



OF 1014/1017 Bus Chassis -Bodybuilding Guidelines



BHARATBENZ

Guidelines and Precautions

1904GL01H

Daimler India Commercial Vehicles Pvt. Ltd., as the manufacturer of BharatBenz vehicles, publishes this body/equipment mounting directive to provide body manufacturers with important technical information about the basic vehicle. This information must be observed by the body manufacturer in the production of bodies and equipment, fittings and modifications for BharatBenz vehicles. Due to the large number of body manufacturers and body types, Daimler India Commercial Vehicles Pvt. Ltd., cannot take into account all the possible modifications to the vehicle, e.g. performance, stability, load distribution, center of gravity and handling characteristics, that may result from the design of attachments, bodies, equipment or modifications. For this reason, Daimler India Commercial Vehicles Pvt. Ltd., can accept no body manufacturer liability for accidents or injuries sustained as a result of such modifications to the vehicles if such modifications have a negative impact on the overall vehicle. Accordingly, Daimler India Commercial Vehicles Pvt. Ltd., will only assume liability as vehicle manufacturer within the scope of the design, production and instruction services which it has performed itself. The body manufacturer is bound to ensure that its bodies and equipment, fittings and modifications are themselves not defective, nor capable of causing defects or hazards to the overall vehicle. If this obligation is violated in any way, the body manufacturer shall assume full product liability.

Daimler India Commercial Vehicles Pvt. Ltd., does not issue body/equipment approval certificates for bodies not manufactured by BharatBenz. These directives only supply important information and technical specifications to body manufacturers explaining how to handle the product. These body/equipment mounting directives are primarily intended for the professional manufacturers of bodies, equipment, fittings and modifications for our vehicles. As a result, these body/equipment mounting directives assume that the body manufacturer has suitable background knowledge. If you intend to mount attachments, bodies and equipment on or carry out modifications to our vehicles, please be aware that certain type of work (e.g. welding work on chassis components) may only be carried out by qualified personnel. This will avoid the risk of injury while also ensuring that the degree of quality required for the attachments, bodies, equipment and modifications is given.

Illustrations and schematic drawings are examples only and serve to explain the texts and tables. References to regulations, standards, directives etc. are given in keywords and serve for information only. Additional information is available from any of the Daimler India commercial Vehicles Pvt Ltd authorized Dealers or Service Centers.

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Mechanical part

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1.1 Dimensions

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For the dimensioning of the bodies, the following basic dimensions must be taken into account (values only for initial reference):

Tab1- Basic Dimensions

(mm)	OF 1014/1017	OF 1014/1017
Wheelbase	4,250	5,300
Front Overhang	1,193	1,193
Rear Overhang	1,940	2,000
Overall Length	7,383	8,493

Important:

As a safety measure, the technical limitations of the chassis always prevail over local legal values for the application of ready-made vehicles..

For OF 10T Chassis Body width has been limited to 2400 mm maximum.

For the approval of the body dimensioning (length, wheelbase and overhangs), it is necessary that the technical and legal limits of total and per axle load capacity of the chassis are not exceeded, considering all operation and load conditions (dynamic and static). Refer to the chapter “Admissible Load per Axle” [page 8](#).

These chassis have been developed to meet several body building conditions, making possible the best relations between the weights and the body dimensions. However, if it is necessary to change the dimensions of the wheelbase, it is mandatory to present a technical proposal for Daimler Buses India for approval in advance.

Official approval

Important:

During the dimensioning of the front and rear overhangs take into consideration the legal limits and the local operation conditions in order to meet the approach and departure angles specifications.

For the OF1014/1017 chassis, the dimension of the rear overhang is technically limited to 60% of the wheelbase value, in order to ensure the vehicle's driveability in accordance with adequate weight distribution.

Please refer to the offer drawings specific for other dimensions.

Drawings offered for reference:

- OF 1014/1017 5300WB A 831 000 35 99

Official approval

1.2 Use of BharatBenz trademarks

The “BharatBenz Logo”, and the written expression “BharatBenz” are Daimler Buses India trademarks. The following notes, referring to the use of these trademarks, embrace a worldwide level for body builders that install a body not made by Daimler on a BharatBenz chassis:

- The BharatBenz logo is to be attached only on the front of the body, centered at body height for the identification of the chassis. The name of the body maker has to be attached at a distance from the BharatBenz, referring to the body maker, and according to the drawings in the following pages.

- The written “BharatBenz letterings” has to be used for the identification of the chassis at the front & rear part, The name of the body maker has to be always attached at a distance from the written “BharatBenz expression” (see drawings).

Therefore, the BharatBenz chassis are always supplied with the chrome plated BharatBenz Logo and the chrome finish BharatBenz written expression for the identification of the chassis. This chrome finish logo is attached by the body maker, to the body front end at chassis height, in name of Daimler Buses or its affiliated companies. The same applies to the attachment of the written BharatBenz expression to the rear body end at a height below the rear glass. (see drawings)

The BharatBenz trademarks cant be used to identify the chassis, if the complete vehicle does not comply with the quality specifications contained in the Daimler Buses guidelines, for body makers.

- Specific Daimler buses names, as Mercedes-Benz, CITARO, TRAVEGO, SHD etc., for example, cant be attached to the body. The body maker can only use his own type designation, which should not permit any confusion with the specific Daimler Buses names.
- The BharatBenz key, Fuel caps and steering wheel are marked with the BharatBenz by the manufacturer and are part of the chassis delivery scope. Interior elements (for ex., seats, ashtrays, roof interior, etc.), which are not integrated by the chassis manufacturer, are forbidden to be marked with BharatBenz trademarks.

Official approval

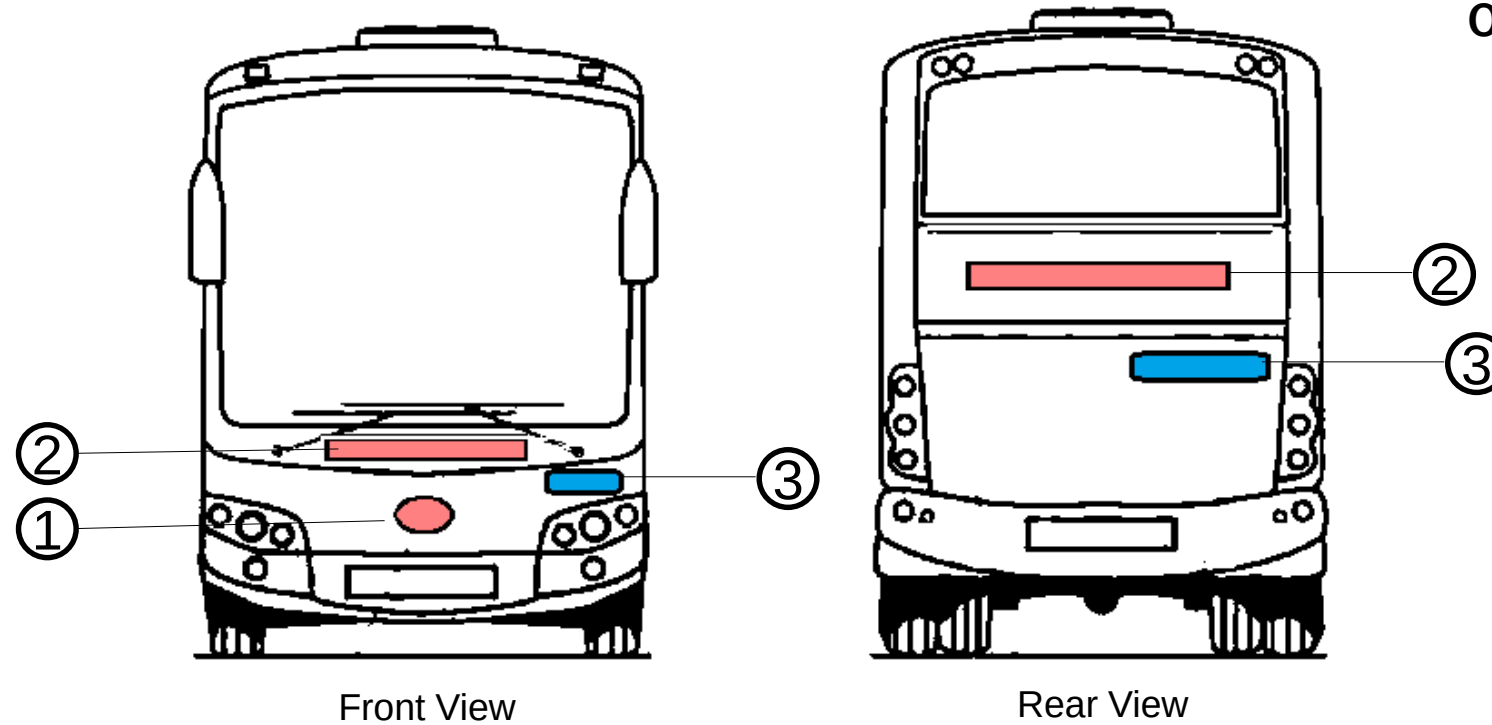
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The bodybuilders not authorized to use the original design for the body, or to copy the original design or elements of the original design. The body maker will have to create an independent design, whose appearance cant be confused with the original Daimler design. The use of original BharatBenz parts, with significant design, such as mirrors, headlights and other elements, require, therefore, the express approval from Daimler Buses or from its affiliated companies.

- The bodybuilder commits himself to permit the necessary monitoring of the product and process of the bus body quality, by a consultant of the Daimler Buses body builder/Affiliated company. The acceptance of the body by the body maker consultant is not to be considered, under any circumstances, as a reduction of responsibility of the body maker on the product/ legislation/liability on the body. The maker of the body will also be made responsible for the chassis, under the aspects of responsibility on the product, should he not attain himself to the Daimler body building guidelines and, thus, compromising the performance of the chassis.

Any and all markings of bus bodies, with BharatBenz trademarks, that exceed these marking guidelines, require a separate trademark licensing agreement with Daimler Buses and a written authorization from Daimler Buses.

Official approval



Pink colored area: Protected area for BharatBenz trademark.
This space is not to be used for the attachment of any other designations.

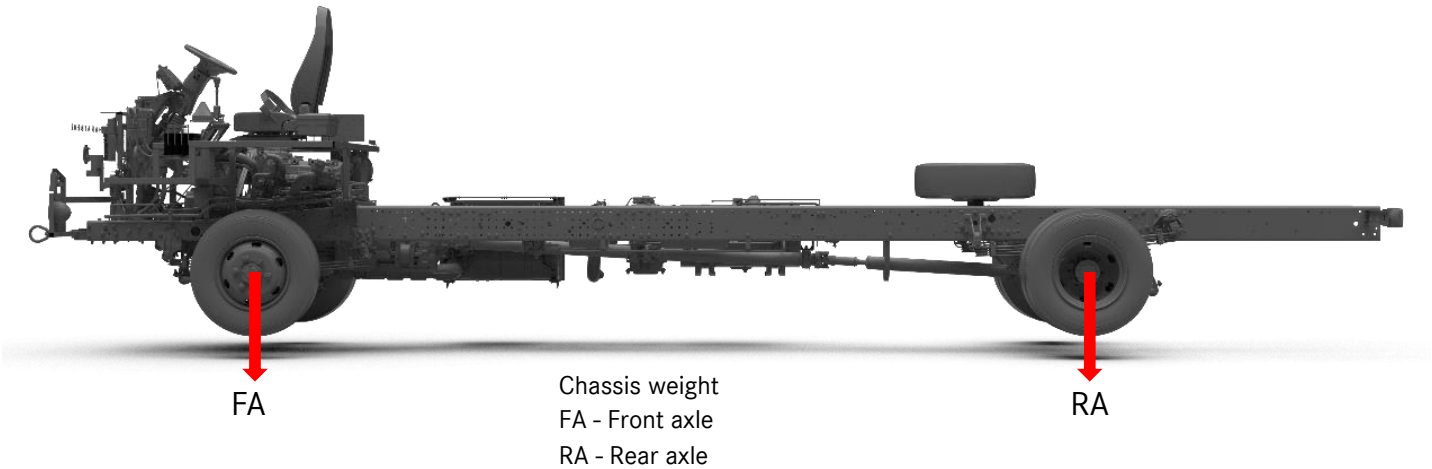
- 1- Recommended position for the BharatBenz Logo.
- 2- Recommended position for the BharatBenz Letters.
- 3- Recommended position for the Bodybuilder trademarks.

Blue colored area: The space other than protected areas (pink color) can be used by the body builder for Body Manufacturer logo/ trademark within the scope of the brand directives.

Chassis Weight

2.1 Reference Values 1904GL01H

The weight values presented below are only for reference. For the adequate dimensioning of the body, the correct weight values must be established according to the chassis composition.



Tab2- Weight Reference values

Chassis	Wheelbase	Front Axle (kg)	Rear Axle (kg)
OF 1014 /1017 BSVI	4,250	1700	1405
OF 1014/1017 BSVI	5,300	1810	1370

Weight: chassis without body, without driver, with fire extinguisher, with tool box, with spare wheel:

Chassis Weight

2.2 Chassis Weight

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OF 1014/1017 5300WB: Weights: chassis without body, without driver, with toolbox, with spare wheel type 235/75R17.5 tires, with fuel tank full, with rear axle AAM 7.14 and front axle IF 3.6, these weights can vary according to the optional fitments.

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Admissible loads per axle

3 Admissible loads per axle

The OF 1014/1017 chassis frames are dimensioned to form a "single" structural set together with the body.

The joining points between the body and the chassis must be distributed to avoid concentration of tensions, and that duly absorbs all the strains applied on the frame.

The Body Builder must ensure that all the interface points and those that are subject to strains are built duly embedded pursuant to the guidelines issued by Daimler Buses India.

The admissible technical loads per axle for the chassis are as follows:

Tab3- Admissible loads per axle

[Kg]	OF 1014/1017 4250 WB	OF 1014/1017 5300 WB
Front Axle	3600	3600
Rear Axle	7000	7000
Total	10600	10600

When the gross weight total of front and rear axles exceed "Technical limit" value of the vehicle, axle maximum values can not be used simultaneously.

The Body Builder must also observe the weight specifications mentioned in the corresponding law. When the technically admissible values and the legal admissible values differ, the one that presents the smallest value must prevail.
No complete vehicle may delivered with a GVW that exceeds the one indicated by the manufacturer.

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GVW = Gross Vehicle Weight = Chassis + Body + Load (passengers + luggage)

Admissible loads per axle

3.1 Admissible loads per axle

To ensure the drivability of the vehicles in all operation conditions: unladen, with partial loads or fully loaded at its GVWR limit, the Body Builder must plan and ensure the building of the body with a load distribution plan that makes possible that the static load on the front steering axle(s), is equal or higher than the one specified in the table presented below.

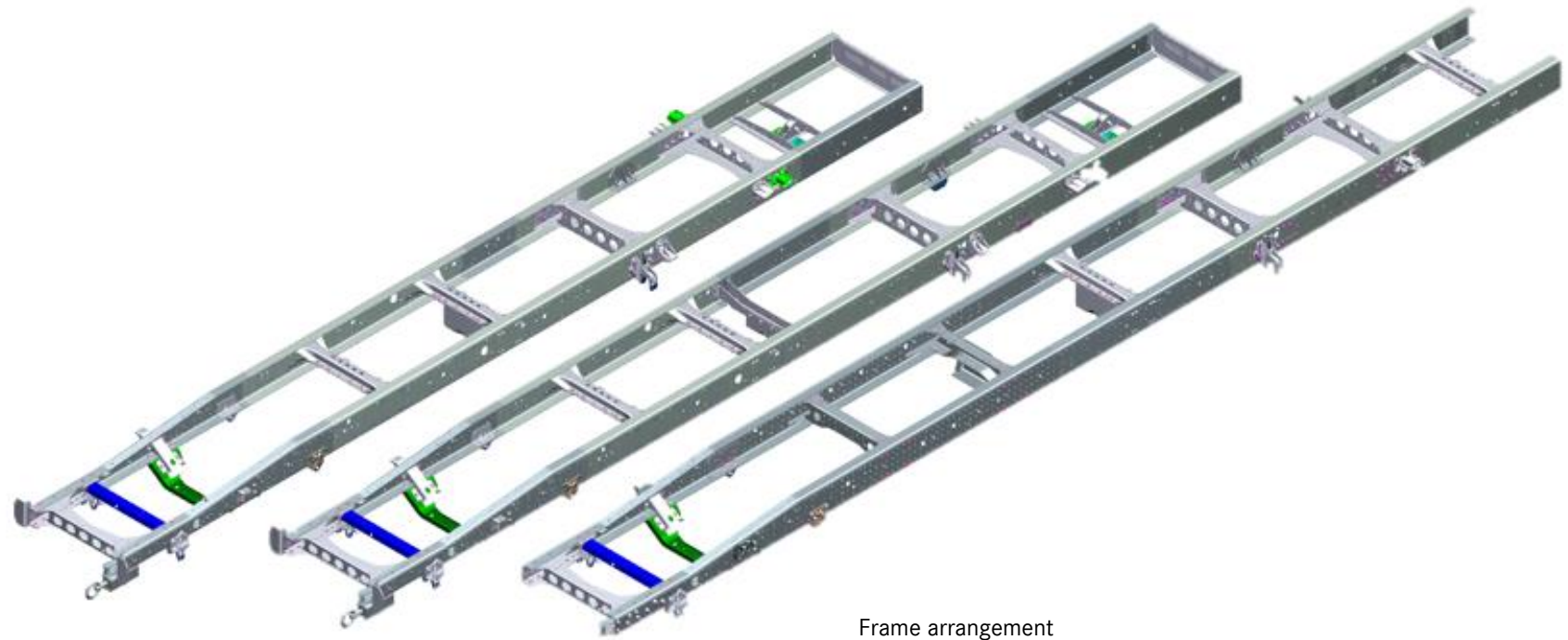
Tab4- Admissible loads per axle

Parameter	Description	OF (All)
Unladen	With the empty vehicle, without any load	25%
Laden (GVW)	With the loaded vehicle/GVW	25%

Vehicle Frame

4.1 Frame arrangement 1904GL01H

The OF 1014/1017 chassis has a single frame concept, of the "ladder type" and with cross members fastened by bolts & rivets. Alteration or removal of any cross member fastener or rivet is not allowed.

**A****B****C**

Frame arrangement

A: 4,250 mm wheelbase frames.

B: 4,800 mm wheelbase frames.

C: 5,300 mm wheelbase frames.

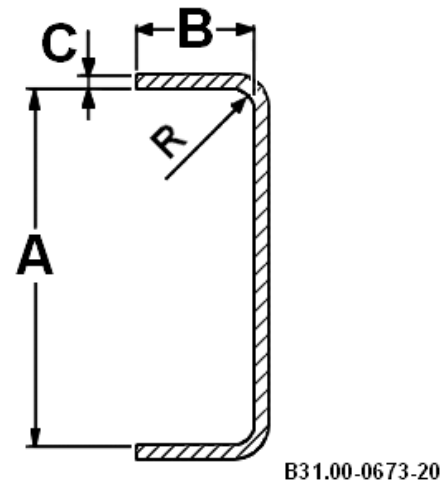
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Vehicle Frame

4.2 Chassis materials 1904GL01H

Tab5- Structure materials

Chassis	Material	Equivalent
OF 1014/1017	BSK 46	NBR 6665 LNE 50



Long member dimensions

- A 216 mm
- B. 80 mm
- C. 6 mm
- R 12 mm

Chassis modifications and adjustments

5.1 First cross member adjustment

No changes or repositioning are allowed for the first cross member of the OF chassis.

Remark:

The first cross member is not designed to receive the towing hook installation or loads.

Chassis modifications and adjustments

5.2 Driver's Podest

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The OF 1014/1017 chassis are delivered with a structural frame platform called as the driver's podest.

In the upper and lower areas, body builder must connect fastening elements to the podest frame with the body lateral structure.

Chassis are supplied with the driver's podest placed in a final position.

In order to facilitate the body assembly, depending on the body design, the driver's podest can be welded or it's components be disassembled (e.g. Electric switches, hand brake lever, instrument cluster, electrical cables etc.) without disturbing the steering column original geometry, pedal positions and driver's ergonomics.

Drivers podest is fastened to chassis frame by means of rigid brackets, modifications to its original geometry are not permitted.

It is mandatory that all modification to the chassis's original configuration must be coordinated and approved by the BBA Daimler Buses India in order to protect Warranty Conditions.

Remark:

The driver cockpit should be integrated to body structure through definitive joints because it is not self supporting.

Chassis modifications and adjustments

5.3 Vertical adjustment of front overhang

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Not applicable.

The longitudinal members are fixed and cannot be adjusted.

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Chassis modifications and adjustments

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5.4 Wheelbase modifications

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Not applicable.
No wheelbase modifications are allowed.

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Chassis modifications and adjustments

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5.5 Rear overhang extension

Extension of the rear overhang of the OF chassis is allowed as long as the admissible weight limits are observed (legal and technical) and the constructive limits for the rear overhang.

The departure angle must be kept within the established limits.

The extension of the vehicle frame must be done according to the following technical prescriptions:

- In the preparation of the extension, the Body Builder must provide for the additional cross members, in adequate quantity and distribution to keep unchanged the vehicle frame rigidity.
- The material used for the frame extension and for preparation of the new cross members, fastening plates and reinforcement pieces, must have thickness and quality equivalent to those of the original vehicle frame, as described in the chapter "Chassis Material" page 17.
- The welding should be carried out as recommended in the chapter 3.13 - Welding techniques/welding methods - of the manual Guidelines for Body Building - "General Manual".
- After welding the vehicle frame longitudinal members, apply reinforcements symmetrically in both sides of the frame. To avoid cracks in the spot weld and to preserve the longitudinal members elasticity, weld or bolt the reinforcement pieces to the frame in the shape of beveled corner plates and, at the ends, forming a common face with the upper or lower tabs of the longitudinal member. Keep enough distance between the longitudinal member web and the upper and lower reinforcement corner plates.
- For OF chassis, the rear overhang dimension is technically limited to 60% of the wheelbase value to assure vehicle drivability according to the proper weight distribution

Remark:

A cross member must be mounted at the rear end, even if the frame extension and/or towing coupling have not been planned.

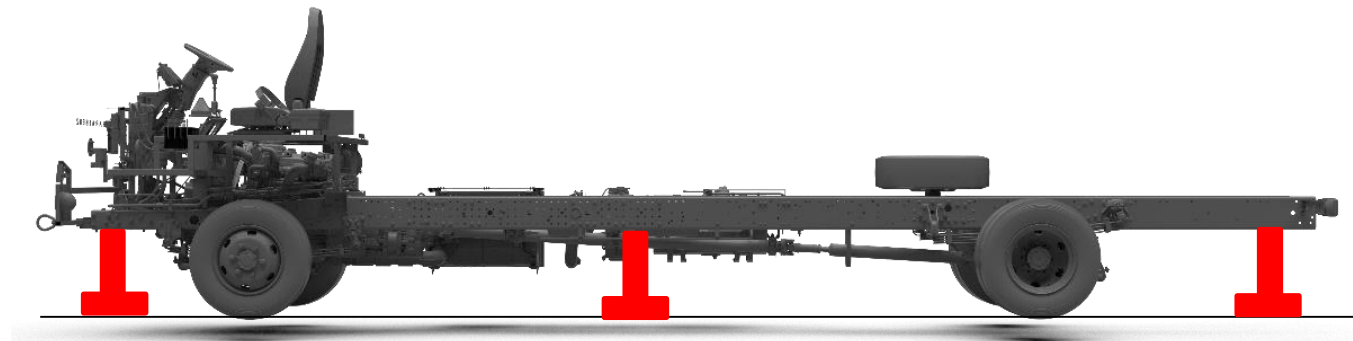
Chassis modifications and adjustments

6.1 Chassis alignment and leveling

The OF chassis should be supported on a flat horizontal floor, duly with chokes and supported on racks as per the figure below. They must not be subject to strains and stresses caused by the weight of the engine and the transmission.

The figure below is illustrative.

The necessary quantity and the arrangement of the devices should be established by the Body Builder, in such a manner that the chassis alignment conforms the respective offer drawings



Chassis alignment and leveling

During the leveling process the chassis must be leveled with reference to the corresponding proposal offer.

The devices must be supported exclusively on the vehicle frame longitudinal members. The use of mechanic components such as those is not allowed: engine, transmission, axles, articulations, etc. Crossmembers and wings must not be used as support points.

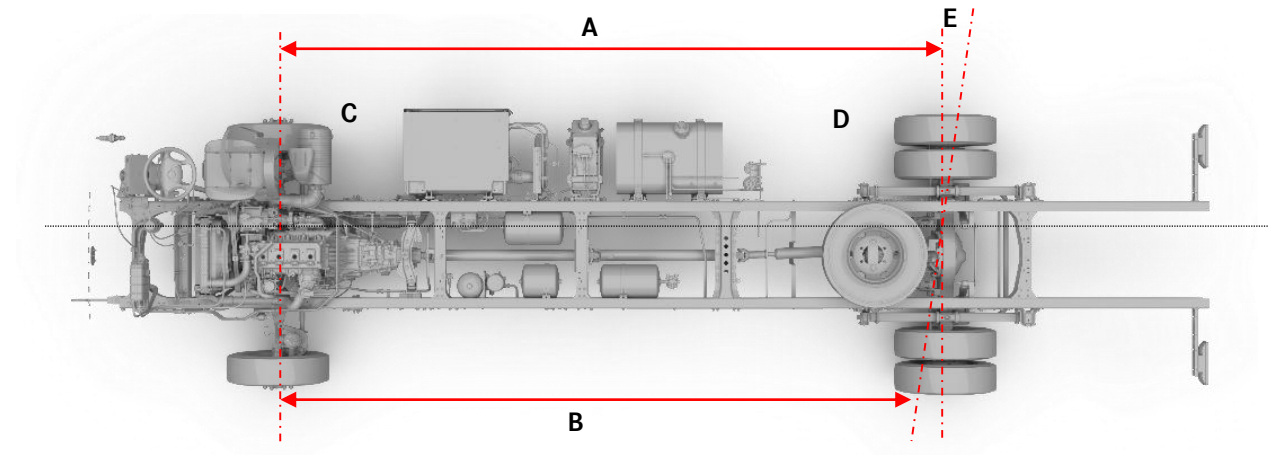
The devices used in the leveling process must be rigid enough to ensure that the movements of people on the chassis or dimensional variations due to its own weight, transport and storage do not compromise the process. These devices must not be removed until the complete fastening of the body structure on the vehicle frame.

The chassis leveling must be ensured in other directions, the longitudinal and the transverse direction.

Chassis modifications and adjustments

6.2 Chassis alignment 1904GL01H

For complete vehicles, it must be ensured that the misalignment between the axles does not exceed the maximum values indicated below:



Chassis alignment

$(A - B) \text{ or } (B - A) = \text{maximum } 5 \text{ mm}$

$E^\circ = 0 \pm 15'$

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It is the manufacturer's responsibility to prevent that the misalignment of the axles does not exceed the specified maximum values, to ensure the perfect drivability and stability conditions.

Interface Between the Body and Chassis

7.1 Areas for body fastening

The OF chassis are not freestanding. The assurance of its integrity is shared with the body structure. The correct fastening of the body to the chassis is extremely important to keep the structural stability of the set, avoiding concentration of tensions and dynamic loads.

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Welding or drilling holes in the longitudinal member and frame cross members tabs are not allowed.

To fasten the body on the chassis, it is mandatory to use bolt elements. Periodic maintenance must be carried out for tightening of loosened body connections during service intervals.

The body structure must be designed and assembled in such a manner that they ensure the structural stability of the bus set (chassis + body) pursuant to the dimension values specified in the offer drawings of the focused chassis, and/or other technical information made available by Daimler Buses India.

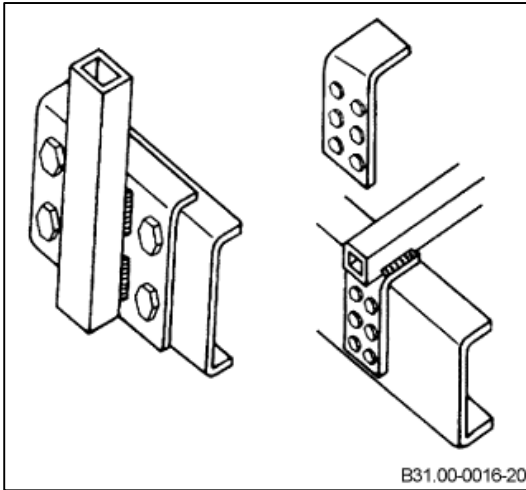
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Daimler Buses India does not interfere in the structural project of the body, which is sole responsibility of its manufacturer. Daimler Buses India makes available fastening points and relevant guidance to make possible the interface between the body and the chassis. The Daimler Buses India chassis have been designed, tested and produced to meet the requirements of the relevant applications.

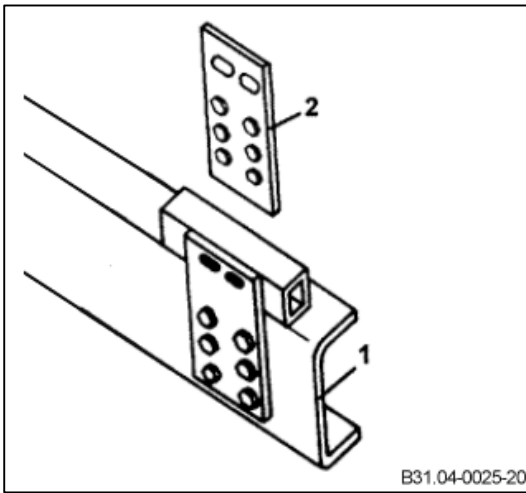
During the development of the body, the Body Builder must pay attention to the correct applications and to the legal and technical limits of the final bus set (chassis + body).

Interface Between the Body and Chassis

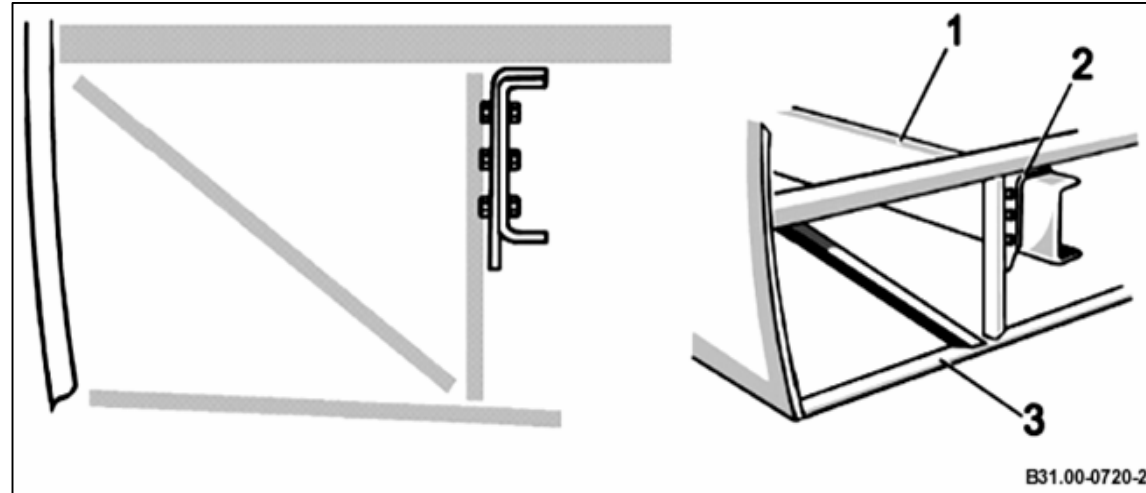
7.1 Areas for body fastening



Body fastening by means of corner plates



Body fastening by means of corner plates



Body fastening by means of corner plates

- 1 Chassis rail
- 2 Fastening corner plate
- 3 Auxiliary structure

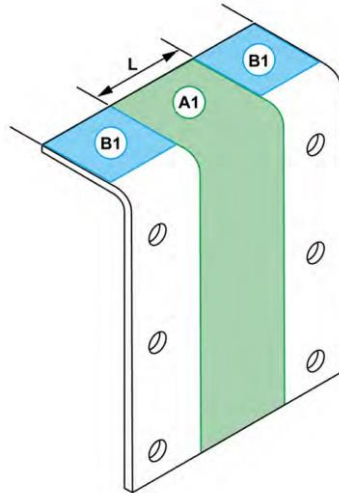
The plate must be fastened to the chassis rail exclusively by ISO 8765 class bolts with a minimum rating of 10.9. Rivets for fastening cross members may be replaced for this purpose by bolts of suitable length and the aforementioned classification.

The profiles used for fastening the structure to the chassis frame must be made of bent or stamped sheet steel with the same thickness as the chassis rail and mechanical properties compatible with those indicated in chapter "Chassis material"

For examples of body fastening to chassis frame, see illustrations.

7.1 Regions for the Body Fastening

Interface Between the Body and Chassis



Support for the Interface Between the Body and Chassis Structures:

A1 - ("green" area) Area serving as interface for the Body Builder

B1 - ("blue" area) The Body Builder decides whether this area will be used for body structuring

L - The value must ensure the access and the integrity of the fastening bolt heads that serve to fasten the plates to the longitudinal members webs.

It is essential that the whole available area on the support, highlighted in green color in the figure in the previous page, is used to avoid deformation of the interface supports and consequently of the longitudinal members ("spring" effect) and to provide an adequate interface between the body structure and the vehicle frame.

On these supports, the cross members (or extensions) of the body base structure must be welded to the upper part, associated to the "wings" that join the body lateral parts (side cross members or their supplementary components).

Welding's should not be applied next to upper and lower ends of the holder as well as they can not be used in the bending radius area.

For the fastenings screwed between the holder and the vehicle frame of the longitudinal member, use bolts with flange M14x1.5-10.9. Apply a torque of 172 ± 13 Nm.

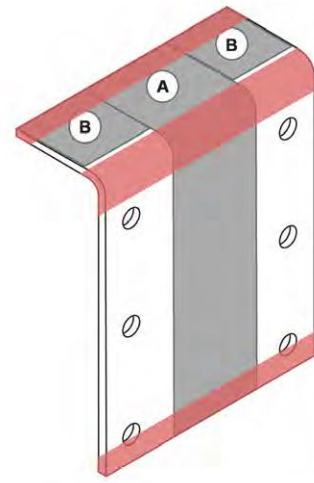
Use at least four bolts in each holder observing the minimum distance of 50 mm between the holes.

To avoid interferences in all operation conditions, the Body Builder should foresee the movements between the axles, steering system, suspension etc during the development and assembly of the holders.

Trimings are not allowed in the longitudinal members, except for the trimings aiming at rear overhang dimension adequacy.

In case new holes in the longitudinal members are necessary, they should be drilled as per chapter 3.10 Chassis Drilling in the Guidelines for Body Building - "General Manual".

It is not allowed the installation of feed-through type luggage compartment in the wheelbase area due to the propeller shaft arrangement.



Not adequate areas for welding

Interface Between the Body and Chassis

7.2 Unsuitable areas for body fastening

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Drilling holes in the longitudinal members and frame crossmembers tabs are not allowed.
Weld fastenings are not allowed on the vehicle frame..

Important:

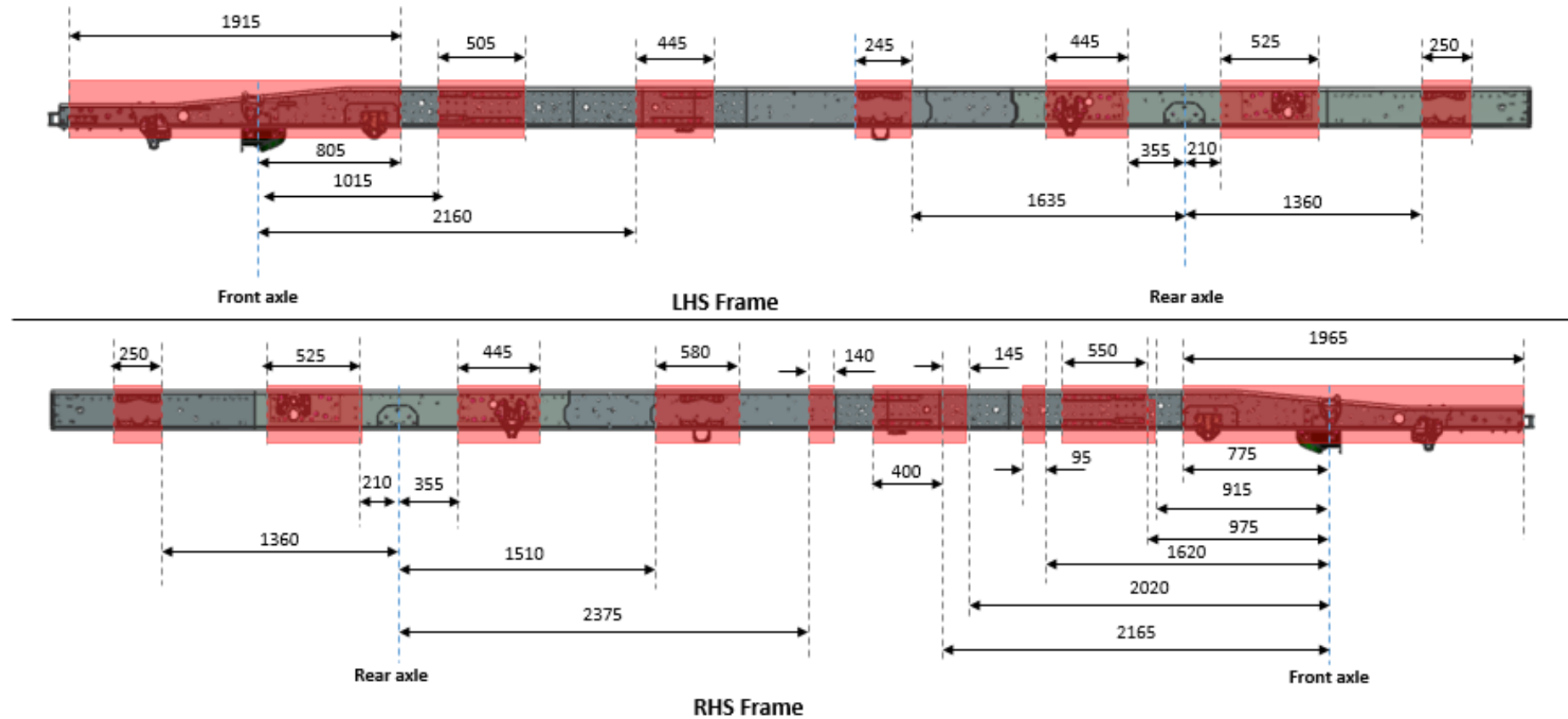
Due to possible harm to the chassis structure, weld application on the vehicle frame will lead to warranty void.

In some areas of the chassis, no fastening type can be introduced:

- In the longitudinal members area where the following items are fastened:
 - Cross member of the transmission.
 - Steering gearbox
 - Mounts of the power train (Engine, Gearbox, transmission shaft)
 - Fuel tank.
 - Spring fastening holders.
 - Stabilizer bar holders.
 - On chassis numbering.
 - On cross member of the chassis frame.
 - On the supporting structure of the coolers set.
 - On longitudinal members tabs.

Unsuitable areas for body fastening

Interface Between the Body and Chassis



Interface Between the Body and Chassis

7.3 Frame ends

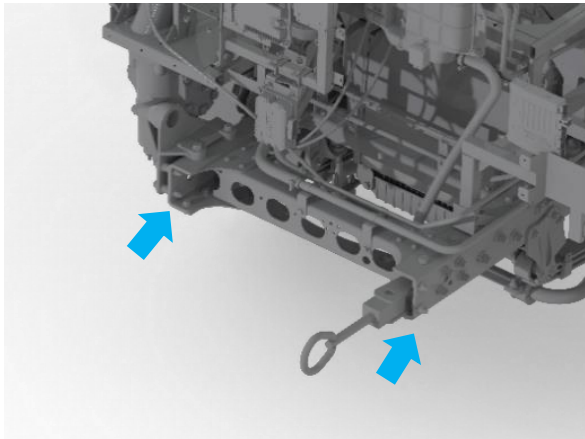
Due to the arrangement of the power train set in the OF chassis front area, changes to the front overhang are not allowed.

The rear overhang may be altered as explained in chapter “Rear Overhang Extension” ¶ page 29.

At the end of the front overhang, an additional 80 mm are available to fasten the body structure.

Body fastening in this area can be done exclusively using bolts, welding is not allowed. Use at least three bolts with flange M14x1.5-10.9 and apply torque of 172 ± 13 Nm.

Drill holes as per chapter 3.10 Chassis Drilling of the manual Guidelines for Body Building - “General Manual”.



Frame ends- Front

Important:

When positioning body supports in the suspension area, spring travel must be taken into consideration.

Interface Between the Body and Chassis

7.1 Wheelhouses

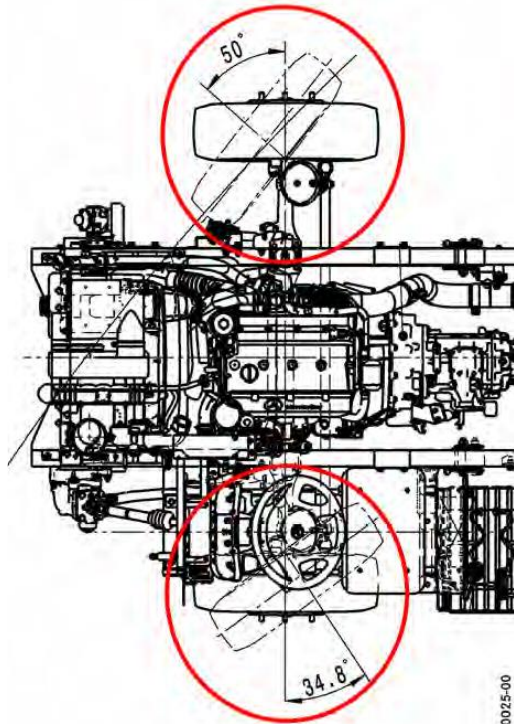
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The wheelhouses must make possible the free movement of the wheels, i.e., the wheels must not have their movement prevented when they are fully turned or during the flexure of the suspension system. Foresee clearances for the steering system movements.

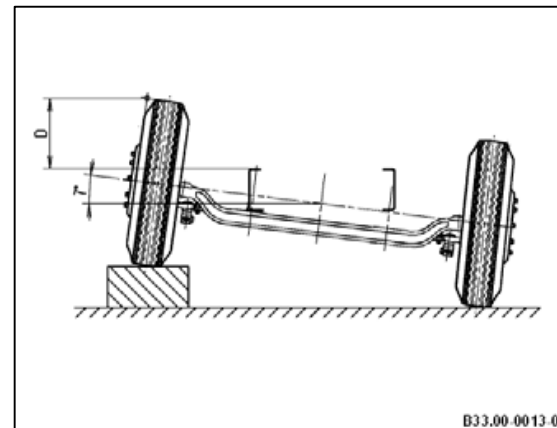
The dimensions of the wheelhouses, indicated in the respective offer drawings, must be considered as minimum reference values. When the wheelhouses is designed, please take into account the tires dimensions, the possible use of anti-skid chains and the ventilation

Remark:

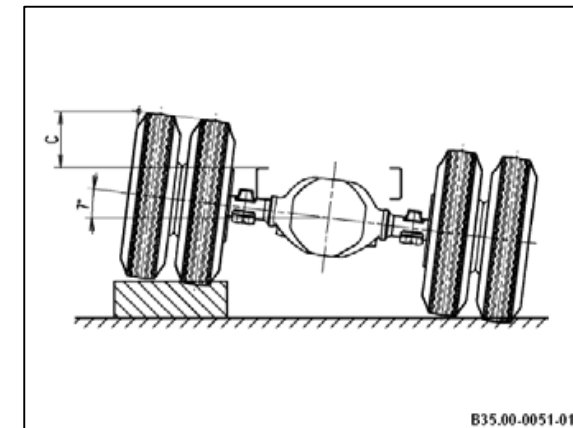
Check height values "C" and "D" updated values in the respective offer drawings, according to the adopted versions.



Steering angle



Front axle



Rear axle

Interface Between the Body and Chassis

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7.5 Central Unit Structure

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Not applicable.

Regarding OF chassis, the removal of the central part of the vehicle frame is not allowed to install the feed-through type luggage compartment in the wheelbase.

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Cooling System

8 Cooling system

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The coolers must be kept in their initial position, in such a manner that the fastening mounts may operate freely. The air cooler must be protected before the execution of any services, to avoid damages to the fins. The cooler must not be painted.

To ensure enough air flow for the coolers, do not put stickers, plates or other adornment pieces.

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The support structure of the cooling system is self-standing, i.e, they do not need to be tied to the body. Drilling holes, trimming and welding are not allowed to be done in this structure and also in their support points.

A clearance larger than 50 mm must be kept between the surface of the coolers set support structure ("cage", including its components) and the body parts (engine cover, side panel, etc.), to meet the requirements of possible manufacturing variations .

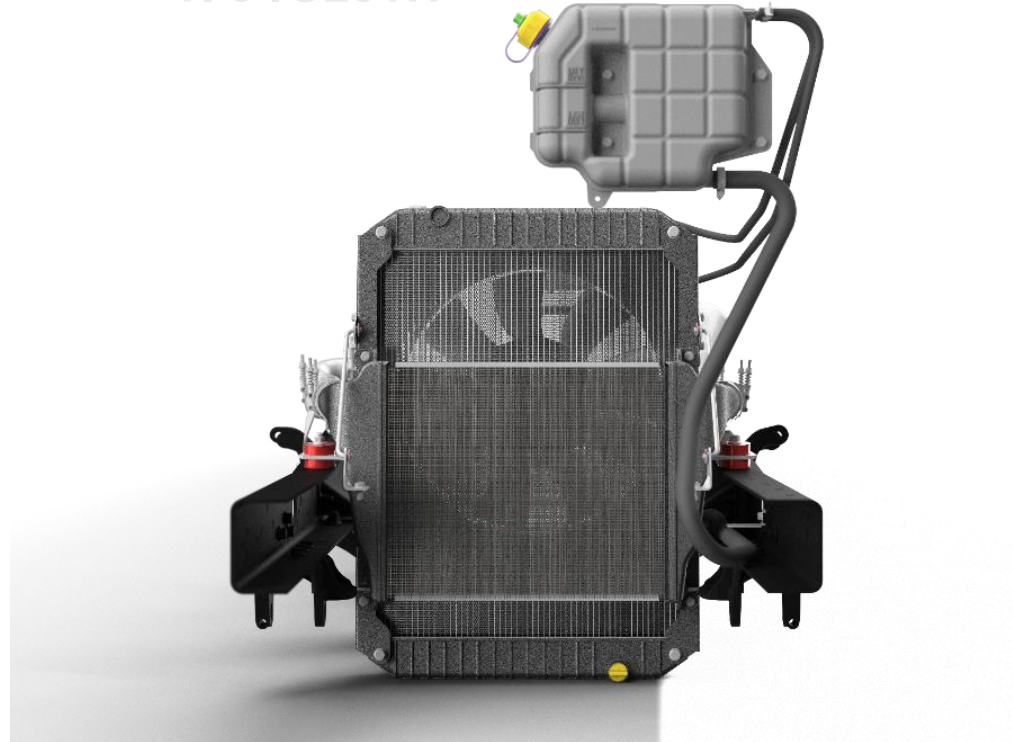
The body must be equipped with an access cover to the cooling system, big enough to make possible the maintenance of the coolers (including replacement works).

When the body has cross members in this area that make it impossible or difficult to carry out the maintenance services, they must be produced in a manner that renders them removable..

8.1 Radiators fixation structure

Cooling System

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Sustaining structures of the radiators

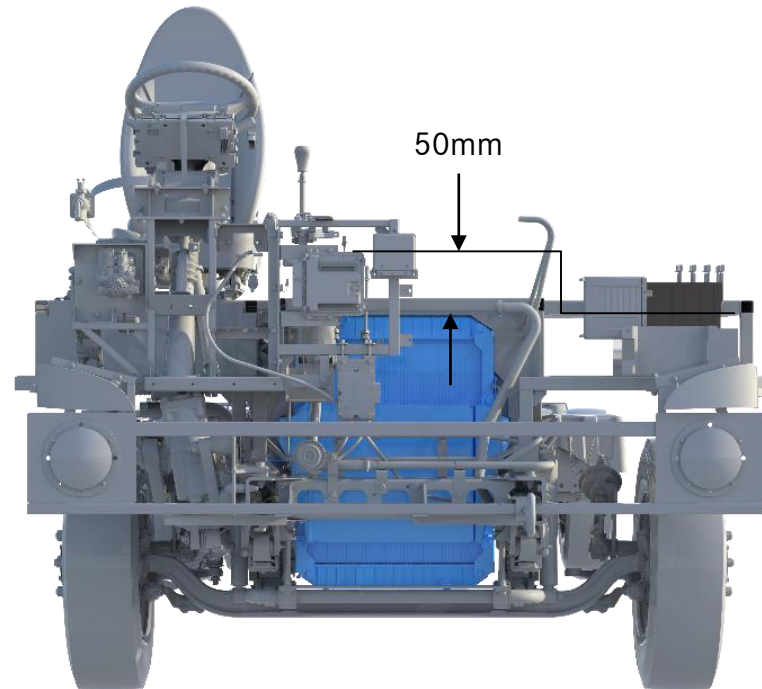
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Fastenings of the body to the coolers support structure are not allowed.

Cooling System

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Ensure a minimum clearance of a minimum of 50 mm between the radiators support structure and the front panel and/or the body front structure.

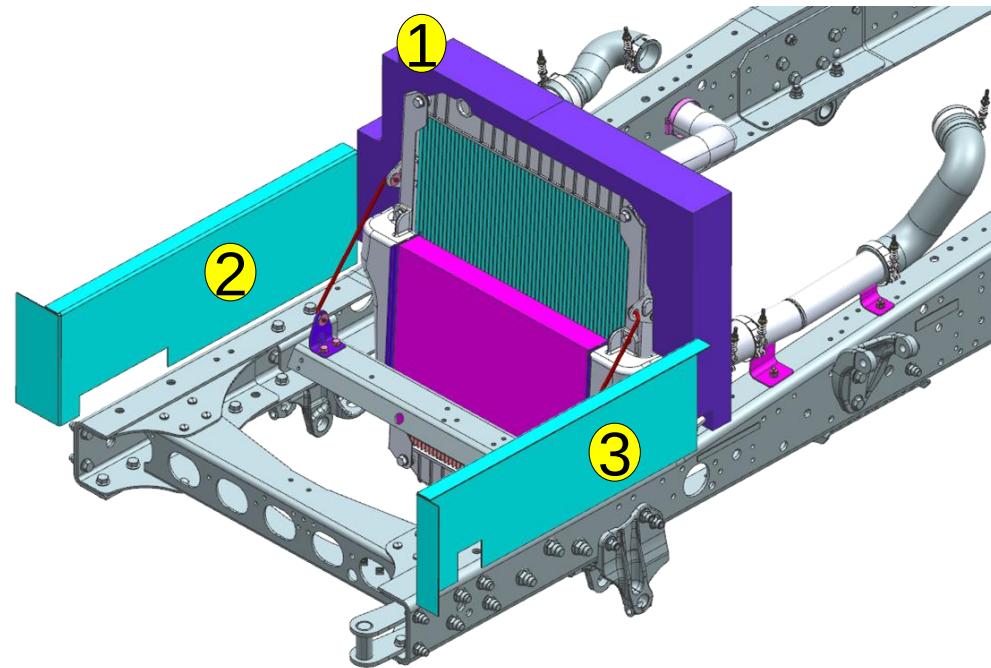


Min. gap between cooling system

Cooling System

8.2 Radiators' compartment

The original configuration used in the cooling system of the chassis requires the body builder of assembling additional deflectors between the radiators' set and the engine. also, the body needs to have openings at the radiators' front part, as described in "Cooling system openings" [page 33](#).

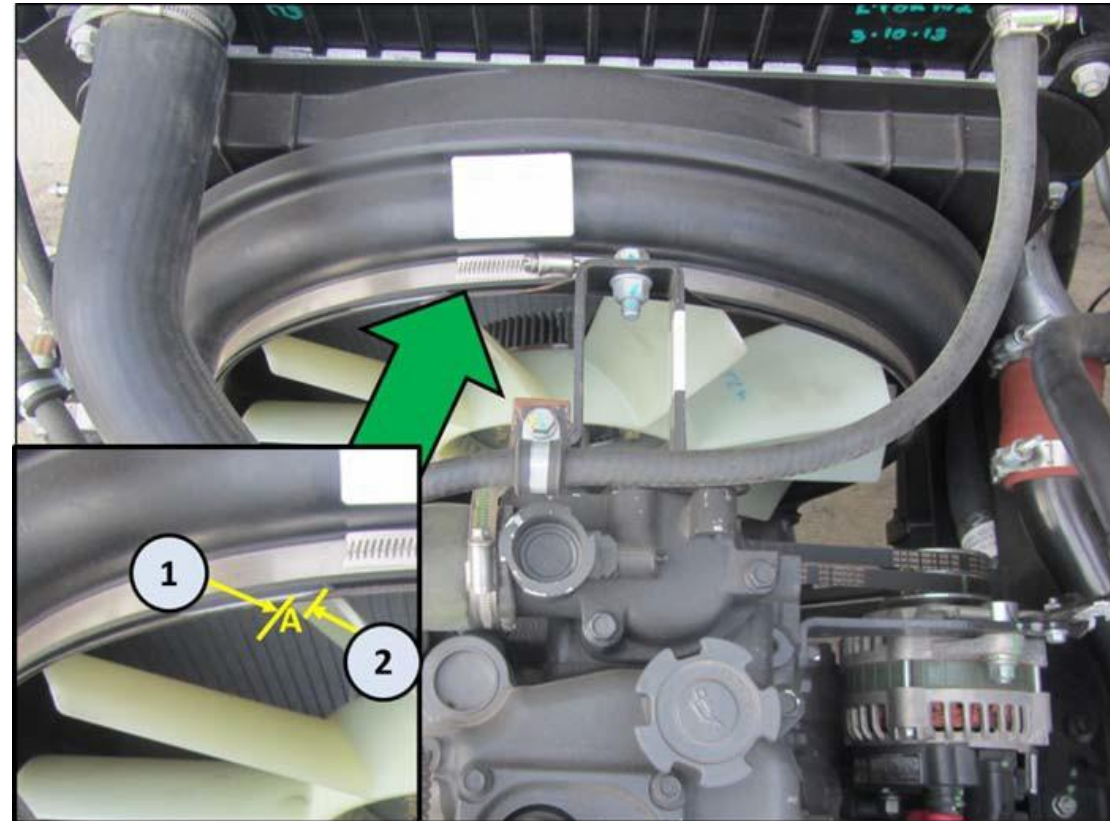


Radiator sealing

8.3 Radiators' fan and air deflector

Cooling System

It is necessary to centralize the wind deflector with regard to the fan, with a minimum distance “A” in the radius between the deflector and the tip of the fan propeller, as shown



Fan blade positioning

1 Sealing shroud

2 Fan blade

A Minimum clearance = 5 to 7 mm

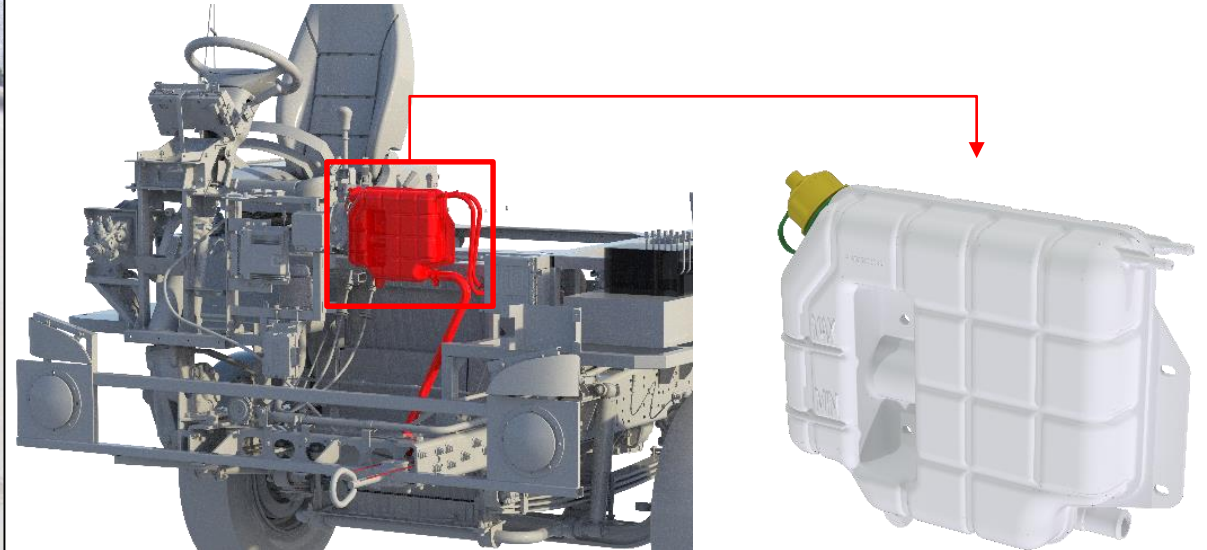
8.4 Expansion tank

Cooling System

The expansion tank must be kept, whenever possible, in its original position. However, it can be mounted on body structure keeping same height with respect to radiator. If it is mounted on body structure, height from radiator top tank to DAT must be ensured as original position. Reposition on body must be approved by Daimler Buses India.



Expansion tank Temporary position



Expansion tank

Body builder can use the same support structure for mounting expansion tank which is provided with the chassis, but further strengthening is mandatory as this structure is meant for transportation usage.

Repositioning of expansion tank, if necessary, must be previously approved by Daimler Buses India.

The expansion tank mouth must permit free access for its replenishment with a watering can and/or automatic equipment (pistol with flow control).

Expansion tank caps are also pressure regulating valves and must not be exchanged or modified.

Cooling System

8.5 Cooling system openings

The frontal area for the radiators cooling must have free aspiration, located just in front and centered to the radiators and have a minimum opening as mentioned below.



Free area for Cooling System

Variant	Frontal Opening
OF 1014/1017 BS VI	35dm2

!

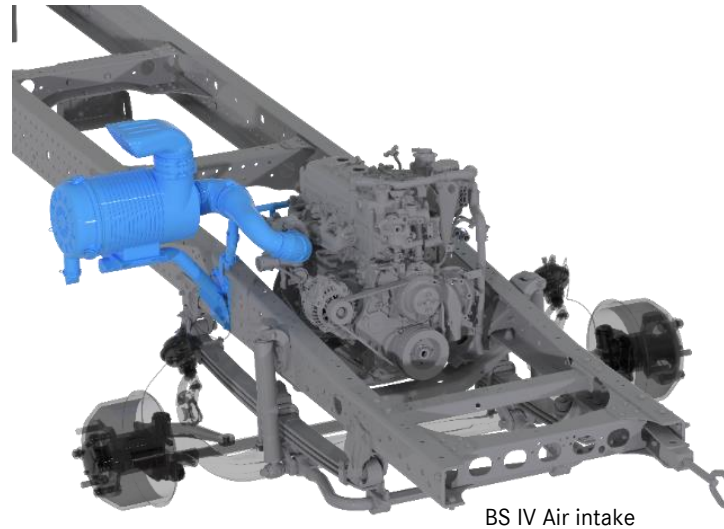
The unobstructed air intake openings must be positioned immediately in front of the radiators.

Engine Air Intake System

9.1 Engine Air Intake System

1904GL01H

It is highly important that the engine receives enough air quantity for the combustion and such air must be free of dust and impurities. It is important that the intake system is dimensioned and designed in such a manner that satisfies these needs. During the body building process, the whole intake air system must be protected from impacts or paint residues.



BS IV Air intake

!

The air filter assembly must not be repositioned.

!

If necessary, disassemble the air filter snorkel (suction mouth) during the body building process, the connection hose between the air filter and the engine Turbo must be immediately sealed after the removal of the air filter and kept that way during the entire body building process. Remove the seals only during the air filter installation.

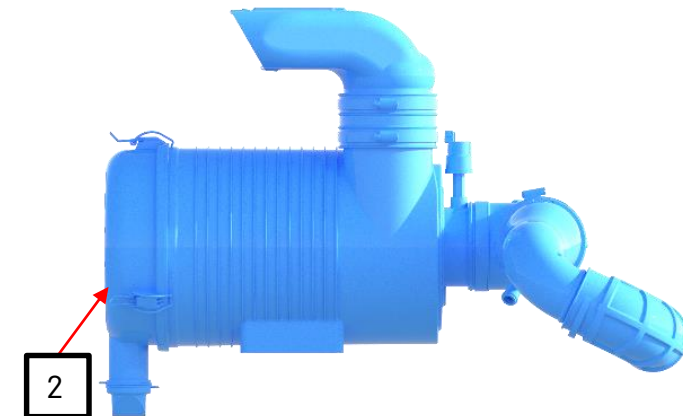
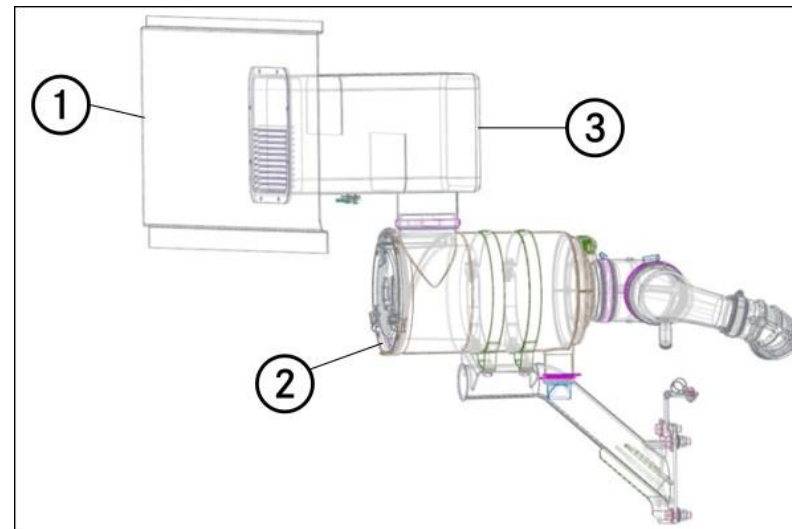
Engine Air Intake System

9.2 Air intake box

The OF 1014/1017 chassis are originally delivered with an air intake filter in the final position, and must not be changed without prior written technical approval from BBA, Daimler Buses India.

The air intake box can be disassembled to prevent damages during the process of coupling chassis/body, however The air filter inlet should be sealed in order to avoid residues getting in.

It must be ensured that maintenance access is provided in the body to inspect the air intake system.



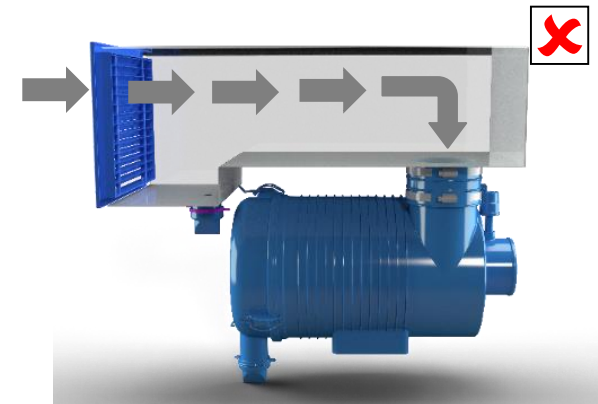
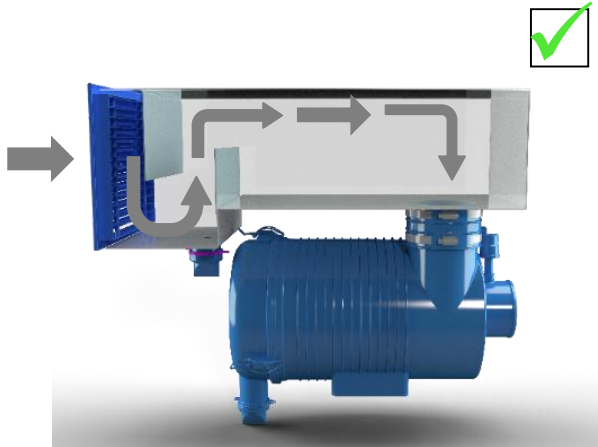
- Air intake box
- 1 Body panel
 - 2 Air filter
 - 3 Air intake box

Engine Air Intake System

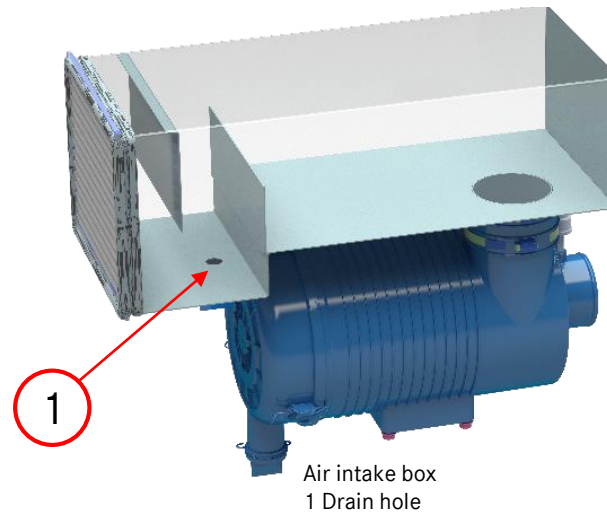
9.2 Air intake box

Air intake boxes must be provided in the front area (next to the air filter), according to the following instructions:

- Air intake box should be provided with sidewall openings;



Air intake box



- Air intake boxes must be provided with internal drains to avoid water and residue accumulation;
- It is recommended that the lower part of the air intake box be slightly tilted to allow draining, and that it be positioned at a level between 50 and 100 mm below the air intake opening of the filter.
- Internal drain in air intake box lower part to avoid accumulation of water.

If there is any possibility of water reaching the filter element (while washing the vehicle, for example), deflectors must be installed to separate the water, observing full load maximum restriction value of 25 mbar measured at the air filter outlet (maintenance and indicator nozzle) as per description in chapter 3.21 Air intake system restriction - Body Building Directives.

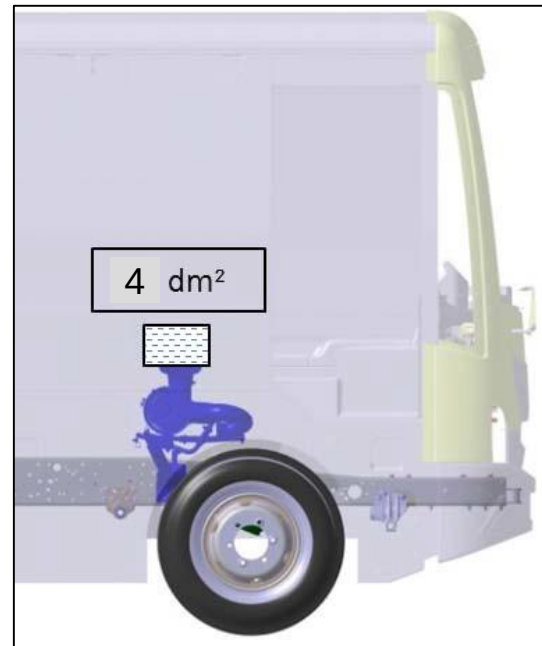
Engine Air Intake System

9.3 Air intake opening 1904GL01H

The body opening for air intake to the engine must have a minimum area of:

Tab6- Air intake opening

Chassis	Filter position	Minimum area (dm ²)
OF 1014 /1017	Right-hand side	4

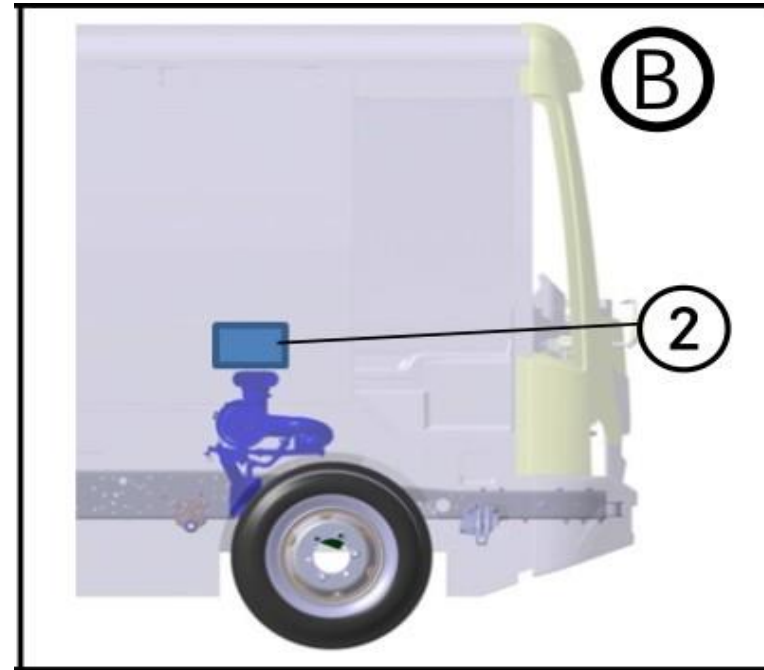


Air intake opening

Engine Air Intake System

9.4 Air intake position 1904GL01H

OF1014/1017 chassis equipped with position "B" need to be provided with an air intake box, according to construction details contained in chapter ["Air intake box"](#) ¶ page 37.

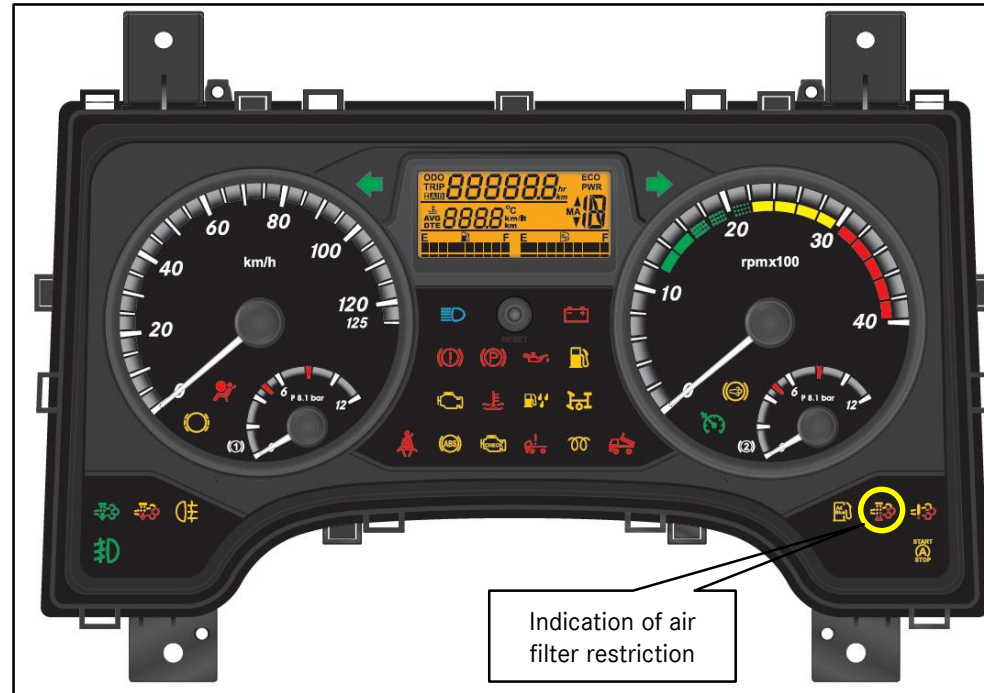


- B Positioned at rear of front axle
- 2 Air intake box

Engine Air Intake System

9.5 Air filter restriction level sensor

The chassis OF 1014/1017 are equipped with electronic sensor with indication of air filter restriction. During the body building process, the sensor must be protected against impacts or painting residues to prevent dirty from entering in the air inlet.

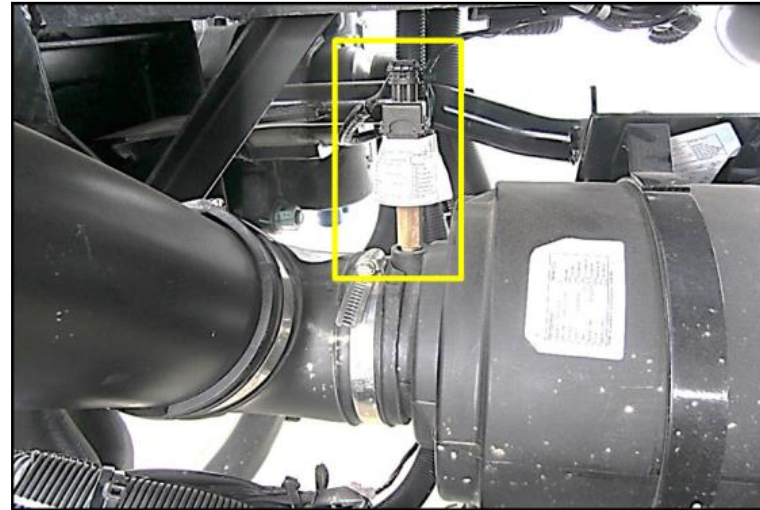


Air filter restriction indication on instrument cluster

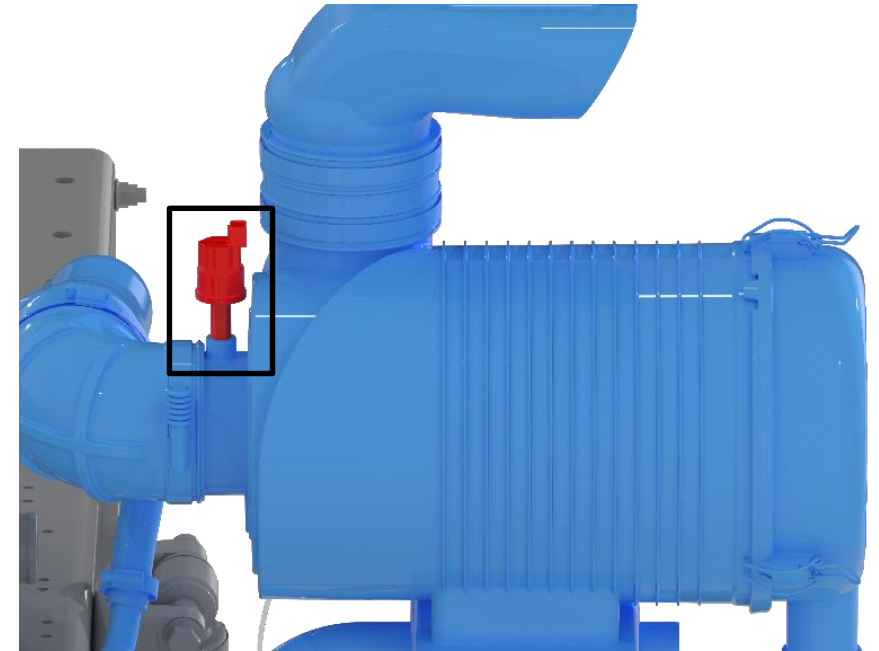
Engine Air Intake System

9.5 Air filter restriction level sensor

The chassis OF1014/1017 are equipped with electronic sensor with indication of air filter restriction. During the body building process, the sensor must be protected against impacts or painting residues to prevent dirty from entering in the air inlet.



Air filter restriction sensor- EURO III/IV Chassis

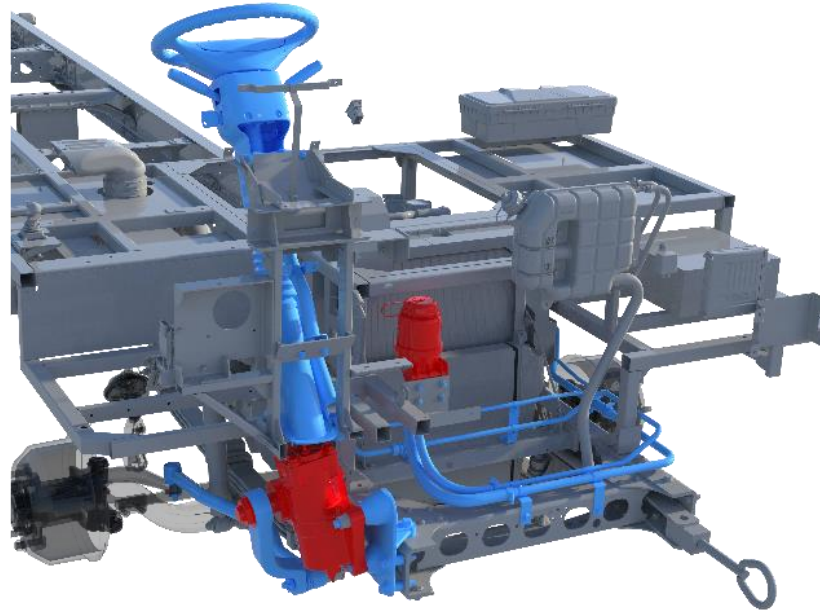


Air filter restriction sensor- BS6 Chassis

Steering System

10.1 Steering system

The position of the steering gear and transfer box consoles must not be altered.



Steering gear position

Special care with steering system during the body mounting process:

The steering components must be adequately protected during the welding and painting process.

- The use of steering system components to carry out tests of welding electrodes and/or to connect to ground the welding equipment.
- During the drilling and trimming operations, take care not to damage the hydraulic line.

Check for leaks the power steering system, mainly around the connections, when completing the installation of the body.

Steering System

10.2 Power steering oil reservoir

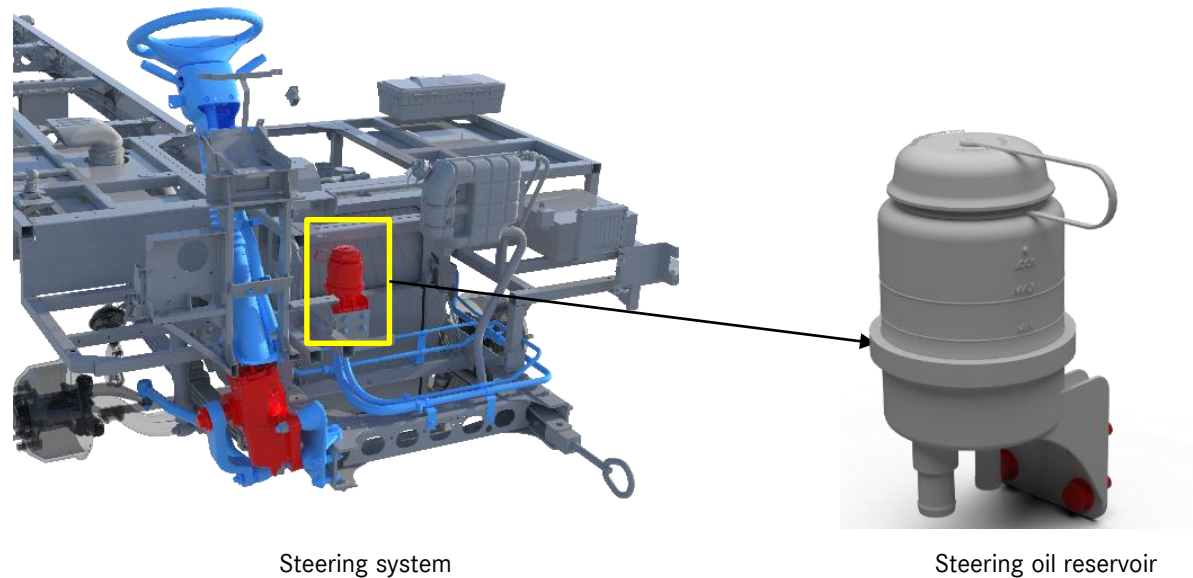
Do not reposition the power steering oil reservoir as changing the original pre-molded hoses of the chassis is not allowed.

It is necessary to ensure the access to refuel through the front cover, or through the upper part, inside the vehicle.

Power steering oil reservoir must be protected against painting overspray.



Power Steering Oil reservoir position



Steering system

Steering oil reservoir

!

Disassembly of Alterations on hydraulic piping are not allowed.

Steering System

1904GL01H

10.3 Adjustable steering column

The OF 1014/1017 chassis are fitted with adjustable steering column, with the objective of its adaptation to the driver position. the body builder will have to foresee, while building of the vehicle's dashboard, a distance to the steering column that enables all assembly conditions.

The body dashboard will need to have a minimum clearance of 5 mm for all steering column adjusting positions.

The steering wheel adjusting positions are indicated in the respective offer drawings, they should be considered minimum values.

Modifications or disassembly of steering column to it's mounting brackets and steering gearbox is not permitted during body assembly process.

Remark:

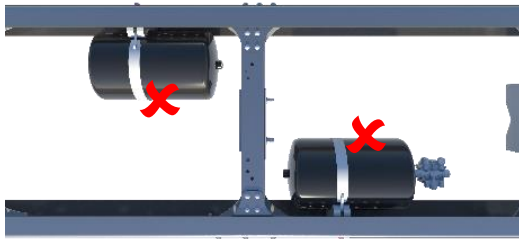
Do not Disassemble the steering column or any of its mounting brackets.

For adjustment the steering column refer the respected chassis offer drawing.

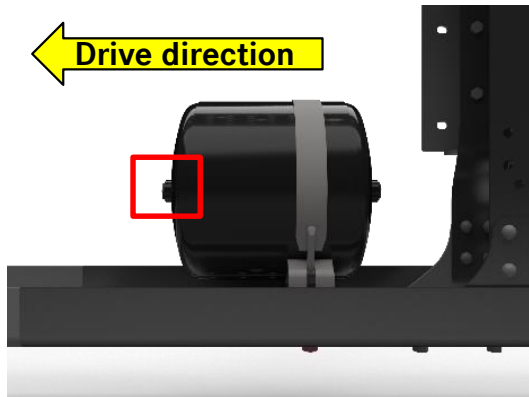
Pneumatic System



11.1 Pneumatic connection for auxiliary services BSVI Chassis



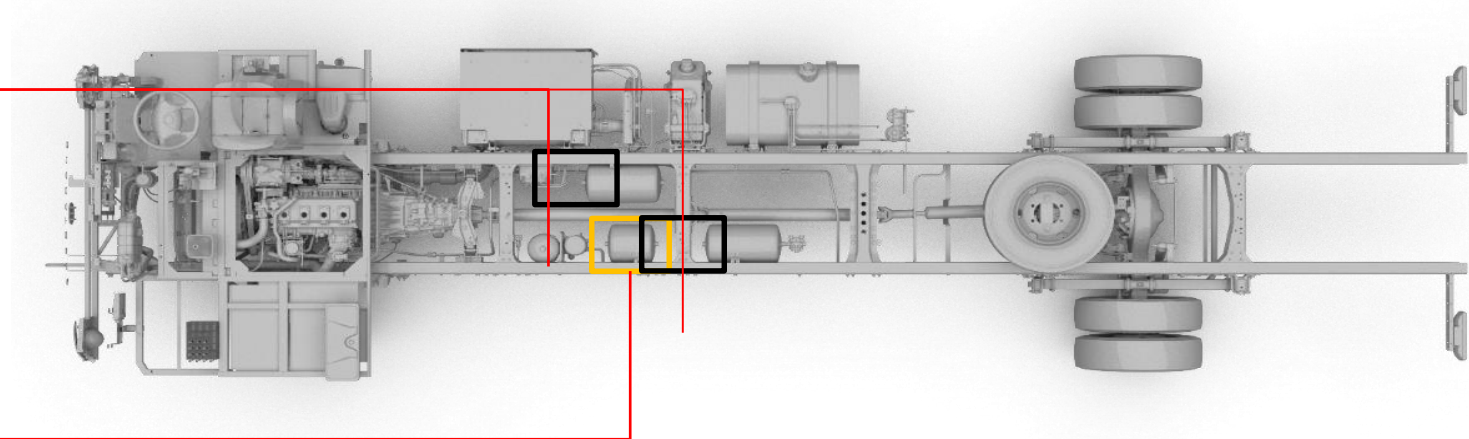
Position of compressed air tank for Service Brakes
Not suitable for



Auxiliary tank B42.00-1010-01
Position of auxiliary tank on the chassis

Air actuated body accessories such as horn, door operation, etc., must not be, in any way, connected directly to the parking or service brake circuit as well as the air tanks (capacity 25 L).

The air supply shall be exclusively taken from auxiliary tank (capacity 15 L) as shown below, which is foreseen for driving auxiliary equipment for OF 1014/1017 Chassis.



Position of Air tank on OF1014/1017 chassis

Pneumatic System

1904GL01H

11.2 Pneumatic piping (connection plates)

i

Not applicable.

Exclusive item for the buggy-type chassis.

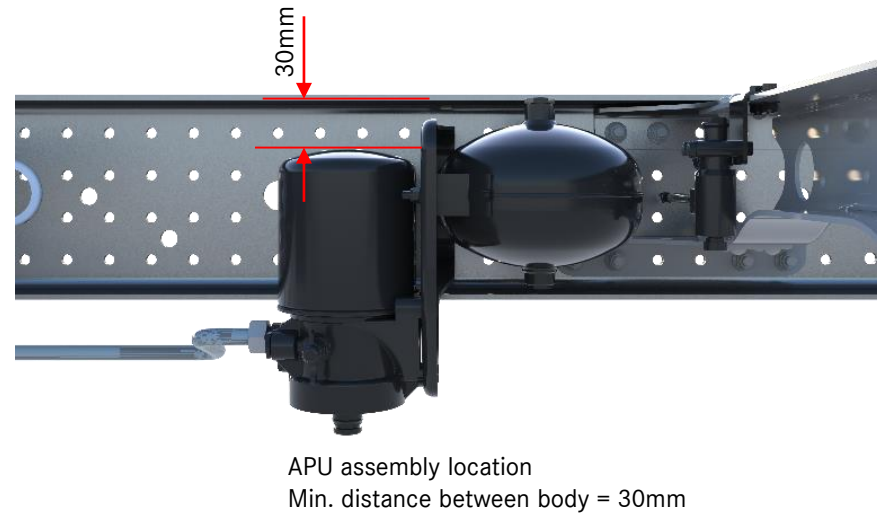
1904GL01H

Pneumatic System

11.3 APU (Air Pressure Unit) 1904GL01H

The position of the APU (Air Pressure Unit) set is the definitive one, and must not be altered. Prepare access for the removal, to facilitate the maintenance.

Provide an “A” clearance of 30mm on the APU set to make its removal possible



!

Do not start the engine while the APU (Air Pressure Unit) control pipe is removed.

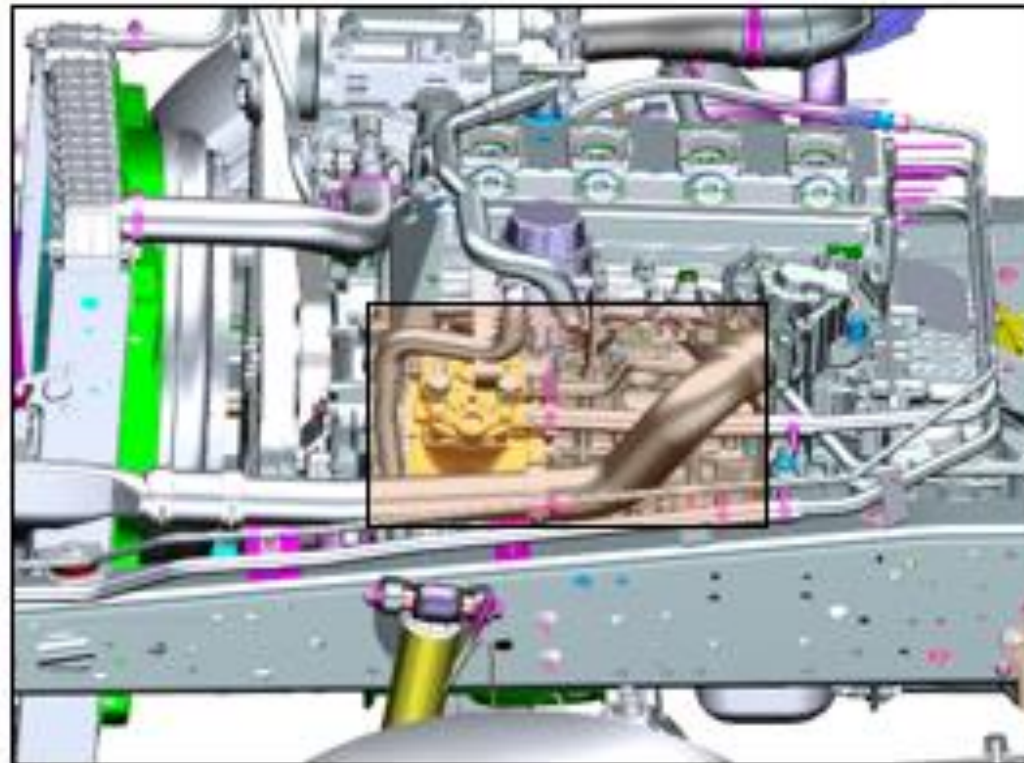
Pneumatic System

11.4 Compressors

1904GL01H

The chassis compressors are actuated by gears and are coupled to the engine.

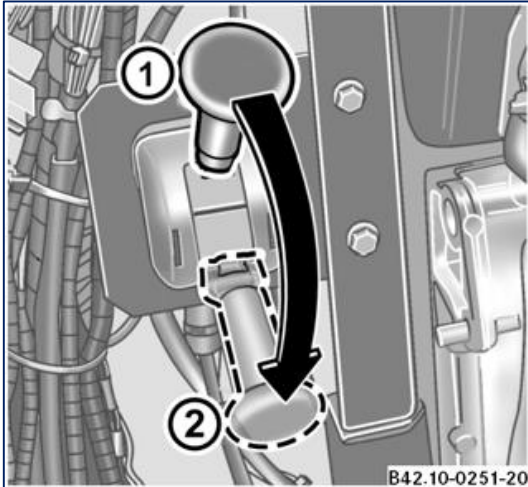
While manufacturing the engine cover, it is necessary to consider access to the upper part of the compressor.



Air compressor

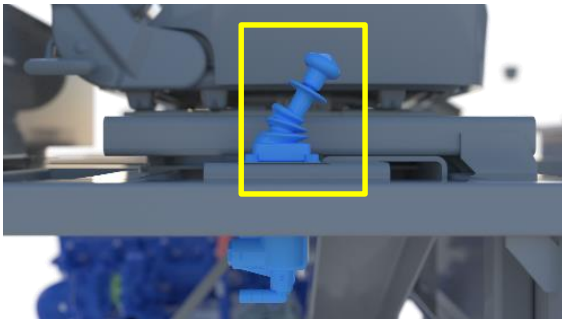
12 Brake system

Brake System



Parking brake lever

1. Actuated brake
2. Released brake



The chassis brake system must not be changed.
During the body building processes, the systems must be duly protected.

Do not insert derivations in the brake circuits, as the use of the connections previously made available in the chassis for the actuation of the pneumatic components as described in the chapter “Compressed-air Connection for Accessories” ¶ page 63 is compulsory.

The Body Builder must carry out inspections to identify possible leakage and/or damages in the components after the completion of the body installation process. Before the dynamic assessments are carried out, all the systems must be duly reviewed and corrected as a safety measure.

If doubts arise, Daimler Buses India must be referred to.

Parking brake lever

The parking brake actuation lever is supplied in the chassis in a provisional position.

The Body Builder must provide for its fastening in a visible and practical place, of easy access to the driver, foreseeing also the need to use it in emergency cases.

It must also be positioned in a place that makes impossible its accidental or undue access. The complete travel of the lever must be free from interferences.

Service Brake Pedal

The service brake pedal is assembled in its definitive position in the chassis, however the Body Builder must ensure its free travel, without interferences such as from wiring harnesses, lines, trim parts, floor, etc.

Brake System

12.2 Retarder

1904GL01H

i

Not applicable.

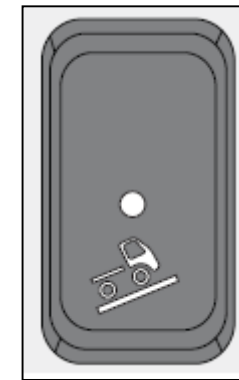
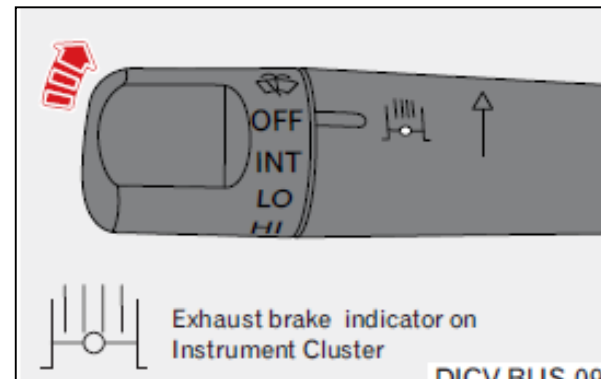
1904GL01H

12.3 Exhaust Brake

12 Brake System

Exhaust brake operation

The chassis OF 1014/1017 are equipped with 'exhaust brake system' for enhanced braking performance and improved service brake life.



- Exhaust brake
- 1 Combination Switch
 - 2 Override Switch

Exhaust brake can be engaged by shifting the wiper combination switch towards dashboard or pressing service brake. Below condition is true, exhaust brake will be engaged.

Input

- Combination lever switch should be in ON condition. (or) Override switch should be OFF.
- (and) Brake pedal should be pressed condition.

Condition

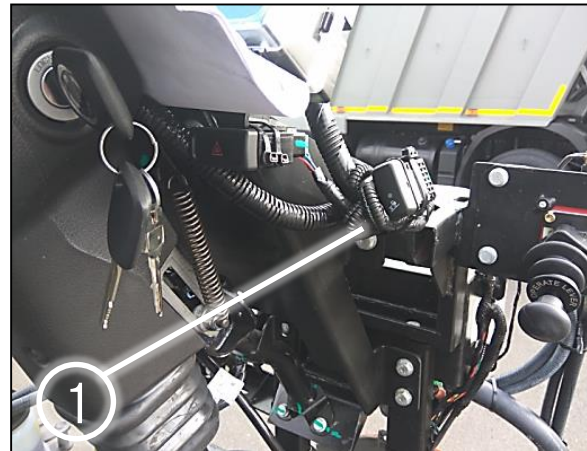
- Accelerator pedal should be in released condition.
- Engine RPM should be more than 1000.
- Clutch pedal should be in released condition/Clutch should be engaged.

12.3 Exhaust Brake

12.2.2 Exhaust brake override switch

The 'Exhaust brake override switch' is delivered in a provisional location on the chassis. body manufacturer must foresee the interference free operation of the actuation controls such as operating lever and easy access to override switch, that enable easy and practical reach by the driver, avoiding ergonomic problems and interference.

It should also be installed in a way to prevent improper or accidental use.



Exhaust brake

1. Provisional location on chassis Ref.
2. location on body panel

Exhaust system

1904GL01H

13.1 Exhaust system counter pressure

The genuine part of the chassis, engine until the muffler/catalytic converter (including) should not be changed or altered.

In case of original exhaust output pipe change, counter-pressure measurements shall be carried out and the resulting values shall be lower than **130 mbar**.

i

For more information, please refer to the manual Guidelines for Body Building - "General Manual", in chapter 3.23 - Exhaust system.

1904GL01H

Exhaust system

13.2 Exhaust outlet position

In the case of exhaust pipe extension, the pipe added by the Body Builder must have a diameter equal or greater than the one of the genuine component. The minimum radius required to bend the additional pipe should be 2.5 times the average diameter of the pipe.

The fastening of such extension to the body must be made by means of elastic elements identical to the original ones supplied with the chassis.

When extending the pipes, it is necessary to take care to prevent that the exhaust gases back pressure does not exceed the established limit, according to “Exhaust System” – page 71.

For the assembly of horizontal outlet, the bumper layout project must foresee an orifice for the exhaust pipes, with minimum clearance of 10 mm to avoid possible interferences. According to the material used in the production of the bumper, it is necessary to study the necessity of adopting protections to avoid damages by heating.

In the production of line extension, the movements of some components must be taken into account, such as: axles, transmission shafts, etc.



The pipe material does not need to be of stainless steel.

13.2 Exhaust outlet position

Exhaust system

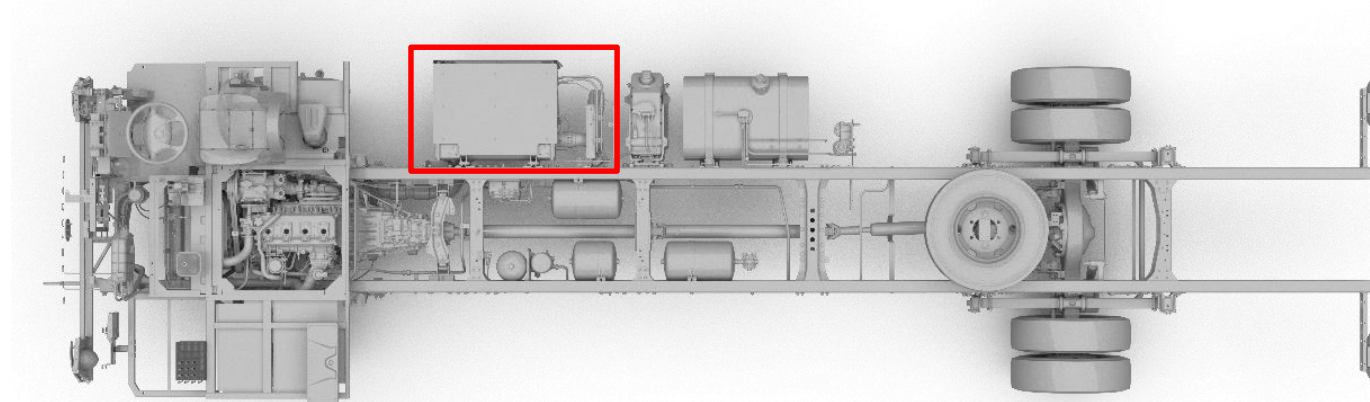
BS VI Exhaust

1904GL01H

The chassis OF 1014/1017 are equipped "SCR" system, required to comply with the BSVI legislation.

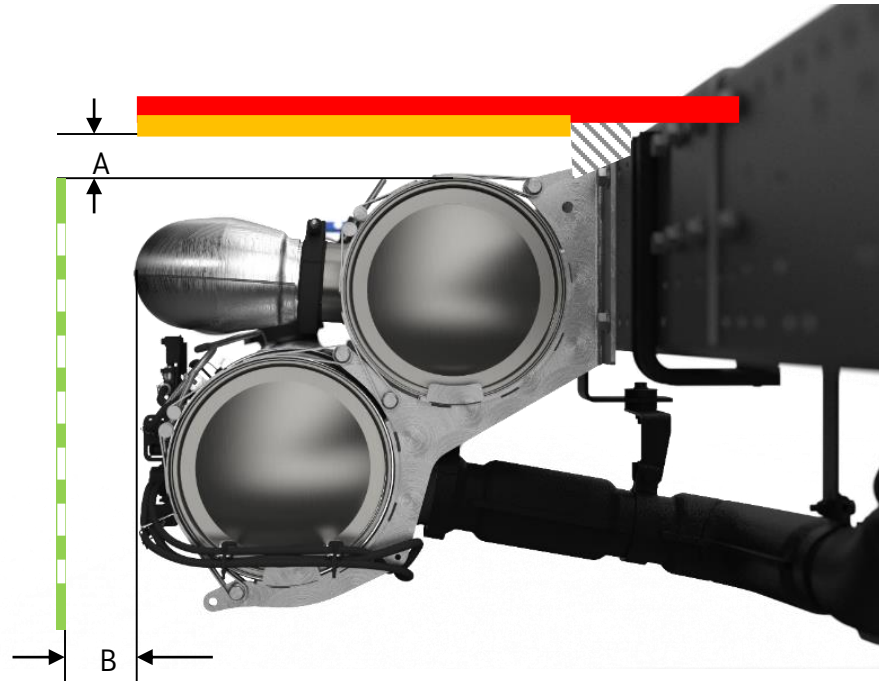
No change in the exhaust position should be done by the body builder.

A minimum opening of **20dm²** to be provided in the Body for efficient cooling of the Exhaust system, The Perforations to be given on the body flap on side of the muffler .Thermal insulation to be provided, Minimum of **50mm** gap to be available between the exhaust system and body panel/Insulation.



The Heat Shield is unique for BS VI and is to be used only for transportation purpose, Heat shield to be removed during body building process, however care is to be taken to ensure that ATS system is protected from welding spots and paint overspray.

13.3 Exhaust unit insulation



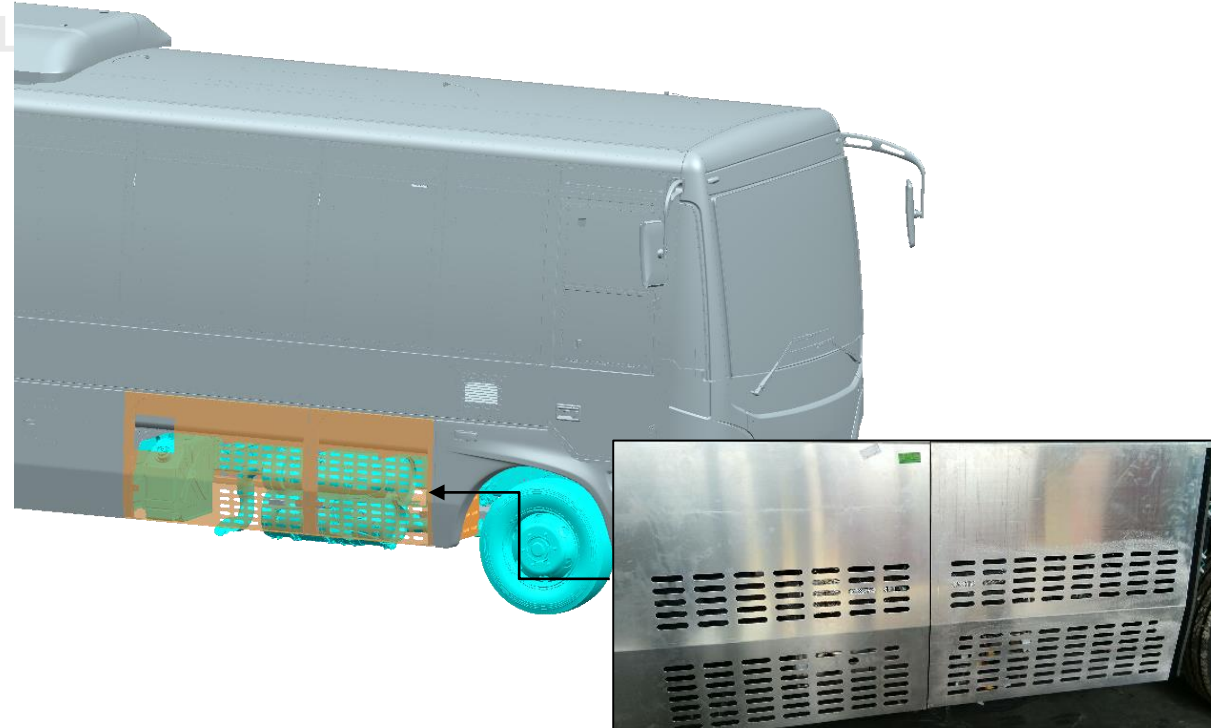
A – 100 mm

Fig. ATS View from front

B – 100 mm

- Insulation: Superwool plus 1200 with AL foil
Density : 128 Kg/m³
Source; (Murugappa Morgan Thermal Ceramics Pvt. Ltd)
- Plywood
- Skirt panel
- Body support structure

Exhaust system



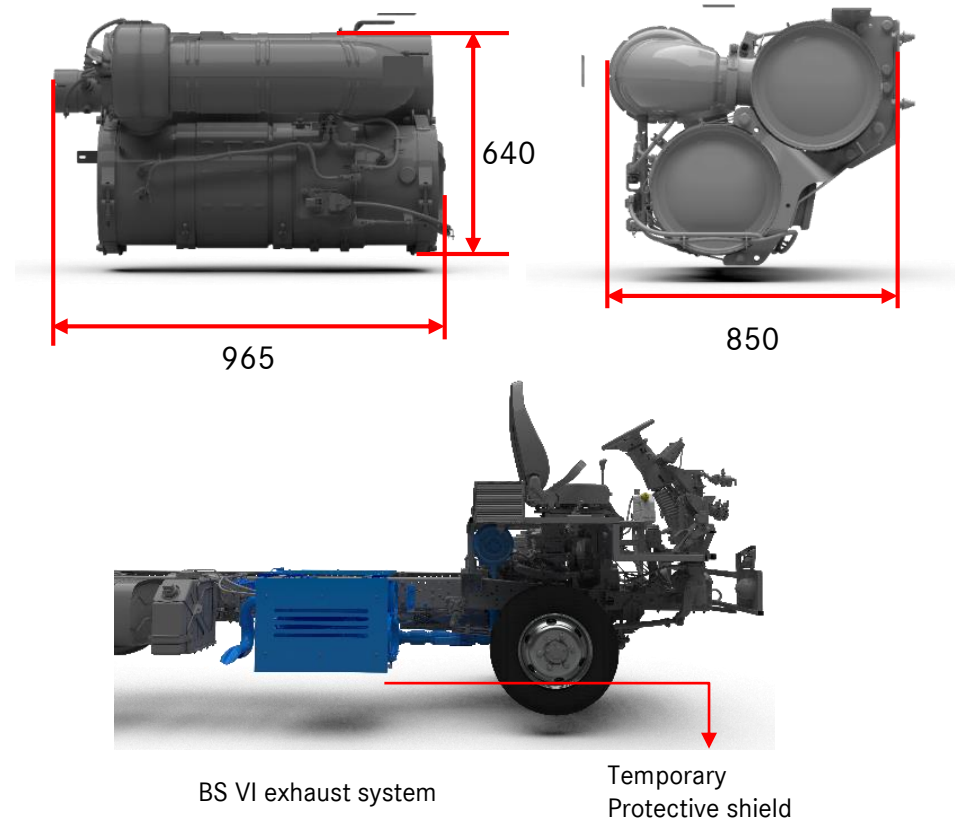
ATS Body side panel with 20 dm² Openings

- The ATS unit and Exhaust pipe should not be relocated from the original position
- The body components near BS6 exhaust unit should be well insulated, There must be a gap of minimum 100mm between the top of the ATS and Body (A).
- Similarly, There should be a minimum gap of 100mm from the muffler and body in the lateral direction (B);
- The body skirt panel on ATS should have an perforations of minimum 20dm² opening positioned exactly in front of the ATS to allow free flow air for cooling of the ATS.

Exhaust System

13.3 Exhaust outlet position

Exhaust pipe configuration and arrangement for BSVI variants



1904GL01H

13 Exhaust gases treatment system

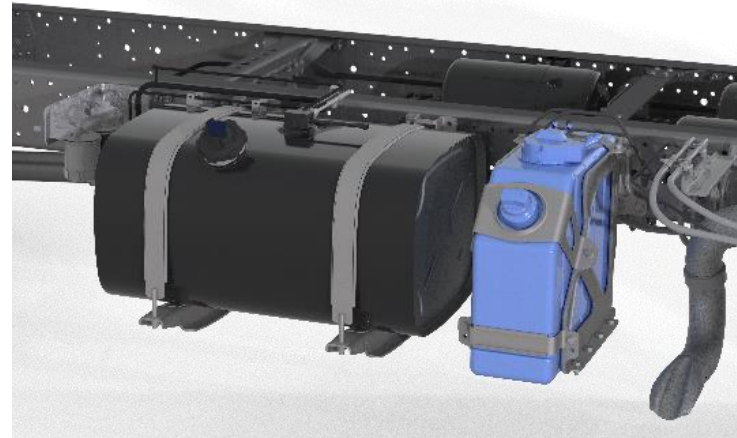
Exhaust System

“AdBlue” tank and pump

The chassis OF 1014/1017 are equipped with AdBlue® tank, "SCR" system component, required to comply with the Emission norms of EURO IV & BSVI.

“AdBlue®” reservoir and the pump should have not their original positions changed and piping should not have any joints. If damages occur during the body building process, the entire line must be replaced with the same original material specifications..

If necessary, the AdBlue® pipes and the pump can be removed during the body assembling process however they must be properly stored and identified.



AdBlue tank BSVI

During the Body Building assembly, the system shall remain closed (including the breather) to preserve covers, filler necks and connections. Protective rubber plugs can be used on the original covers enhancing the safety against damages to system components.

During the handling of after treatment system components, they should remain closed and protected (with its original covers and other protection). Besides, they should be kept away from contaminants, such as fuel, oil, grease, water, dust, dirt, metal residues and detergents.

Exhaust System

13.4 Exhaust gases treatment system

“AdBlue®” Metering Device

For EURO V chassis, “AdBlue®” metering device is located in front of the catalytic converter. The body structure should allow free access to the metering device.

For BSVI chassis, “AdBlue®” metering device is located on the right side of the engine next to the turbocharger. The body structure should allow free access to the metering device through the inspection cover (hood).“.

“AdBlue®” Pump

The “AdBlue®” pump must not be removed from its original position, even if changes in the “AdBlue®” reservoir position occur.

The connection hoses between the tank, the pump and the metering valve have been sized for this purpose and their replacement is not necessary.

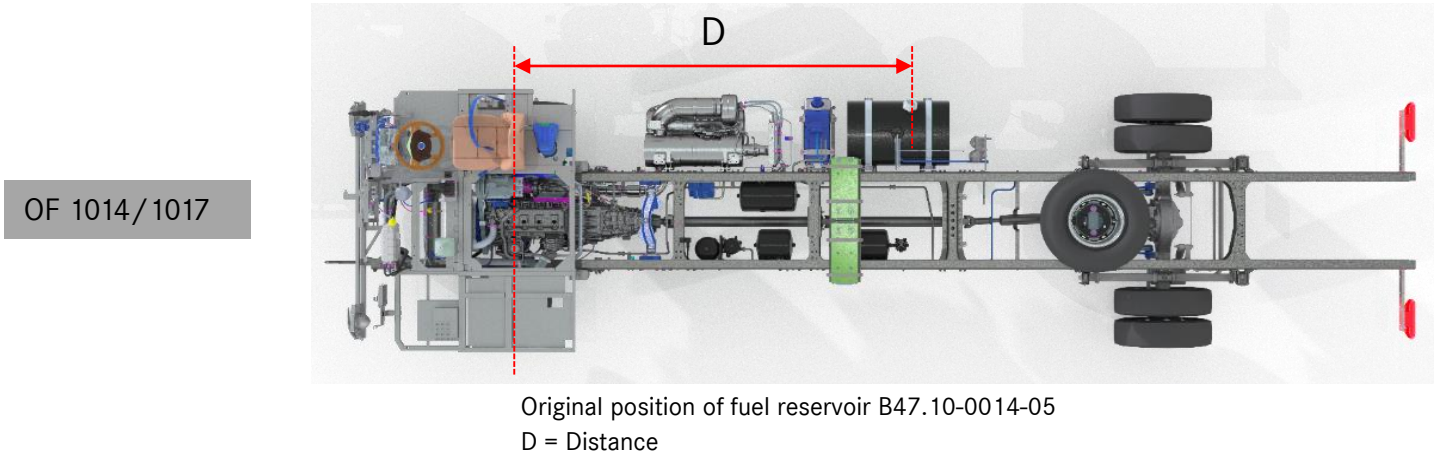
Fuel System

14.1 Fuel reservoir

The OF 1014/1017 chassis are supplied with 160L capacity fuel reservoirs at their definitive positions, alterations are not allowed.

Protection for fuel reservoir & it’s hoses shall be applied during bodybuilding processes, do not spray paint the fuel tank & any fuel hoses.

Please refer chassis specific offer drawing for exact fuel tank location.



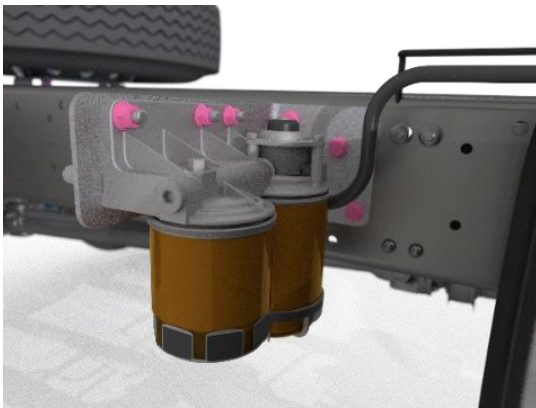
Tab8- Original fuel tank position for Export market variants

Fuel tank/Chassis	OF 1014/1017 4250 WB	OF 1014/1017 5300 WB
160L/RHD	1862	3200

Fuel System



Water separating filter EURO III/IV



Water separating filter BS VI

Water separating filter

The fuel system has a water separator filter, which has as function to improve the quality of the fuel, making possible a better performance and increasing the durability of the engine. The body manufacturer must foresee in the project an easy access for the view and maintenance.

If the repositioning of the separator filter is necessary, please previously contact Daimler Buses India. The access must be easy for view and maintenance purposes.

This new location must not make possible oil spillage on components such as the belts, exhaust pipe, cooler and other peripheral components, during the removal for cleaning.

The maintenance services must be carried out according to the "Mercedes-Benz Maintenance Plan" or whenever a high concentration of water in the fuel is present.

Fuel System Bleeding

It is not necessary to release or disconnect the connections and lines to bleed the fuel system. If the lines between the nozzle and the diesel injection unit is removed, replace them with new lines to avoid leaks..

!

This new position must not allow oil spills to occur on engine components such as drive belts, exhaust pipes, radiator, etc., on removal for cleaning.

The incorrect installation of the lines in the nozzles and/or injector units may cause diesel leakage, and consequently, the risk of fires.

Bleeding Procedure

- Pump the fuel, using the manual pump handle, until you notice a strong resistance caused by the increase of the system pressure.
- Actuate the starter motor, without accelerating. If the engine does not start within 20 seconds, interrupt the starter motor actuation and wait for at least a minute before trying again. If the engine does not start to operate, repeat the bleeding process.
- Let the engine continue to operate for approximately 1 minute to eliminate completely the air from the system by the self-bleeding process.

14.2 Central fuel tank

i

Not applicable.

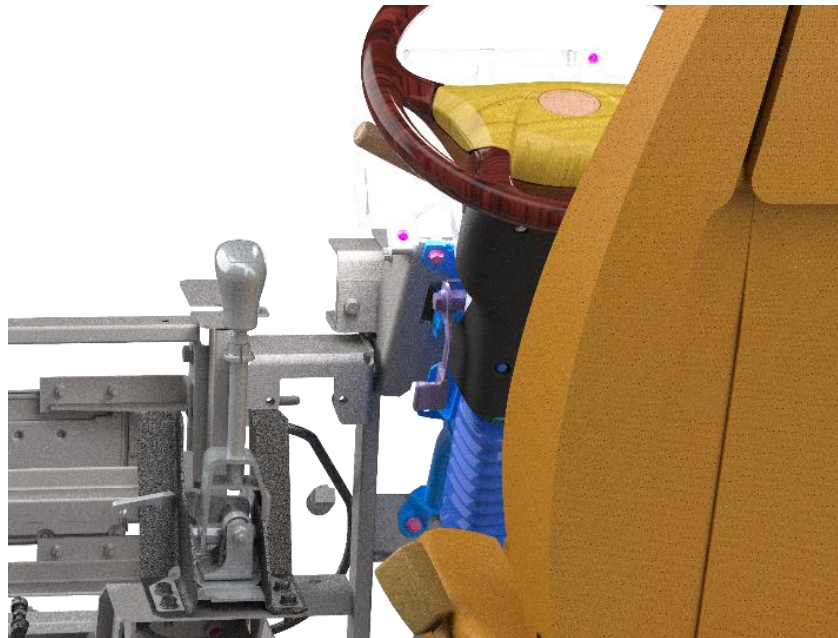
Transmission

15.1 Care with the Transmission Control System

Chassis are supplied with the transmission control system in its definitive configuration, and its change is not necessary.

Transmission control system and lever movements must be foreseen during the development of the hood and the front panel, considering all possible gear shifts, as well as the clearance of the power train mount systems to avoid interferences.

In the area of the gearshift lever, foresee the assembly of finishing parts to avoid noises, heat and impurities.



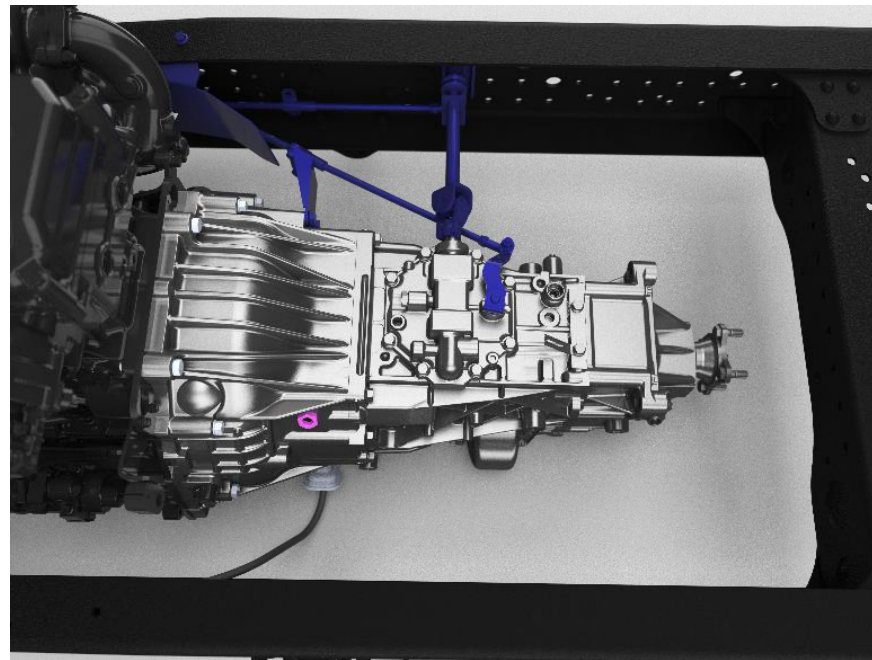
Cable shifting system

Transmission

15.2 Shifting system cables length

i

The transmission control system cables feature the correct length and can not be changed..



Transmission system cables

Transmission

15.3 Gearshift cables - disassembly and assembly

i

Transmission control system cables can not be removed during body building.

1904GL01H

Transmission

15.4 Gear shifting cables adjustment

i

Not applicable.

1904GL01H

Transmission

15.5 Positioning of the shifting lever support

i

The shifting lever is supplied in its definitive position, without adjustment options. Its repositioning is not allowed.

1904GL01H

Transmission

1904GL01H

15.6 Propeller shaft

The propeller shaft must not be painted or covered with anti-corrosion material.
Changes in the propeller shaft are not allowed.

1904GL01H

Automatic Transmission

16. Automatic gearbox

1904GL01H

!
Not Applicable

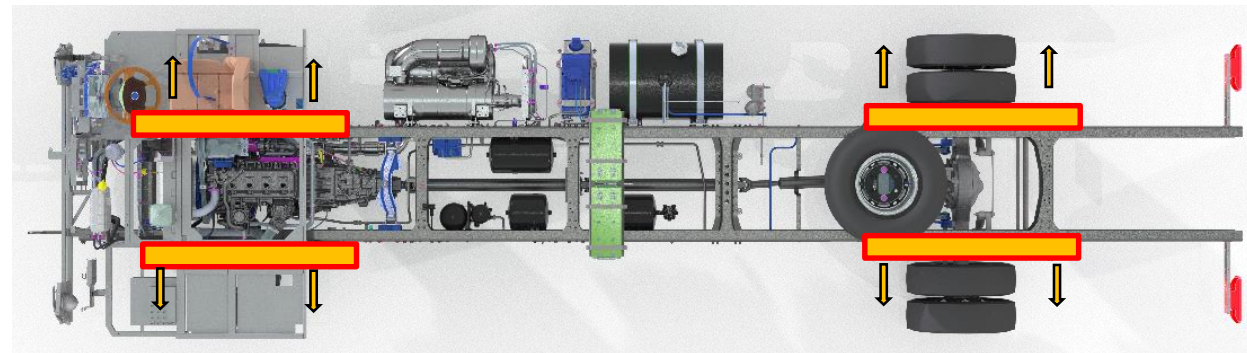
1904GL01H

Suspension System

17.1 Suspension system 1904GL01H

Take the due precautions with the suspension when you carry out body installation works to avoid damaging the suspension components. During the painting and eventual welding processes, the wiring harnesses, springs, air bellows, lines, and pneumatic valves must be protected.

The use of suspension components (such as springs, shock absorbers and its holders) in the welding equipment electrodes tests is not allowed.



Room for disassembling suspension springs

Check the possibility of disassembling the front and rear suspension springs, as shown in the figure.

!

The body must allow the removal and installation of the leaf spring of the front and rear suspension

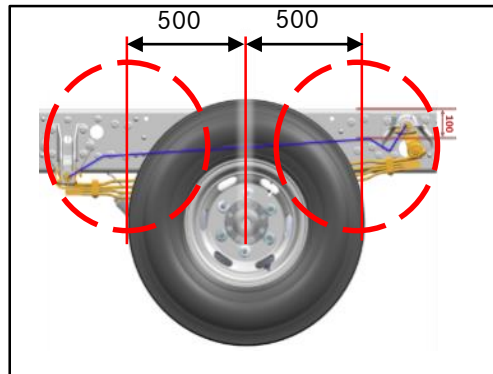
Suspension System

17.1 Suspension height 1904GL01H

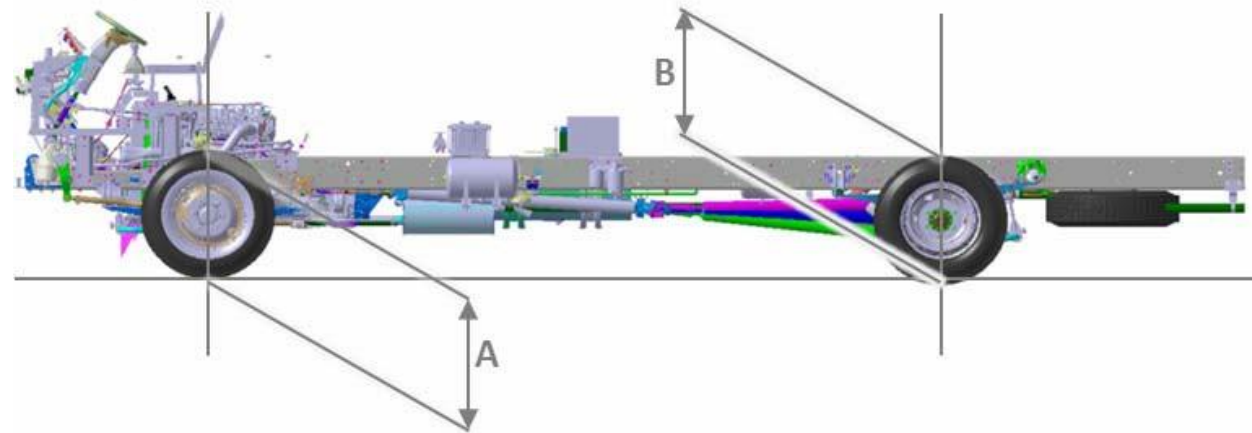
To determine the height of the first step of the body and the height of the floor with regard to the ground, it is necessary to check the height of the chassis with regard to the ground for the several foreseen loads.

Offer drawings show chassis heights as per tires dimensions.
Always use the most updated offer drawing.

Chassis rear spring deflection OF 1014 and OF 1017



Rear spring deflection



Chassis height

A Frame height near front axle, to ground level

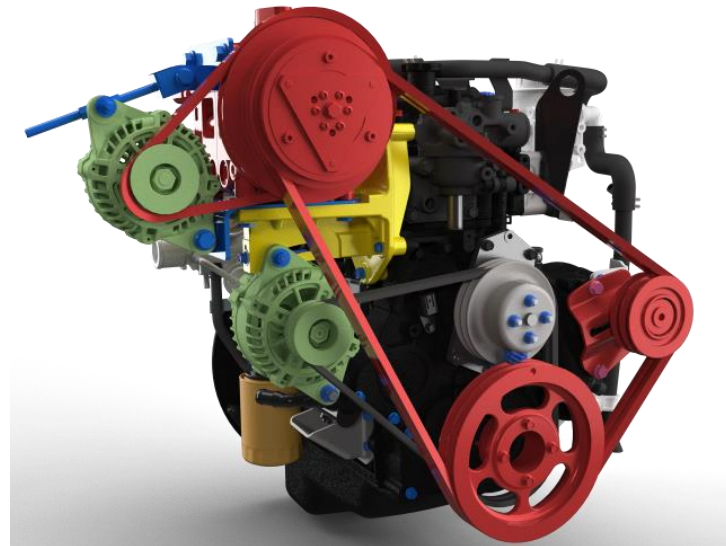
B Frame height near rear axle, to ground level

During the body development, foresee the extreme condition of bending of chassis rear springs, condition of metallic stop.
The figure below contains the relative dimensions between upper leaf springs and the upper trim of the longitudinal member.

Climate Control

18.1 High power Air conditioner

OF 1017 BSVI Chassis are factory-equipped high power air conditioning system which consists TM-43 AC Compressor, additional alternator & bigger engine pulley for the air conditioning system.



TM 43 Air conditioner set up

If the chassis is not equipped with the TM-43 Air conditioning system, then corresponding parts can be obtained in the Daimler Dealership network, as follows:

Note:

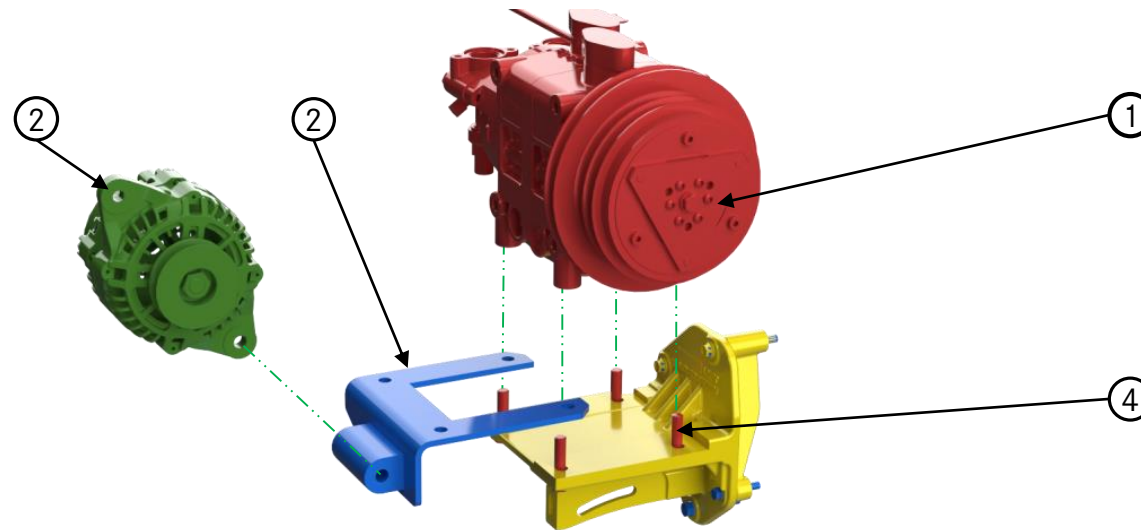
Suitable roof air conditioning unit to be checked before installation, for technical support BBA Daimler Buses India can be contacted.

Tab9- Components required for High Power Air Conditioning compressor

#	Part number	Description	Quantity
1	A 007 990 92 82	WASHER	1
2	A 400 205 03 74	STUD BOLT / ALTERNATOR/ADDITIONAL/45A/BUS	1
3	A 400 234 09 40	BRACKET / AC COMPR	1
4	A 400 234 12 12	BELT PULLEY / ADD ON CASTED PULLEY	1
5	A 400 990 07 01	HEXAGONAL HEAD SCREW WITH FLANGE / M8X1.25X65-7T	4
6	A 400 990 09 13	TENSIONING BOLT / ADDITIONAL/80A/BUS	1
7	A 400 990 26 50	HEXAGON NUT / M10X1.25 - 6T	5
8	A 831 831 00 82	BELT PULLEY / TENSIONER / TWIN GROOVE	1
9	A 831 832 01 14	BRACKET / ADD ON ALTERNATOR	1
10	A 831 832 02 14	BRACKET / TENSIONING / TM43	1
11	A 831 835 01 03	COMPRESSOR / AC TM43	1
12	A 831 988 00 64	BOLT / M12X1.75X45-7T	4
13	A 831 988 01 64	BOLT / M12X1.75X35-7T	2
14	A 831 990 00 01	HEXAGONAL HEAD SCREW WITH FLANGE / M8X1.25X75-12T	2
15	A 831 990 02 01	HEXAGONAL HEAD SCREW WITH FLANGE / M8X1.25X85-12T	1
16	A 831 990 03 01	HEXAGONAL HEAD SCREW WITH FLANGE / M8X1.25X45-12T	1
17	A 831 990 04 01	HEXAGON FITTED BOLT WITH FLANGE / M10X1.5X55-12T	1
18	A 831 993 04 95	V-BELT / ENG TO AC COMP / TM43	2
19	A 831 993 05 95	V-BELT / AC COMP TO ALTERNATOR / TM43	1
20	N 910105 010006	HEX SCREW MBN 10105-M10X 20- 10.9	1
21	N 910105 010008	HEX SCREW MBN 10105-M10X 45- 10.9	1
22	N 910105 010009	HEX SCREW MBN 10105-M10X 25- 10.9	1
23	N 910105 012041	HEX SCREW MBN 10105-C M12X1,5X140-10.9	1
24	N 910112 010001	HEXAGON NUT EN 1661-M10-10	1
25	N 910112 012001	HEXAGON NUT EN 14218-M12X1,5-10	1

Assembly of the compressor and the additional alternator.

Assemble the compressor to the support "TM 43" following the torque indicated for the bolts "3" (torque 51 ± 10 Nm).



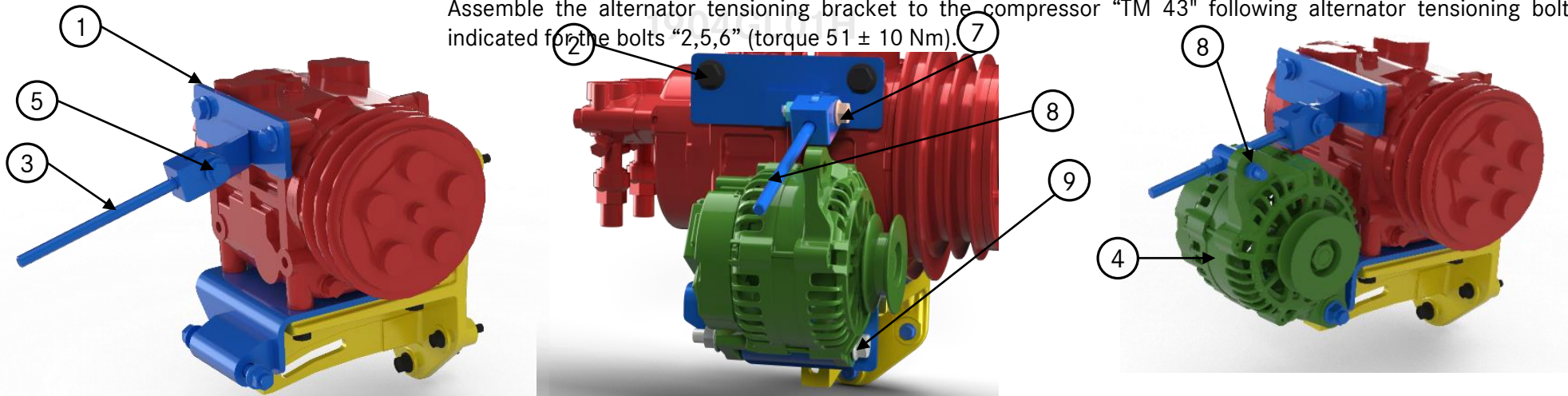
TM 43 Compressor mounting

Tab12- Components for the TM43 Compressor assembly

#	PART NUMBER	DESIGNATION	QTY
1	A 831 835 01 03	COMPRESSOR / AC TM43	1
2	A 831 832 01 14	BRACKET / ADD ON ALTERNATOR	1
3	A 400 155 03 37	MOUNTING BRACKET / ALTERNATOR	1
4	A 831 988 00 64	BOLT / M12X1.75X45-7T	4

Assembly of the additional Alternator mounting bracket

Assemble the alternator tensioning bracket to the compressor "TM 43" following alternator tensioning bolt to the torque indicated for the bolts "2,5,6" (torque 51 ± 10 Nm).



Tab13- Components for the additional alternator & bracket assembly

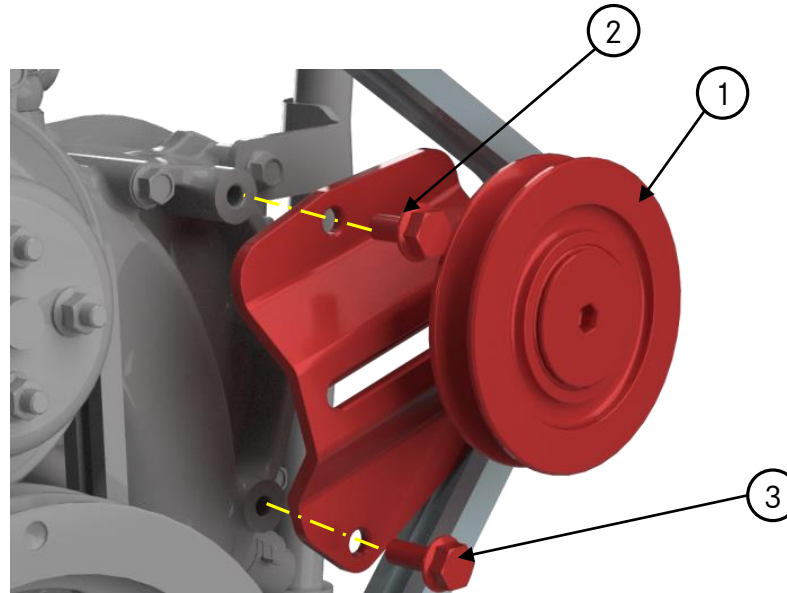
#	PART NUMBER	DESIGNATION	QTY
1	A 400 155 04 37	ADDITIONAL ALTERNATOR TENSIONING BRACKET	1
2	N910105010009	HEX SCREW MBN 10105-M10X 25- 10.9 DBL9440.40	2
3	A 831 990 00 13	ADDITIONAL ALTERNATOR TENSIONING BOLT	1
4	A 400 150 00 22	80A SINGLE GROOVE ALTERNATOR	1
5	N910105010008	HEX SCREW MBN 10105-M10X 45- 10.9	1
6	N 910112010001	HEX SCREW MBN 10105-M10X 45- 10.9	1
7	A 400 205 03 74	STUD BOLT	1
8	A 400 990 26 50	HEXAGON NUT / M10X1.25 - 6T	5

#	PART NUMBER	DESIGNATION	QTY
9	A 831 990 00 13	TENSIONING BOLT	1
10	A 400 990 26 50	HEXAGON NUT / M10X1.25 - 6T	4
11	A 400 205 03 74	STUD BOLT	1
12	A 007 990 92 82	WASHER	1

Climate Control

Assembly of AC compressor pulley tensioner

The Air conditioner compressor tensioner pulley is prefixed to engine to the torque indicated for the bolts “2,5” (torque $46 \pm 7\text{Nm}$).



Tab15- Components for the Tensioner pulley assembly

#	PART NUMBER	DESIGNATION	QTY
1	A 400 234 03 12	V-BELT PULLEY / AC COMPRESSOR / TENSIONER PULLEY	1
2	N910105010006	HEX SCREW MBN 10105- M10X 20- 10.9	1
3	N910105010009	HEX SCREW MBN 10105- M10X 25- 10.9	1

Climate Control

1904GL01H

In order to standardize the air conditioner's compressor system, the customer's operation characteristics must be considered according to the engine's revolution limits:

Tab15- Engine speed

Chassis	OF 1017
Engine	4D34i
Idle Speed (AC Off)	650 rpm
Idle Speed (AC ON)	850 rpm
Maximum torque speed	1500 rpm
Maximum power speed	2500 rpm
Maximum rpm	3120 rpm
Maximum free speed	2600 rpm

Note:

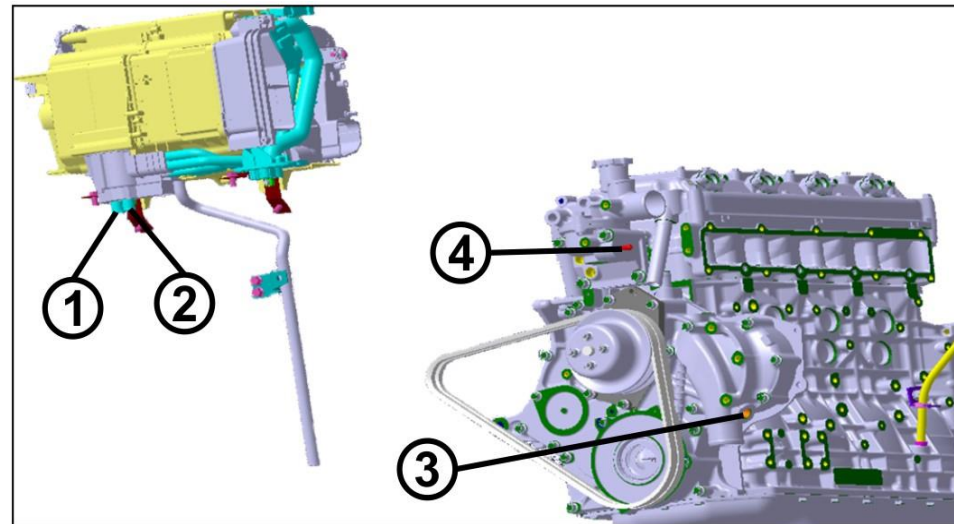
AC controller connection shall be made as instructed in 'Electric part', to ensure the Engine rpm increases as soon as AC compressor is engaged.

1904GL01H

18.2 Heating system

Climate Control

The OF 1014/1017 chassis are optionally equipped with provision for heating provision for demister application. Below is the arrangement of the engine's coolant tapping and return points for the space heating system:



Heating system

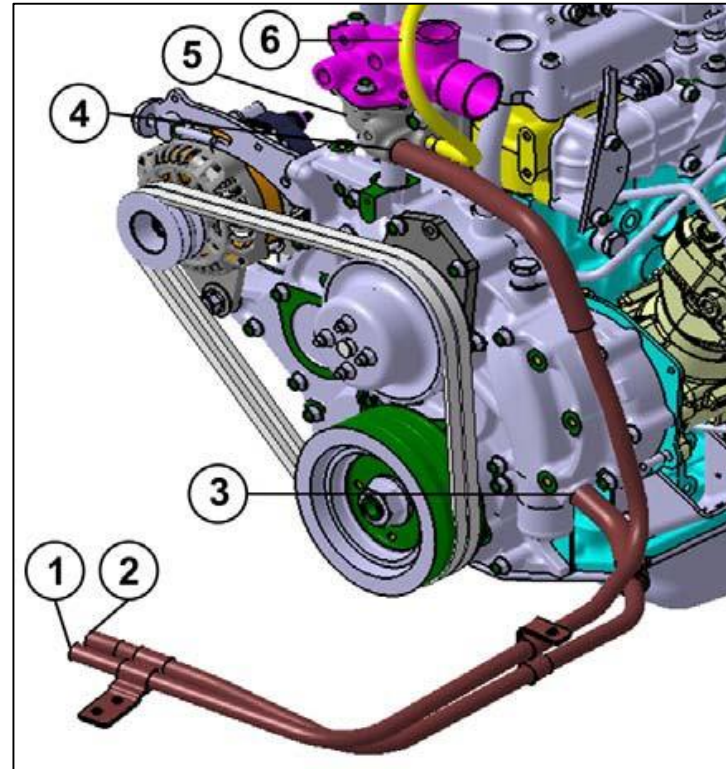
1. Heater outlet (ref purpose)
2. Heater inlet (ref purpose)
3. Engine inlet
4. Engine outlet

Note:

OF chassis are developed to support the driver cabin heating or front Windshield demister application only, passenger saloon heating system must not be connected to given engine ports.

Demister circuit

Climate Control

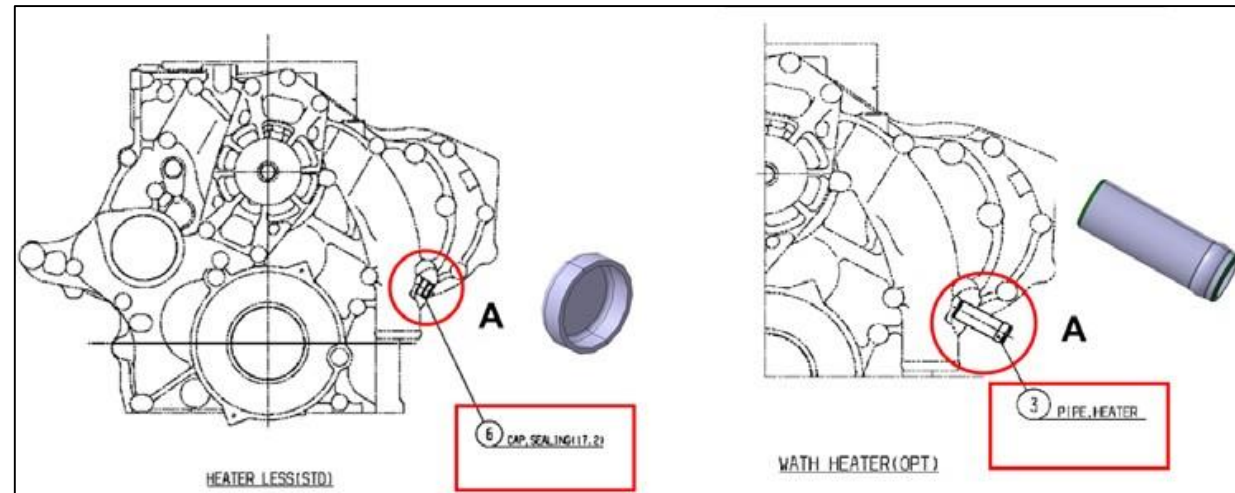


Demister circuit

- 1 Demister inlet
- 2 Demister outlet
- 3 Demister outlet to engine inlet
- 4 Engine outlet
- 5 New thermostat case
- 6 Deaeration hose

Climate Control

1904GL01H



Demister connections ports

Position A is used to connect the demister hoses. The body builder can accommodate the demister circuit by removing the sealing cap from position A and the heater pipe adaptor can be assembled.

1904GL01H

Maintenance Access

19.1 Maintenance accesses

The Body Builder must foresee in the projects, the free access for the maintenance services (lubrication, repairs, adjustments, etc.), as well as making possible the removal and installation of any component of the vehicle, such as: engine, transmission, etc.

Bodybuilder must foresee also easy access to check refuel level of the coolant expansion reservoir, power steering fluid reservoir and clutch operation system.

Whenever necessary, the Body Builder should install removable covers and/or covers that make possible the easy execution of the several maintenance and repair services in the vehicle (for example: access cover to the upper part of the transmission).

Arrangement of the Inspection and Maintenance Covers

In the figures below, we give examples of the external and internal covers for the focused chassis. The dimensions must ensure easy access for the inspection and maintenance of the vehicle.

Note:

The vehicles equipped with optional items (for example, retarder, automatic transmission, and fuel tank) must have covers that enable easy access for maintenance.

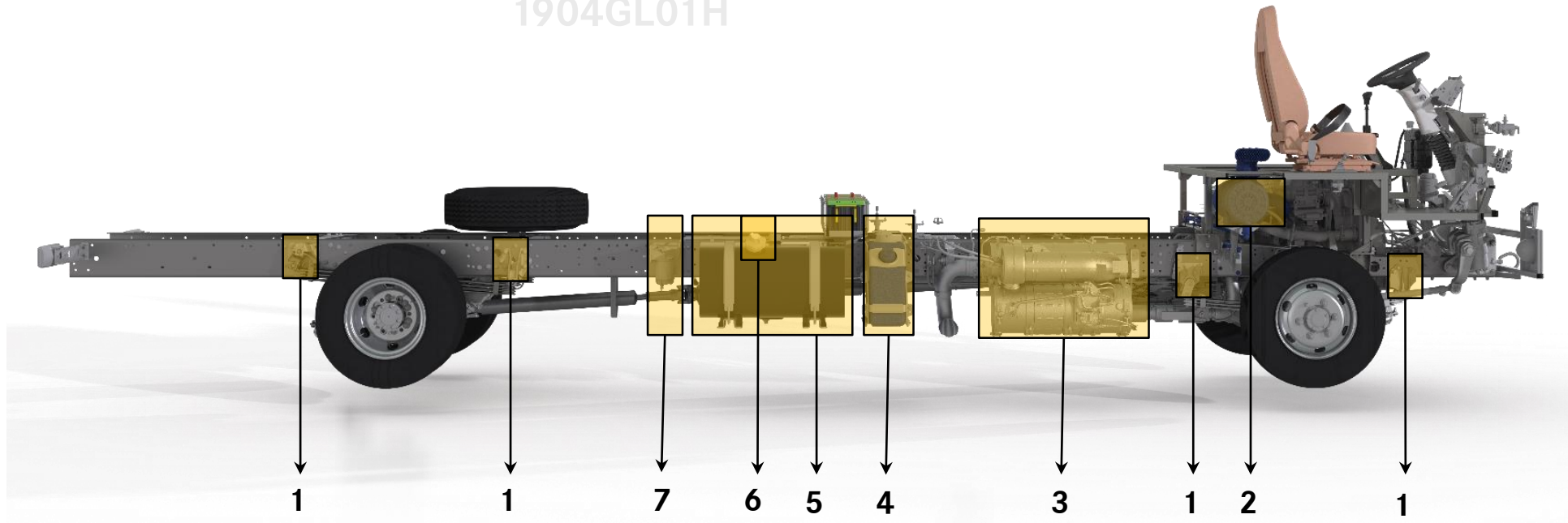
The Body Builder must install means of access to the Radiator set, Coolant reservoir, fuel filter, steering system reservoir, clutch fluid reservoir and other reservoirs, as well as making possible to see the air filter cleaning condition indicator.

If it is not possible the access from the frontal part, provide internal access covers.

Maintenance Access

Maintenance access on RHS side BSVI)

1904GL01H

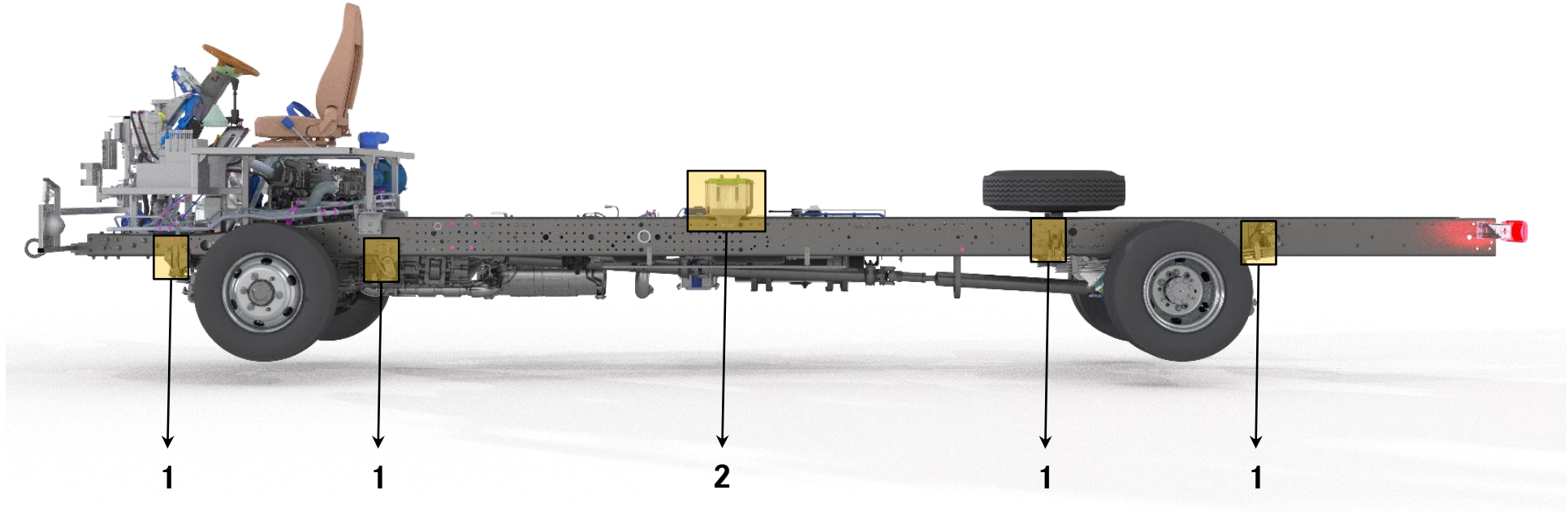


1904GL01H

1. Access to the front and rear springs eyelets, left and right sides
2. Air filter: adequately sized and positioned cut-out to be provided for removal and refitment of air cleaner elements;
3. Access side for the Muffler Assembly (for BSVI side panel must be ventilated).
4. Complete access side lid to the Ad Blue tank. Estimate exclusive lid for the Ad Blue filling nozzle;
5. Complete access side lid to the fuel tank.
6. Estimate exclusive lid for the fuel filling nozzle
7. Complete side access for Water separating filter

Maintenance Access

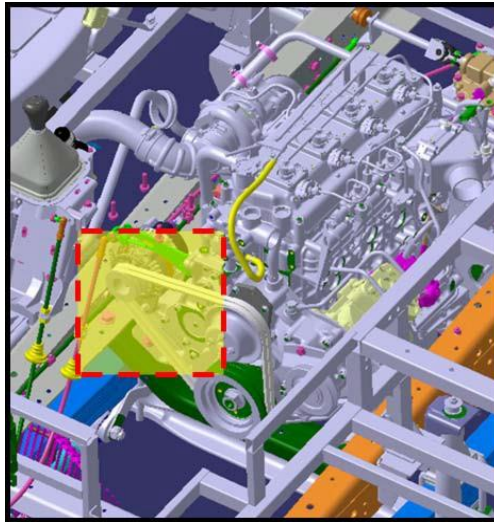
Maintenance access on Left side (BSVI)



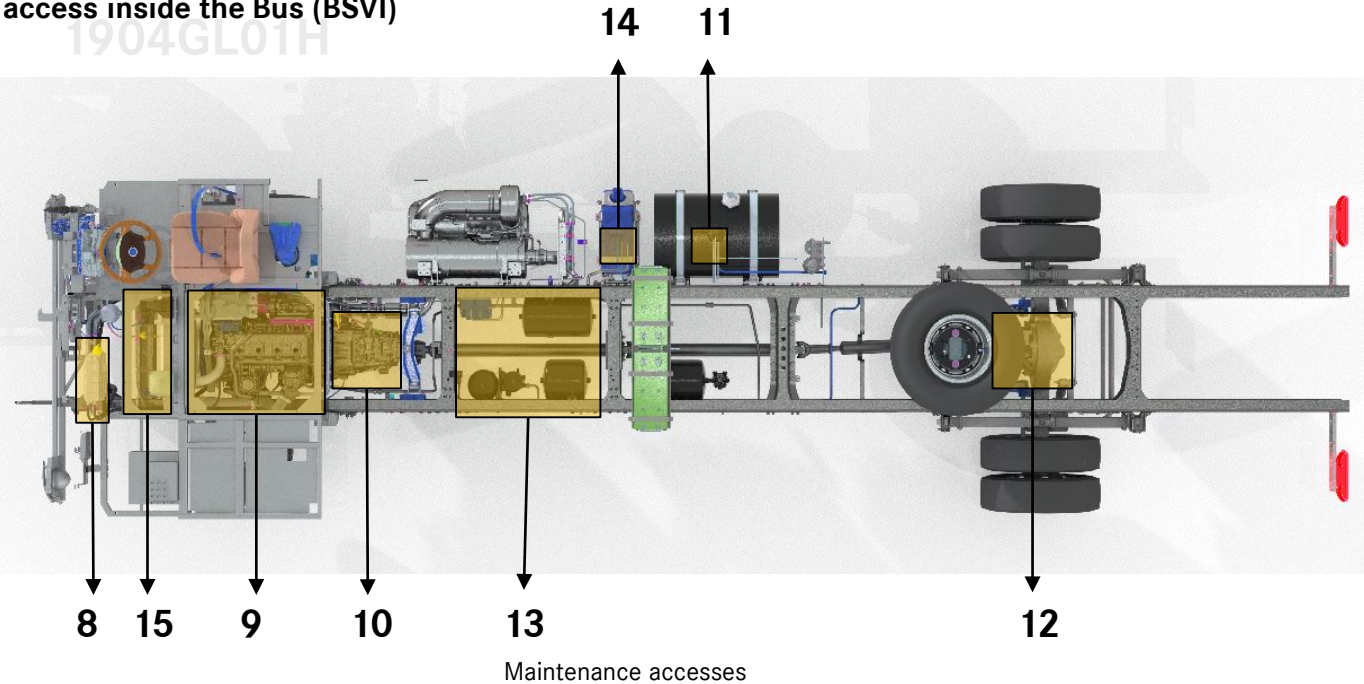
1. Access to the front and rear springs eyelets, left and right sides
2. Access side lid to the batteries and general switch (compartment must be closed and ventilated). The batteries position depends on the body project

Maintenance Access

Maintenance access inside the Bus (BSVI)



Engine belt accessibility

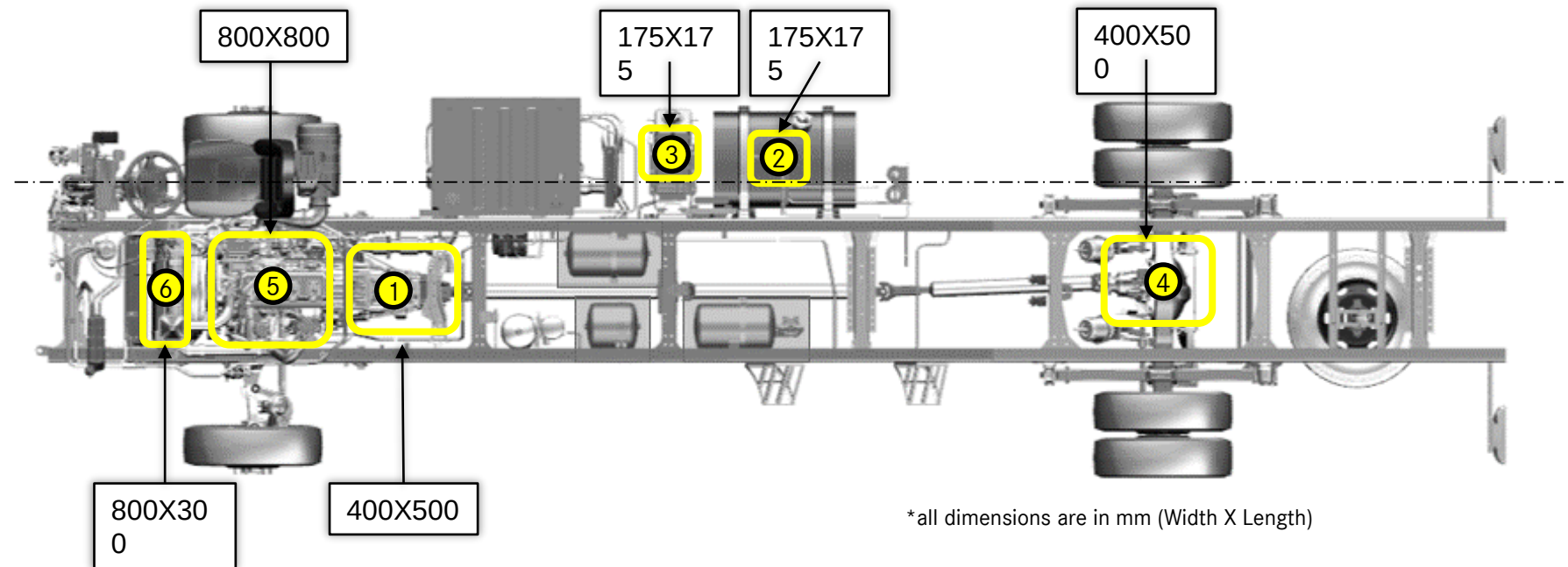


Maintenance accesses

8. Access to the expansion tank upper part, hydraulic steering oil reservoir, clutch fluid reservoir, instrument cluster;
9. Access to the engine (engine head, lubricant oil filters, compressor, cooling hoses, engine belt tensioner etc.);
10. Access to the clutch, cushions bolts and gearbox;
11. Access to the fuel tank level sensor;
12. Access to the rear axle (lids not necessary);
13. Access to the air tanks and pneumatic valves (APU) (lids not necessary)
14. Access to AdBlue level sensor
15. Access to Radiator and fan

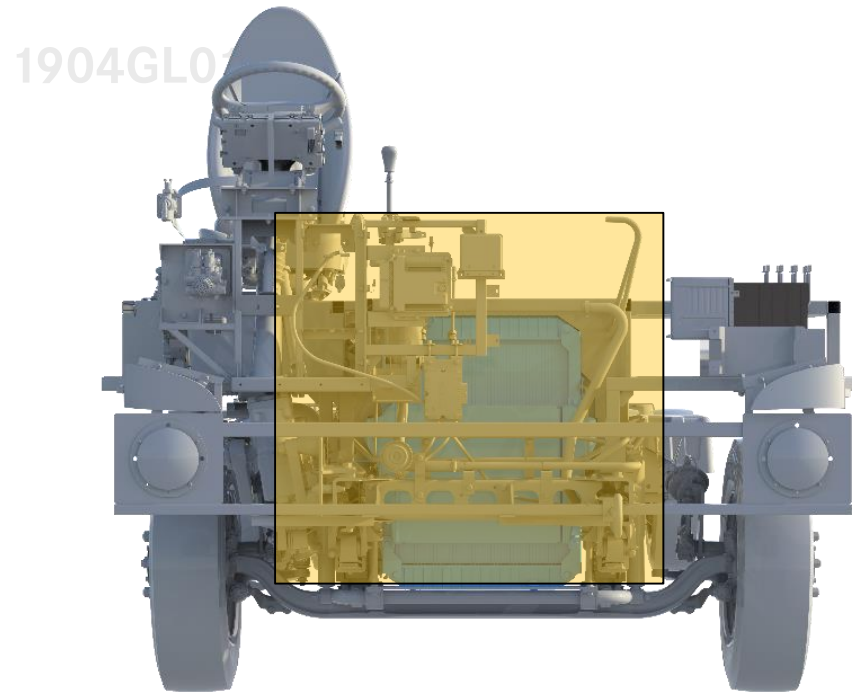
Maintenance Access

Maintenance access dimensional requirement



1904GL01H

Maintenance Access



Access for frontal maintenance

Frontal lid with complete opening for cooling and air intake, with accesses to:

- Charged air cooler and water radiator;
- Pedal Valve assembly;
- Front towing hook;
- Hydraulic steering fluid reservoir;
- Clutch fluid reservoir;
- Expansion tank coolant reservoir;
- Horn

Ergonomics

20 Thermal and acoustic insulation

!

There is no specific information available on this issue for this chassis.

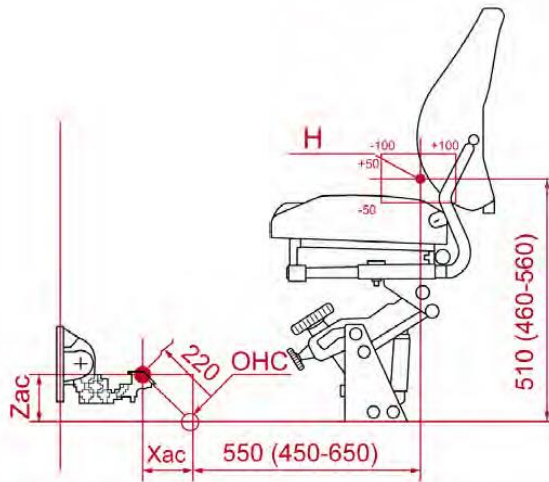
For further information, please refer to Body Building Directives - General Part - chapter 3.17 - Thermal and acoustic insulation.

1904GL01H

Ergonomics

21.1 Driver's seat

1904GL01H



Driver's seat positioning

OHP accelerator heel point

Point H driver's hip joint point

X ac distance of accelerator center / OHP

Z ac height of the accelerator center

For the correct positioning of any seat model, the Body Builder must use as reference the x and z distances between the OHC (accelerator foot heel point) and the H point (driver's hip articulation), as established in the ergonomic requirements of vehicles standards (ISO/DIS 16121-1 Standard: Road vehicles – Ergonomic requirements for driver's workplace in line-service buses).

The figure indicates the horizontal and vertical distances recommended for the driver's seat, using as reference the center of the accelerator pedal and the H point of the seat.

The seat suppliers must inform in the technical drawings the x and z coordinates of the H point in relation to the fastening points of the seats, as well as the seat travel settings.

It is important to emphasize that the ISO/DIS 16121-1 standard establishes as minimum seat travel settings, 200mm for the horizontal and 100mm for the vertical travel setting. The positioning shown below is valid only for seats with settings equal or greater than these.

OHC: Vehicle floor point measured 220 mm far from the accelerator center.

H: the seat suppliers must inform the Body Builders the correct H point positioning.

Zac: Accelerator height.

Zac varies according to the body floor between 100 and 120 mm, and this is why the Xac dimension may also vary.

Zac Xac

100 173

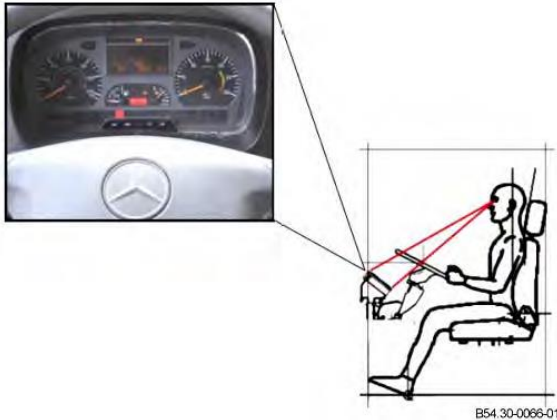
120 160



Driver's ergonomics

Ergonomics

21.2 Instrument cluster 1904GL01H



Visibility of instrument cluster

The instrument cluster is supplied in the chassis in an ergonomically adequate position and the Body Builder must use definitive holders to install the instrument cluster in the body.

The Body Builder should observe the following items when positioning the instrument cluster in the vehicles according to the geometry:

The Body Builder must ensure that the adopted positioning makes possible to see adequately, in all the steering wheel adjustment conditions, all the instrument cluster elements, including the indicator lamps. The line of sight cannot be cut by the rim or by the central area of the steering wheel.

The inclination of the panel should be 62.5° to eliminate the possibility of reflections due to the curvature of the front lens.

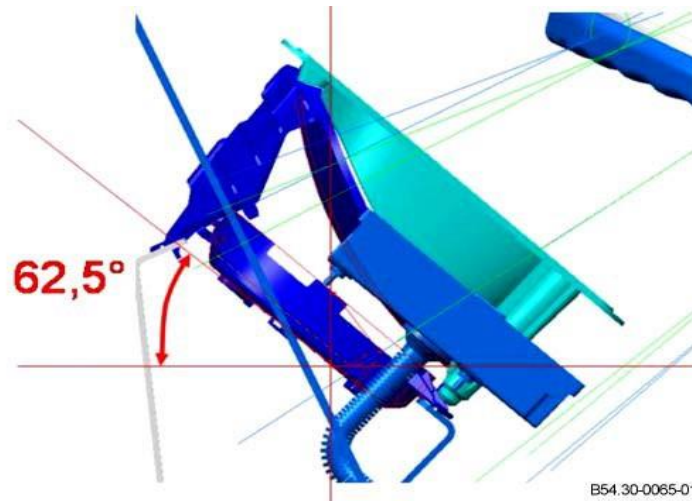
If it is necessary for the Body Builder to reposition the instrument cluster, its displacement must be carried out exclusively in the center line of the average height driver's view point, keeping its 62.5° inclination.

As a suggestion, the instrument cluster may be embedded in the trim piece. The instrument cluster painting is recommended to be made in black color to avoid reflection. Align the centers between the instrument cluster, steering wheel and driver's seat.

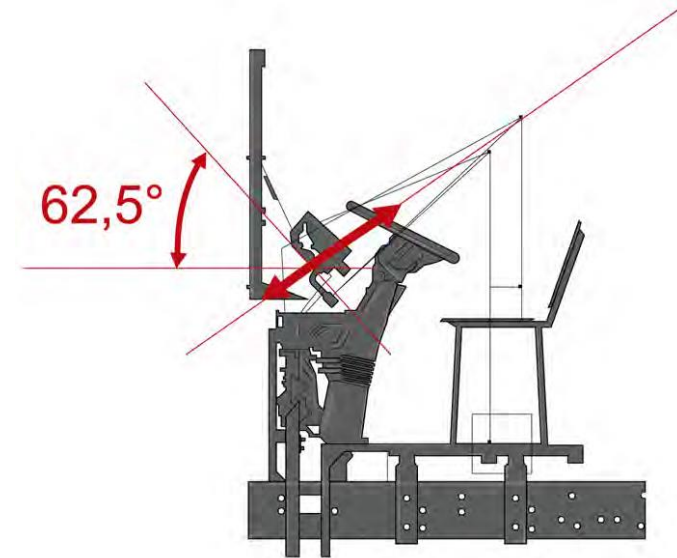
Ergonomics

1904GL01H

The panel inclination must be 62.5° to eliminate the possibility of reflections arising from the front lens curvature.



Visibility of instrument cluster B54.30-0064-01

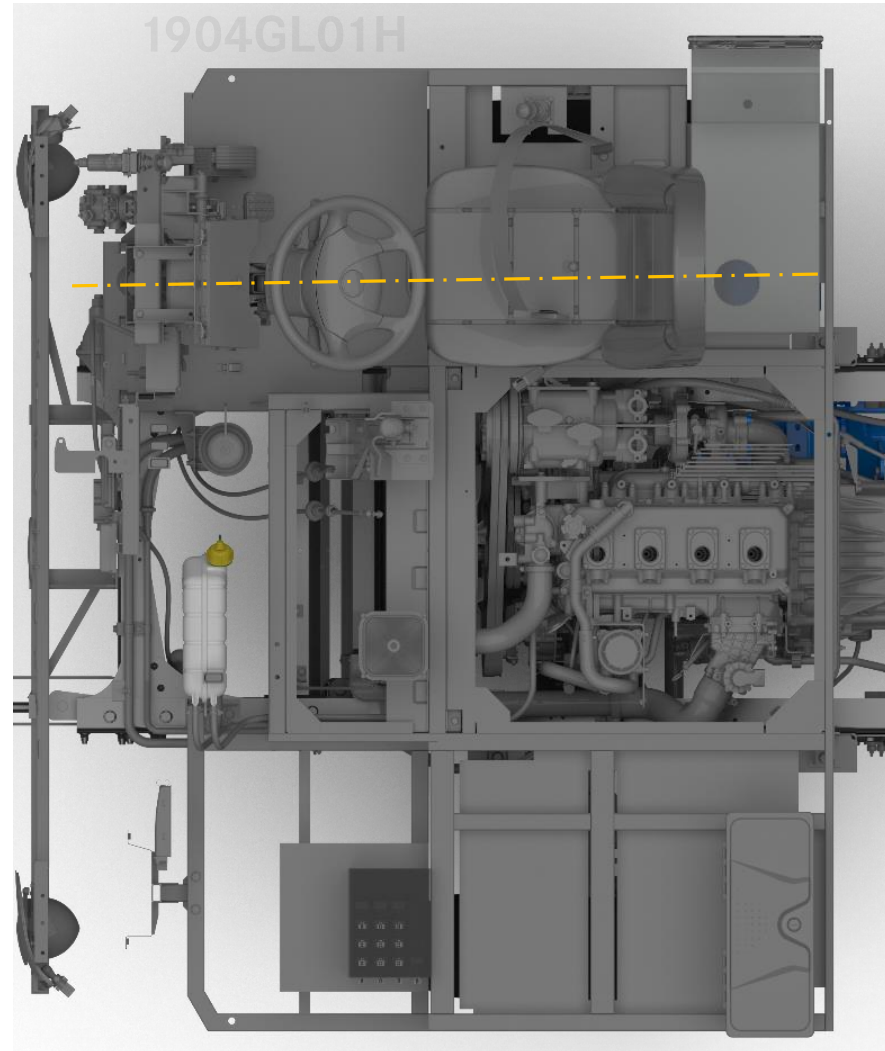


Visibility of instrument cluster B54.30-0064-01

1904GL01H

Ergonomics

The driver seat must be aligned with steering wheel & instrument cluster centerline.



Ergonomics

21.3 Gear shift lever

1904GL01H

The chassis are supplied with the gearshift lever installed in it's final ergonomic position, it does not have any reposition movements.



Gear shift lever

1904GL01H

Articulation

22 Articulation

1904GL01H

!

Not applicable. Exclusive item of articulated chassis.

1904GL01H

23 Appendix

23.1 Chassis transport procedures

For non transportation pack chassis, it is compulsory to use semi-trailers to transport the chassis that have the appropriate standard devices required for the transportation in urban lanes and highways.

Important:

Chassis should not be driven in streets or highways until unless transportation pack fitted to chassis, the vehicle speed should not exceed 40 km/h..

During maneuvers while loading and unloading on semi-trailers, the vehicle speed should not exceed 5 km/h..

Chassis Towing

The first and last cross members of the chassis are not prepared aiming at being used in direct towing operations. The Body Builder must assemble a mechanism appropriate for this purpose, according to its operational needs, foreseeing the adaptation to the body.

Important:

It is necessary to remove the propeller shaft to tow the chassis with automatic transmission. For more information, refer to chapter “Automatic Transmission.” □ page 91.



The chassis must be parked in a flat floor place, avoiding possible twists that may cause permanent deformations in its structure.

23 Appendix

1904GL01H

The chassis have plastic covers for the protection of the instrument cluster, electrical center, batteries, and other electric and electronic components.

If such covers are removed during the transfer of the vehicle, take care for them to be put again and be correctly fastened to avoid damages to the mentioned electric and electronic components.

For further information, refer to the manual Guidelines for Body Building - "General Manual", chapter 3.6 Chassis transportation.

1904GL01H

Electric and Electronic part

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Contents

1904GL01H

- Introduction
- Body building process –Disassembly & assembly of WH
- Podest & surrounding EE systems
- Combined instrument panel
- Electric centre (ECU, Fuse, Relays...)
- Diagnostic plug
- Connector main board
- Body-chassis interface
- Ground point, battery compartment
- MR control unit/alternator

1904GL01H

Technical data

1.1 Technical data

Tab1- Technical data – OF 1014

	Specifications
Model	OF 1014
Nominal voltage	24V
Battery	2 x 12 volts , 75 Ah
Alternator	1x45A
Starter motor	3.7 Kw
Fuses	Littel Fuses
Horn	340 Hz

Tab2- Technical data – OF 1017

	Specifications
Model	OF 1017
Nominal voltage	24V
Battery	2 x 12 volts , 120Ah
Alternator	80A + 80A (For normal AC) 120A+ 80A (for High power AC)
Starter motor	3.7 Kw
Fuses	Littel Fuses
Horn	340 Hz

Body building process

2 Body building process

1904GL01H

2.1 Disassembly of modules and wiring harnesses

All electronic modules must be removed before the body mounting process.

All electronic modules must be stored in areas protected from dust, welding (high temperature, high current), paint and anti-corrosion materials.

Electronic modules must not be replaced due to the parameterizations to be specified by the chassis VIN.

Wire harnesses must be protected to prevent weld spatter, cutting or crushing.

Wire harnesses must not be sectioned as their design includes the necessary lengths for body construction; if additional cable length is absolutely necessary, Daimler Buses India must be consulted.

Use cable gauges compatible with the load to be installed.

Do not modify the original vehicle installation when performing maintenance procedures or additions. Maintain the same cable gauge in case of repair procedures. Do not make direct connections bypassing relays or other components; such procedures may compromise the entire electrical installation of the vehicle.

Bodybuilders must carefully protect wire harnesses against welding and high temperatures during the body mounting process, in order to prevent damages and short-circuits.

It is essential to prevent the new wire harness guides from passing through areas with sharp edges or high temperatures, in order to prevent insulation damages.

Wire harnesses have “fixed points” throughout its lengths. Such fixed points are represented by colored bands identifying the area through which harnesses must be passed. This feature assists the mounting and standardization of components.

3. Podest



Plastic protective cover for Instrument panel and Electrical & electronic components

It consists of the combined instrument which is an independent instrument, main light switch and press button switches.

The components are attached to a support so that they can be transported with safety to avoid mechanical damage and/or short-circuits.

The panel is protected against water and dust by a cover that should be maintained in place from final inspection by Daimler buses until the beginning of body building. There is a transparent part in the protection cover that allows the driver to see the instruments without having to remove the cover every time the vehicle has to be driven

It is extremely important that the cover continues to be used to protect the instruments, switches, accelerator pedal and steering wheel against water and dust infiltration during the period the vehicle is being transported or while it is parked in the yard.

Electric System

The OF 1014/1017 vehicles have a central electric centre with a fuse box system, protected against humidity by a plastic cover. The thickness of the protective cover is designed to allow removing and putting it back again as many times as needed without the risk of tearing it, so it is advisable always to use this cover to avoid damage to the electric unit due to moisture or excessive dirt accumulation.

!

Protect electric electronics equipment with protective covers.

Never remove protective covers before the body mounting procedure

Podest

3. Combined instrument

3.1 Combined instrument cluster 1904GL01H

The Instrument cluster consists of speedometer, rev counter, fuel gauge, engine coolant temperature gauge, air brake pressure gauge, tell-tales and odometer display. Before the body mounting process, the combined instrument shall be removed from the panel and stowed away in a place safe against dust, solder (high temperature, high currents), painting and anticorrosive.

There shall be a track ability control during the body mounting process through some identification label because the instrument is parameterized at supplier end with vehicle-variant specific data and may not be mounted on another vehicle.



Combined instrument for OF 1014/1017 Vehicles

Tab3- Instrument cluster Telltale

Podest

INDICATOR	DEFINITION	INDICATOR	DEFINITION
	High Beam		DPF Generation
	Right Turn		DPF status Lamp
	Left Turn		Rear Fog lamp
	Cruise control		Engine Start & Stop
	Front Fog lamp		Low Fuel Level
	DPF Regeneration		Water separator
	Seat Belt Warning		Low AD Blue
	Engine Oil pressure		ABS
	Air Bag		PTO engaged
	Battery Charging		Exhaust Brake
	Air Brake pressure warning		Malfunction indicator lamp
	Parking Brake		Check Engine Lamp
	Coolant Temperature		Disc Brake warning
	Driver Inducement		

Podest



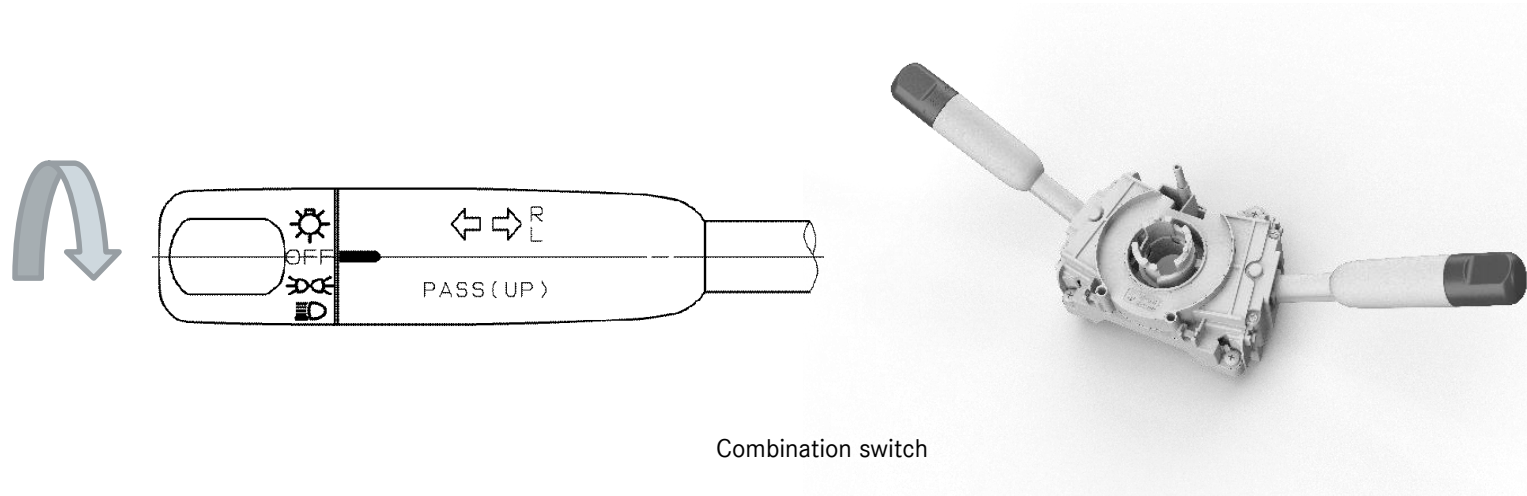
Combined instrument Dimensions

3.2.1 Combined instrument cluster dismantling

- Release the connectors, with special attention to the internal panel connector.
- Loosen the 4 bolts of the instrument cluster.
- Place the instrument cluster in a protected area until the body mounting process is completed.
- Do not mix panels, since they have different configurations for each vehicle type.
- Do not change the internal panel switching configuration, since this will alter tachometer calibration (3 switches).

3.3 Combination switch

1904GL01H



Combination switch

The Combination switch is mounted on the steering column, below the steering wheel to the left side of the driver. The switch can control the following accessories,

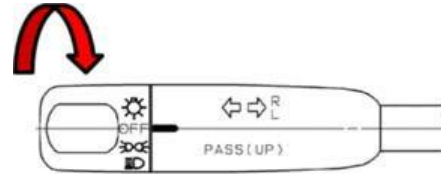
- Parking lamp can be switched “ON” by rotating the knob in  this position
- Head lamp can be switched “ON” by rotation the Knob in  this position

3.3 Combination switch

Podest

High beam

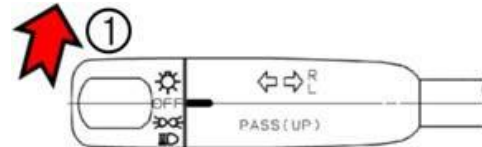
The headlights can be engaged to high beam by rotating the combination switch to high beam symbol position provided on the combination switch.



High beam

Pass-by beam

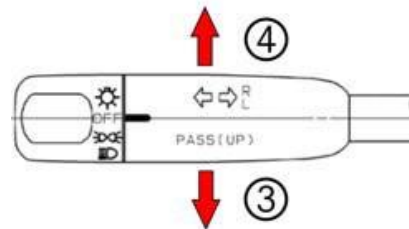
The pass-by beam glows as long as the combination switch is held in position "1".



Pass-by beam

Turn indicator

Move the combination switch to position "4" to turn on the right turn indicator, and to position "3" to turn on the left turn indicator.



Turn indicator

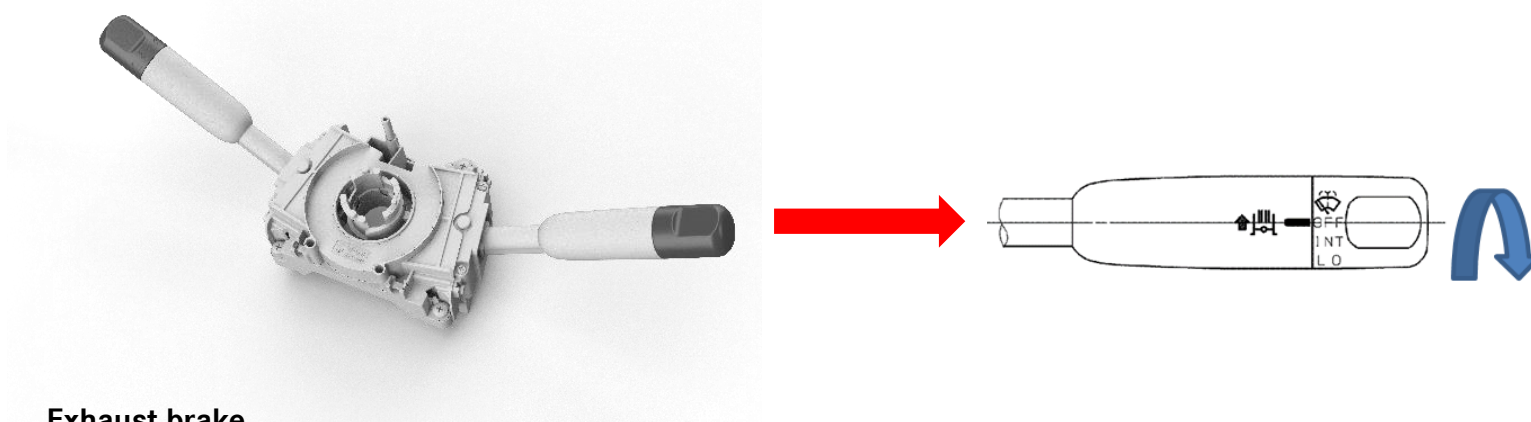
3.3 Combination switch

Podest

Wiper

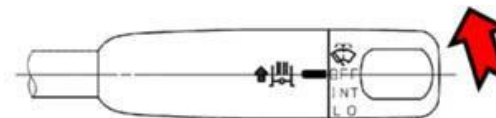
The wiper has three speeds (intermittent, low and high), which can be controlled by rotating the wiper control knob.

To activate the automatic windshield wiping and washing rotate the wiper control knob towards position "B" and hold it until washing is completed, so it can return to its normal position regularly.



Exhaust brake

Exhaust brake can be engaged by shifting the wiper combination switch towards the dashboard (accelerator pedal must be in released position).



Exhaust brake

!

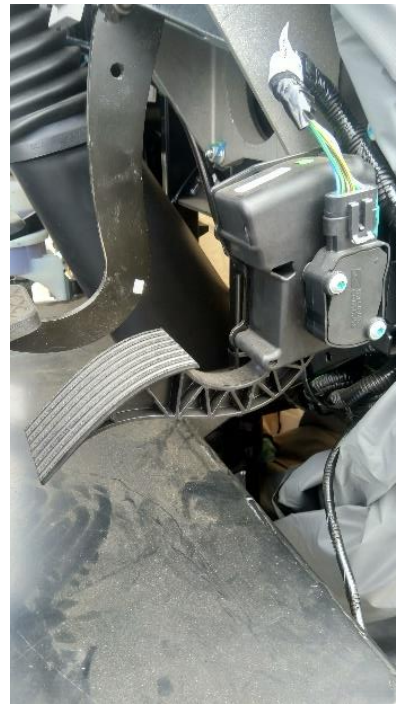
Do not switch on the exhaust brake during normal driving conditions. It is to be used only when driving downhill for optimum performance.

Podest

3.4 Accelerator pedal

The OF 1014/1017 RF chassis have an electronic accelerator pedal. It is connected to the electrical wiring harness by means of a yellow connector which on completion of body construction, should be attached under the Dashboard to be protected against water when the bus is washed.

Its attachment is designed according to the driver's place ergonomics. Disconnect the electronic accelerator pedal during soldering work on the chassis to protect the electronic accelerator circuit.

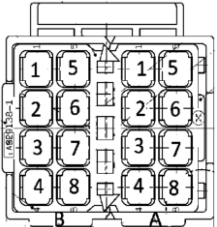
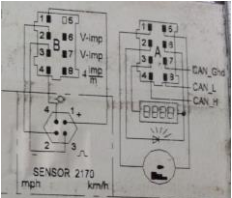


Electronic accelerator pedal

Podest

3.5* Tachograph

Applicable as optional feature, Hardware not included in chassis supply condition only interface is provided.

P1 Tachograph A+B	
Chassis side Connector	Component side
MB Part no:	MB Part no:
Secondary lock:	
TYCO 16 POLES: 929092-1	TYCO 16 POLES:
Tyco lock :	Tyco lock:
Color: Grey	Color:
	Interface at the component side " VDO MTC 1324" 

P1 TACHOGRAPH A+B											
Color-code	Circuit N.	Gauge (mm²)	pin	pin	Input/Output	Potential	Max Current	Min Current	Function	Symbol	Description
R	TCOP	2	A1	A1	Input	(+VE) KL30			Battery Supply		
			A2	A2							
Y-G	TCOIG	0.85	A3	A3	Input	(+VE) KL15			Ignition Supply		
B	TCO CANHI	0.5	A4	A4		CAN			TACHOGRAPH CAN HIGH		
B	TCOE	2	A5	A5	Input	(-VE)			GROUND		
B	TCOE.1	2	A6	A6	Input	(-VE)			GROUND		
			A7	A7							
W	TCO CANLO	0.5	A8	A8		CAN			TACHOGRAPH CAN LOW		
			B1	B1							
			B2	B2							
Y-W	SS04S.2	0.85	B3	B3	Input	(+ve) C3 Speed Signal - 8V			Speed signal input to Tachograph		
			B4	B4							
			B5	B5							
			B6	B6							
			B7	B7							
			B8	B8							

3.6 FR control unit

1904GL01H



Not applicable.

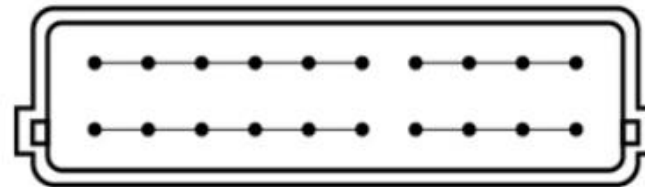
Podest

3.7 Neutral point (CAN)

1904GL01H

This is a CAN interconnection center between all electronic control units. This component is necessary to allow the electronic control units to share data.

There are two CAN star points in BSVI vehicles. These must be installed in a place of easy access for maintenance & inside the closed area, should not be exposed to Water splashes, dust & hot air.



Neutral point

3.7.1 CAN System

1904GL01H

The CAN system is defined as a data communication digital interface between electronic control units. It is a communication “network” that handles and distributes information and data control in real-time.

The CAN communication speed is “High speed” and with 5V tension. In order not to have loss of information between the modules, their distance to the “star point” is restricted to 2.5m. In case of welding jobs on the vehicle, all modules must be disconnected to avoid damage to the circuits.



The branching of the electric wiring harnesses are not to be spliced under any circumstances.

The purpose of the CAN system is to intelligently enhance data handling and acquisition, also reducing the number of connections and wires between the systems.

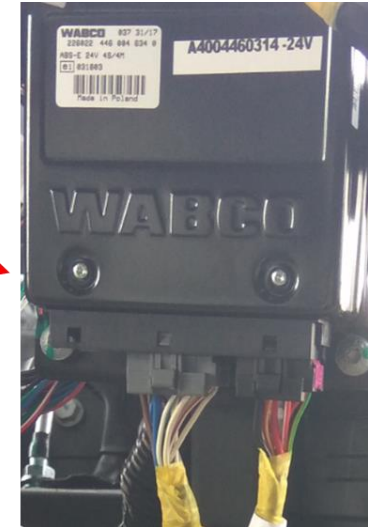
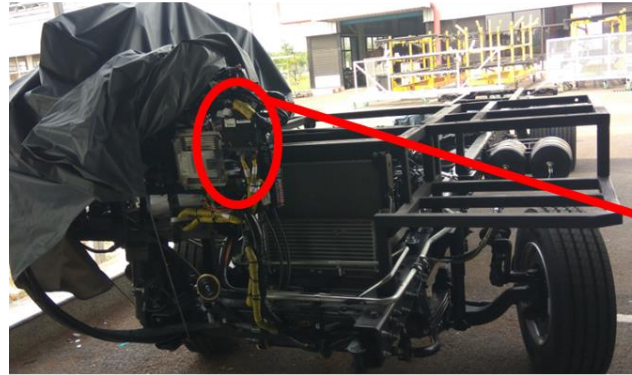
The CAN system permits the reduction of wires and increases the safety of the whole system.

The bodybuilder cannot manipulate the CAN. There are special pins, where the bodybuilder can obtain some specific signals.

The faults of the electronic system are displayed in the instrument cluster via the CAN. These faults are also saved. The faults that arise during the bodybuilding are to be removed from the memory. They can be erased on the instrument panel display. Enter the “Diagnosis” menu and click “Clear all events”.

3.8 ABS system

All OF chassis are equipped with ABS systems.



ABS ECU

Note:

- Never assemble or disassemble any connection if they are powered. Switch off the vehicle to disconnect or connect the module.
- Never measure the connections when they are on by using probes or cables ends. Never remove the connectors pulling them by the wires. After unlatching them, lift them out pulling at the same connector body.
- To remove the connector from the module, press the side latch and remove it. Never install additional equipment on the chassis “fuse-box” switch cabinet. The bodybuilder must install a second switch cabinet for the body.



The modules are to be installed in a place of easy access for maintenance.

Podest**3.9 NR system**

1904GL01H



Not applicable.

1904GL01H

Podest

3.10 Converter

1904GL01H



Not applicable.

1904GL01H

Podest**3.11 Flame start system**

1904GL01H



Not applicable.

1904GL01H

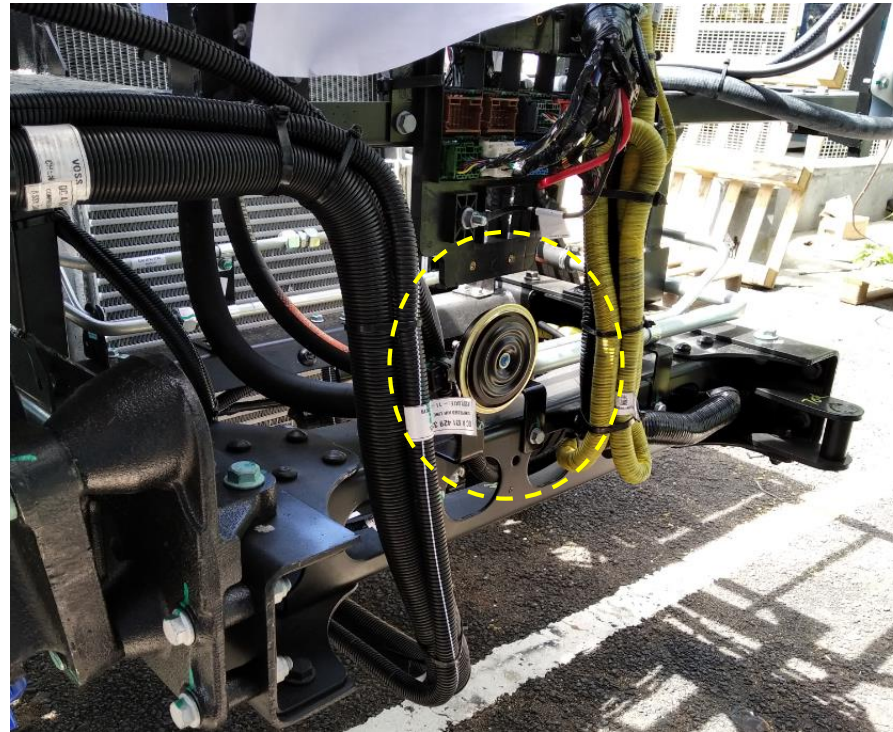
3.12 Horn

Podest

i

Electric Horn location:

The bodybuilder is responsible for the electric horn location to ensure proper sound propagation, as per applicable country laws, as well as due flood protection



Horn

Podest**3.13 Outside air temperature sensor 1904GL01H**

The outside air temperature sensor must be mounted on the front of the vehicle, in an area of easy maintenance access.

4 Electric Center

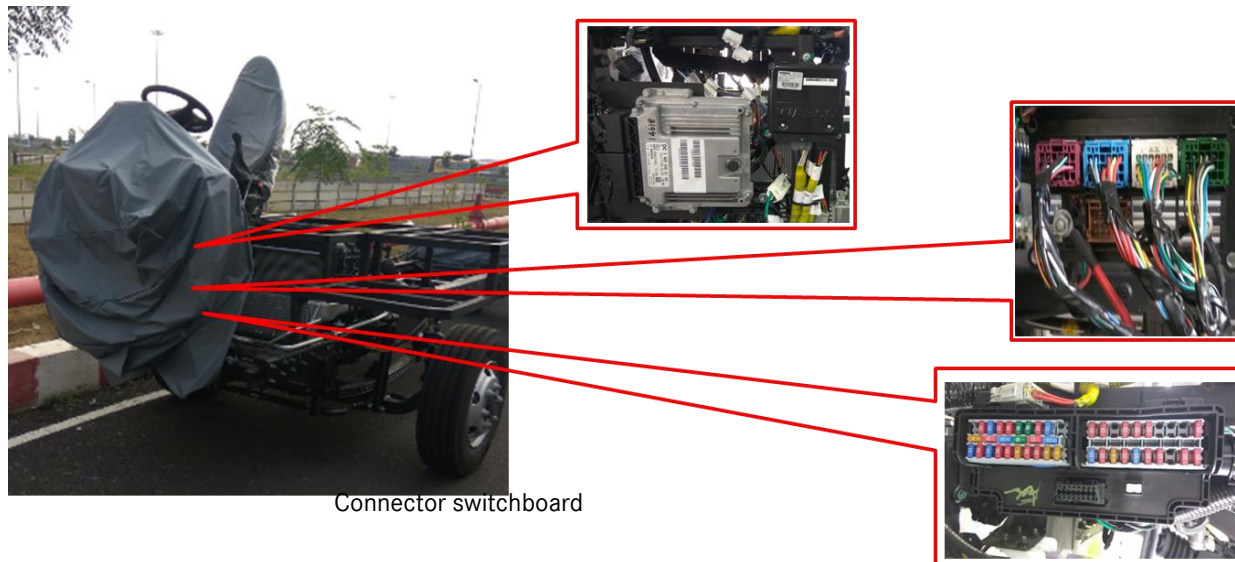
Electric Center

OF Chassis have an electric center with Fuse Box system protected by a plastic cover, in order to prevent exposure to moisture.

The thickness of the protective cover is designed to allow its application and removal as often as necessary without any risk of tearing; therefore, always use this cover to prevent electric center damages due to exposure to water or excessive dust accumulation.

The ABS module and the electric center must always be protected against the weather. Do not remove it before the body building.

Only remove the electric control center cover at the moment of body building, and ensure electrical control center is protected from humidity, high temperature, high current Etc.



The cabin Fuse box & Relay mounting bracket should be given by Bus body builder inside the cabinet..

Electric Center

4.1 Additional comments for handling Electrical center

Always refer to the chassis wiring diagram before any complementation. Always use auxiliary relays to activate any equipment to be installed, mainly if it is via ignition or start key.

Always install fuses on the systems according to the need of the equipment. Only the auxiliary relay coil must be actuated by the ignition key.

The electric center location must be protected against water infiltration and impurities. The vertical position is the most suitable for the “fuse box”.

In case any complementation or maintenance is required, do not change the vehicle original electrical wiring. Keep the same cable gauge if a repair is needed. Do not make direct connections eliminating relays or other components. These procedures will put into risk the whole vehicle electrical wiring.

Make sure that electrical wiring does not rub against cutting edges on the vehicle's metal structure, because this is one of the main short-circuit and fire risk factors.

Damaged fuses must be replaced with others with the same rating. If there is frequent fuse burn out, detect the cause. Never replace a fuse with a different rating, and never insert clamps or other objects into the fuse holders with the purpose of replacing them under an emergency condition and/or temporarily.

All electronic modules must be installed in an easily accessible place for maintenance, protected against water infiltration and impurities. They must never be repaired but, instead, they must be replaced by new parts because they are safety items.

4.2 Fuse box Cabin fuse box

“Fuse Box” is a cabinet containing relays, protection fuses, diodes and resistors.

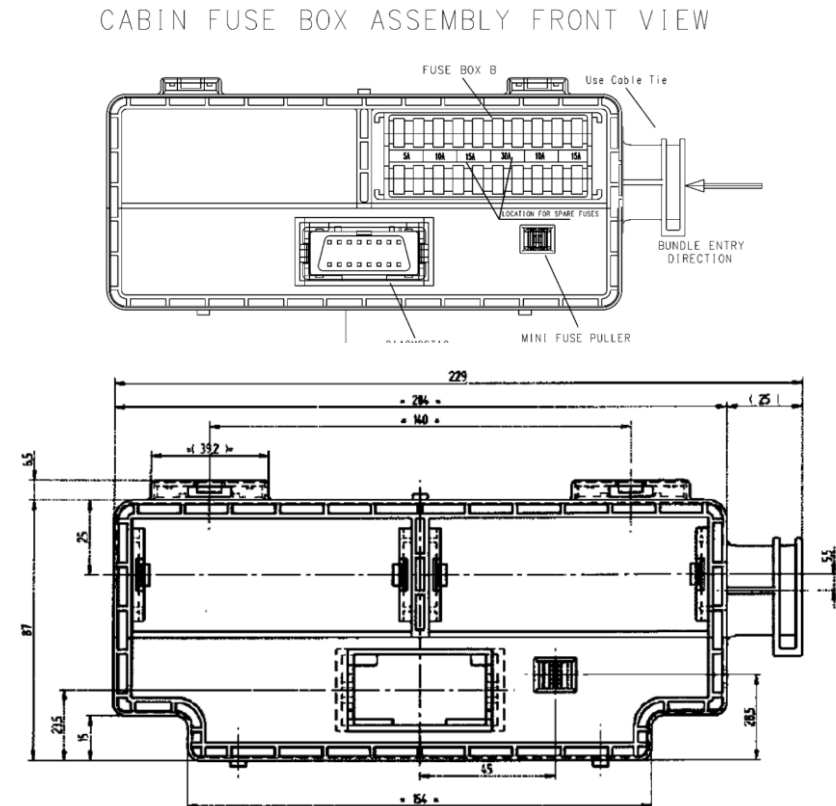
The layout and features of such components are detailed in the fuse label provided along with the toolbox.

This label must be attached next to the bus electric center to allow proper identification of components during eventual maintenance procedures. The disassembled Fuse Box must be stored in a secure location, duly protected from dust, welding (high temperature), paint and anticorrosion materials.



Cabin fuse box for 1014/1017vehicles

Electric Center



1904GL01H

4.2.1 Fuse capacity

Electric Center

The fuses that are part of the fuse box switch cabinet of all Daimler India Bus chassis can be differentiated by their colors and their capacities:buses India

- Light brown - 5 Amperes
- Red - 10 Amperes
- Light blue - 15 Amperes
- Yellow - 20 Amperes
- Natural - 25 Amperes

In order to achieve a successful bodybuilding, we recommend that these instructions are followed to avoid any problem concerning the vehicle electrical wiring.

The electric center is located in a temporary position, and its final location will be determined during the bodybuilding. All the components which supply these vehicles are dimensioned to attend the electric loads for their original equipment.



Fuse identification

4.3 Relays

The relays assembled in the electric center (“FUSE-BOX”) of all Daimler India Bus chassis are color coded for each function; check the vehicle electric center label for more information.

Relay	Color	Type
K10 AC Control Switch & Start Coil Relay	Brown	Micro
K30 NOX/UQS Relay	Brown	Micro
K20 Exhaust Brake & Fog Lamp Relay	Brown	Micro
K7 Wiper high Relay	White	Mini
K24 Wiper Low Relay	White	Mini
K25 Washer Relay	White	Mini



Connector Main Board



Micro Relay



Mini Relay

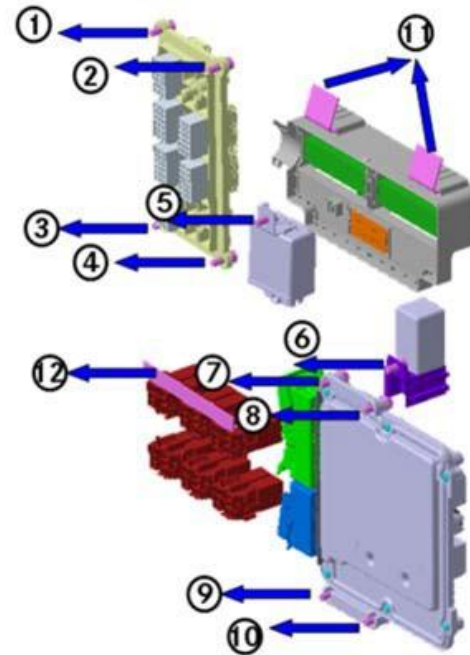
1904GL01H

4.4 Cabin fuse box, interconnector, relay and electronic control unit mounting

During the body building process, the cabin fuse box and relay should be fitted in inside the driver cabin, as shown in the picture.



Ref. Components arrangement



Recommended Fasteners

- 1- M 6X16
- 2- M 6X16
- 3- M 6X16
- 4- M 6X16
- 5- M 6X12
- 6- M 6X12
- 7- M 6X20
- 8- M 6X20
- 9- M 6X20
- a. M 6X20
- b. See attached drawing
- c. See attached drawing

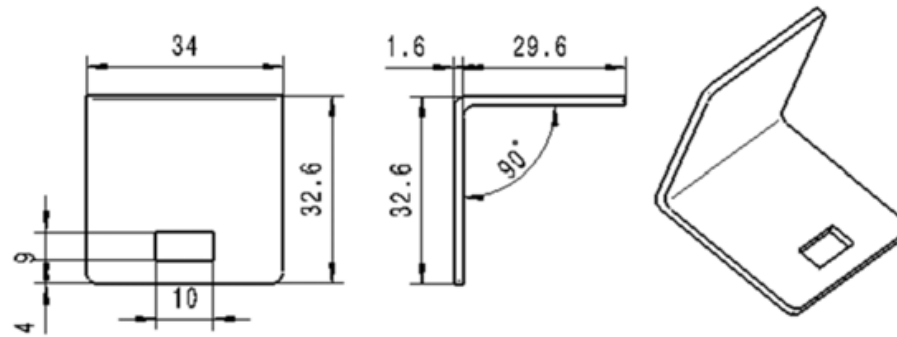
Note:

The cabin fuse box and relay mounting bracket should be provided by the bus body builder inside the cabinet.

Electric Center

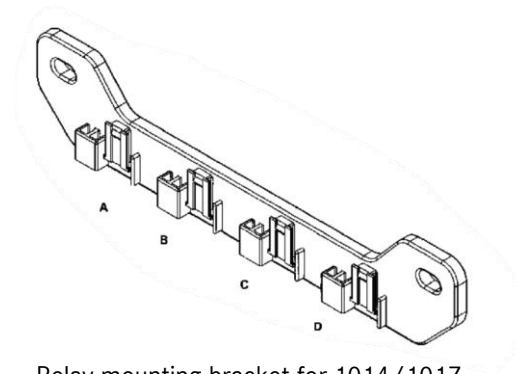
4.5 Cabin fuse box, interconnector, relay and electronic control unit mounting

Fuse box mounting bracket



Fuse box mounting bracket

Relay mounting bracket



Relay mounting bracket for 1014/1017

Electric Center

4.5 Diode capacity

1904GL01H



Not applicable.

1904GL01H

Electric Center

4.6 Electronic control unit

1904GL01H

4.6.1 Main cabinet



Electronic control unit

Engine management system is the processor that manages the running of the engine. This module receives the signals from all engine and vehicle sensors and identifies the operation regimen. It is installed in such a way that it remains in vertical position at all times during vehicle operation.

This module is attached in the cabin. Connection to all the sensors installed in the engine is carried out by means of a 60-way connector (A). Connection to the vehicle is carried out by means of a 94-way connector (K).

Before the body mounting process, the EMS should be removed from the main cabinet and kept in an ESD cover, protected from dust, water, welding splashes (high temperature), paints and anticorrosive. A traceability control must be available since the units are parameterized with vehicle specific data so as to prevent interchange. Never use high-pressure washing equipment on the connectors.

EMS should be disconnected at all times during welding. It should be connected only after connecting all sensors, actuators, entire cabin/chassis wiring harness, engine and vehicle connector before battery connection. After ensuring all the connections, vehicle should be cranked and checked for any fault codes.

Never assemble or disassemble any connection if they are powered. Switch off the vehicle to disconnect or connect the EMS.

Never make any measurements on powered connections using test leads or cable ends. Use appropriate test leads. Never remove the connectors pulling them by the wires.

Note:

More details on mounting directives can be obtained from TCD 0281Y035MF of EMS.

Electric Center

4.6.2 Temporary location

1904GL01H



ECU temporary Location

For the mounting situation, ECU screwed with the wiring harnesses to the metal bracket, protection against the following environmental conditions are to be followed:

- Water and dust, especially the wiring harnesses that were routed through the top.
- Mechanical damage, especially the pressure compensation element and the male pins in the connector.
- In case of paintwork on the remaining vehicle, avoid paint on the ECU and its terminals.
- Electrostatic discharge.
- Contamination with the media's whose tubes are beside the ECU.
- The protection should be executed with a plastic foil which protects the ECU and, in parallel, the wiring harness. Material of the foil: polypropylene conductible plastic.

While transporting the chassis or shifting in a container (for approx. 1-2 months) protection against the following must be ensured:

- Environmental conditions: heat, water and dust.
- Mechanical damage, especially on the pressure compensation element and the male pins in the connector.
- In case of paintwork on the remaining vehicle, avoid paint on the ECU and its terminals.
- Electrostatic discharge.
- Contamination with the media's whose tubes are beside the ECU.
- Relative humidity higher than 60% could cause corrosion.
- The protection should be executed with a plastic foil which protects the ECU and, in parallel, the wiring harness. Material of the foil: polypropylene conductible plastic which has some additional VCI corrosion protection. Example see link: <http://www.excor.de/vci/index.html>

Electric Center

4.6.3 Mounting assessment of ECU at the permanent location Mounting location incl. wiring harness fixation



Arrangement of ECU, Relay & Fuses

ECU should be mounted inside the driver compartment besides co-driver area; inside or on the dashboard area.

The fixation should be done according to the RB standard (offer drawing) with distance between the cable outlet and the fixation point less than 150 mm on the same vibration level as the ECU itself.

Vibration load

Vibration test profile according to Standard ISO 16750-3 (commercial vehicles - chassis mounted). Test must be performed with assembled cable harness.

- Random vibration test

Test duration: 3 x 32h RMS: 57.9 m/s²

Components mounting B54.15-0023-01

Thermal load

T_{imax} = 105 °C

Humidity and corrosion

On this location, dashboard, we expect no critical humidity and corrosion load because the mounting place is covered.

While transporting the chassis or shifting in a container (for approx. 1-2 months) protection against the following must be ensured:

- Environmental conditions: heat, water and dust.
- Mechanical damage.

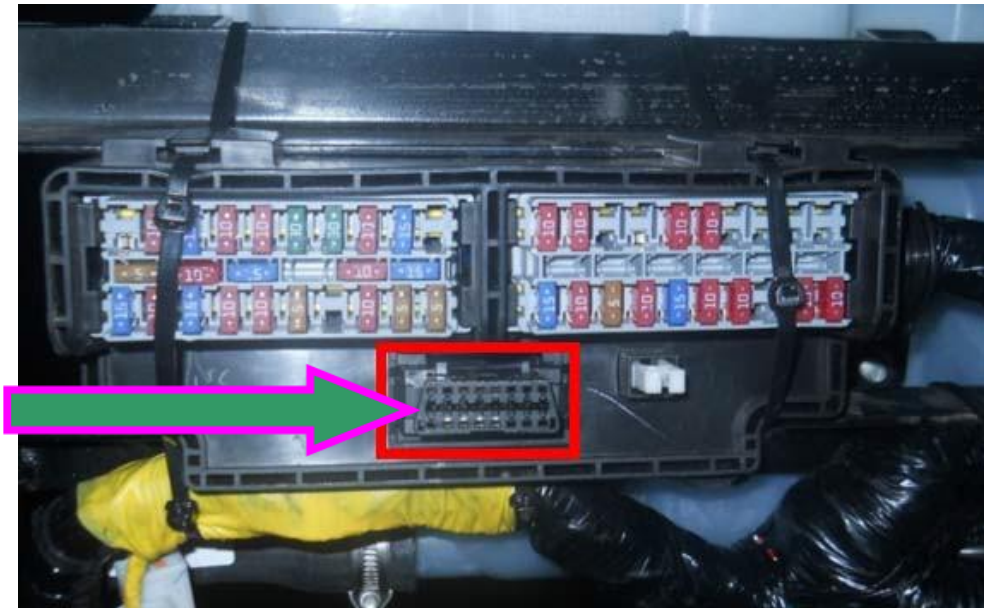
Diagnostics plug

5 Diagnostics plug

1904GL01H

This plug is integrated in the cabin fuse box and its function is to allow “off board” diagnostics, or diagnostics with external test equipment. When disassembling for body mounting, care should be taken as to prevent infiltration of impurities (dust), welding (high temperature), paints and anticorrosive, because this would hamper its use.

Diagnostic Plug

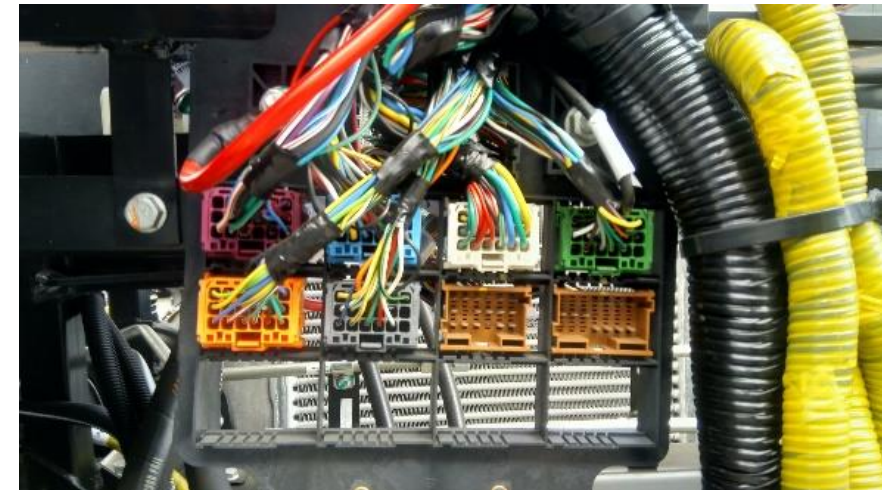
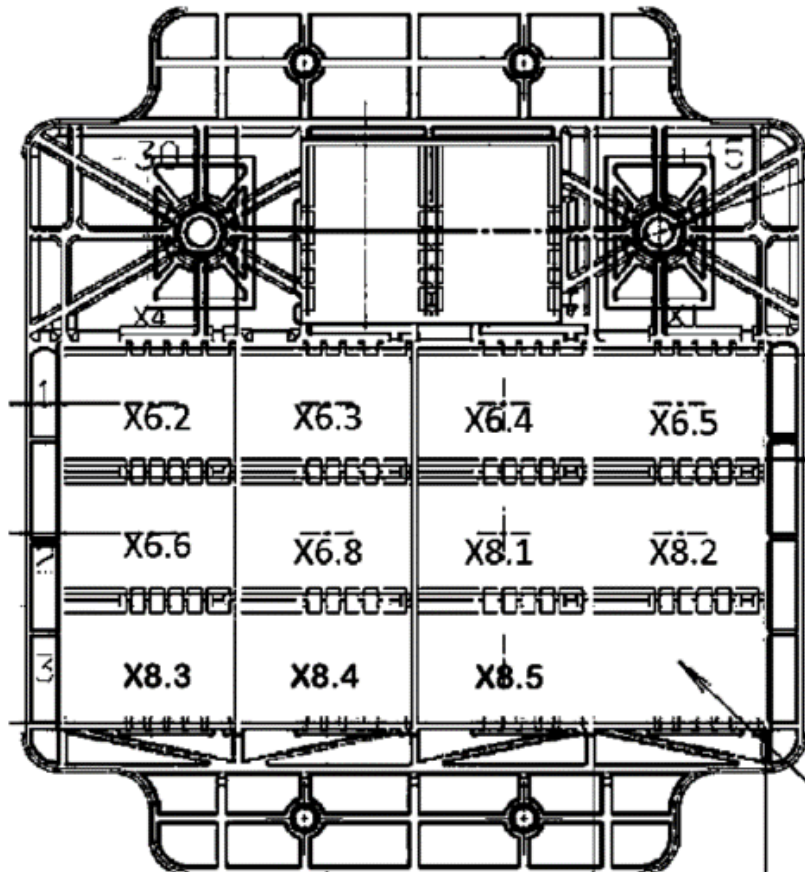


Diagnostic plug for NON multiplexed chassis

6 Connector Main Board OF 1014/1017

All connections between wiring harnesses for OF 1014/1017 chassis are made in this main cabinet. The purpose is to concentrate every connection in a single board, thus making maintenance easy, standardizing connectors and providing a specific location for bodybuilders to add their wiring harnesses connections, achieving savings in space inside the bus switch cabinet compartment.

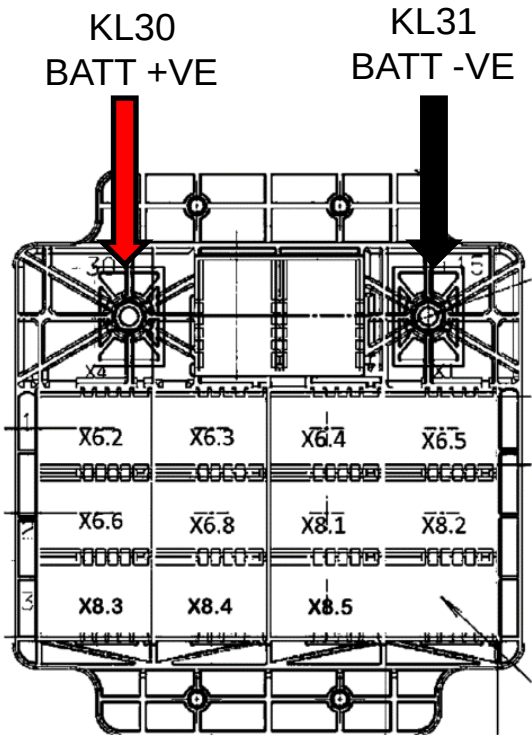
The connector arrangement and their respective functions, as well as the standby connectors for body mounting, are listed below



Connector Main Board

6 Connector Main Board Description

Connector Main Board



Connector main board

KL30: (+VE)

X6.1 – CHASSIS INTERCONNECTOR
X6.9 – CHASSIS INTERCONNECTOR

KL31:(-VE)

CHASSIS EARTH
X6.10 – CHASSIS INTERCONNECTOR

Tab1- Connector main board Details OF 1014/1017

Connector main board				
Function	Coordinate	Color	Cavity	Description
X6.2	X1-1	Glared violet	18	Chassis interconnector
X6.3	X1-2	Light blue	18	Chassis interconnector
X6.4	X1-3	Natural	18	Chassis interconnector
X6.5	X1-4	Green	18	Chassis interconnector
X6.6	X2-1	Orange	18	Chassis interconnector
X6.8	X2-2	Stale grey	18	Chassis interconnector
X8.1	X2-3	Brown	18	Body interconnector
X8.2	X2-4	Brown	21	Body interconnector
X8.3	X3-1		6	Body interconnector
X8.4	X3-2	Rape Yellow	9	RPAS interconnector
X8.5	X3-3		12	Body Interconnect External lamp
EARTH	—	—	—	Chassis/Body

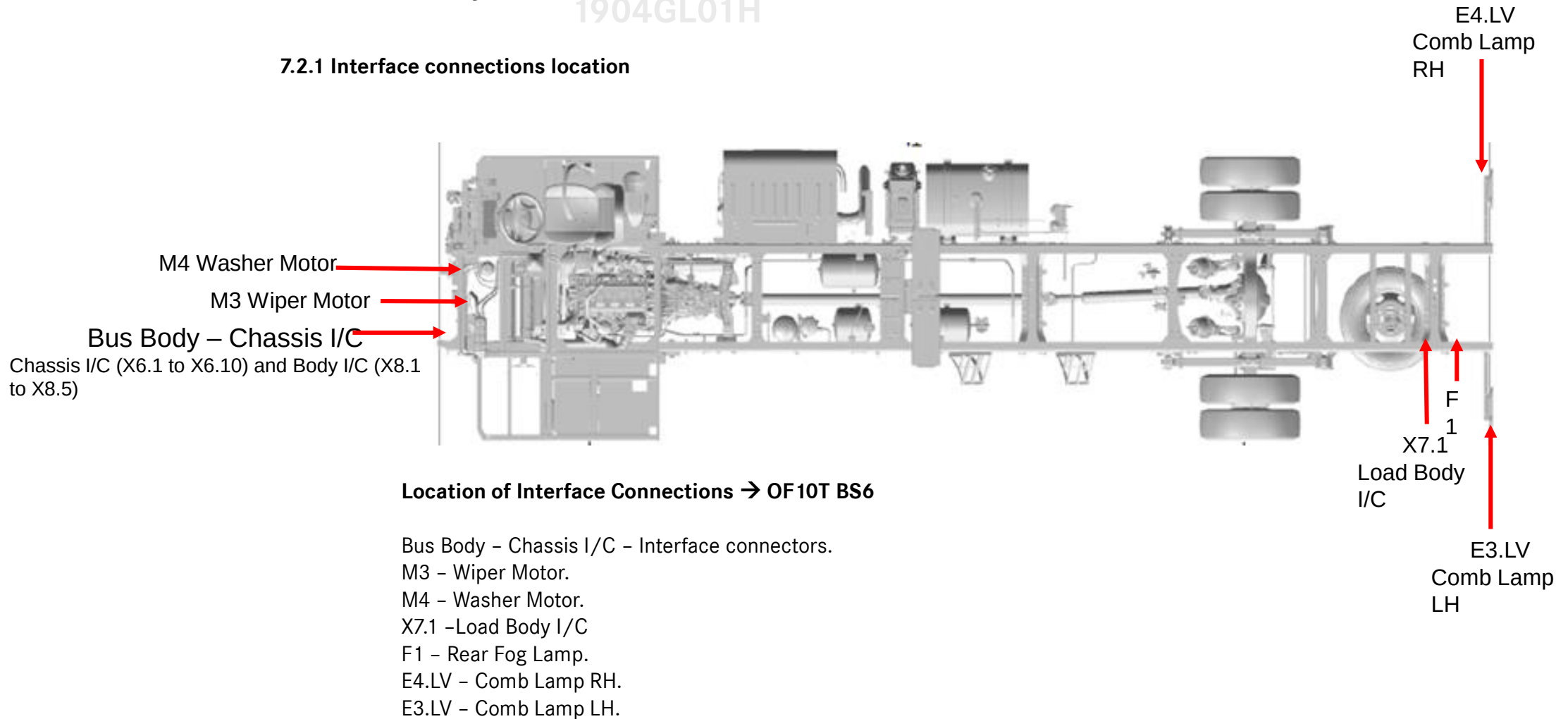
1904GL01H

Interface chassis and body

7.2 Interface chassis and body OF 1014/1017

1904GL01H

7.2.1 Interface connections location



Interface chassis and body

Color codes of wires

For wire colors, please refer to the table below:

Tab5- Color code

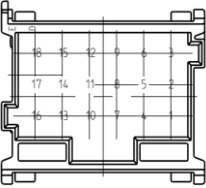
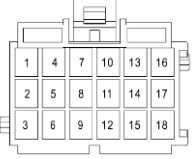
Color code	Color description
B	Black
Br	Brown
Ch	Chocolate
Dg	Dark green
G	Green
L	Blue
Lg	Light green
O	Orange
P	Pink
R	Red
Sb	Sky blue
V	Violet
W	White
Y	Yellow
Gr	Gray

7.9 Bus body interconnector

The standby connector functions for body mounting located in the switch cabinet, as well as the Daimler India Buses and AMP connector number to be used by the bodybuilder, are listed in the table below.

Interface chassis and body

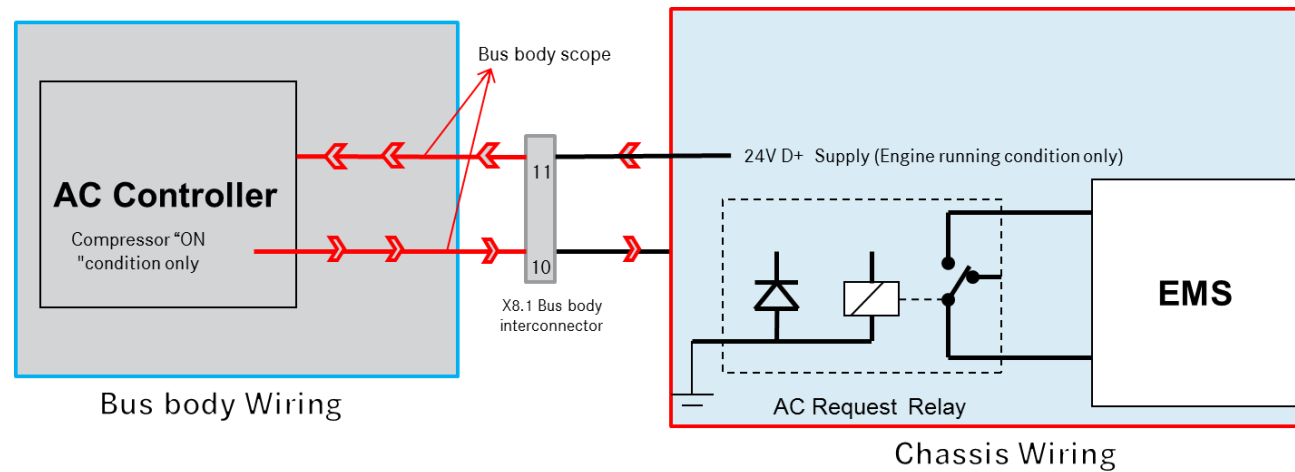
Tab12- Bus body interconnector X8.1 pin details for OF 1014/1017 Variants

Electric center - X8.1 Bus Body Interconnector	
Chassis side Connector	Bus Body builder side
MB Part no:	MB Part no:
Secondary lock:	
TYCO 18 POLES: 1-	TYCO 21 POLES: 1-
Tyco lock : 967634-1	Tyco lock: 967634-1
Color: Clay Brown	Color: Clay Brown
Coding : "A"	Coding : "A"
Latching mechanism = 'B-C'	Latching mechanism = 'B-C'
	

X8.1 BUS BODY INTERCONNECTOR											
Color-code	Circuit N.	Gauge (mm ²)	pin	pin	Input/Output	Potential	Max Current	Min Current	Function	Symbol	Description
R	DCLI	0.85	1	1	Output	(+ve)	1		DRIVER CABIN LAMP		This is protected circuit from the MUX and the SW to be provided by the body builder for Driver cabin lamp.
G/R	IL01	0.5	2	2	Output	(+ve) KL58	0.5		PARKING ILLUMINATION ON		Parking lamp is in ON Condition (Top marker & Body SW illumination will turn ON)
R/Y	RLI	1	3	3	Output	(+ve) D+ ON	1		READING LAMP ON		This is protected circuit from MUX and the SW to be provided by the body builder for Reading lamp.
R/G	SLI1	1.25	4	4	Output	(+ve) KL15	4		SALOON LAMP ON		This is protected circuit from MUX and the SW to be provided by the body builder for saloon lamp.
L	FSL01	0.85	5	5	Output	(+ve) KL15	1		DOOR OPEN SIGNAL		This is protected circuit from MUX and the SW to be provided by the body builder for Door Open/Close. Whenever the Door opens, Foot step lamp will turn
L-R	BUZI	0.85	6	6	Output	(+ve) ACC ON	1		ACC ON + Emergency door switch ON + Foot Step Switch ON + Bus Stop Switch ON +		Whenever any of the function ON buzzer will get continuous beep sound.
			7	7							
R/Y	BBIGN	1.25	8	8	Input	(+ve) KL15			IGNITION I/P TO VTS, MONITOR,DVD,STOP REQUEST SW AND AMBIENT SW POWER		Ignition supply to the Body builder for VTS, Monitor and DVD etc..
			9	9							
R/Y	ACCI	0.5	10	10	Input	(+ve)			AC COMPRESSOR STATUS		
G	ACD+	1.5	11	11	Output	(+ve) D+			POWER FOR AC CONTROLLER		
Y/W	SS04S	0.85	12	12	Output	(+ve) C3 Speed Signal - 8V			DOOR CONTROLLER , TACHO		
L	EDLO	0.85	13	13	Output	(+ve) KL30	1		B+ ON + Emergency Declaration Lamp Switch ON		This is the protected circuit from MUX and the SW to be provided by the body builder.Whenever the Emergency declaration SW is ON, the lamp will glow with the sound which indicate the emergency.
			14	14							
Y-L	DOSS.1	0.85	15	15	Input	(+ve)			DOOR OPEN SIGNAL		
G	SLBB	0.5	16	16	Output	(+ve) KL15	3		IG ON + Brake Switch ON		Stop lamp ON when brake sw pressed
G-Y	BL01D.2	0.5	17	17	Input	(+ve)			Reverse signal Input		Reverse gear ON input goes to the MUX unit.
B	BBE	3	18	18	Gnd	(-ve)			Vehicle Ground		

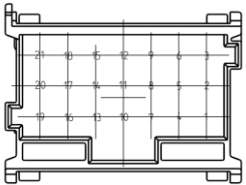
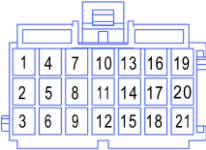
Interface chassis and body

7.9 Bus body interconnection details for Air Conditioning interface for OF 1017 chassis



7.10 Bus body interconnector

The standby connector functions for body mounting located in the switch cabinet, as well as the Daimler India Buses and AMP connector number to be used by the bodybuilder, are listed in the table below.

Electric center - X8.2 Bus	Body Interconnector
Chassis side Connector	Bus Body builder side
MB Part no:	MB Part no:
Secondary lock:	
TYCO 21 POLES: 1-	TYCO 21 POLES: 1-
Tyco lock : 967635-1	Tyco lock: 967635-1
Color: Clay Brown	Color: Clay Brown
Coding : "A"	Coding : "A"
Latching mechanism = 'B-C'	Latching mechanism = 'B-C'
	

Tab13- x8.2Bus body interconnector pin details for OF 1014/1017 Variants

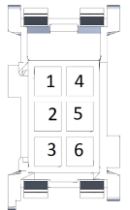
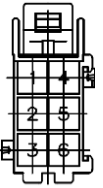
X8.2 BUS BODY INTERCONNECTOR											
Color-code	Circuit N.	Gauge (mm ²)	pin	pin	Input/Output	Potential	Max Current	Min Current	Function	Symbol	Description
L-W	BBA1.3	1.25	1	1	Output	(+ve) ACC	3		Door IC, Front Destination & Door Lamp for Non-AC		
			2	2							
B/Y	DCLSO	0.85	3	3	Input	(-ve)			Driver cabin lamp		This is the protected circuit from MUX and the SW to be provide by the body builder.
B/L	SLSO	0.85	4	4	Input	(-ve)			Saloon Lamp		This is the protected circuit from MUX and the SW to be provide by the body builder.
			5	5							
Y/R	DO1	0.85	6	6	Input	(+ve)			Door Open		This is the protected circuit from MUX and the SW to be provide by the body builder.
Y/W	DCI	0.85	7	7	Input	(+ve)			Door Close		This is the protected circuit from MUX and the SW to be provide by the body builder.
			8	8							
Y/B	DO2	0.85	9	9	Output	(+ve)	1		ACC ON + Door Open Switch		Door open symbol will display in the SW
Y/G	DC2	0.85	10	10	Output	(+ve)	1		ACC ON + Door Close Switch		Door close symbol will display in the SW
			11	11							
BR	FALO1	0.85	12	12	Input	(-ve)			Fire detection alarm input		
			13	13							
L	USBD+	0.85	14	14	Output	(+ve)	1		USB ON		D+ ON , USB power supply ON
			15	15							
			16	16							
BR	EFSP0	0.85	17	17	Input	(-ve)			Emergency Door switch, Foot stop switch, Bus stop switch		
			18	18							
			19	19							
B/P	ELSO	0.85	20	20	Input	(-ve)			Emergency declaration lamp switch		This is the protected circuit from MUX and the SW to be provide by the body builder. Emg declaration lamp SW O/P goes to the
			21	21							

7.11 Bus body interconnector

Tab 14- x8.3 Bus body interconnector pin details for OF 1014/ 1017 Variants

X8.3 BUS BODY INTERCONNECTOR											
Color-code	Circuit N.	Gauge (mm ²)	pin	pin	Input/ Output	Potential	Max Current	Min Current	Function	Symbol	Description
			1	1							
B	BBCANHI	0.5	2	2	CAN				Body Builder CAN		Only for Body Builder interface with CAN
W	BBCANLO	0.5	3	3	CAN				Body Builder CAN		Only for Body Builder interface with CAN
			4	4							
			5	5							
			6	6							

Electric center - X8.3 Bus Body Interconnector

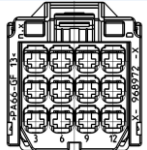
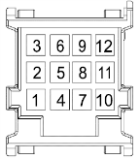
Chassis side Connector	Bus Body builder side
MB Part no:	MB Part no:
Secondary lock:	
TYCO 6 POLES: 1-965641-	TYCO 6 POLES: 1-965640-3
Tyco lock : 968271-1	Tyco lock: 968271-1
Color: Slate Grey	Color: Slate Grey
Coding : "A"	Coding : "A"
Latching mechanism = 'B-C'	Latching mechanism = 'B-C'
	

Interface chassis and body

7.12 Body Interconnect External Lamp for OF 1014/1017 Chassis

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Tab15- Body Interconnect External Lamp for OF 1014/1017 Variants

Electric center - X8.5 Body Interconnect	
Chassis side Connector	Bus Body builder side
MB Part no:	MB Part no:
Secondary lock:	
TYCO 12 POLES: 7-	TYCO 12 POLES: 2-
Tyco lock :	Tyco lock: 967632-1
Color: Natural	Color: Natural
Coding : "B"	Coding : "B"
Latching mechanism = 'A-C'	Latching mechanism = 'A-C'
	

X8.5 BODY INTERCONNECT EXTERNAL LAMP											
Color-code	Circuit N.	Gauge (mm ²)	pin	pin	Input/Output	Potential	Max Current	Min Current	Function	Symbol	Description
R-G	LE01BY	0.5	1	1	Output	(+ve)	4		Head Lamp Low Beam LH		
R	HLL1	1.25	2	2	Output	(+ve)	4		Head Lamp Low Beam RH		
R-L	HLLR.1	1.25	2	2	Output	(+ve)	4		Head Lamp Low Beam RH		
W	HL01HL.1	1.25	3	3	Output	Discrete (Active high)	4		B+ ON + High Beam Switch ON Head Lamp High Beam LH		Tell tale will display in the instrument cluster
G-O	LE02	0.85	4	4	Output	(+ve)			Head Lamp Leveller		
B	HLE1LL	2.5	5	5	Output	(-ve)			Ground		
G-R	IL04R	0.5	6	6	Output	(+ve)			Parking Lamp on		
G-W	DRL02	1.25	7	7	Output	(+ve)	1		Day time running Lamp ON		
Y-L	TR01FL	0.5	8	8	Output	(+ve)	3.8		Turn Lamp LH ON		
Y-R	TR01FR	0.5	9	9	Output	(+ve)	3.8		Turn Lamp RH ON		
R-W	FOG FR	1.25	10	10	Output	Discrete (Active high)			Front fog lamp ON		Tell tale will display in the instrument cluster
W	HL01HR	1.25	11	11	Output	(+ve)	4		Head Lamp High Beam RH		
			12	12							

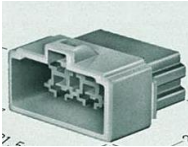
7.13 Wiper Motor Connection for OF 1014/1017 chassis

Interface chassis and body

1904GL01H

Tab16- A9 Wiper Motor Connection

M3 WIPER MOTOR											
Color-code	Circuit N.	Gauge (mm²)	pin	pin	Input/Output	Potential	Max Current	Min Current	Function	Symbol	Description
L-W	WI06INT	2	1	1	Output	(+ve)			Auto stop		
L	WI05	2	2	2	Input	(+ve)			Ignition supply to wiper motor		
B	WME1	2	3	3	Output	(-ve)			Ground		
L-B	WI03H	2	4	4	Output	(+ve)	0.4		Wiper High		
L-R	WI0P	2	5	5	Output	(+ve)	0.4		Wiper Low		
			6	6							

M3 WIPER MOTOR	
Chassis side Connector	Bus Body builder side
MB Part no:	MB Part no:
Secondary lock:	
SUMITOMO 6 POLES: 6070-	SUMITOMO 6 POLES: 6070-
Lock :	Lock:
Color: Natural	Color: Natural
ET06-2W 60706481 Natural 3 2 1 6 5 4	

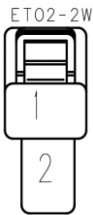
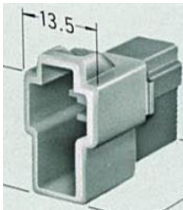
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Interface chassis and body

7.14 Washer Motor Connection for OF 1014/1017 chassis

Tab17- E21 Washer Motor Connection

M4 WASHER MOTOR											
Color-code	Circuit N.	Gauge (mm²)	pin	pin	Input/Output	Potential	Max Current	Min Current	Function	Symbol	Description
L	WI08.1	0.85	1	1	Output	(+ve) KL15	1		Washer motor ignition supply		
B	WI09	0.85	2	2	Output	(-ve)			Ground		

M4 WASHER MOTOR	
Chassis side Connector	Bus Body builder side
MB Part no:	MB Part no:
Secondary lock:	
SUMITOMO 2 POLES: 6070-	SUMITOMO 2 POLES: 6070-
Lock :	Lock:
Color: Natural	Color: Natural
	

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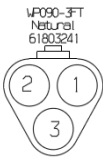
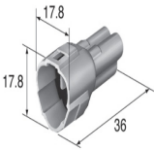
7.15 License Plate & Rear Roof Marker Lamp for OF 1014/ 1017 chassis

Interface chassis and body

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Tab18- License Plate & Rear Roof Marker Lamp

X7.1 LOAD BODY											
Color-code	Circuit N.	Gauge (mm²)	pin	pin	Input/Output	Potential	Max Current	Min Current	Function	Symbol	Description
G-W	TL01LC	0.5	1	1	Output	(+ve) KL58	2		License Plate Lamp		
G-R	TL01RC	0.5	2	2	Input	(+ve) KL58	4.2		Rear Roof Marker Lamp		
B	EA15	0.85	3	3	Output	(-ve)			Ground		

X7.1 LOAD BODY	
Chassis side Connector	Bus Body builder side
MB Part no:	MB Part no:
Secondary lock:	
SUMITOMO 3 POLES:	SUMITOMO 3 POLES: 6187-
Lock :	Lock:
Color: Natural	Color: Natural
	

1904GL01H

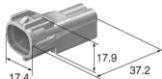
7.16 24V socket for OF 1014/1017 chassis

Interface chassis and body

1904GL01H

Tab19- F1 Rear Fog Lamp Interconnector

F1 REAR FOG LAMP INTERCONNECTOR											
Color-code	Circuit N.	Gauge (mm²)	pin	pin	Input/Output	Potential	Max Current	Min Current	Function	Symbol	Description
G-L	FOGROP	1.25	1	1	Output	(+ve) KL 15	1		Rear Fog Lamp Ignition supply		
B	FOGE	1.25	2	2	Output	(-ve)			Ground		

F1 REAR FOG LAMP INTERCONNECTOR	
Chassis side Connector	Bus Body builder side connector
MB Part no:	MB Part no:
Secondary lock:	
SUMITOMO 2 POLES: 6189-	SUMITOMO 2 POLES: 6188-0266
Lock :	Lock:
Color: Gray	Color: Gray
	

1904GL01H

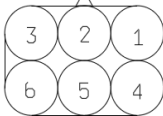
7.17 Comb Lamp LH for OF 1014/1017 chassis

Interface chassis and body

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Tab20- E3.L Comb Lamp LH

E3.LV COMB LAMP LH											
Color-code	Circuit N.	Gauge (mm²)	pin	pin	Input/Output	Potential	Max Current	Min Current	Function	Symbol	Description
W-G	SL01L	0.5	1	1	Output	(+ve)	3		Brake Lamp LH		
G-W	TL01.L	0.5	2	2	Output	(+ve)	2		Tail Lamp LH		
Y-L	TR01RL	0.5	3	3	Output	(+ve) Discrete	3.8		Left turn indicator	↩	Tell tale will be displayed in Instrument Cluster
B	EA14L	0.85	4	4	Output	(-ve)			Ground		
			5	5							
R-L	BL01L	0.5	6	6	Output	(+ve)	4		Reverse Lamp LH		Whenever Reverse gear ON, Reverse buzzer will start to beep along with reverse light

E3.LV COMB LAMP LH	
Chassis side Connector	Bus Body builder side
MB Part no:	MB Part no:
Secondary lock:	
SUMITOMO 6 POLES:	SUMITOMO 6 POLES: 6189-
Lock :	Lock:
Color: Natural	Color: Natural
MT090 WP-6F 61806181 Natural 	

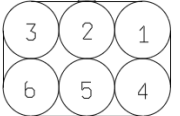
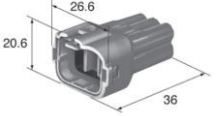
1904GL01H

7.18 E4.L Comb lamp RH for OF 1014/ 1017 chassis

Interface chassis and body

Tab21- E4.L Comb lamp RH

E4.LV COMB LAMP RH											
Color-code	Circuit N.	Gauge (mm ²)	pin	pin	Input/ Output	Potential	Max Current	Min Current	Function	Symbol	Description
W-G	SL01R	0.5	1	1	Output	(+ve)	3		Brake Lamp RH		
G-R	TL01.RD	0.5	2	2	Output	(+ve)	4.2		Tail Lamp RH		
Y-R	TR01RR	0.5	3	3	Output	(+ve) Discrete	3.8		Right turn indicator	⇨	Tell tale will be displayed in Instrument Cluster
B	EA14R	0.85	4	4	Output	(-ve)			Ground		
			5	5							
R-L	BL01R	0.5	6	6	Output	(+ve)	4		Reverse Lamp RH		Whenever Reverse gear ON, Reverse buzzer will start to beep along with reverse light

E4.LV COMB LAMP RH	
Chassis side Connector	Bus Body builder side connector
MB Part no:	MB Part no:
Secondary lock:	
SUMITOMO 6 POLES: 6180-	SUMITOMO 6 POLES: 6189-6171
Lock :	Lock:
Color: Natural	Color: Natural
MT090 WP-bF 6180b181 Natural 	

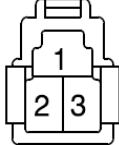
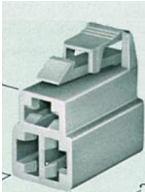
Interface chassis and body

7.19 Head Lamp Leveling Switch for OF 1014/ 1017 chassis

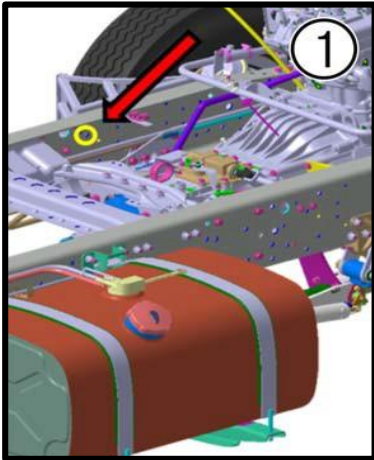
1904GL01H

Tab25- S26 Head lamp leveling switch

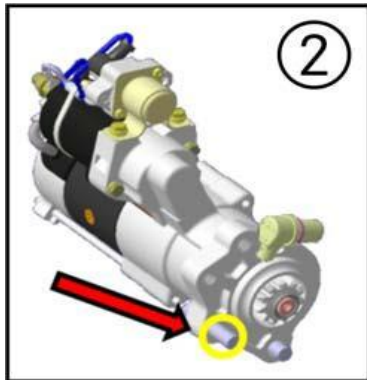
S26 HEAD LAMP LEVEL SWITCH											
Color-code	Circuit N.	Gauge (mm ²)	pin	pin	Input/Output	Potential	Max Current	Min Current	Function	Symbol	Description
B	LEE1	0.5	1	1	Output	(-ve)			Ground		
R-G	LE01BY	0.5	2	2	Input	(+ve)			Ignition Supply		
G-O	LE02	0.85	3	3	Output	(+ve)			Head Lamp Leveller		

S26 HEAD LAMP LEVEL SW	
Chassis side Connector	Bus Body builder side connector
MB Part no:	MB Part no:
Secondary lock:	
SUMITOMO 3 POLES: 6070-3471	SUMITOMO 3 POLES: 6070-3481
Lock :	Lock:
Color: Natural	Color: Natural
ET03-1W 60703471 	

8 Ground point



Ground point Location 1



Ground point location 2

OF Chassis are equipped with electronic engines are designed with a specific body grounding feature. Several issues may be generated if the body grounding interferes with the chassis grounding, such as: the engine may go out without any previous sign in the panel; defects with no coherent explanations; random operation of other systems; etc.

The body structure cannot be used as ground (i.e. the body must have a similar grounding project than the vehicle chassis grounding project). A specific side member point must be used for the chassis area, which is known as: “Joint ground point”.

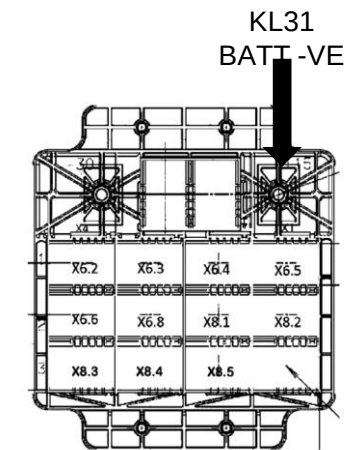
The ground point to be used in the body must arise from the joint ground points, since the points are interconnected to the negative battery terminal via power cables.

The grounding point must be connected to a specific point in the instrument cluster area, which virtually contains only electrical signals and no power cables.

This is due to the interference of the EMC (Electrical Magnetic Compatibility) over electronic equipment.

The ground points are located in three locations on the chassis, at the left side near the starter motor, below the instrument panel and at the connection main cabinet.

- 1.Chassis earth;
- 2.Starter motor earth;
- 3.Bus body earth - dashboard wiring harness earth should be done in the bus body.



Ground point Location 3 (OF 1014/1017)

Ground point

Battery compartment

9 Battery compartment

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The chassis is delivered with two 12V-75Ah/120Ah (24V system) mounted on a temporary bracket attached to the chassis frame. Never installed 12V equipment connected to only one of the batteries. Use a 24V-to-12V converter if necessary.



Temporary Battery location on chassis

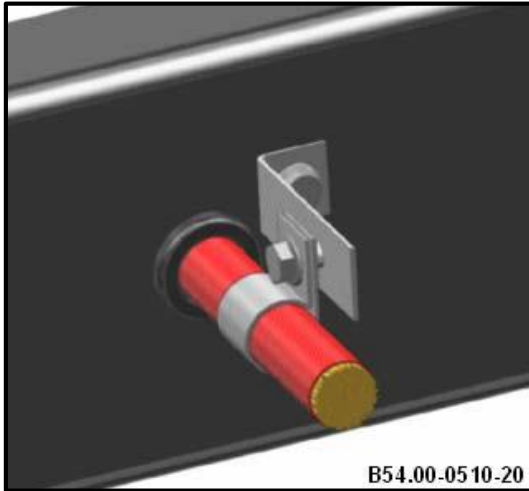
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Do not remove the cover before the body building or during Storage conditions.

Battery compartment

9 Battery Compartment

1904GL01H



Cable support example

The battery compartment must be sealed to prevent exposure to water and/or dirt. In addition, the battery compartment must be well ventilated; the gas ventilation / exhaust section must be isolated from the passenger and luggage compartments, located in a dedicated compartment easily accessed from outside the vehicle and on the opposing side of the driver, as a safety precaution, with sufficient space to remove the batteries without damaging the cables and the housing.

The internal battery compartment temperature must not exceed 50C°; otherwise, the batteries may be damaged.

Never mend battery cables. Install firmly secure battery cables in place.

Protect power cables from mechanical friction / abrasion with other cables or other vehicle parts. In addition, cables must be shielded from excessive heat in order to mitigate fire risks. In case of risk of damages due to mechanical friction in cables passing through beams or plates, such passages must be duly lined to prevent damages. Use wire ducts or conduits if necessary. However, it is recommended to secure cables to such passages using a liner to prevent any friction.

The positive and negative cables connecting the batteries to the starter and ground point have lengths and gauges based on the location of the batteries in the chassis, and they were designed considering the chassis transportation to the bodybuilder, which is why the batteries are attached to a wooden board. The bodybuilder is responsible for assessing the need to replace these components, adjusting them to new lengths and gauges without causing high voltage drops. In this case, the specifications set out in the following standards must be followed:

- For cables - MBN 22.004-B;
- For terminals - DIN 46.234 (Crimped; welding-free).

The purpose of such standards is to ensure the use of flexible crimp cables and flexible electrical tape between the cable ends and terminals (no welding applied to terminals). Always keep terminals properly tightened and clean.

Battery cable lengths must not be altered without prior authorization from the Electronic and Electrical Engineering Department of Daimler Buses India

Battery compartment

9 Battery Compartment

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During tests and analyses, never cause short-circuits between battery terminals, alternator terminals and the starter engine or other systems to verify voltage or for any other reasons; in addition to damaging the components, using large-scale on-board vehicle electronics, this process causes irreparable damages.
Pay close attention to the level of leakage current (electrical consumption while the engine and all electrical consumers are switched off;. example: radio memory, clock, GPS, etc.). The smaller this electrical consumption, the better.

- The following levels are acceptable:
- 300mA for vehicles with 100Ah batteries;
 - 500mA for vehicles with 135/170 or 220Ah batteries.

Only recharge batteries after disconnecting them from the electrical system of the bus, following the instructions provided by the battery and charger manufacturers. To recharge batteries considering a state-of-charge of 60% (between 12.35V and 12.45), we recommend:

Tab26- Battery charging Time

Model	Charging Time	Current	Max constant voltage
100Ah	6 hours	10.0 Amps	14 Volts
135Ah		13.5 Amps	
170Ah		17.0 Amps	
220Ah		22.0 Amps	
Values vary according to the battery's state of charge			

We recommend applying up to 02 recharges in each battery and completing the body mounting checklist.
Recharged batteries must not remain in stock for over 60 days.

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Battery compartment

9 Battery Compartment

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In case of any sign of corrosion in the battery or terminals, remove the terminal cables and wipe them using a wire brush. Battery acid can be neutralized using a baking soda and water solution.

Reinstall the cables after wiping. Since the original batteries are maintenance-free, it is not necessary to apply Vaseline / grease over the battery terminals.

Recharge the batteries if their open-circuit voltage is below 12.4 V. The recharging time varies depending on the batteries' state of charge.

Batteries temporarily removed from vehicles must be stored in well-ventilated and dry areas. We recommend storing batteries in proper charging stations.

The batteries' voltage (minimum voltage of 12.4 V) must be checked every 2 months. Recharge the batteries if necessary.

Protect the batteries against UV radiation. Use the protective cover whenever necessary.

During emergencies, if the vehicle battery charge is insufficient to start the vehicle, auxiliary batteries connected in parallel may be used.

Do not use fast chargers for auxiliary starts.

Battery compartment

9 Battery Compartment- Cut off main Switch



Main switch

Clockwise (ARROWS) - ON position

The OF1014/1017 RF LHD chassis are equipped with a mechanical main switch at the negative battery pole. This switch must be mounted in an easily accessible area. The main mechanical switch is attached to a temporary bracket. We recommend properly securing and using the bracket to prevent impacts and/or risk of short-circuit.

Anticlockwise direction - Switch off MAIN SWITCH before starting body building process.

Every cable harness must be disconnected from the electronic modules before carrying out any welding work in the chassis. No cable harness must be cut and/or stretched.

For chassis transport, the battery negative and positive cables up to the starter motor feature lengths and sizes according to the battery location on the chassis. These cables were designed only for the chassis transport with the batteries on the wood board, and the bodybuilder is in charge of evaluating these cables change to adapt them to the sizes.

The negative pole must be connected to the starter motor negative end. Never use the chassis frame or any other chassis or body metallic part as a conductor element (mass and/or grounding).

Make sure that the ignition key is switched off if it is necessary to disconnect any electronic modules. Avoid removing the battery terminal protecting cover.

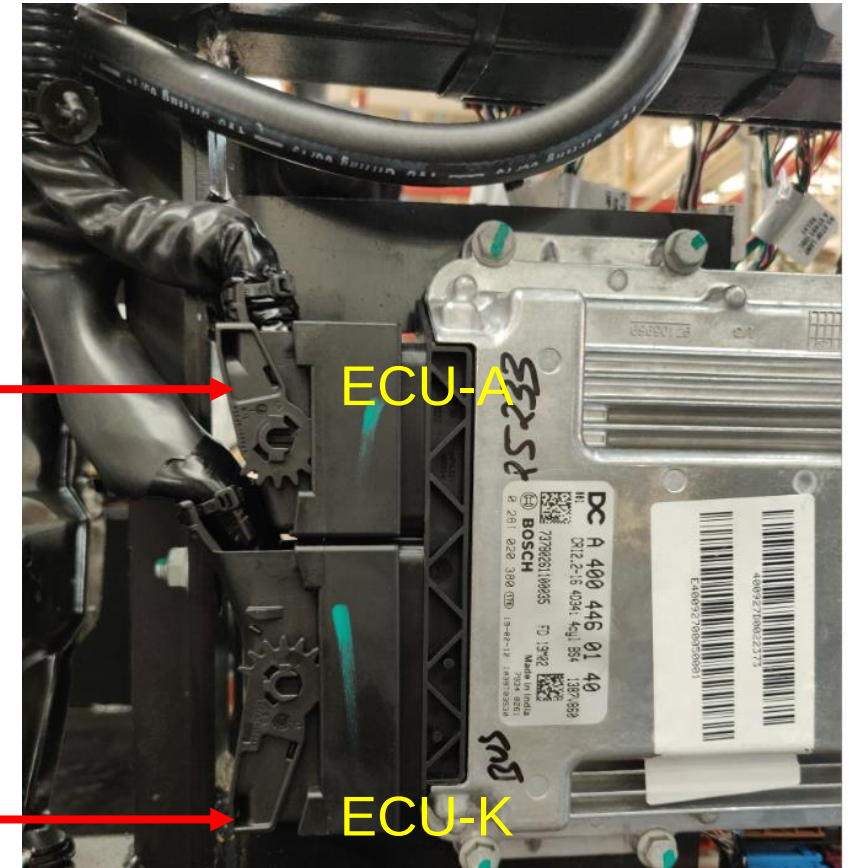
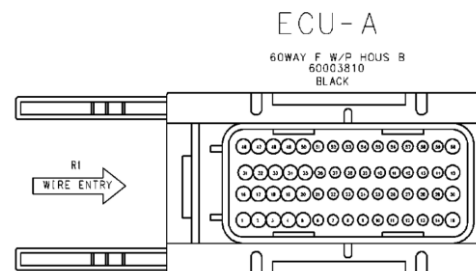
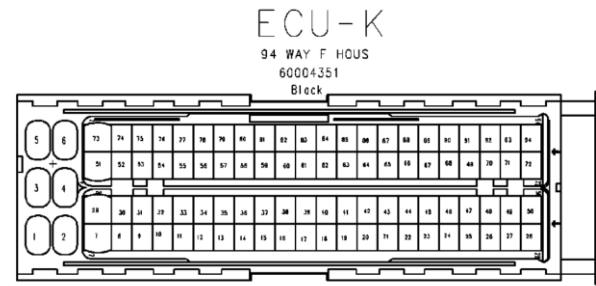


Hold the handle firmly and turn it anticlockwise to turn off the vehicle's main switch.

MR Electronic control unit

ake connector slide

- 2



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11 Alternator

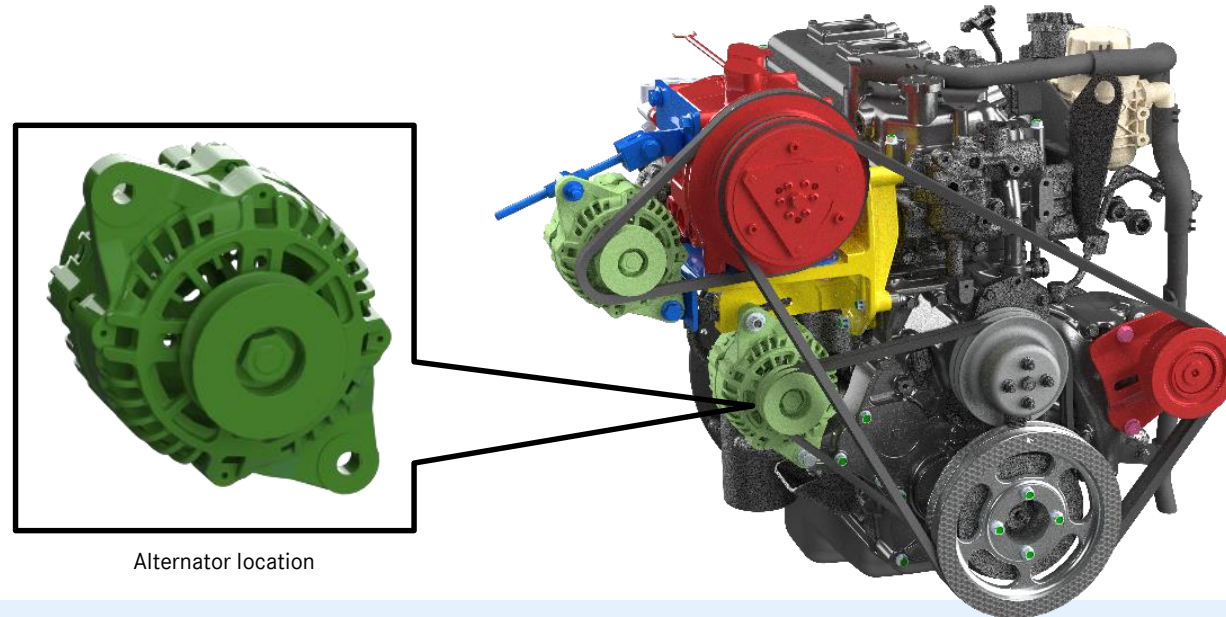
Alternator

The OF 1014 chassis are equipped with a primary 24V 45A alternator and OF 1017 chassis are primary equipped with 80A (For normal AC) 120A (for High power AC) alternator.

Additional 80A or 120A alternator may be supplied for OF1017 chassis as loose part in toolkit box or on chassis supplied AC compressor based on chassis variant.

The alternators are provided with rectified regulators with zener diodes in order to prevent harmful tension noises to the electronic modules.

After air conditioning unit assembly, 120A and 80A alternator must be connected with primary alternator.



Alternator location

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Alternators cannot be switched on before being duly connected to the vehicle's batteries, since this causes an electrical surge that damages electronic modules and voids the electronic module and alternator warranty, as a result.

12 Body Electrical Loads

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Note:

1. Bus Body Electrical load source has to be take from KL30 & KL31 terminal points, The same has been controlled through Each 80A fuse near battery compartment.
2. These two 80A Fuse is common for Chassis load and bus body loads
3. Separate control and protection circuit has to be made for bus body loads after power source termination from KL30 & KI15
4. The available load capacity is cumulative value of KL30 & KL15, Load sharing has to control by the body builder respectively
5. The available Electrical load capacity is Direct propionate to the engine RPM, see the below table with reference of different stage of engine RPM
6. Recommended to body builder to control the loads bus body load accordingly
7. All exterior lamp which is being control by the chassis system and wiper motor are considered as part of chassis load, the available load excluding those loads

12 Body Electrical Loads

OF 1014 Alternator Config.: 45A		
	Engine RPM	Available Load Current for Body
Idle	600	—
Vehicle Running	1500	21

OF 1017 Alternator Config. 80A+80A		
	Engine RPM	Available Load Current for Body
Idle	600	56
Idle(AC ON)	850	91
Vehicle Running	1500	136

Rear start system

12 Rear start system

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Not applicable.

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1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524
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21 Contact

BBA- Body Building Advisory,
Daimler Buses India

Helpline:

+91 44 4969 5342

Internet

www.bharatbenz.com/

www.daimler.com

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