Title: CAR SUPERSTRUCTURE FIXING

Abstract: Car superstructure fixing enables elimination of torsional flexibility of a vehicle frame and production inaccuracies, and of longitudinal and diagonal deformations of the superstructure frame. Car superstructure (2) is attached to the vehicle frame (1) through a minimum of one elastic rotary fixing (3) formed by elastic rotary silentblock (32) and a minimum of two elastic flat fixings (4) formed by elastic flat silentblocks (42). Elastic rotary fixing (3) is attached to the car superstructure (2) by decoupling joints (35) and (36), which enable the setting of elastic rotary fixing (3) against the car superstructure (2) vertically and horizontally. Elastic flat fixings (4) are situated on the vehicle frame (1) and are attached to the car superstructure (2) by decoupling joint (45), which enables the setting of elastic flat fixing (4) against the car superstructure (2) vertically.
CAR SUPERSTRUCTURE FIXING

The Area of Technique

The invention concerns a constructional solution for fixing of the car superstructure, which eliminates a torsional flexibility of a vehicle frame, production inaccuracies, longitudinal and diagonal deformations of the superstructure frame. The defined fixing enables movement of a vehicle with the car superstructure in a difficult terrain with barriers.

The Present State of Technique

There are known fixings of a car superstructure, where superstructure is connected to a vehicle frame by an auxiliary frame. This auxiliary frame has function of an intermediary - the auxiliary frame is attached to a superstructure and the auxiliary frame is firmly connected to a vehicle frame. This solution is used in mobile concrete mixers, auto cranes, portable hydraulic arms, road tankers. There is also a known solution for fire-truck superstructure based on PUV 126-2005. A disadvantage of these solutions is that they do not result in elimination of production inaccuracies in the final stage of superstructure assembly and when travelling in terrain, its unevenness causes increased stress on the auxiliary frame, strength and stiffness dimensioning which increases superstructure weight.

The Matter of Invention

The above named disadvantages of the present state of technique are eliminated by the car superstructure fixing, which eliminates torsional flexibility of a vehicle frame and production inaccuracies, longitudinal and diagonal deformations of the superstructure frame, where the car superstructure is connected to the vehicle frame by a minimum of one elastic rotary fixing and by a minimum of two elastic flat fixings, while axis of rotation of all elastic rotary fixings are situated in neutral axis of torsional deformation of the vehicle frame and elastic flat fixings are located on the vehicle frame, characterized in that elastic flat fixing is formed by elastic flat silentblock.

Elastic rotary fixing is attached to the car superstructure by a decoupling joint with oval hole, enabling the setting of elastic rotary fixing against the car superstructure vertically, and by a decoupling joint with oval hole enabling the setting of elastic rotary fixing against the car superstructure horizontally.
Elastic flat fixing is attached to the car superstructure by a decoupling joint with oval hole enabling the setting of elastic flat fixing against the car superstructure vertically.

The car superstructure fixing as per the invention enables movement of a vehicle with car superstructure in a difficult terrain with barriers, when a vehicle in motion through its chassis copies unevenness of the terrain, causing torsional deformation of the vehicle frame. Besides elimination of torsional deformation of a vehicle frame and elimination of production inaccuracy of the superstructure, car superstructure fixing eliminates also transmission of vibrations to the superstructure, as well as small unexpected deformations of the chassis occurring when travelling through barriers.

**The Overview of the Pictures in the Plans**

The invention will be explained in details by means of drawings, which represent:

Picture 1: Axonometric view from below on four-point fixing of the superstructure
Picture 2: Axonometric view from above on four-point fixing of the superstructure frame bottom to a vehicle frame
Picture 3: Axonometric view from below on three-point fixing of the superstructure
Picture 4: Axonometric view from above on end elastic rotary fixing of the superstructure
Picture 5: Vertical incision of the axis of torsional deformation of end elastic rotary fixing of the superstructure
Picture 6: Axonometric view from above on middle elastic flat fixing of the superstructure
Picture 7: Diagonal vertical cross-section of middle elastic flat fixing of the superstructure

**The Examples of Invention Implementation**

**EXAMPLE 1**

FOUR-POINT FIXING OF THE CAR SUPERSTRUCTURE TO THE VEHICLE FRAME

Four-point fixing of the car superstructure to the vehicle frame is depicted in Pictures 1 and 2, and details of individual fixings in Pictures 4 to 7.

Car superstructure 2 is connected to the vehicle frame 1 by two elastic rotary fixings 3 and two elastic flat fixings 4. Elastic rotary fixings 3 are situated in the neutral axis of torsional deformation 11 of the vehicle frame 1. Elastic rotary fixing 3 consists of the body 31 to which is attached an elastic rotary silentblock 32. It is a rubber case spring made of technical rubber, pressed-in between metallic tubular bodies. Elastic rotary fixing 3 is attached to the vehicle frame 1 through a pair of lower flanges 33 by a decoupling joint 36.
with oval holes 331 by means of bolts, nuts and washers. The attachment through oval holes 331 enables horizontal shift of construction of the car superstructure 2 during assembly when it is being attached to the vehicle frame 1. In positions where decoupling joint 36 passes through a closed profile of the vehicle frame construction 1 there is a stretcher used, not marked in the pictures. Elastic rotary fixing 3 is attached to the car superstructure 2 through a pair of upper flanges 34, namely through oval holes 341 by a decoupling joint 35 by means of bolts, stretchers, nuts and washers. This attachment through oval holes 341 enables vertical shift of construction of the car superstructure 2 during assembly when it is being attached to the vehicle frame 1. Elastic rotary fixings 3 are situated in the neutral axis of torsional deformation 11 of the vehicle frame 1. Elastic flat fixing 4 consists of a lower body 43 and upper body 44, between them is placed an elastic flat silentblock 42. It is a rubber prismatic spring made of technical rubber, inserted in slots in lower body 43 and in upper body 44, and prestressed by the bolts 46 under the bolt head with cup washers, under bolt nuts with plate washers, neither of them are marked in the pictures, while bolts 46 at the same time fasten elastic flat fixing 4 to the vehicle frame 1. Elastic flat fixing 4 is attached to the car superstructure 2 through oval holes 441 in flanges of upper body 44 by a decoupling joint 45 by means of bolts, stretchers, nuts and washers. The attachment through oval holes 441 enables vertical shift of construction of the car superstructure 2 during assembly when it is being attached to the vehicle frame 1.

EXAMPLE 2
THREE-POINT FIXING OF THE CAR SUPERSTRUCTURE TO THE VEHICLE FRAME

Three-point fixing of the car superstructure to the vehicle frame is depicted in Picture 3 and details of individual fixings in Pictures 4 to 7. The car superstructure 2 is attached to the vehicle frame 1 which is not shown in Picture 3, through one elastic rotary fixing 3 and two elastic flat fixings 4. Construction of elastic rotary fixing 3 and construction of elastic flat fixing 4 are identical to the elements described and depicted in EXAMPLE 1.

Industrial Versatility

Car superstructure fixing can be advantageously utilized for heavy superstructures designated for movement in terrain, such as fire-truck and other superstructures with tanks, superstructures of concrete mixers and concrete mix containers, superstructures for heavy military technology etc.
CLAIMS

1. Car Superstructure Fixing, eliminating a torsional flexibility of a vehicle frame and production inaccuracies, longitudinal and diagonal deformations of the superstructure frame, where the car superstructure (2) is connected to the vehicle frame (1) by a minimum of one elastic rotary fixing (3) formed by elastic rotary silentblock (32) and a minimum of two elastic flat fixings (4), while axis of rotation of all elastic rotary fixings (3) are situated in the neutral axis of torsional deformation (11) of the vehicle frame (1) and elastic flat fixings (4) are located on the vehicle frame (1), characterized in that elastic flat fixing (4) is formed by elastic flat silentblock (42).

2. Car Superstructure Fixing in accordance to claim 1, characterized in that elastic rotary fixing (3) is attached to the car superstructure (2) by a decoupling joint (35) with oval hole (341), enabling the setting of elastic rotary fixing (3) against the car superstructure (2) vertically, and by a decoupling joint (36) with oval hole (331) enabling the setting of elastic rotary fixing (3) against the car superstructure (2) horizontally.

3. Car Superstructure Fixing in accordance to claim 1 or 2, characterized in that elastic flat fixing (4) is attached to the car superstructure (2) by a decoupling joint (45) with oval hole (441) enabling the setting of elastic flat fixing (4) against the car superstructure (2) vertically.
## A. CLASSIFICATION OF SUBJECT MATTER

INV. B62D24/04  B62D33/10  B60G99/00

ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of database and, where practical, search terms used)

**EPO-Internal**

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

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<td>EP 0 016 469 AI (MAGI RUS DEUTZ AG [DE]) 1 October 1980 (1980-10-01) claims 1-2; figures</td>
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| X | See patent family annex. |

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