

**BEML - TATRA 815**

**26RR36 22 255 6x6.1R/50T, 51T**

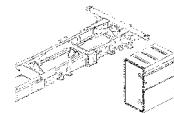
**Workshop manual**

**Part 12 – FRAME AND FRAME BODY**

**Publication numer: 03-0254-ENG/00**







## 12 FRAME AND FRAME BODY

### 12.1 Description and Main Technical Specifications

The vehicles BEML - TATRA T 815 - 26RR36 22 255 6x6.1R/50T and BEML - TATRA T 815 - 26RR36 22 255 6x6.1R/51T feature the extended central member frame, to which the auxiliary ladder-type frame is attached.

The **extended central member frame** consists of the central longitudinal beam, which is composed of axle final drive housings **6, 8, 12**, front backbone tube **11**, auxiliary gearbox **10**, rear backbone tube **9**, rear connecting part **7**, front cover **1**, rear cover **5** and cross girders **2, 3** and **4**.

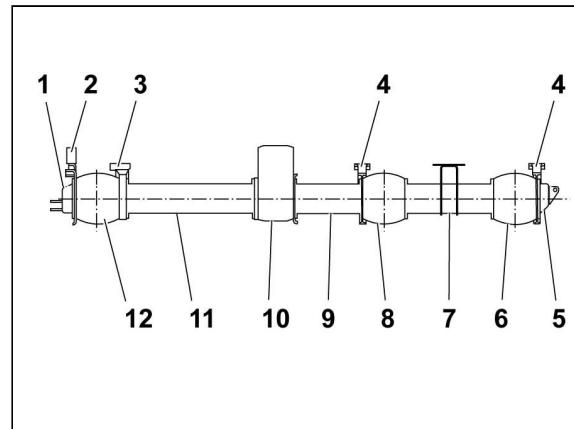


Fig. 12.1 Arrangement of central member frame

The **front cross girder 4** is bolted using nuts **1** together with front cover **2** to the front axle final drive housing. Between the front cover **2** and front cross girder **4** the sealing ring **3** is mounted.

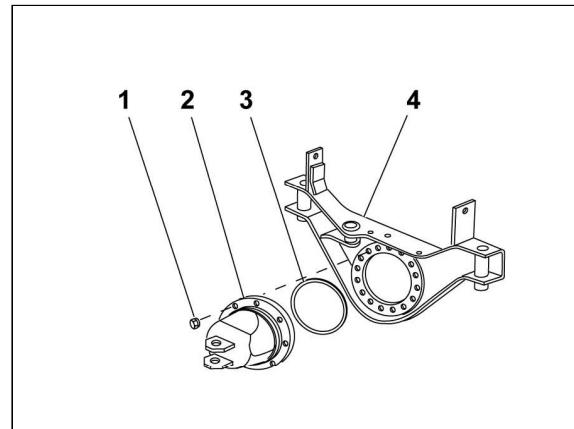
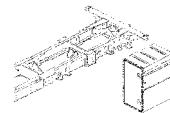


Fig. 12.2 Front cover c/w cross girder



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The **rear cross girder 1** is bolted using nuts **4** together with rear cover **2** to the 3<sup>rd</sup> axle final drive housing. Between the rear cover **2** and rear cross girder **1** the sealing sing **3** is installed.

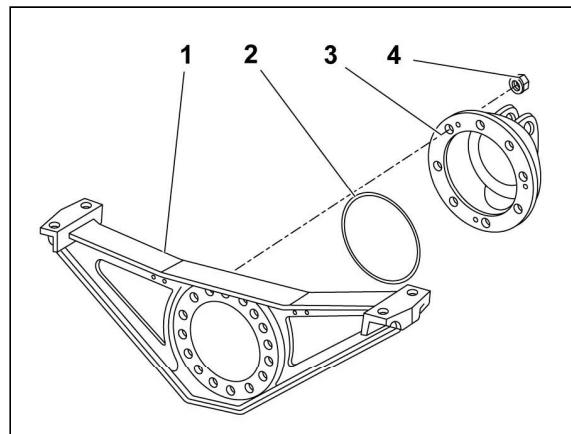


Fig. 12.3 Rear cover c/w cross girder

The **auxiliary ladder-type frame** is designed to fix cabin, engine, superstructure and further vehicle components. The auxiliary frame is welded of profile beams – two longitudinal beams **8** and **13** of the same cross section and several cross members **7, 10, 11** and **12**. In the rear bumper **9** there are holes to attach the trailer hitch. To longitudinal beams **8** and **13** the silent blocks holders for front mounting of cabin **5**, rear cabin brackets **6**, foot boards brackets, mudguards holders, rear cluster lamps brackets, toolbox brackets, brackets of axle shaft stops, brackets for mounting of frame on the central member frame, etc. are welded. In the frame the holes are drilled for fastening bolts to attach the front bumper, steering gear, batteries case, fuel tank holders, air filter holder, etc. In addition, on the truck's version 50T there are holes for mounting of winch and cable guide pulley.

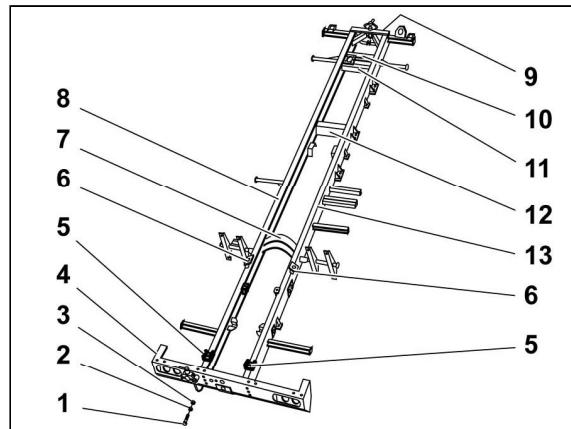


Fig. 12.4 Auxiliary ladder-type frame

The **front bumper 4** is attached using bolts **1**, nuts **2** and locking nuts **3** to front plates of longitudinal beams **8** and **13**.

On the truck's version 50T, holder of the winch cable slider is welded to front **4** and rear **9** bumpers.

Bolts with spacer washers, washers and nuts are used to fix the **auxiliary frame** to cross girders of the central member frame. At the front the auxiliary frame is fixed to the front cross girder using bolts **1**, washers, nuts and bolts **4**, washers, spring washers and nuts. The bolts nuts **1** are accessible after removal of rubber plugs **3** in the auxiliary frame. A possible clearance between cross girder and frame is taken up with washers **2**.

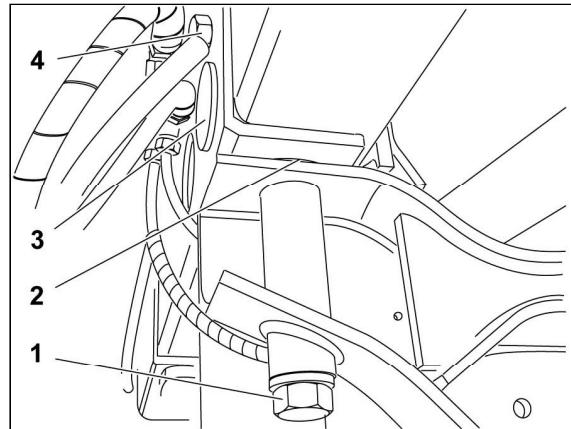
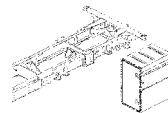


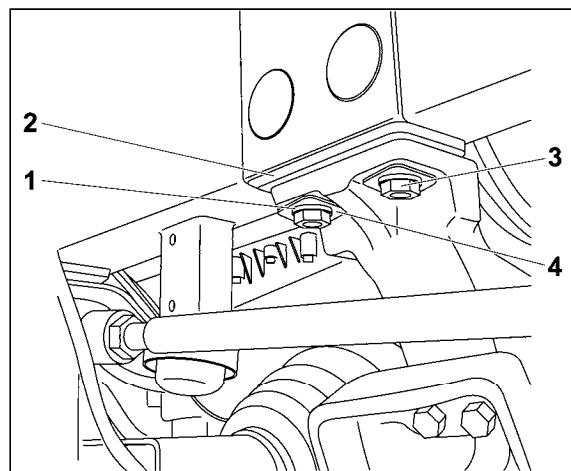
Fig. 12.5 Attachment of frame to the front cross girder



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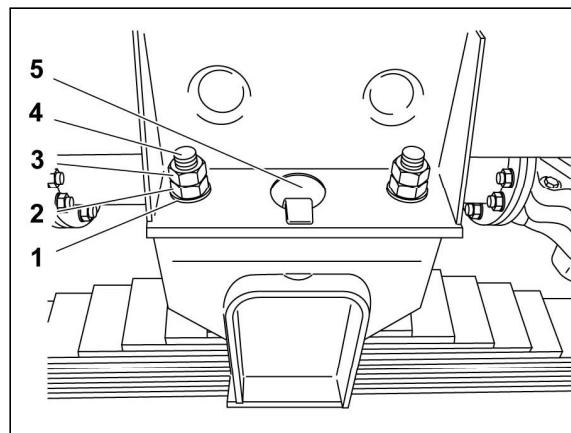


Above the front axle the frame is attached to the axle final drive cross girder by means of bolts, slotted lock nuts 3, lock sheets 4 and lock rings 1. Bolts heads are secured with locking washers 2 against turning. Bolts heads are accessible after removal of rubber plugs in the auxiliary frame.



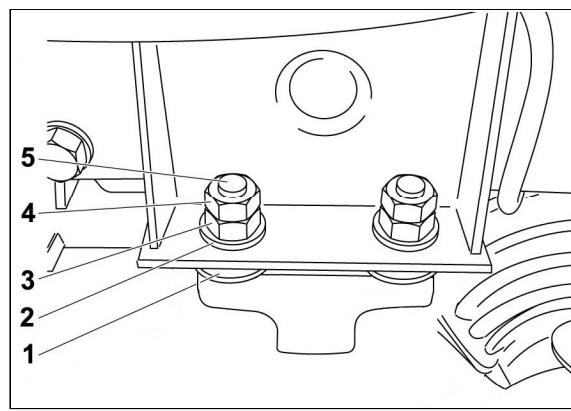
*Fig. 12.6 Attachment of frame to the cross girder behind the axle final drive housing*

To the cross girder of rear connecting part the frame is attached using bolts 4, washers 1, nuts 2 and 3. Between cross girder and auxiliary frame the centering lens 5 to adjust the frame position are installed.



*Fig. 12.7 Attachment of frame to cross girder of the rear connecting part*

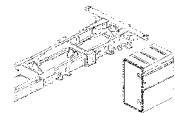
At the rear the frame is fixed to two cross girders ahead of the 2<sup>nd</sup> axle final drive and behind the 3<sup>rd</sup> axle final drive of the extended central member frame by means of bolts 5, washers 2 and nuts 3 and 4. A possible clearance between cross girders and frame is taken up with washers 1.



*Fig. 12.8 Attachment of frame to rear cross girders*



## 12 Frame and Frame Body



The **frame body parts** consists of batteries case, toolbox, holder of spare canisters, free pulley casing (version 50T), front body parts, rear body parts, fuel tank, etc.

The **batteries case** is fixed to the auxiliary frame on the LH side of vehicle beneath cabin using bolts **12** and spring washers **11**. The batteries case consists of: case proper **1** welded of sheets (including holders **13** and **15**, which are fixed by bolts **17** with washers **16** and **3** c/w nuts **4**), face cover **14** and upper cover **7**. The accumulator batteries are attached in the case using side bars **5** and middle bar **6**. The front cover **7** is attached to the case **1** using wing nuts **8** c/w washers **9**. Bushings **2** and **10** are滑入到 case的侧壁。

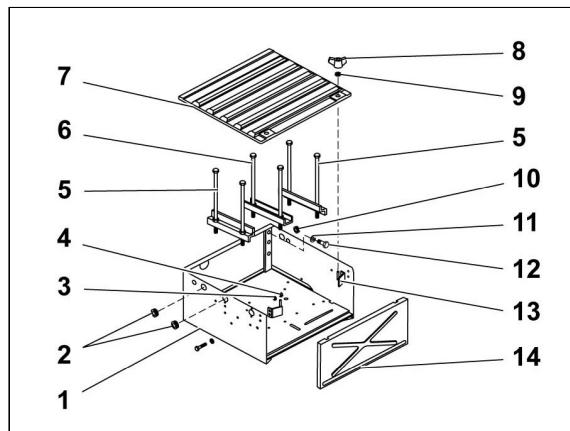


Fig. 12.9 Batteries case

The **toolbox** is composed of:

- Box proper **1** c/w gasket **5**, which fits to the box, inner space of the box is adapted to carry the vehicle outfit,
- Cover **6**, which is滑入到 box pins and secured with washers **7** and split pins **8**.

The toolbox is attached using bolts **4**, spring washers **3** and washers **2** to brackets on the left-hand frame longitudinal beam ahead of the 1<sup>st</sup> rear axle wheel.

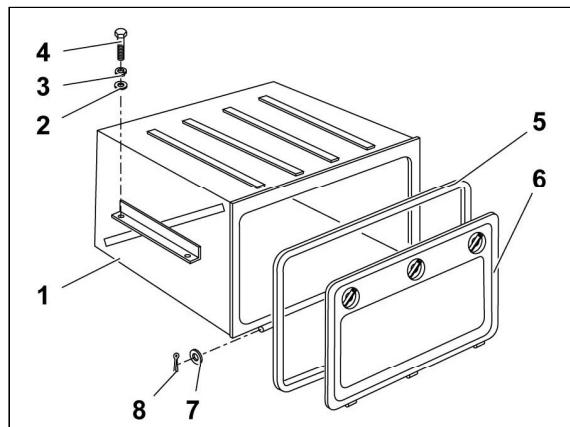


Fig. 12.10 Toolbox

The **spare canisters holder** **6** is attached by means of bolts **9**, spring washers **8** and washers **7** to brackets on the left-hand frame longitudinal beam behind the front axle wheel.

On the truck's version 50T the free pulley casing **10** to carry the free pulley from vehicle outfit is attached to holder **6** of spare canisters by means of screws **5**, spring washers **4**, and washers **3** and nuts **2**. The free pulley is secured with pin **1** and clip **11** against falling down.

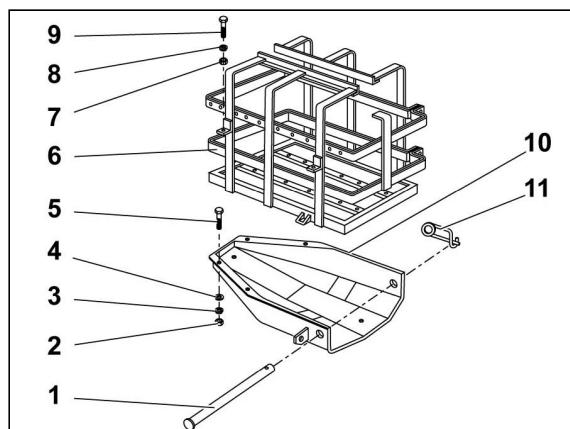
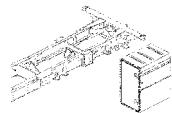


Fig. 12.11 Spare canisters holder



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The **front body parts** include:

- Side sheet, LH **2**, mudguard part, LH front **12**, side sheet, RH **6** and mudguard part, RH front **7** are screwed to the driver's cabin,
- Foot boards, LH **1** and foot boards, RH **5** are attached to the front bumper and screwed to foot boards brackets on the frame,
- Rear part of front mudguard, LH **11** and rear part of front mudguard, RH **9** with mudguards flaps **10** are screwed to mudguards holders on the frame,
- Frame, LH **14** and mudguard flap, LH **13**, frame, RH **3** and mudguard flap, RH **4**, are all screwed to brackets of foot boards on the frame,
- Cover sheet **8** is screwed to the front bumper.

The **rear body parts** include holder **1** and holder of the license plate **2**. They are screwed to brackets of rear lamps.

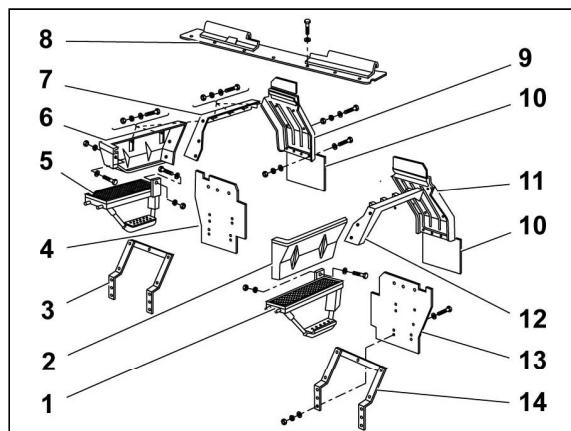


Fig. 12.12 Front body parts

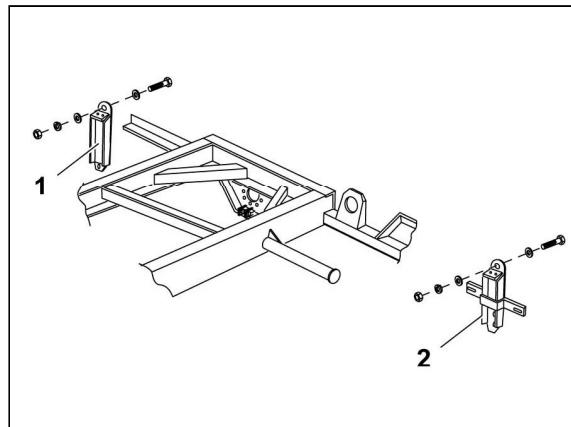


Fig. 12.13 Rear body parts

The **fuel tank** **1** is situated on the RH side of vehicle. It is welded of sheets. The fuel tank fits on holders with rubber washers, which are bolted to the auxiliary frame and fixed to holders by means of sheet strips fitted with rubber washers. The fuel tank can be refilled after removal of fuel cap **2**. The fuel amount is measured by fuel gauge c/w float **3**. The fuel tank capacity is 400 liters.

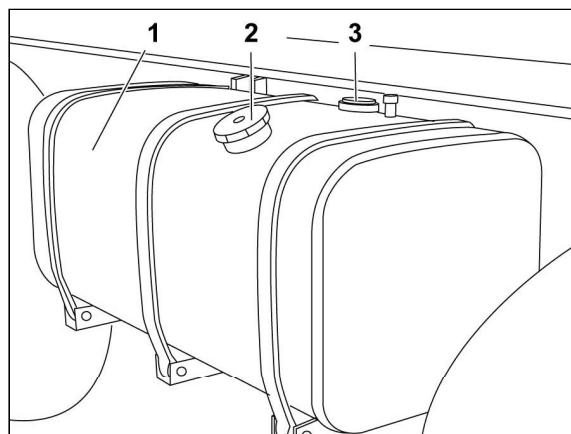
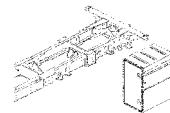


Fig. 12.14 Fuel tank - location



## 12 Frame and Frame Body



The **trailer hitch coupling - front 4** consists two main components:

- Front part of coupling - mouth c/w closing pin,
- Tie-rod.

The coupling is swing connected with the tie-rod using the joint cross pin via mouth. In position suitable to connect the trailer (horizontal position), the mouth is secured with special safety piece. The closing pin is locked and unlocked manually. The coupling is rotary and without suspension.

The coupling tie-rod is slided into a mouth guide in the front bumper and attached with washer 1 and nut 2, which is secured with split pin 3.

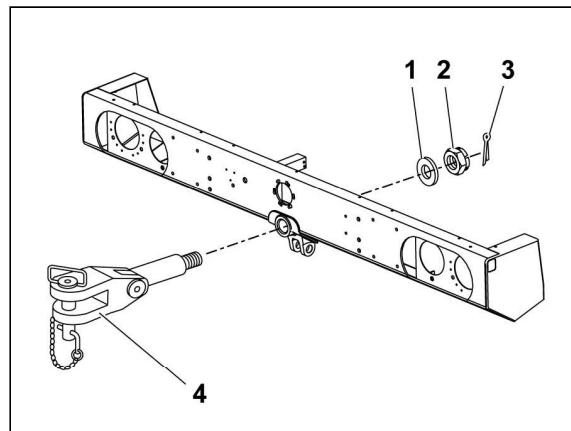


Fig. 12.15 Trailer hitch coupling - front

The **trailer hitch coupling - rear 2** consists two main components:

- Front part of coupling - mouth c/w closing pin,
- Coupling body c/w tie-rod and elastic inserts.

The coupling is swing connected with the tie-rod using the joint cross pin via mouth. In position suitable to connect the trailer (horizontal position), the mouth is secured with special safety piece. The closing pin is locked and unlocked manually. The coupling device is sprung-mounted in both directions, i.e. both during moving-off and braking by means of elastic inserts.

The rear trailer hitch coupling device is attached to the rear bumper of auxiliary frame by means of bolts 3 and self-locking nuts 1.

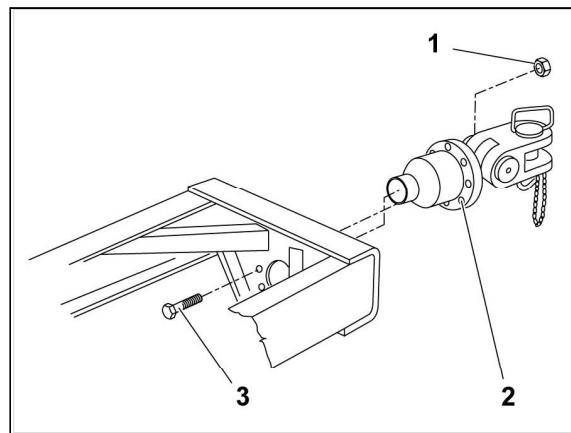
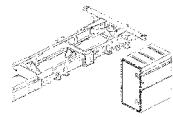
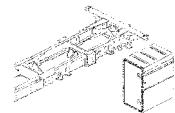


Fig. 12.16 Trailer hitch coupling - rear



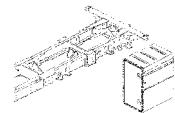
## 12.2 Faults Causes and Troubleshooting

Fault	Cause	Remedy	Mentioned in:
Damaged / deformed front bumper	Impact into obstacle during off-road drive or damage caused by other vehicle	Replace the bumper	(See Subchapter 12.5.2)
Damaged batteries case	Mechanical damage to batteries case	Replace the batteries case	(See Subchapter 12.5.3)
Damaged toolbox	Mechanical damage to toolbox	Replace the toolbox	(See Subchapter 12.5.4)
Damaged free pulley casing	Mechanical damage to free pulley casing	Replace the free pulley casing	(See Subchapter 12.5.4)
Damaged spare canisters holder	Mechanical damage to spare canisters holder	Replace the spare canisters holder	(See Subchapter 12.5.6)
The fuel leaks from tank	Mechanical damage to tank	Replace the tank	(See Subchapter 12.5.7)
Front trailer hitch coupling is not functional	Front trailer hitch coupling is not functional	Replace the trailer hitch coupling	(See Subchapter 12.5.8)
Rear trailer hitch coupling is not functional	Impact into obstacle during off-road drive or damage caused by other vehicle	Replace the trailer hitch coupling	(See Subchapter 12.5.9)
Damaged / deformed front strut	Impact into obstacle during off-road drive	Replace the strut	(See Subchapter 12.5.11)
Damaged / deformed rear strut	Impact into obstacle during off-road drive	Replace the strut	(See Subchapter 12.5.10)
Damaged auxiliary ladder-type frame	Mechanical damage (cracks)	Replace the auxiliary ladder-type frame	(See Subchapter 12.5.12)



## 12.3 List of Special Tools

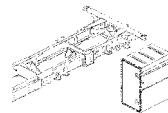
No special tools have been prescribed for the mentioned technological procedures related to the frame and frame-body BEML - TATRA T 815 - 26RR36 22 255 6x6.1R/50T and BEML - TATRA T 815 - 26RR36 22 255 6x6.1R/51T.



## 12.4 Survey of Torque Specifications

Tab. 12.1 Torque specifications

Data	Unit	Value
Nuts M 20 x 1.5 of bolts fixing the auxiliary frame to the central member frame	Nm	400 ± 40
Nuts M 22 x 1.5 of bolts fixing the auxiliary frame to the central member frame		300 ± 40
Nuts of tank metal sheet strips		15 ± 10%
Nuts of bolts fixing the rear trailer hitch coupling		190 ± 10%



## 12.5 Working Procedures

### 12.5.1 Inspection and Tightening-up of Fastening Nuts between Frame and Undercarriage

#### a) Reason for Inspection

1. Technical servicing after consuming every **16,000 ltr** of fuel, after working of **1,200 engine hours** or covering **40,000 km**, which first occurs.

#### b) Technical Conditions

1. Tighten nuts M 20 x 1.5 to **400 ± 40 Nm**.
2. Tighten nuts M 22 x 1.5 to **300 ± 40 Nm**.

#### c) Inspection Procedure

1. Loosen and unscrew bolts nuts **3** from the front cross girder.
2. Secure bolts **3** against turning.
3. Tighten and check whether nuts are tightened to the specified torque, i.e. **400 ± 40 Nm**.
4. Remove rubber plugs **2**.
5. Slacken and unscrew locking nuts of bolts **1**.
6. Secure bolts **1** against turning.
7. Tighten and check whether nuts are tightened to the specified torque, i.e. **300 ± 40 Nm**.
8. Mount locking nuts and tighten to **300 ± 40 Nm**.
9. Remove rubber plugs from the cross girder behind 1<sup>st</sup> axle final drive.
10. Remove lock rings **1** and lock sheets **3** from slotted locking nuts **2**.
11. Tighten and check whether nuts **2** are tightened to the specified torque, i.e. **400 ± 40 Nm**.
12. Fit lock sheets **3** and lock rings **1** on nuts **2**.
13. Close holes with rubber plugs.

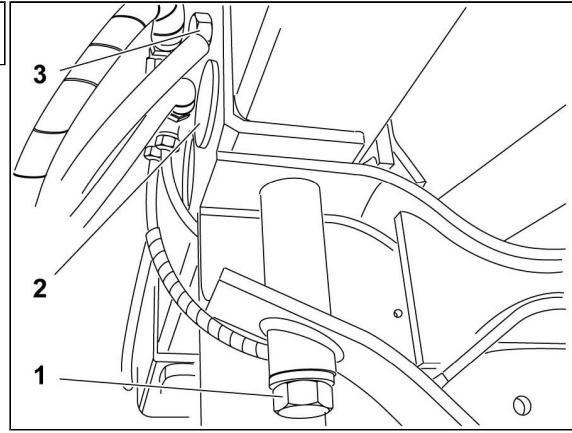


Fig. 12.17 Connection of frame with the front cross girder

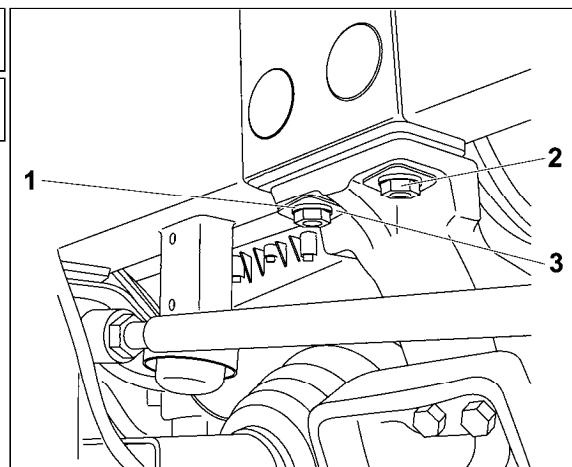
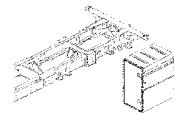


Fig. 12.18 Connection of frame with the cross girder behind axle final drive



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14. Slacken and unscrew locking nuts **2** from cross girder of the rear connecting part.
15. Secure bolts **3** against turning.
16. Tighten and check whether nuts **1** are tightened to the specified torque, i.e.  $400 \pm 40$  Nm.
17. Mount locking nuts **2** and tighten to  $400 \pm 40$  Nm.

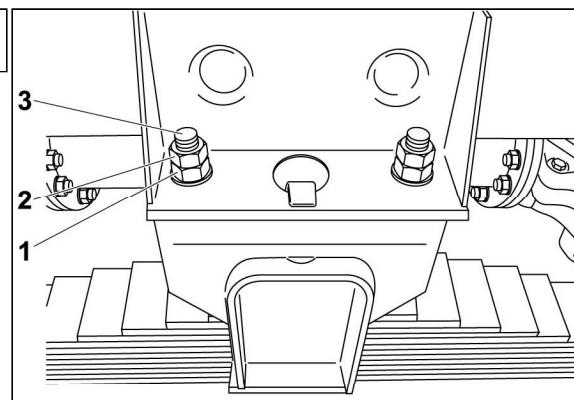


Fig. 12.19 Connection of frame with the cross girder of the rear connecting part

18. Loosen and unscrew locking nuts **2** from rear cross girders, ahead of 2<sup>nd</sup> and behind 3<sup>rd</sup> axle final drives.
19. Secure bolts **3** against turning.
20. Tighten and check whether nuts **1** are tightened to the specified torque, i.e.  $400 \pm 40$  Nm.
21. Mount locking nuts **2** and tighten to  $400 \pm 40$  Nm.

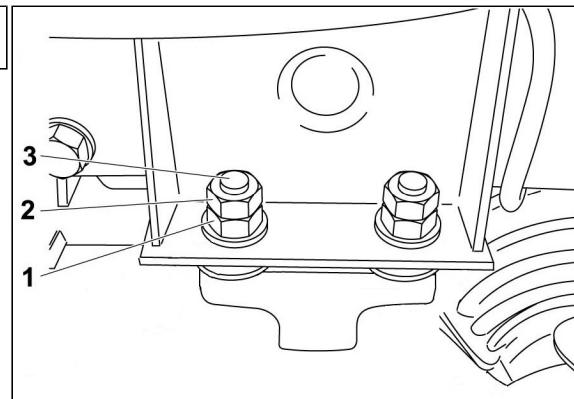
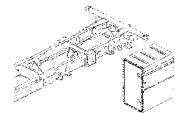


Fig. 12.20 Connection of frame with rear cross girders



### 12.5.2 Removal and Installation of the Front Bumper

#### a) Reason for Removal

1. The bumper has been damaged or deformed.

#### b) Technical Conditions

1. No ones have been stipulated.

#### c) Removal Procedure

1. Dismount the front strut according to the procedure mentioned in: (See Subchapter **12.5.10**).
2. Dismount the front trailer hitch coupling according to the procedure mentioned in: (See Subchapter **12.5.8**).
3. Disconnect cable clips and clamps fixing cable harnesses and pneumatic manifolds to the inner side of bumper.
4. Remove cover sheet **1**.
5. Remove headlamp grilles **3** from main headlamps **4**.
6. Dismount main headlamps **4** according to the procedure mentioned in: (See Part **15**).
7. Dismount fog headlamps **2** according to the procedure mentioned in: (See Part **15**).
8. Dismount side marker lamps, which are fixed using bolt **5**, according to the procedure mentioned in: (See Part **15**).

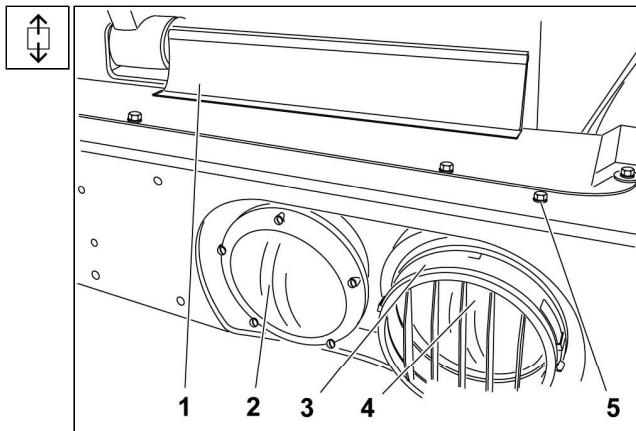


Fig. 12.21 Cover sheet - removal

9. Dismount seven-pole socket **3** according to the procedure mentioned in: (See Part **15**).
10. Remove connection **4** for the air supply from the external source.
11. Disconnect two screwed connections fixing the filler neck **5** to the front bumper **2**.
12. Disconnect six screwed connections **1** fixing the bumper **2** to face plates of auxiliary frame longitudinal beams and remove the bumper.
13. Unscrew lubricating nipple from the mouth guide in the bumper **2**.

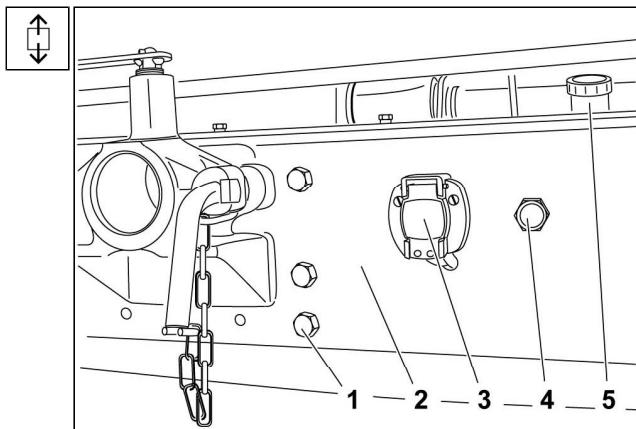
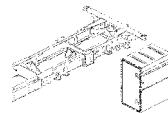


Fig. 12.22 Front bumper - removal



## 12 Frame and Frame Body



### d) Installation Procedure

1. Screw lubricating nipple into mouth guide in the bumper **2**.
2. Fit bumper **2** to face plates of frame longitudinal beams, slide the pins of foot boards to side walls of bumper, and attach using bolts **1**, nuts and locking nuts.
3. Use two screwed connections to attach the filler neck **5** to the front bumper **2**.
4. Install connection **4** of the air supply from the external source.
5. Install seven-pole socket **3** according to the procedure mentioned in: (See Part **15**).

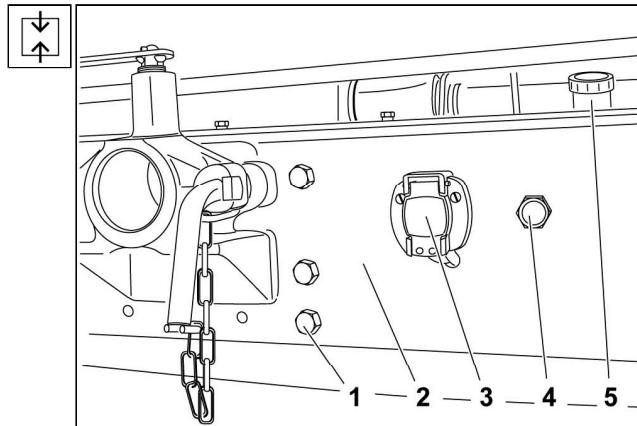


Fig. 12.23 Front bumper - installation

6. Install side marker lamps, which are fixed with bolt **5**, according to the procedure mentioned in: (See Part **15**).
7. Install fog headlamps **2** according to the procedure mentioned in: (See Part **15**).
8. Install main headlamps **4** according to the procedure mentioned in: (See Part **15**).
9. Fit headlamp grilles **3** on main headlamps **4**.
10. Mount cover sheet **1**.
11. Use clamps and cable clips to fix cable harnesses and pneumatic manifolds to the inner side of the bumper.

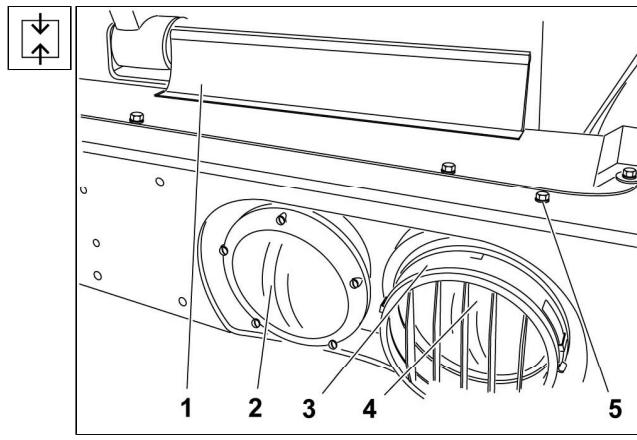
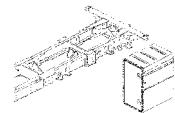


Fig. 12.24 Cover sheet - installation

11. Mount the front trailer hitch coupling according to the procedure mentioned in: (See Subchapter **12.5.8**).
12. Mount the front strut according to the procedure mentioned in: (See Subchapter **12.5.10**).



### 12.5.3 Removal and Installation of the Batteries Case

#### a) Reason for Removal

1. The case has been damaged.

#### b) Technical Conditions

1. Non ones have been stipulated.

#### c) Removal Procedure

1. Switch the batteries circuit breaker off.
2. Lift the driver's cabin.
3. Unscrew wing nuts **2**.
4. Withdraw washers **3** and upper cover **1**.
5. Remove face cover **4**.

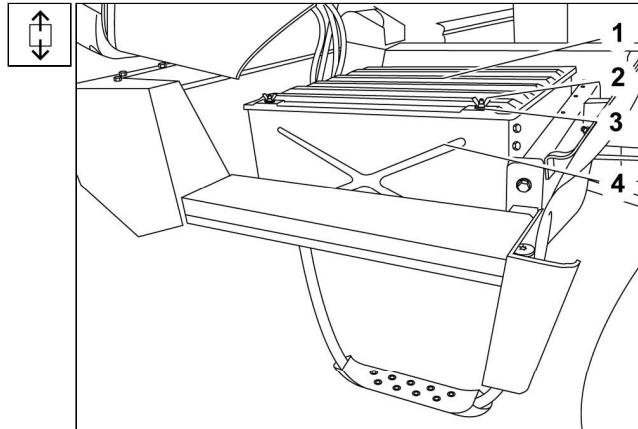


Fig. 12.25 Upper cover and face cover - removal

6. Dismount the batteries according to the procedure (See Part 15).

7. Unscrew nuts **4**.
8. Remove spring washers **3**, holder, LH **8** and holder, RH **9**.
9. Remove bolts **11** c/w washers **10** from the batteries case **1**.
10. Remove bushings **2** and **5** from the batteries case **1**.
11. Unscrew bolts **7** c/w spring washers **6** and withdraw the batteries case **1** from longitudinal beam of the auxiliary frame.

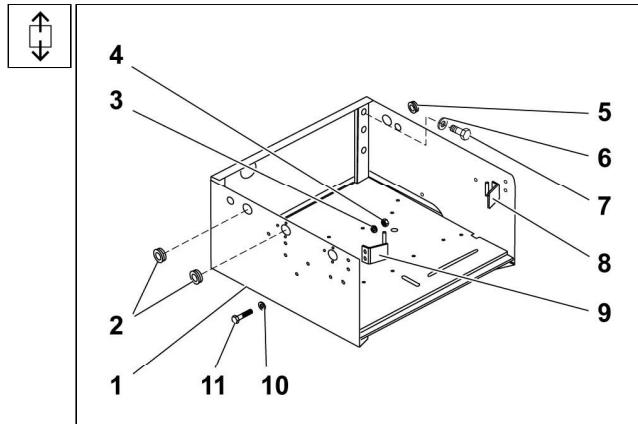
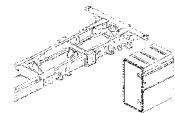


Fig. 12.26 Batteries case - removal



## 12 Frame and Frame Body



## d) Installation Procedure

1. Use bolts **7** and spring washers **6** to attach the batteries case **1** to longitudinal beam of the auxiliary frame.
2. Fit bushings **2** and **5** into batteries case **1**.
3. Use screws **11**, washers **10**, spring washers **3** and nuts **4** to fix holder, LH **8** and holder, RH **9** to the batteries case **1**.

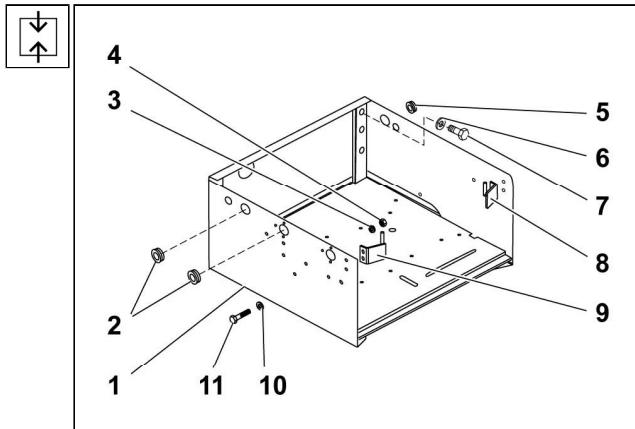


Fig. 12.27 Batteries case - installation

4. Install the batteries according to the procedure (See Part 15).
5. Fit the face cover **4** and upper cover **1** on the batteries case.
6. Use washers **3** and wing nuts **2** to attach the upper cover **1**.

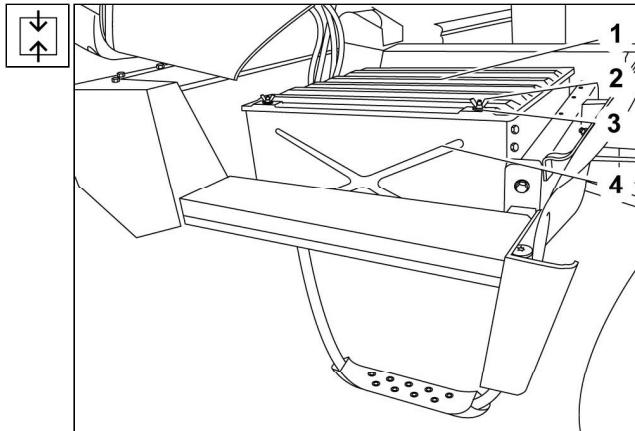
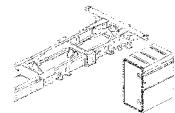


Fig. 12.28 Upper cover and face cover - installation

7. Lower the driver's cabin.
8. Switch the batteries circuit breaker on.



### 12.5.4 Removal and Installation of the Toolbox

#### a) Reasons for Removal

1. The toolbox has been damaged.

#### b) Technical Conditions

1. No technical conditions have been stipulated.

#### c) Removal Procedure

1. Remove all tools from the box 1.
2. Dismount bolts 2 c/w spring washers 3 and washers 4.
3. Withdraw the box 1 from brackets of auxiliary frame.

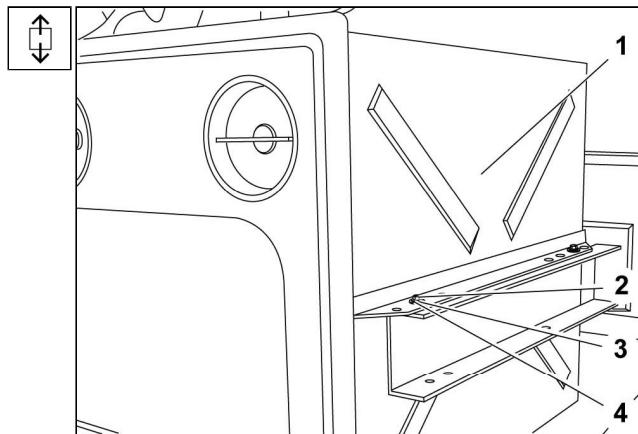


Fig. 12.29 Toolbox - removal

#### d) Installation Procedure

1. Install the box 1 into the brackets of auxiliary frame. Use bolts 2, washers 4 and spring washers 3 to attach the box 1.
2. Place all tools back into the box 1.

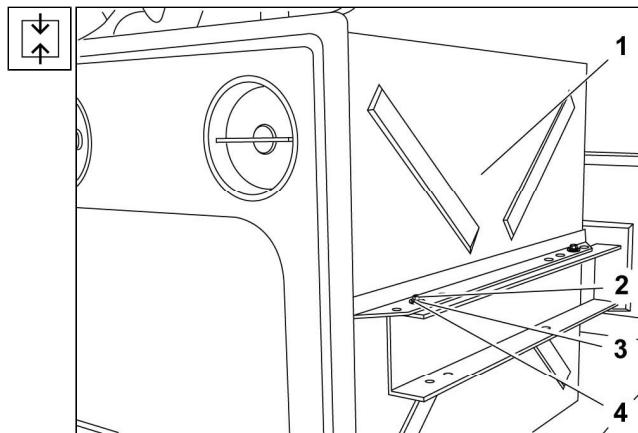
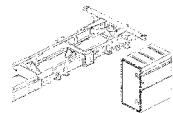


Fig. 12.30 Toolbox - installation



### 12.5.5 Removal and Installation of the Free Pulley casing

#### a) Reason for Removal

1. The free pulley casing has been damaged.

#### b) Technical Conditions

1. No ones have been stipulated.

#### c) Removal Procedure

1. Remove free pulley from the free pulley casing 1.
2. Unscrew six screwed connections 3 fixing the free pulley casing 1 to holder of spare canisters 2 and withdraw the housing.

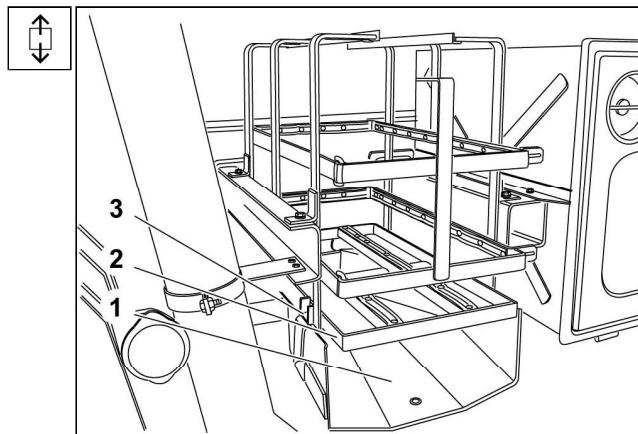


Fig. 12.31 Free pulley casing - removal

#### c) Installation Procedure

1. Fit the free pulley casing 1 to holder of spare canisters 2 and attach it using six screwed connections 3.
2. Fit the free pulley to free pulley casing 1.

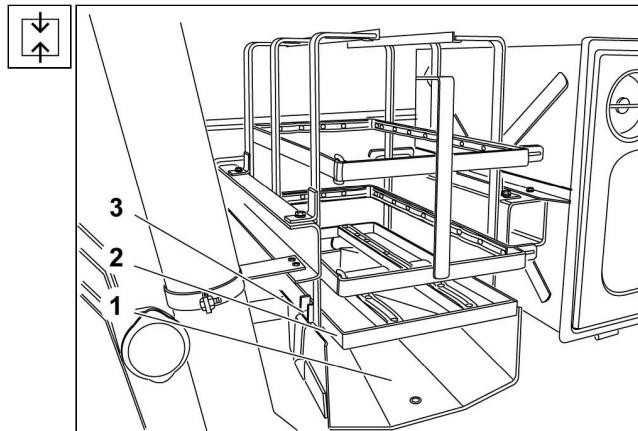
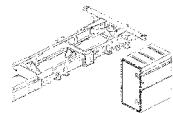


Fig. 12.32 Free pulley casing - installation



### 12.5.6 Removal and Installation of the Spare Canisters Holder

#### a) Reason for Removal

1. The spare canisters holder has been damaged.

#### b) Technical Conditions

1. No ones have been stipulated.

#### c) Removal Procedure

1. Remove canisters from the spare canisters holder **5**.
2. Dismount the free pulley casing **1** according to the procedure mentioned in: (See Subchapter **12.5.5**).
3. Unscrew bolts **4** and withdraw spring washers **3** and washers **2**.
4. Withdraw the spare canisters holder **5** from brackets of auxiliary frame.

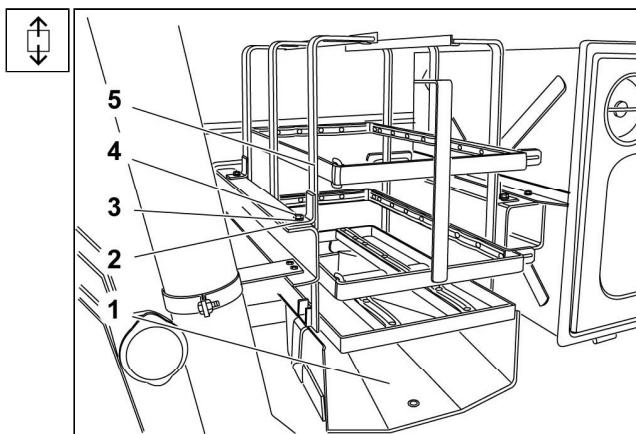


Fig. 12.33 Spare canisters holder - removal

#### d) Installation Procedure

1. Fit the spare canisters holder **5** on brackets of auxiliary frame and attach using bolts **4** c/w spring washers **3** and washers **2**.
2. Install the free pulley casing **1** according to the procedure mentioned in: (See Subchapter **12.5.5**).
3. Fit canisters into the spare canisters holder **5**.

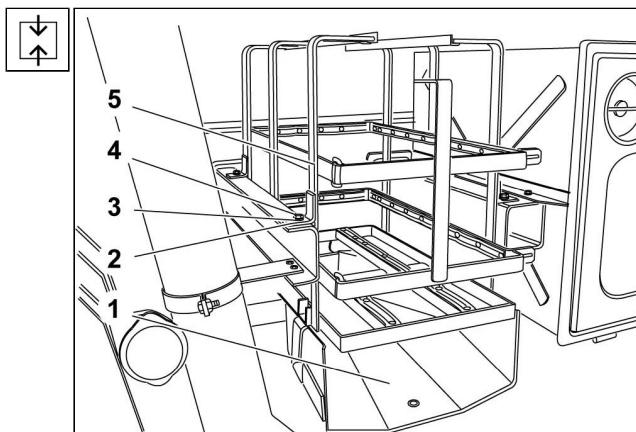
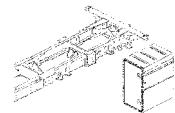


Fig. 12.34 Spare canisters holder - installation



### 12.5.7 Removal and Installation of the Fuel Tank

#### a) Reasons for Removal

1. The tank has been damaged.
2. The tank has become leaky.
3. Tank holders have been deformed.

#### b) Technical Conditions

1. Apply the sealant to contact surfaces from outside during installation of the tank float.

#### c) Removal Procedure

1. Unscrew the tank **2** cap **1**.
2. Unscrew the drain plug **3** with sealing ring to drain the fuel into a pan prepared.

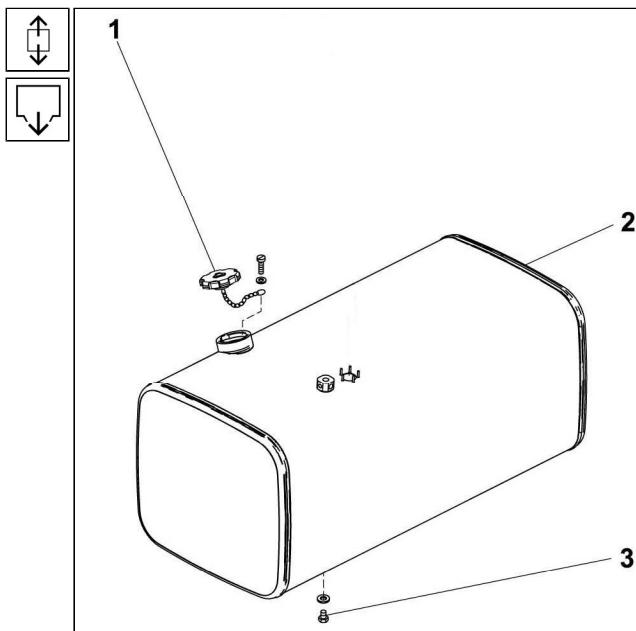
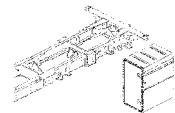


Fig. 12.35 Fuel tank



## 12 Frame and Frame Body



3. Switch the batteries circuit breaker off, disconnect the cable clip **1** and withdraw the float lid **2**.
4. Unplug electric cables **3** from float.
5. Detach the fuel manifold **4** from tank.

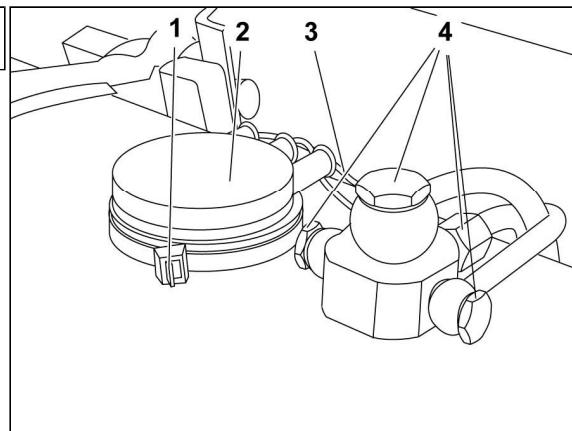


Fig. 12.36 Float and fuel manifold - disconnection

6. Unscrew bolts **3** and remove pins **4**, loosen tank strips **2** and strip rubber washers **1**.

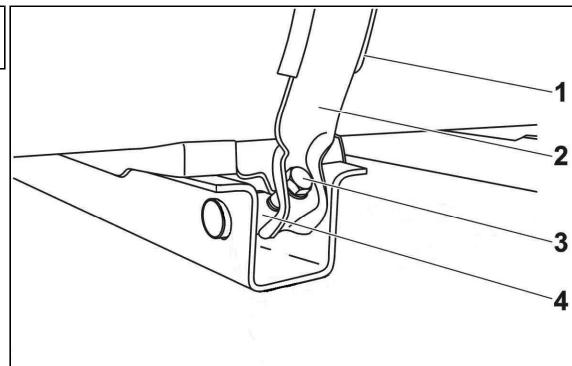


Fig. 12.37 Attachment of fuel tank strip - removal

7. Withdraw tank strips **2** and strips rubber washers **1**. Remove the tank **3** from tank holders **4** and place it aside.

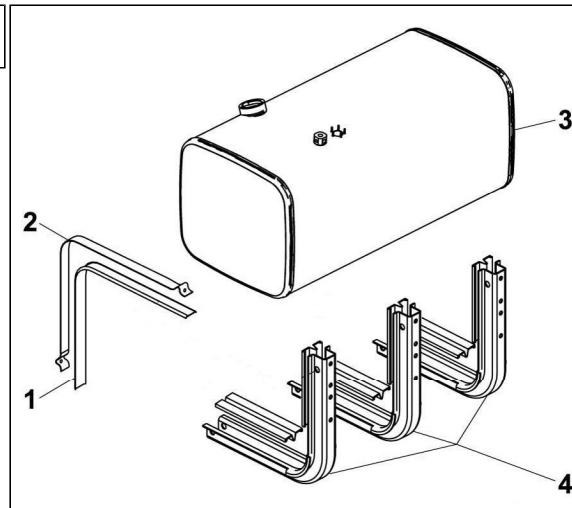
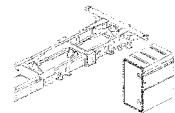


Fig. 12.38 Tank strips and tank - removal



## 12 Frame and Frame Body



8. Unscrew nuts **3** c/w spring washers **4**.
9. Remove float **5**.
10. Withdraw sealing ring **2** from tank **1**.

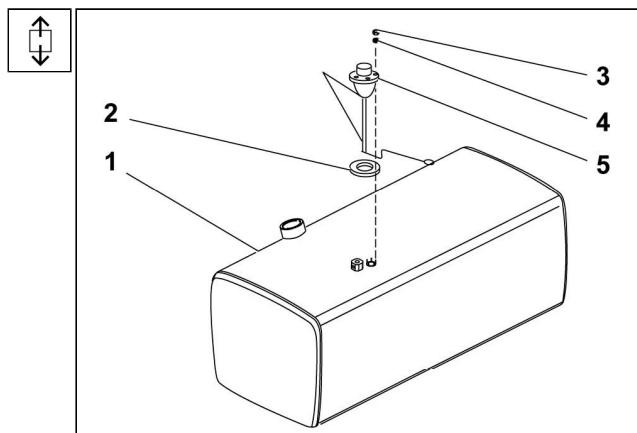


Fig. 12.39 Float - removal

11. Withdraw rubber washers **1** from tank holders **5**.
12. Unscrew screws **2** c/w spring washers **3**.
13. Remove plates **4** and tank holders **5** from longitudinal beam of the auxiliary frame.

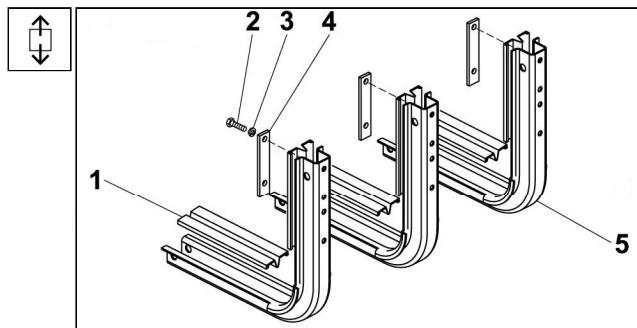


Fig. 12.40 Fuel tank holders - removal

## d) Installation Procedure

1. Use plates **4** and bolts **2** c/w spring washers **3** to attach tank holders **5** to the auxiliary frame.
2. Fit rubber washers **1** into tank holders **5**.

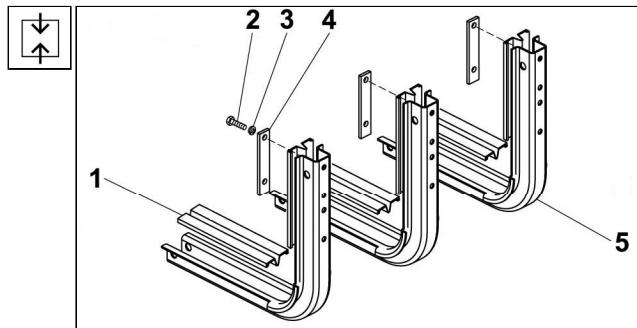
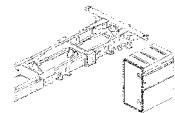


Fig. 12.41 Fuel tank holders - installation



## 12 Frame and Frame Body



3. Fit sealing ring **2** on tank **1**.
4. Insert float **5** into tank and fix using spring washers **4** and nuts **3** to tank.
5. Smear the contact surfaces of float and nuts with sealant from outside.

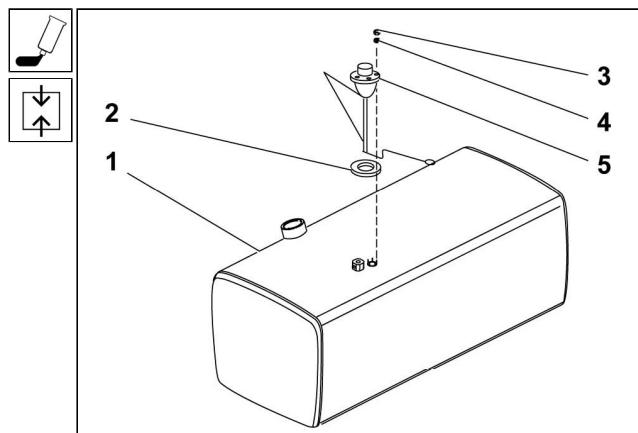


Fig. 12.42 Float - installation

6. Fit tank **3** into tank holders **4**.
7. Fit strips washers **2** on tank strips **1** and fit strips on tank **3**.

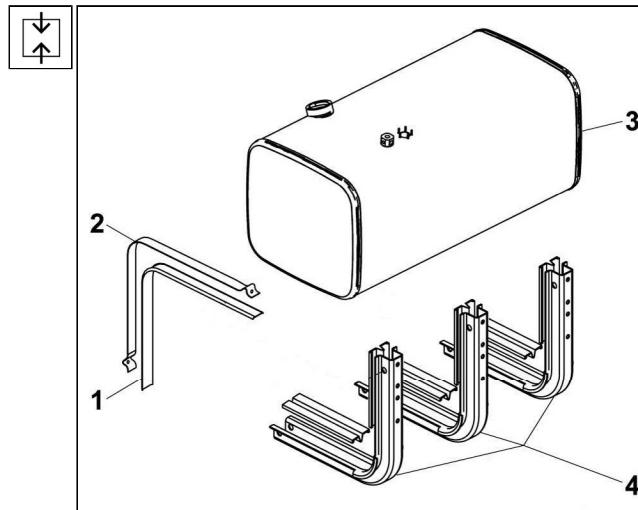


Fig. 12.43 Tank strips and tank - installation

8. Use bolts **3** and pins **4** to attach the tank strips **2** c/w strips rubber washers **1** to tank holders.
9. Use the torque wrench to tighten the bolts **3** evenly per **5 Nm** to **15 ±10% Nm**.

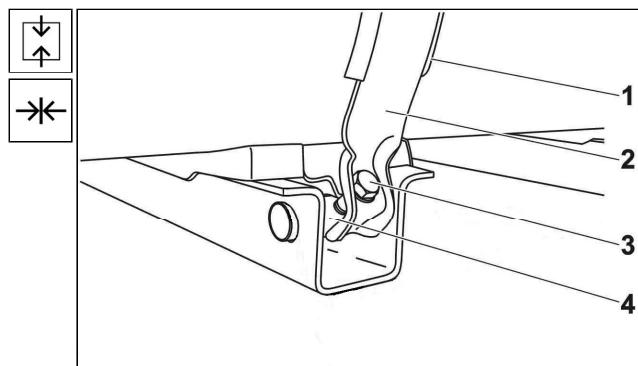
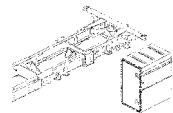


Fig. 12.44 Attachment of fuel tank strip - installation



## 12 Frame and Frame Body



10. Connect electric cables **3** to float, switch the batteries circuit breaker on, and check the float for function.
11. Fit rubber lid **2** on float and secure with cable clip **1**.
12. Attach fuel manifold **4** to tank.

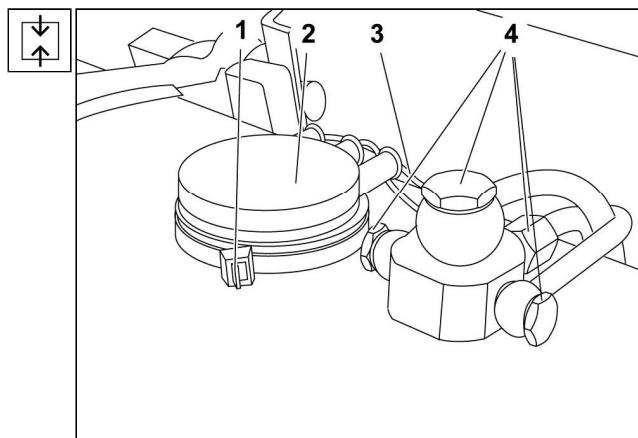


Fig. 12.45 Float and fuel manifold - connection

13. Screw the drain plug **3** c/w sealing ring into tank **2**.
14. Fill the tank with fuel and close the tank with cap **1**.

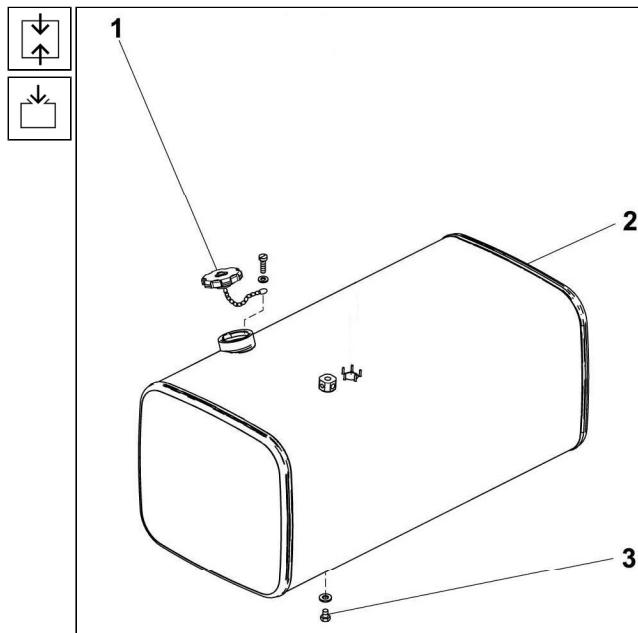
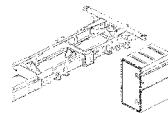


Fig. 12.46 Fuel tank



### 12.5.8 Removal and Installation of the Front Trailer Hitch Coupling

#### a) Reasons for Removal

1. The hitch coupling is not functional.
2. Replacement of front bumper.

#### b) Technical Conditions

1. To install the trailer hitch coupling, use only the connecting material, washer and nut, which are part of the coupling.

#### c) Removal Procedure

1. Unscrew wing nut **1** fixing the mouth holder **4** to the front bumper.
2. Withdraw rubber washer **2** and washer **3**.
3. Tilt the coupling mouth **5** into horizontal position.

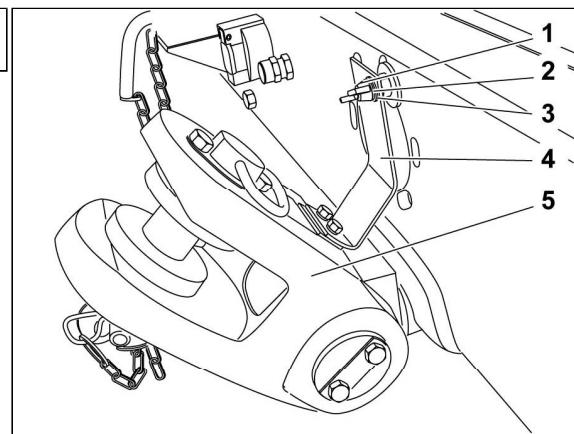


Fig. 12.47 Mouth holder - removal

4. Remove split pin **4** of crown nut **3**.
5. Unscrew nut **3**.
6. Withdraw washer **2**.
7. Move the coupling tie-rod **1** out of the mouth guide.

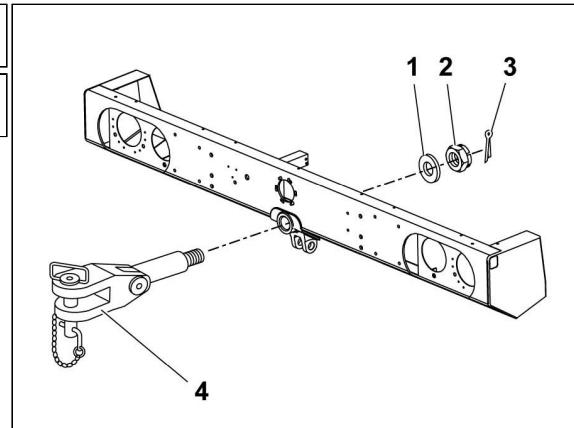
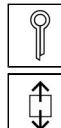
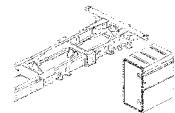
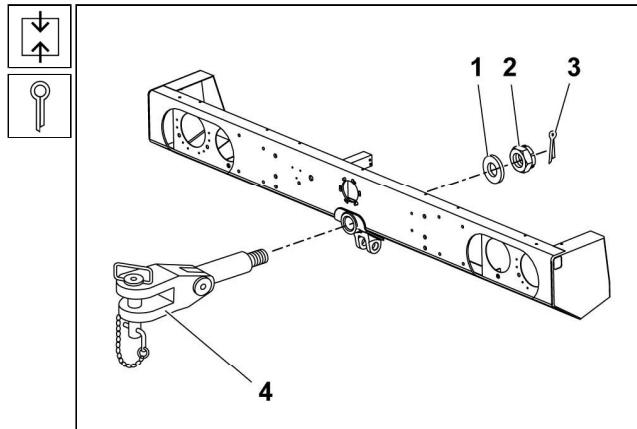


Fig. 12.48 Front hitch coupling - removal

**d) Installation Procedure**

1. Slide the coupling tie-rod **1** into mouth guide.
2. Fit washer **2**.
3. Mount nut **3**, tighten it with the nearest slot into hole in thread and secure with split pin **4**.

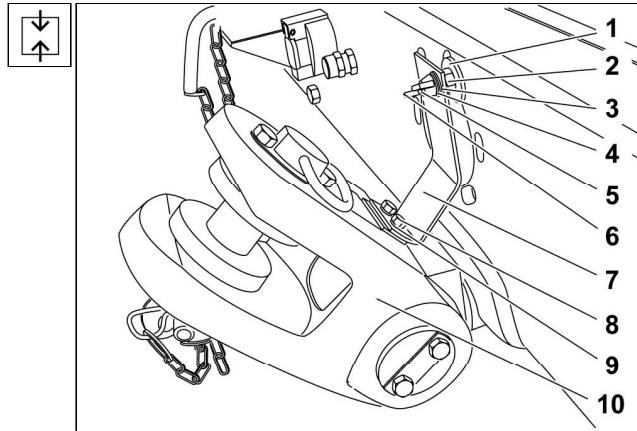
*Fig. 12.49 Front hitch coupling - installation*

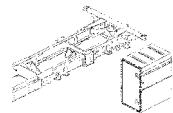
4. If a new hitch is installed, use bolts **8** c/w spring washers **9** (which are unscrewed from mouth) to attach the mouth holder **7** to coupling mouth **10**.

**CAUTION:**

If the hitch coupling is installed into a new bumper, insert bolt **4** into oval hole in bumper from inside and attach it using washer **1** and nut **3**.

5. Partially lift the mouth and fix the mouth holder **7** using washer **3**, spring washer **4** and wing nut **6** to the front bumper.

*Fig. 12.50 Mouth holder - installation*



### 12.5.9 Removal and Installation of the Rear Trailer Hitch Coupling

#### a) Reasons for Removal

1. The hitch coupling is not functional.
2. Replacement of auxiliary frame.

#### b) Technical Conditions

1. To install the trailer hitch coupling, use only the connecting material, bolts and nuts as specified in the Spare Parts Catalogue.

#### c) Removal Procedure

1. Remove cover 4 from the rear body 1.
2. Remove binding wire 7 and unscrew two bolts 6 from the hook tie-rod 10.
3. Pull the lock spring 5 out.
4. Unscrew nut 3.
5. Move the hook tie-rod 10 c/w mouth 11 out of the hitch coupling body.
6. Unscrew eight self-locking nuts 13, and remove bolts 14 and rear body 1 c/w respective parts 2, 8 and 9, which are placed in the rear body, and remove the front body 12 from hole in the rear bumper of the auxiliary frame.

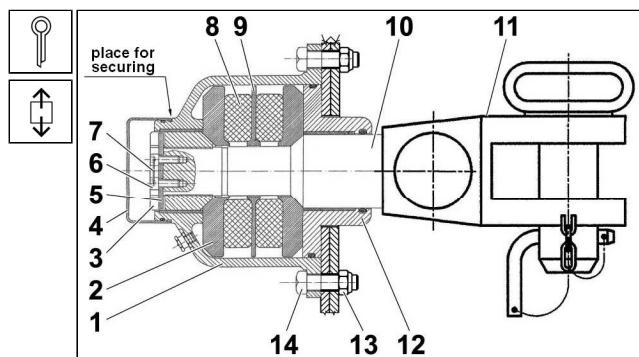


Fig. 12.51 Rear hitch coupling - removal

#### d) Installation Procedure

##### CAUTION:

Prior to install a new hitch, it is necessary to carry out the below-mentioned operations 1 through 6:

1. Withdraw cover 2 from the rear body 12.
2. Remove binding wire 5 and unscrew bolts 4 from the hook tie-rod 6.
3. Remove the lock spring 3.
4. Unscrew nut 1.
5. Move the hook tie-rod 6 c/w mouth 7 out of the hitch coupling body 12.
6. Unscrew four crown nuts 8, remove washers 9 and lock shims 10 and remove four bolts 11.

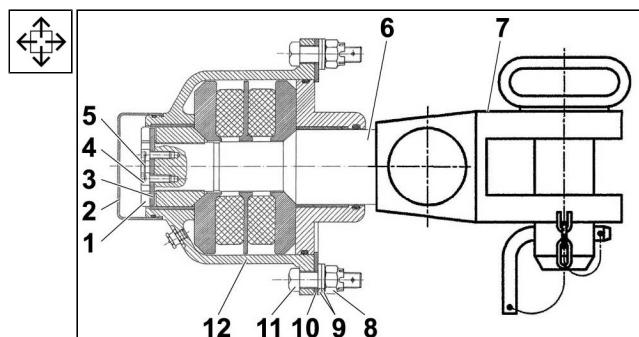


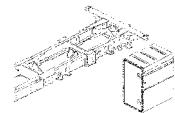
Fig. 12.52 Rear hitch coupling - dismantling

##### Note:

Further installation procedure is identical both for a new and original hitch coupling.



## 12 Frame and Frame Body



7. Insert the front body **12** c/w rear body **1** and respective parts **2**, **8** and **9** situated in the rear body into a hole in the rear bumper of the auxiliary frame and check the clearance between the rear body and rear bumper, which must range from **1** to **3 mm** in order to assure pre-load of spring inserts **8** after installation. If need be, use the spacer shim, which is a part of a new hitch coupling.
8. Use eight bolts **14** and self-locking nuts **13** to attach the rear body **1**. Tighten nuts to **190 ± 10% Nm**.
9. Insert the hook tie-rod **10** c/w mouth **11** into hitch coupling body.
10. Mount nut **3** on the hook tie-rod **10** so that it has the clearance of **0.2 mm** towards the conical surface of the dish **2**. After setting the clearance the hook tie-rod must turn without dragging by **360°** round its axis.
11. Insert lock spring **5** into nut **3** and attach it to the hook tie-rod **10** using two bolts **6**.
12. Secure bolts **6** with binding wire **7** against loosening.
13. Slide cover **4** on the rear body **1** and secure with a punch in three places along the cover circumference ( $3 \times 120^\circ$ ) against sliding-out.

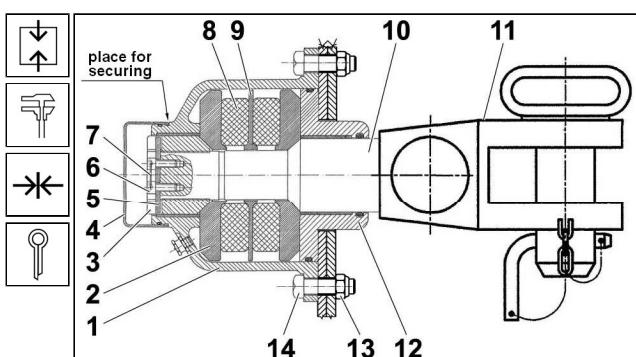
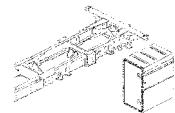


Fig. 12.53 Rear hitch coupling - installation



### 12.5.10 Removal and Installation of the Rear Strut

#### a) Reasons for Removal

1. The rest strut has been damaged or deformed.
2. Removal of rest axles.
3. Removal of auxiliary frame.

#### b) Technical Conditions

1. No ones have been stipulated.

#### c) Removal Procedure

1. Remove split pins **2** from pins **1**.
2. Remove pins **1** and move the strut **5** out of holders on the rest cover and auxiliary frame.
3. Measure and note down the length between central points of strut eyes **3** and **6**.
4. Loosen nuts **4** and **7**.
5. Unscrew strut eyes **3** and **6** from strut **5**.

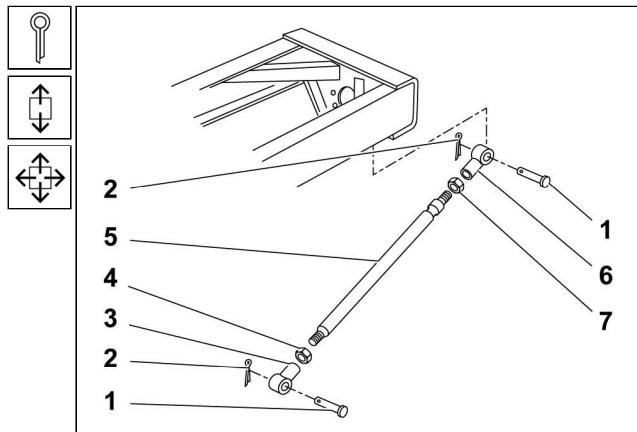


Fig. 12.54 Rear strut - removal

#### d) Installation Procedure

1. Mount low nut **7** (RH thread) on strut **5** on the side with recess.
2. Mount nut **4** (LH thread) on strut **5**.
3. Screw evenly the strut eye **6** (RH thread) and strut eye **3** (LH thread) on strut **5** so that the length between central points of strut eyes holes would correspond to the value, which was measured on the dismounted strut - strut eyes axes must be aligned.
4. Fit the strut **5** into holders on the rest cover and auxiliary frame and insert pins **1**.
5. Secure pins **1** with split pins **2** against falling-out.
6. Turn the strut **5** to tighten it to achieve the required clearance, continue to tighten it by more 1/4 turn and secure with nuts **4** and **7**.

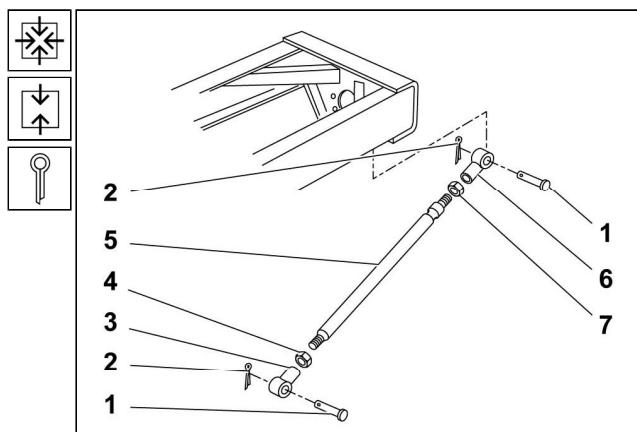
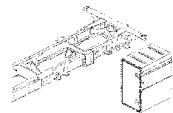


Fig. 12.55 Rear strut - installation



### 12.5.11 Removal and Installation of the Front Strut

#### Reasons for Removal

1. The front strut has been damaged or deformed.
2. Removal of front axle.
3. Removal of front bumper.
4. Removal of auxiliary frame.

#### b) Technical Conditions

1. No ones have been stipulated.

#### c) Removal Procedure

1. Remove split pins **1** from the hinge pin **2** and pin **8**.
2. Remove pin **8** and hinge pin **2**.
3. Remove strut **5** from holders of the mouth guide in the front bumper and front cover.
4. Loosen nuts **4** and **6**.
5. Unscrew strut eyes **3** and **7** from strut **5**.

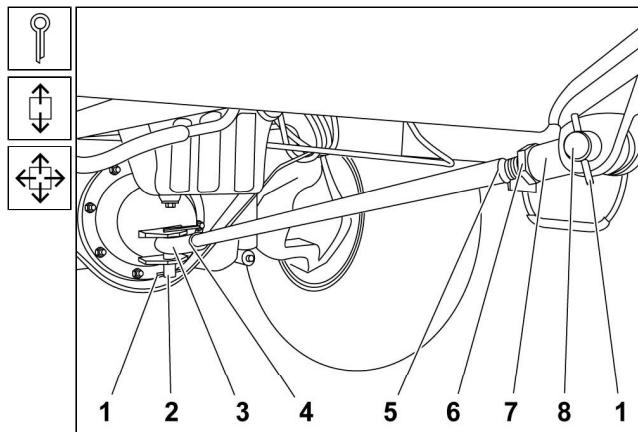


Fig. 12.56 Front strut - removal

#### d) Installation Procedure

1. Mount low nut **4** (RH thread) on strut **5** on the side with recess.
2. Mount nut **6** (LH thread) on strut **5**.
3. Screw evenly the strut eye **3** (RH thread) and strut eye **7** (LH thread) on strut **5**.
4. Fit strut **5** into holders on the front cover and mouth guide in the front bumper and insert the hinge pin **2**.
5. Turn (screw) the strut **5** to adjust it in length and insert the pin **8**.
6. Tighten nuts **4** and **6** to secure the position of strut eyes **3** and **7**.
7. Secure the hinge pin **2** and pin **8** with split pins **1** against falling-out.

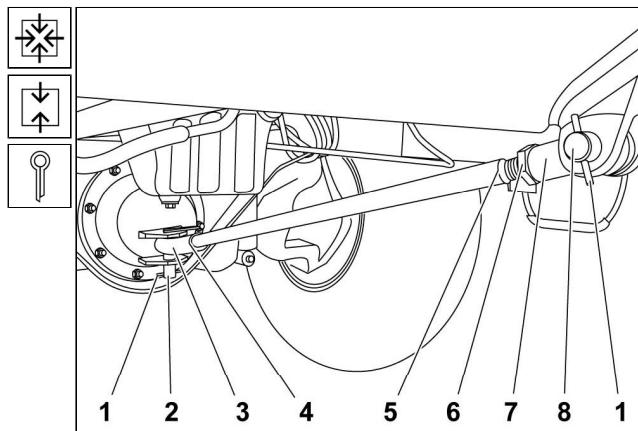
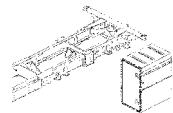


Fig. 12.57 Front strut - installation



### 12.5.12 Removal and Installation of the Auxiliary Ladder-type Frame

#### a) Reasons for Removal

1. Mechanical damage to frame.

#### b) Technical Conditions

1. Adjust the clearance between cross girders of central member frame and auxiliary ladder-type frame with respective washers.

#### c) Removal Procedure

1. Dismount all assembly groups from vehicle, which are attached to the ladder-type frame (cargo platform, cabin, engine, exhaust silencer, suction tube, steering gear, winch and cable guide pulley (on 50T), front bumper, batteries case, toolbox, basket of spare canisters, front body parts, rear body parts, fuel tank, trailer hitch couplings, struts, individual parts of pneumatic system, power steering circuit, cabin lifting mechanism, fuel system and electric equipment on the auxiliary frame).
2. Disconnect suspension shock absorbers from the auxiliary frame (See Part 8).
3. Unscrew nuts from bolts **4** and withdraw spring washers.
4. Remove bolts **4** with fitted washer from frame.
5. Remove rubber plugs **3**.
6. Unscrew locking and fastening nuts c/w washers from bolts **1**.
7. Remove bolts **1** and spacer washers **2**.

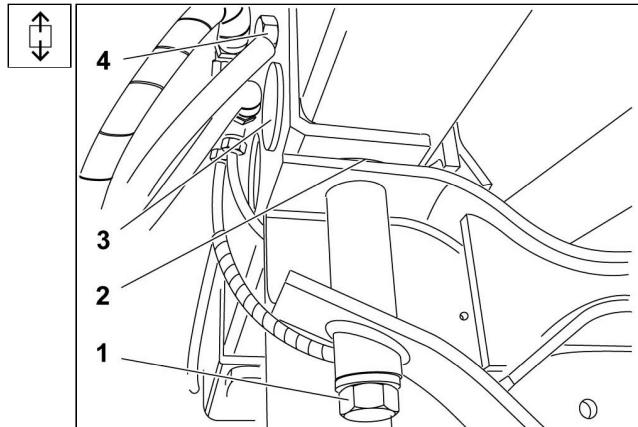
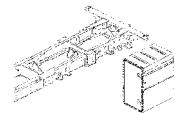


Fig. 12.58 Attachment of frame to the front cross girder



## 12 Frame and Frame Body



8. Remove rubber plugs from cross girder behind front axle final drive.
9. Withdraw lock rings **1** and lock sheets **4** from nuts **3** and unscrew nuts.
10. Remove fastening bolts and lock washer **2** from beneath bolts heads.

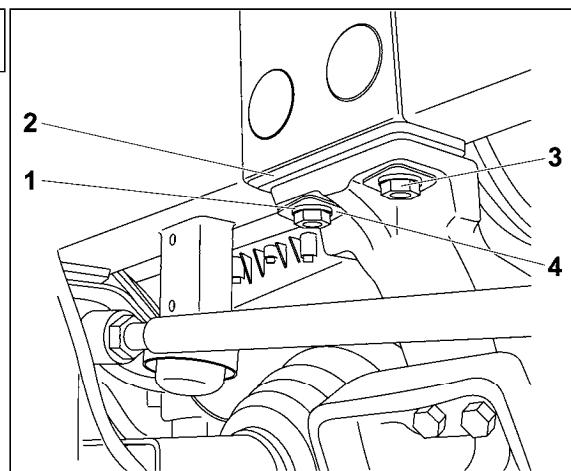


Fig. 12.59 Attachment of frame to the cross girder behind final drive

11. Unscrew locking nuts **4** and fastening nuts **3** from rear cross girders.
12. Remove bolts **5** and withdraw washers **2**.
13. Remove spacer washers **1**.

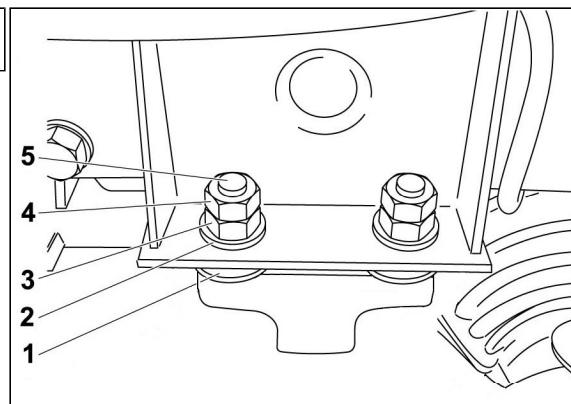


Fig. 12.60 Attachment of frame to rear cross girders

14. Unscrew locking nuts **3** and fastening nuts **2** from cross girder of the rear connecting part **I**.
15. Remove bolts **4** and withdraw washers **1**.

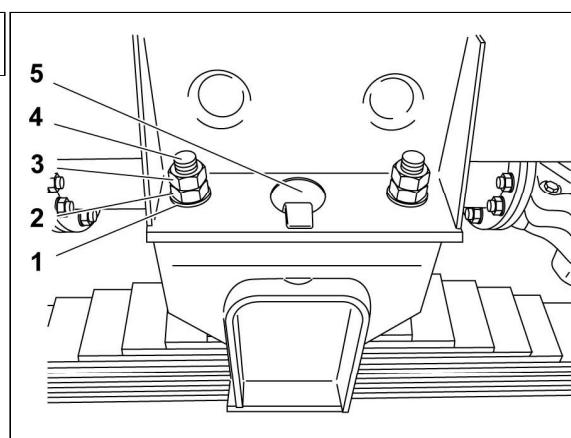
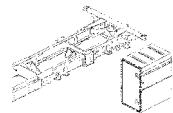


Fig. 12.61 Attachment of frame to the cross girder of the rear connecting part



## 12 Frame and Frame Body



16. Hang the frame on suitable lifting device. Withdraw the frame from cross girders and place it on even surface or support it on stands.

**CAUTION:**

Keep safety precautions valid for work with a hanging load.

17. Remove lens 5 (See Fig. 12.61).

### d) Installation Procedure

1. Insert lens 5 into cross girder of the rear connecting part.
2. Use a suitable lifting device to place the ladder-type frame on cross girders of the central member frame so that the frame comes to bear against the lens 5. Position the frame so that holes for bolts in frame and cross girders are aligned.

**CAUTION:**

Keep safety precautions valid for work with a hanging load.

3. Use bolts 4, washers 1, fastening nuts 2 and locking nuts 3 to attach the frame to cross girder of the rear connecting part.
4. Tighten fastening nuts and locking nuts to **400 ± 40 Nm**.
5. Use bolts with lock washers 2 under head bolts and slotted lock nuts 3 to attach the ladder-type frame to cross girder behind the front axle final drive housing. Tighten nuts 3 to **400 ± 40 Nm**.
6. Fit lock sheets 4 and lock rings 1 on nuts 3.
7. Install rubber plugs into frame.

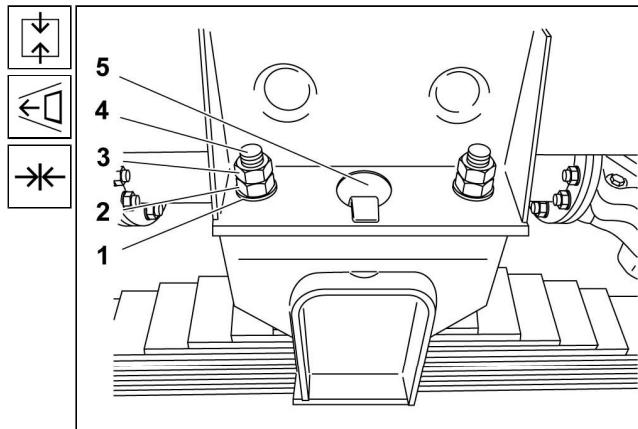


Fig. 12.62 Attachment of frame to the cross girder of the rear connecting part

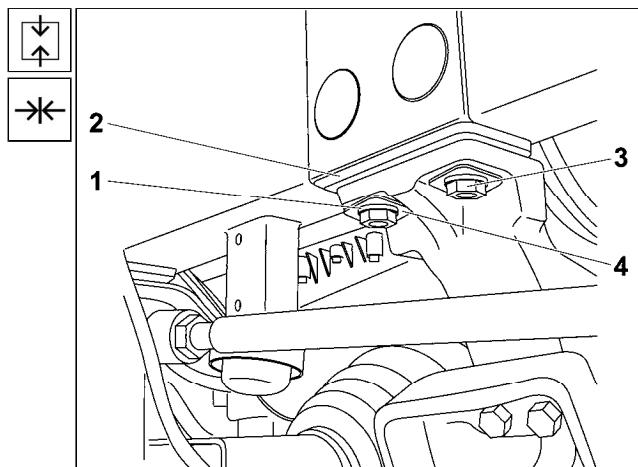
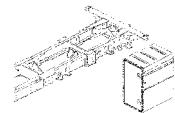


Fig. 12.63 Attachment of frame to cross girder behind the axle final drive



## 12 Frame and Frame Body



8. If need be, fit spacer washers **1**, between rear cross girders and frame.
9. Use bolts **5**, washers **2**, fastening nuts **3** and locking nuts **4** to attach the frame to cross girders.
10. Tighten fastening nuts and locking nuts to **400 ± 40 Nm**.

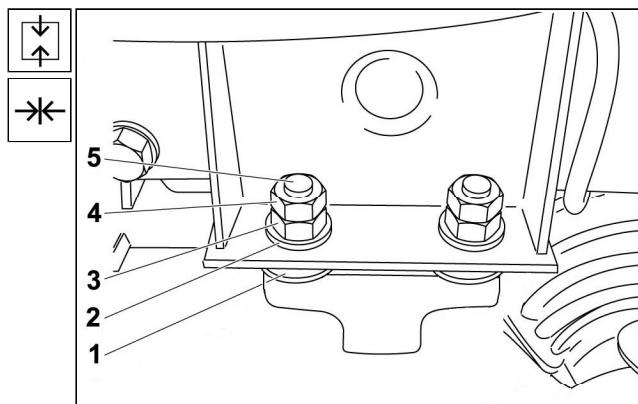


Fig. 12.64 Attachment of frame to rear cross girders

11. If need be, fit spacer washers **2**, between cross girder and frame.
12. Use bolts **1**, washers, fastening nuts and locking nuts to attach the lower part of frame to the front cross girder.
13. Tighten fastening nuts and locking nuts of bolts **1** to **300 ± 40 Nm**.
14. Fit rubber plugs **3**.
15. Use bolts **4** with fitted washer, spring washers and nuts to attach the side parts of frame to the front cross girder.
16. Tighten bolts nuts **4** to **400 ± 40 Nm**.

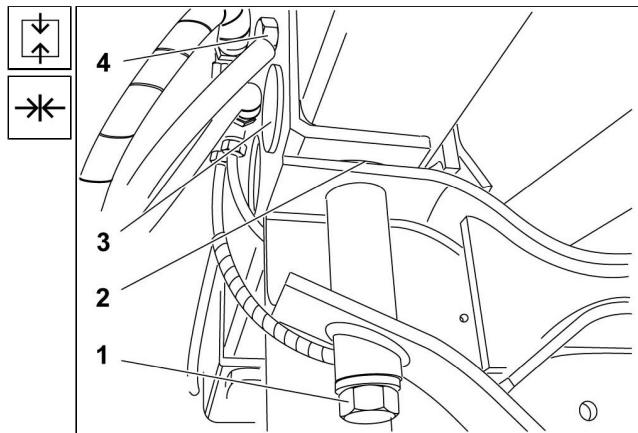


Fig. 12.65 Attachment of frame to the front cross girder

17. Connect suspension shock absorbers to the auxiliary frame (See Part 8).
18. Install all dismounted assembly groups (cargo platform, cabin, engine, exhaust silencer, suction tube, steering gear, winch and cable guide pulley (on 50T), front bumper, batteries case, toolbox, basket of spare canisters, front body parts, rear body parts, fuel tank, trailer hitch couplings, struts, individual parts of pneumatic system, power steering circuit, cabin lifting mechanism, fuel system and electric equipment on the auxiliary frame).

