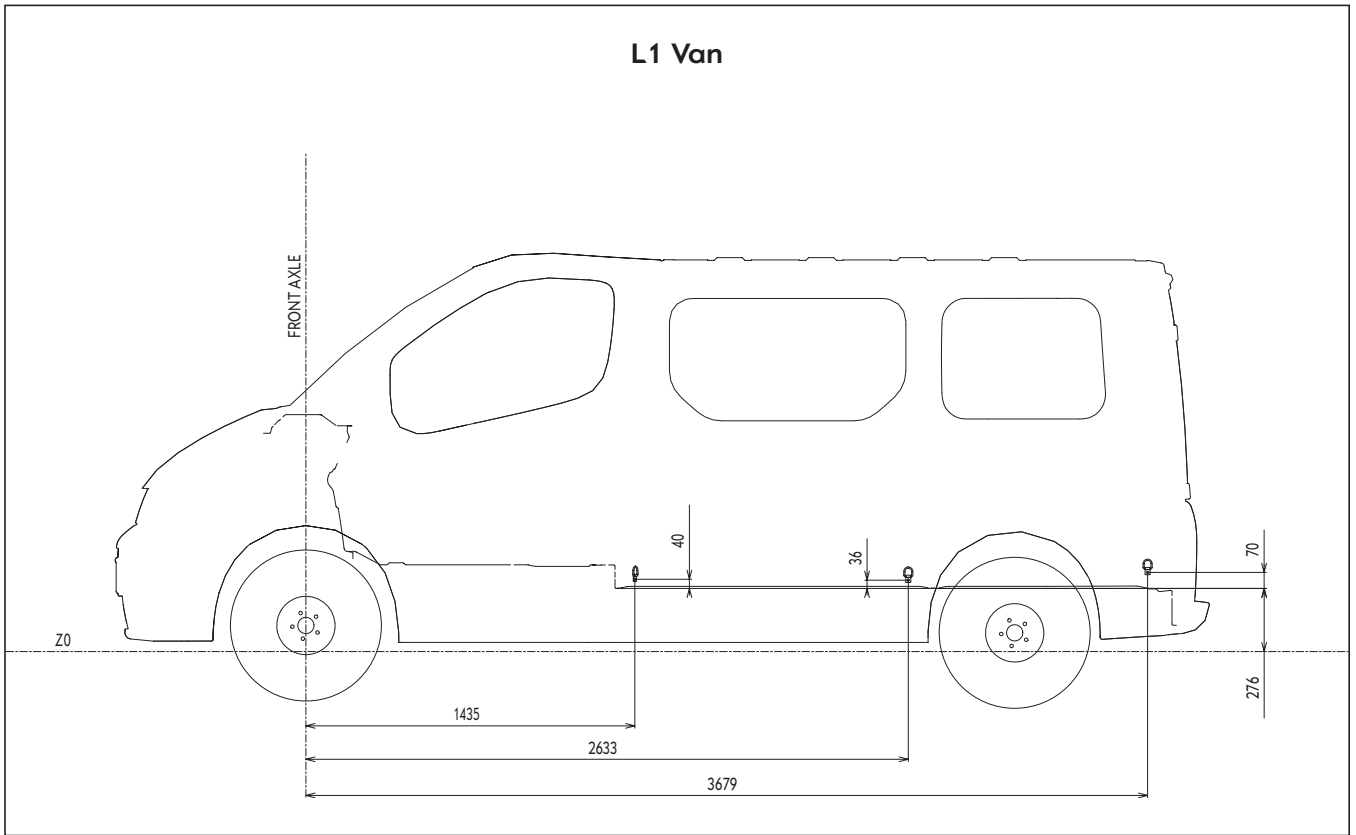
- **Lashing points**

The L1 van features six lashing points, the L2 van features eight.
 All the rings are attached to the sheet metal panel and conform to DIN 75410. The specification for the fastening bolts is M8 x 26.5.





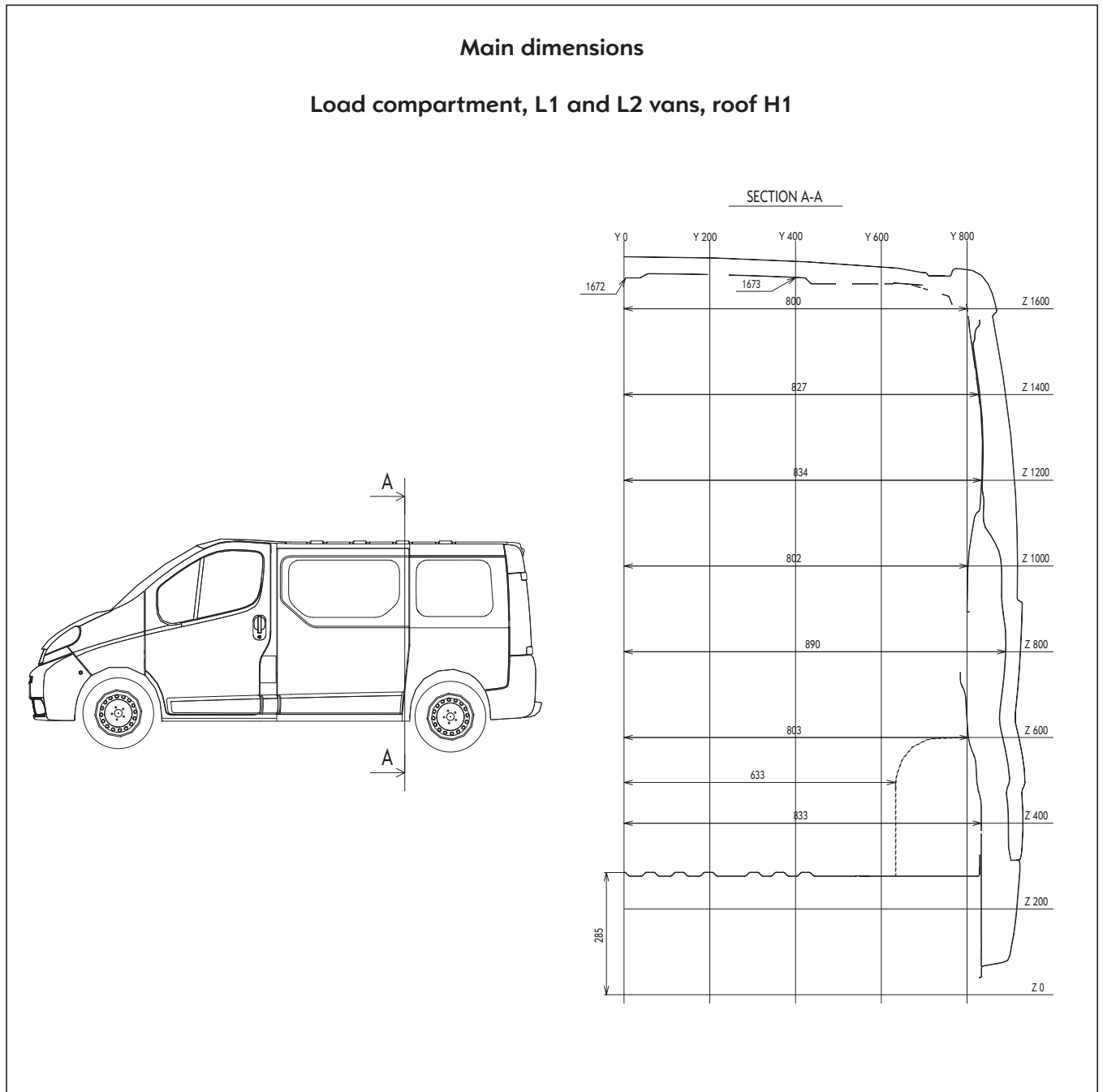
Position of lashing points





- **Load compartment sections**

- The main dimensions of the load compartment and the wheel housings are shown.

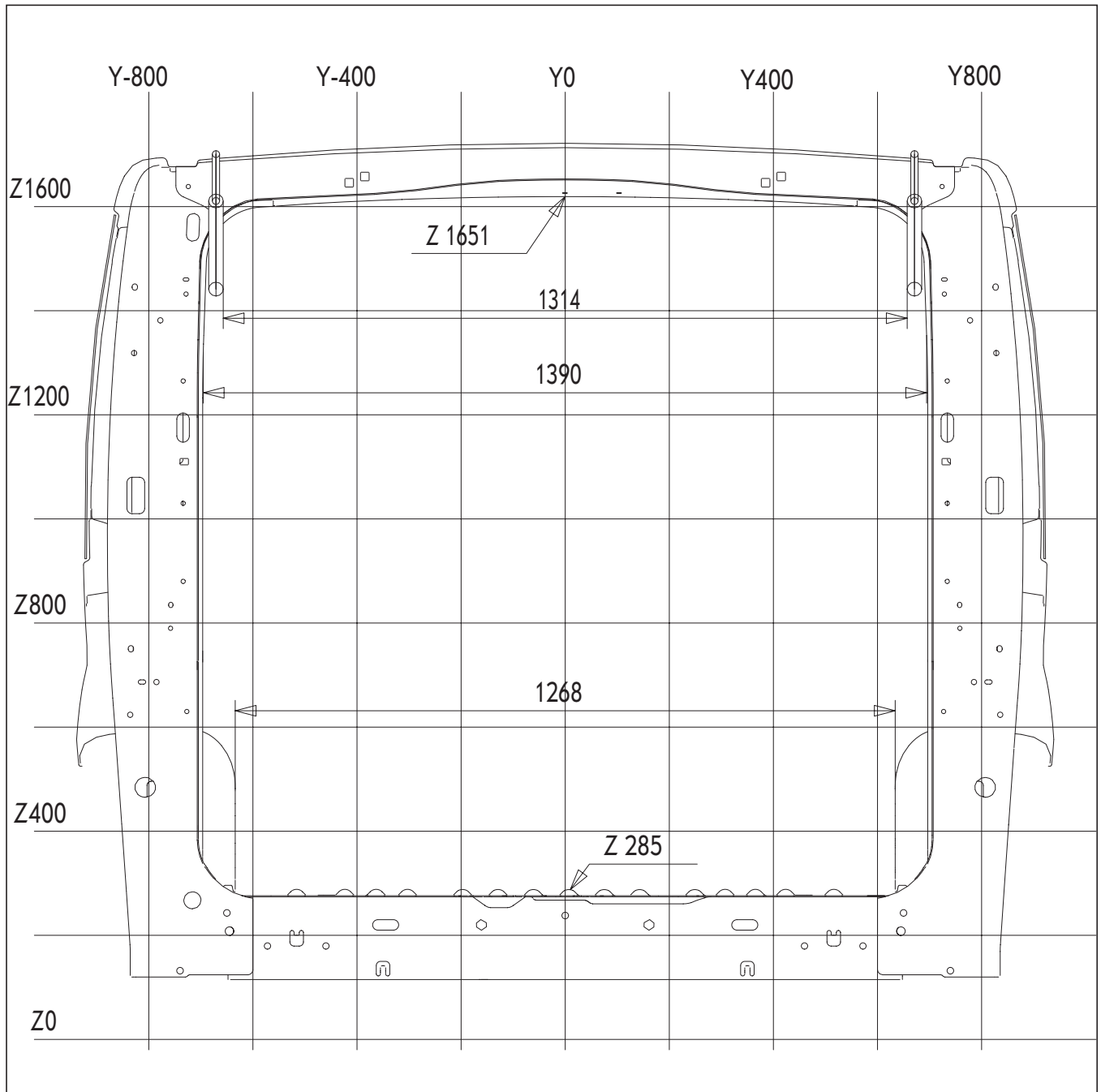




• **Accessibility via rear doors/tailgate**

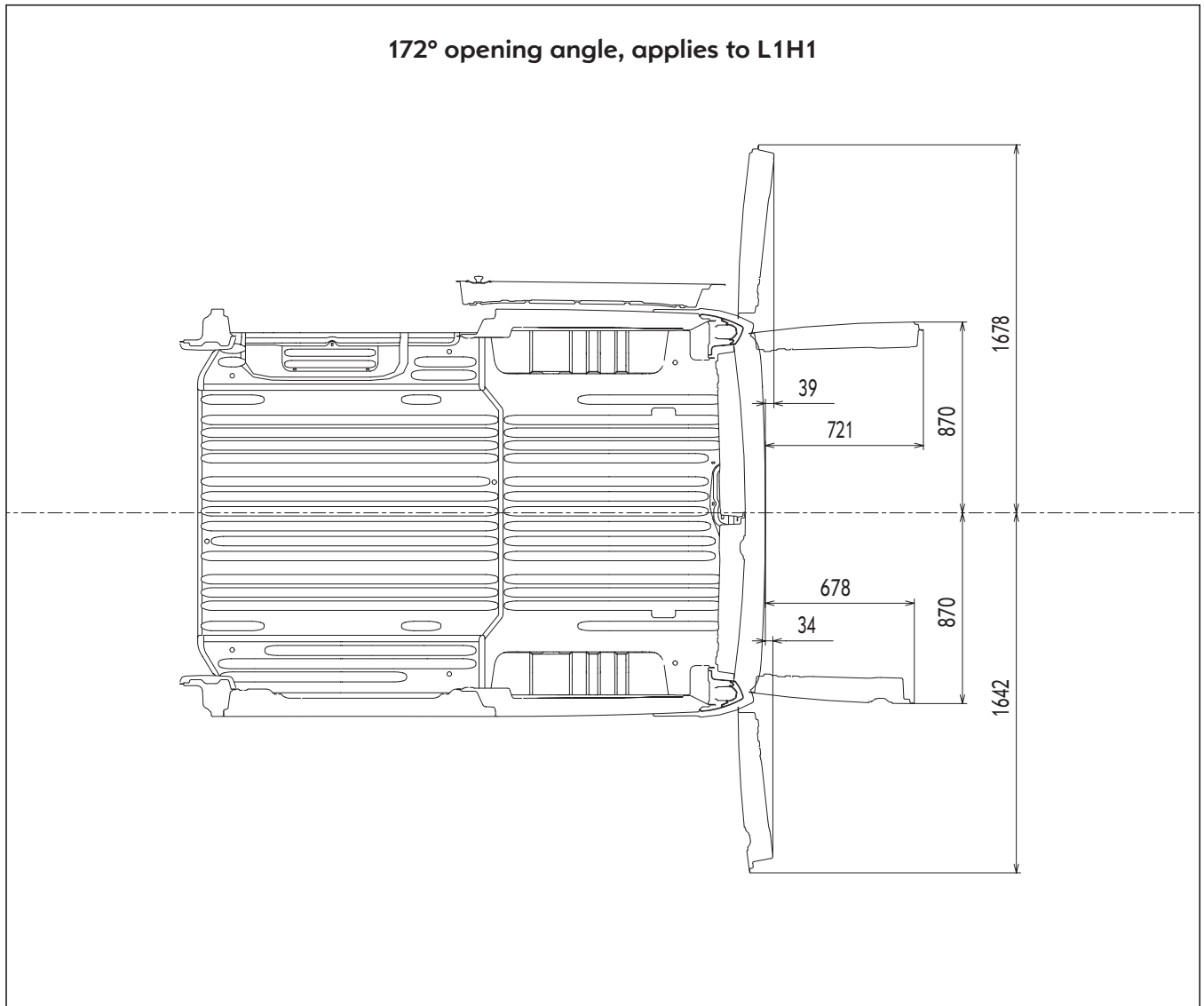
Access to the load compartment via the rear door frame fulfils the EN 1789 for ambulance vehicles. The overall dimensions include details of gap dimensions and installation position (version with 250° opening angle) at various levels.

Note: The height of the floor ribbing is 10 mm





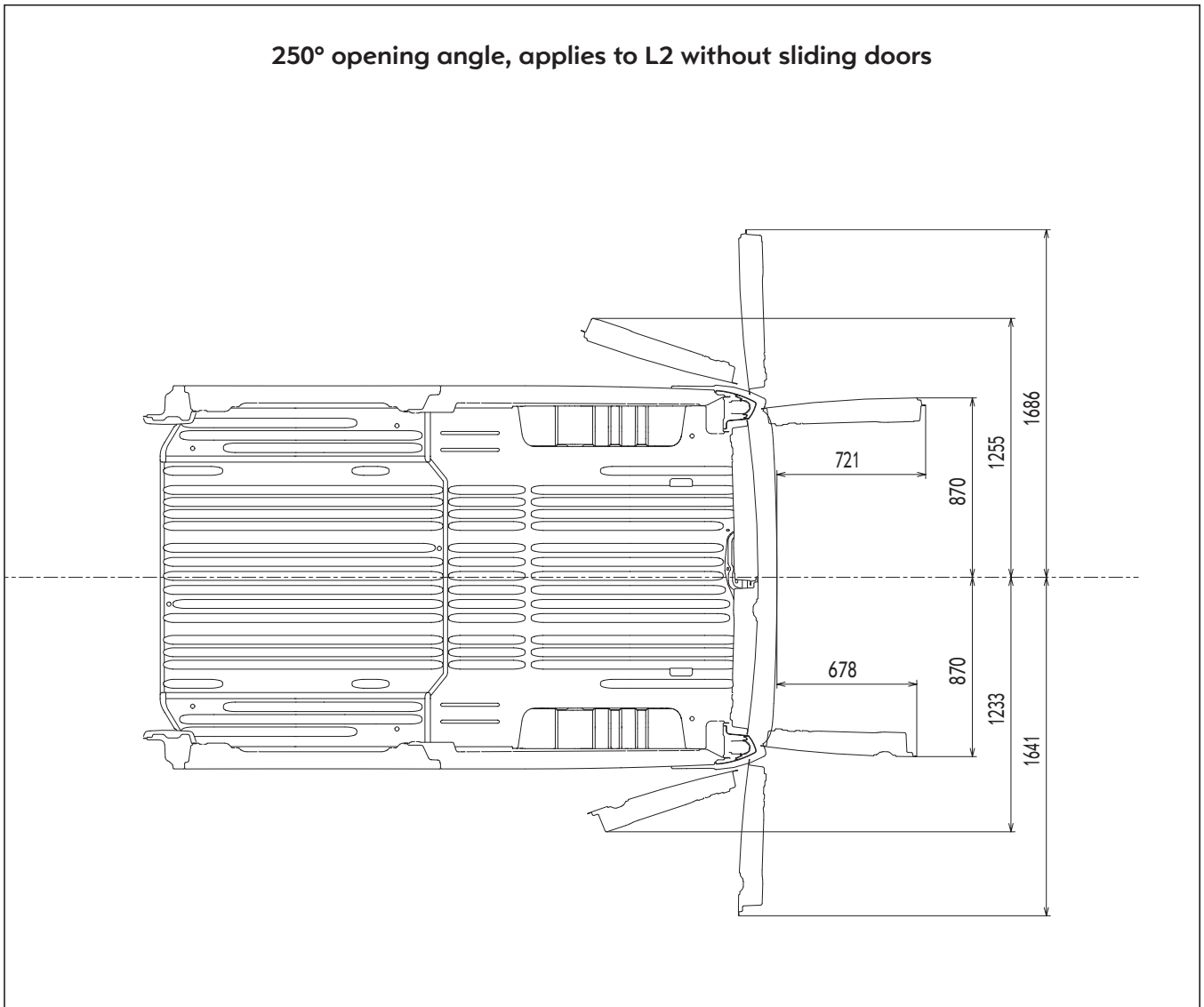
- Accessibility via rear doors





- Accessibility via the rear doors

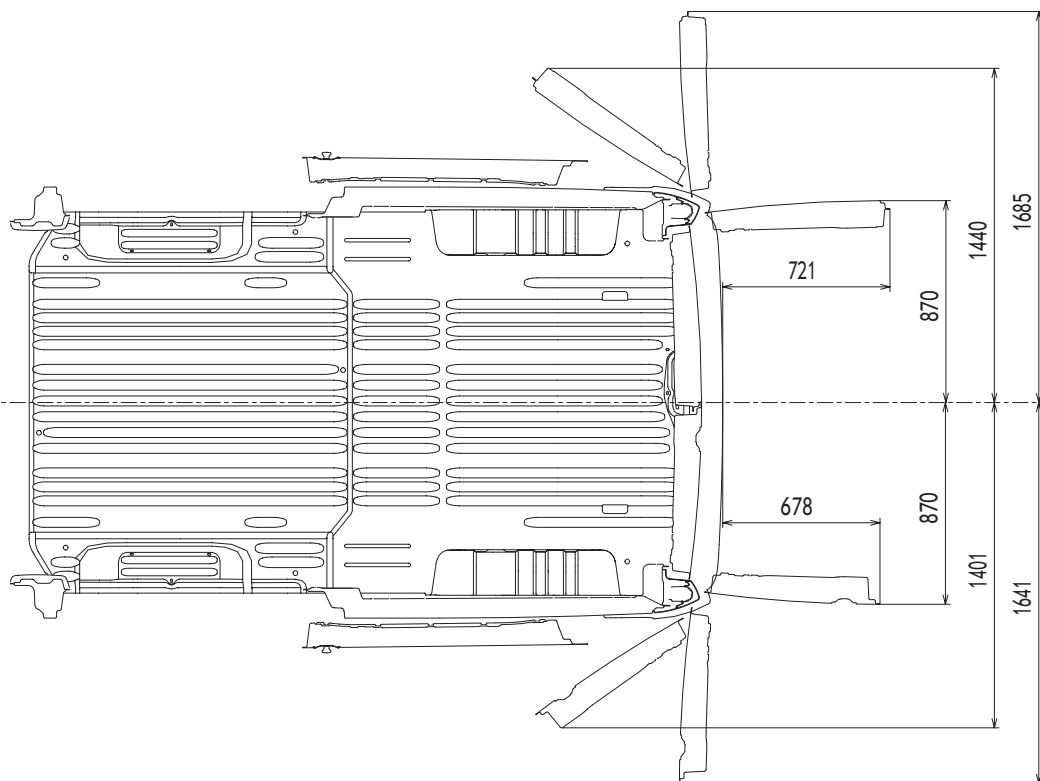
250° opening angle, applies to L2 without sliding doors





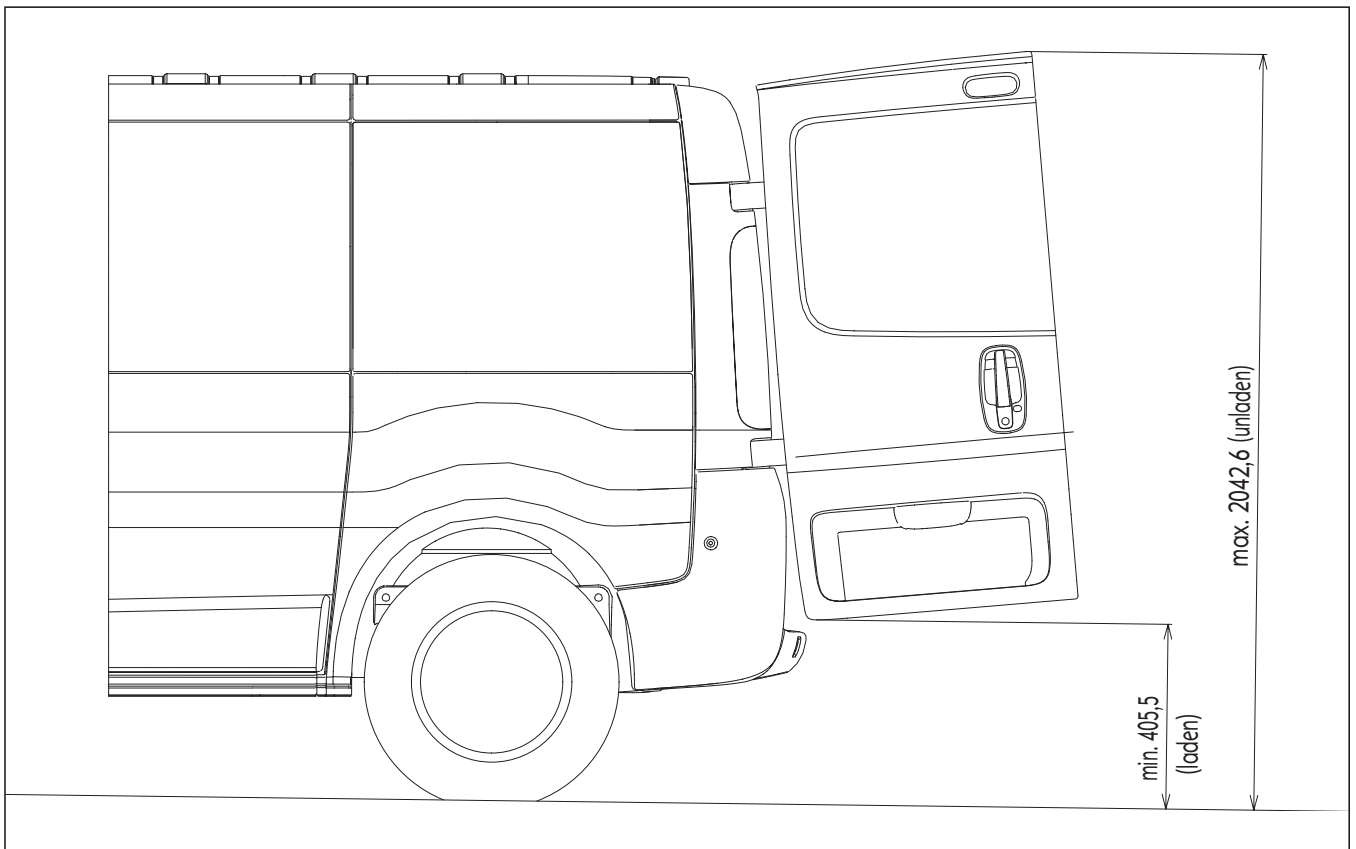
- Accessibility via the rear doors

233° opening angle, applies to L2 with sliding doors

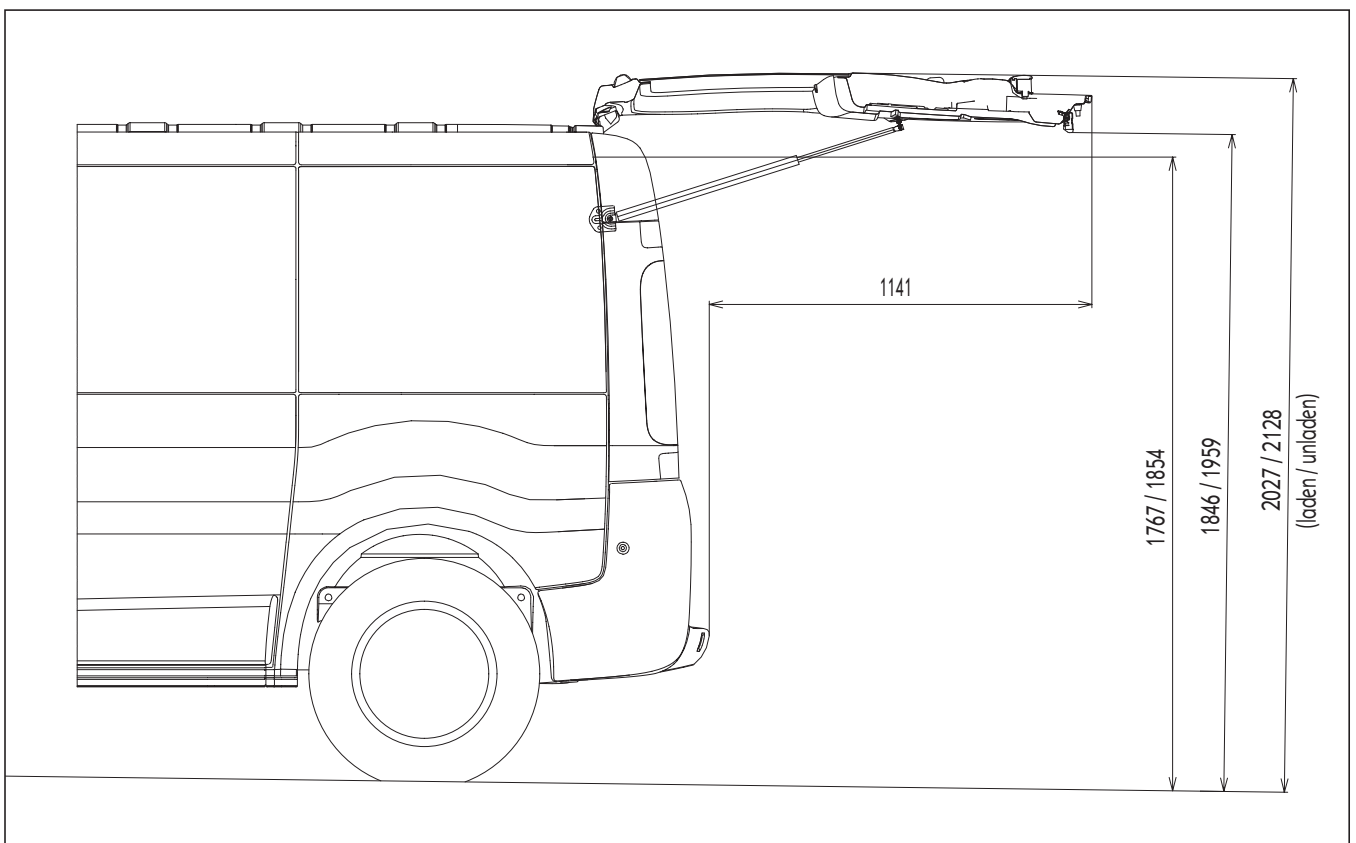




- **Accessibility via the rear doors**



- **Accessibility via the tailgate, applies to L1**

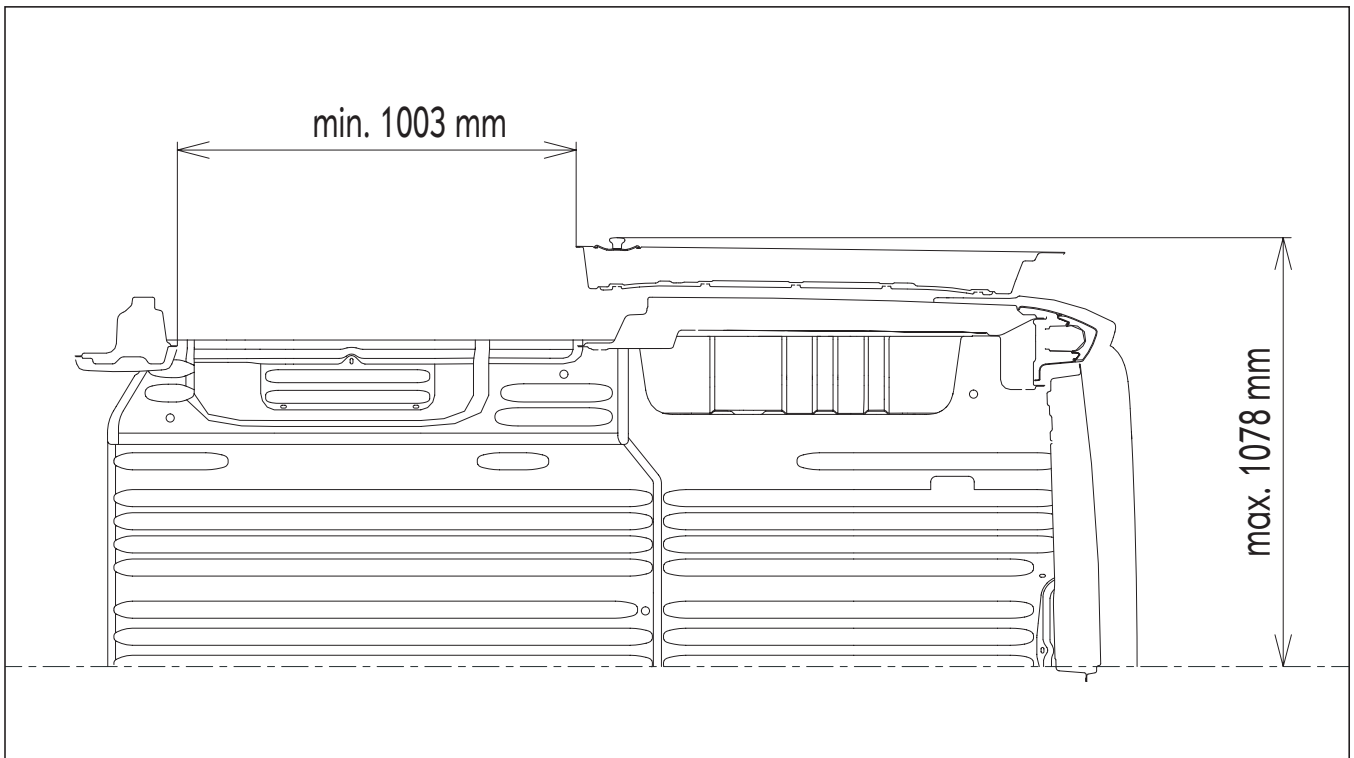




- **Accessibility via the side sliding door**

For further details, see:

- partition wall
- insulation of the side sliding door





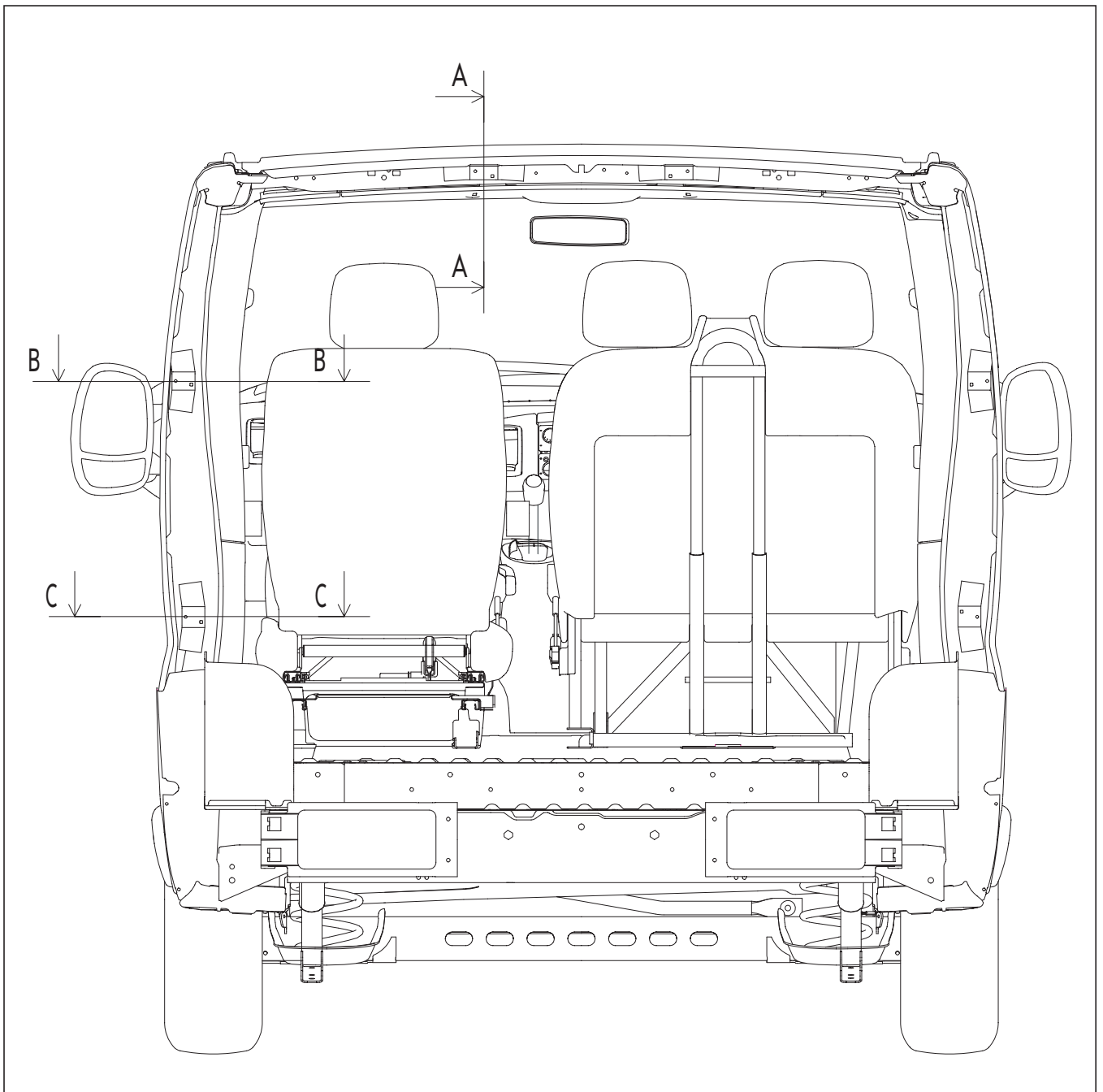
- **Platform chassis**

Vivaro platform chassis are fitted with a connection flange with six fastening points. The seat belt anchor points are certified as such.

- **Body connection – Position of fastening points**

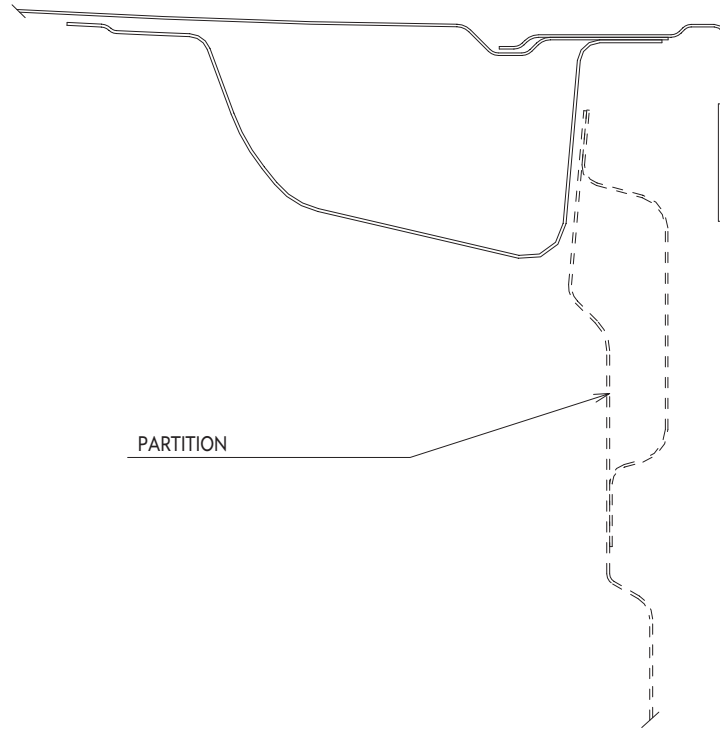
The position of the fastening points is shown below.

Note: For reasons of structural rigidity, the new body must be fastened to all fastening points. It is not sufficient to fasten them to the floor only.

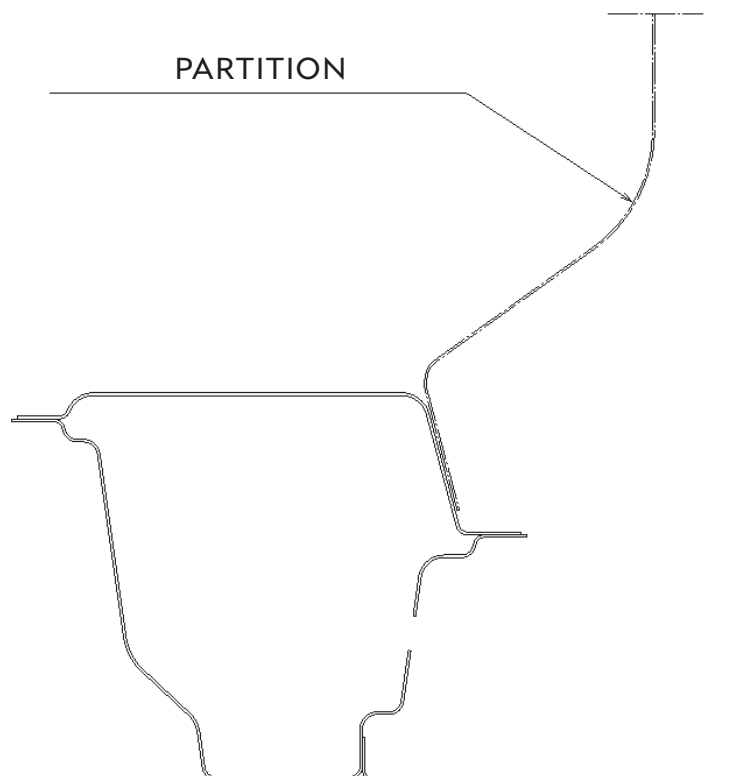


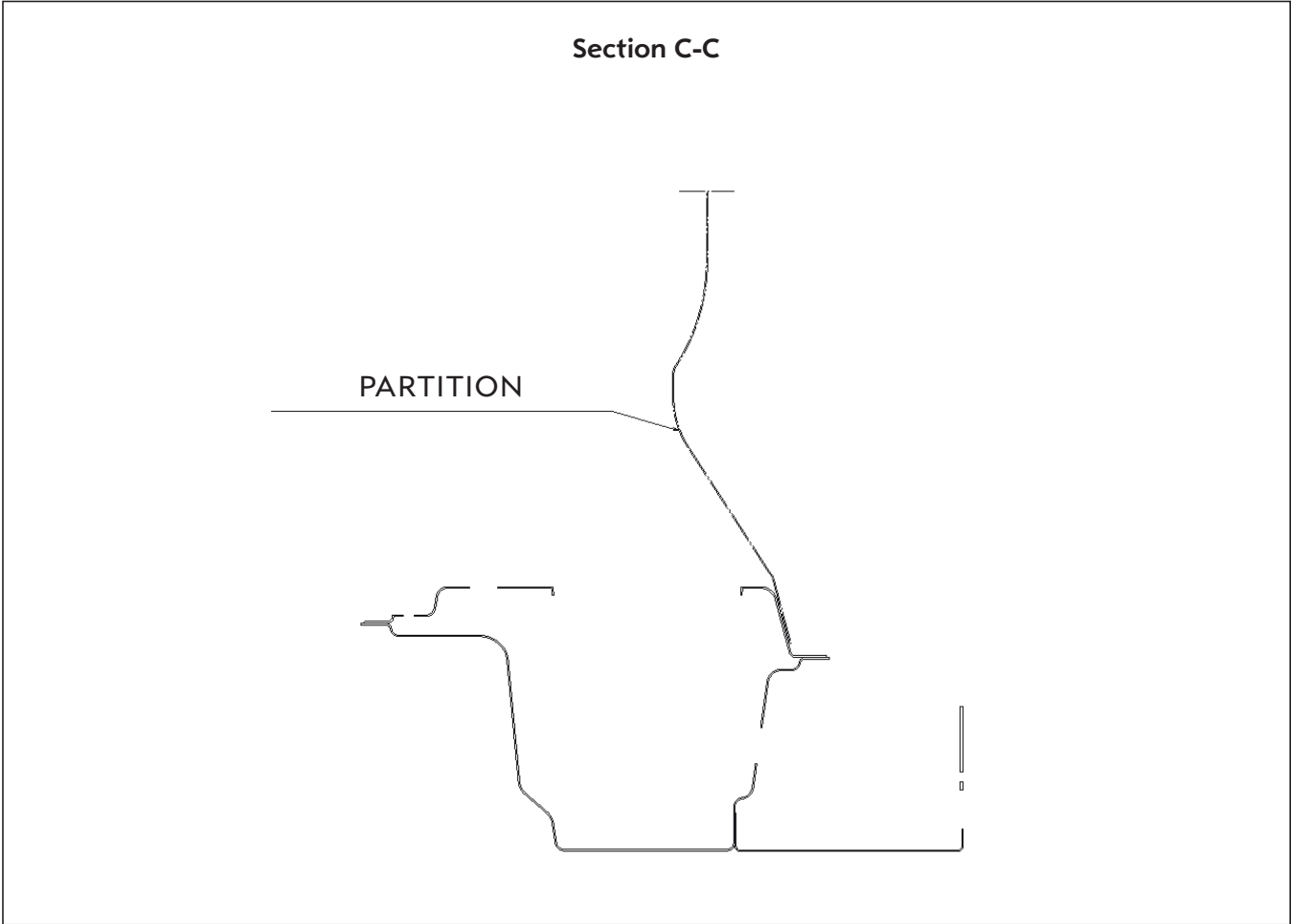


Section A-A
(Body fastening points)



Section B-B

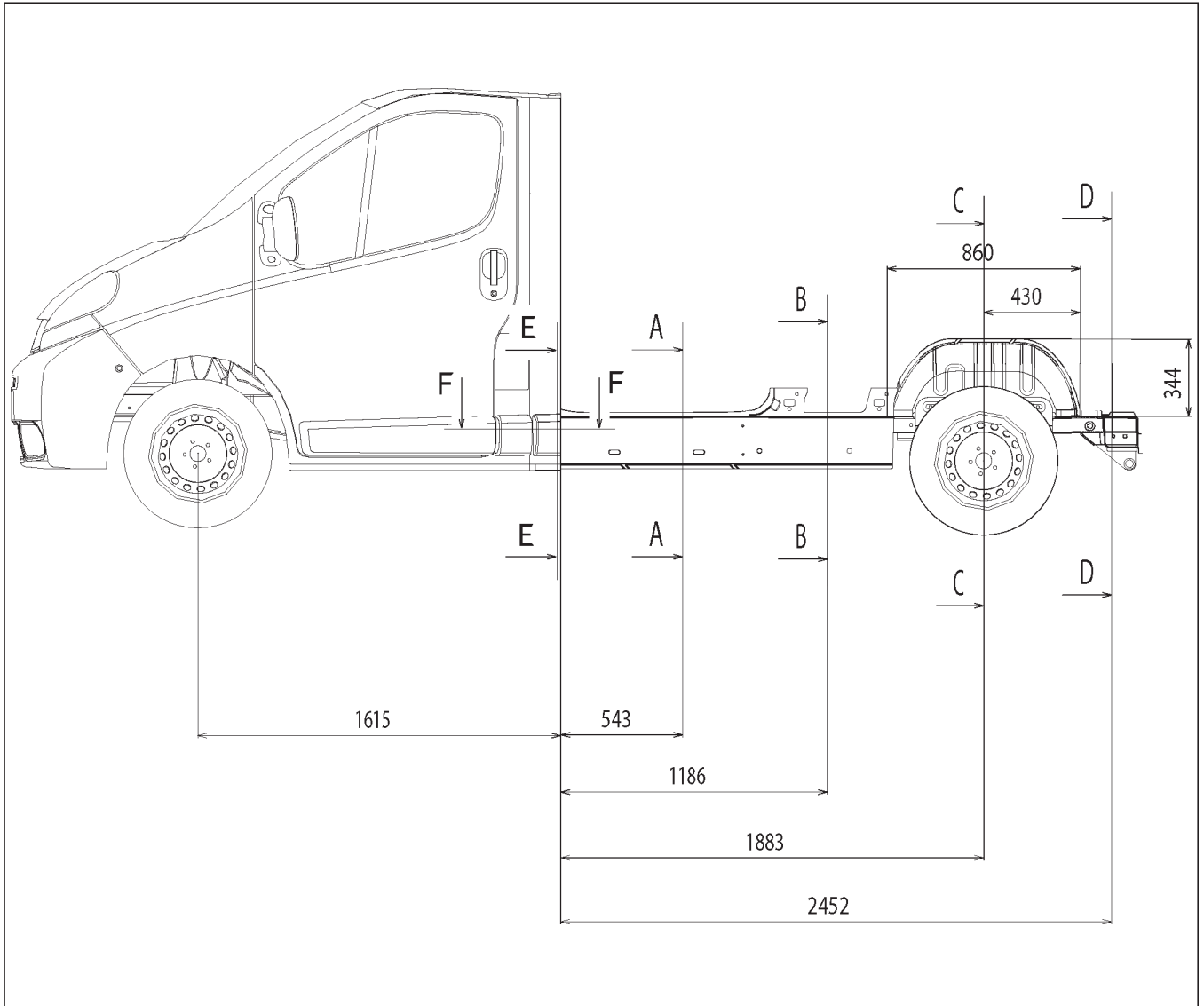


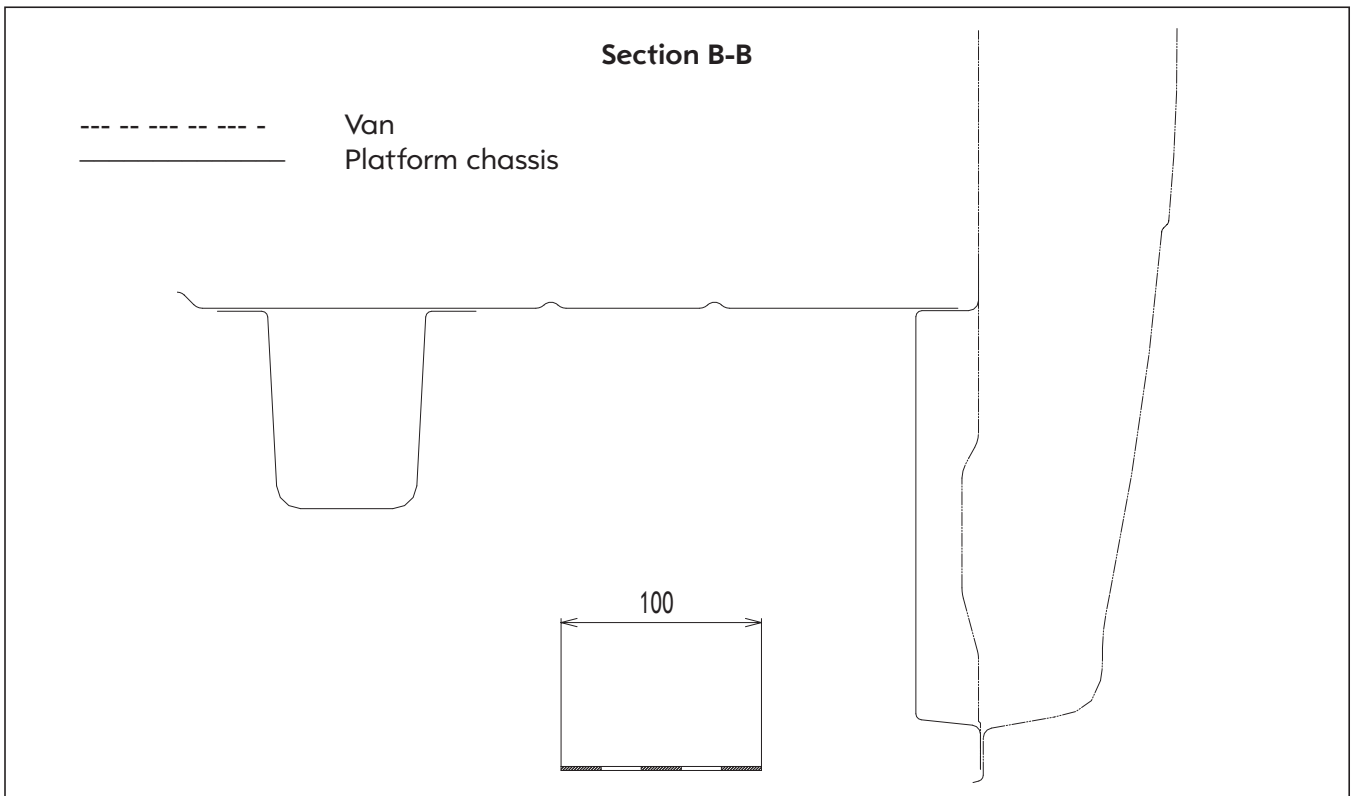
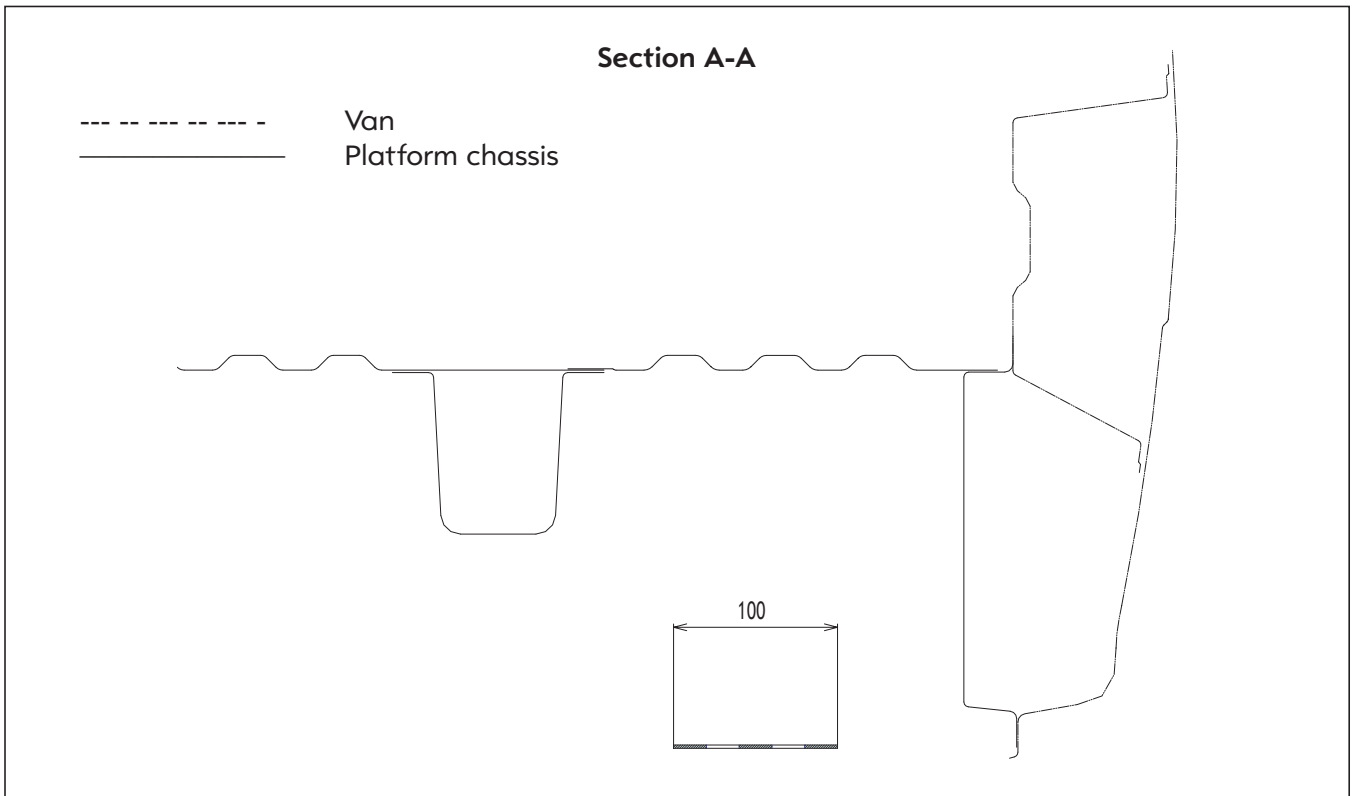


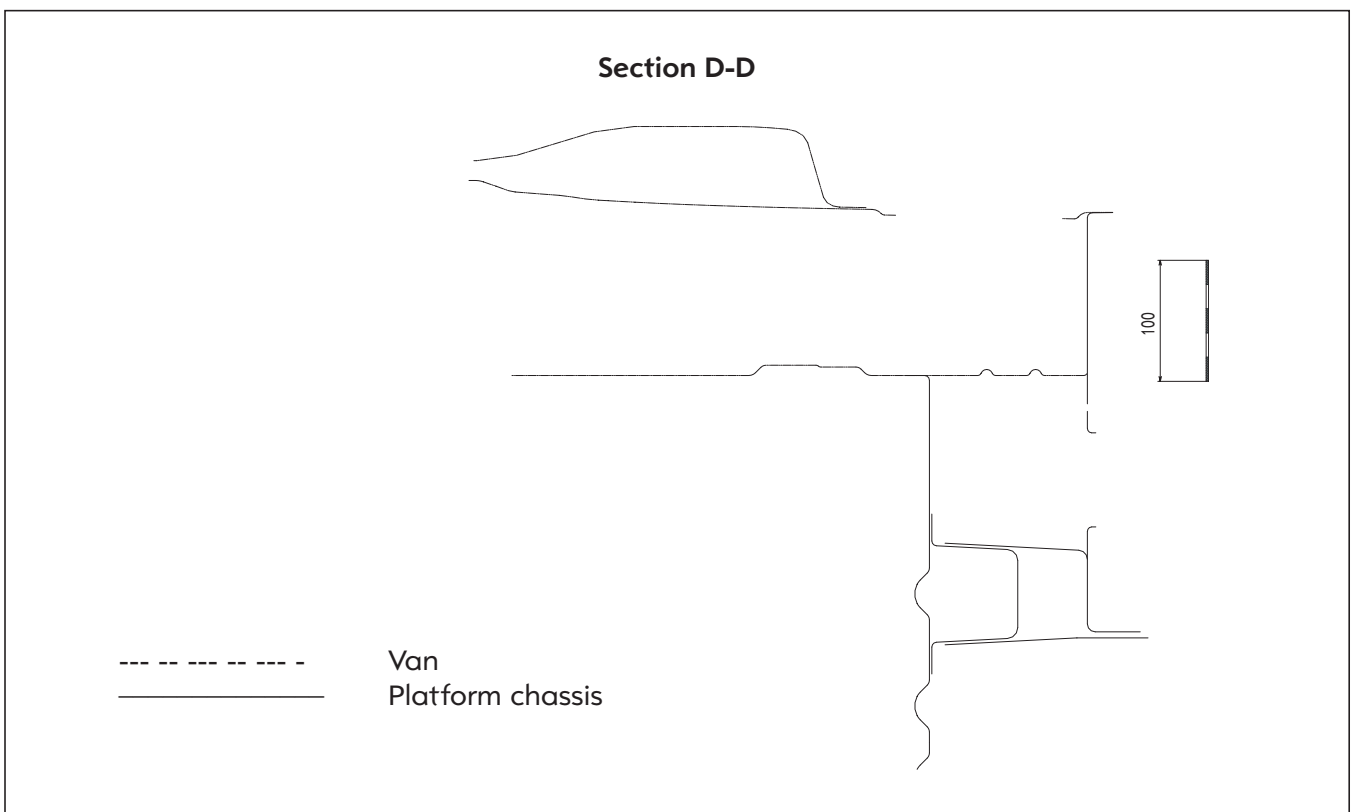
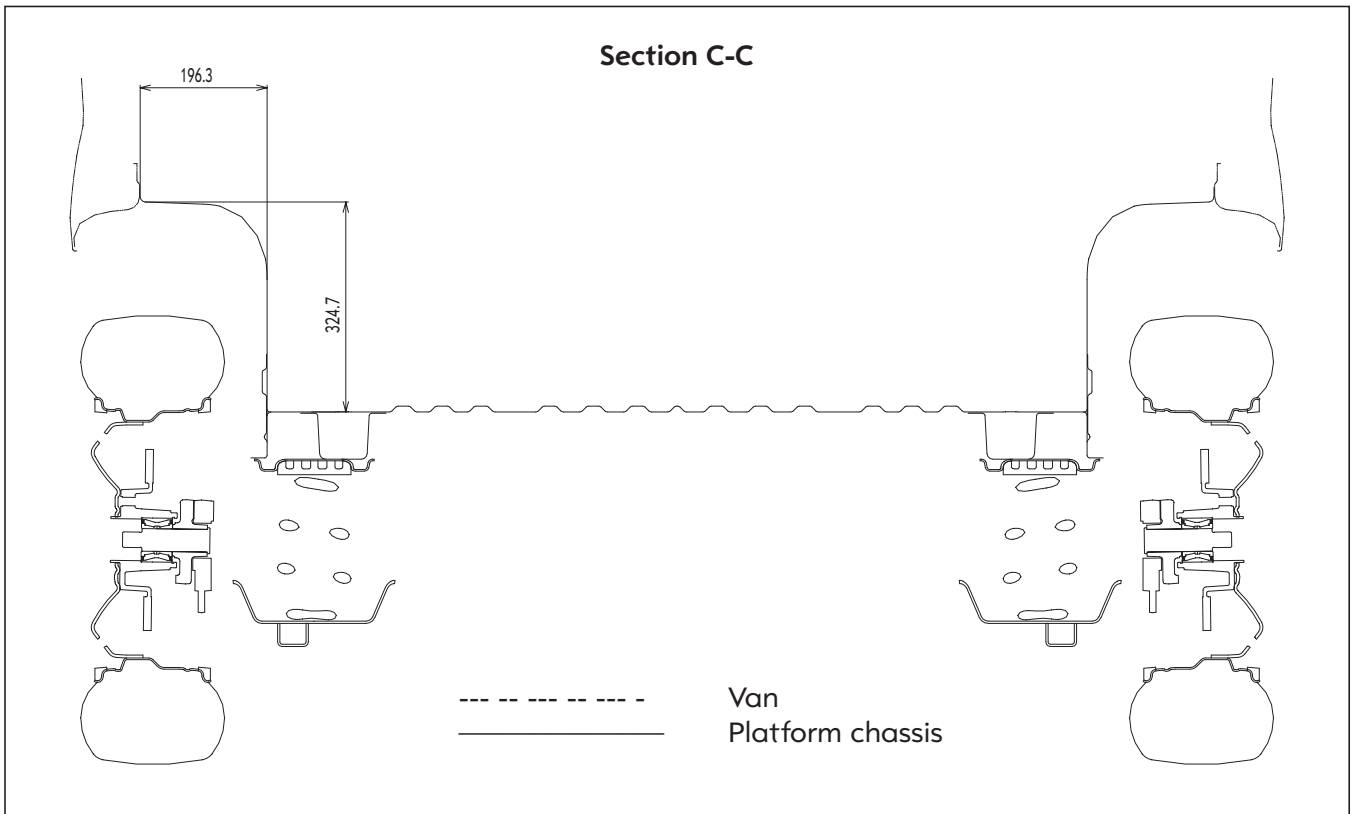


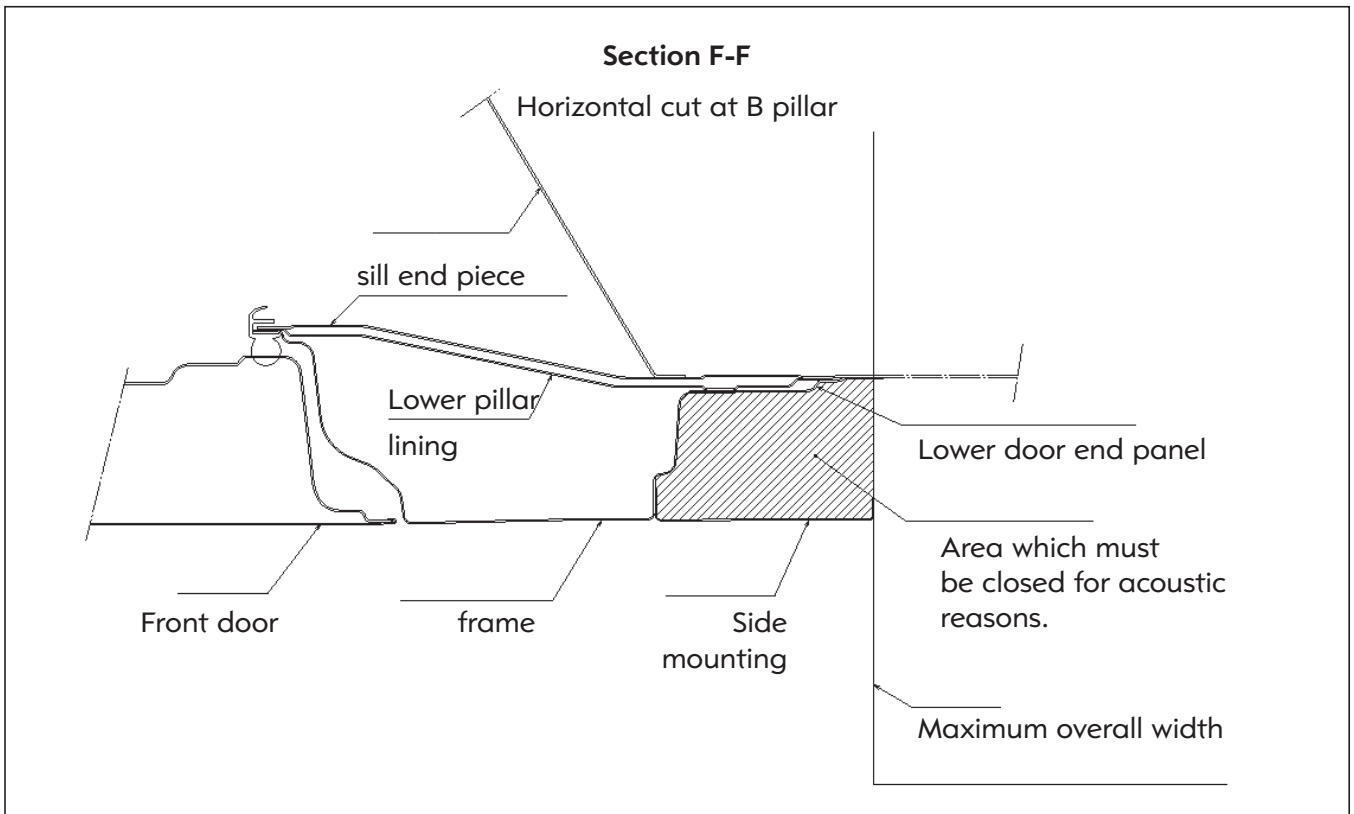
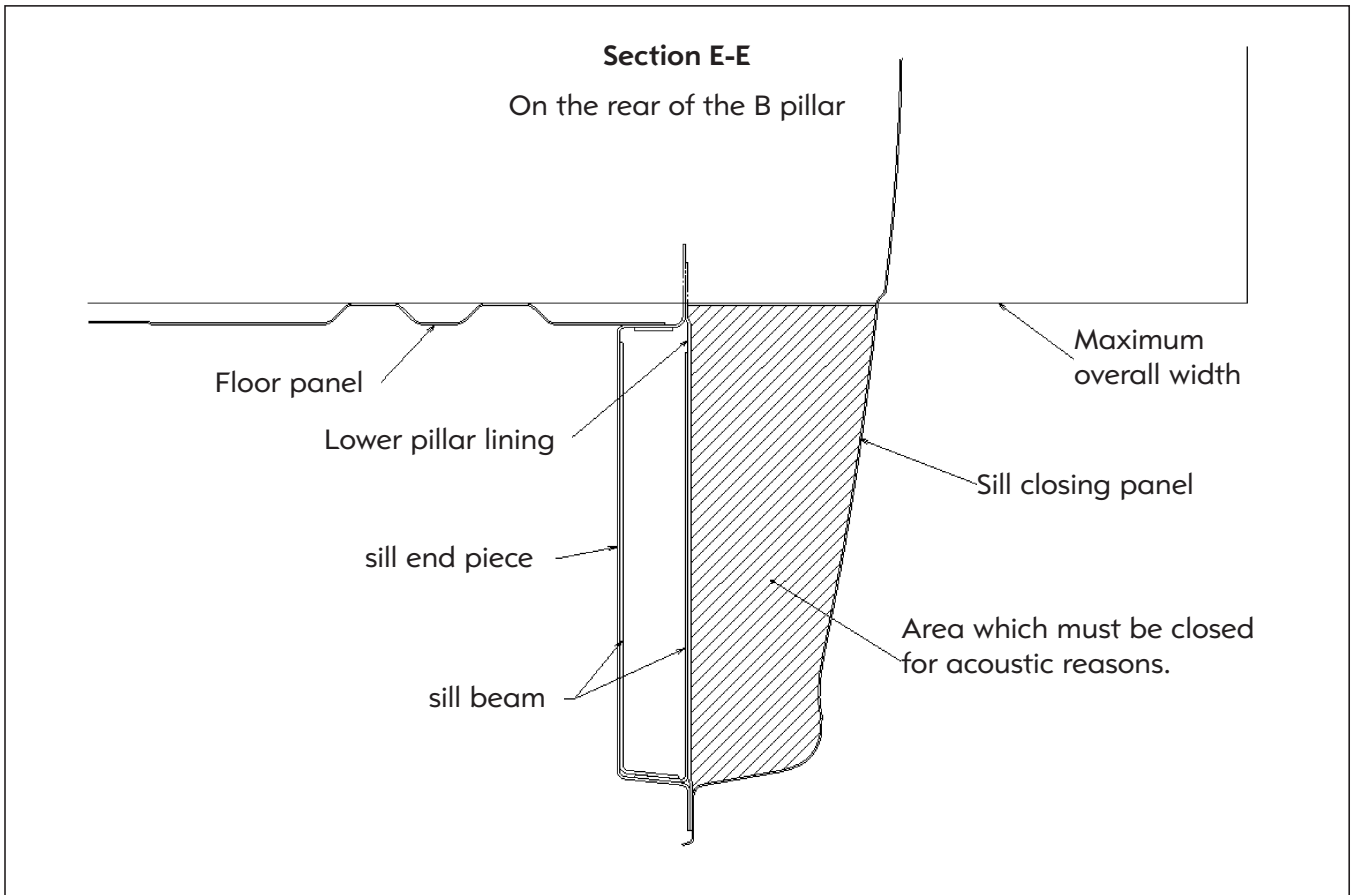
• **Body connection – side sill closing panel**

The following illustrations show the sections of the side sill closing panel for platform chassis and vans. It is advisable to select a geometrical inertia which corresponds to that of the van.







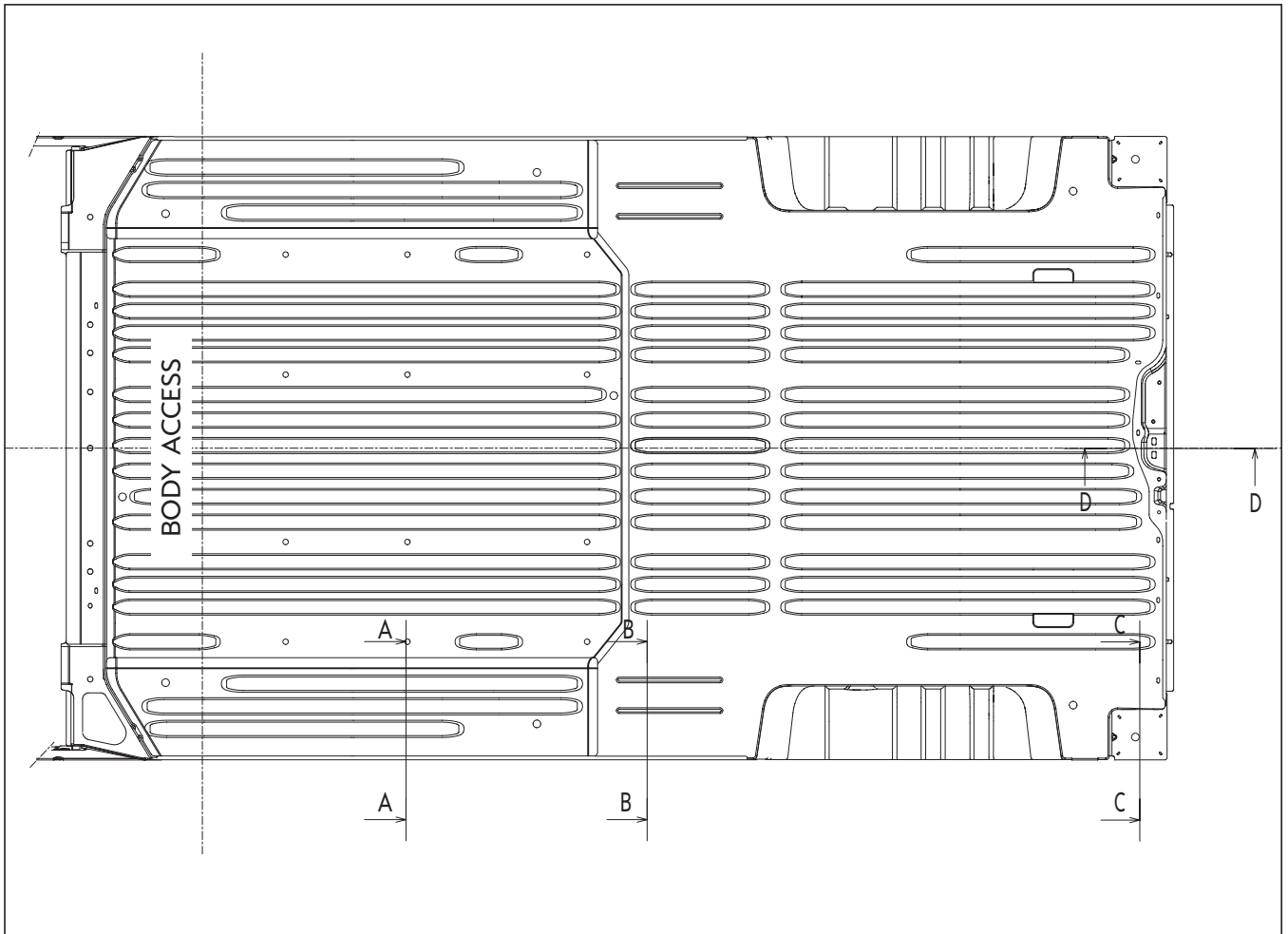


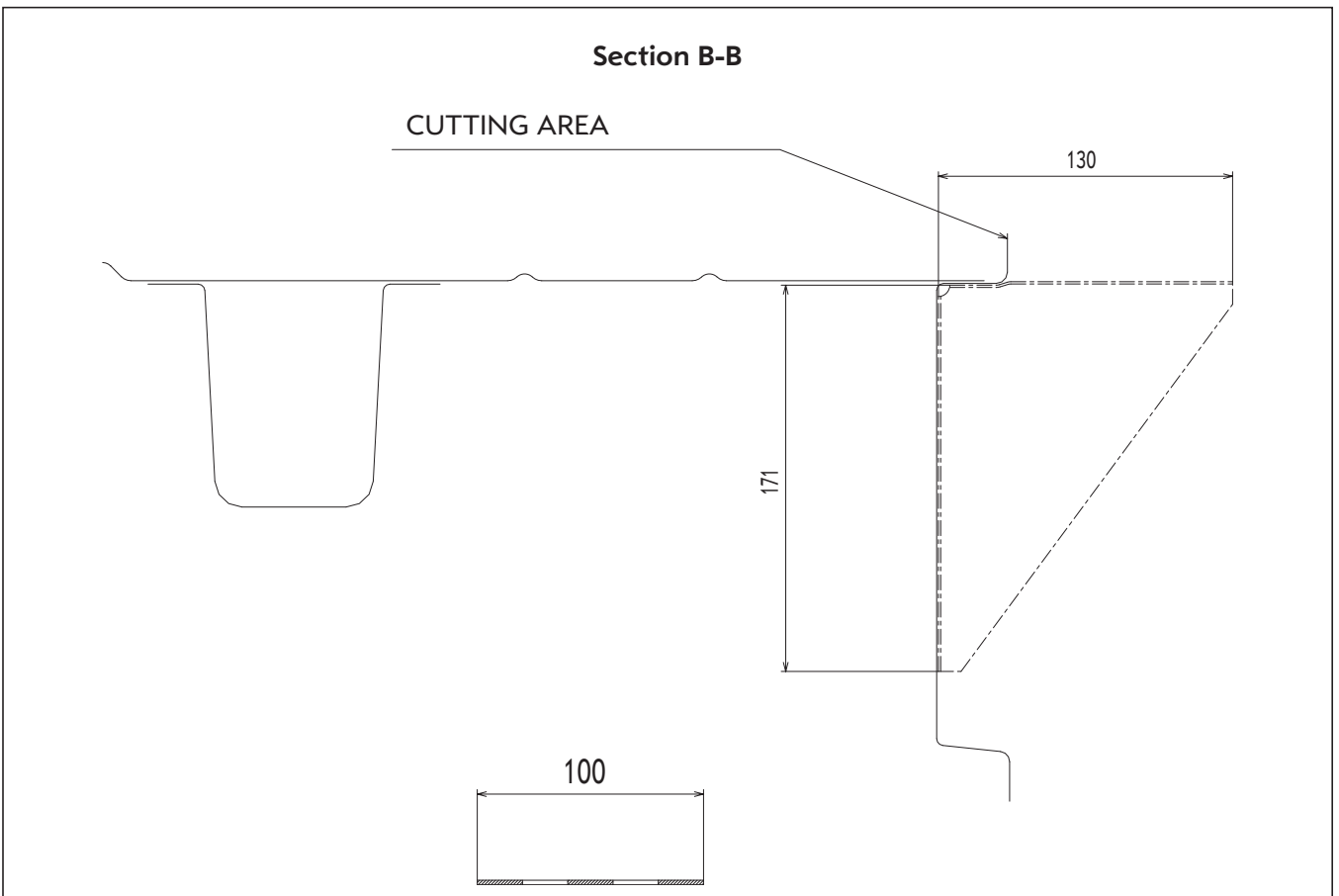
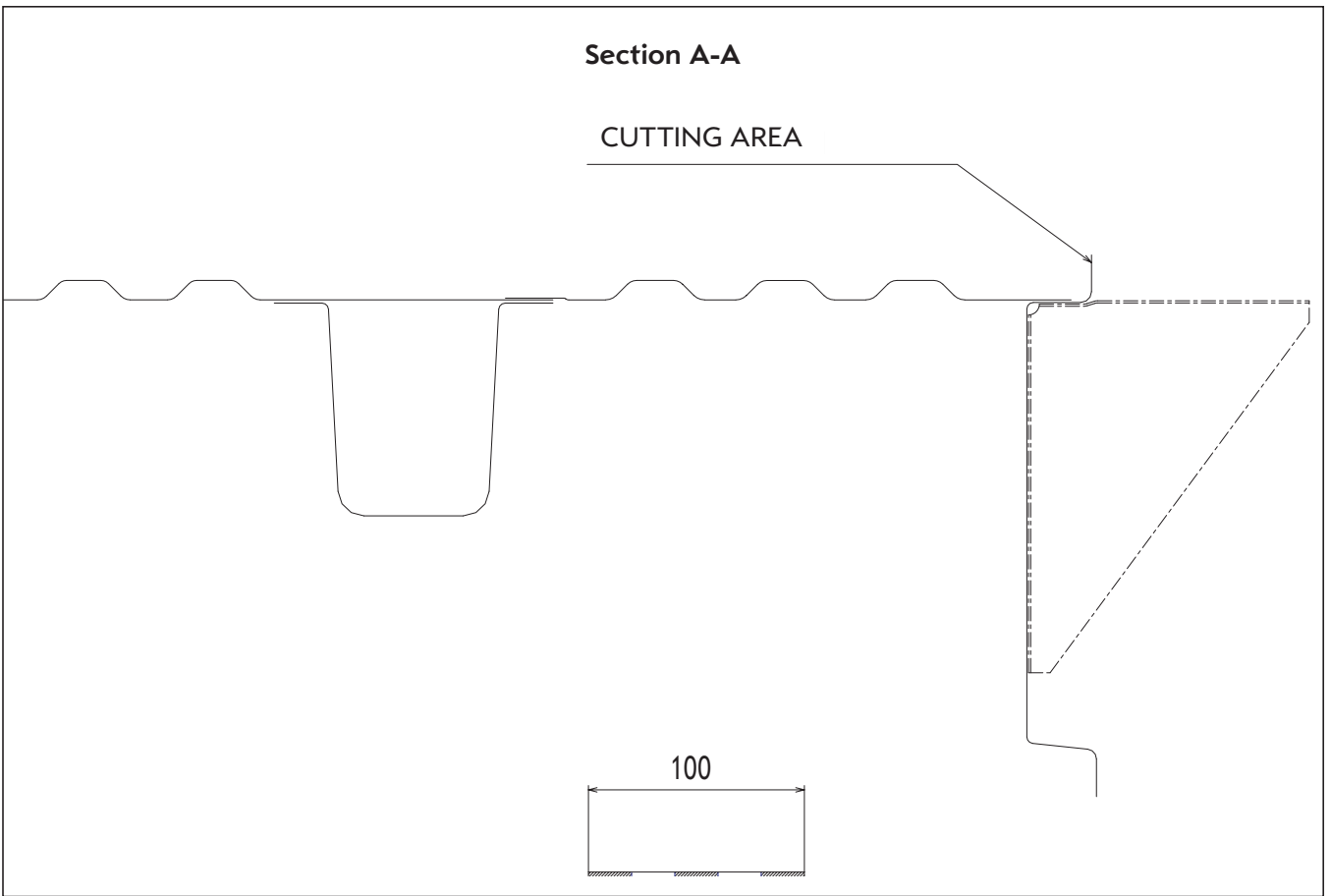


• **Body connection – Floor group**

The following illustration shows sections and fastening points for the floor group. The lower rear panel for various vehicle versions is also illustrated.

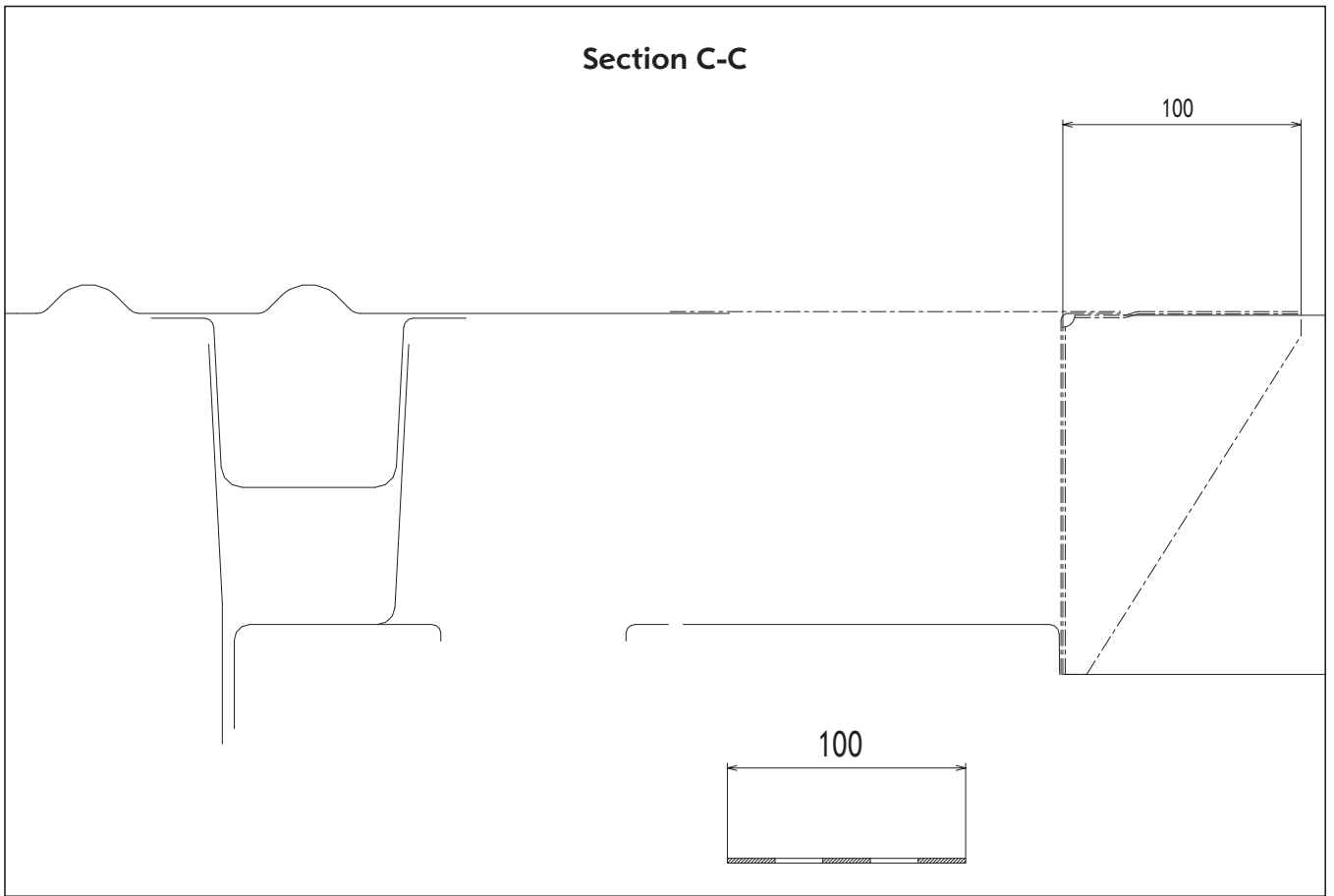
The lower rear panel performs an important load-bearing function. For modifications to the lower rear panel, please consult the Vivaro conversion recommendations manual under “Modifying the rear overhang”.



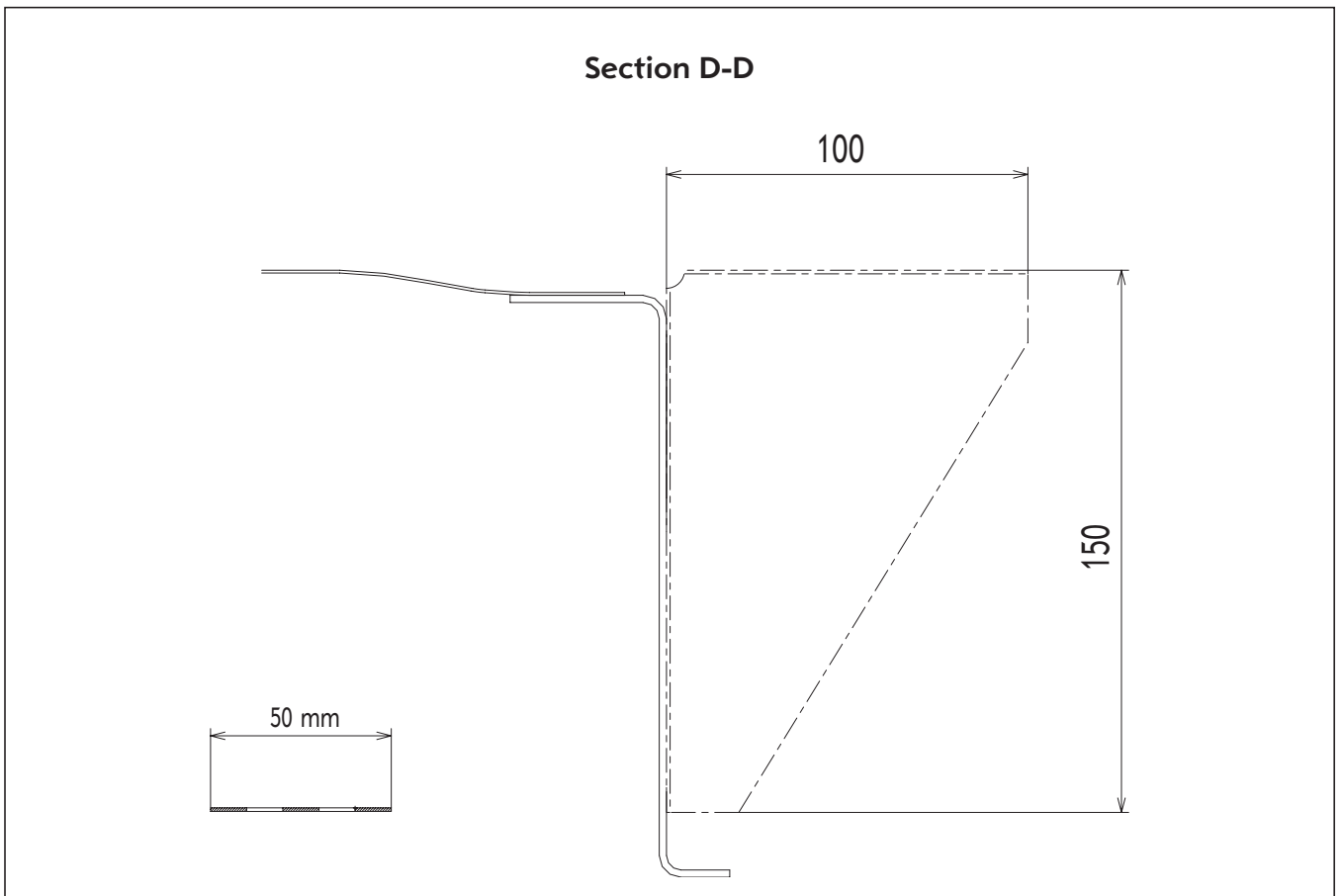




Section C-C



Section D-D



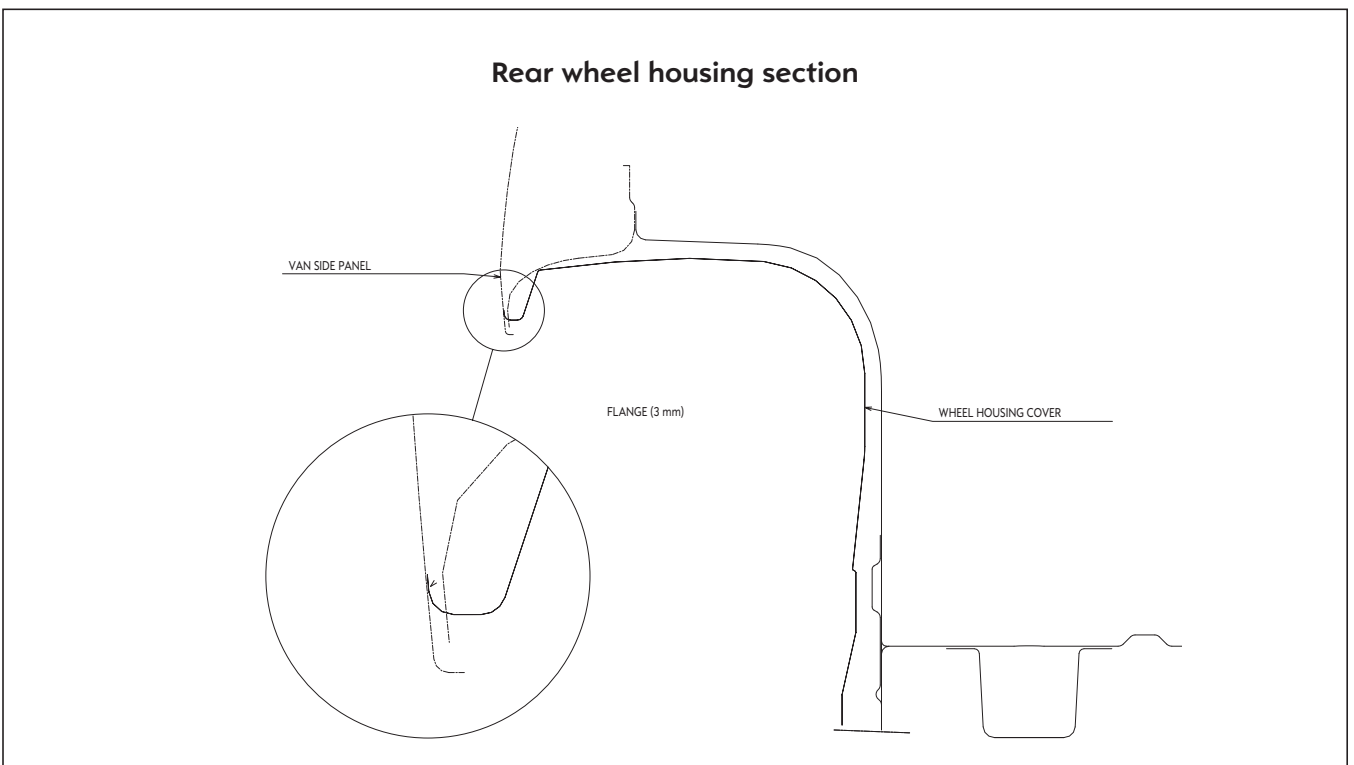
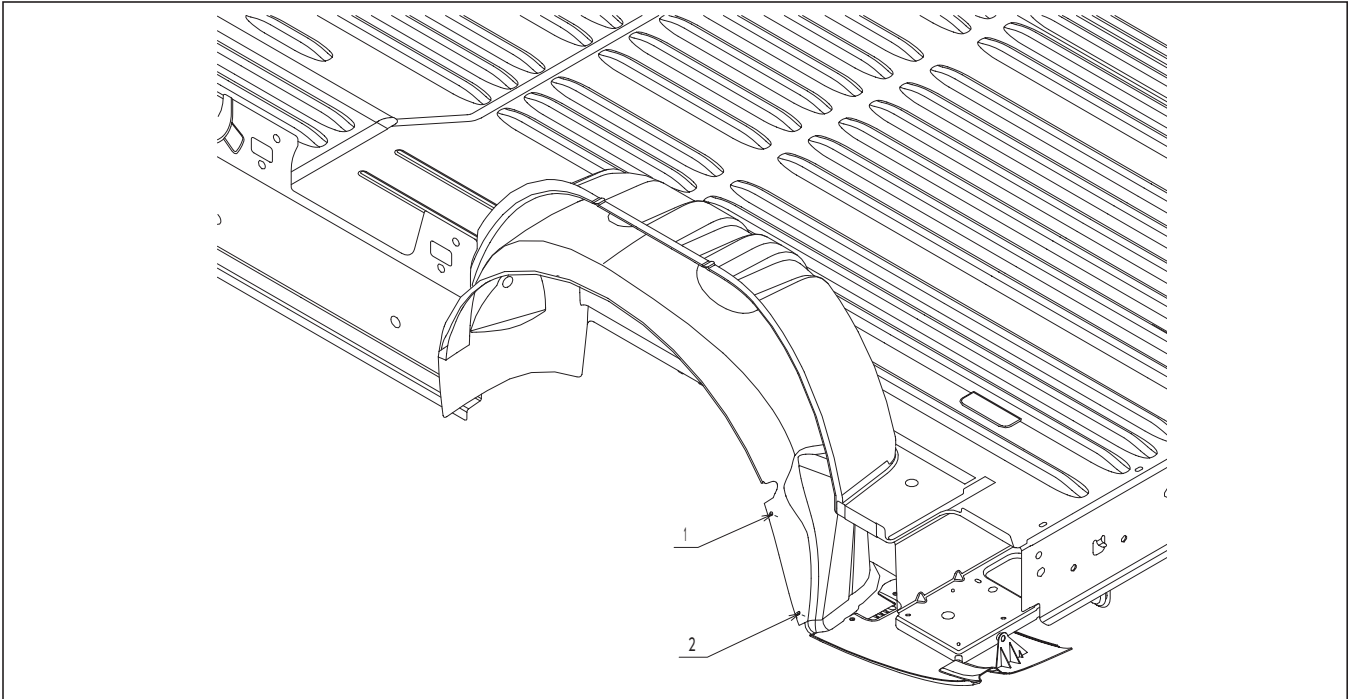


- **Rear wheel housing**

Use standard fastenings 1 and 2 of the rear wheel housing cover to fasten the protective plate to the new body.

The protective plate must be tensioned along the Y axis between the wheel housing cover and body, in order to ensure sufficient stability and water-tightness.

For details, please consult the drawings below.





4 Electrics

• Wiring and positioning of connections

A three-dimensional view of the wiring and the connection points for the Vivaro van is shown below as well as three documents providing a general overview of the wiring for the van, combi and platform chassis.

The relay/fuse box in the engine compartment has the following vacant slots:

- Position X, main fuse reserved for possible future applications
- Two vacant relay sockets

The relay/fuse box in the passenger compartment (accessible via the driver's side flap in the instrument panel) has the vacant sockets: 1, 3, 4, 5, 6, 8, 18, 22, 23, 37, 38 and 39. The use of these vacant slots in production at a later date cannot be ruled out.

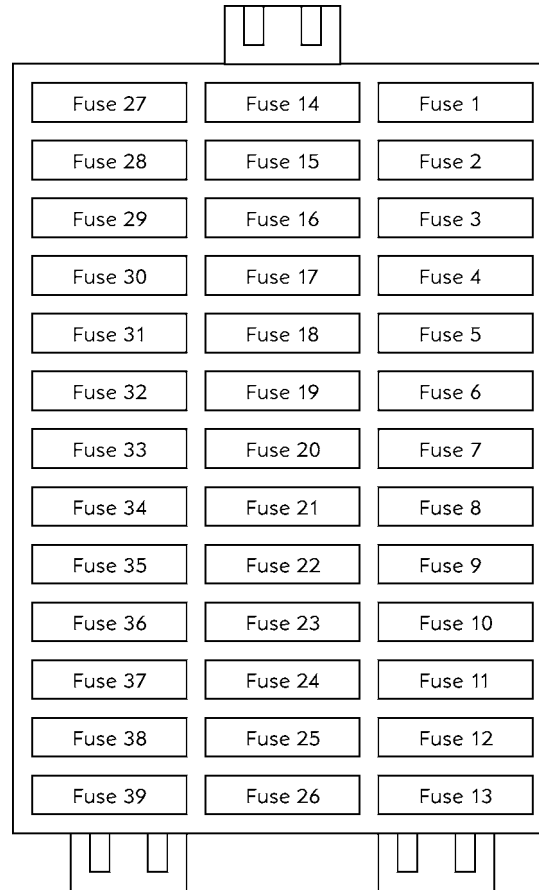
• Circuit diagrams

This section contains the following electrical diagrams:

- Fuse boxes and relay units
- Relais and fuses in driver cabine
- Main fuse in Engine compartment
- Relais in Engine compartment
- Wiring for Van and tailgate



• Relay/fuse box Vivaro



Fuse assignment

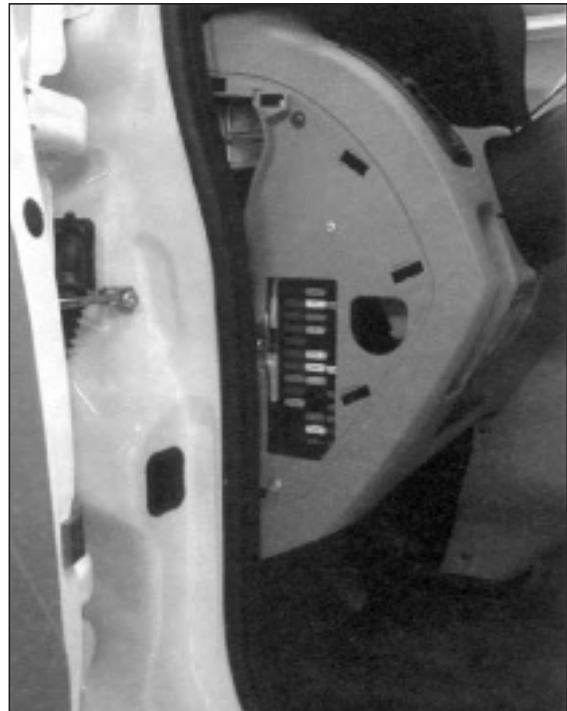
1 Not used	14 Rear screen wiper/washer system	27 High beam, left
2 Radio	15 Screen wipers	28 High beam, right
3 Not used	16 Brake light	29 Low beam, left
4 Not used	17 ABS	30 Low beam, right
5 Not used	18 Not used	31 Tail lamp, left
6 Not used	19 Window winders	32 Tail lamp, right
7 AC, rear	20 Window winders	33 Rear fog lamp
8 Not used	21 Seat heating	34 Horn
9 Fog lamps	22 Not used	35 Mirror heating
10 Central locking	23 Not used	36 Windscreen heating control
11 Interior illumination	24 Radio	37 Not used
12 Diagnostic plug, immobiliser	25 Heating	38 Not used
13 Rear screen heating	26 Accessories	39 Not used



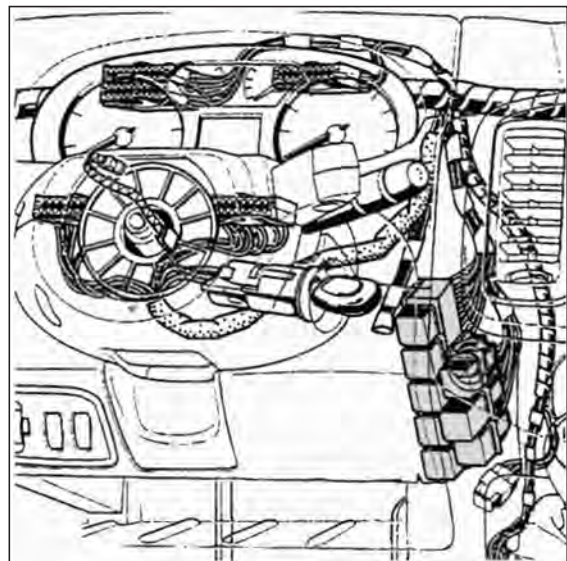
- Fuse and relay boxes

In the cab

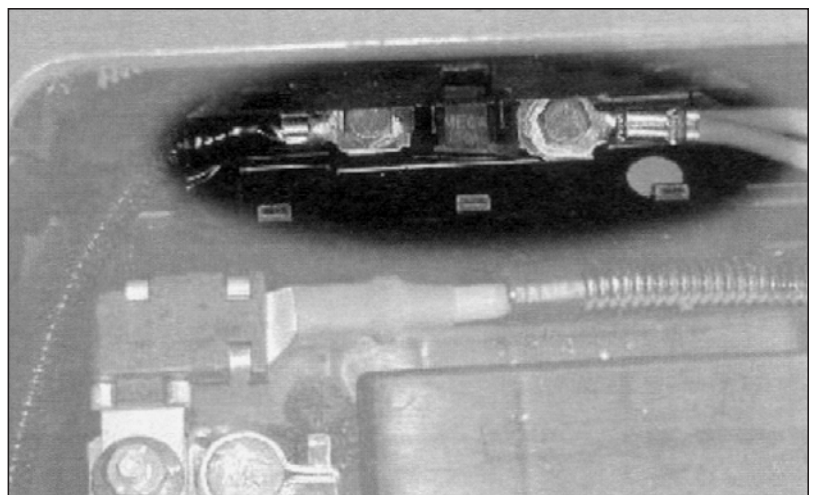
- One relay box behind the cigarette lighter.

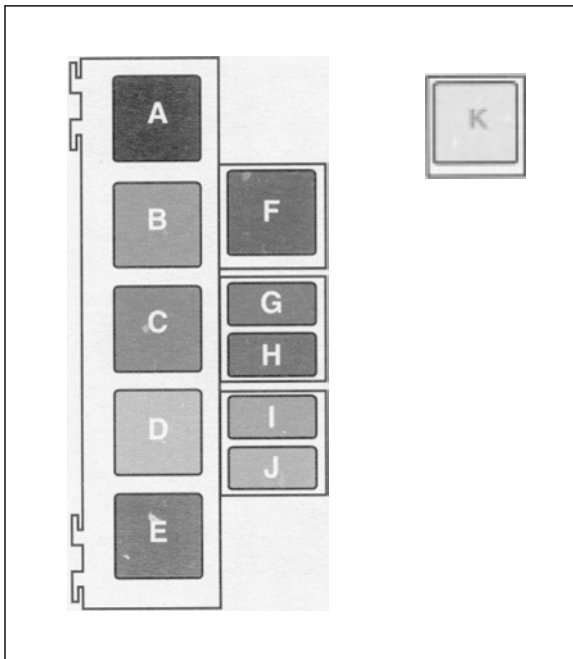


- One fuse box on the left-hand side of the instrument panel.



- One main fuse for the power supply, located on the side of the battery.





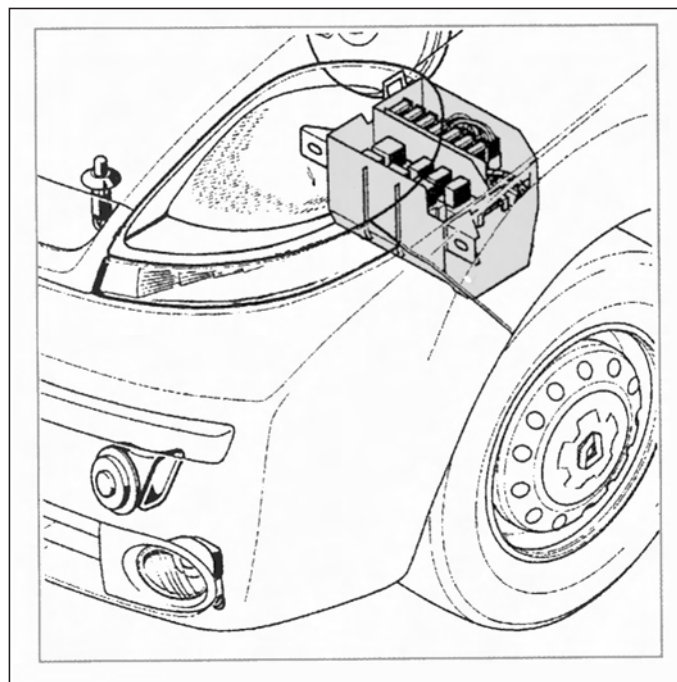
• **Relais in driver cabine**

- A Relay for the rear screen heating
- B Time-out for rear screen wipers
- C Relay for the rear screen wipers
- D Relay + after-contact
- E AC tripping relay
- F Relay for the heatable windscreen
- G Relay for the fog lamps
- H “Headlight” relay for low beam
- H “Headlight” relay for parking lights
- J “Headlight” main relay
- K Relay for the electronic thermostat

Note: The relay for the electronic thermostat is installed on the left-hand side of the air mixer and distributor.

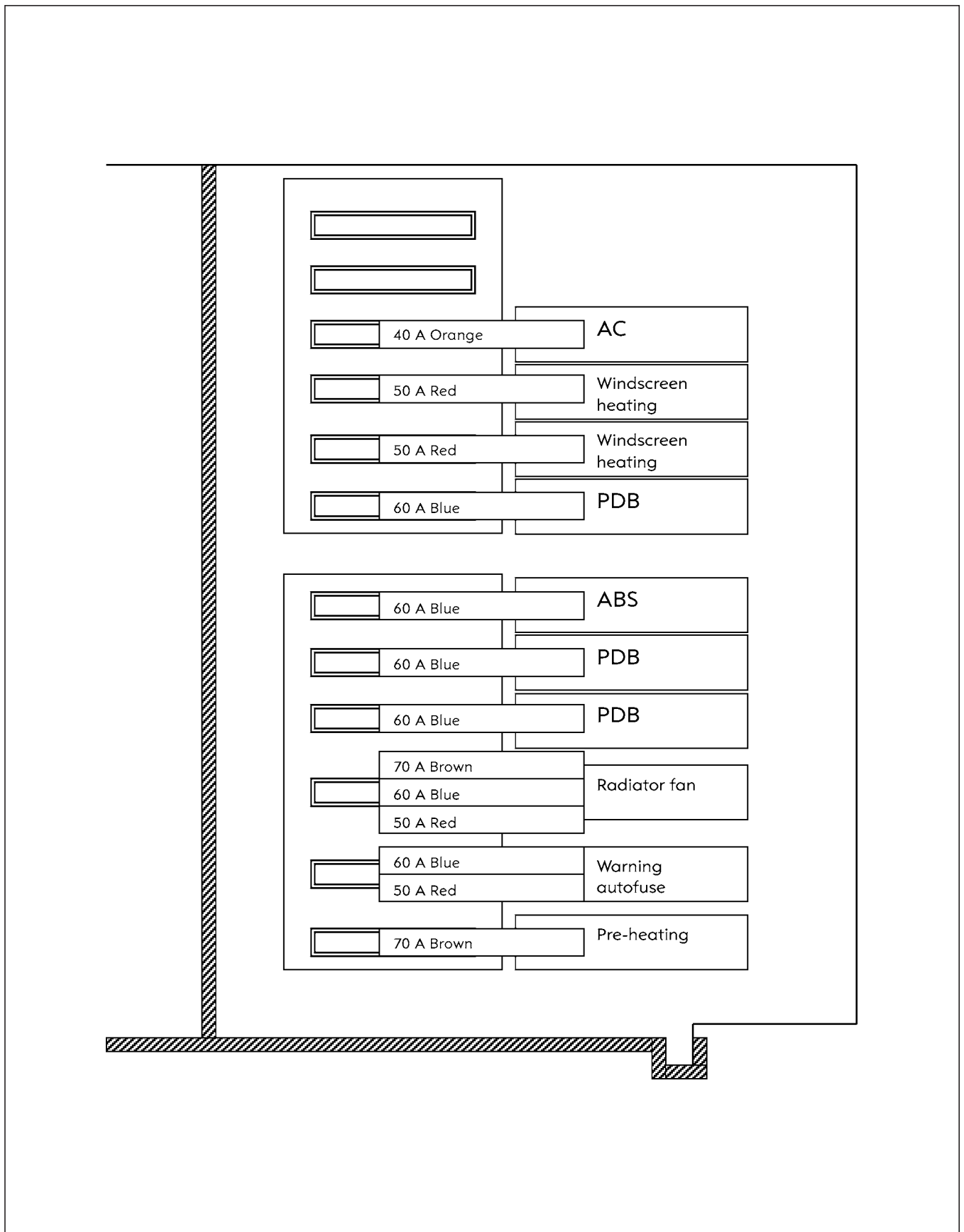
• **In the engine compartment**

One fuse box is located on the left-hand side of the engine compartment.





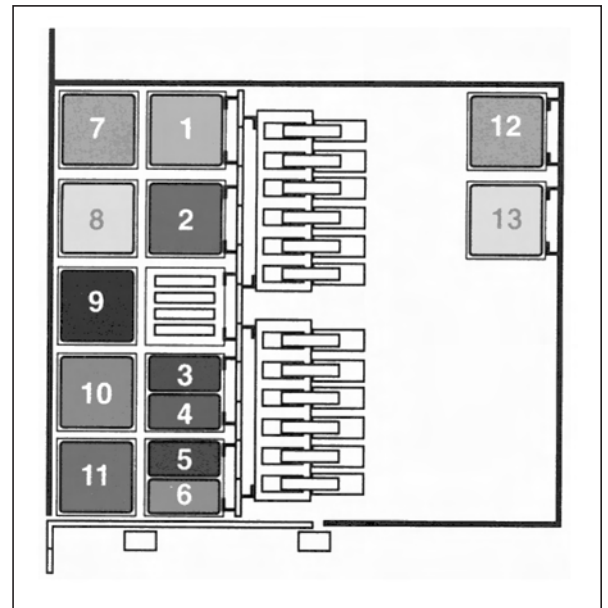
- Main Fuses in engine compartment





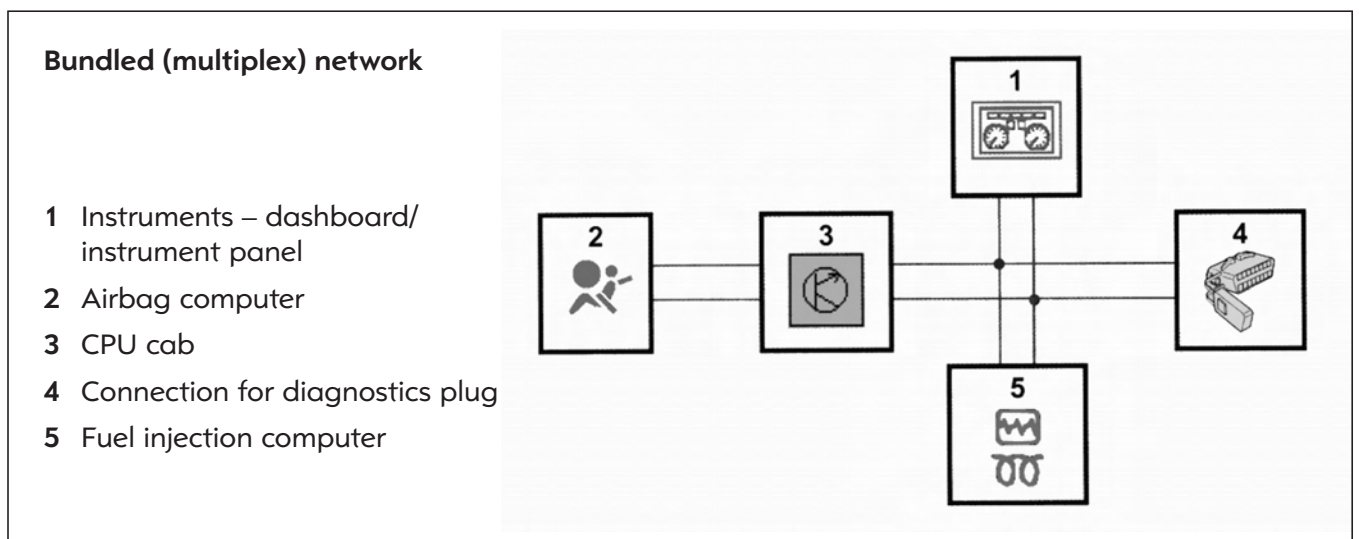
• **Relais in Engine compartment**

- 1 2 or 3 add-on heater (auxiliary heater)/ parking heater (diesel) relay
- 2 Relay for fuel injection computer (diesel)/ injection interrupt (petrol)
- 3 Diesel pump relay
- 4 Fuel pump/diesel pre-heating relay.
- 5 Relay for fan unit, second speed level (Diesel parking heater)
- 6 Coupling relay: AC compressor
- 7 1 add-on heater (thermo-plunger) relay
- 8 2 or 3 add-on heater (thermo-plungers)/ parking heater (petrol) relay
- 9 Fan unit (diesel)/Relay for second speed level with AC (diesel)/first speed level with AC (petrol)
- 10 Fan unit (petrol)/Relay for first speed level of the fan with AC (diesel)/second speed level with AC (petrol).
- 11 Not used.
- 12 Relay for heatable windscreen.
- 13 Relay for heatable windscreen.



Diesel vehicles equipped with cab/parking heater.

Note: In the diesel version the vehicle is either equipped with an auxiliary heater or with a parking heater.

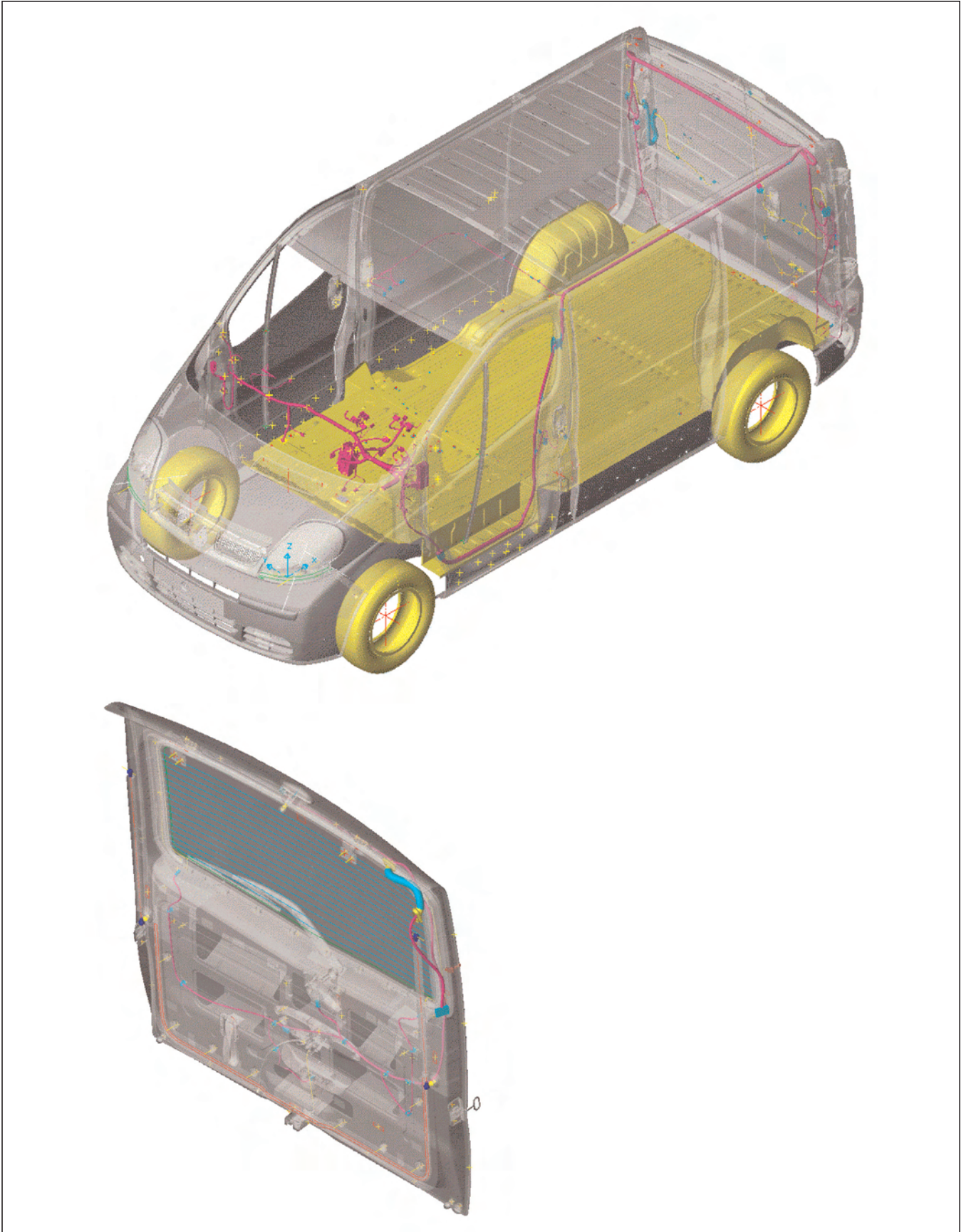


The Vivaro multiplex network enables the 4 computers (CPU cab, fuel injection, airbag and instrument panel) to exchange data.

The network is connected with the connection for the diagnostics plug and uses the CAN (Controller Area Network) protocol



- Wiring harnesses

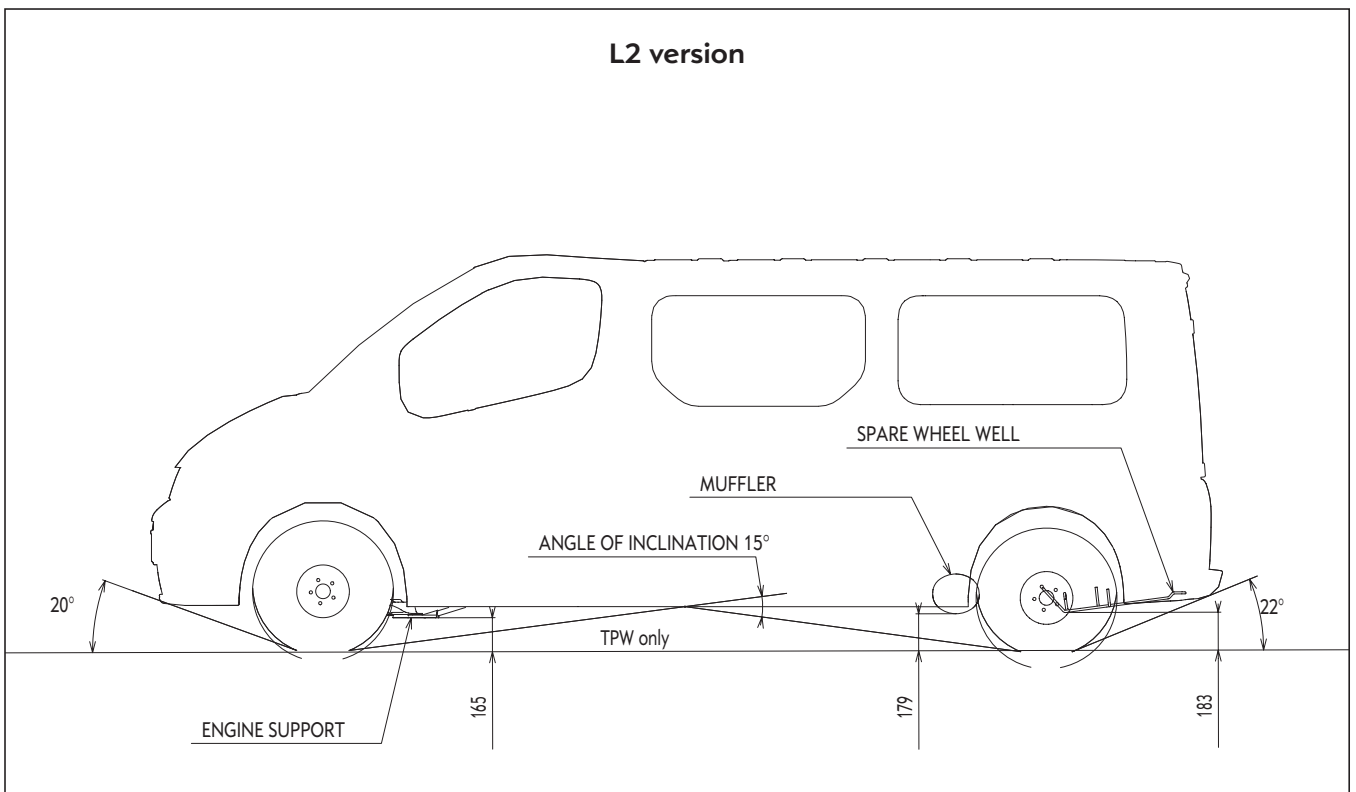
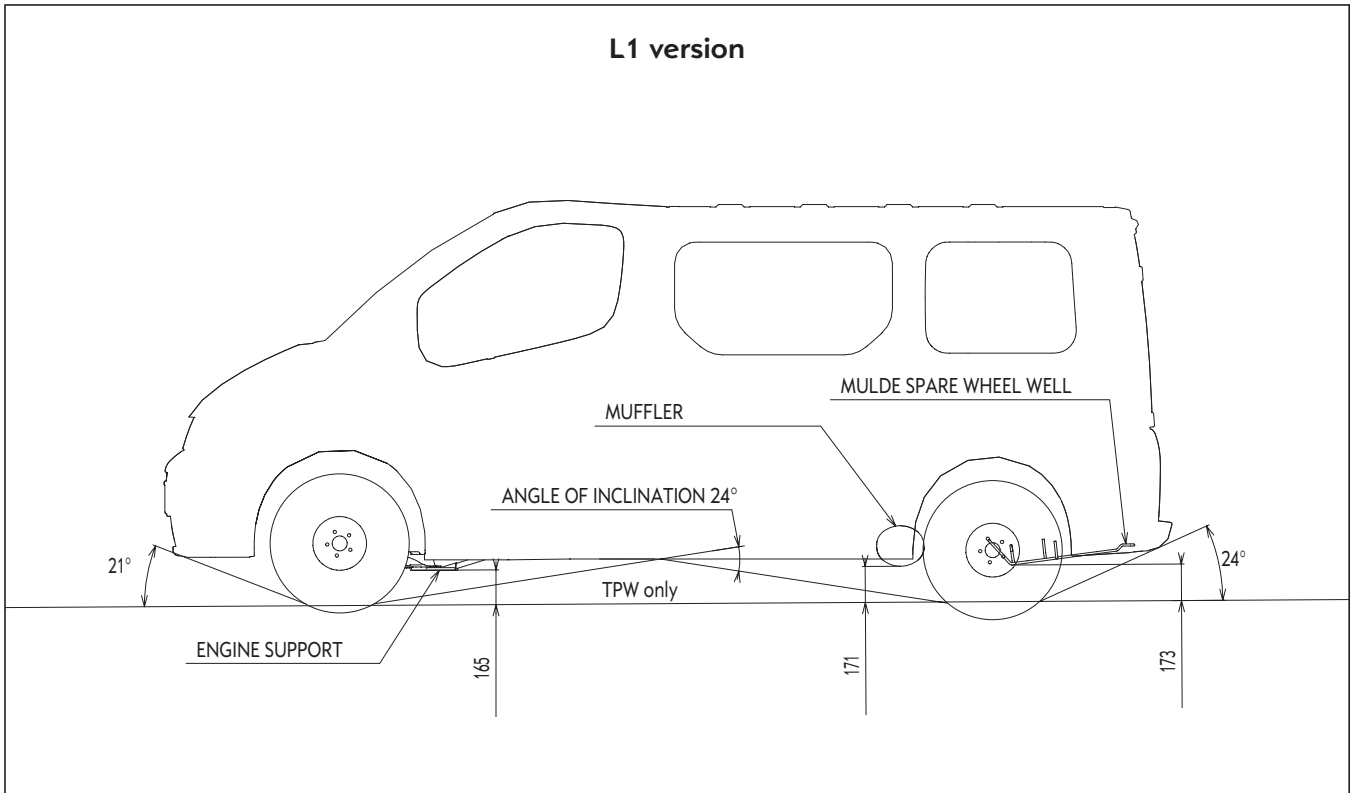


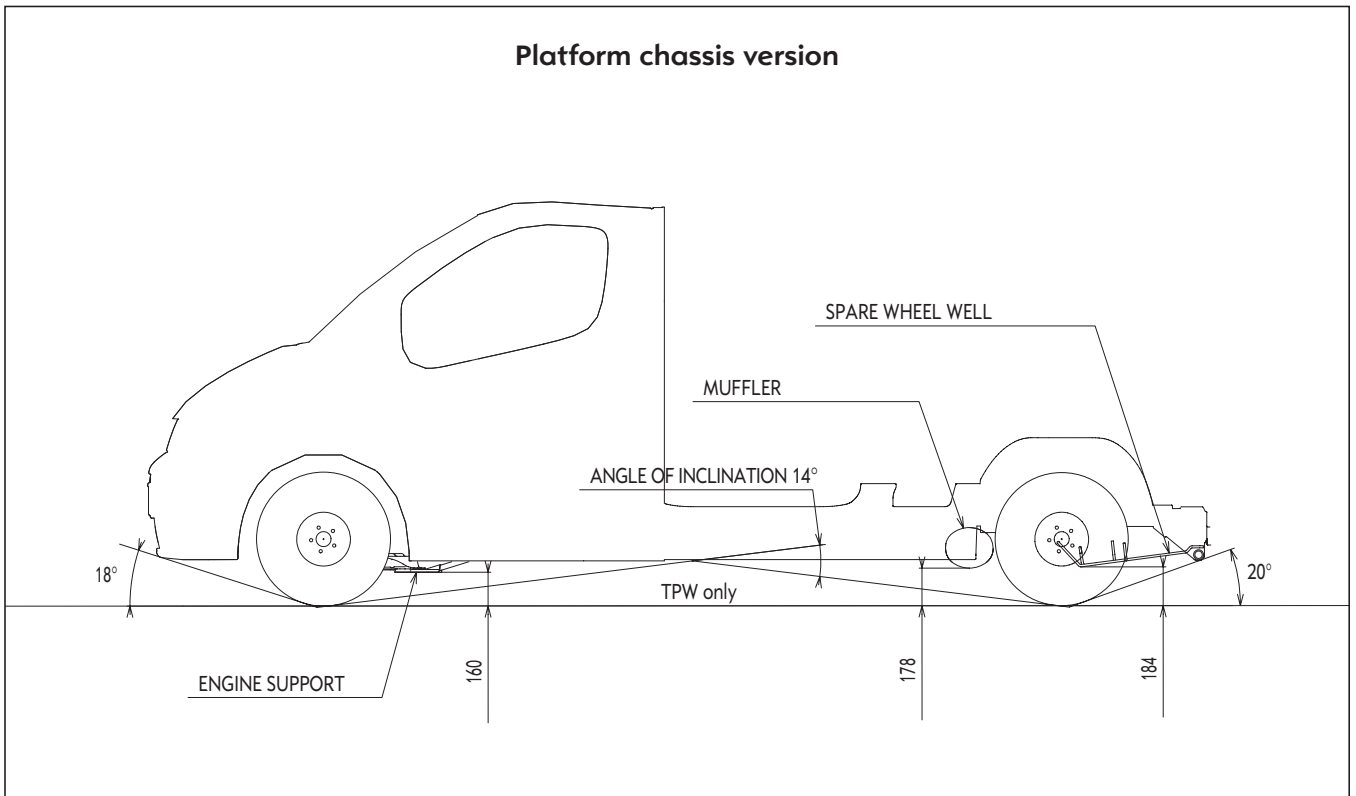


5 Supplementary information

- **Ground clearance**

The specified ground clearance given for the van, combi and platform chassis relate to vehicles at total permissible weight.

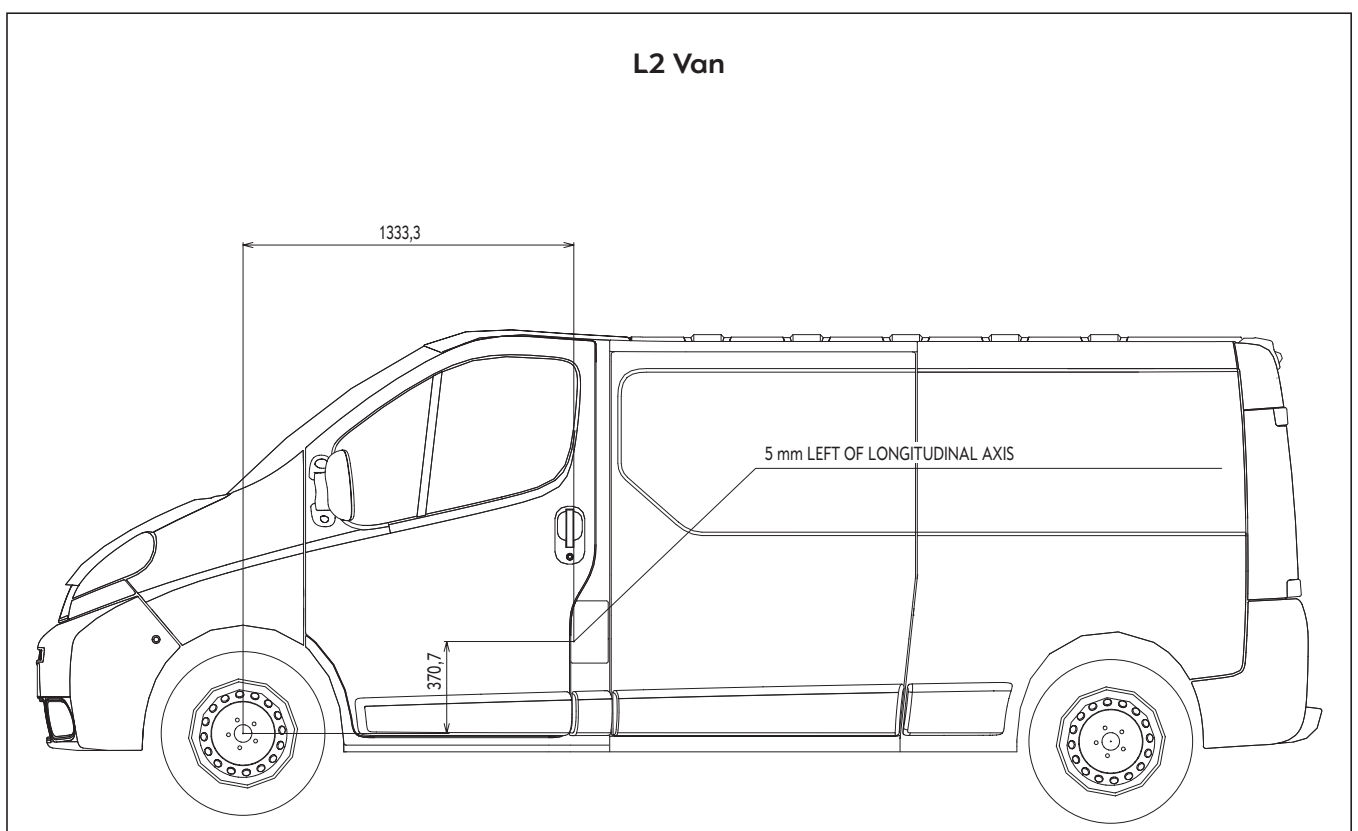
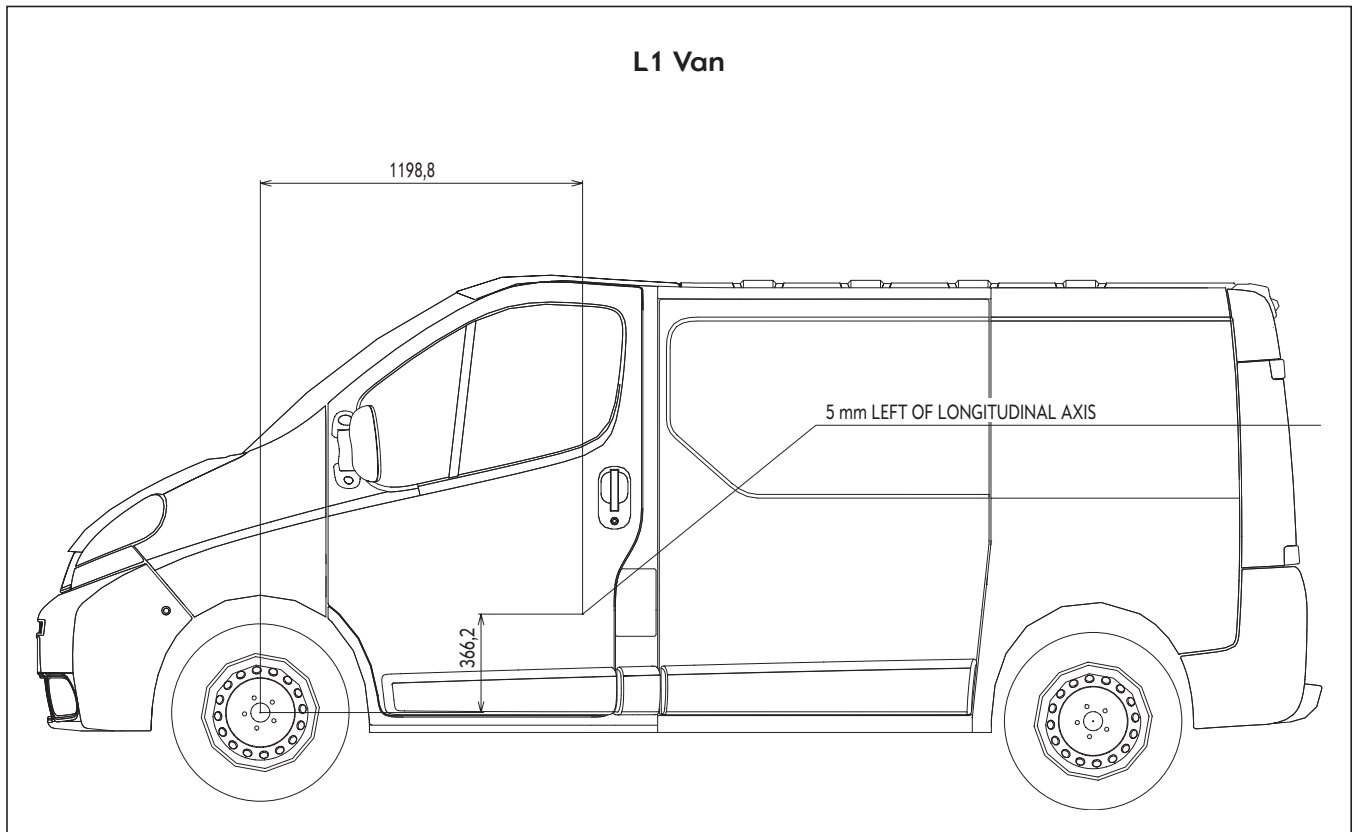






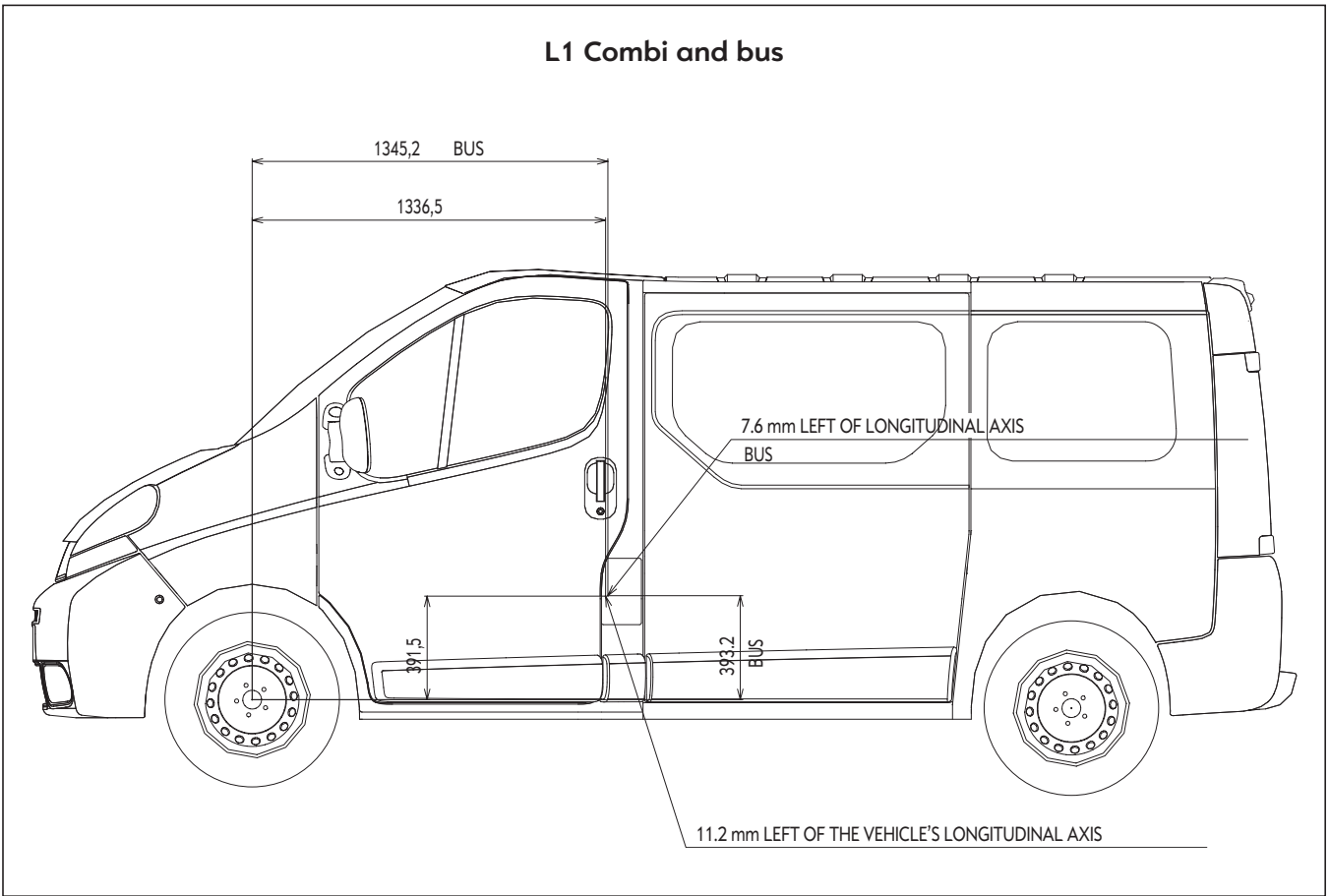
- **Centre of gravity**

The specified centres of gravity relate to the unladen vehicle, ready to drive.

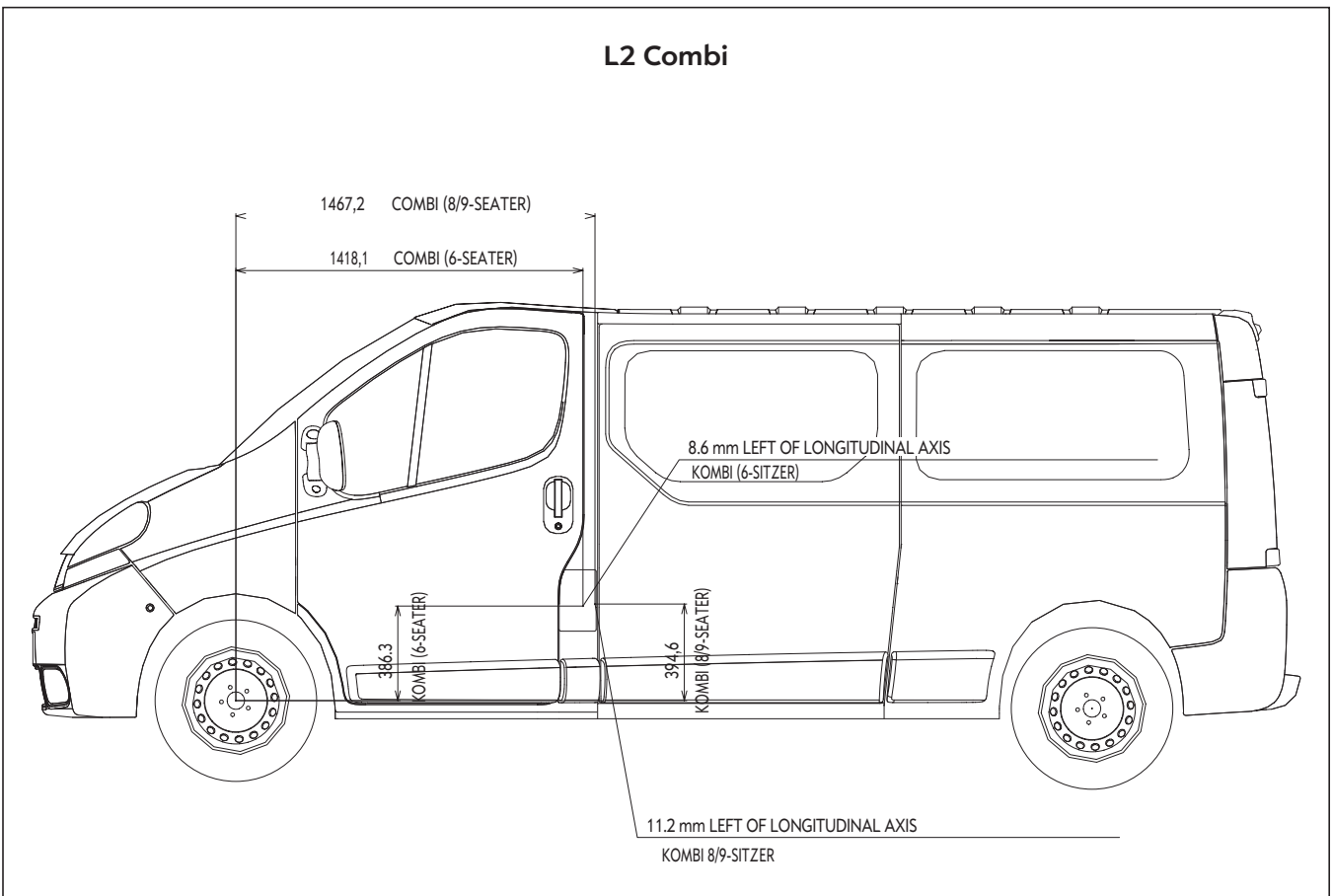




L1 Combi and bus

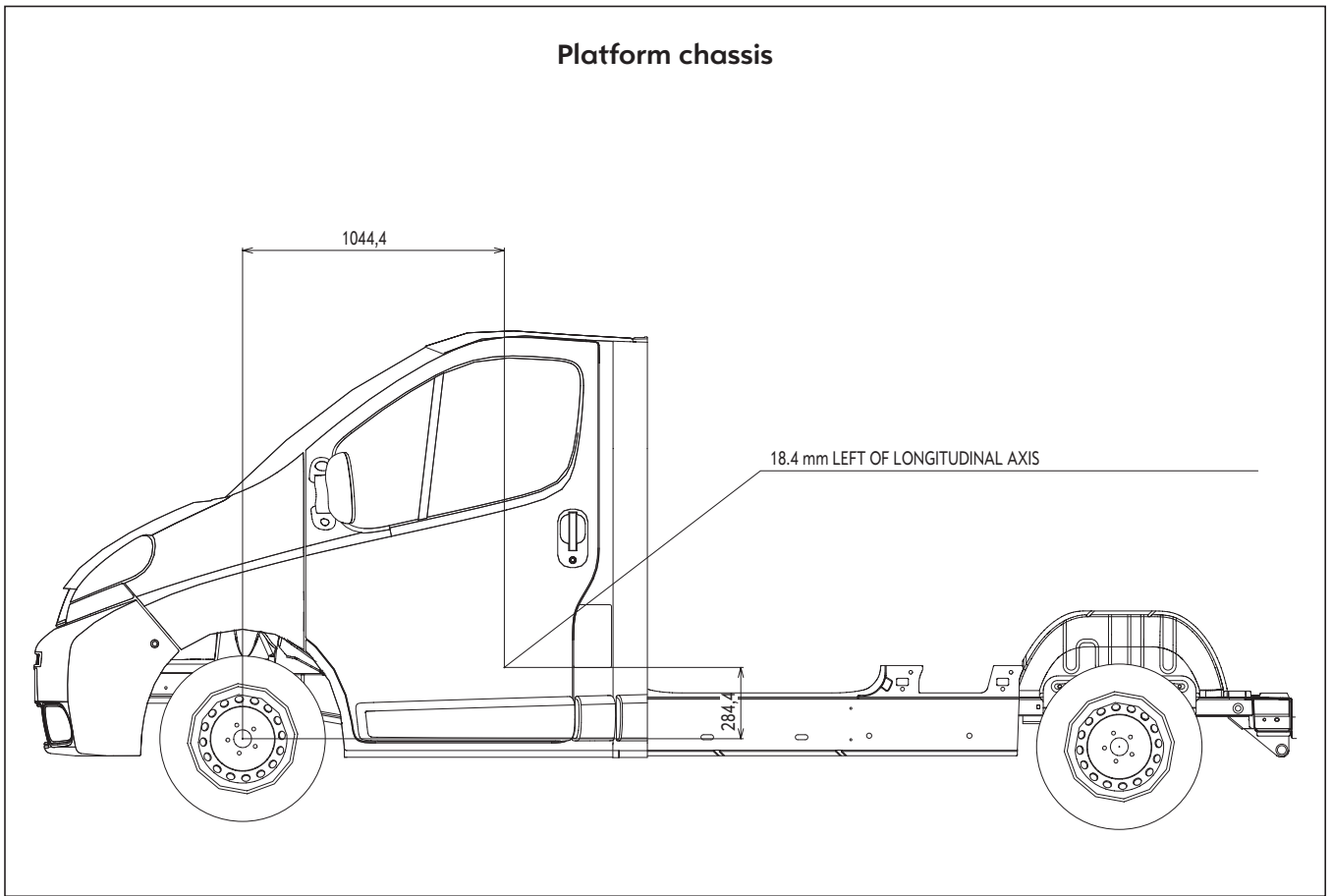


L2 Combi





Platform chassis

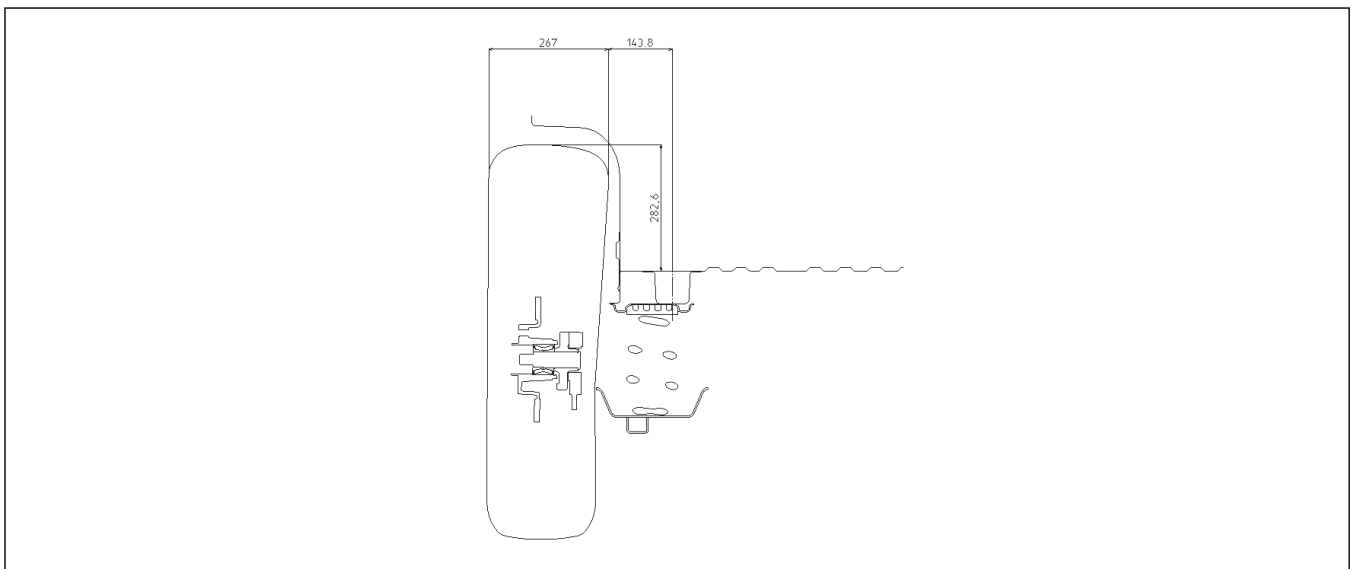




• Tyres and turning circle diameter

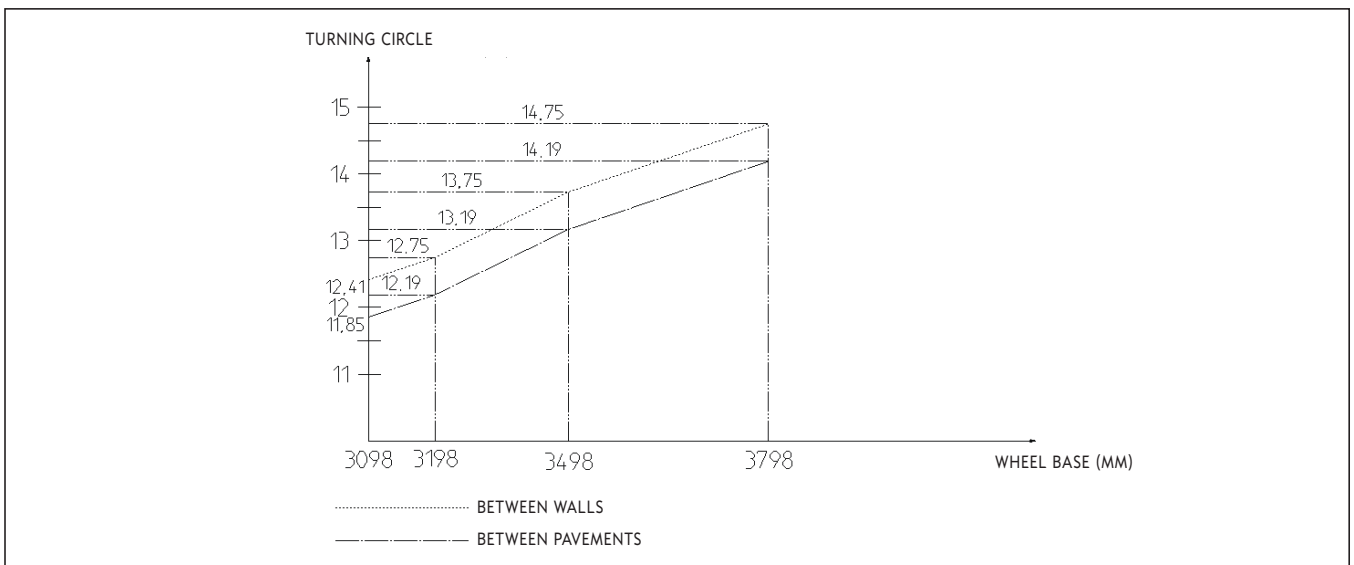
TPW	Tyre size	Rolling circumference	Rims	Speed index	Load index
2,7 t	195 / 65 R16	2000 mm	6J16	R	100/98R
2,9 t	205 / 65 R16	2042 mm	6J16	R	107/105R
Option	215 / 65 R16	2085 mm	6J16	R	106/104R

The rebound clearance envelope of the rear wheels is specified as a section with dimensions. The section is shown with an asymmetrical rebound clearance and fully compressed stops. It is recommended that a clearance of 10 mm should be added for each body position.



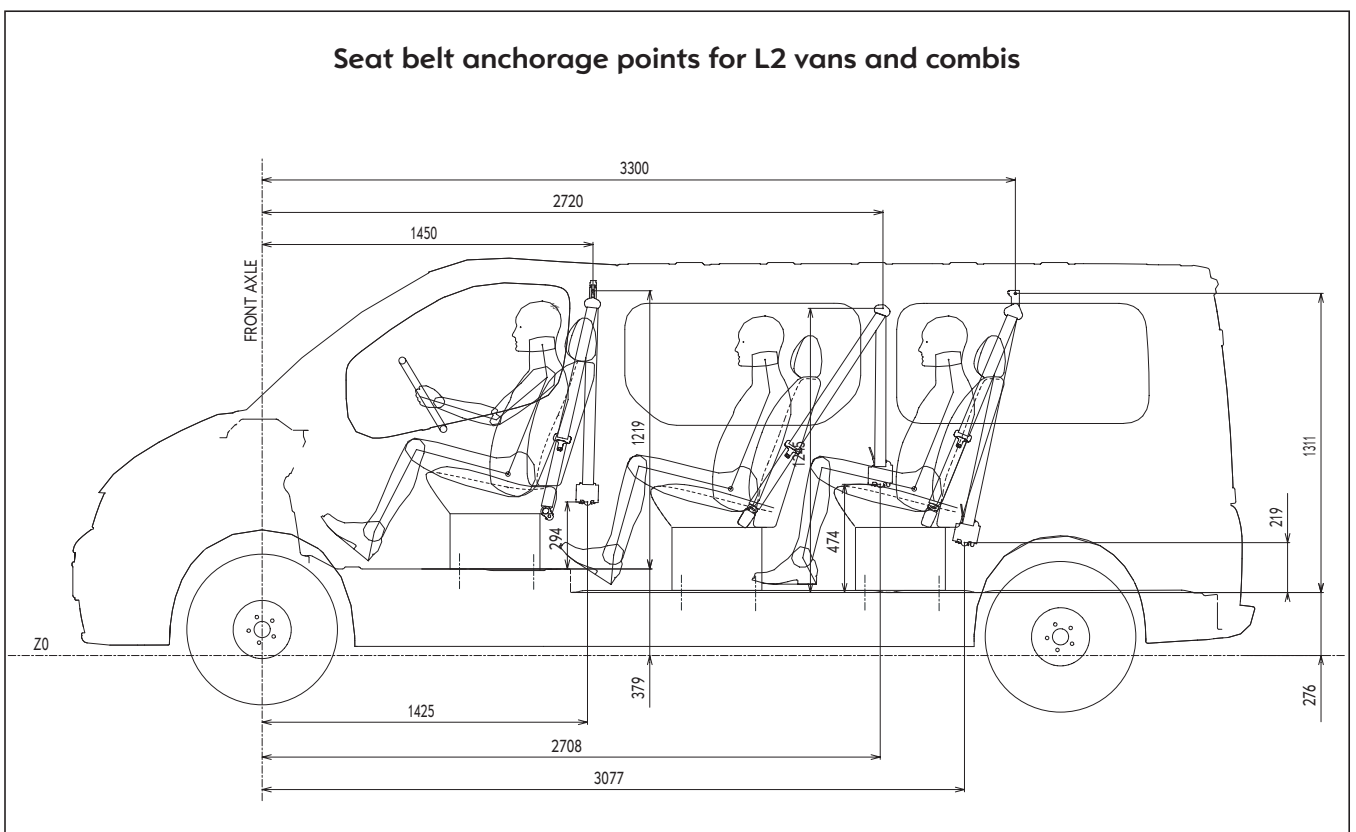
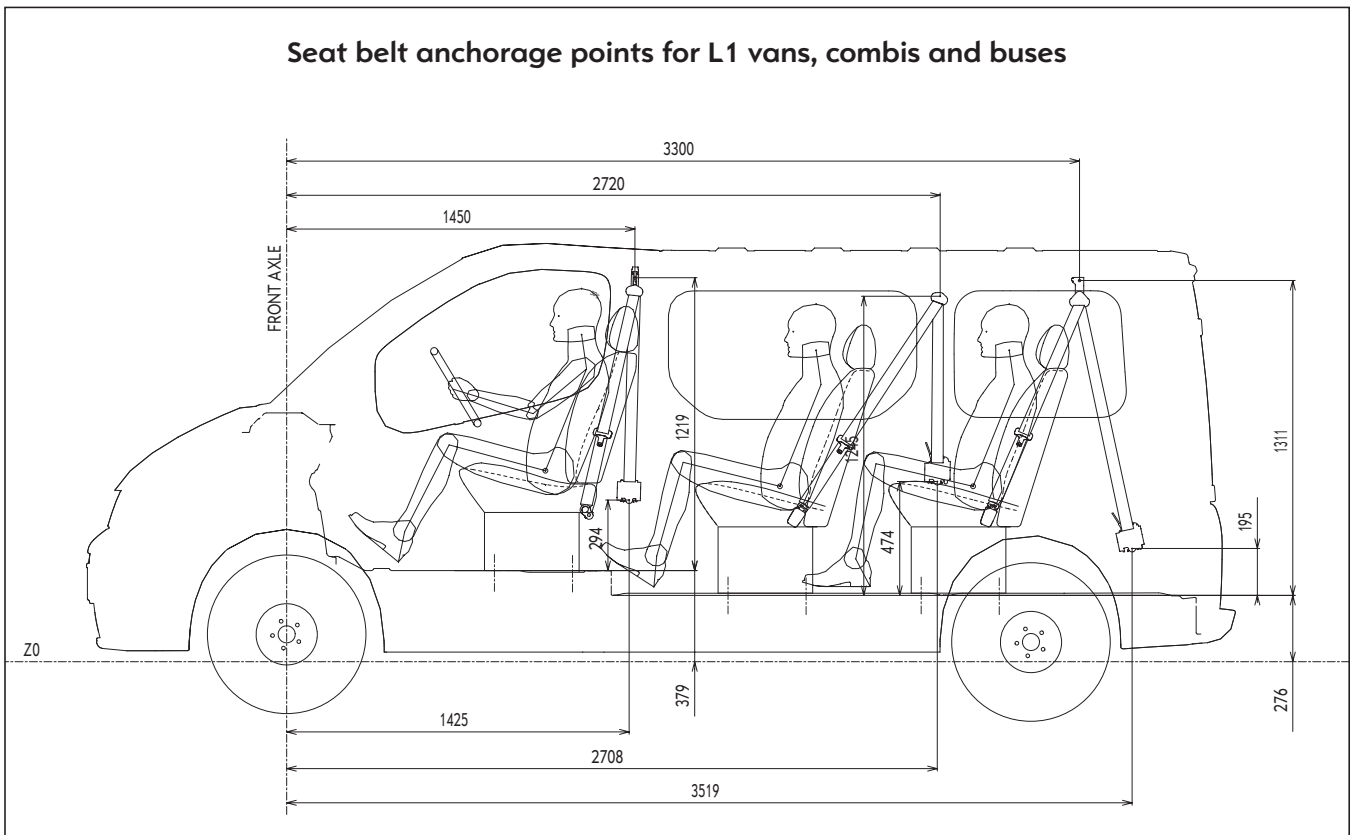
• Turning circle diameter

The specified turning circle diameters relate to wheel bases L1 and L2 and vehicles with extended wheel base.



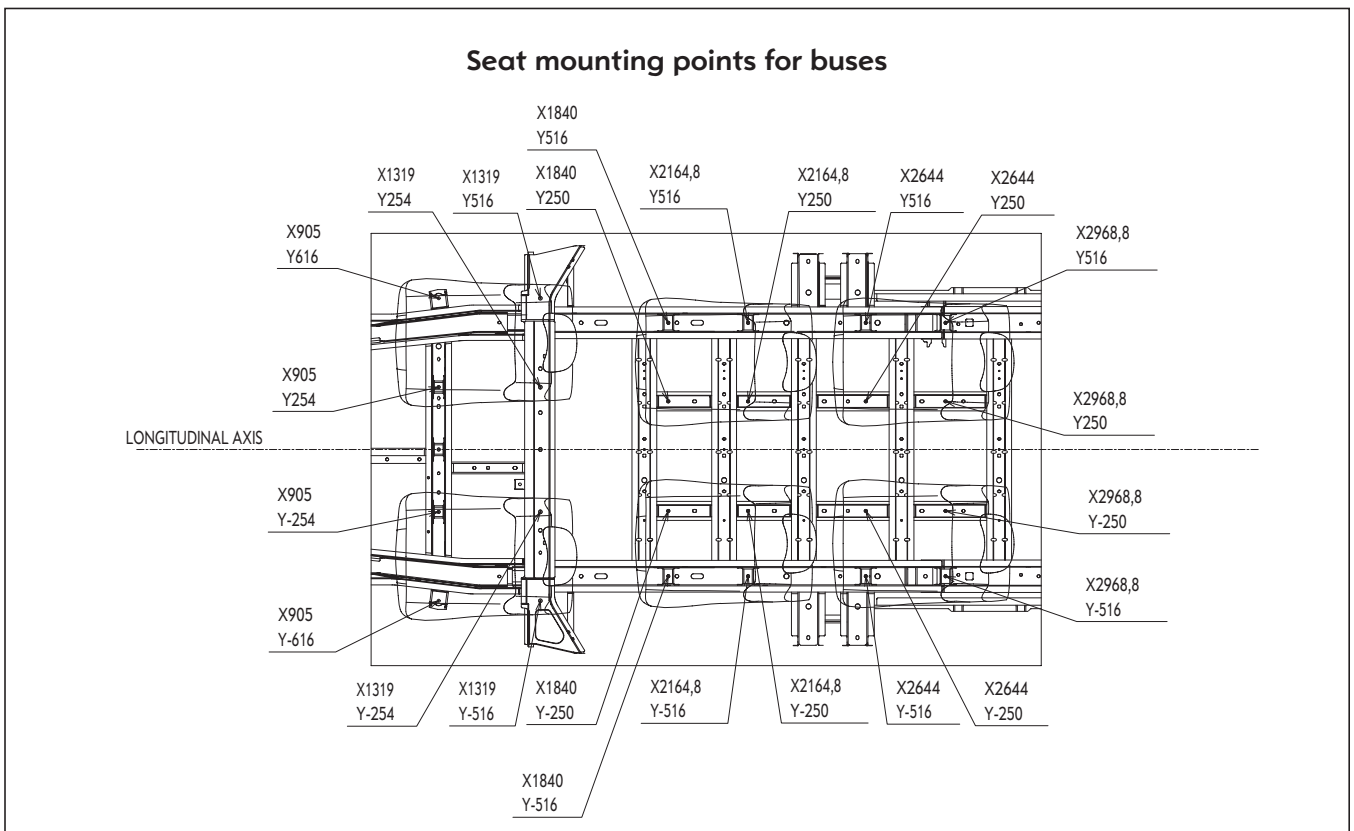
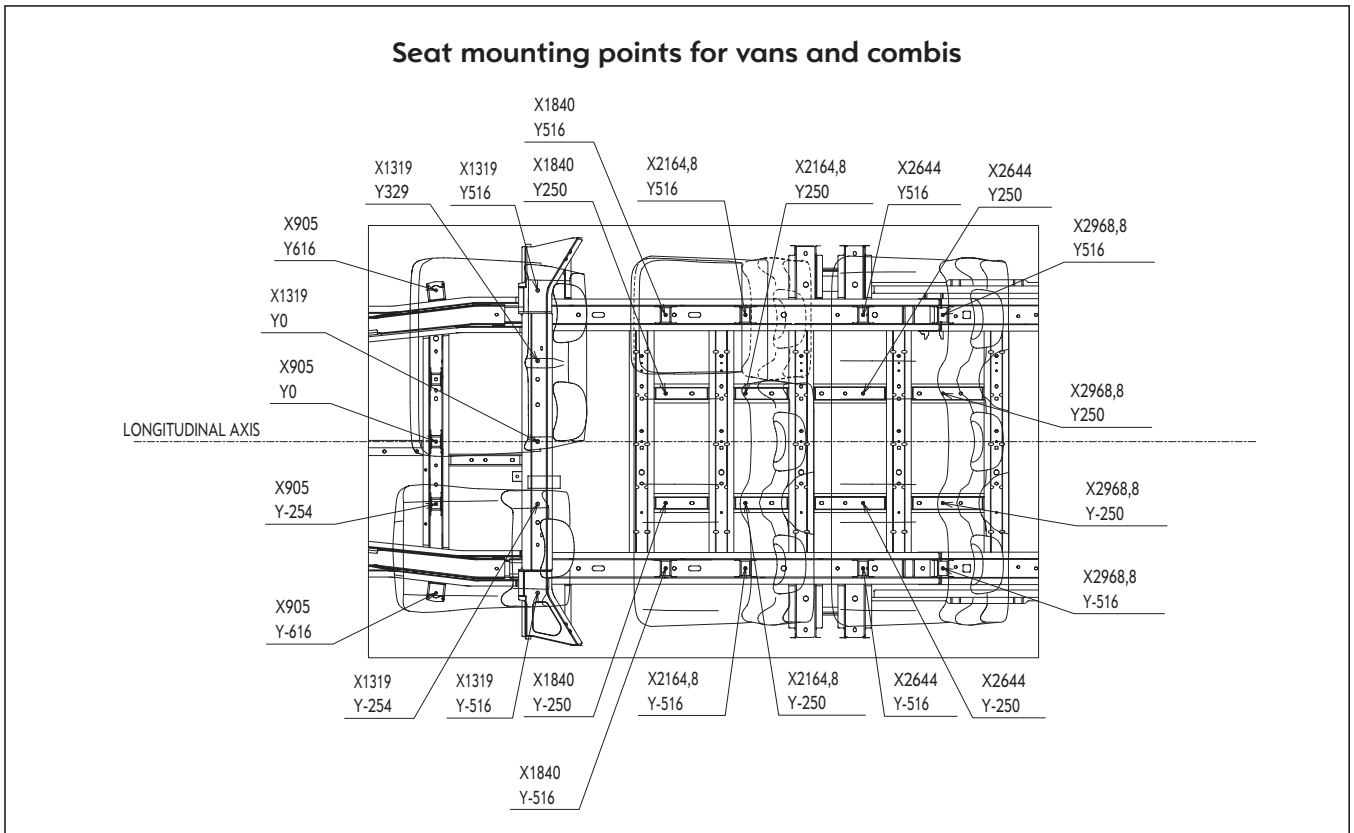


- **Seat belt anchorage points**



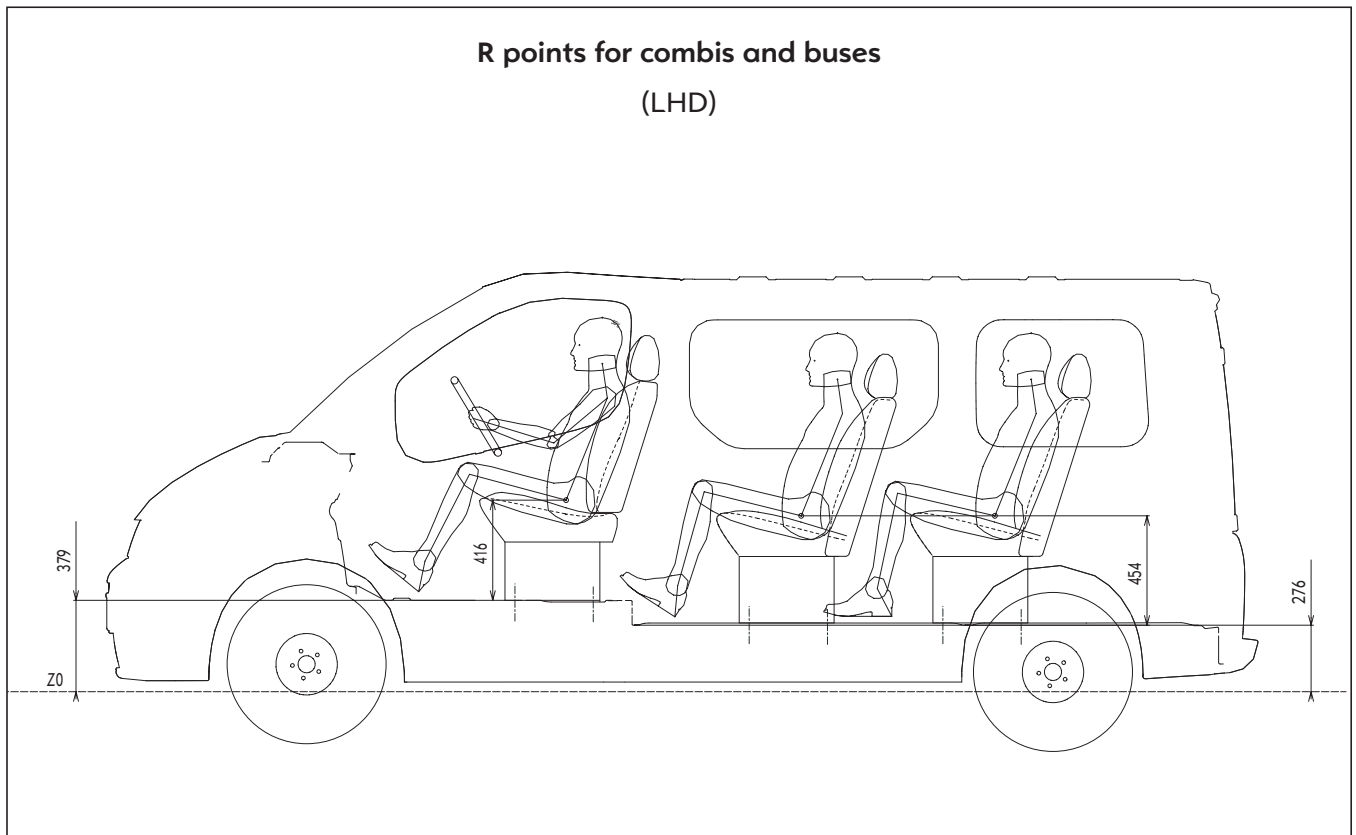


• **Seat mountings:**



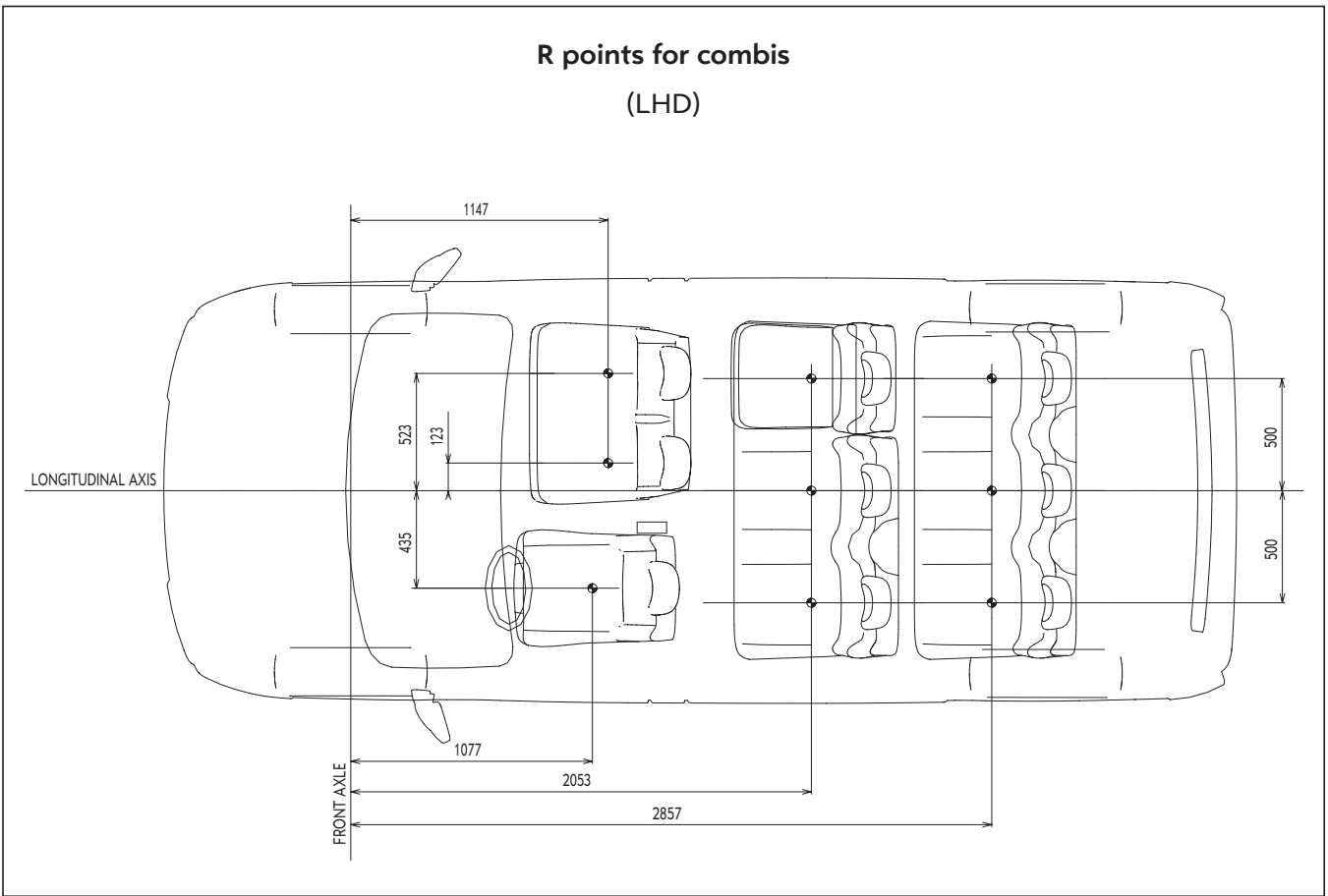


- Position of R points

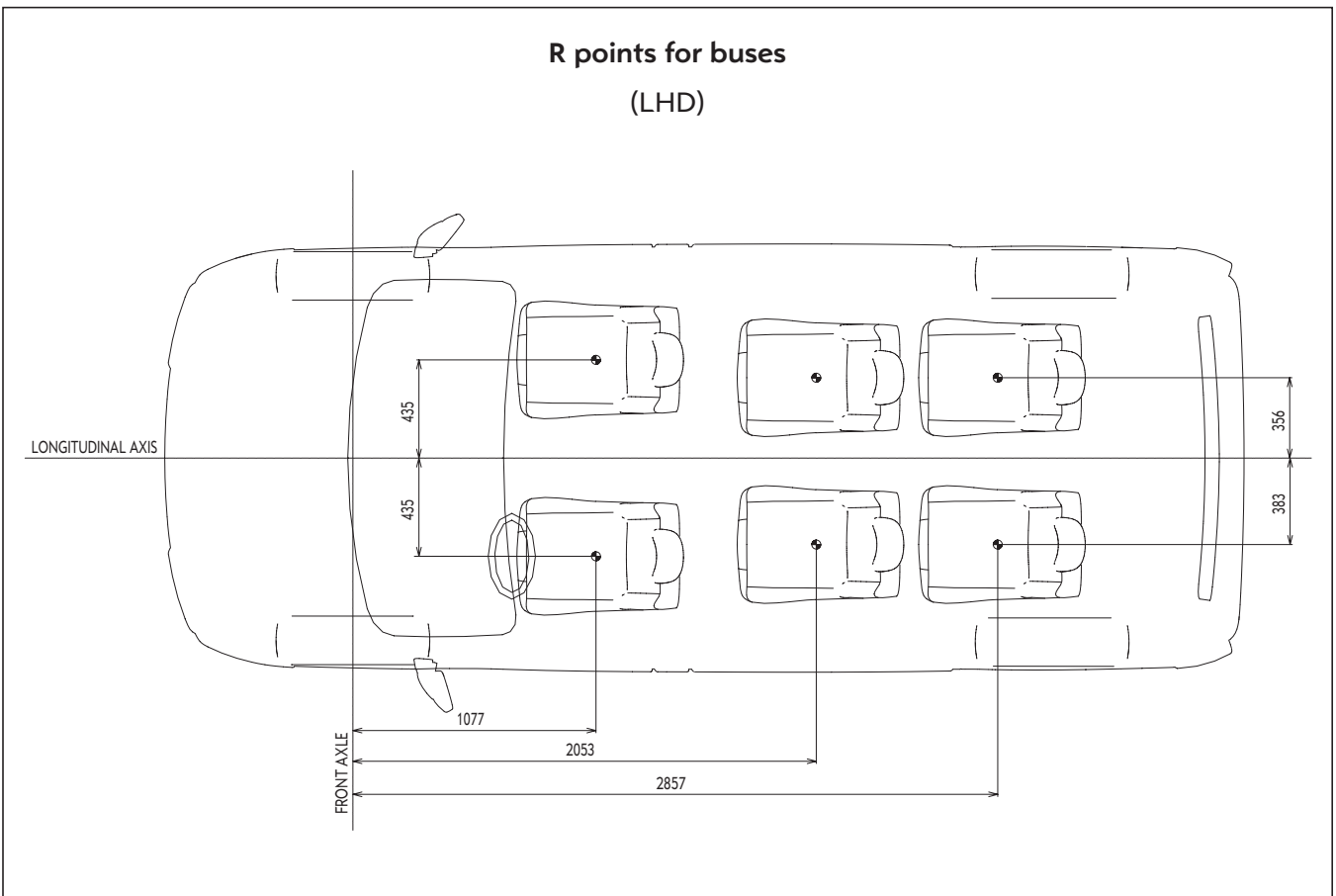




**R points for combis
(LHD)**



**R points for buses
(LHD)**





- **Fuel supply system**

The fuel supply system is identical for all versions, regardless of whether they are LHD or RHD. The fuel tank filler pipe (passenger vehicle model, according to SAE J 1140) is described overleaf. Any changes to the fuel lines or the fuel tank require re-certification. The fuel tank has a capacity of 90 litres.

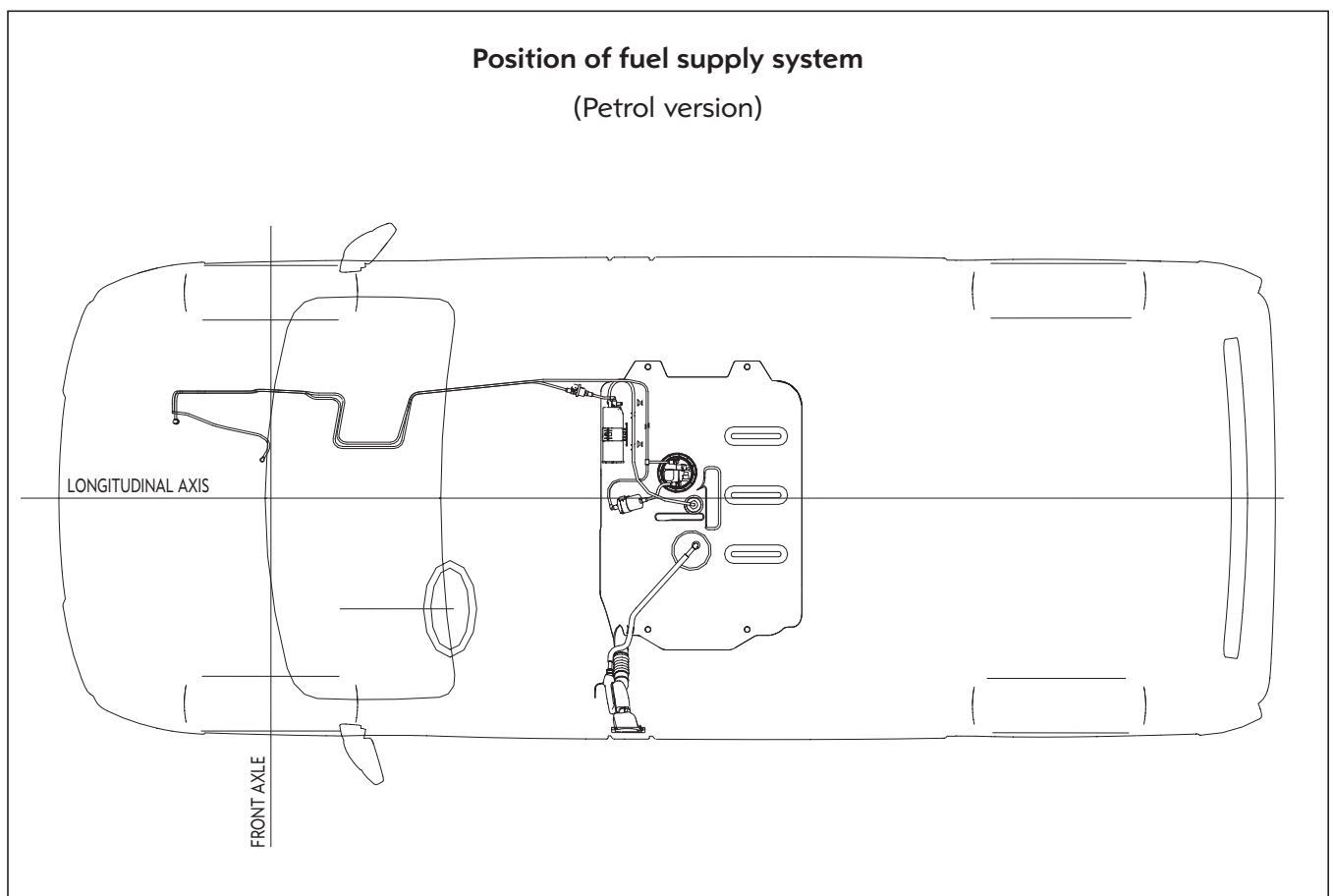
- **Changing position of the filler pipe**

This modification is not recommended as the routing of the tank filler pipe is very complex. If changes are absolutely necessary, the result must comply with all applicable regulations and allow unimpaired filling.

- **Add-on heater**

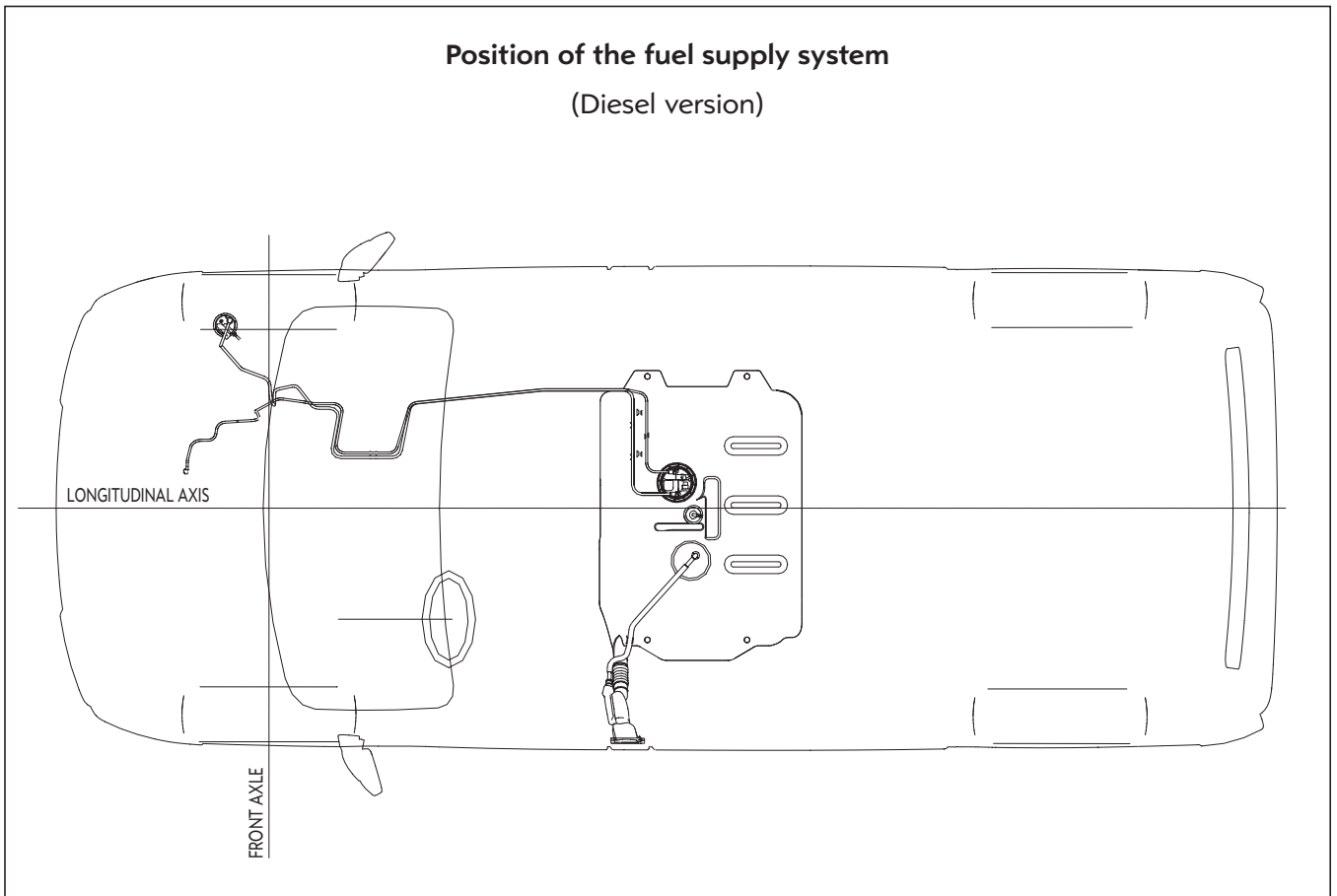
The add-on heater can be ordered ex works. When retrofitting, the feed line must be replaced by part number 91166223. These modifications ensure sufficient fuel supply to the engine, regardless of tank level and vehicle dynamics.

Note: The fuel lines are made from PA11/PA12.

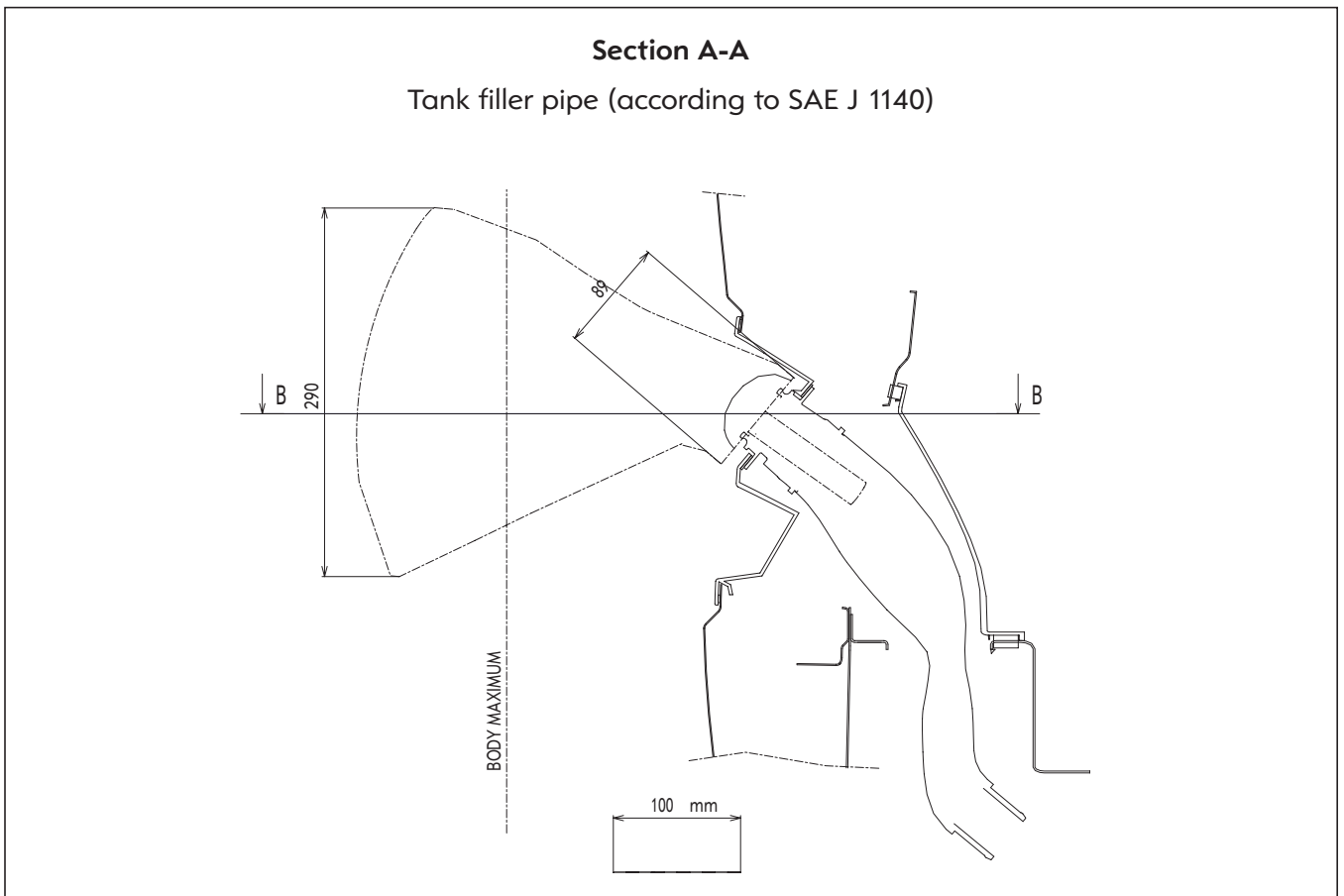




Position of the fuel supply system (Diesel version)



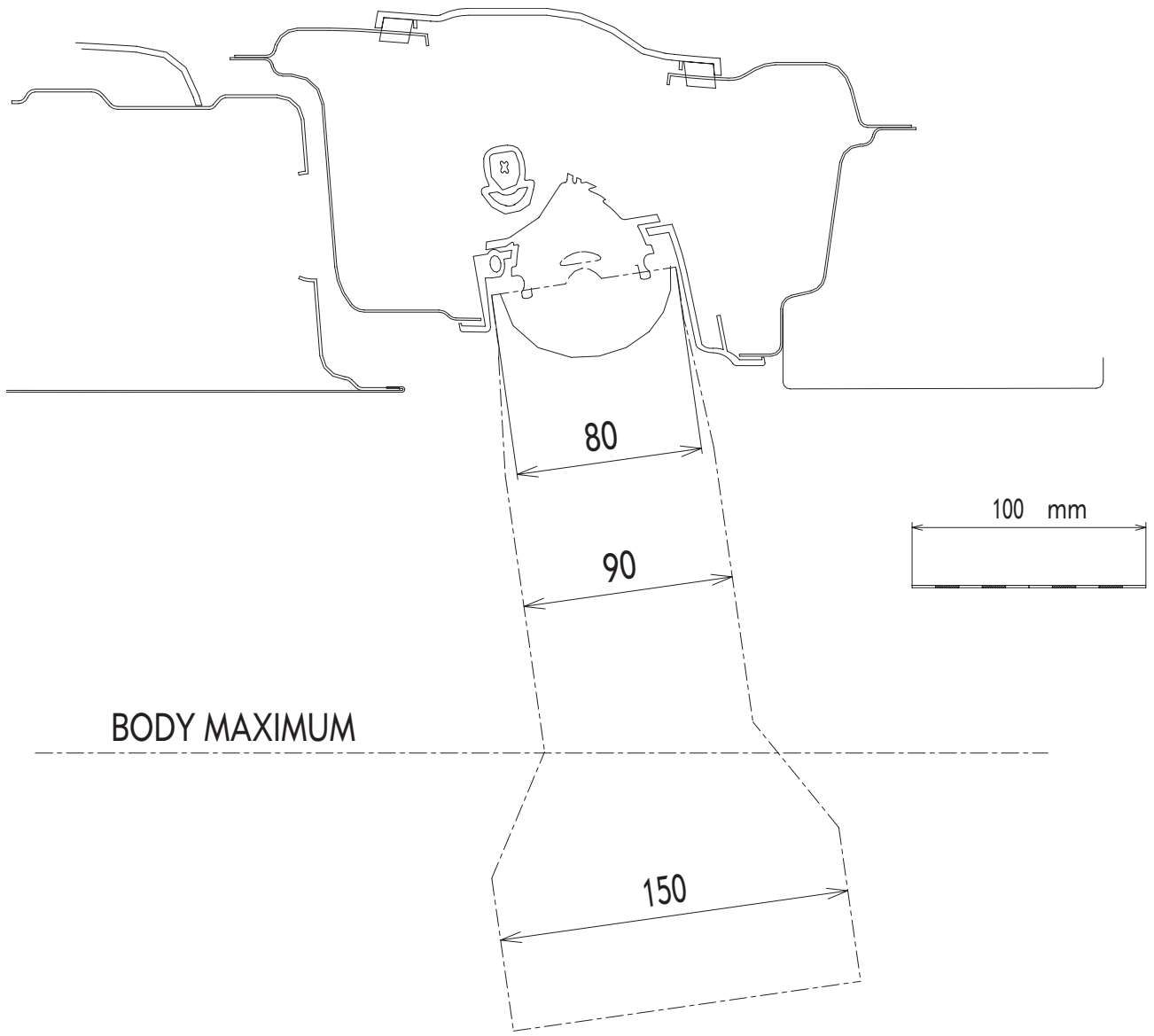
Section A-A Tank filler pipe (according to SAE J 1140)





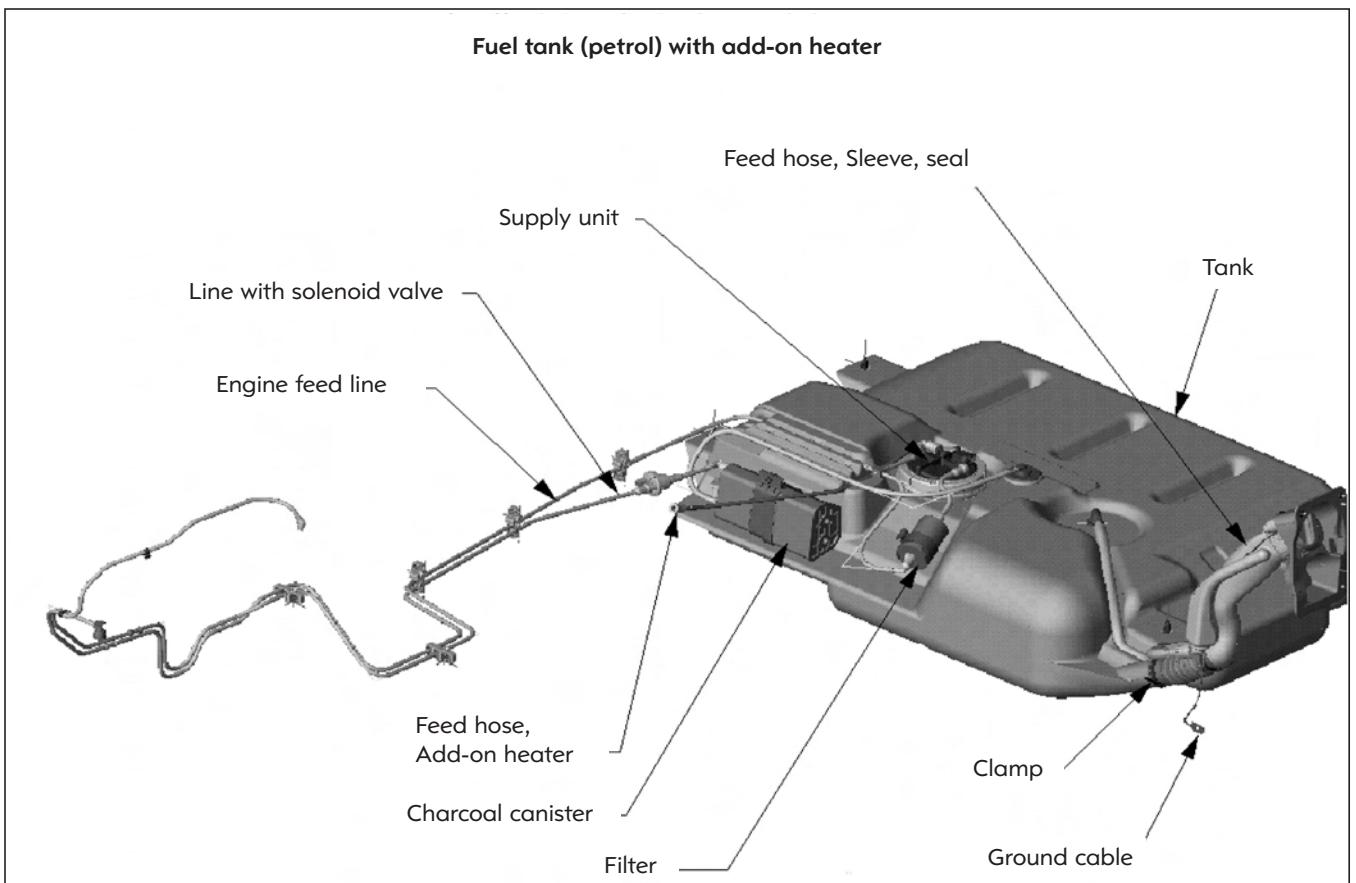
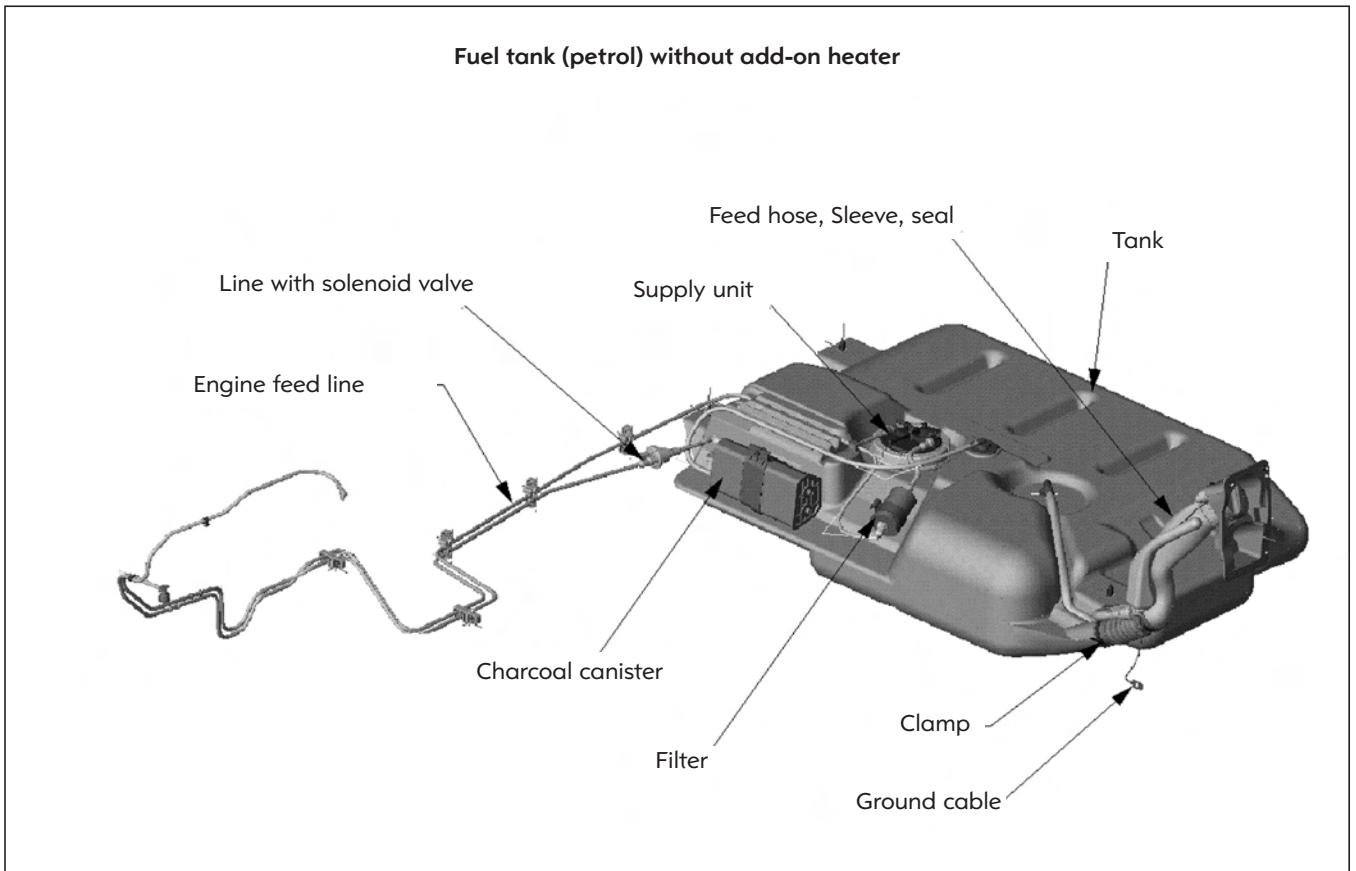
Section B-B

Tank filler pipe (according to SAE J 1140)



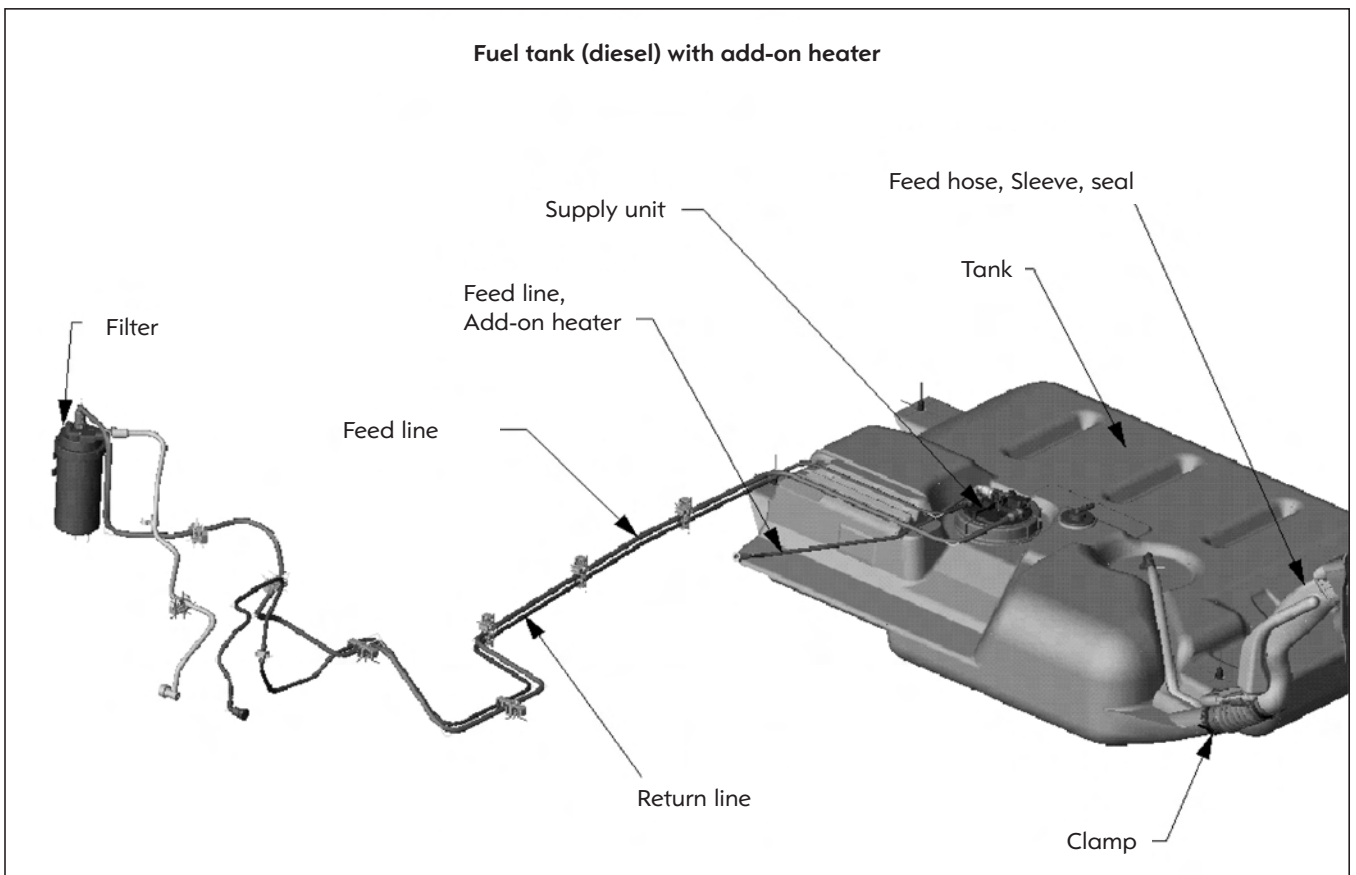
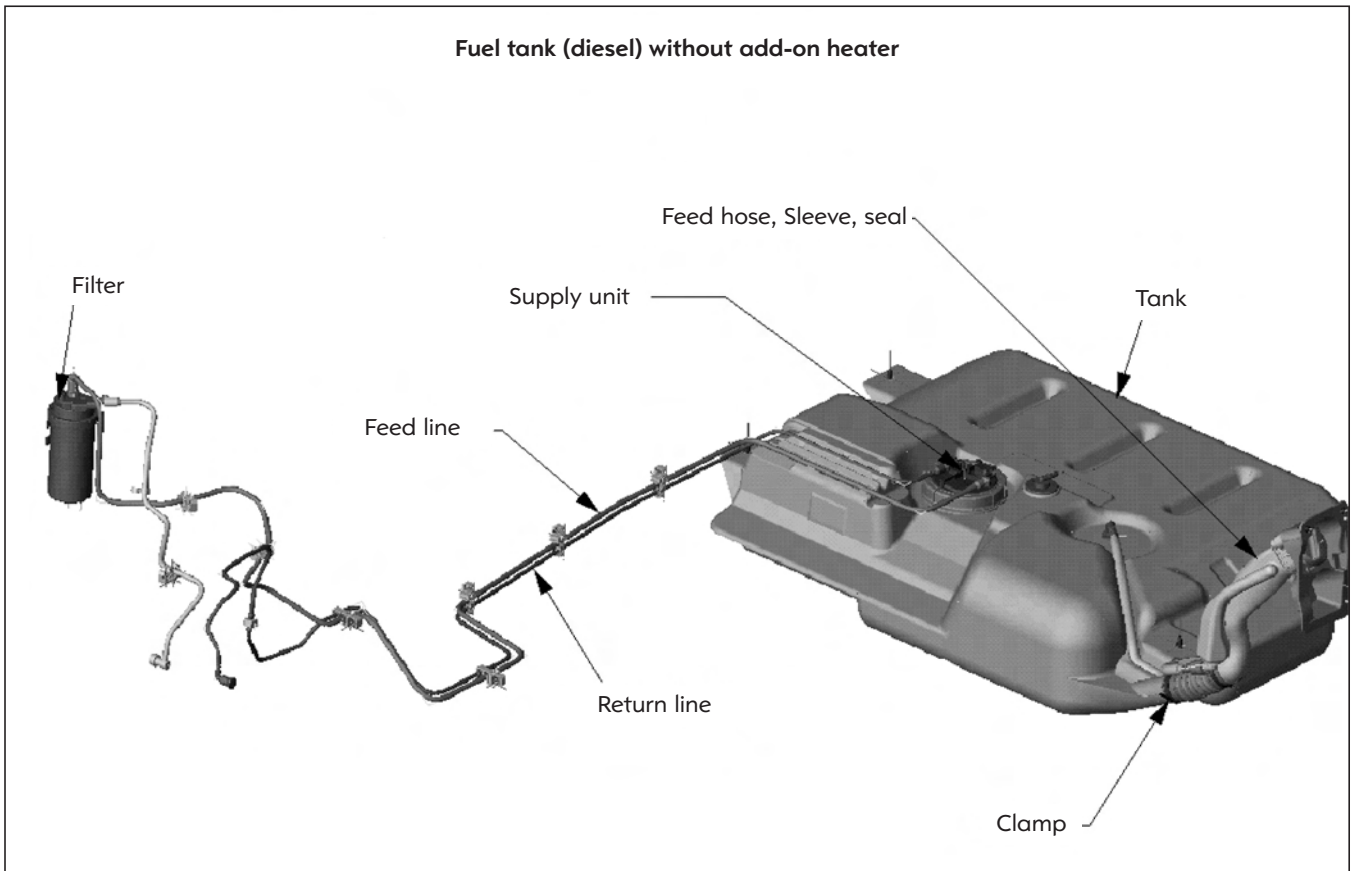


• Fuel tank versions





- Fuel tank versions

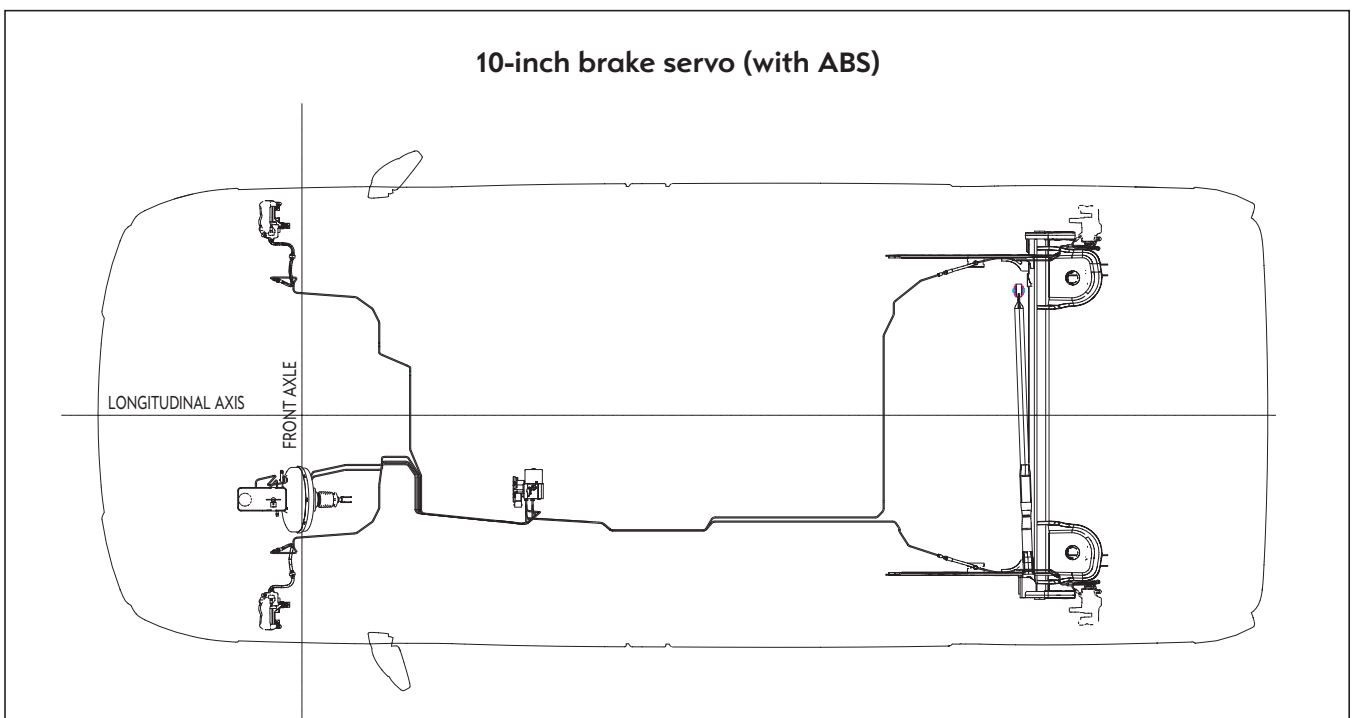
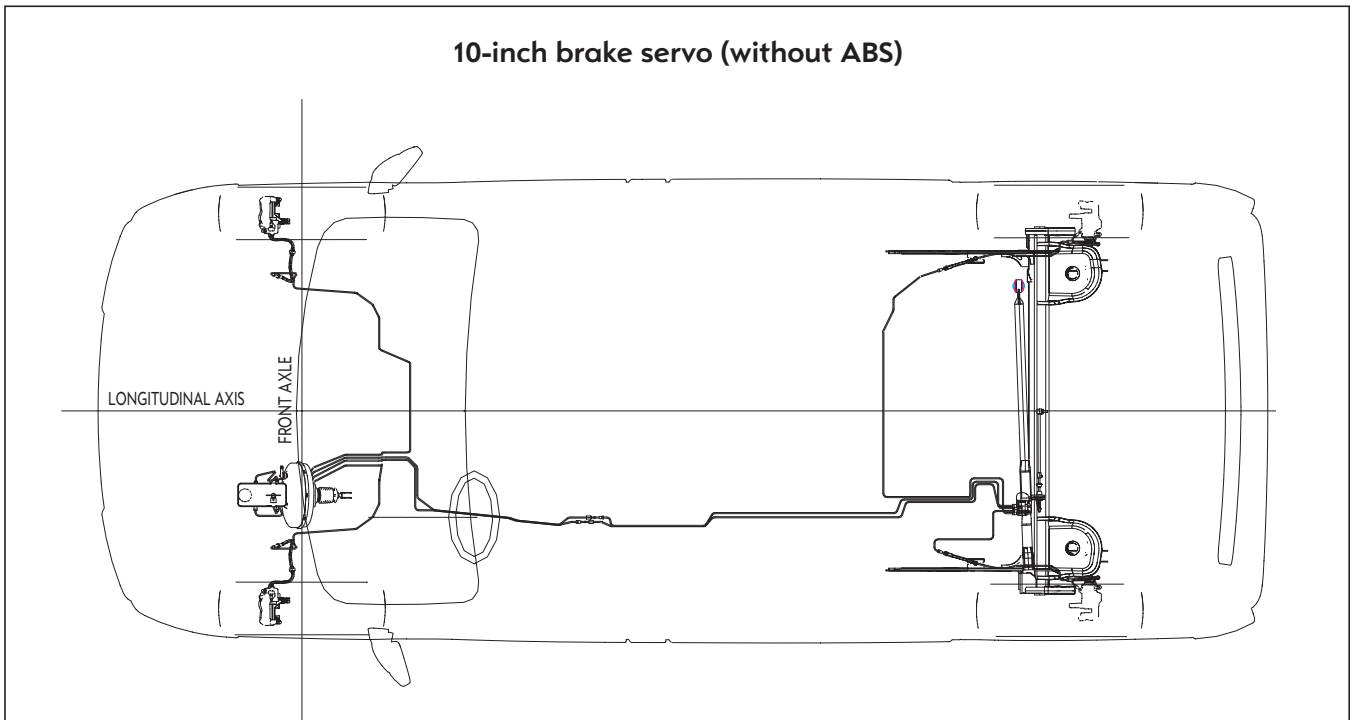




- **Position of brake system**

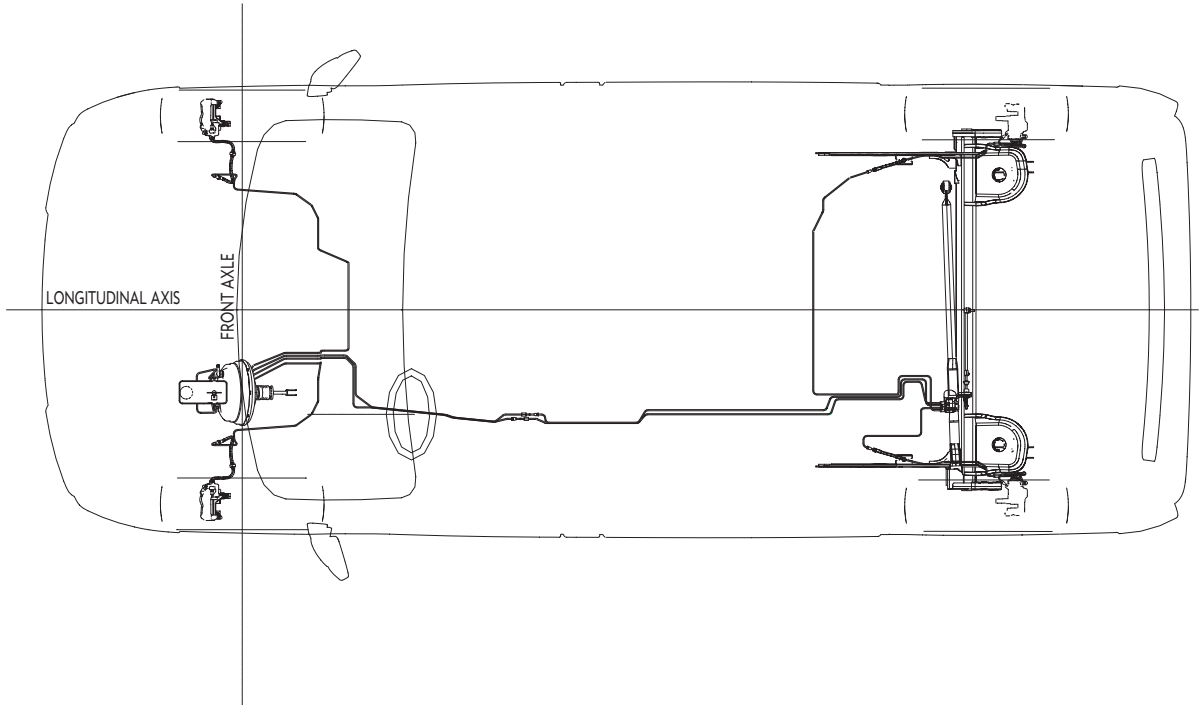
The position of the brake system is shown in the following illustrations. Two different brake servos units are used, depending on the engine and vehicle version. One is a 10 inch brake servo for LHD vehicles with F9Q engine, the other is a 9/10 inch brake servo for versions with F4R or G9U engines and for all RHD vehicles.

Note: For safety reasons, all vehicles with extended wheel base must be equipped with an ABS brake system.

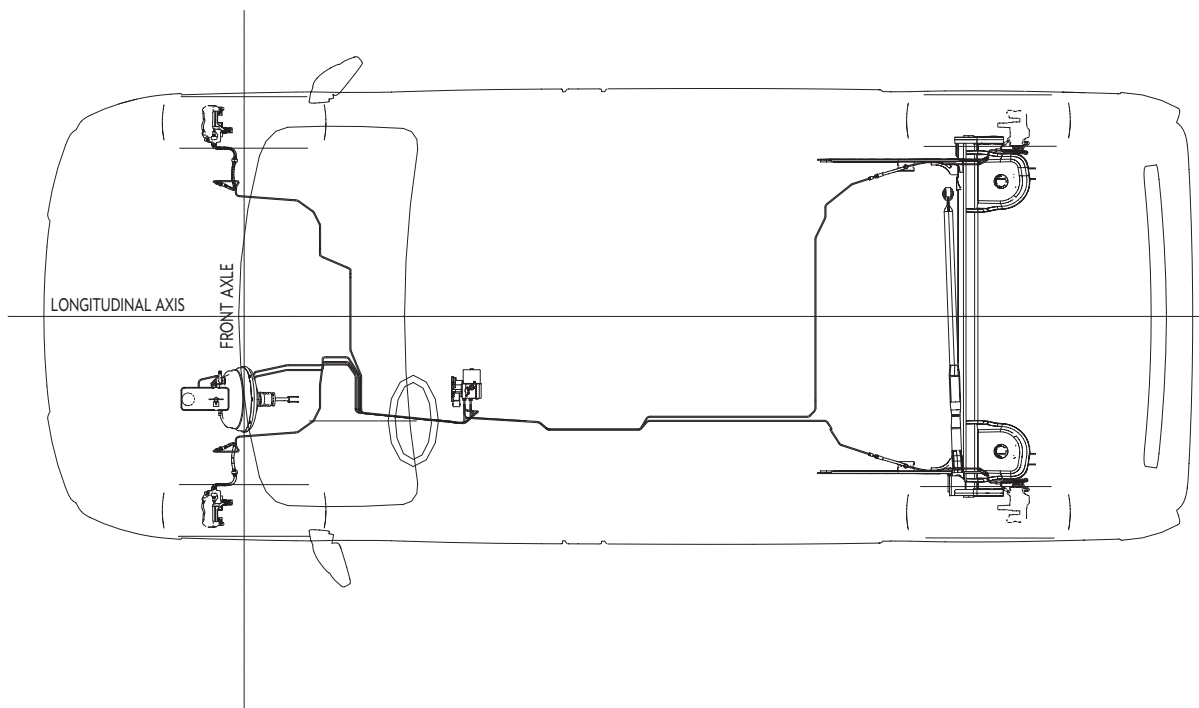




9/10-inch brake servo (without ABS)

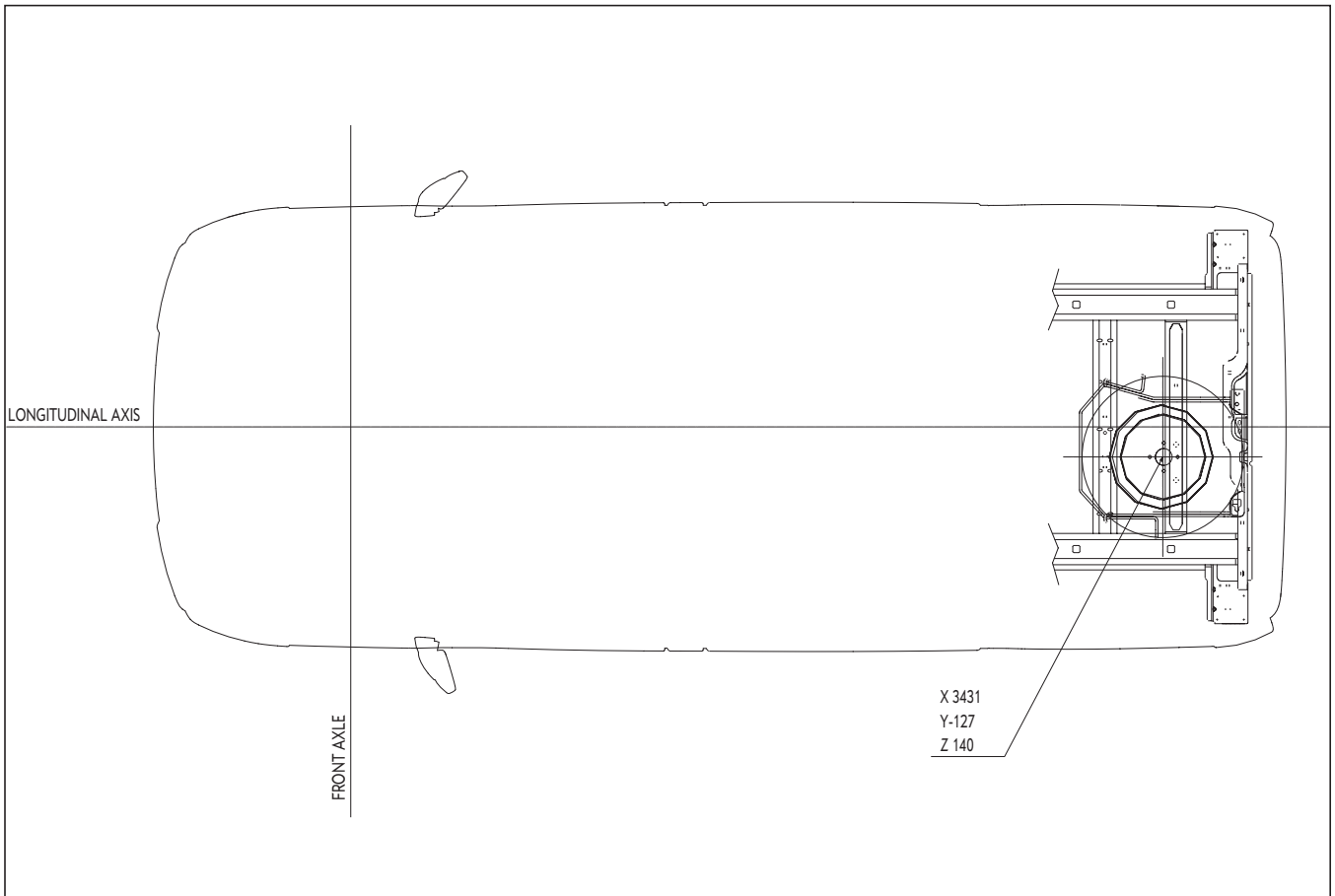


9/10-inch brake servo (with ABS)



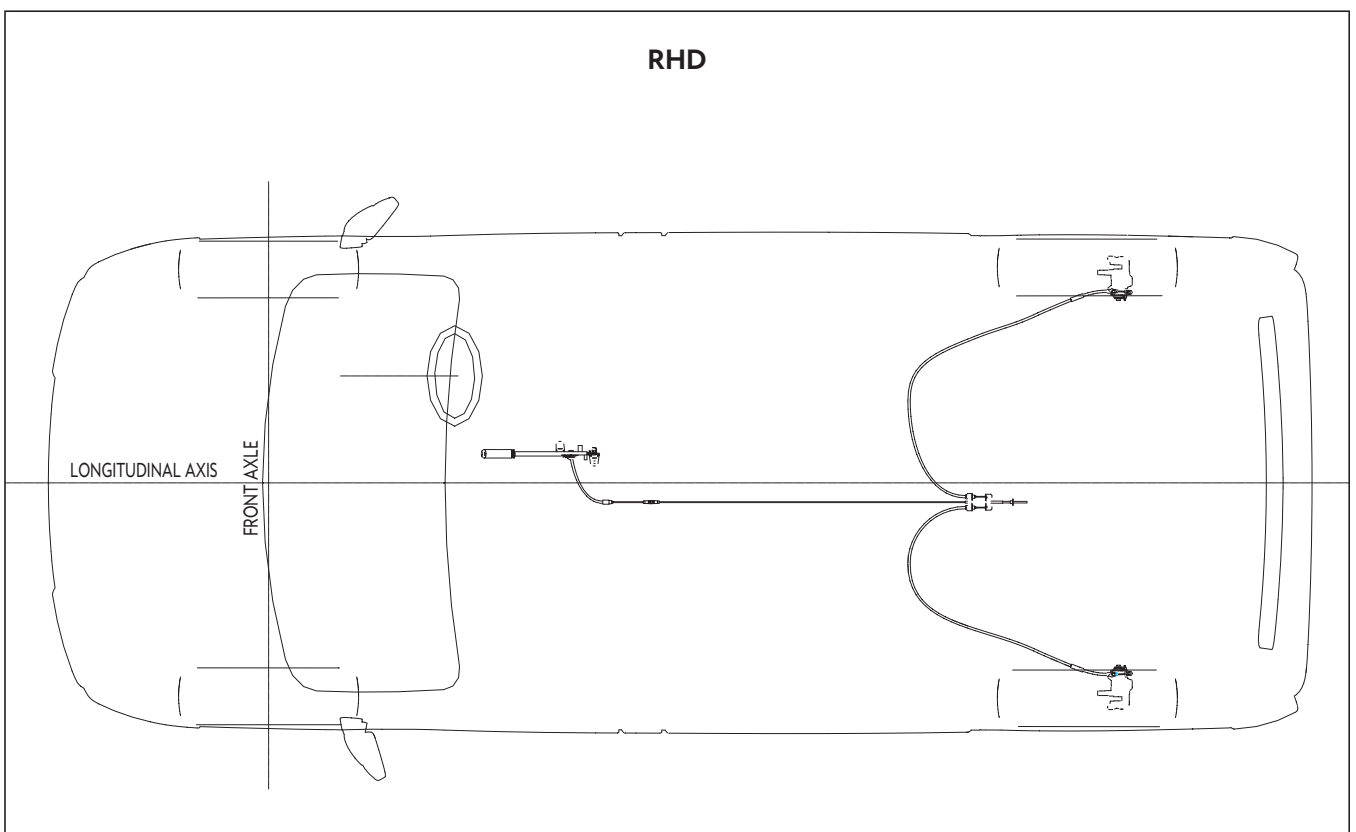
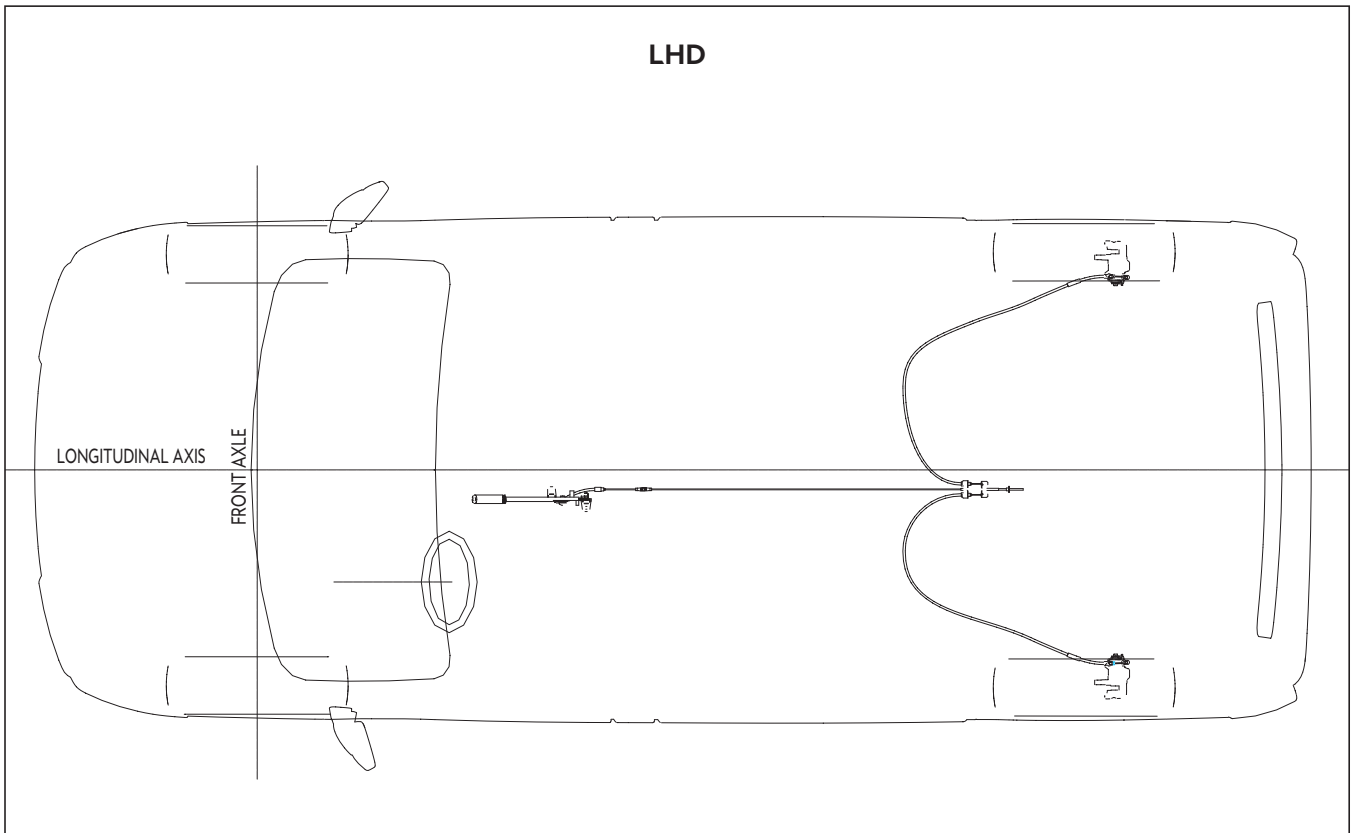


- Location of the spare wheel





- Parking brake system

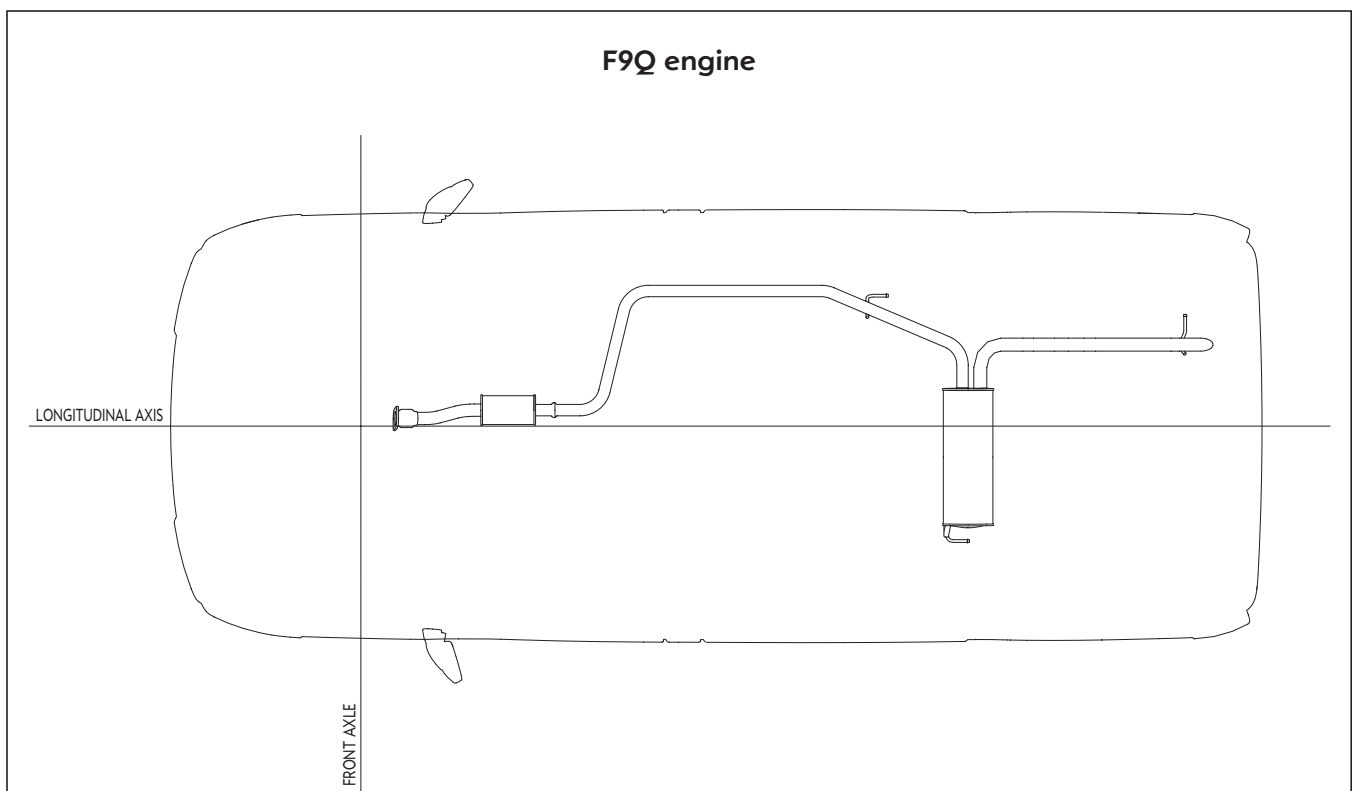
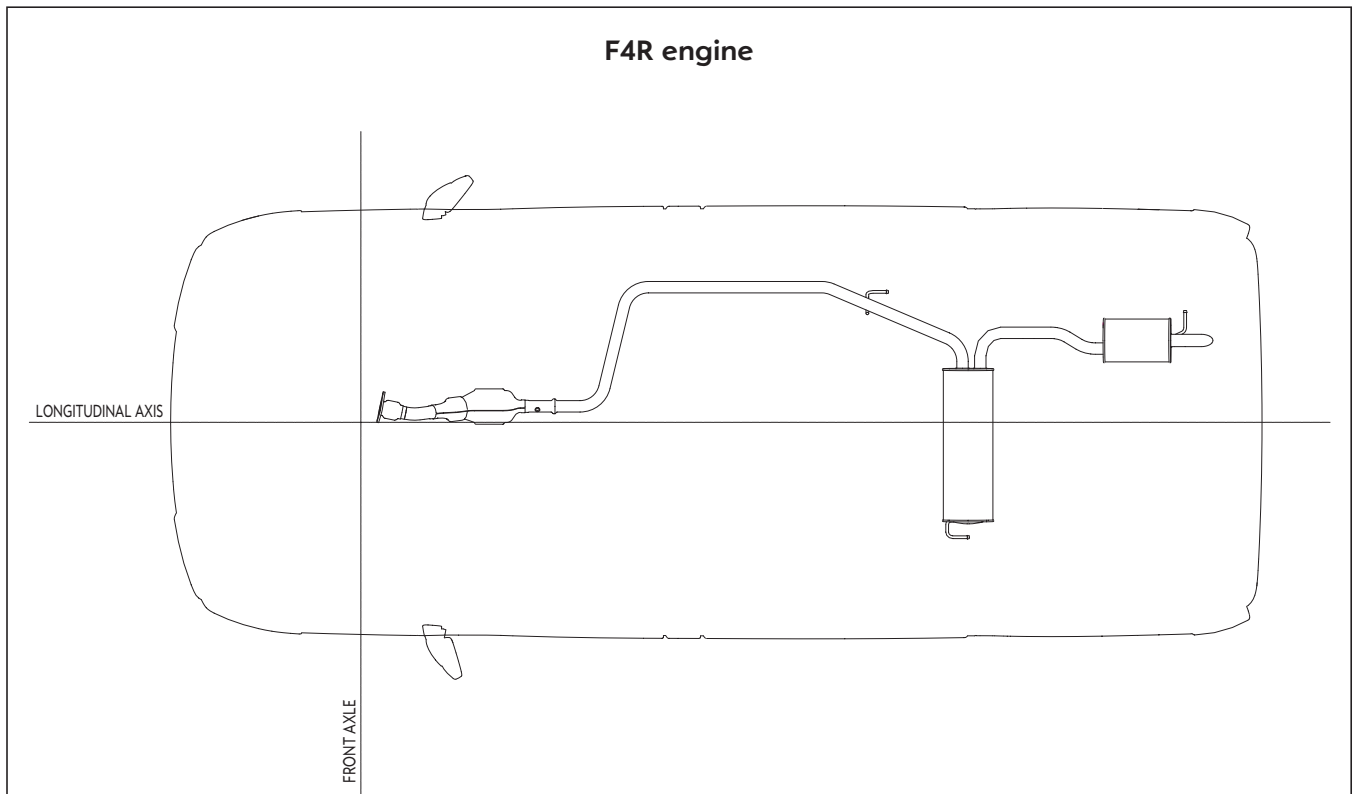




- **Modification of the exhaust system**

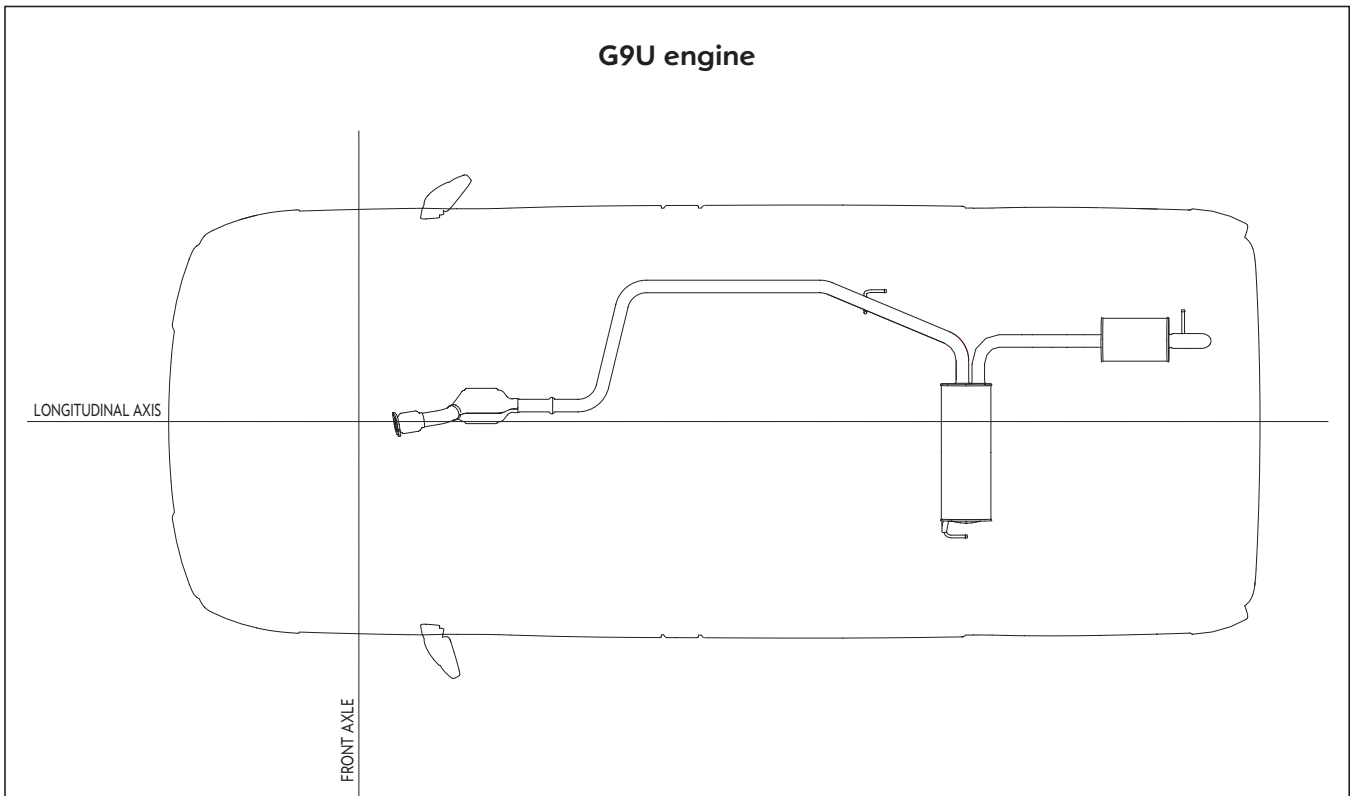
The exhaust pipe must be extended in length in the central section (diameter 50/47 mm).

The extension must be made from stainless steel, in accordance with the warranty against corrosion.





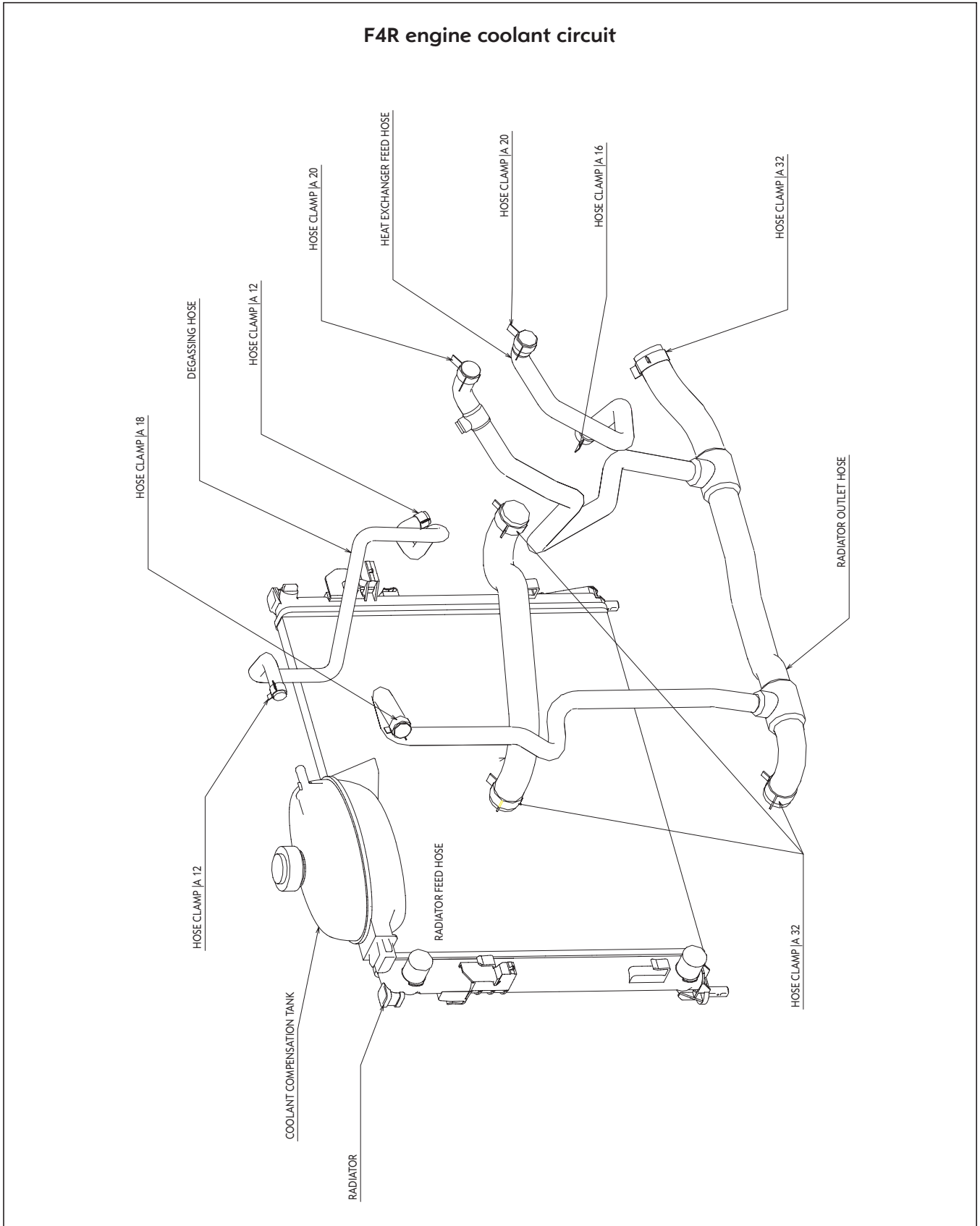
G9U engine





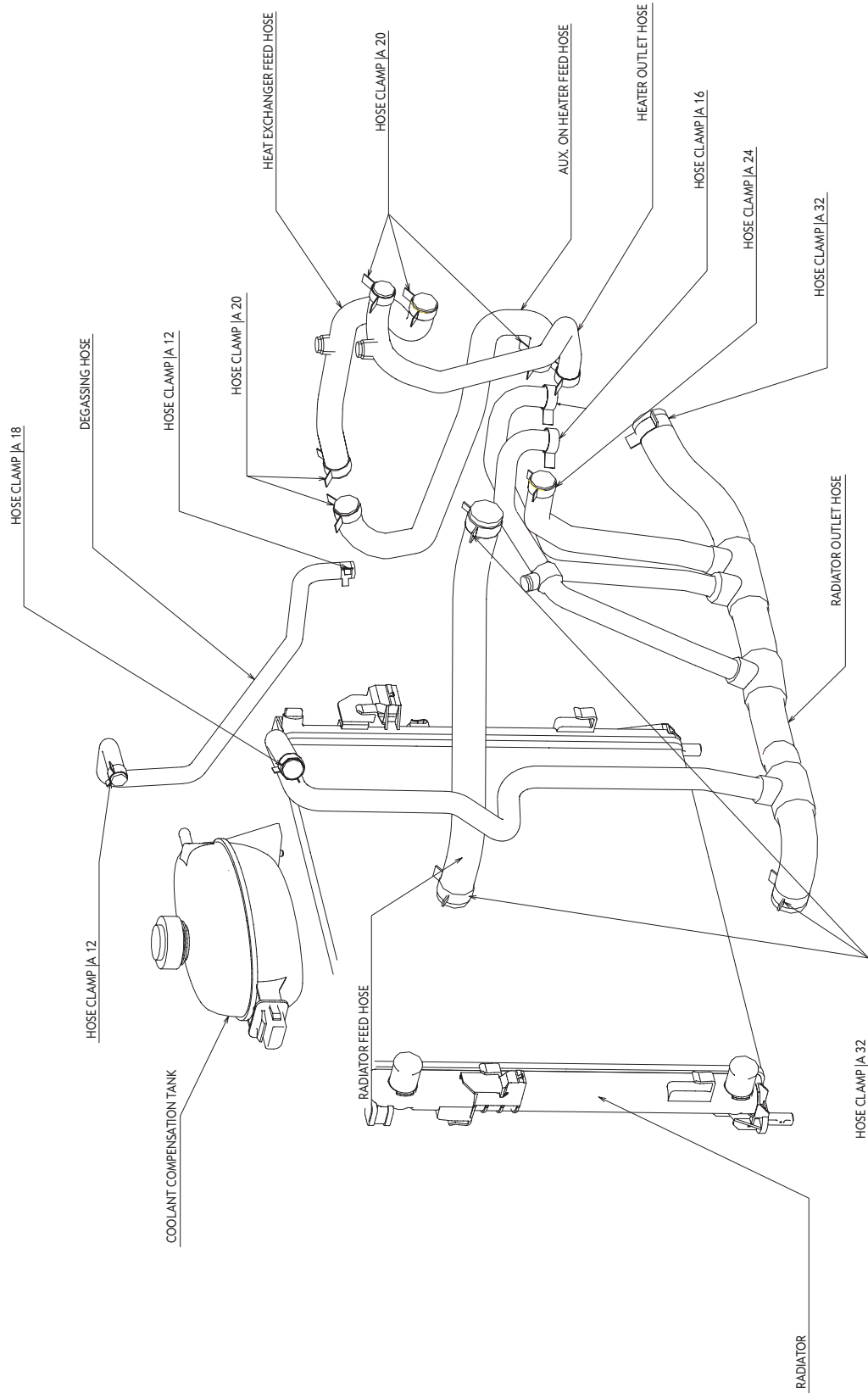
- **Engine cooling**

The illustrations below show the coolant circuits for the engine versions F4R, F9Q and G9U as well as the A/C circuits for the engine versions F4R and F9Q.



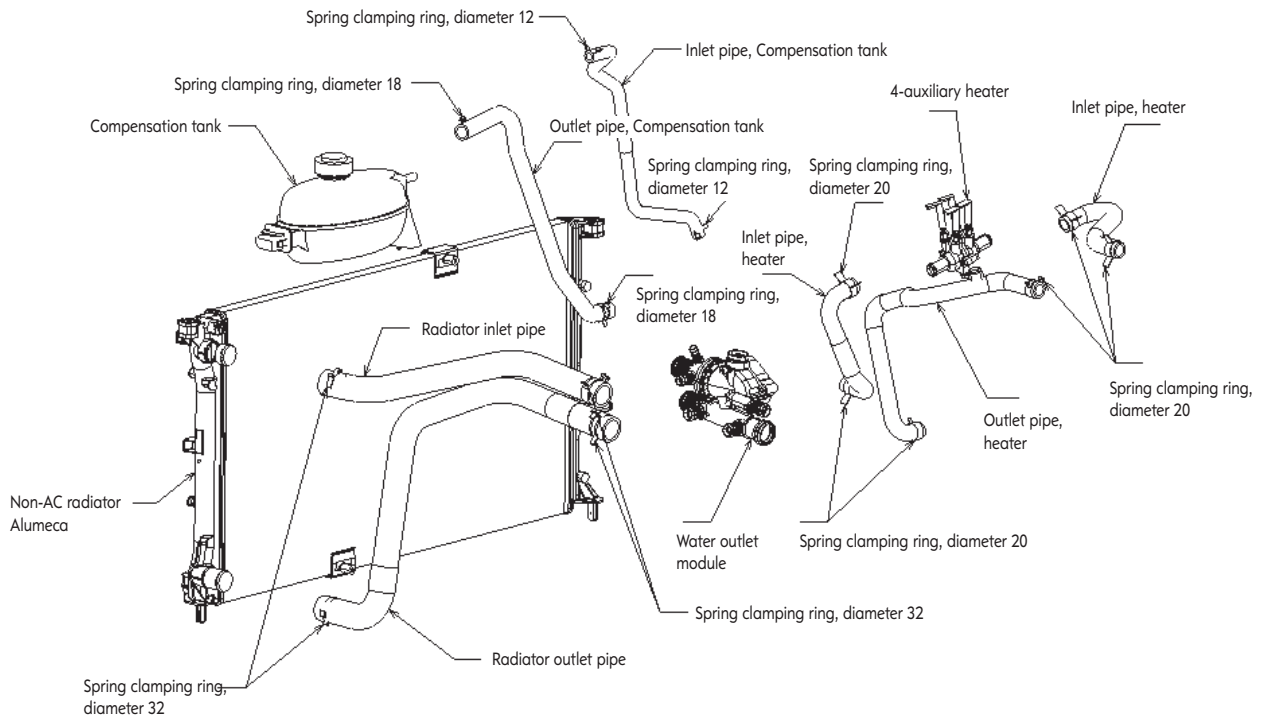


F9Q engine coolant circuit

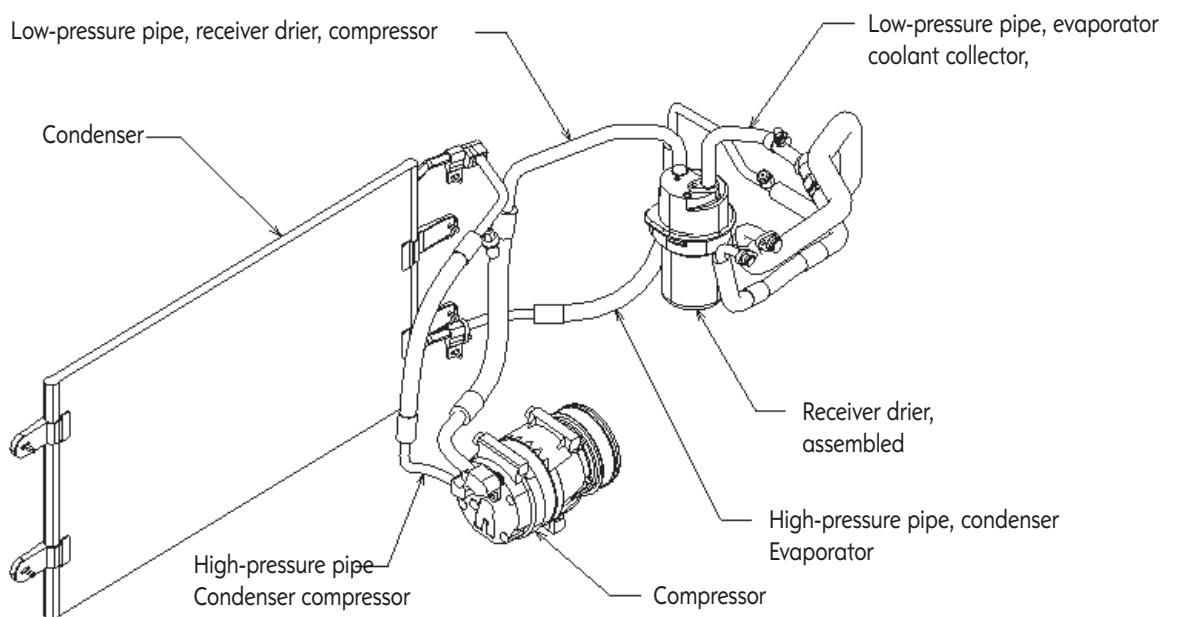




G9U engine coolant circuit

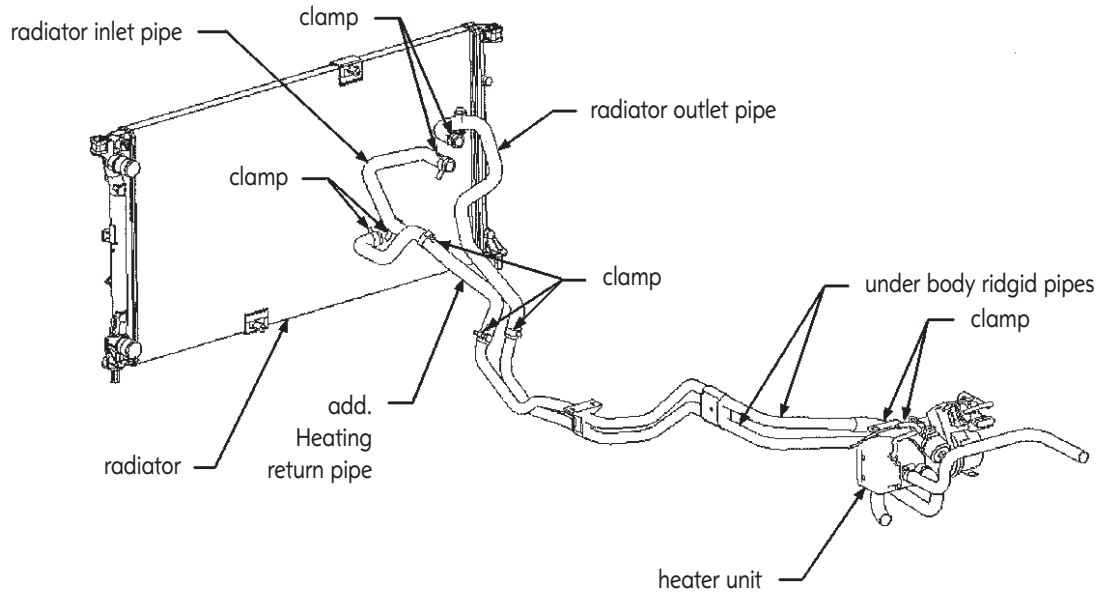


G9U engine AC circuit



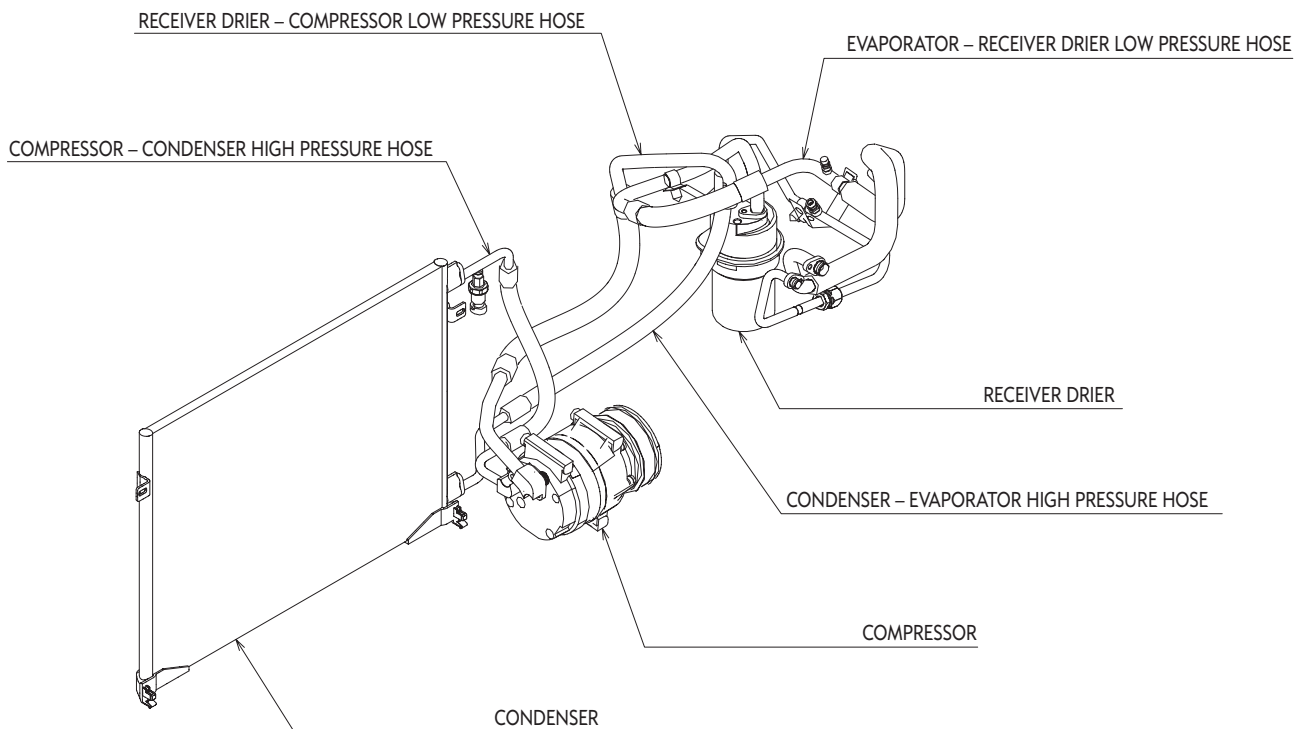


Additional heating circuit for G9U engine



- AC circuit

F4R and F9Q engines





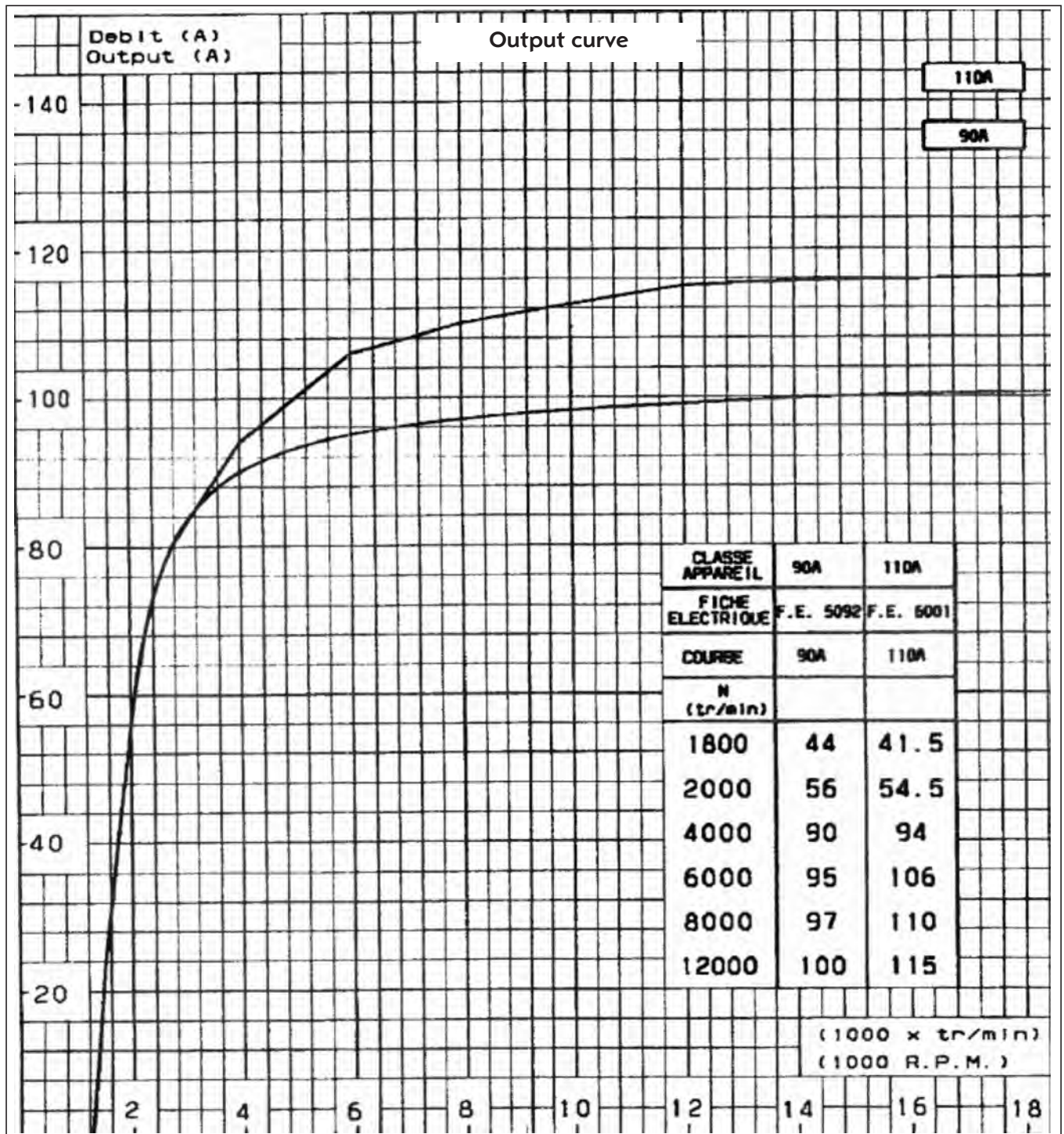
Alternator

Depending on the version and connections, the X83 vehicles can be equipped with one of the two following generators:

- 110 A alternator (F4R engine)
- 125 A alternator (F4R, F9Q and G9U engines)

110 A alternator

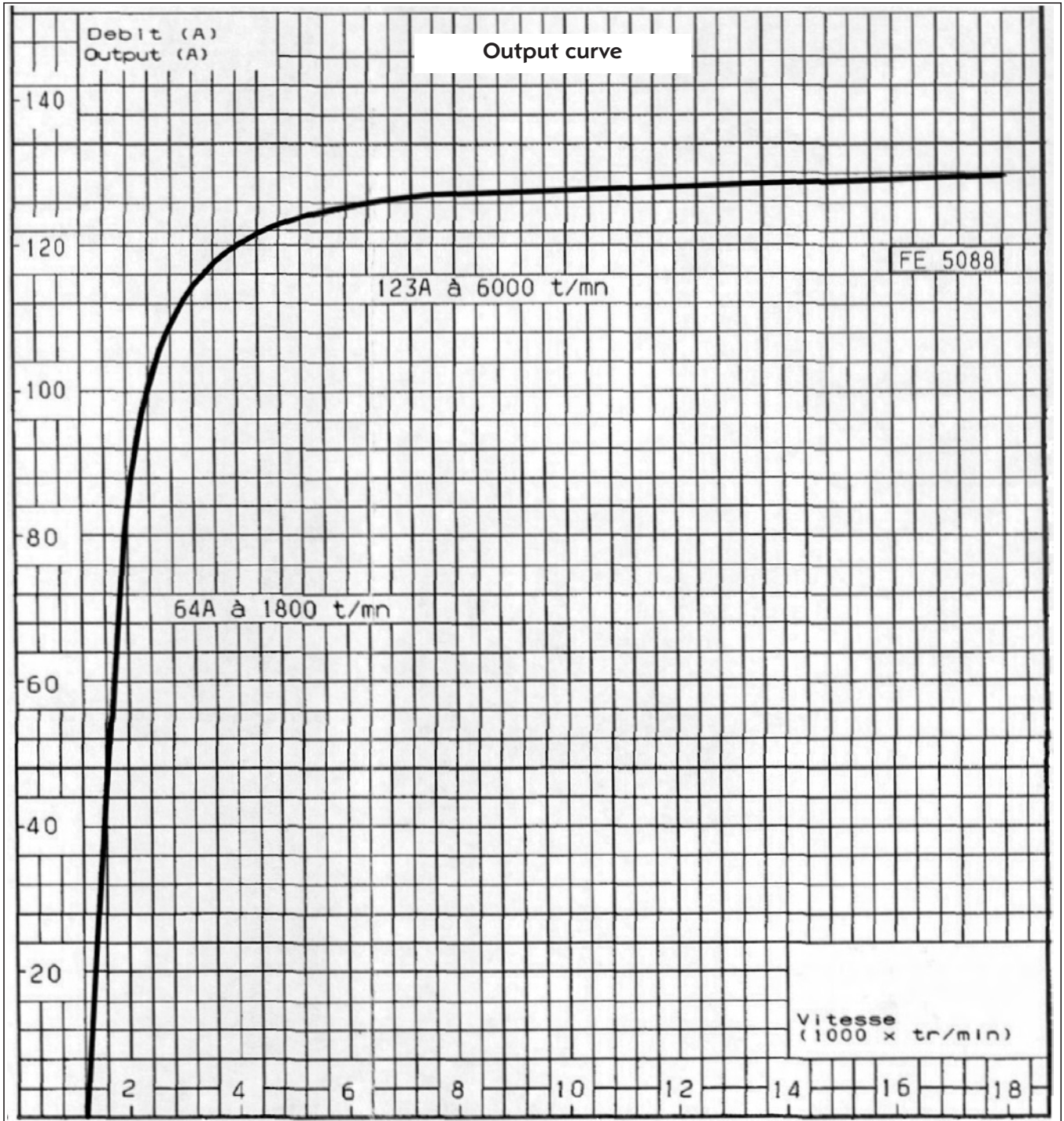
MINIMUM OUTPUT AT 13.5 VOLT (INSTANTANEOUS VALUE) AFTER WARM-UP FOR Ω HOUR
AT 3000 RPM AT 13.5 V





125 A alternator

MINIMUM OUTPUT AT 13.5 VOLT (INSTANTANEOUS VALUE); AFTER WARM-UP PERIOD FOR Ω HOUR AT 3000 RPM AT 13.5 V



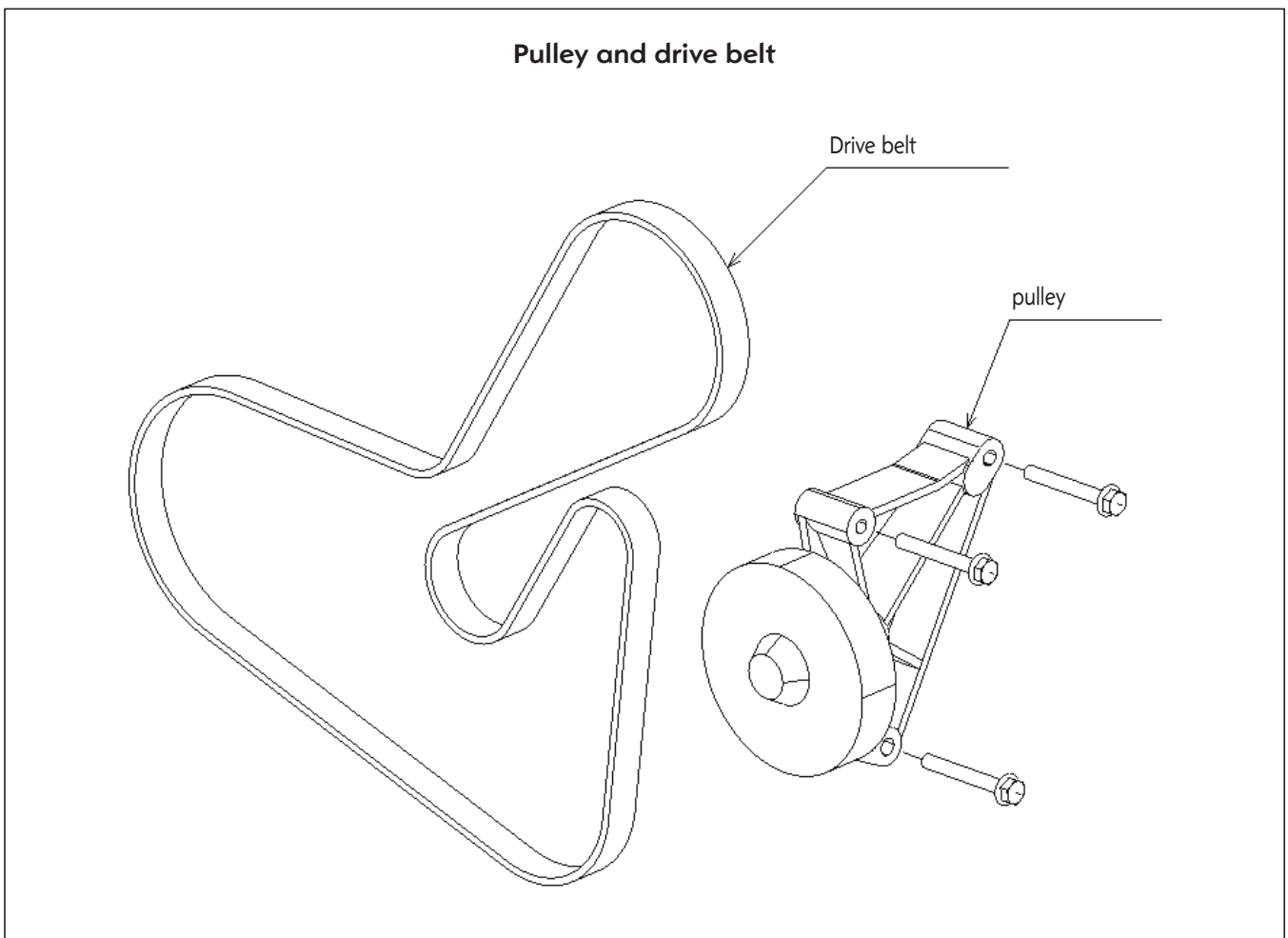


6 Options and Accessories

- **Power take-off**

The vehicle can be ordered with an optional power take-off in the form of a belt-driven pulley. A drive belt with the following specification is employed:

- Number of ribs: 6
- Width (mm): 21.36 ± 0.5
- Length: 1795 ± 0.5
- Service life: 120,000 km (for standard compression characteristics)
- Static tension of the belt in operation: 250 N per strand at 20 °C



Note: The output and torques which can be reached are considerably in excess of the specified values. Systematic calculations are necessary to determine the following values relating to the drive belt and pulley:

- Tension
- Service life

Contact the belt manufacturer in order to determine these values.



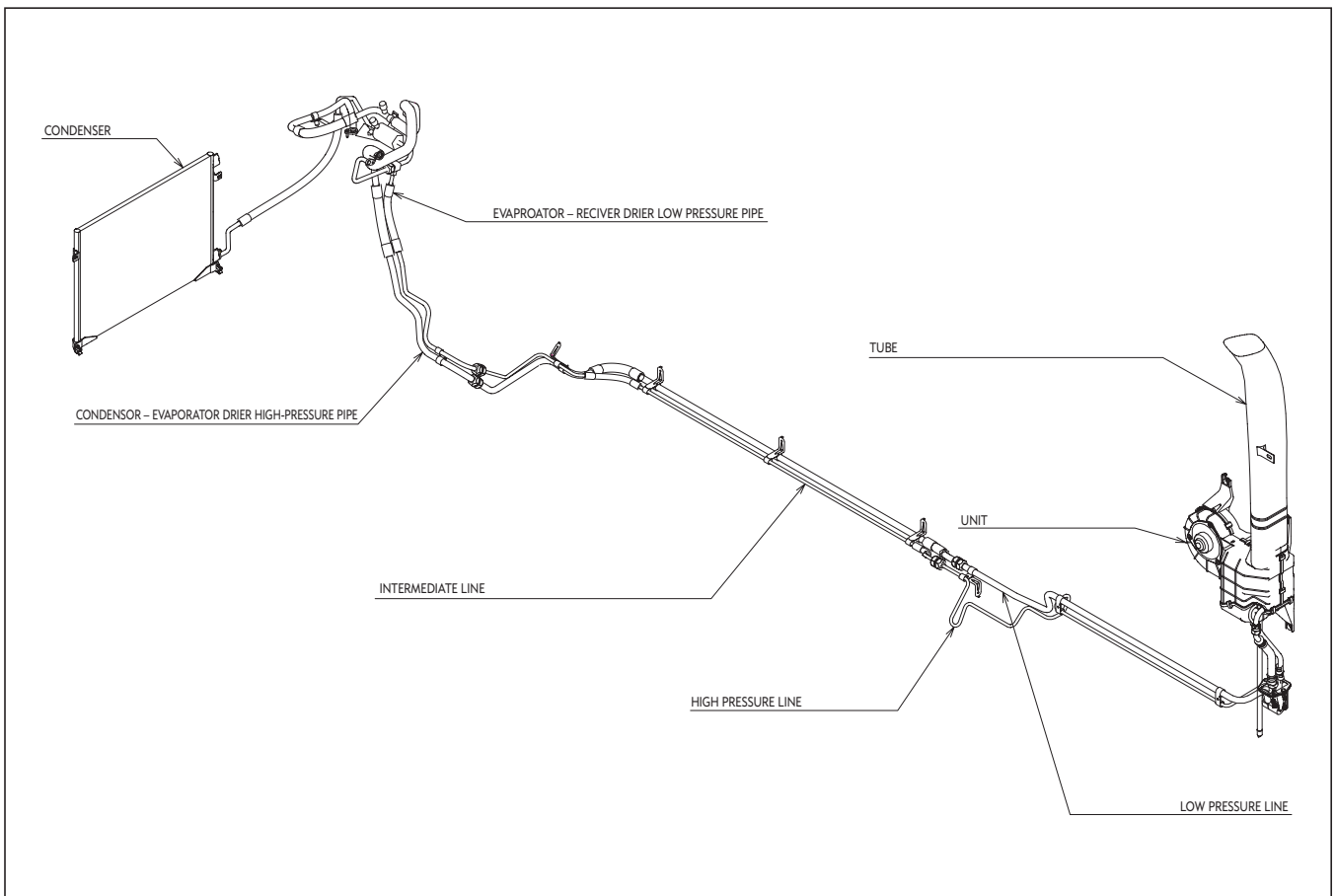
• **Additional Air Condition for engine versions F4R and F9Q
(only in conjunction with AC and power take-off).**

An additional AC is available as an option for the combi and bus versions. In order to equip the van with an additional AC unit it must be retrofitted using combi components.

Procedure:

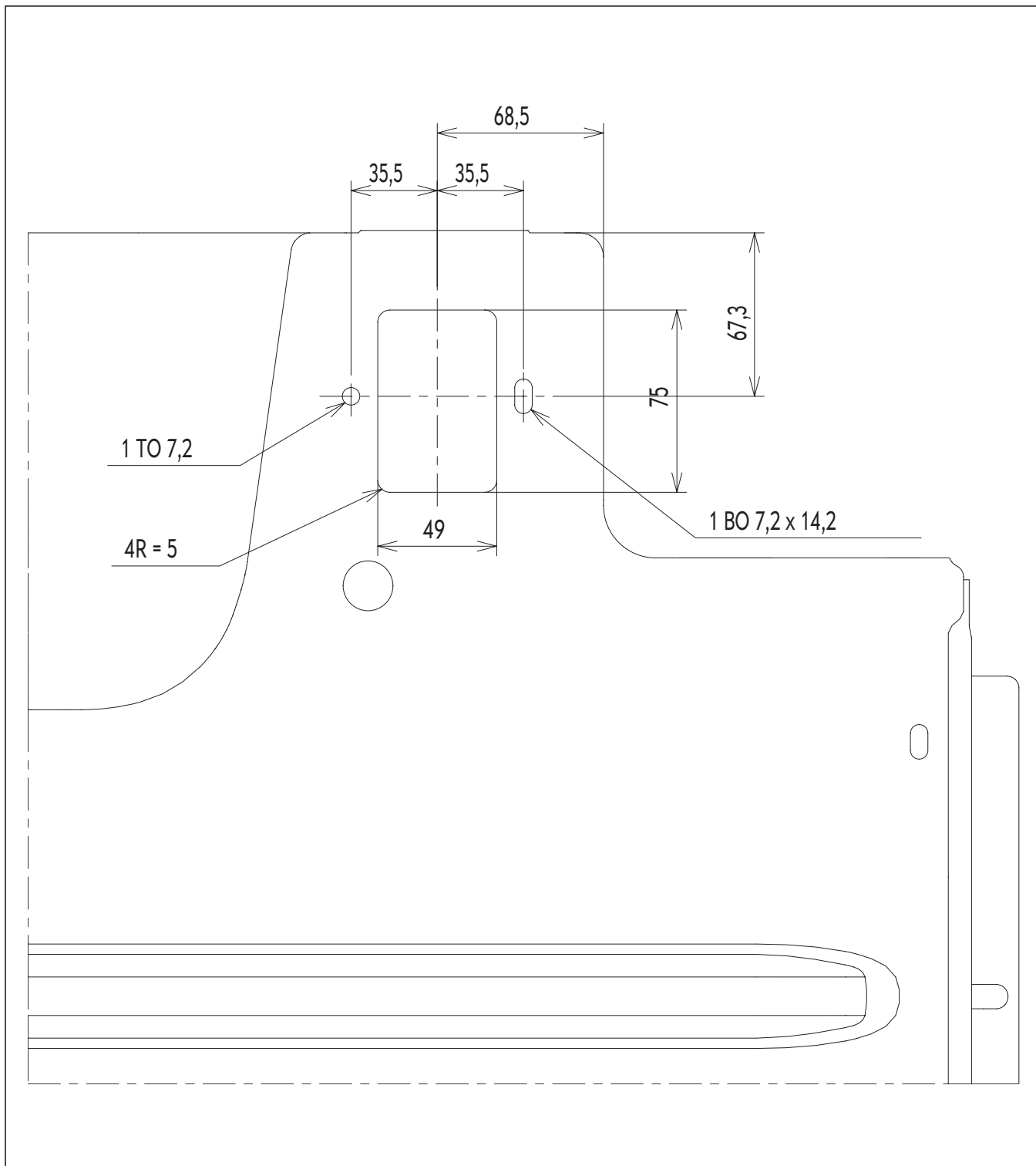
- 1 Use original condenser
- 2 Use evaporator and condenser lines.
- 3 Cut holes in floor panel (see illustration overleaf).
- 4 Attach AC to rear panel inner lining (use existing bores)

(Note: Care is required with part numbers for intermediate pipe for L1 / L2 versions)





- Cutouts for additional AC lines, right side of vehicle, behind the rear wheel housing.





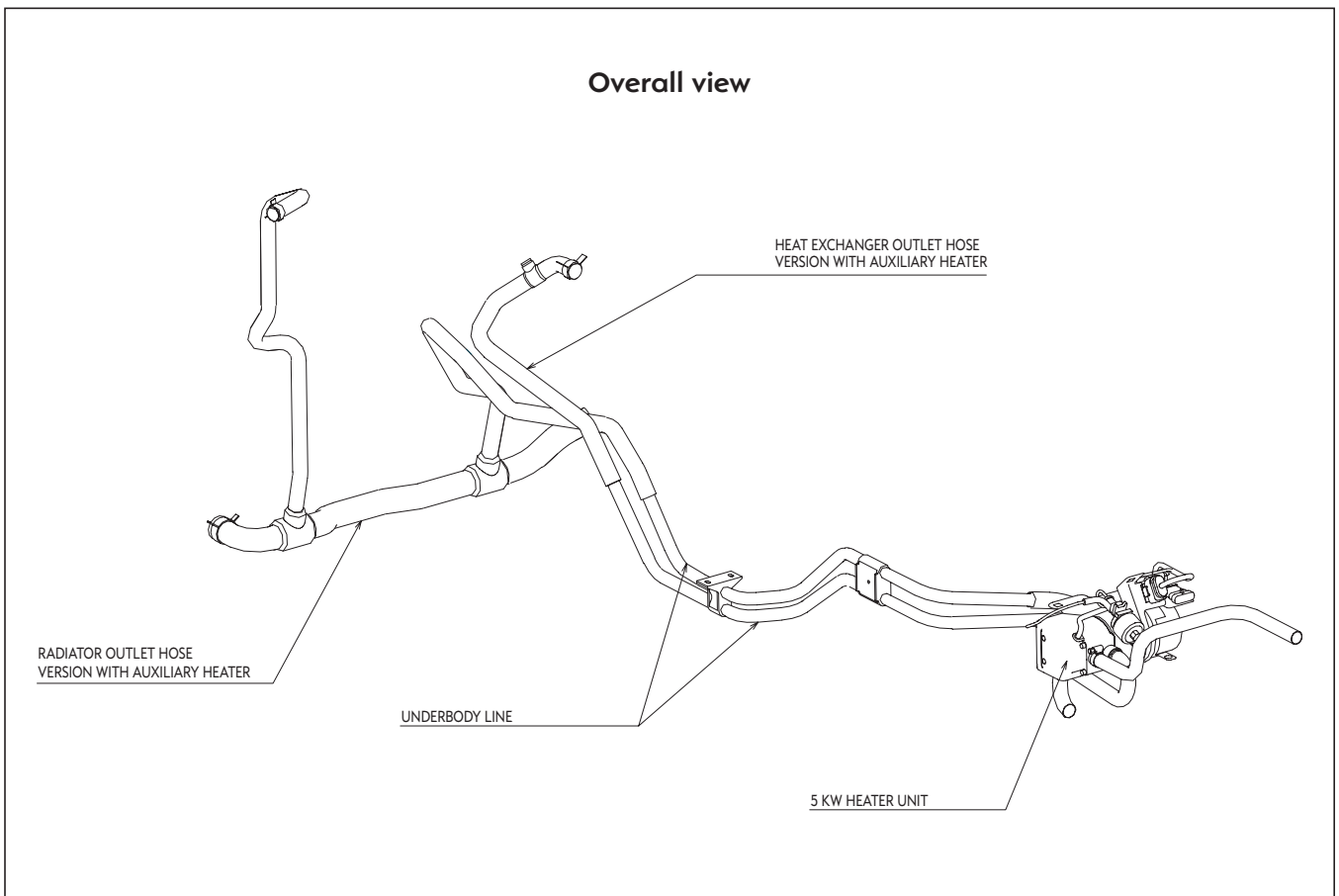
• **Auxiliary heater**

An auxiliary heater is available as an option for the combi and bus versions. In order to equip the van version with an auxiliary heater, combi parts must be used.

Procedure:

- 1 For F4R engine, replace radiator outlet line with part number 91166712; for F9Q engine, replace thermostat outlet line with part number 91166712.
- 2 Replace the original heating radiator feed line with part number 91166713.
- 3 Connect heater unit to the new pipes in the engine compartment (route fixed lines under body, part number 91166732).
- 4 Install auxiliary heater unit (part number 91167501). For details of the tank filler pipe, see fuel supply system.

(Note: For details of electrical connections, see section on “Electrics”)





- **Roof rack**

Vivaro vehicles are fitted with roof rack fastening points, which constitute the only permissible fastening points. The maximum permissible roof load is 200 kg for all vehicle versions. All the fastening points must be used. If a shorter roof rack is used, the maximum permitted roof load is reduced by 25 kg for each fastening point not used.

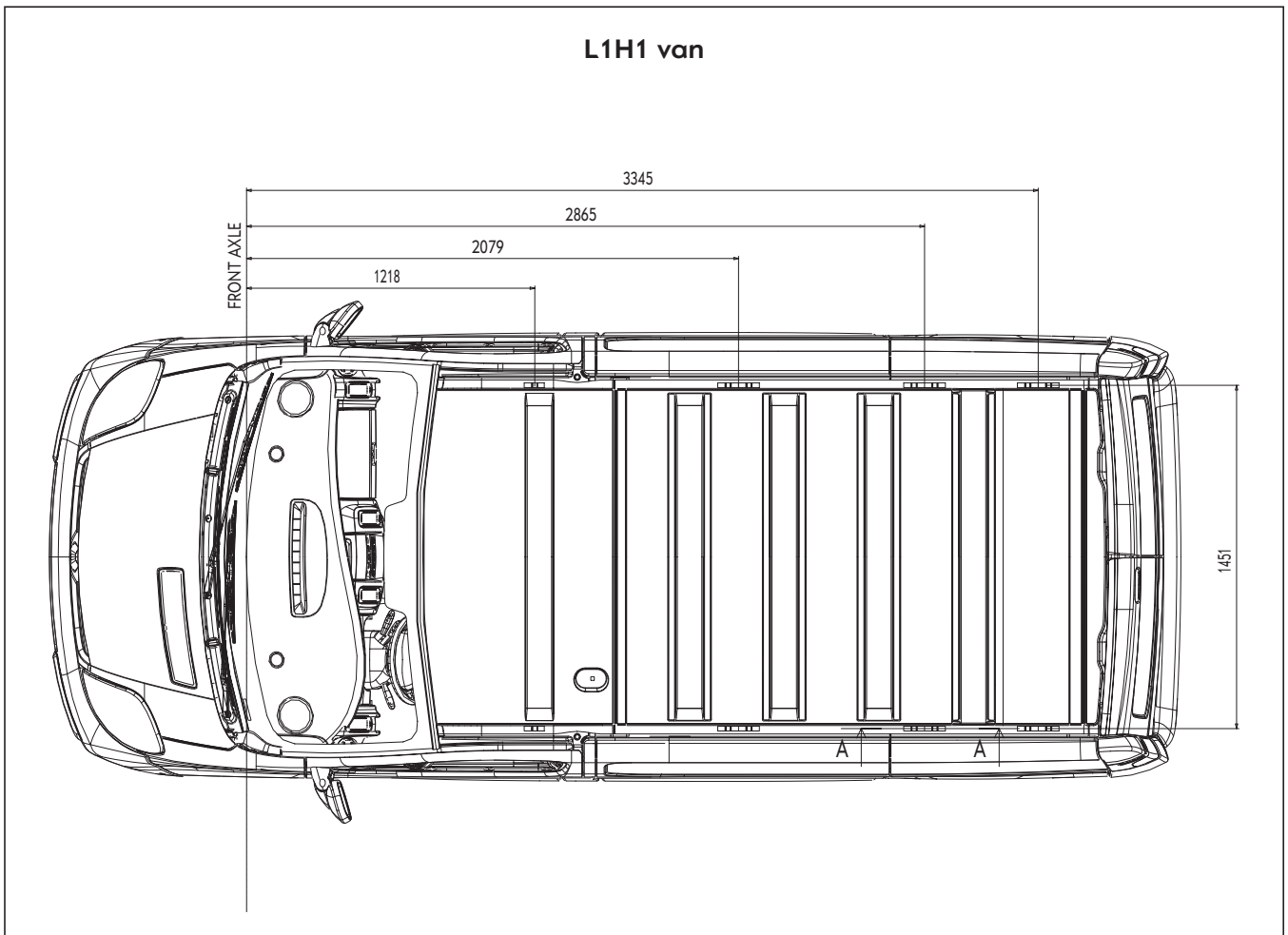
It is recommend to use original parts (roof rack). If other manufacturers' products are used, the attaching points must be identical to the original parts.

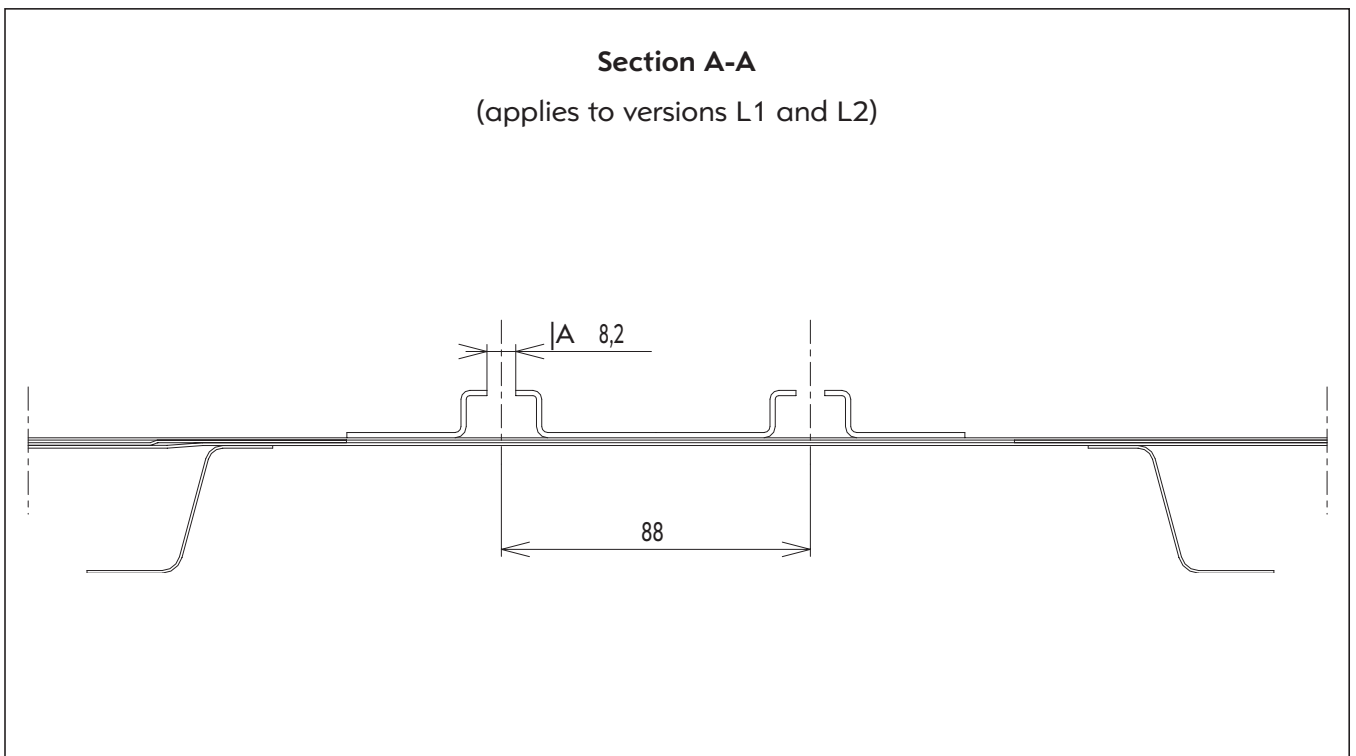
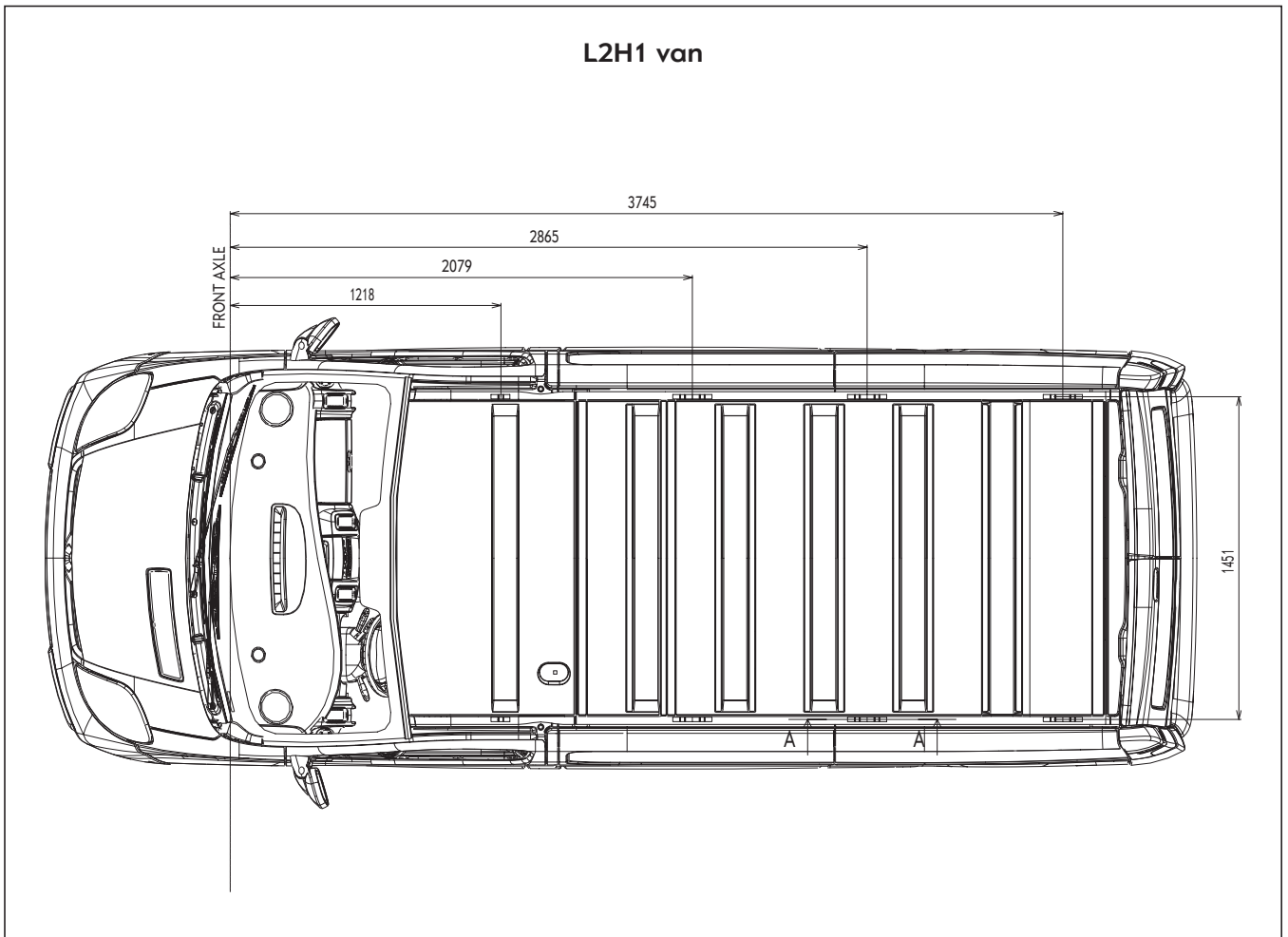
The centre of gravity of the roof load must not be higher than 100 mm above the roof rack, i.e. approx. 200 mm above the van roof.

- **Wind deflector**

Important: Vivaro vehicles are not designed to be fitted with a roof spoiler, this option is therefore not advisable.

The roof would otherwise need to be fitted with suitable fastenings in order to avoid damage caused by vibration and wind pressure.







- **Trailer hitch**

The maximum permissible trailer weight is 2000 kg (braked) and 750 kg (unbraked).

The van and combi versions can be ordered with a pre-installed trailer hitch.

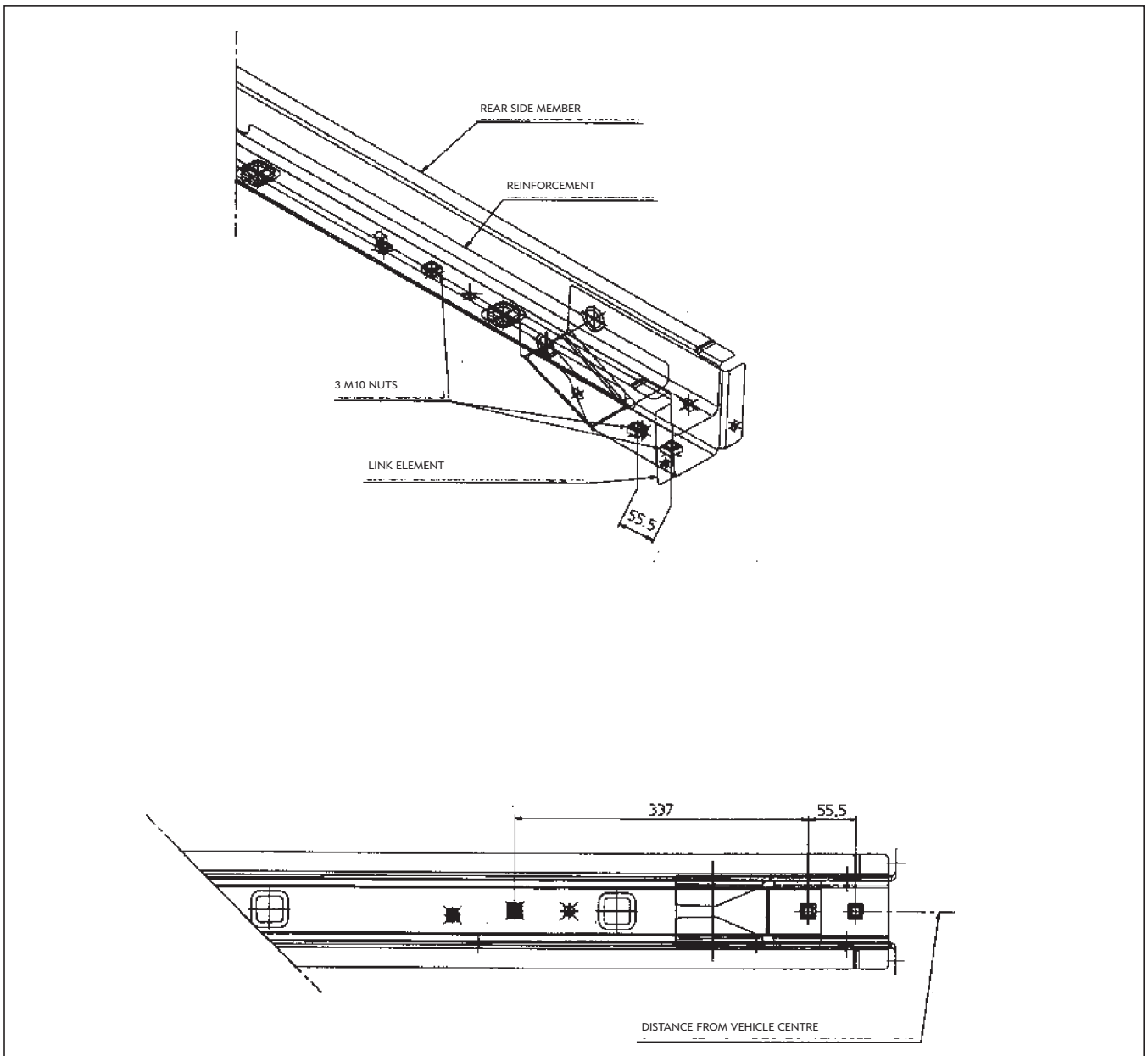
All versions (including platform chassis) can be retrofitted with a trailer hitch.

The maximum permissible tongue load is 80 kg. A telltale lamp indicating faulty trailer turn signal lamps, is located on the instrument panel.

- **Liftgate**

The fastening holes for the trailer hitch can also be used as additional fastening points for a liftgate. These must not, however, be used as the only fastening points, as the forces exposed in this area will result in damages of the underbody structure.

- **Trailer hitch fastening points**





- Trailer hitch fastening points

