New Fiat Ducato 2016

Converters' and Upfitters' Manual

FOREWORD

This publication gives the information, features and instructions for vehicle fitting out and conversion and is addressed to qualified, specialist personnel.
The coach builder is responsible for the fitting-out or conversion project and its execution, and must guarantee compliance with standards given in this publication in addition to all other applicable standards.
Before undertaking any works, make certain to have the publication on the vehicle model on which the works are to be done, as well as all the required accident prevention equipment, which, for information, includes goggles, hard hat, safety shoes, etc., in addition to all necessary tools, lifting and transport gear, etc. The equipment and tools must all be available and efficient, and the vehicle itself must be in condition to permit safe execution of the works.
When carrying out the works the coach builder must strictly adhere to the instructions given in the publication, using the components described, and guarantee that the works carried out are technically correct.

Any modification, conversion or other operation not foreseen in the manual, and not explicitly authorised by FIAT CHRYSLER AUTOMOBILES S.p.A. in writing shall relieve FIAT of any liability, and specifically, if the vehicle is covered by warranty, this shall be immediately forfeit.

FIAT CHRYSLER AUTOMOBILES S.p.A. is available to provide any clarification necessary for execution of the works, as well as instructions for any cases or situations not specifically foreseen in this publication.
The functional, efficiency and safety conditions foreseen by FIAT CHRYSLER AUTOMOBILES S.p.A. must be restored immediately after any conversion works. Contact the FIAT CHRYSLER AUTOMOBILES S.p.A. network for any necessary vehicle tuning.
FIAT CHRYSLER AUTOMOBILES S.p.A. shall not be held liable for the effective execution of the conversion or fittingout works.
The data and information contained in this publication may not be up to date as a result of the alterations that FIAT CHRYSLER AUTOMOBILES S.p.A. reserves the right to make at any time for technical or commercial reasons, or for the need to adapt the vehicle to the requirements of specific local laws.

In case of discrepancy between the contents of this publication and the effective condition of the vehicle, please contact FIAT CHRYSLER AUTOMOBILES S.p.A. before proceeding with any works.

Symbols - Warnings

Hazard to personal safety
Serious hazard to personal safety in case of failure to fully comply with these instructions.

Risk of damage to vehicle
Serious risk of vehicle damage, warranty forfeit, in case of failure to fully comply with these instructions.

General hazard
Combines the risks of the two symbols described above.

Respect the environment
Indicates behaviour code for use of the vehicle in the most environmentally friendly manner possible.

NOTE: Provides any necessary additional information.

AUTHORISATION

Observance of the instructions contained in this manual does not oblige the manufacturer to grant authorisation.
The conversion coach builder must ask the manufacturer for authorisation by sending the appropriate documentation (see sections below) to the following address:
- FIAT CHRYSLER AUTOMOBILES S.p.A.
- FIAT PROFESSIONAL
- MERCATO ITALIA - SERVIZIO ALLESTITORI
  (Italian Market - Coach-builders Service)
  Corso Agnelli 200
  1° piano ufficio B56
  (1st floor, office B56)

In order to grant authorisation, the manufacturer reserves the right to demand that the conversion coach builder carry out any test or verification considered necessary.

AUTHORISATION “NULLA OSTA”

Compliance with the indications contained in this manual does not oblige the Manufacturer to grant authorisation.
The Manufacturer reserves the right to ask the Converter to carry out the tests and trials deemed needed for obtaining authorisation.

DOCUMENTS NEEDED FOR AUTHORISATION

List of documents needed to obtain authorisation:

Documents for the Local Motor Vehicle Registration Office for test request.

The amount of copies to be sent to us (two copies if on paper, one copy if electronic) and the amount of copies needed by the Registration Office.

a. Sketch of the converted vehicle with indication of main dimensions (height, length, width, wheelbase, overhangs, empty vehicle ground clearance). The converted vehicle drawing must include four views on one sheet, normally on 1:20 scale (without indications of structures or calculations checks). Drawings on different scales may be accepted providing they are specifically requested by the Local Vehicle Registration Office in charge of the following testing.
b. Technical report to be submitted to the Local Vehicle Registration Office (this document must clearly and exhaustively illustrate all the changes made to the vehicle).

c. Accurate vehicle type indication. This information must be taken from the vehicle registration document if the converted vehicle was previously registered (in this case, submit a copy of the vehicle registration document) or declaration of conformity or certificate of origin if the vehicle was converted prior to registration.

D.G.M.: Refer to the D.G.M. datasheets at http://www.fiatprofessional-converters.com.

Integrative documents needed by Fiat Chrysler Automobiles for evaluating conversion for authorisation purposes

d. Detailed drawings stamped by an authorised professional engineer of:
- connection system between additional superstructure and basic vehicle;
- any changes to the basic vehicle body (opening of windows, doors, cuts etc.);
- any changes to mechanical parts and/or electric system;
- any wiring diagram of conversion and interfacing with basic vehicle;
- additional structures integrating basic vehicle structure (mandatory for interventions on “chassis cab with load platform”).

e. Calculation of weights respecting basic vehicle type-approval values with determination of gross vehicle weights and capacities in the various conditions of use.

f. Type of mission for which the vehicle is intended (prevalent/exceptional loads, routes, environment conditions etc.).

g. Document releasing Fiat Chrysler Automobiles of liability with regards to faults or failures occurring on the vehicle and related in any manner to its conversion.

GUIDELINES FOR GOOD OPERATION AND ACCESSIBILITY OF VEHICLE COMPONENTS

Special care must be adopted during conversions to prevent altering performance and functional features of original parts in any manner.
Specifically:

- Ensure accessibility to all points which need to be inspected and serviced.

- Do not alter the possibility of disassembling mechanical assemblies.

- Maintain the original engine cooling and intake conditions (radiator, air ducts, cooling lines).

- Maintain adequate brake ventilation.

- Ensure free rear wheel shaking and position the wheel arches appropriately.

- Ensure correct headlight adjustment.

TECHNICAL APPROVAL FOR MULTISTAGE CONTRACT (2007/46/EC)

The Manufacturer reserves the right to ask the upfitter
to carry out the tests and trials deemed necessary with a view to obtaining
Technical Approval.

TECHNICAL APPROVAL DOCUMENTATION

List of documents required for Technical Approval:
The number of copies to be sent to Fiat Chrysler Automobiles
(two copies if in print form, one copy if digital).

a) Detailed technical report (this document must clearly and exhaustively illustrate all the changes made to the vehicle).
b) Sketch of the converted vehicle with indication of main dimensions (height, length, width, wheelbase, overhangs, unladen vehicle ground clearance). The converted vehicle drawing must include four views on one sheet, normally on 1:20 scale (without indications of structures or calculations checks)
d. Detailed drawings, stamped by a professional engineer, of:
- connection system between additional superstructure and base vehicle;
- any changes to the base vehicle body (opening of windows, doors, cuts etc.);
- any changes to mechanical parts and/or electric system;
- any wiring diagram of conversion and interfacing with base vehicle;
- additional structures integrating base vehicle structure (mandatory for interventions on “chassis cab with load platform”).

d) List of parts removed and modified of the original vehicle
e) List of additional parts
f) Calculation of weights respecting basic vehicle type-approval values with determination of gross vehicle weights and capacities in the various conditions of use.
g) The vehicle’s mission profile (prevalent/exceptional loads, routes, environment conditions etc.).
h) Accurate vehicle type indication. This information must be taken from the vehicle registration document if the converted vehicle was previously registered (in this case, submit a copy of the vehicle registration document) or declaration of conformity or certificate of origin if the vehicle was converted prior to registration.
i) Copy of reports of any tests carried out at recognised technical centres
j) Copy of reports of any structural calculations carried out on the conversion or on its components
k) Description of the production process leading to vehicle conversion.
l) Document releasing Fiat Chrysler Automobiles from liability with regards to faults or failures occurring on the vehicle and related in any manner to its conversion.

D.G.M.: Refer to the D.G.M. datasheets at

http://www.fiatprofessional-converters.com

CONTENTS

OVERVIEW

Purpose of coach builder's instructions

This document provides instructions about how to make modifications and/or fit-out original FIAT CHRYSLER AUTOMOBILES S.p.A. vehicles while maintaining the correct function, safety and reliability of the vehicle itself and its component parts.

FIAT CHRYSLER AUTOMOBILES S.p.A. approval for conversions and fitting-out

Modifications must be made according to the criteria given below.

Liability

The approval given by FIAT CHRYSLER AUTOMOBILES S.p.A. only concerns the technical/ conceptual feasibility of the modification and/or fitting-out to apply to an original FIAT vehicle.
The coach-builder is therefore liable for:

- The design of the modification and/or fitting;
- The choice of specifications of the products/materials used;
- The execution of the modification or fitting-out;
- Compliance of the design and realisation with all instructions provided by FIAT CHRYSLER AUTOMOBILES S.p.A.;
- Compliance of the design and realisation with all standards in force in the country in which the vehicle is registered;
- The function, safety and reliability and, in general, efficient performance of the vehicle, as well as the effects that the modification or fitting-out may have on the performance and characteristics of the vehicle.

Warranty

The coach-builder responsible for building the superstructure or making modifications to the chassis must guarantee that the works have been carried out in a workmanlike manner and in full compliance with the instructions given in this publication. The warranty given by FIAT CHRYSLER AUTOMOBILES S.p.A. on the vehicle shall be forfeit if:
- The instructions given are not followed, or the conversion/fitting-out is not authorised;
- The conversion is carried out on a chassis not suitable for the foreseen use;
- The specifications and instructions that FIAT CHRYSLER AUTOMOBILES S.p.A. makes available for the correct execution of certain kinds of conversion are not followed;
- The original parts and components that FIAT CHRYSLER AUTOMOBILES S.p.A. manufactures for certain types of conversions are not used.

Application for approval

Applications for approval or assistance in the realisation of conversion works must be sent to the pertinent FIAT CHRYSLER AUTOMOBILES S.p.A. market agents.
To obtain approval the coach-builder must provide sufficient documentation illustrating the foreseen conversion, type of use and use conditions for the vehicle. All drawings must clearly show any differences to the instructions provided.
The coach-builder shall be responsible for obtaining approval by the competent Authorities of the conversion and/or fitting-out.

Markings and logos

Factory markings, logos and names must not be altered or moved in relation to their original positions; the validity of the vehicle's image must also be upheld.

The application of conversion or fitting/out trademarks or logos must be authorised by FIAT CHRYSLER AUTOMOBILES S.p.A. These must be placed in the immediate vicinity of the existing FIAT CHRYSLER AUTOMOBILES S.p.A. trademarks and logos.

FIAT CHRYSLER AUTOMOBILES S.p.A. reserves the right to remove its trademark or logo if the fitting-out or conversion has any features not in compliance with its requirements; in such cases the coach-builder shall be totally liable for the entire vehicle.

Legal requirements

With the vehicle completed, the coach-builder must verify that all works done (modifications, structural applications.) comply with all legal requirements of the country in which the vehicle is registered (i.e. weight, dimensions, braking capacity, emissions, noise levels).

The vehicles described in this manual comply with EU Directives. This compliance must be maintained even after conversion and/or fitting-out. Possible exceptions to this requirement may include cases in which it is possible to obtain local approval, different to that of the EU.

Seat belt anchor points

Works undertaken on zones in the vicinity of seat belt anchor points may alter their compliance with EU certification and therefore the coachbuilder must always check compliance with legal standards.

Seats

The seat floor anchors are realised in compliance with legal standards on retainer systems.

If they are moved from the original position, passenger safety may not be assured, nor the quality of the conversion works. It is therefore forbidden.

Altering the configuration of the cabin seats (number of places) is also forbidden.

Interior shelving

These structures must be designed and realised to be self-supporting and sufficiently rigid.
The internal fastening must be to the floor supporting structure (cross and side members) and mealised such as to distribute the load evenly.
Anchors to side structures, realised without creating any pre-stress, may be fastened to:
- the boxed pillar structure, where specific holes and anchor points are already provided (see paragraph – LOADS ON SIDES)
- the upper side connector members.

Operations on vehicle structure and floor

Following the instructions and precaustions already described in the previous paragraph. In particular, note that:
- when perforating non-structural box sections, avoid zones where stress is more concentrated
- holes for floor anchors must be protected and sealed against water, gas and dust infiltration.

Ambulances

We advise special attention in:
- connection of the side panelling and under-roof, using the anchor zones and holes already present on the body shell, both on cross and side members, avoiding any cutting that may weaken the structure.
- checking to verify that the application and use of medical equipment does not interfere with the basic vehicle electrical/electronic systems.

Accident prevention

The structures and systems applied to the vehicles must comply with all accident prevention and safety standards in force in the individual countries to which the vehicles are destined.

All precautions dictated by technical knowledge and common sense must also be taken to prevent breakdowns or functional defects.
The manufacturer of the applied structure or system is obliged to comply with these requirements.

Choice of materials: Environment - Recycling

During the design phase, an increasing amount of attention must be paid to the choice of materials to use, in particular as regards aspects associated with the environment and recycling, and especially in the light of continually changing national and international standards governing waste disposal.
Here are a few guidelines:
- It is forbidden to use materials that are harmful to human health, or that may present a potential hazard, such as those containing asbestos, lead, halogen additives, fluorocarbons, cadmium, mercury, hexavalent chromium, etc.
- Always use materials that produce a minimal amount of waste when processed, and that permit easy recycling after first use.
- With composite type synthetic materials, use components that are compatible with each other, envisaging their possible use even combined with other recovered or recycled materials. Always apply markings in compliance with standards in force.

Vehicle hand-over

Before handing-over the vehicle, the coach builder must:
- Make certain that the conversion and/or fitting-out has been correctly realised;
- Fully tune the vehicle and/or fitting-out applied;
- Check vehicle and/or fitting-out function and safety;
- Prepare and hand-over to the end user all the necessary instructions for operating and maintaining the vehicle version and any additional systems fitted;
- Include all new data on specific information plates on the vehicle;
- Provide confirmation that the works carried out comply with the instructions given by the vehicle Manufacturer and all legal requirements;
- Issue a warranty for the modifications made to the vehicle.

The vehicle leaves the factory with “Logistic Mode” (LM) function on.
By deactivating some electric loads, such as radio, roof lights, main beam headlights, etc., this function preserves the battery charge while the vehicle is on stock.
The battery warning light blinks on the instrument panel when the LM function is on.
The correct instrument (EXAMINER or RD 380) is needed for deactivating the function if the outfitter finds loads deactivated by the LM function during conversion.
The LM function must be activated again after vehicle conversion.
WYTECH Plus: the diagnosis equipment used in all FGA authorised workshops for running diagnosis on vehicles and for deactivating the Logistic Mode function.

Supplier:
ACTIA ITALIA S.r.l. (After-Sales Division)
Via Europa, 31-20010 PREGNANA MILANESE (MI)
Fax: +39 02 93 59 50 40
Web site: www.actiaitalia.com – www.wytechplus.com
Email: actiasupport@actiaitalia.com

RD380: Instrument which rapidly allows the activation and deactivation of Logistic Mode. It has no other functions.

Supplier:
SIX TAU S.p.A.
Via Guglielmo Marconi, 810040 DRUENTO (TO)
Ph. +39 011 994 08 24
Fax +39 011 994 04 08
Web site: www.sixtau.com
Email: info@sixtau.com

Vehicle management in compounds

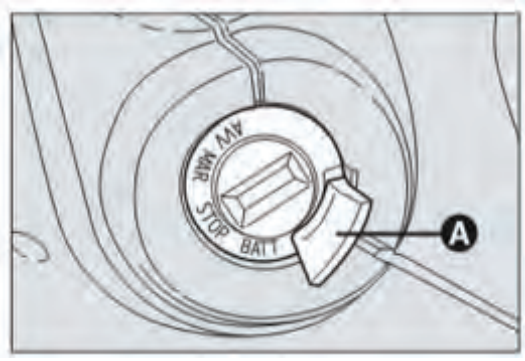
Subject of the document
This procedure is a set of mandatory regulations for vehicles on compounds aimed at preserving the original quality of the product and avoiding malfunctions for the end customers.

Area of application
This procedure described applies to all vehicles parked at compounds.

Procedure
Parking position

- **Battery**: disconnect the battery by disconnecting the negative battery pole.

  If the vehicle is provided with a battery master switch, turn the ignition switch to the



- **Windscreen wipers:** lift the blades from the glass.
- **Handbrake:** leave gear in idle position and engage first gear

  (in case of Comfort-Matic robotised gearbox, set lever in position N).

Maintenance
- **Battery**: check battery charge state one month after the production of the vehicle and then once every three months (it is advisable to carry out the measurements two hours after having connected it).
  - Change the battery if the voltage is lower than 12.1 V.
  - Recharge the battery if the voltage is from 12.1 V to 12.49 V.
  - The battery is charged if voltage is higher than 12.5 V.

  It is important to keep track of checks and measurements on a specific form.
- **Tyres**: check inflation pressure of tyres one month after the production of the vehicle and then once every three months. Pressure must be measured when cold and correspond to the values shown in the Owner Handbook.
  Restore the correct pressure, if required.

Commissioning
- **Battery**: before dispatching the vehicle, reconnect the negative battery pole by correctly connecting the terminal. If an optional “battery master switch” is fitted, simply turn

the key to the “MAR” position.

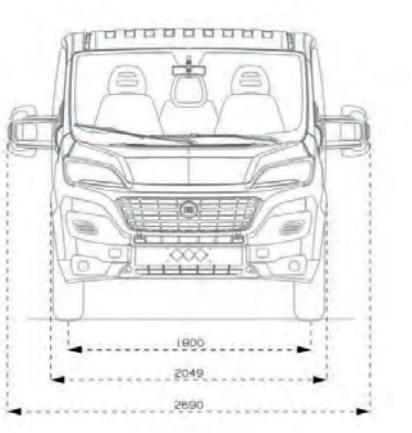
- **Tyres**: re-establish correct pressure.
- **Fuel:** for storage over three months, pour antibacterial protection in the tank (e.g. Petronas “Tutela Professional Diesel TMF PLUS”).

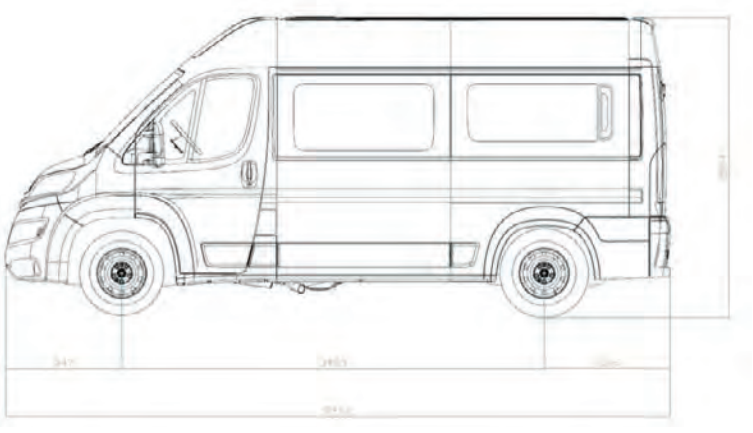
Presentation of the range

The range of vehicles suitable for conversion includes the following versions:
- Van;
- Van with windows;
- Chassis cab;
- Special chassis cab;
- Chassis cab with platform;
- Basic chassis;
- Special basic chassis;
- Double cab;

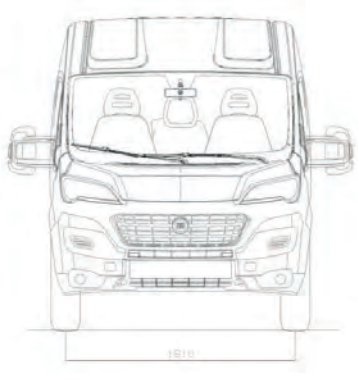
The drawings listed are for information only. For all the wheelbases and main dimensions, refer to the chapter ‘Dimensions’ from page 4.1.

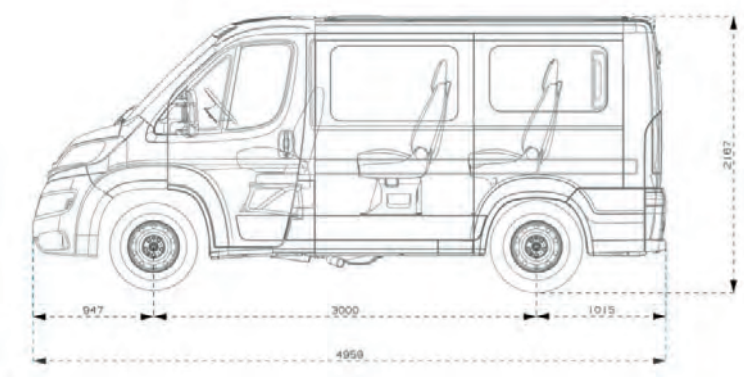
VAN



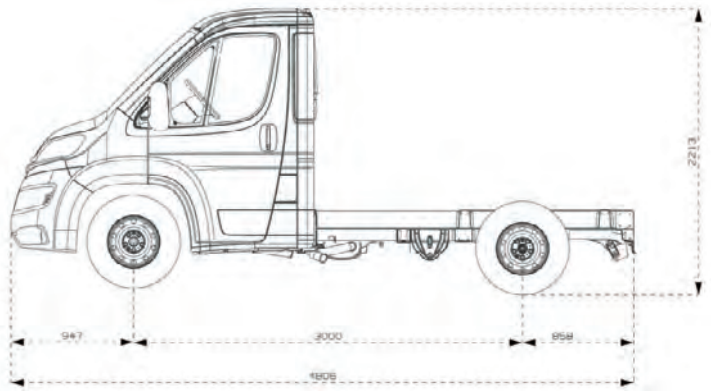


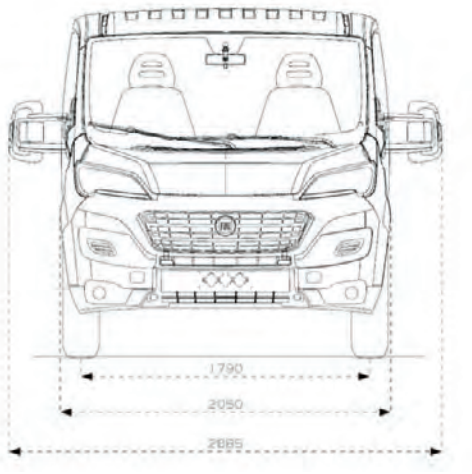
VAN WITH WINDOWS



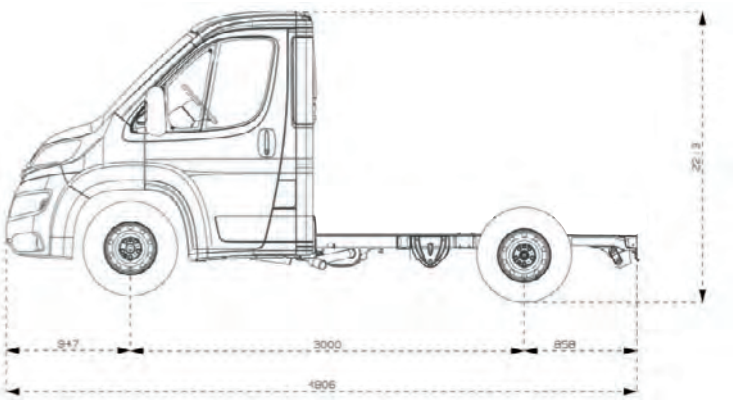


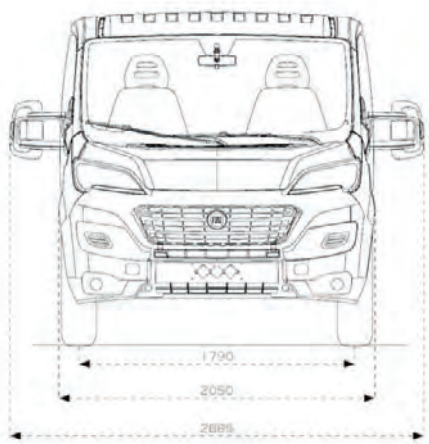
CHASSIS CAB



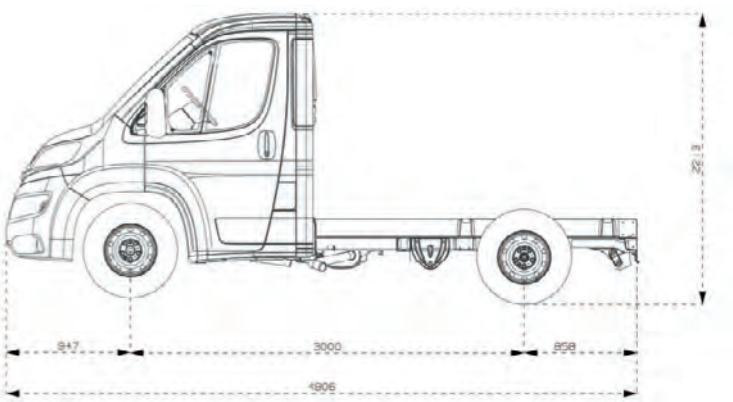


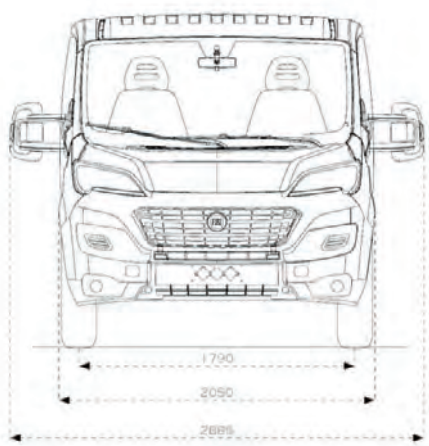
SPECIAL CHASSIS CAB



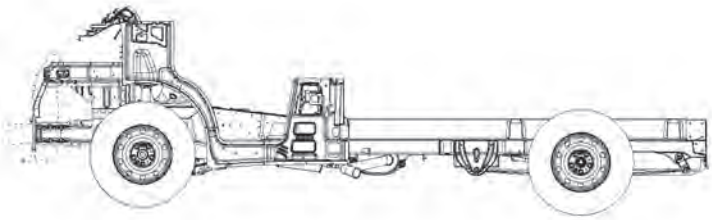


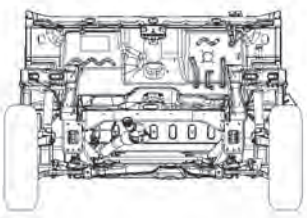
CHASSIS CAB WITH PLATFORM



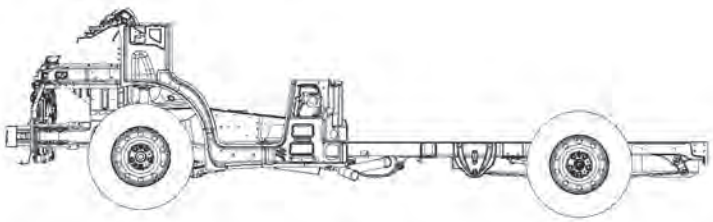


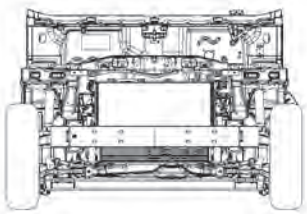
BASIC CHASSIS



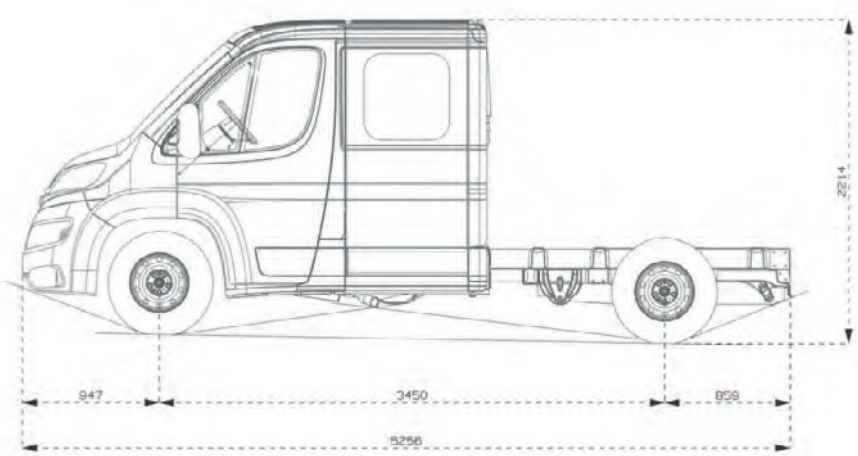


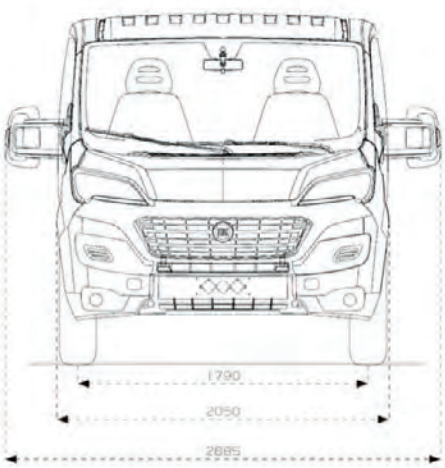
SPECIAL BASIC CHASSIS





DOUBLE CAB





BODYWORK AND CHASSIS

Maximum permitted weights

Overall vehicle weights and the maximum admissible weights per axle are given in the table below. The tare weights refer to STDA configuration (unladen weight with 90% of fuel);
Special equipment may cause variations to weight and weight distribution over the axles.
Before carrying out the conversion, check vehicle unladen weight and weight distribution per axle.
To ensure constant and correct set-up and peak capacity, even on low grip road surfaces, safe dynamic behaviour reliability and the required performance, weight distribution must be within the following limits (that must not be exceeded) in all load conditions:

- **Front axle: weight at ground always between 70% and 40% of the total vehicle ground weight**
- **Rear axle: weight at ground always between 30% and 60% of the total vehicle ground weight.**

According to the weight distribution, the total ground weight and/or maximum admissible weights on the axes may not be fully saturated.

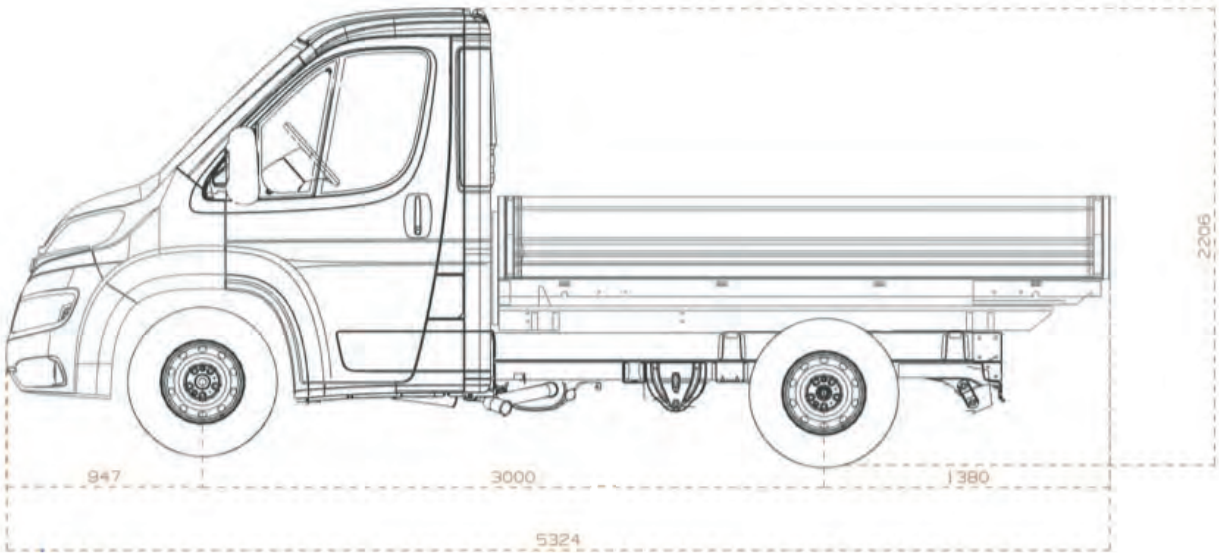
Vehicle diagram identification data table

Ducato					
version	GVW Kg	Max. front axle Kg	Max. rear axle Kg	Payload q	wheels
12 Q	3000	1630	1650	11-12	R" 15
15 Q	3300	1750	1900	13-15	R" 15
17 Q	3500	1850	2000	15-17	R" 16
Ducato Maxi					
17 Q	3500	2100	2400	14-16	R" 16
20 Q	4000	2100	2400	18-20	R" 16
22 Q	4250	2100	2400	18-22	R" 16

Camping-car chassis-cabs and chassis-cowls

Ducato					
version	GVW Kg	Max. front axle Kg	Max. rear axle Kg	Payload q	wheels
30 Q	3000	1630	1650	-	R"15
33 Q	3300	1750	1900	-	R"15
36,5 Q	3650	1850	2000	-	R"15/16
Ducato Maxi					
42,5 Q	4250	2100	2400	-	R"16
44 Q (180HP)	4400	2100	2500*	-	R"16

* standard on 150-180 HP



W: GVW;
W1: Max. Load on front axle;
W2: Max. Load on rear axle;
R: Wheels.

Towing capacity

The limits given in FIAT CHRYSLER AUTOMOBILES S.p.A. documents must be respected. Special attention must be paid to vehicles with load concentrated on the rear overhang and short wheelbase vehicles with high centre of gravity.
The positioning of auxiliary equipment and superstructures must ensure even transverse load distribution. For each wheel, a variation in the nominal load on the wheel (1/2 the load on the axle) of ±4% with respect to the permitted tyre loading is possible without jeopardising braking capacity and vehicle driving stability.

Version	GVW (Kg)	Towing weight (Kg)
30	3000	2000
33	3300	2000
35	3500	2000
36,5	3650	1850
Maxi 35	3500	2500
Maxi 40	4000	2500
Maxi 42,5	4250	2250
Maxi 44	4400	2100

The rear overhang of the superstructure must be realised considering the maximum permitted axle loading, the minimum load required on the front axle, length limits, the position of the two hook and the underrun protection bar foreseen by various standards.

Special exceptions to the maximum permitted weights may be given for special uses, for which precise use limits will be nevertheless established, along with any reinforcing to apply to vehicle organs.

These exceptions, if they exceed legal limits, must be authorised by the administrative Authorities.

NOTE: With the vehicle ready for the road (conversion completed) the difference in weight between the right side and left side must not exceed 100 kg, to prevent prob-lems with vehicle geometry.

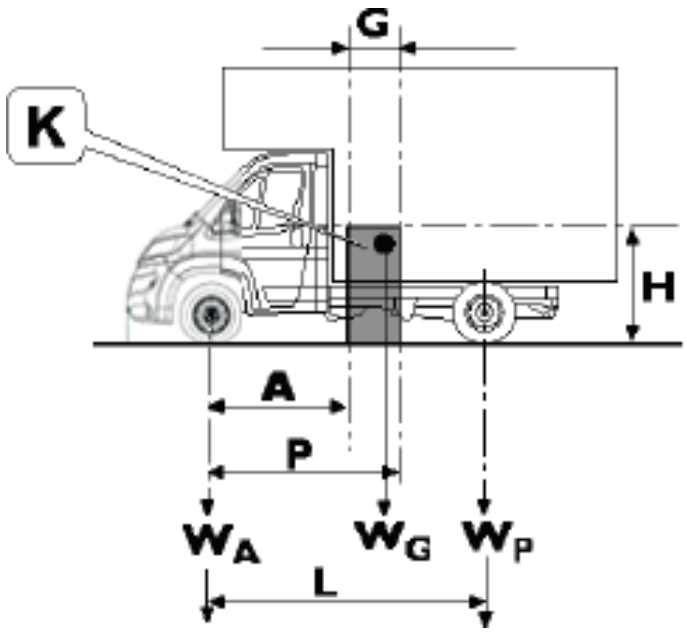
Centre of gravity

The height from ground of the non-converted chassis cab vehicle centre of gravity is given in the specific technical documentation for each model/version.

To test the vehicle complete with superstructure, the coach-builder must check that the height of the equipment centre of gravity (including the payload) or the entire vehicle under full load respects the maximum permitted values.

These limits are defined in compliance with national and international standards (e.g. EU Directives on braking), or are required by FIAT CHRYSLER AUTOMOBILES S.p.A. to assure good vehicle dynamic behaviour (e.g. transverse stability in motion).

Full functionality of ESC system is assured when those limits are respected.

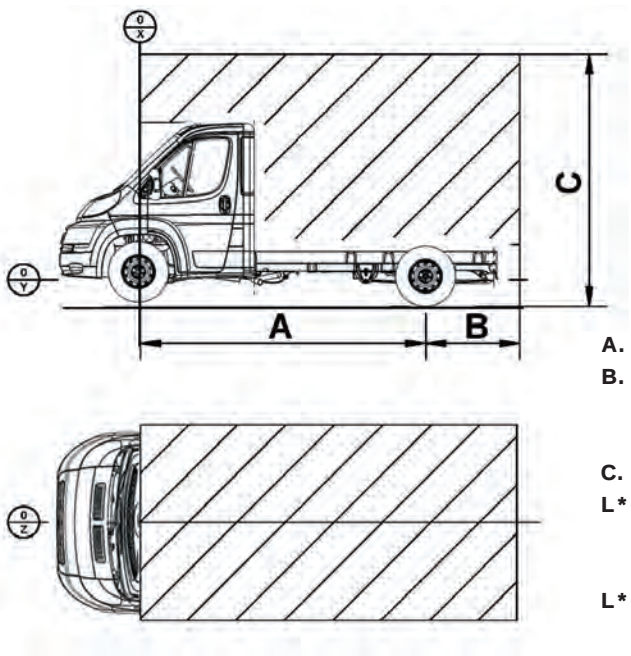


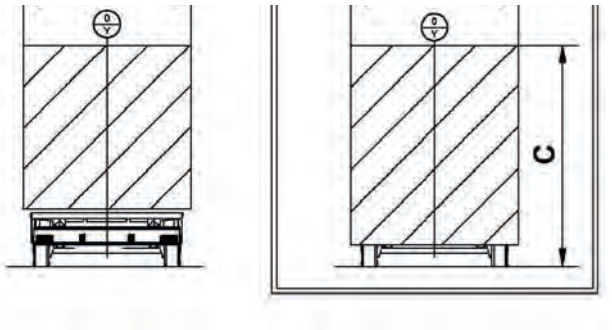
K	=	Centre of gravity G position in all converted vehicle load conditions
L	=	Vehicle wheelbase
Cm	=	Gauge (maximum between fr. and rear)
WG	=	Total maximum ground weight
WA	=	Front axle max admissible weight
WP	=	Rear axle max admissible weight
A	=	WG - WA)*L/WG (minimum distance from front axle)
P	=	L* WP/ WG (maximum distance from front axle)
G	=	P – A (G longitudinal range)
H	=	0,7*Cm (G vertical range)

In version where the payload can shift sideways (e.g. suspended loads, transport of fluids, etc.), higher dynamic loads may be generated when turning, resulting in reduced vehicle stability. This must be considered in the vehicle operating instructions, or for any reductions to centre of gravity height.

Particular attention must be given to ensuring compliance with the weight limits established for the individual axles and the overall weight limit, also considering the foreseen number of passengers and a sufficient margin for the loads that may be transported with them, such as:
- luggage, tents, sports equipment;
- water tank capacity, toilets;
- gas bottles, etc.

PROFILE LIMITS (chassis cabs)





A. Wheelbase

B. Overhang = 60% of wheelbase
(65% of wheel base for motorhome)
with coach-builder responsible for approvals (•)

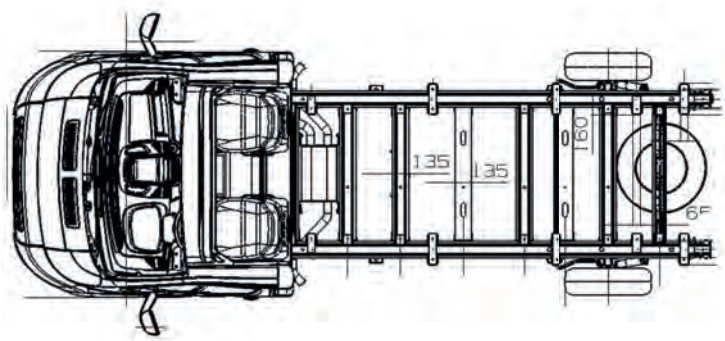
C. Height = 3500 mm (with unladen vehicle)

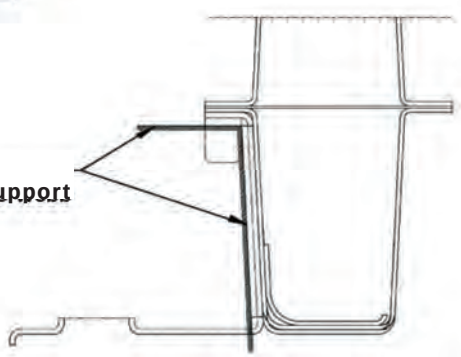
L* 2050 mm with standard mirrors
2200 mm with long arm mirrors
2350 mm with extra-long arm mirrors

L** 2430 mm – conversion from basic chassis vehicle into motorhome

(•) For all wheelbases longer than 3800 mm, the maximum permitted overhang must not exceed 2400 mm.

Elimination of mounting for Webb hook





NOTE The mounting must be cut as shown. Restore anti-rust treatment after cutting.

Modifying rear overhang

Modifying the rear overhang causes a significant change in the distribution of ground loads on the axles. Lengthening works must take this into account, checking that the values of the maximum loads permitted for each axle are nevertheless observed.

The operation to modify the overhang must be carried out in accordance with the requirements given on the following pages.

In addition, the possible lengthening operations may be deduced from the diagrams (see following page), where the shaded area defines all the possible dimensions of the overhang in relation to the vehicle's wheelbase.

Lengthening the overhang may involve repositioning the underrun protection bar in compliance with regulations in force.

The modification must be made without making welds on chassis box sections, as this procedure would involve destroying the internal treatment obtained by cataphoresis; in addition, the vehicle is already equipped with holes for fastening overhang extension structures (see following pages).

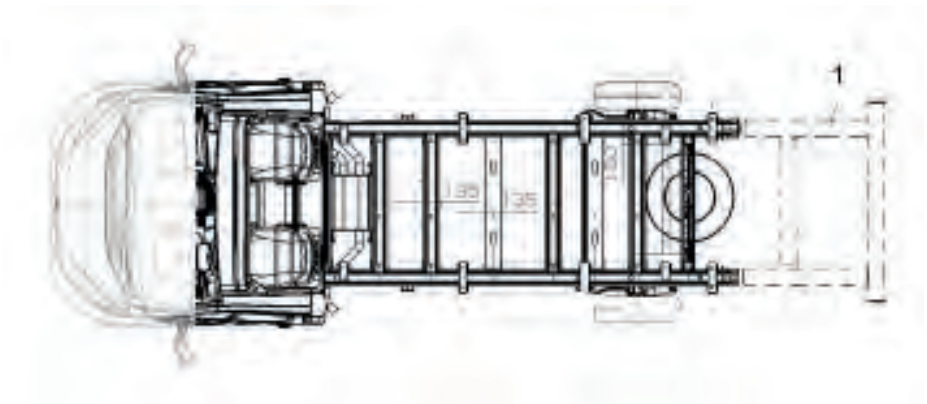
NOTE: Do not make cuts in areas where stresses are highly concentrated.

In addition the cutting lines must not affect existing holes on the longitudinal members.

For materials of the added structures, refer to the specifications of the original longitudinal members.

For overhang lengthening instructions, see the following pages.

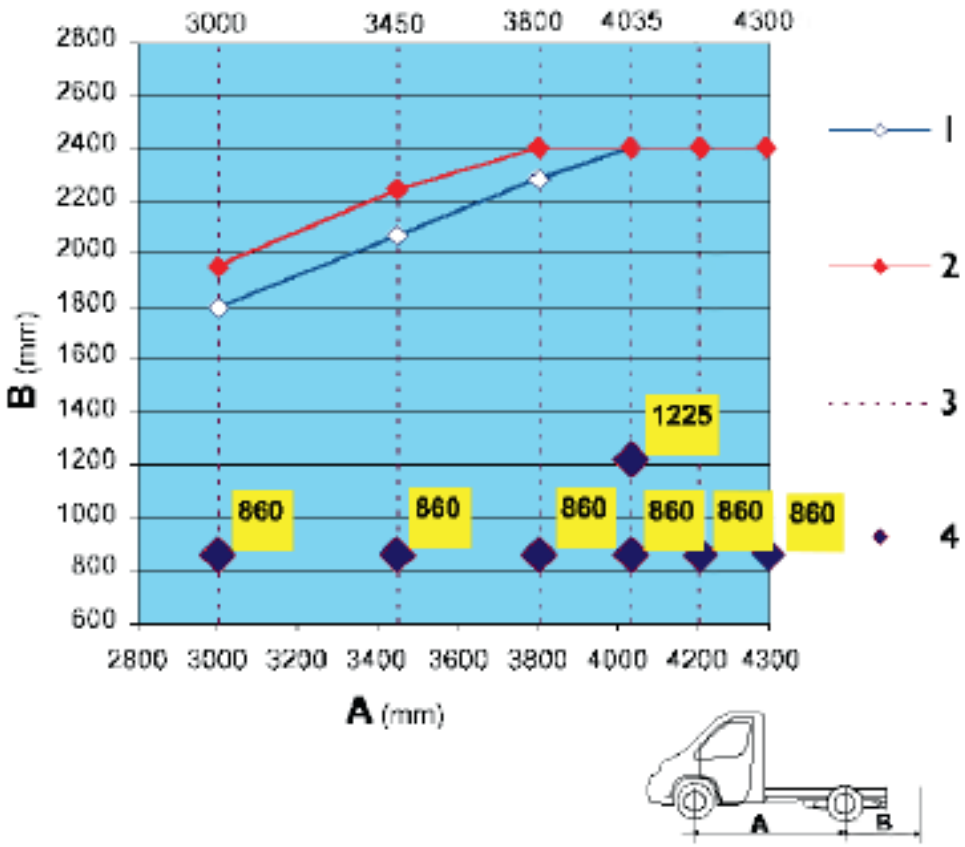
Per le indicazioni di allungamento dello sbalzo, vedere le pagine seguenti.



1: indicative outline of structure for lengthening overhang.

Chassis cab lengthening limits.

The permitted extensions to the overhang can be deduced from the diagram below.



1. Maximum overhang length according to wheelbase (60% for all versions excluding Camping-car).
2. Maximum overhang limit according to wheelbase (65% for Camping-car versions).
3. Original wheelbase.
4. Original overhangs (*).

For all wheelbases that exceed 3800 mm the maximum length of the projecting part must not exceed 2400 mm.

(*) - Chassis cabs, chassis cab with platform and standard basic chassis: 860 mm; (extra-long overhang: 1225 mm).

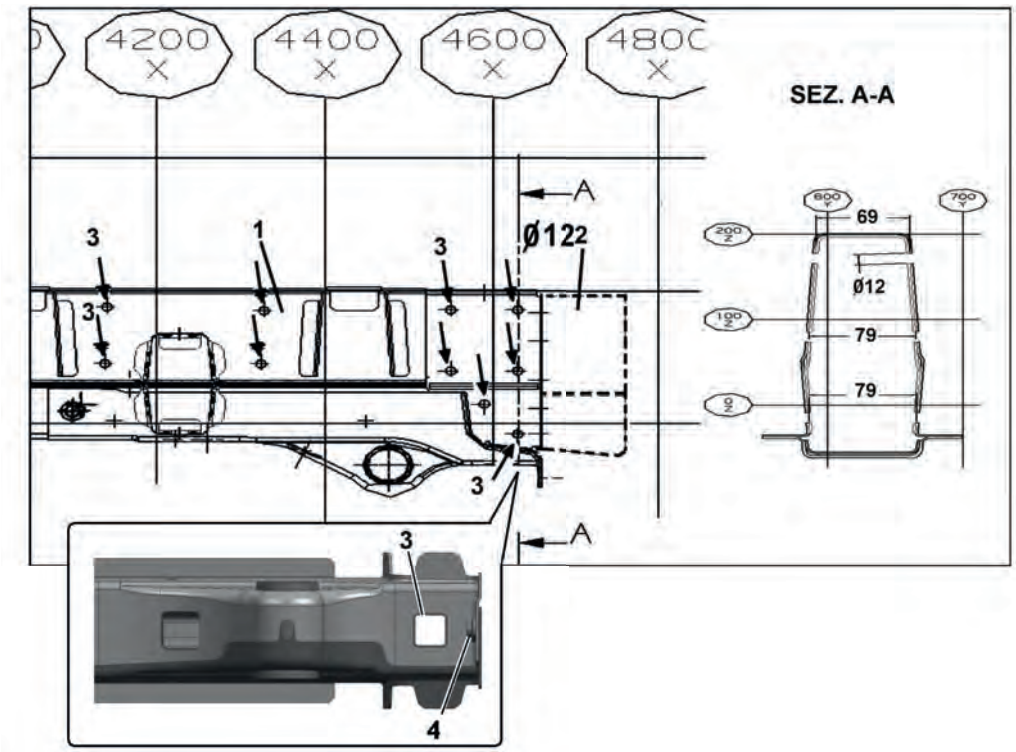
- Special cabs, chassis cab with platform and special basic chassis: 880 mm; (extra-long overhang: 1245 mm).

A: Wheelbase length.

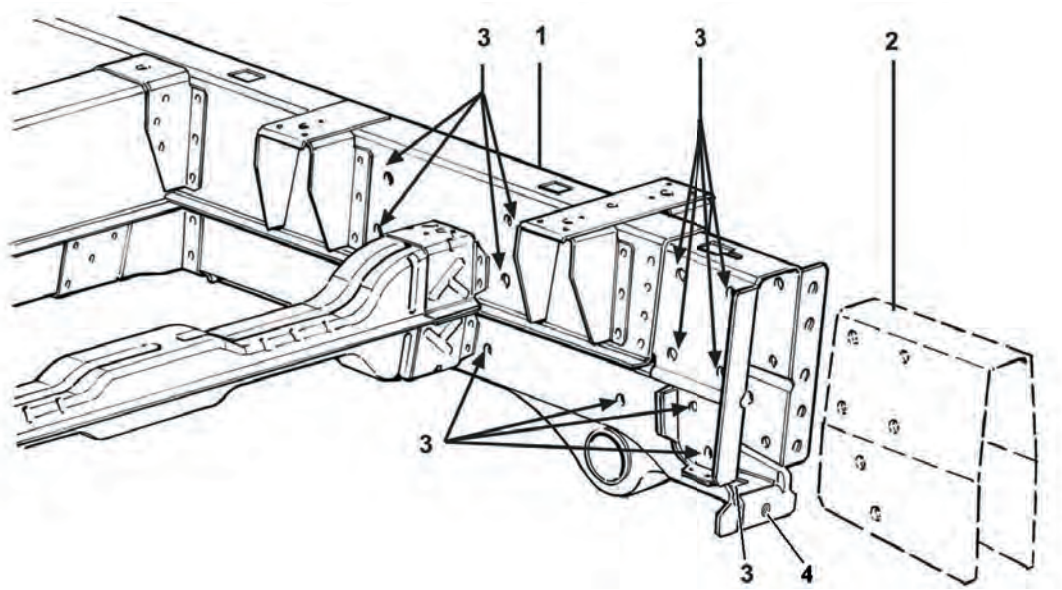
B: Overhang length.

Overhang lengthening methods
Normal chassis cab (with sub-frame)

Sections



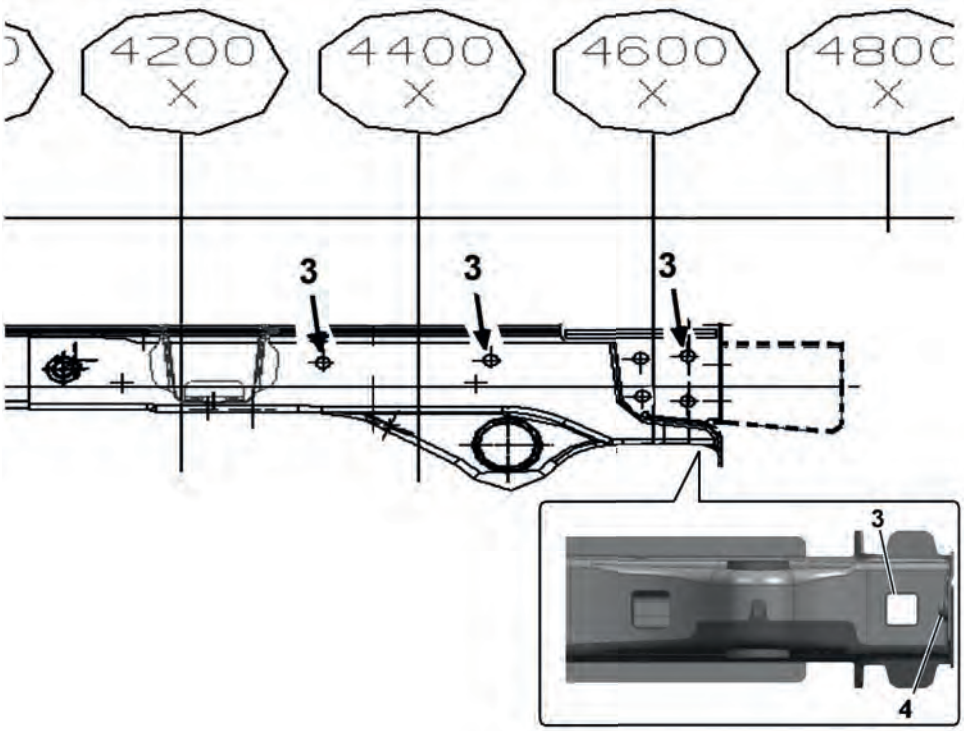
Perspective view



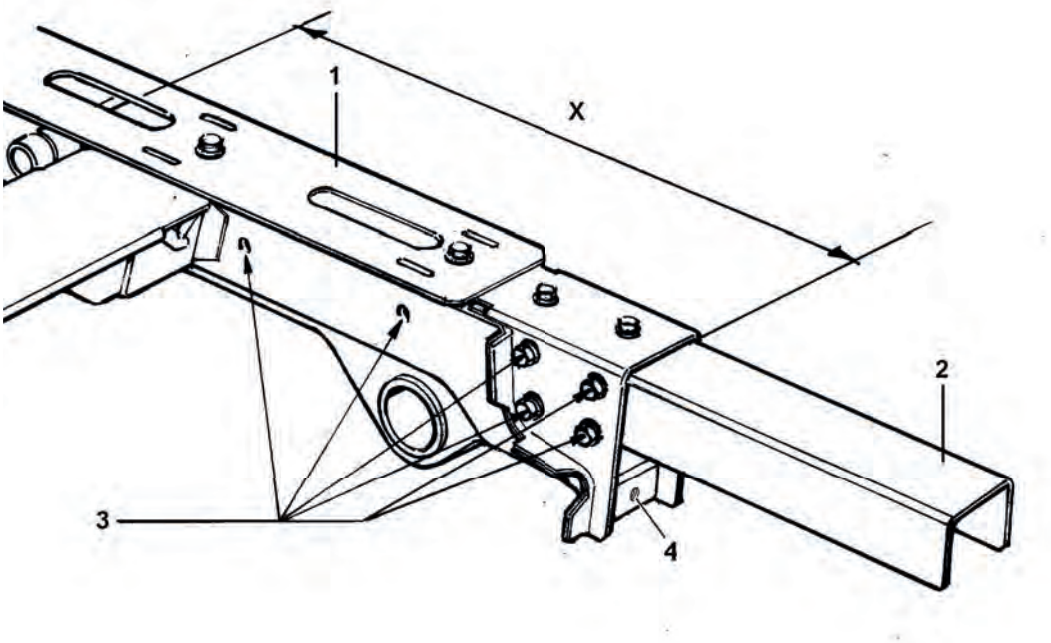
1: longitudinal member; 2: structure by coach-builder; 3: holes for fastening structure, 4: ring nut.

Special chassis cab (without sub-frame)

Sections



Perspective view



1: longitudinal member; 2: structure by coach-builder; 3: holes for fastening structure; 4: ring nut x: maximum length of reinforcing: 560 mm.

Towing hook

Overview

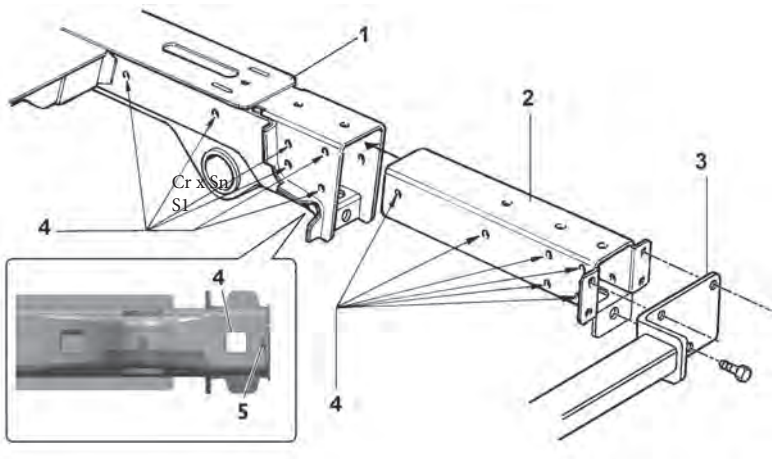
A towing hook can be applied without requesting authorisation to FIAT CHRYSLER AUTOMOBILES S.p.A. only on the specific cross-member provided and only on vehicles that FIAT CHRYSLER AUTOMOBILES S.p.A. has declared suitable for towing trailers.
Installation of towing hooks on vehicles for which towing is not originally foreseen must be authorised by FIAT CHRYSLER AUTOMOBILES S.p.A..

NOTE: Since tow bars are an important element for vehicle driving safety, all limitations imposed by standards in force must be respected, such as minimum space for braking and electrical system connections, minimum distance between axles, towing pin and rear edge of superstructure.

In the case the dimension of the hook attachment flange does not coincide with the existing holes on the vehicle transom bar, modifications can be authorised if suitable reinforcing is applied.

Attachment pre-fittings

The drawing shows the pre-fittings for applying the towing hook. The solution is valid for all Camping car.



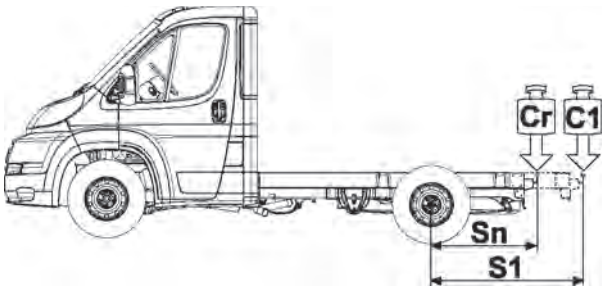
1: structure of the vehicle on which the towing hook transom bar is fastened; 2: tow hook stringer; 3: towing hook attachment flange; 4: holes for fastening assembly to chassis; 5: nut.

Calculation of maximum towable weight after vehicle conversion.

If overhang is lengthened, or the towing hook position changed with respect to the approved position, the towable weight can be calculated by means of the following formula:

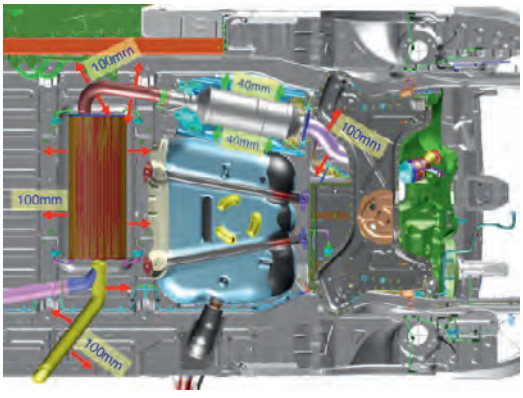
$$C_1 = \frac{Cr \times Sn}{S_1}$$

Where: S1 = Overhang with moved hook
C1 = New towable weight
Sn = Overhang with standard hook
Cr = Standard towable weight



Minimum distance from exhaust

As a result of the high temperatures reached by the exhaust pipe during the regeneration of the particulate filter (DPF), the following minimum distances from the “hot” elements should be observed when developing the underbody layout:
- Clearance of 100 mm on the sides from the areas where there is no heat shield*
- Clearance of 40 mm, in all directions, from the areas where there is a heat guard.”



(*) Do NOT plan any component above the hot zone if there is no heat shield.

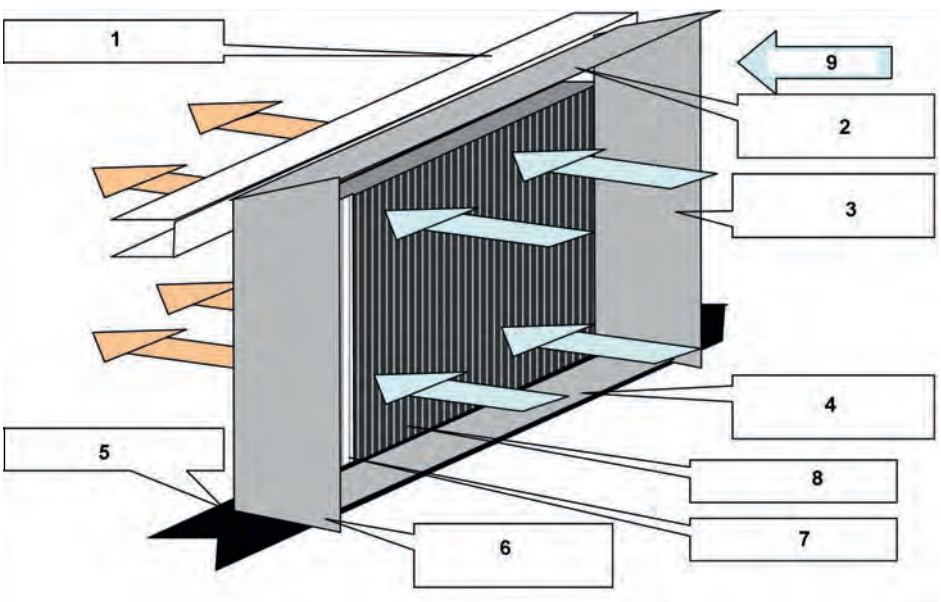
Finishing elements

If a different mat to the original is used on the floor of the driver's side, it must not interfere with the excursion of the pedals, limiting them (accelerator, brake, clutch).

Engine compartment

When making the conversion (motor-home), the front radiator grill must be designed to ensure at least the same passage of air as the original, as on the version with the same chassis cab.
Correct engine cooling must also be ensured, as on the original vehicle, making no changes to the inlet air permeability area, which must be no lower than that defined and visible on the version with similar cab.
When necessary, it is also recommended to implement an air flow conveyor, such as, for instance, the one in the attached diagram, in order to allow a regular flow toward the radiator.
No alterations or additional elements must be made to the areas of the engine that emit most heat (e.g. shields).

Dynamic flow WITHOUT conveyance on radiator – intercooler and air inlet cross member

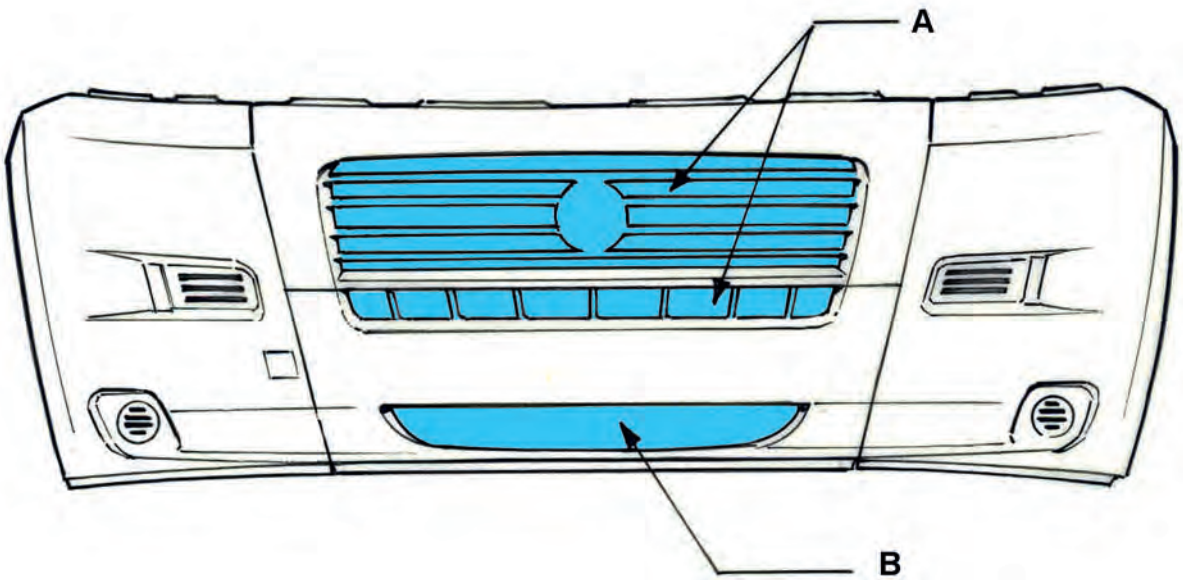


1: Upper cross member
2: Upper conveyance
3: LH lateral conveyance
4: Lower conveyance
5: Lower cross member
6: RH lateral conveyance
7: Intercooler
8: Engine radiator
9: Air flow

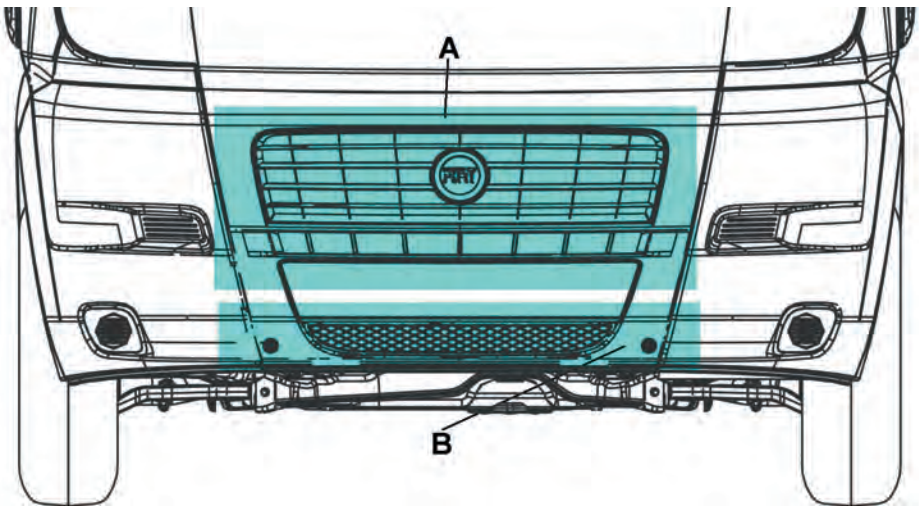
Indications for modifying front.

Technical specifications of intake air permeability surface in engine bay on basic vehicles.

A	14.8 dm^2	A: upper air intake
B	3.9 dm^2	B: lower air intake
C	18.7 dm^2	C: total area



If modifications to the vehicle front are required, the air permeability surface must be uniformly distributed, maintaining the values used on the original version, over the areas corresponding to the radiator (see diagram below).

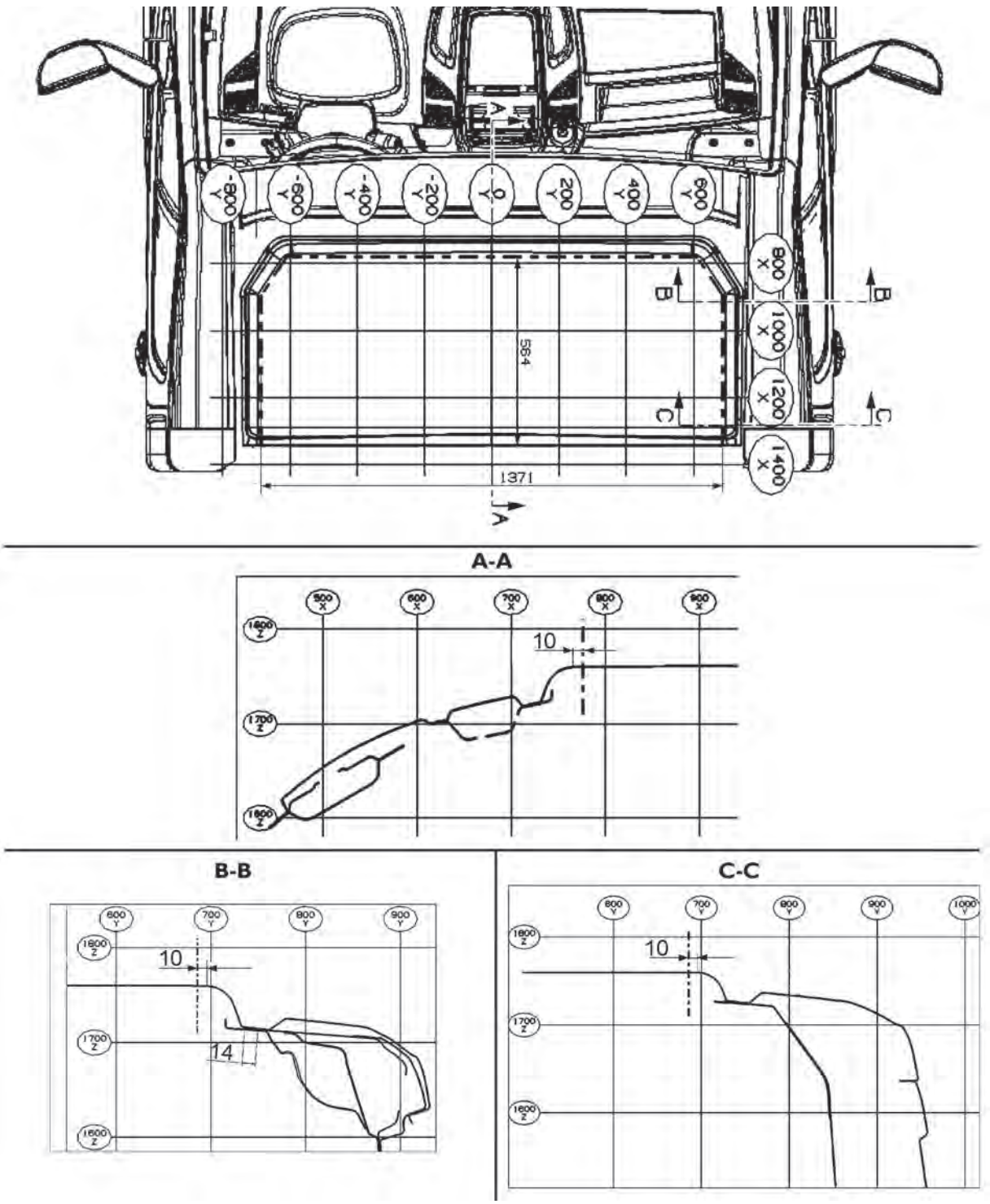


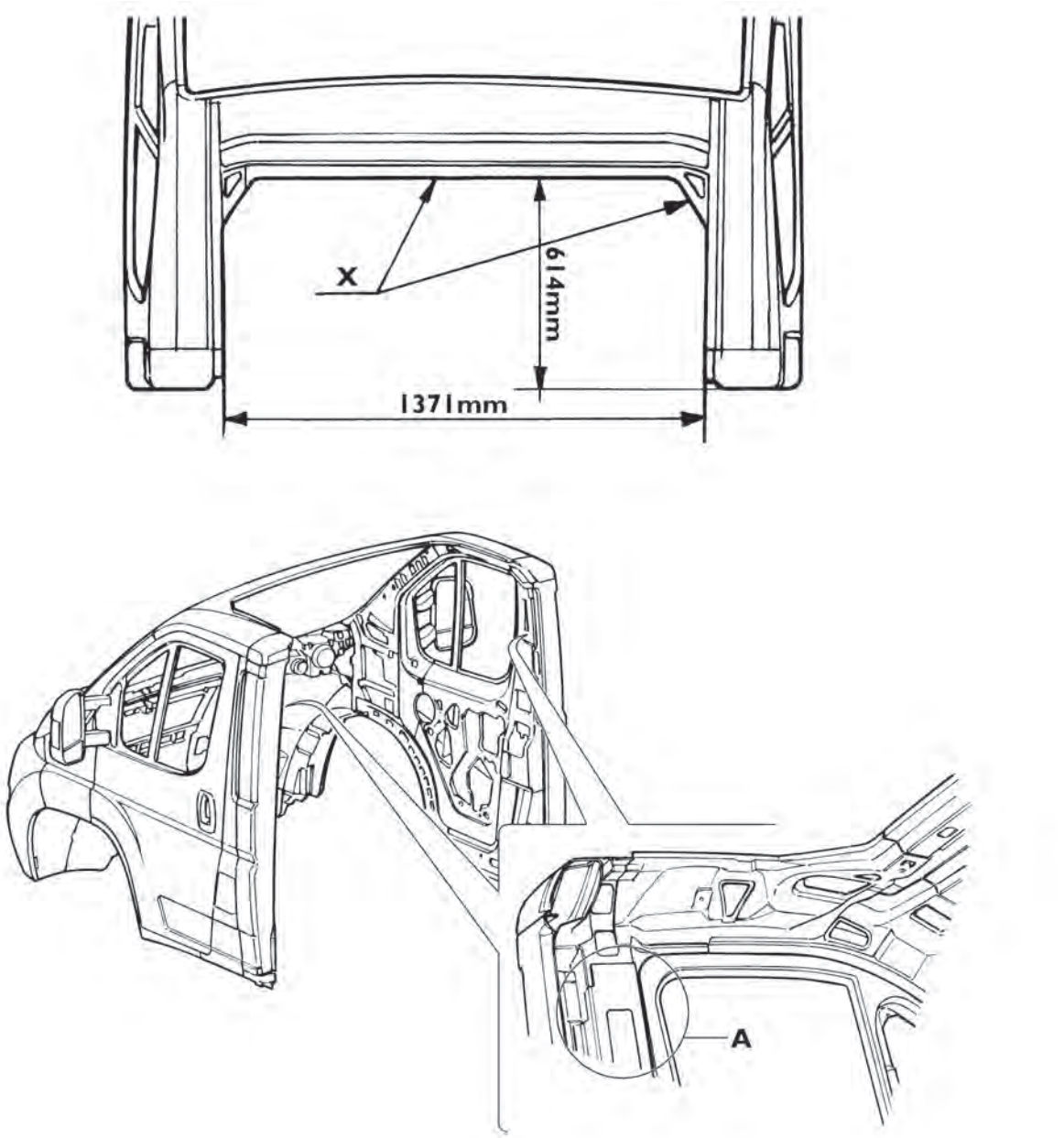
Warning: failure to observe the indications provided may result in serious engine damage.

Modifications to the roof

Instructions for cutting roofs of chassis cabs with OPT 59E.

The cab roof can be cut as shown below:





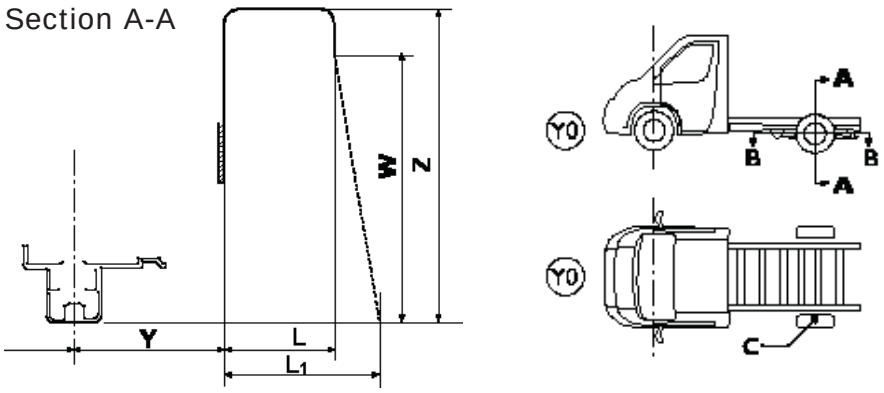
X: maximum permitted limit cutting roof.

Installations and modifications to realise specific versions must be carefully carried out in order to safeguard structural rigidity and maintain the function and protection offered by the cab, as well as the seat belt top anchor points (see detail A).

Wheelarch dimensions

The graphic shows the maximum wheel excursion with the vehicle in use.
Respect the dimensions given when modifying the wheel arch.

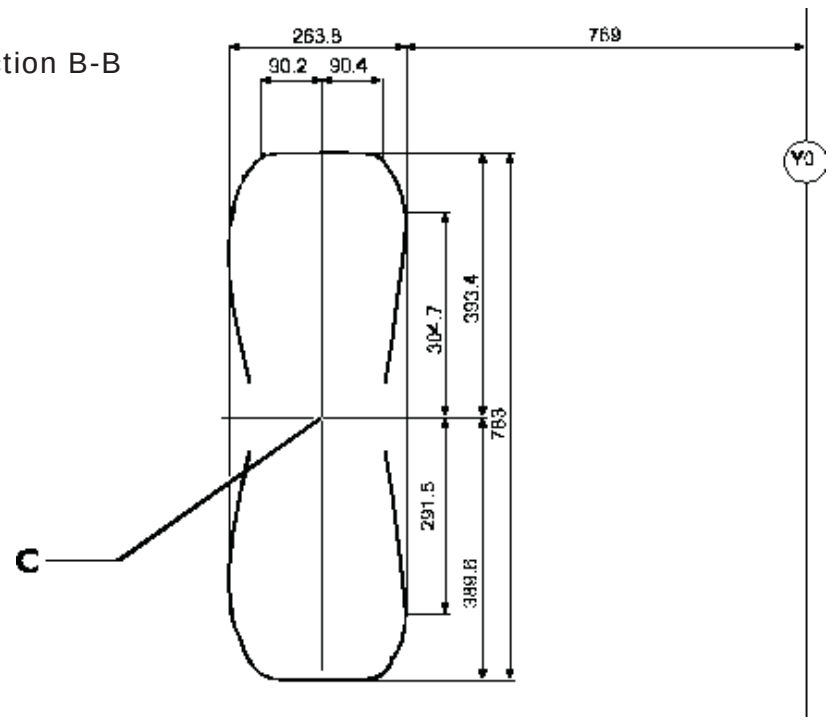
Section A-A



Track	Tyres	Y	L	L1	W	Z
Normal	225/70 R15 C	83	290	365	350	400
	225/75 R16 C	83	290	380	370	450
Widened	225/70 R15 C	173	300	365	350	410
	225/75 R16 C	173	300	380	370	460

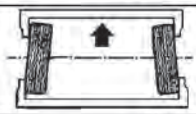
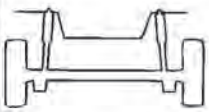
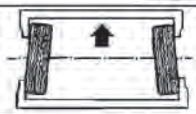
NOTE: The values given in the diagram include maximum play of 10 mm in relation to tyre (without chains) in conditions of asymmetrical jolting with maximum buffering.

Section B-B



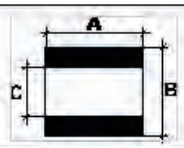
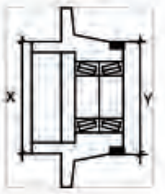
Wheels and suspension

For vehicles converted by coach-builders, a check on toe-in and suspension geometry must be made by the coach-builder/converter, prior to handing the vehicle over to the customer (tractor cabs only).

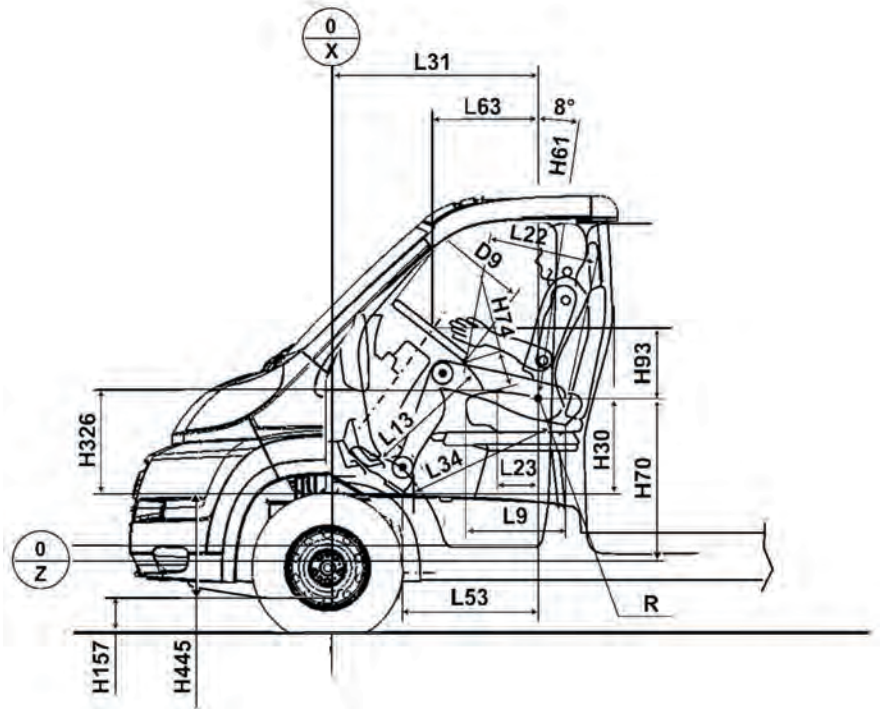
WHEEL TRIM		ALL VERSIONS
		 Vehicle unladen (*)
 Front suspension	Camber (**) 	0° ±30'
	Incidence (**) 	1° 30' ±30'
	Toe-in 	-1 ±1 mm
 Rear suspension	Camber (**) 	0° ±30'
	Toe-in 	0 ±1 mm

(*) With tyres inflated to required pressure with vehicle ready for road
(**) Angles not adjustable

WHEEL BEARINGS

	FRONT	Rear LIGHT	Rear HEAVY	
A	54	76	76	
B	90	X=72 Y=100,950	X=79 Y=100,950	
C	55	42	42	

Cab habitability diagram

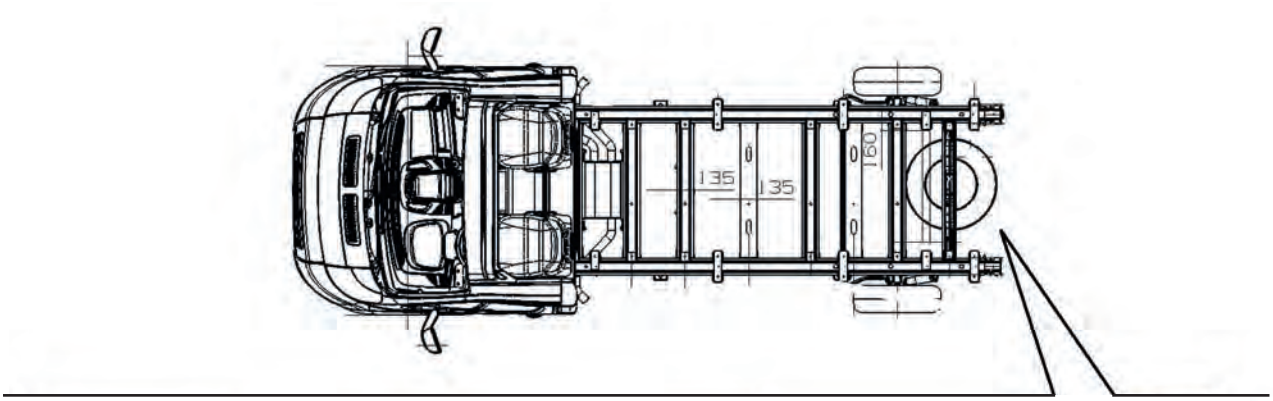


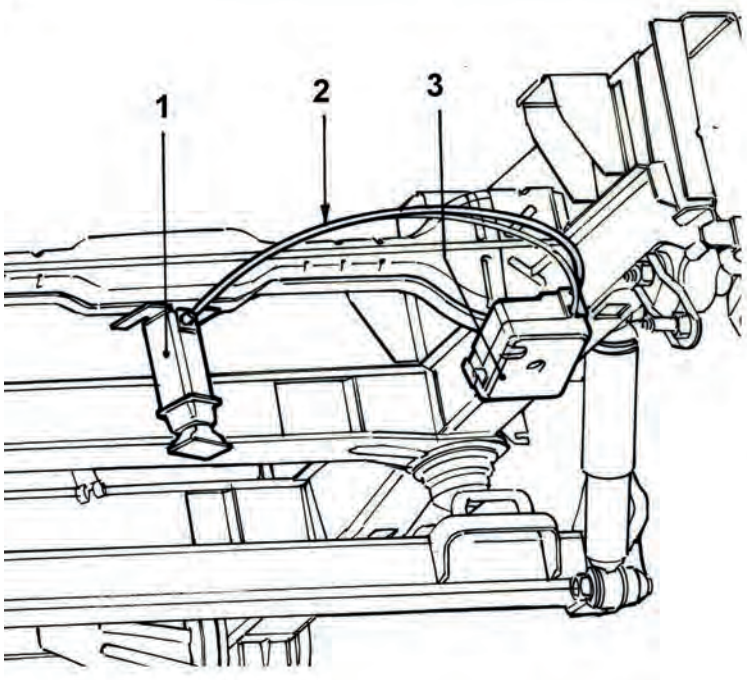
Reference	mm
d9	390
h30	435
h61	1081
h70	740
h74	165
h93	330
h157	199
h326	450
h445	257
l9	500
l13	635
l22	523
l23	170
l31	1004
l34	985
l53	670
l63	465

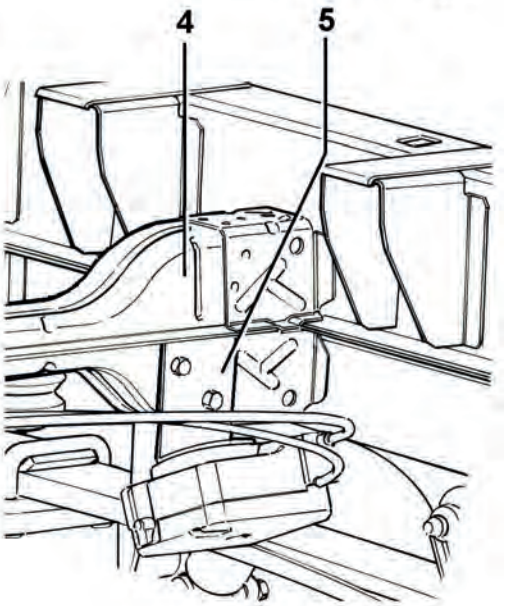
Spare wheel

The spare wheel is positioned in the rear part of the vehicle, in the external compartment under the chassis.
The complete device is fastened to the cross-member (4):
- at the centre by the wheel lifting/lowering cylinder (1),
- to the side by the control (3) with cables and brackets (5).

Spare wheel position for chassis cab and basic chassis versions







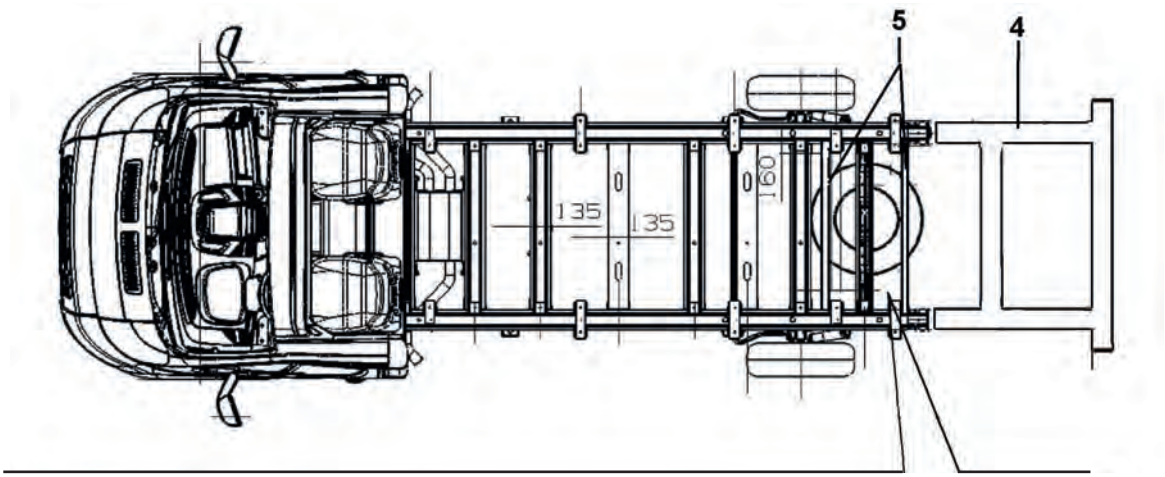
Relocation of spare wheel for chassis cab and basic chassis versions

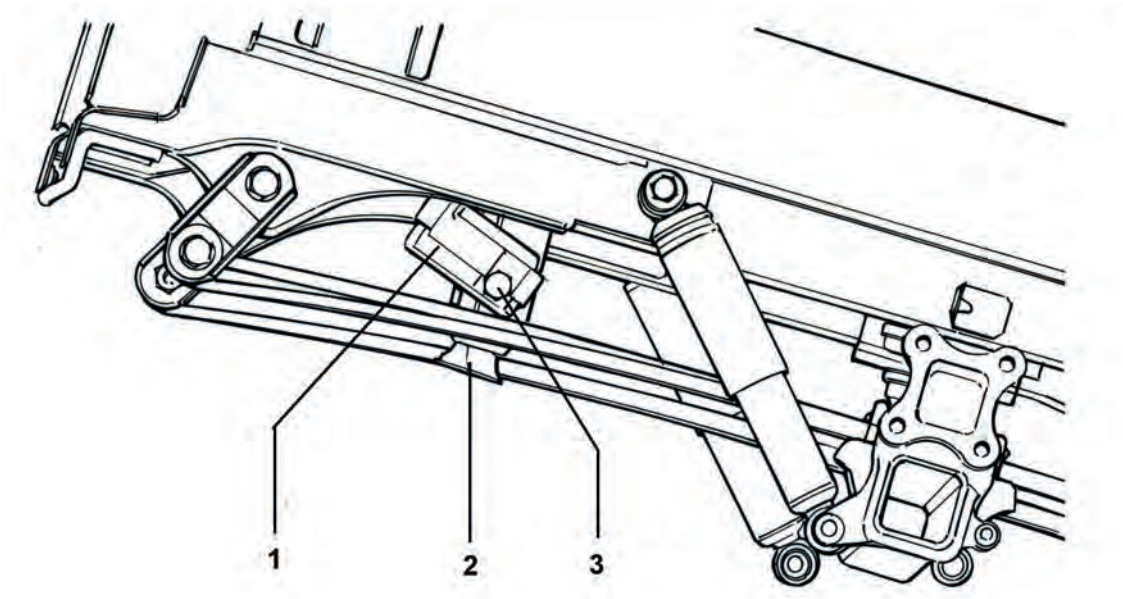
If the spare wheel mounting (3) and (2) has to be repositioned (for instance for lengthening the overhang, see detail 4), the anchor points must b transferred to the new structure, at the same distances used for its installation on the original vehicle (see drawings on previous page).

In this condition the device will function correctly.

When repositioning, easy access must be maintained not only to the spare wheel, but also to the control must (detail 3 in diagram below).

NOTE: restore the wheel upper fastening points by means of two cross members (5).



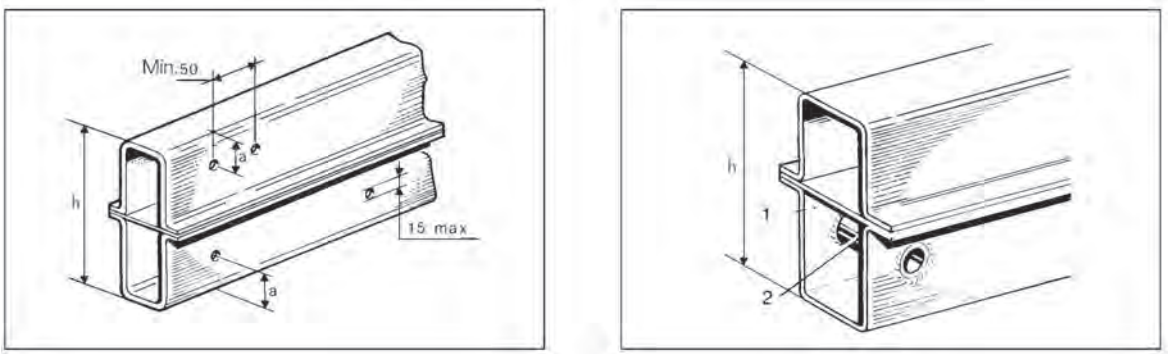


Indications for connecting superstructures

Drilling holes in the chassis

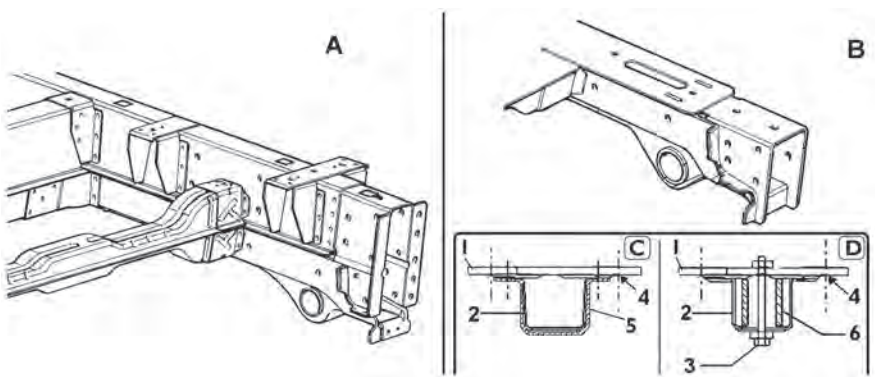
To fit additional assemblies to the chassis or bodyshell, as a general rule existing holes should be used.
If new holes have to be made they should be made on the vertical wall of the longitudinal member and thoroughly de-burred and reamed.
For the drilling, keep to the figure, and so:
- under no circumstances should the dimension 'a' be less than 30% of the chassis height (h);
- the distance between adjacent holes must never be less than 50 mm;
- the maximum diameter of the holes must not exceed 12 mm;
- the new holes must not be made near areas under greater stress, such as: areas for spring mountings, shock absorbers, brackets, crossmember attachments.

When necessary, fit spacers in the original structures. Make the weld as shown in the diagram and then apply corrosion protection.



1- Chassis; 2 - Spacer bush

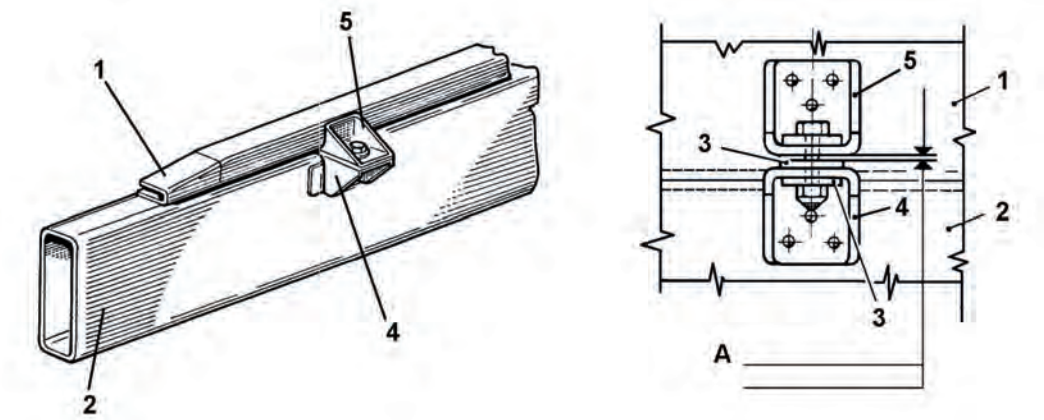
For chassis cab versions with sub-frame, superstructures can be mounted on the upper longitudinal member present on the basic version (fig. A). For 'special' versions, holes are provided for use as shown in figure (B).



1: upp. plate - 2: longitudinal member - 3: attachment - 4: reinforcing plate
5: superstructure fastening holes - 6: box-member reinforcing bush.
C: fastening solution with addition of an external U-bolt.
D: fastening solution with addition of internal bush.

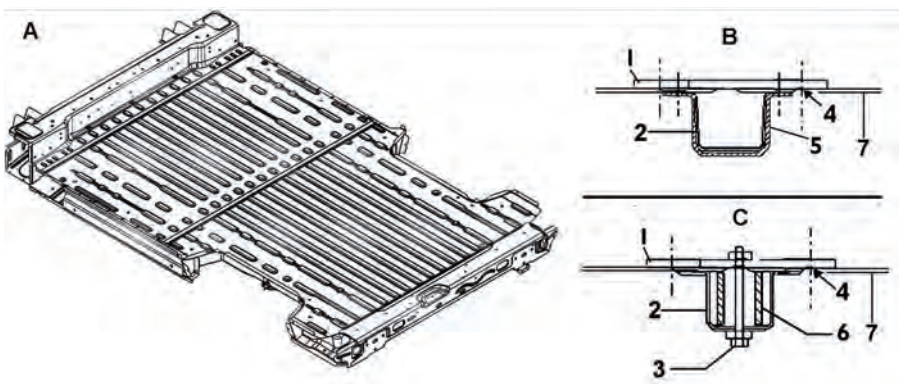
Fitting the counterframe

The purpose of a counterframe is to ensure an even distribution of the loads over the vehicle frame and to contribute to the stiffness of the vehicle as a function of its intended job.
For its construction, keep in mind that the material must have good mechanical weldability properties. The elements anchoring the counterframe to the vehicle frame must be designed to ensure a stable connection under the effects of lengthwise and crosswise thrusts (due to the loads when cornering and when the brakes are applied).
Interpose an elastic block, made of canvas rubber or a similar material with Shore hardness < 70, under the first fastener at the cab end. Interpose rigid spacers under the other connections.



1: Counterframe; 2: Frame; 3: Spacer; A: Gap between the frames: 4-5 mm.
4: Bracket on frame; 5: Bracket on counterframe.

'Special chassis-cab with flatbed' versions come with holes that can be used as shown in figure (A).

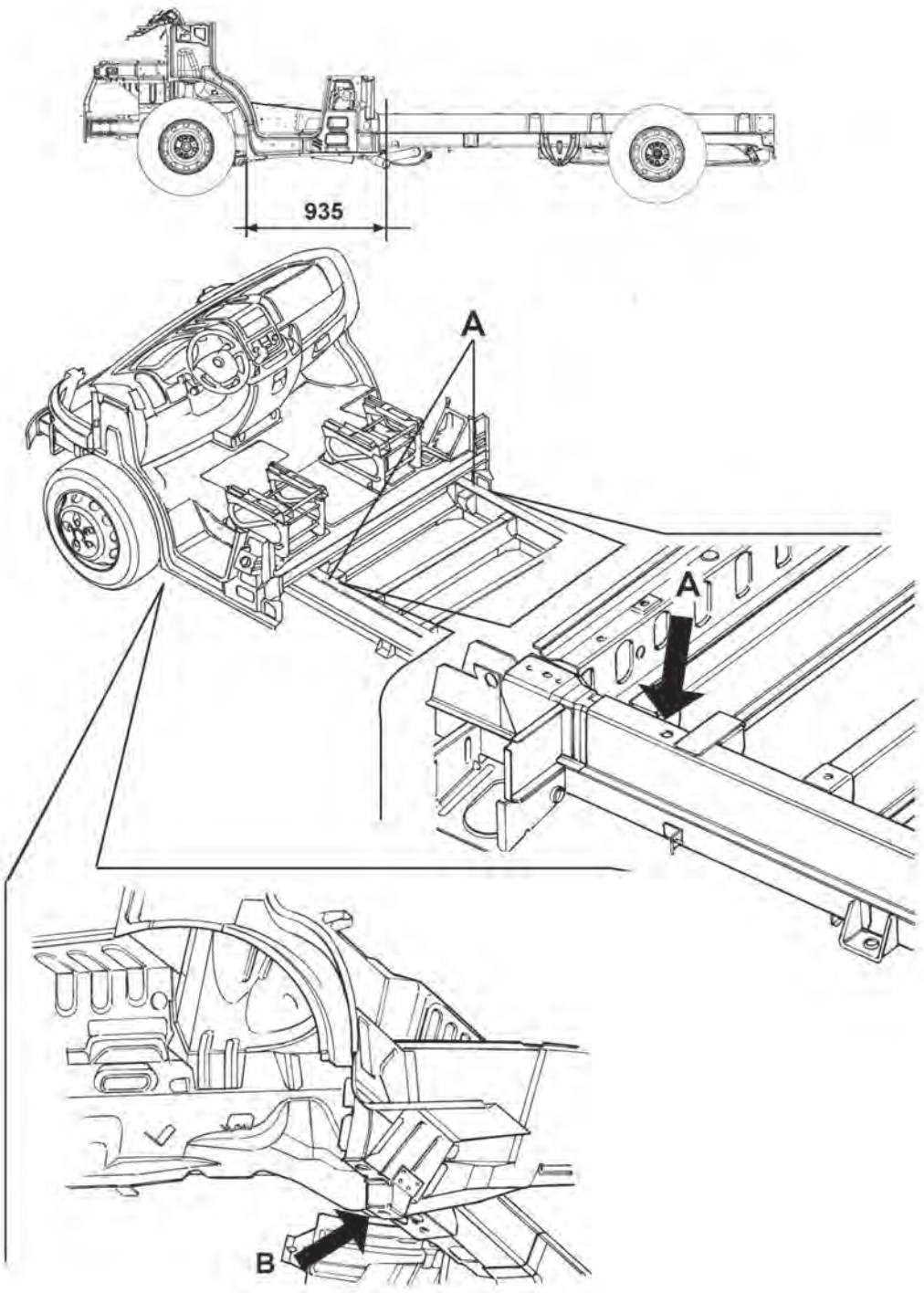


1: Upper plate - 2: Longitudinal - 3: Connection - 4: Anchoring screws
5: Boxed reinforcement
U-bolt - 6: Boxed reinforcement bushing - 7: Flatbed.
B: Fastening solution with the aid of an external U-bolt.
C: Fastening solution with the aid of an internal bushing.

Note: for box-bodies or dropside it's suggested to keep a maximum distance between structure and body not exceeding 80 mm.

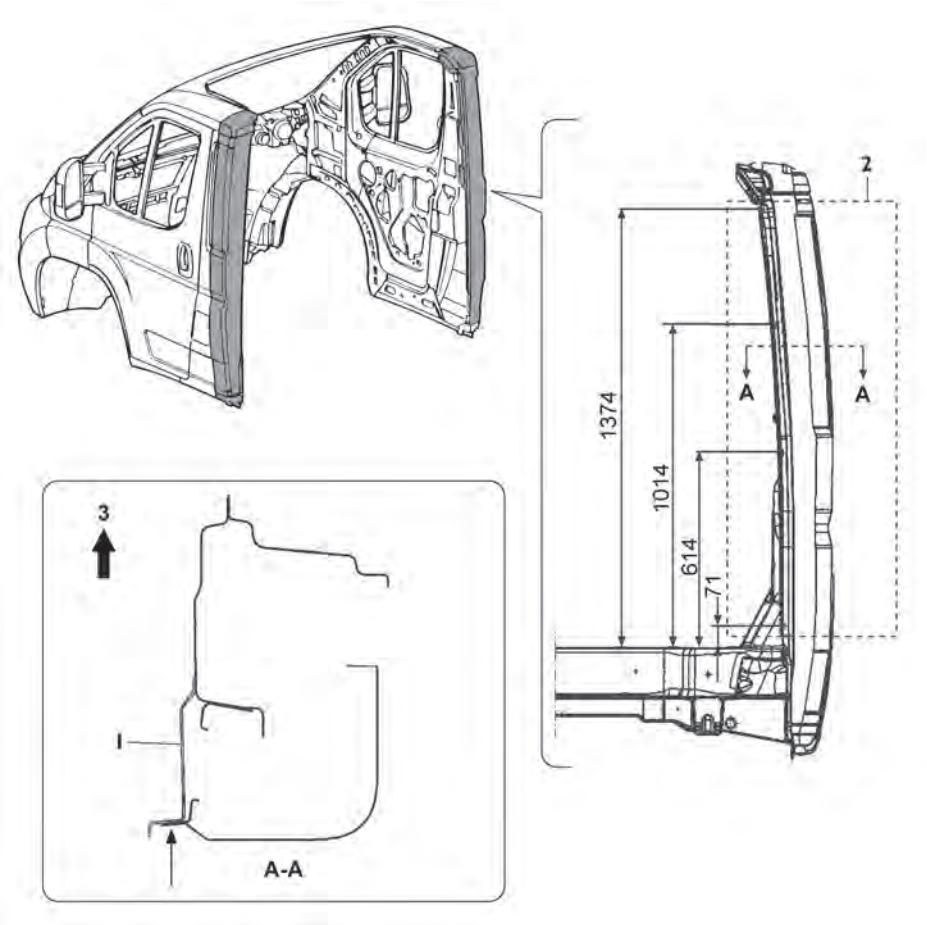
Plan and reference holes for superstructure application (Camping Car)

Reference holes for superstructures



A: reference holes for conversion works by coach-builders;
B: bodyshell reference points.

Cab interface for application of superstructure (Camping Car)

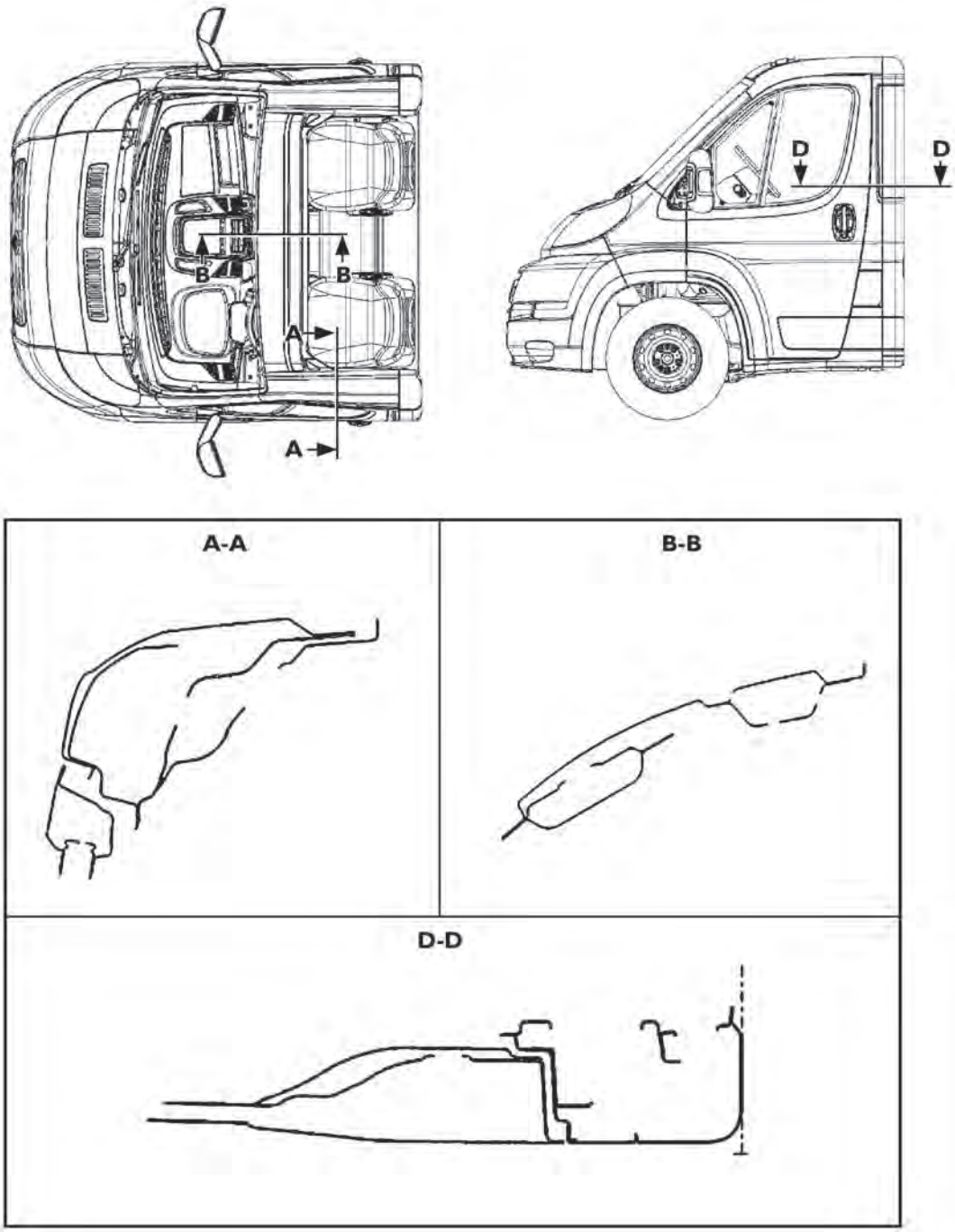


1: structural reinforcement; 2: recommended interface area; 3: direction of travel.

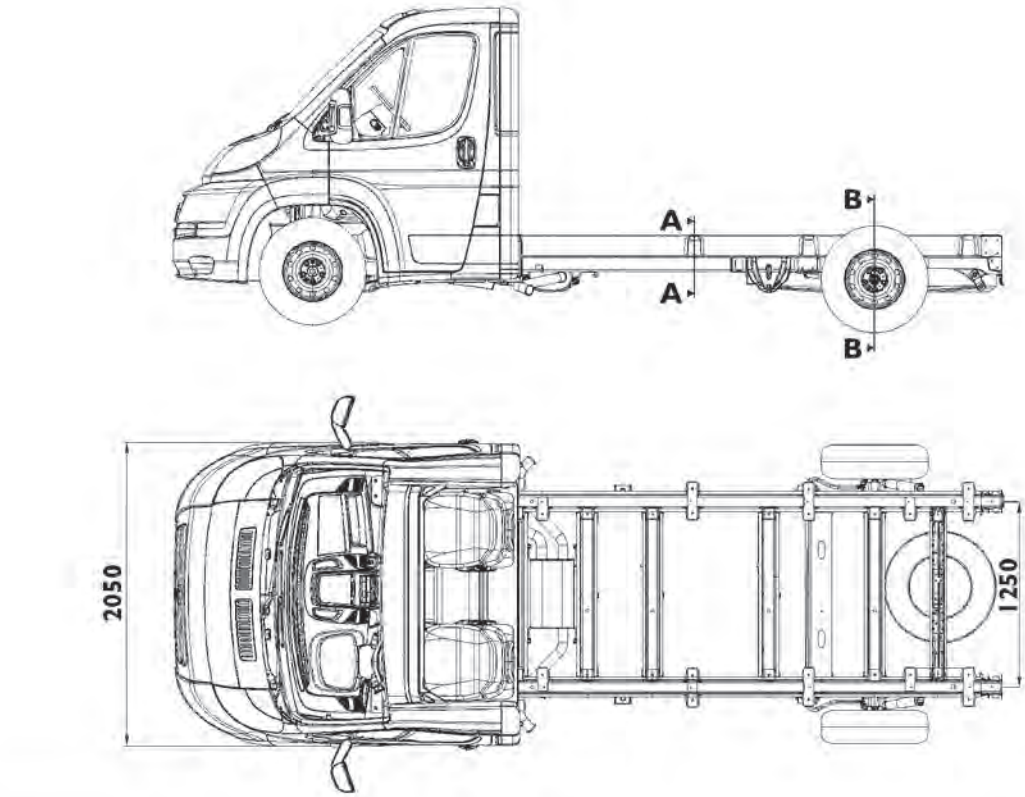
In the 'cut roof' chassis cab version the angular structure of the side/rear wall, has reinforcement (1).
If it is considered necessary to interface a new structure with the cab of the basic vehicle, we recommend using the reinforcement (1) as anchor point in the indicated position ( ).
The configuration of the basic vehicle structure, shown in section A-A, is the same along the entire area indicated in the drawing by (2).
The drawing shows the recommended distances between the various interface points between the structures.

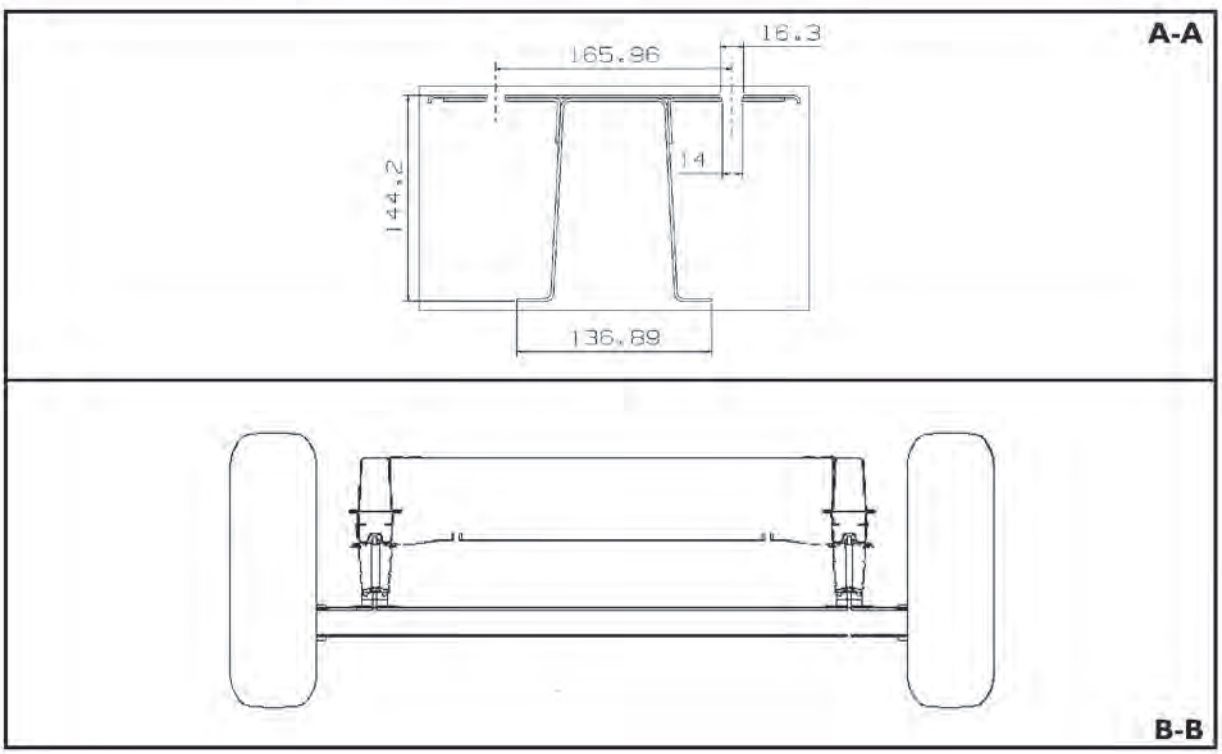
The main sections of all versions are given below. These provide general information on the condition of the structure and are strictly for information only.

Cab sections

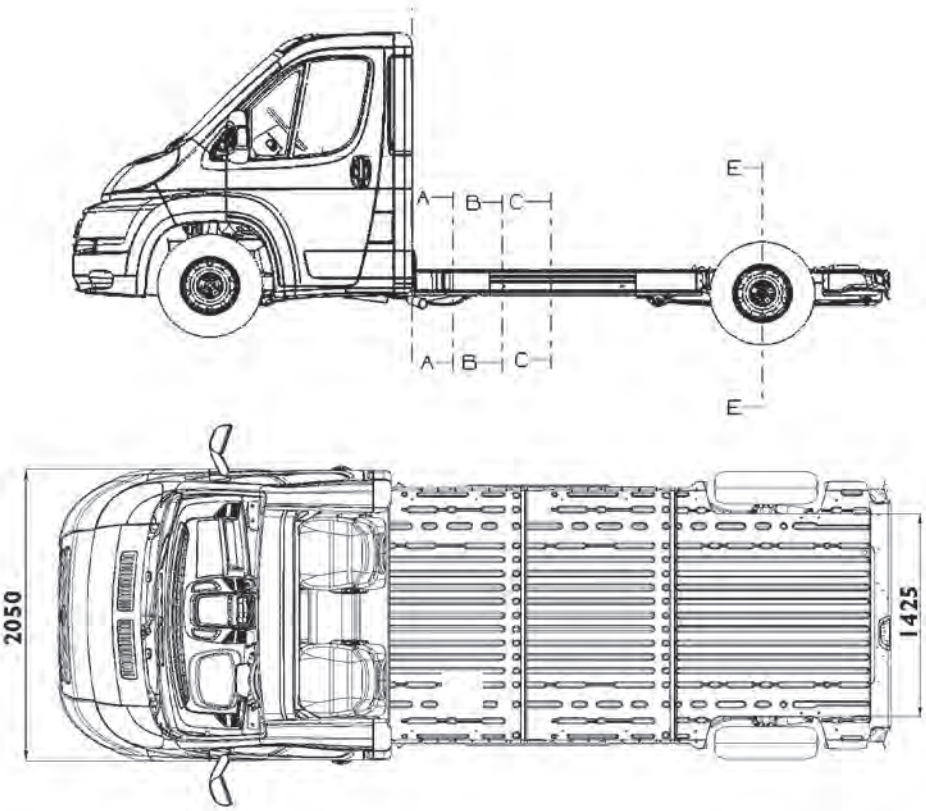


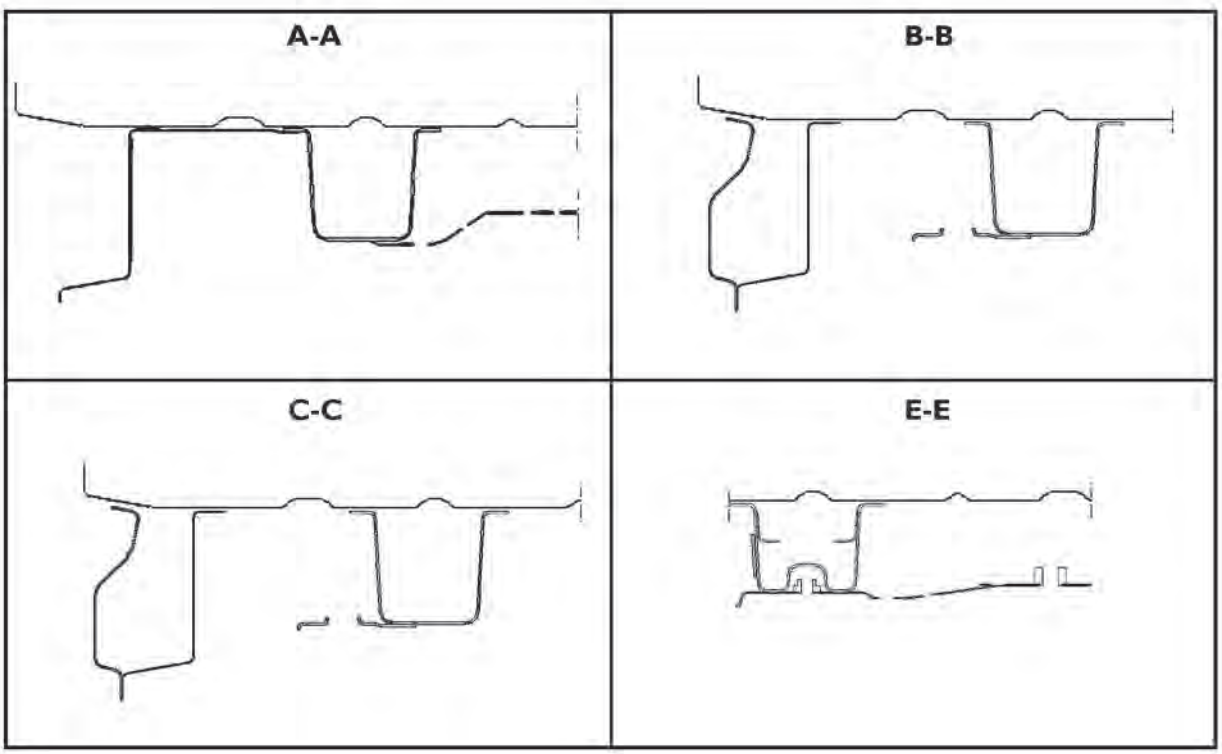
Chassis cab sections



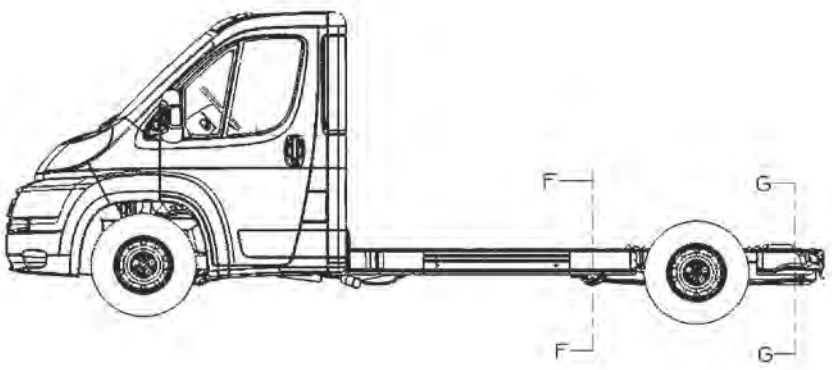


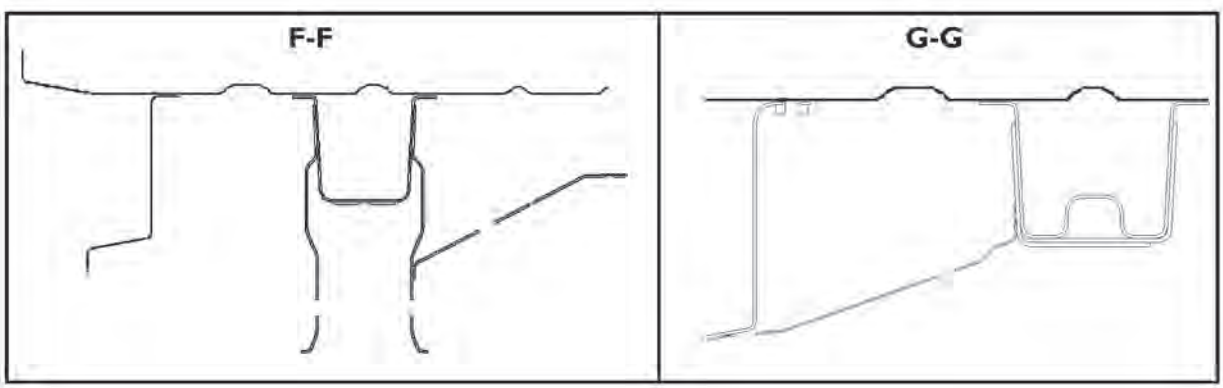
Chassis cab with platform version sections



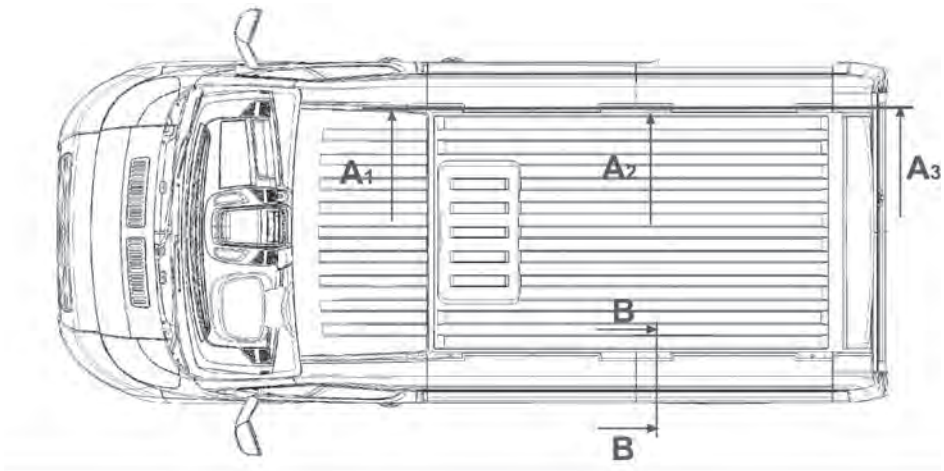


Chassis cab with platform version sections

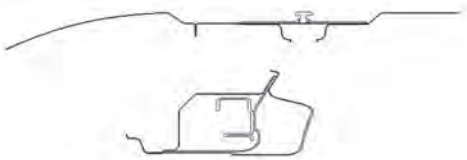




Van roof sections

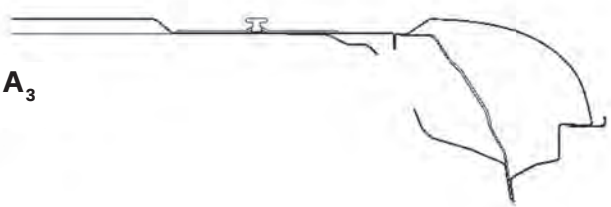


SEC. A_1

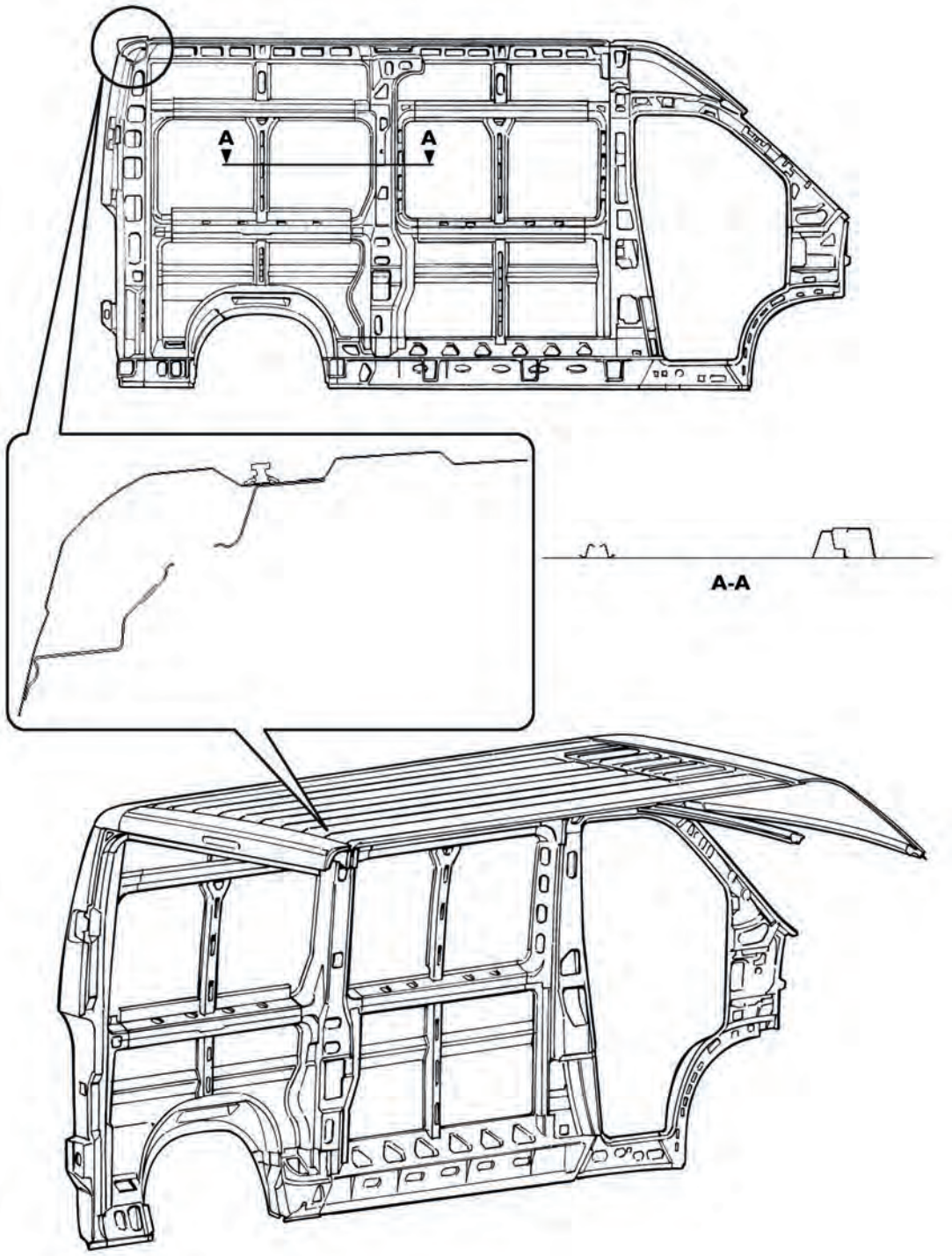


SEC. A_2

SEC. A_3

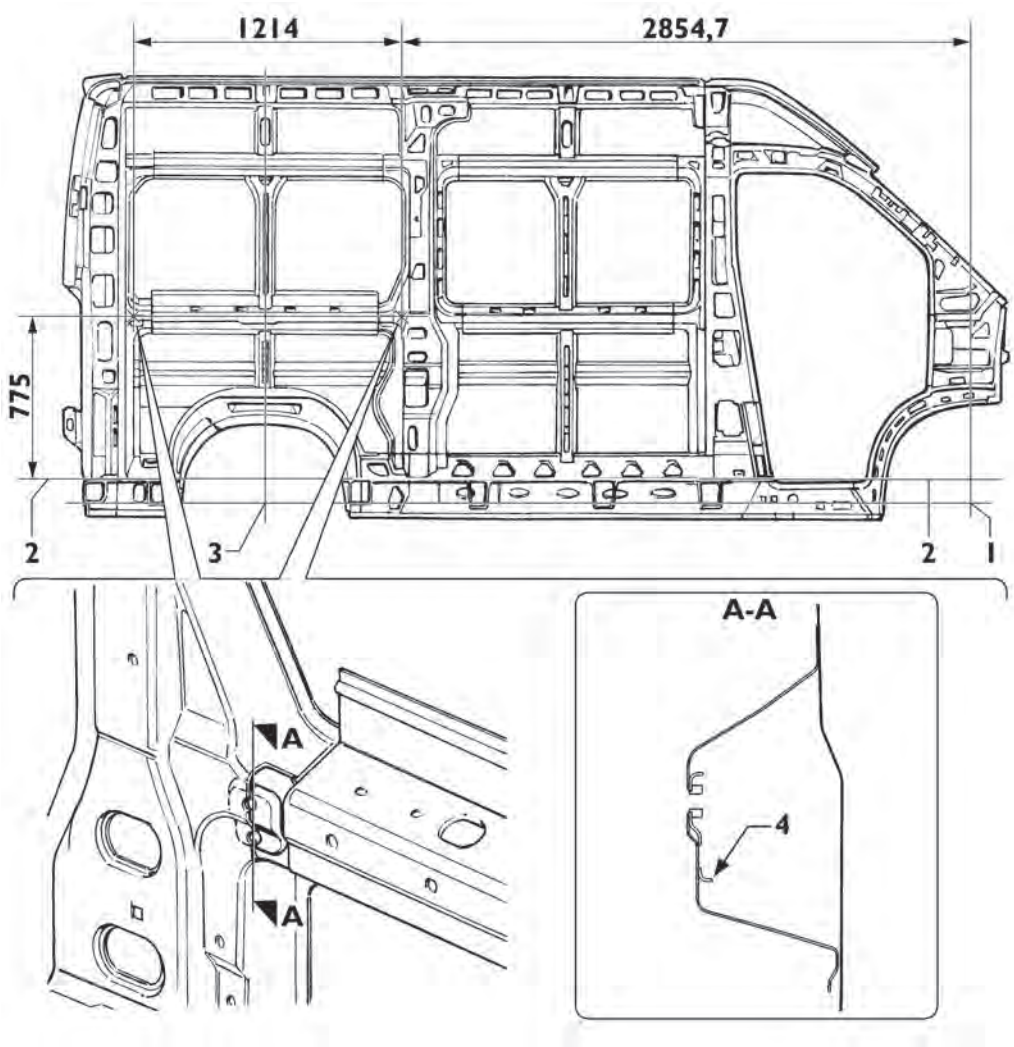


Van side sections



Side Load Retention

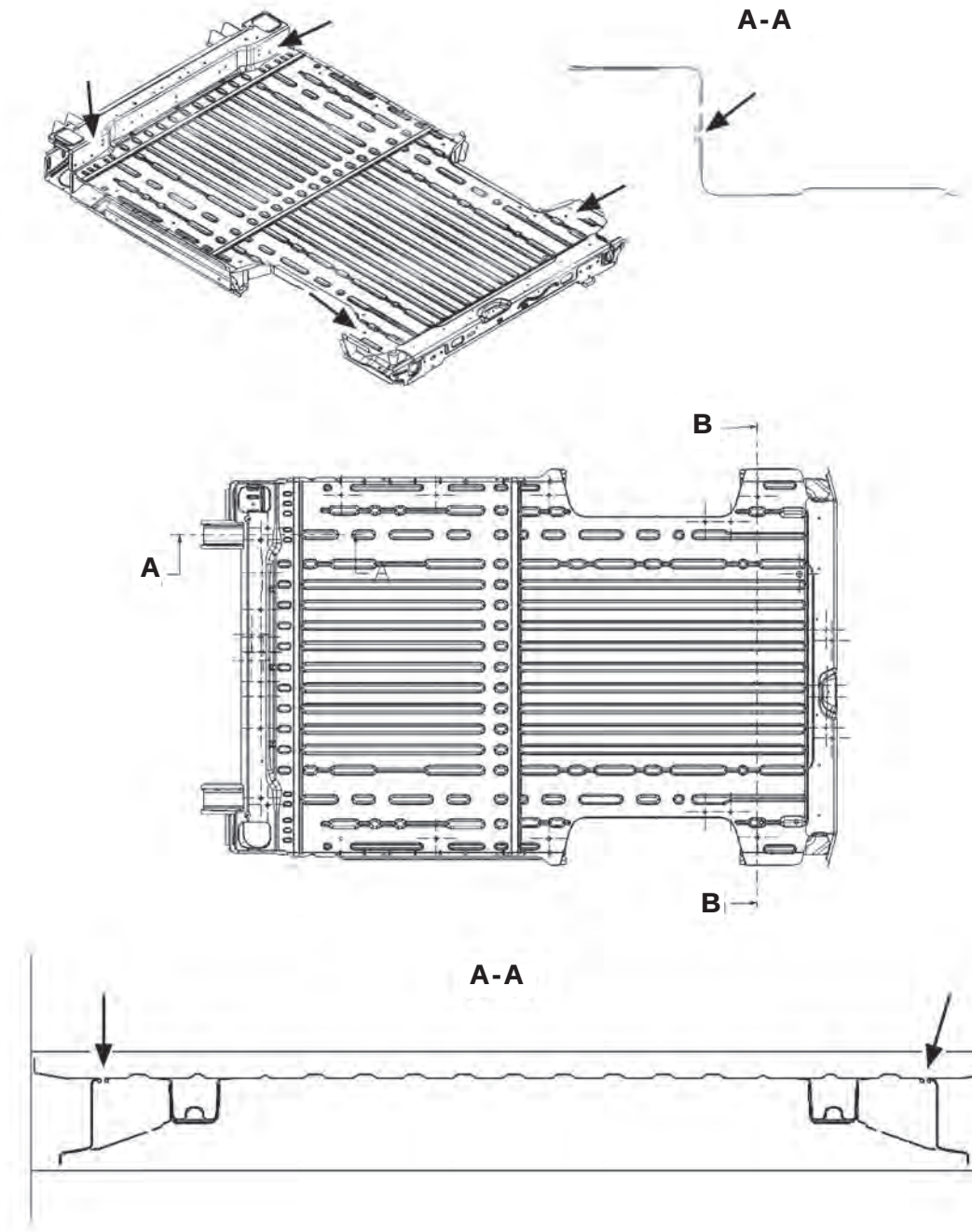
The quantity and relative position of the anchor points for loads are the same as those for all ‘van’ version wheelbases.
The anchor points are shown below.



1: FRONT WHEEL CENTRE;
2: UPPER FLOOR PROFILE ALIGNMENT;
3: REAR WHEEL CENTRE;
4: LOAD ANCHOR REINFORCING.

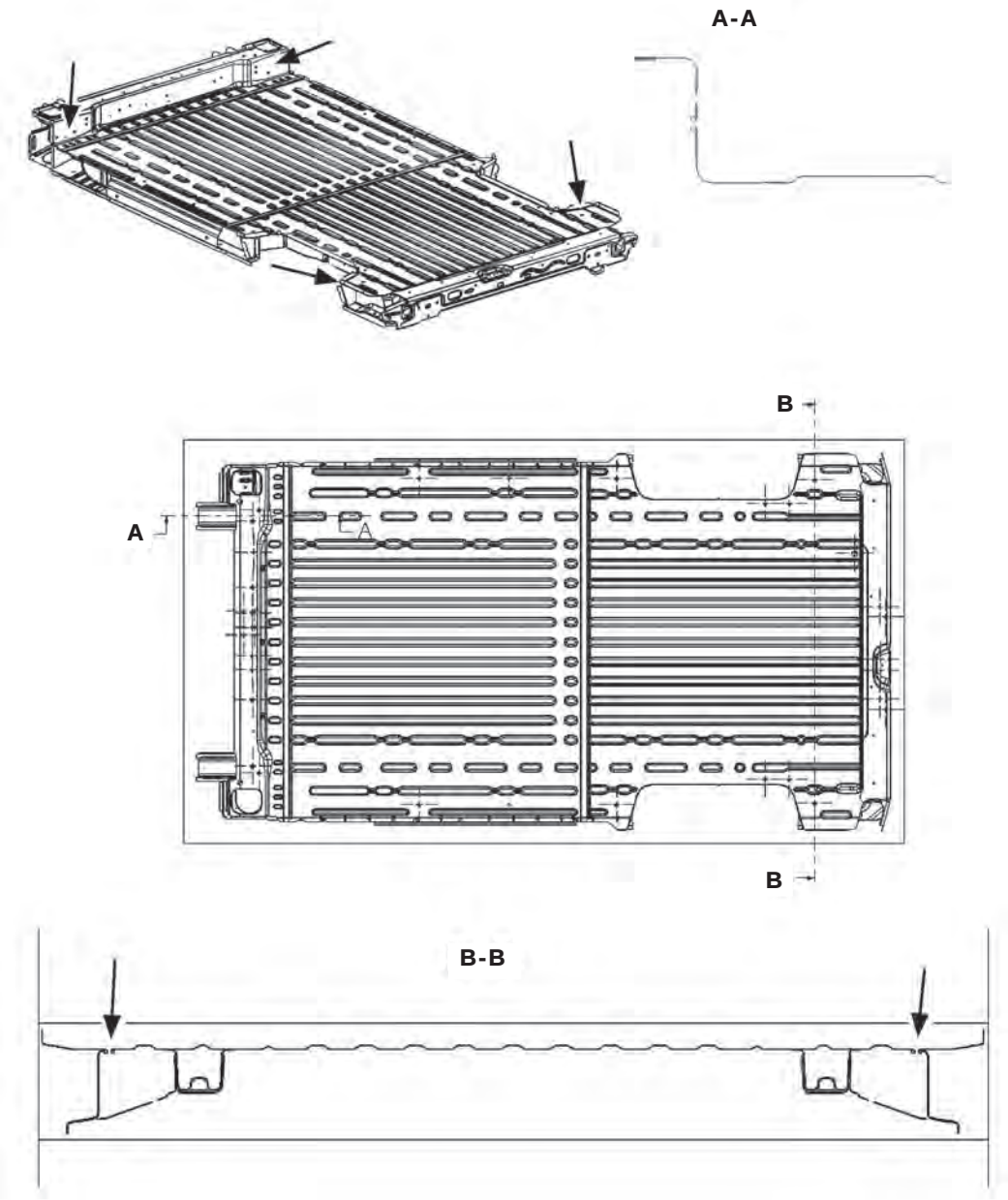
Load retaining hooks on floor

Short wheelbase



Load retaining hooks on floor

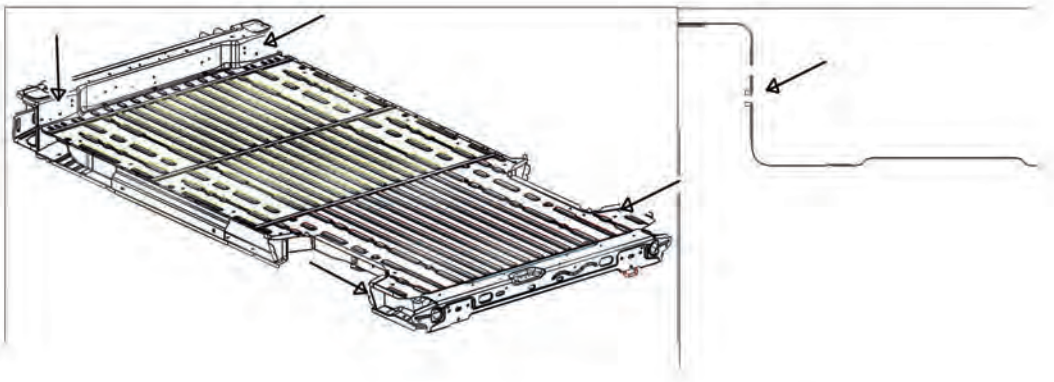
Medium wheelbase

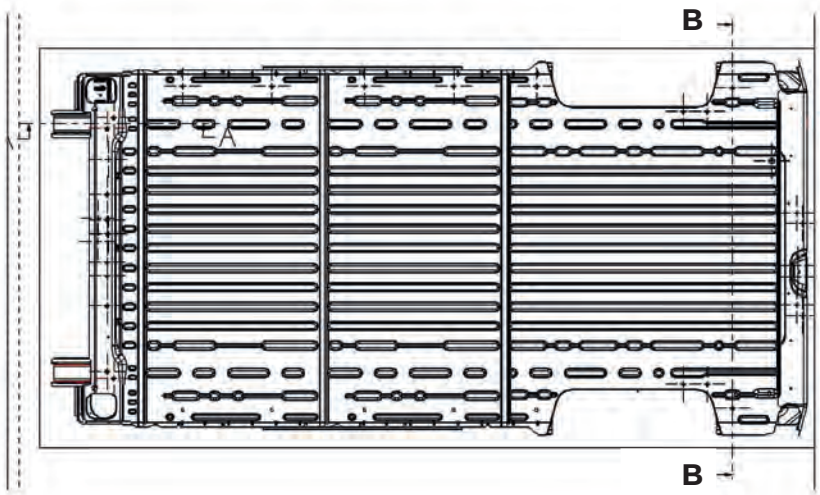


Load retaining hooks on floor

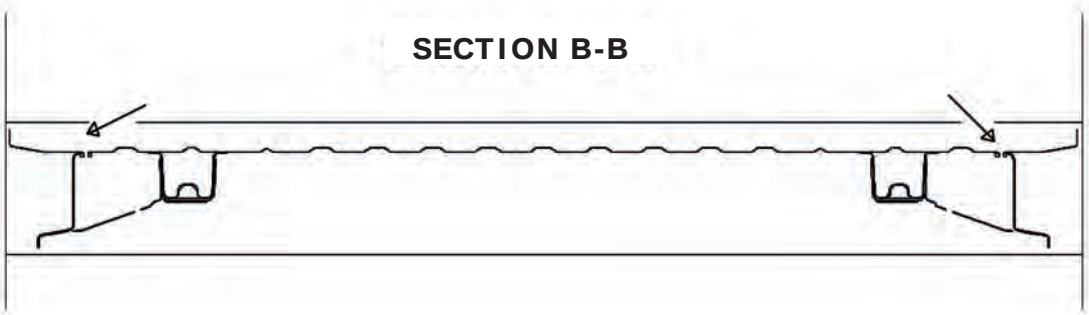
Long wheelbase

SECTION A-A





SECTION B-B

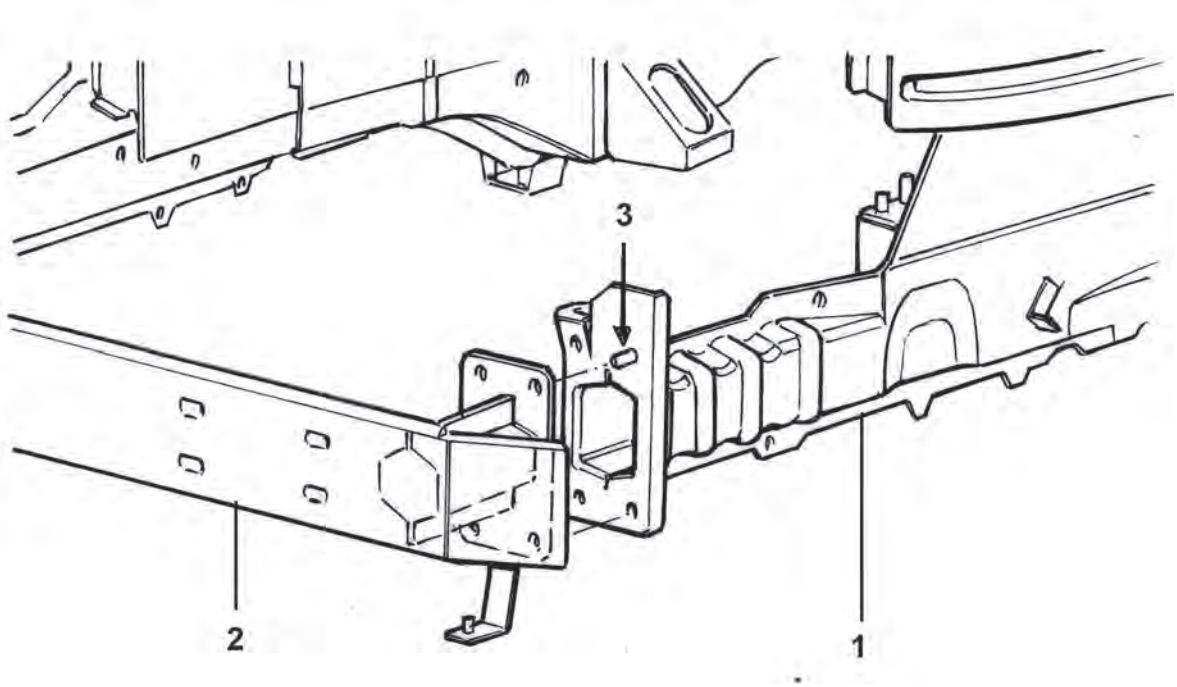


Instructions for eliminating 'crash box' cross member (only for vehicles without air-bag)

All basic versions are fitted with impact absorbing cross-members.

Removal of the cross-member is only possible in cases of vehicles without airbag ('chassis-cowl' versions).

Front crash-box for all versions



2: front crash box cross-member - 1: controlled impact absorption strut
3: centring pin.

NOTE: for vehicles fitted with air-bag, restore the structure with technical specifications similar to those removed.

Fuel supply system

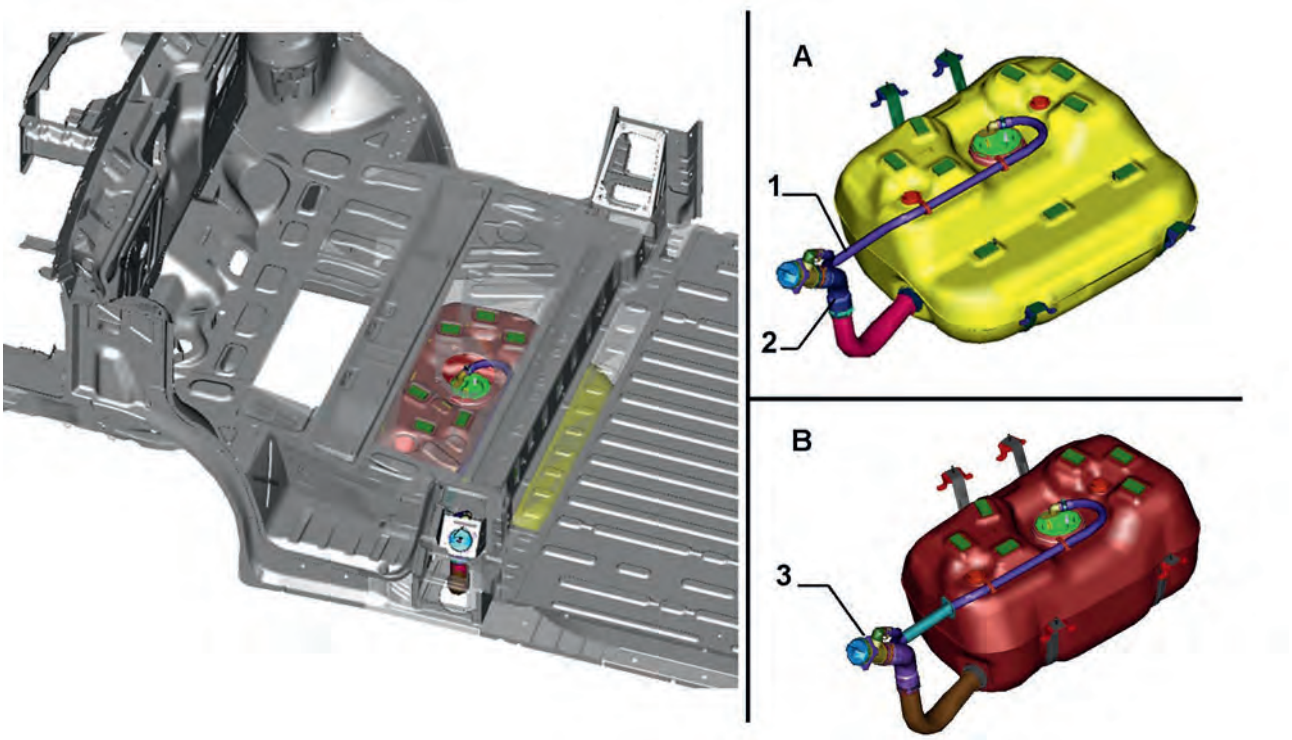
The fuel supply system is identical on all versions (vans, basic chassis vehicles, etc.)
The passage cone for the fuel filler pistol (model VP std. SAE J 1140) is shown on the drawing given below.
The tank capacity is 60 lt (optional), 90 lt (standard) or 120 L (optional).

Modifications to fuel filler position.

A corrugated flexible pipe can be fitted between the tank and filler, taking care to comply with regulations in force.

If necessary the corrugated pipe (2) or pipe (1) must be replaced with others with the same technical specifications (materials, cross-section and fastening, see diagram on following page).

Descriptive outline



A: 120 L tank.
B: 90 L tank.
1: breather pipe; 2: corrugated connector pipe; 3: fuel filler

Pipe technical specifications

Component technical data:

a: letter in relief for correct mounting on vehicle;
c: metal insert with extraction load >= 100 N.
d: flexible collar;
e: nylon corrugated pipe;
L: max. length 261. 8 mm.