

Chapter 7 Front Wagon

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7.1 Introduction

The Front Wagon is built up around the front frame, which is the base for the engine and the transmission. The frame is resting on the front suspension, and connected to the rear wagon in the articulation bearing.

The fenders and mudguards are attached to the frame as well as the cab and the bonnet. Both the cab and the bonnet are hinged for easy access to engine and transmission for inspection and maintenance.

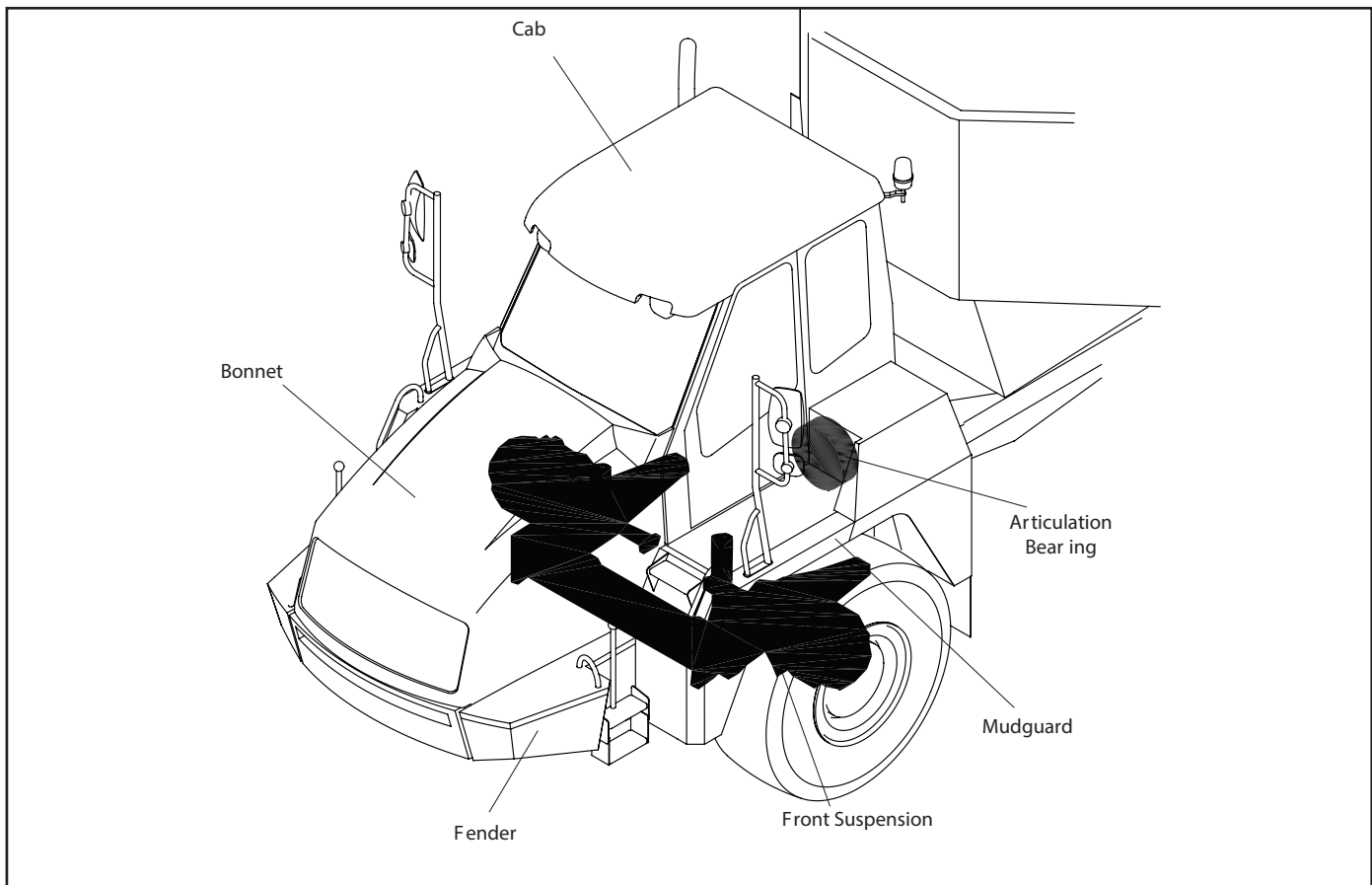


Figure 1

7.2 Front Axle Suspension

The Front Axle Suspension consists of two independent suspension arms connected to each other via the cross tube. There are two hydraulic cylinders installed, one on each suspension arm. In addition, the suspension is stabilized by the panhard bar connected to the front wagon frame.

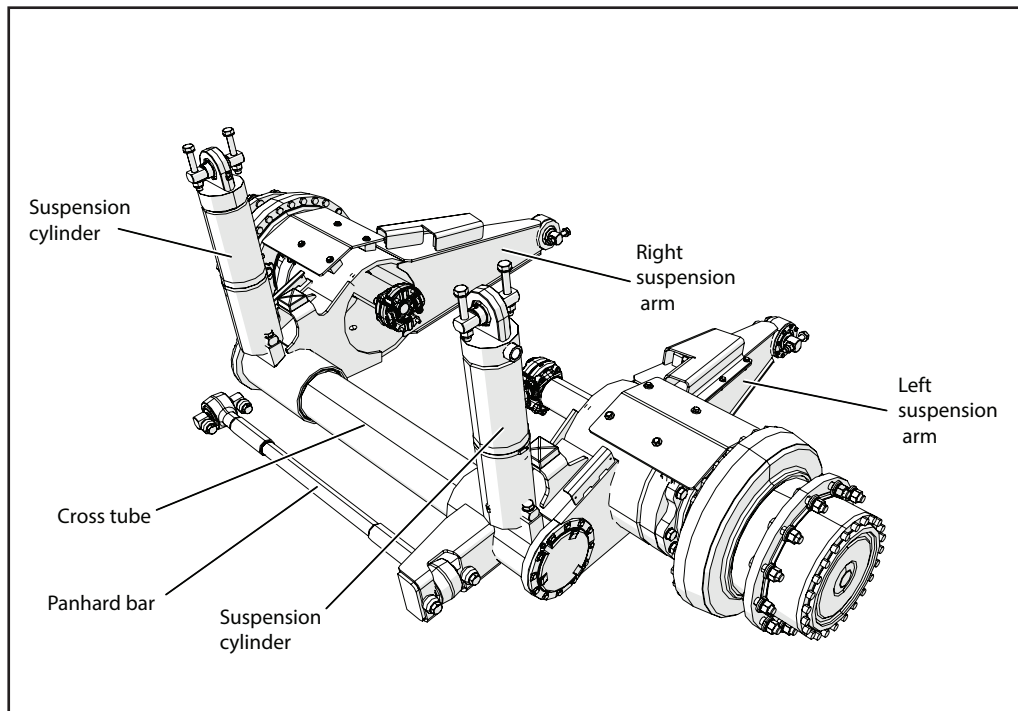
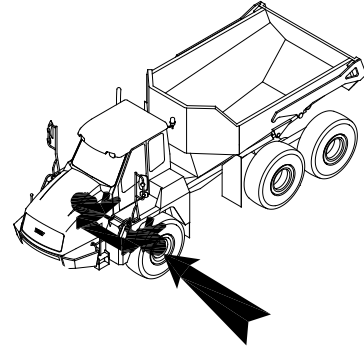


Figure 2

Front Axle Suspension

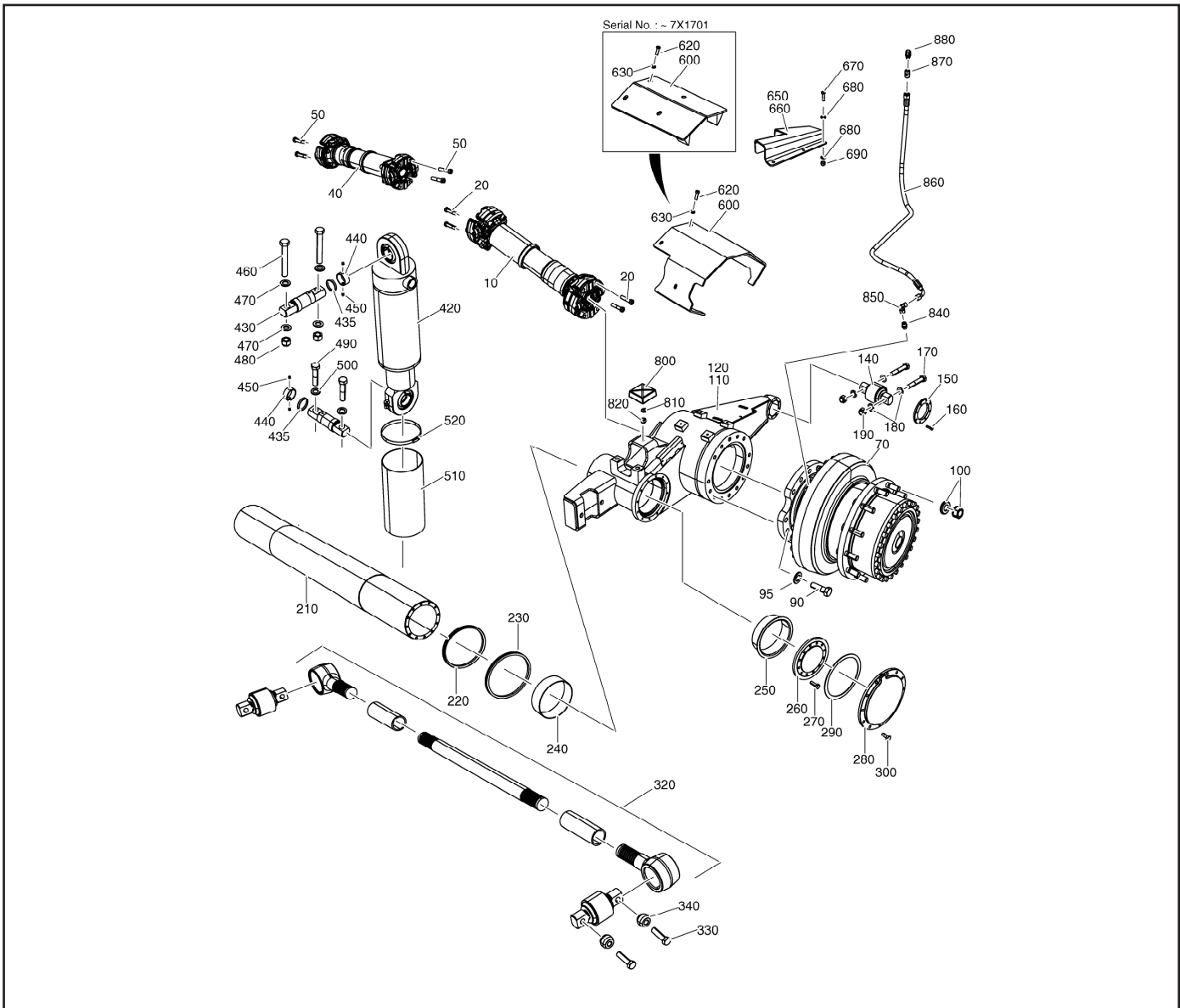


Figure 3

- | | | | | | |
|-----|-------------------|-----|------------------------------|-----|-------------------------------|
| 10 | CARDAN SHAFT | 240 | BEARING,SLIDING | 500 | WASHER |
| 20 | SCREW,HEX | 250 | BEARING,SLIDING | 510 | PROTECTION;
SUSPENSION ROD |
| 40 | CARDAN SHAFT | 260 | COVER,END | 520 | CLAMP,HOSE |
| 50 | SCREW,HEX | 270 | SCREW | 600 | PROTECTOR;HOSE |
| 70 | *WHEEL HUB ASS'Y | 280 | COVER | 600 | GUARD,HOSE |
| 90 | SCREW | 290 | RING,THRUST | 620 | SCREW |
| 95 | WASHER | 300 | SCREW | 630 | WASHER |
| 100 | NUT,WHEEL | 320 | ROD | 650 | PROTECTOR;LH |
| 110 | SUSPENSION,ARM;LH | 320 | ROD;PANHARD | 660 | PROTECTOR;RH |
| 110 | SUSPENSION,ARM;LH | 330 | SCREW | 670 | SCREW |
| 120 | SUSPENSION,ARM;RH | 340 | SPACER | 680 | WASHER |
| 120 | SUSPENSION,ARM;RH | 420 | CYLINDER ASS'Y | 690 | NUT |
| 140 | BEARING | 430 | BOLT;SUSPENSION CYL.
BOLT | 800 | BUFFER |
| 150 | RING,THRUST | 435 | SHIM;SUSPENSION CYL | 810 | WASHER |
| 160 | SCREW | 440 | BUSHING | 820 | NUT |
| 170 | SCREW | 450 | SCREW,SET | 840 | CONNECTER |
| 180 | WASHER | 460 | SCREW | 850 | CONNECTOR |
| 190 | NUT | 470 | WASHER | 860 | HOSE ASSY,HYDRAULIC |
| 210 | TUBE | 480 | NUT | 870 | CONNECTOR ASSY |
| 220 | SEAL RING | 490 | SCREW | 880 | BREATHER,AIR |
| 230 | DISTANCE RING | | | | |

Hydraulic cylinder disassembly



WARNING

Place the dump truck on level ground and apply parking brake.

Apply articulation lock and wheel chocks.

NOTE

The Hydraulic cylinder reduce the motion in the wheel suspension when driving on rough road condition.

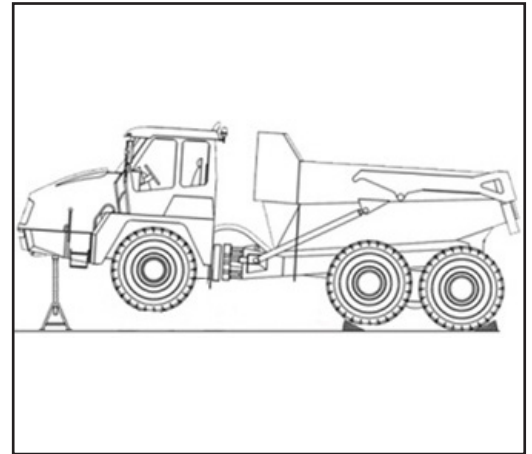


Figure 4



WARNING

Serious injury or death may occur if handled improperly.

Loosen nuts and remove actual wheel using tire handling device.



WARNING

Be aware of the risk of injury to people and equipment when handling heavy objects!



Figure 5



DANGER

Place hydraulic stand beneath suspension arm to prevent it from falling down on removal.

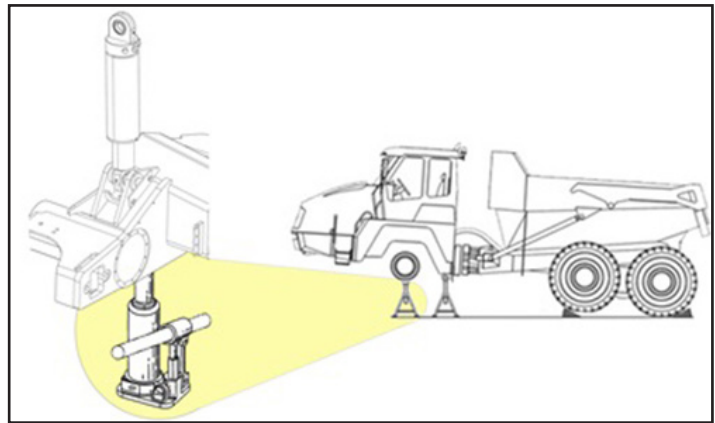


Figure 6

Thoroughly clean the front suspension.

Unscrew and remove the suspension cover plate.

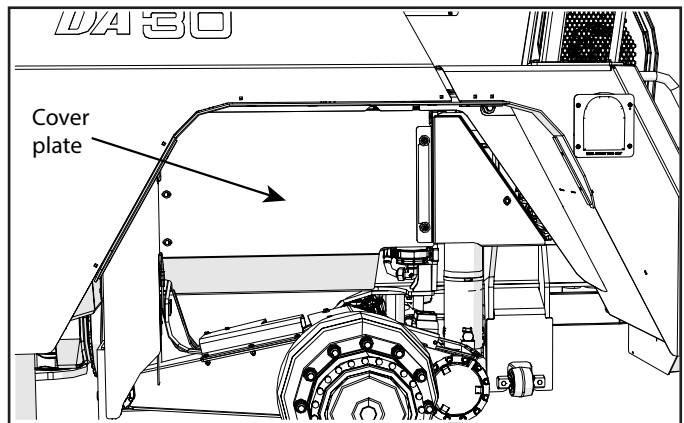


Figure 7



WARNING

Release the pressure in the cylinder before working on the unit.

Access cylinder pin (6) to loosen cylinder.

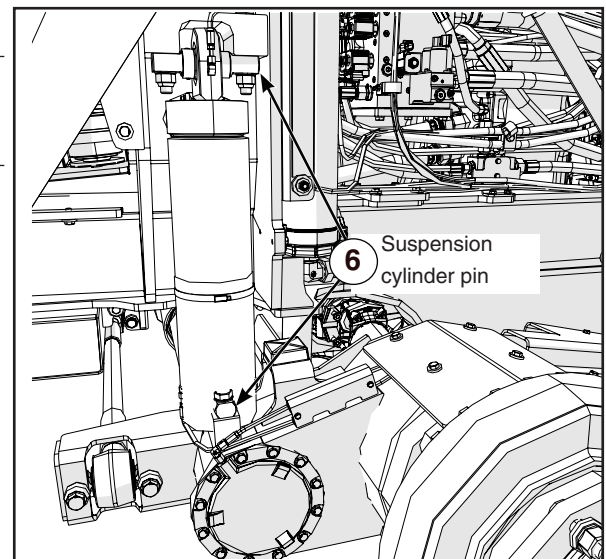


Figure 9



DANGER

Secure cylinder from falling before loosening lower bolt on cylinder

Disassemble lubrication attachment.

Remove cylinder pin to loosen cylinder.



Figure 8

Hydraulic cylinder reassembly

- Use lubrication inside the protection for easier installation.

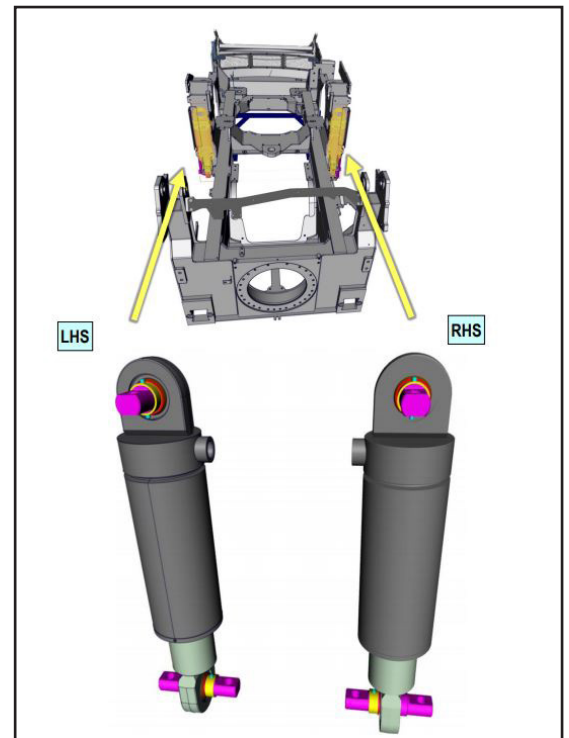


Figure 10

- Mount the suspension cylinder bolt pos.2. The top lubrication hole should be outwards and the bottom one should be forward.

Torque pos.4: 6 Nm
Loctite pos.4: 2400

- Put the cylinder protection on, 150 mm and mount the clamp on the rear side.

Torque pos. 6: 5 Nm

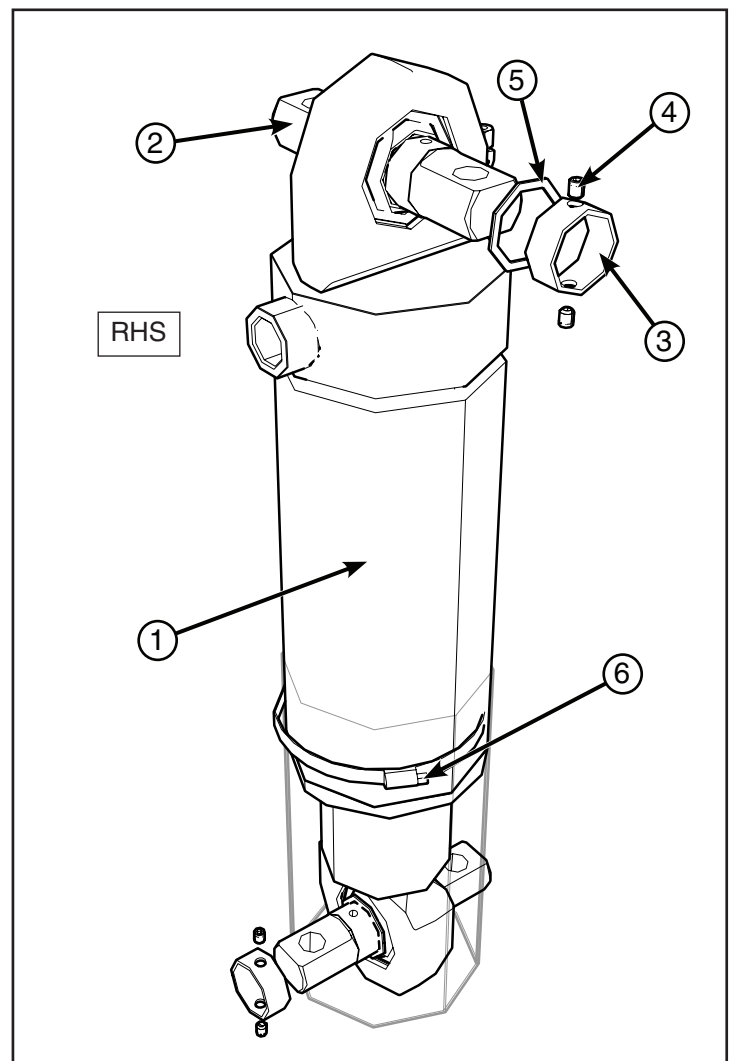


Figure 11

- Mount the suspension cylinder assembly to the front frame.

Torque pos. 1: 541 Nm

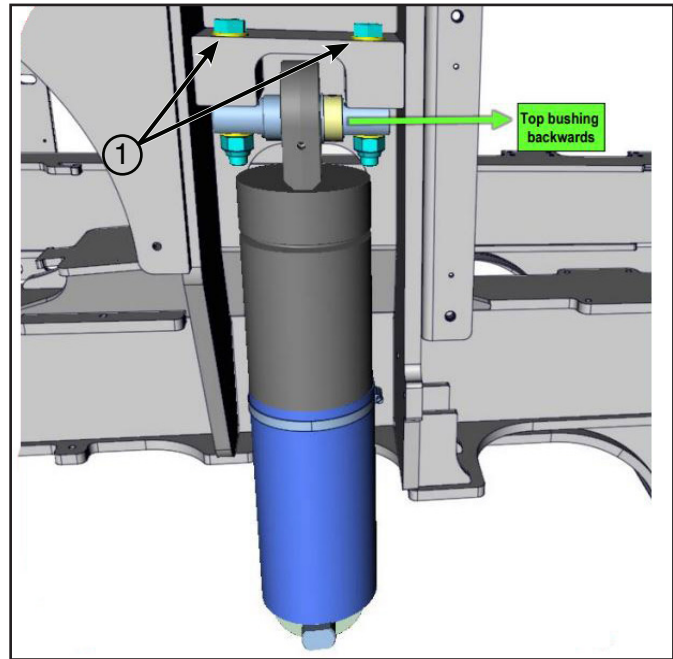


Figure 12

- Mount the upper and lower lubrication connectors pos.2 and the lubrication hose pos.3.

Torque pos. 2: 10 Nm (approx.)

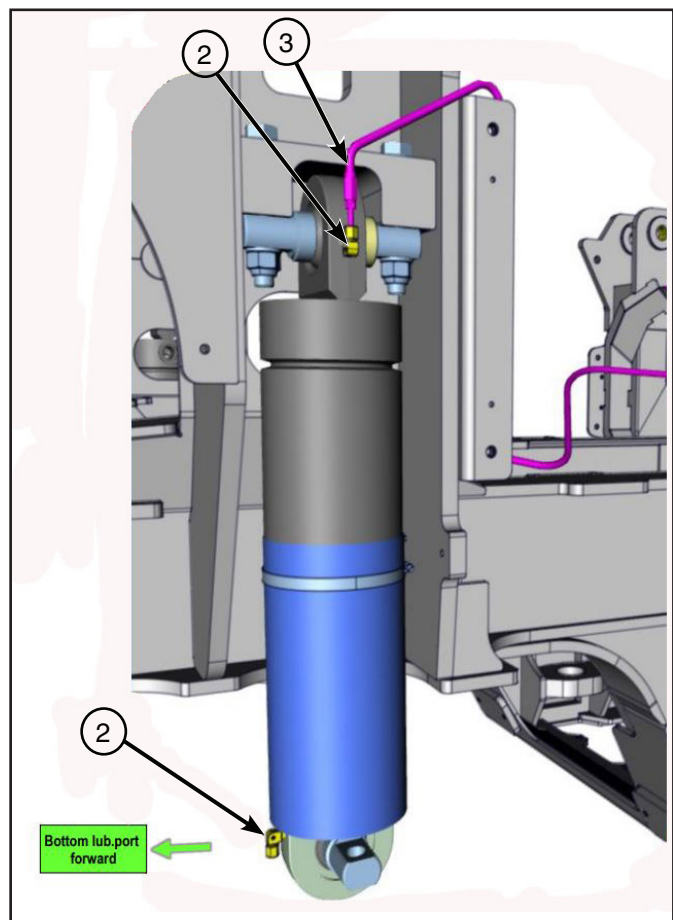


Figure 13

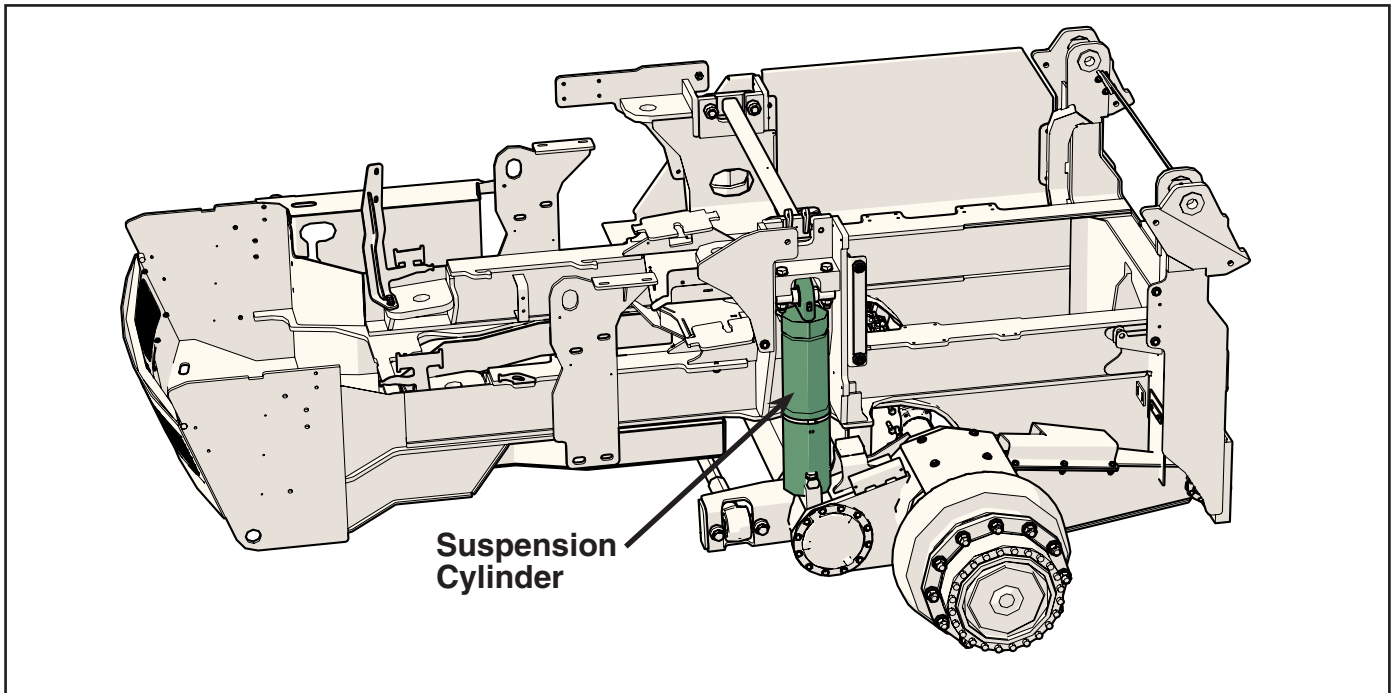


Figure 14

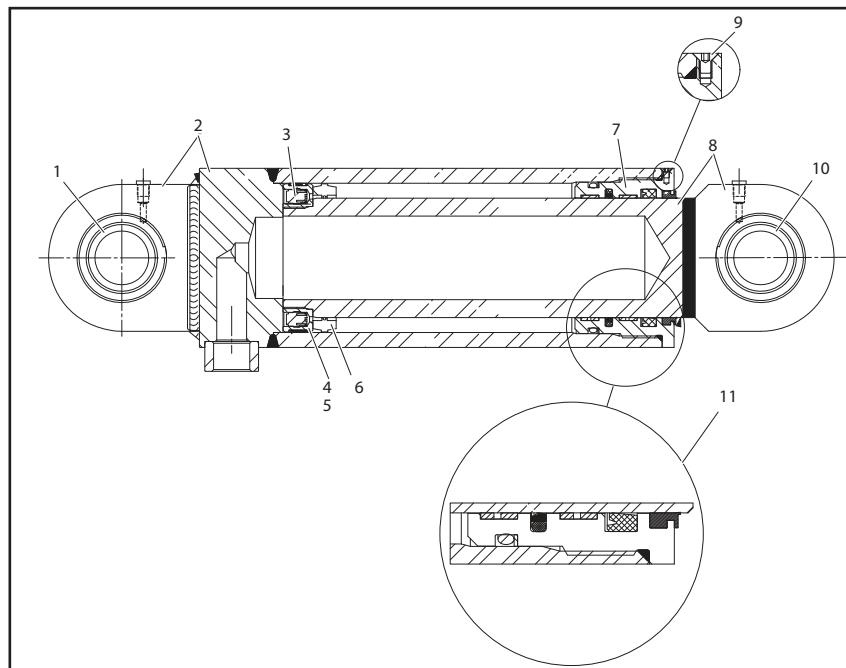


Figure 15

Position	Item	Position	Item
1	Bushing	7	Steering cylinder
2	Cylinder tube	8	Cylinder rod
3	4x Check valve	9	Screw
4	Piston	10	Bushing
5	Screw	11	Seal kit
6	Cushion ring		

Suspension cylinder repair instructions (up to 7x1889 / 8x1804)



WARNING

Cylinder repair should be carried out in a workshop familiar with hydraulic cylinders. Protect against injury by wearing the correct PPE. (Personal protective equipment) appropriate for the job. Avoid high pressure oil. Never search for leaks with your hands. If hydraulic oil penetrates your skin, seek medical help immediately.

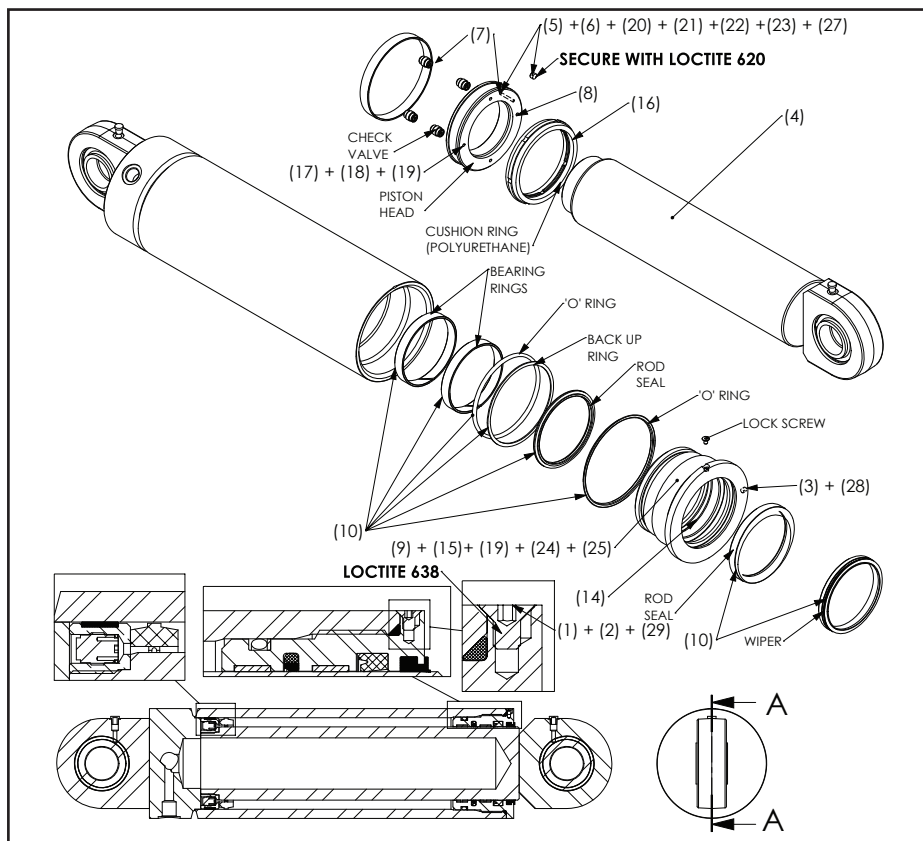


Figure 16

NOTE

Before starting work, make sure to clean the outside of the cylinder. Place the cylinder into a secure clamp in a clean working environment.

Suspension cylinder repair instructions (from 7x1890 / 8x1805)



WARNING

Cylinder repair should be carried out in a workshop familiar with hydraulic cylinders. Protect against injury by wearing the correct PPE. (Personal protective equipment) appropriate for the job. Avoid high pressure oil. Never search for leaks with your hands. If hydraulic oil penetrates your skin, seek medical help immediately.

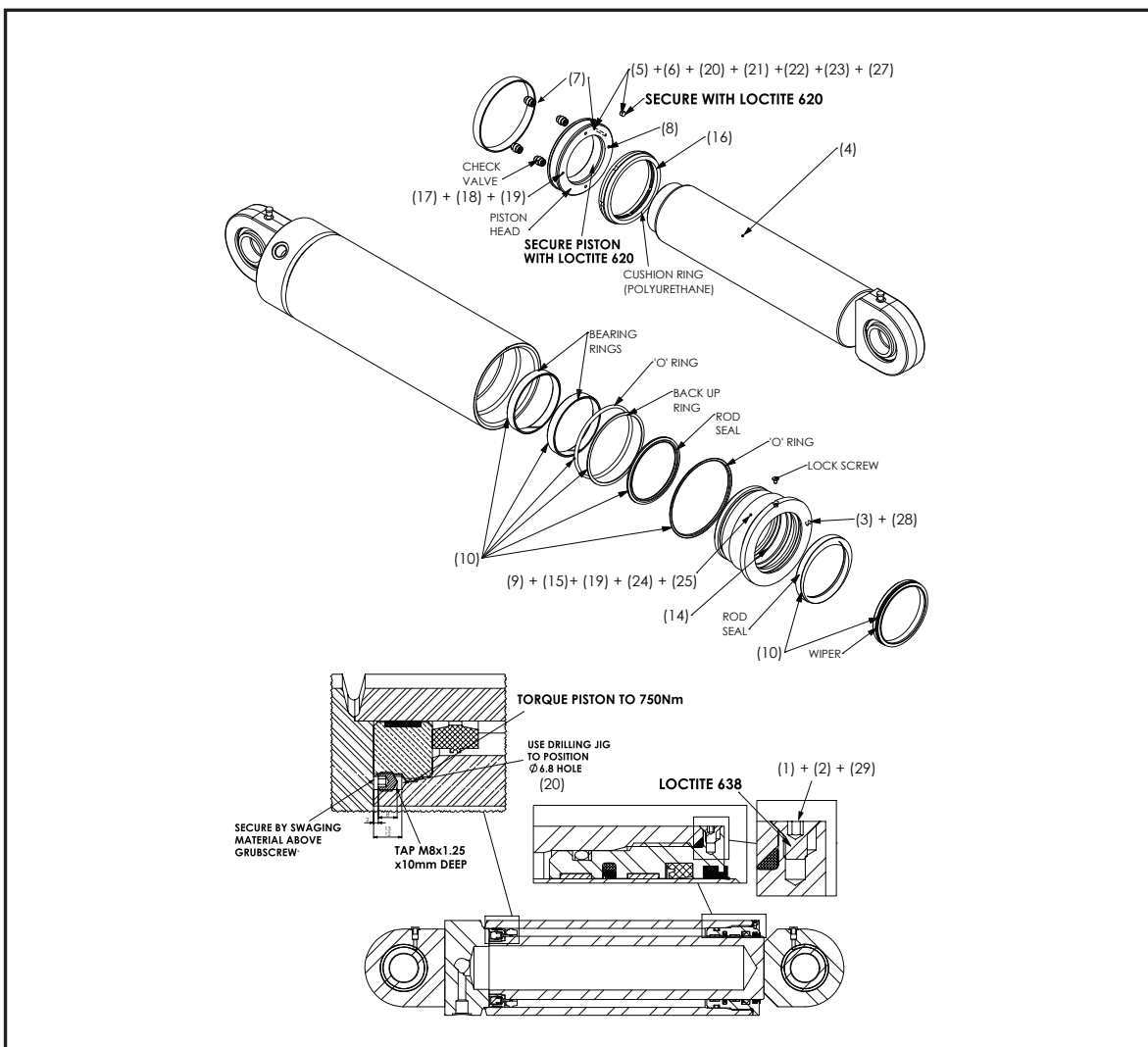


Figure 17

NOTE

Before starting work, make sure to clean the outside of the cylinder. Place the cylinder into a secure clamp in a clean working environment.

- (1). Heat the area around the lock screw with a light flame.
- (2). Remove the lock screw with an allen key
- (3). Using a 'c' spanner remove the gland. (oil will escape at this point. collect in a suitable container)
- (4). Remove the entire piston rod from the tube.
- (5). Heat the area around the grub screw that secures the piston.
- (6). Remove the grub screw with an allen key.
- (7). Using an 8mm hss drill bit, drill away the area the thread left after removing the grub screw
- (8). Using a 'y' spanner remove the piston.
- (9). Remove the gland from the piston rod.
- (10). Remove all seals using appropriate tools. take care not to damage the sealing surfaces.
- (11). Clean all parts and inspect for damage. if sealing surfaces are damaged the part is beyond repair. replace all damaged parts.
- (12). Replace all seals, taking care of seal direction as the image below.
- (13). Inspect all parts to ensure they are clean before assembly.
- (14). Lightly oil the inside of the gland. (with hydraulic oil)
- (15). Push gland onto the piston rod .
- (16). Place cushion ring onto the piston rod.
- (17). Assemble the piston onto the piston rod.
- (18). Using the 'y' spanner and a copper hammer tighten the piston. hit the 'y' spanner handel several times to ensure the thread is tight.
- (19). Using paper and tape, wrap the piston and gland to prevent debris entering the system.
- (20). Drill and tap a new hole for the grub screw. (7.8 drill bit (MX538292) and m8 x 1.25 tap).
- (21). Clean the area with loctite cleaner.
- (22). Fit the grub screw and secure with loctite 620.
- (23). Swage the metal close to the tapped hole to give extra security.
- (24). Remove the tape and paper.
- (25). Clean the area.
- (26). Make sure the tube weld assembly is clean in all areas.
- (27). Assemble the piston into the tube.
- (28). Using a 'c' spanner tighten the gland to align the lock screw.
- (29). Fit lock screw and secure with loctite 638.

NOTE

Allow the cylinder to sit for 24 hours to let the loctite cure.

Panhard Bar

The Panhard Bar restrict the sideways motion and stabilises in the front suspension.

Removal:

- Thoroughly clean the front suspension.
- Remove the two bolts securing the bar to the front frame.
- Save the shims.
- Remove the two bolts securing the panhard bar to the left suspension arm.



WARNING

Be aware of the risk of injury to people and equipment when handling heavy objects!

Installation:

- Position the panhard bar in the left suspension arm bracket. Tighten the two bolts.
- Position the bar in the right side front frame bracket.
- Replace the shims, and tighten the two bolts.

Control:

- Check that all components are located as when removed.
- Perform a test drive to see that the front suspension is functioning properly.

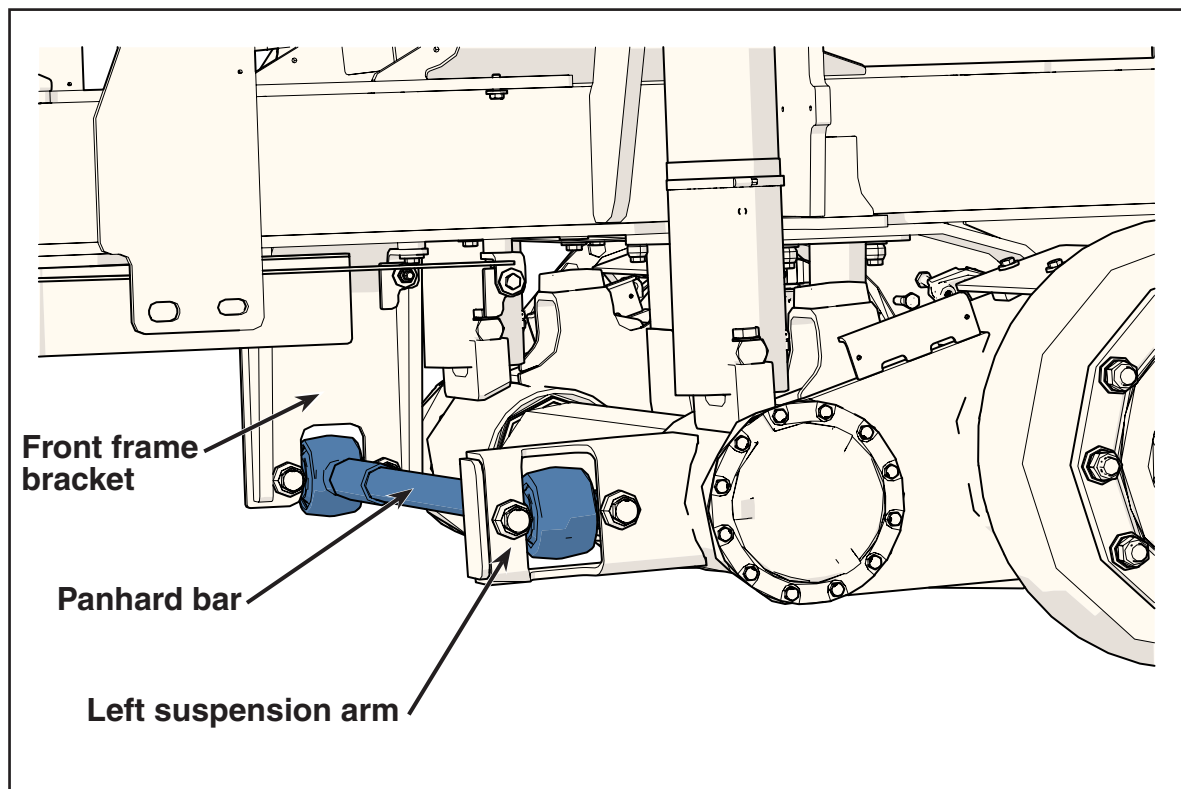


Figure 18

Suspension Bearing

The Suspension Bearings are the pivot points for the front wheel suspension arms.

Removal:

- Thoroughly clean the front suspension.
- Remove actual wheel. Front frame must be supported on safety stands, not the suspension.
- Disassemble the hydraulic cylinder suspension from the suspension arm.
- Remove panhard bar.
- Disconnect the driveshaft on left- and right side.
- Attach a chain hoist between the suspension arm and an eye bolt inserted in the upper rear attachment hole for the wheelwell side cover.
- Lift suspension arm to take up the weight on the suspension bearing. Remove any jack positioned under suspension.
- Remove the four bolts securing the suspension bearing to the front frame. Save the shims.
- Attach another chain hoist between the cross tube and the attachment point in front of the dumper.
- Pull suspension arm slowly forward to expose the suspension arm bearing. Take care not to damage brake lines and lubrication lines.



WARNING

Be aware of the risk of injury to people and equipment when handling heavy objects!

- Unscrew the eight bolts securing the bearing cover to the suspension arm, and remove cover.

The cover compresses the rubber bearing, and by removing cover the bearing can be withdrawn from suspension arm.

Installation:

- Insert suspension bearing in suspension arm, and replace the bearing cover. Orient the mounting holes to align to the front frame bracket. Tighten the cover bolts until cover is snug against suspension arm to expand the bearing.
- Slowly release the chain hoist pulling from front to get suspension arm back in position, adjust with the other hoist, and position fastening bolts and shims to secure suspension arm against front frame bracket.
- Tighten bolts.
- Replace panhard bar.
- Check and replace the hydraulic cylinder suspension if necessary.

Control:

- Before replacing the wheel, check that all components are located as when removed.
- Replace wheel.
- Perform a test drive to check that the front suspension is functioning properly.

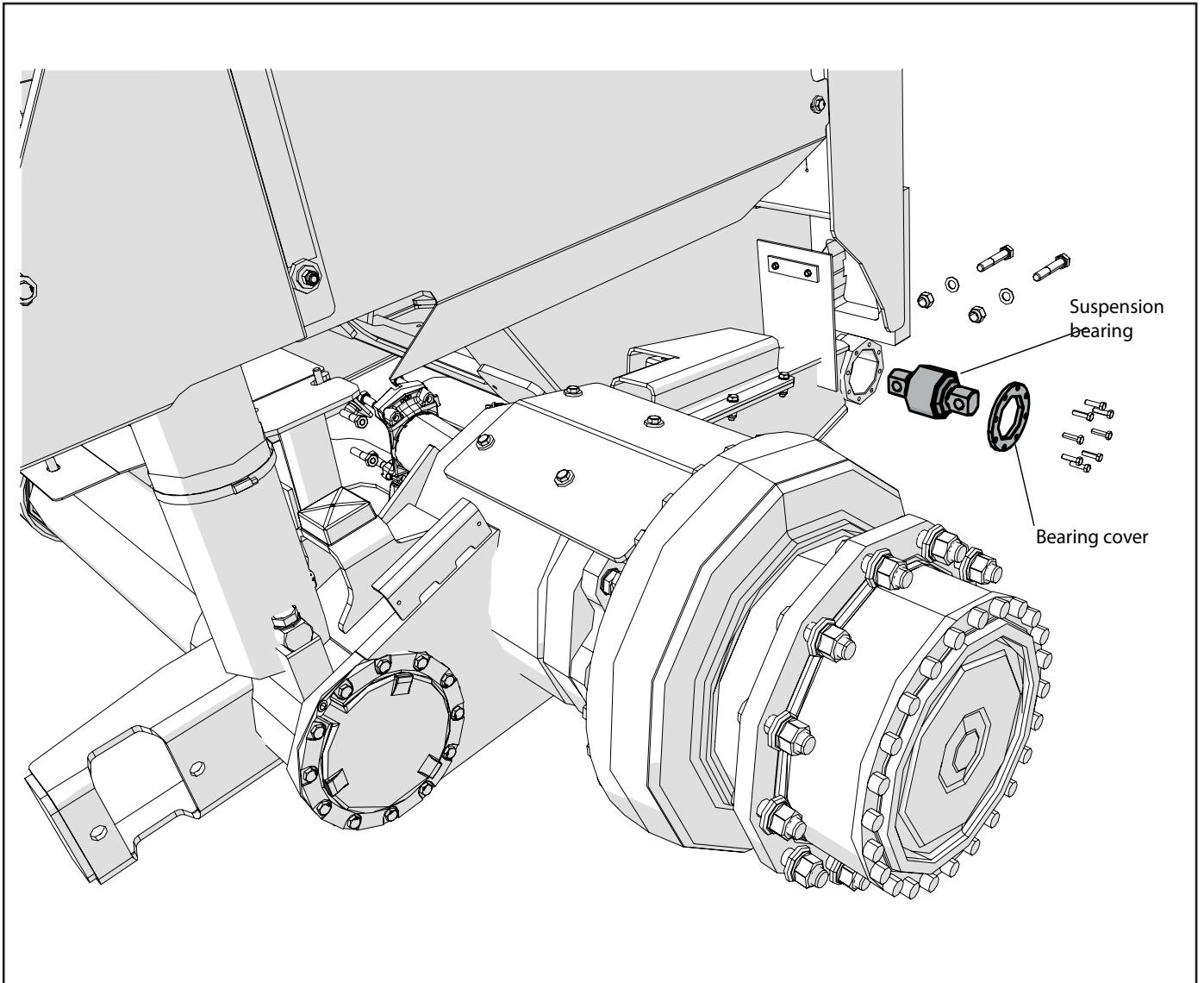


Figure 19

Cross Tube Bushings

The Cross Tube connects the left and right front suspension arms. The suspension arms rotate relative to the cross tube on the cross tube bushings.

- Disconnect right front axle drive shaft by unscrewing the 8 bolts.

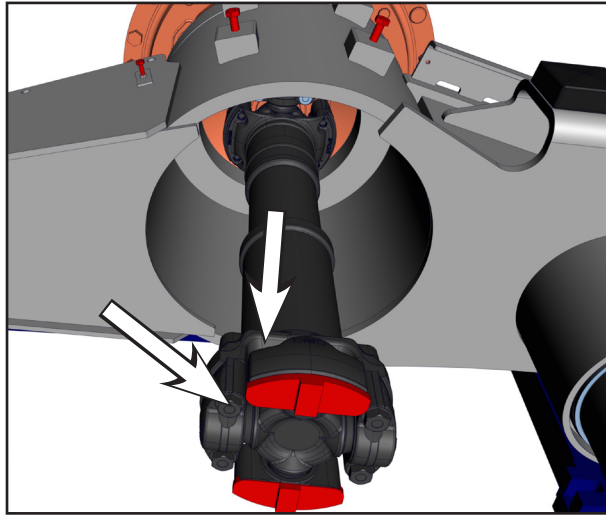


Figure 20

- Disconnect right front wheel brake lines.

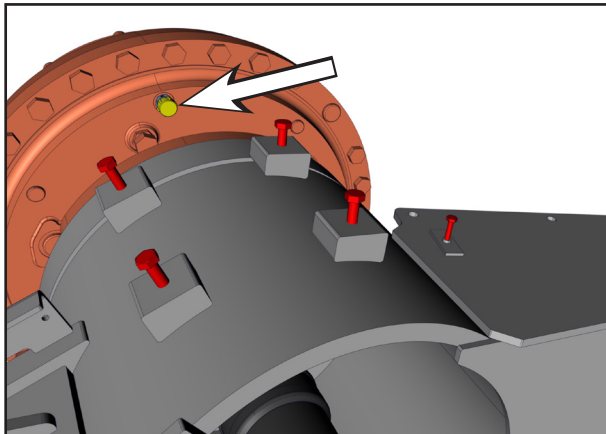


Figure 21

- Disconnect lubrication line to the right suspension arm.

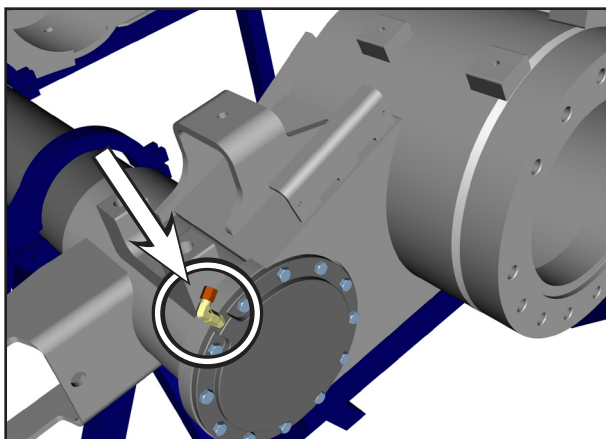


Figure 22

- Remove right suspension bearing, by unscrewing the 8 bolts.

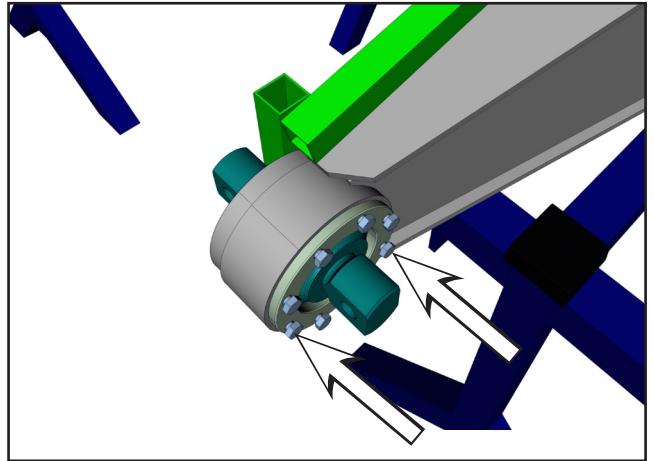


Figure 23

- Support right suspension arm on a pallet.
- Support cross tube on a safety stand.

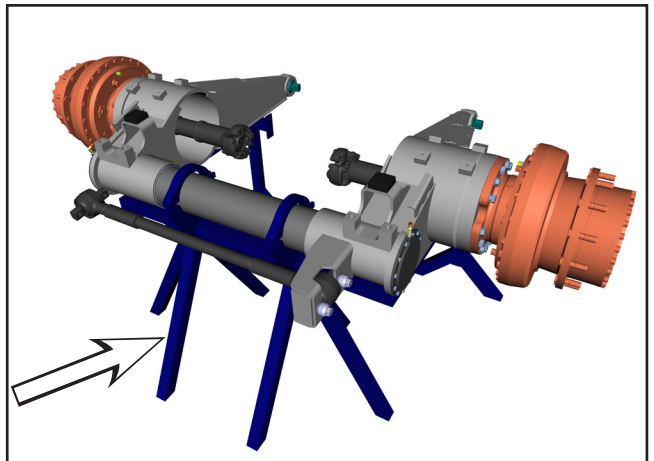


Figure 24

- Remove cross tube cover by unscrewing twelve bolts.
- Retrieve the thrust ring behind cover.
- Remove cross tube right thrust plate by unscrewing twelve bolts.
- Pull suspension arm to the right, away from cross tube by means of a pallet jack.

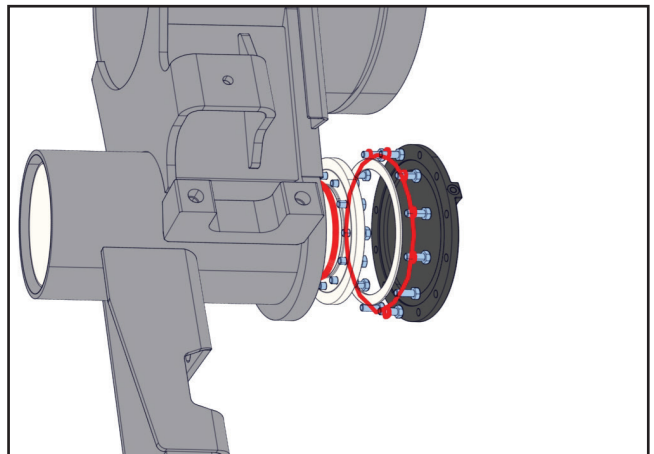


Figure 25

**WARNING**

Be aware of the risk of injury to people and equipment when handling heavy objects!

Right suspension arm is now free for removal of the cross tube bushings and seal ring.

- To expose left cross tube bushings, disconnect lubrication line, and remove cross tube left cover by unscrewing twelve bolts. Retrieve the thrust ring behind cover.
- Remove cross tube left thrust plate by unscrewing twelve bolts.
- Place cross tube on pallets, and by means of a pallet jack pull cross tube out of left suspension arm.
- Left suspension arm is now free for removal of the cross tube bushings and seal ring.
- Tap bushings and seal ring out of suspension arm by means of a soft dowel.

Installation:

- Thoroughly clean the bushing mating surfaces, and tap the new bushings in place. Cover the bushings with chassis grease. Install the seal ring.
- Assemble the cross tube in opposite order as described for removal.

Control:

- Before replacing the wheels, check that all components are located as when removed.
- Replace wheels.
- Perform a test drive to check that the front suspension is functioning properly.

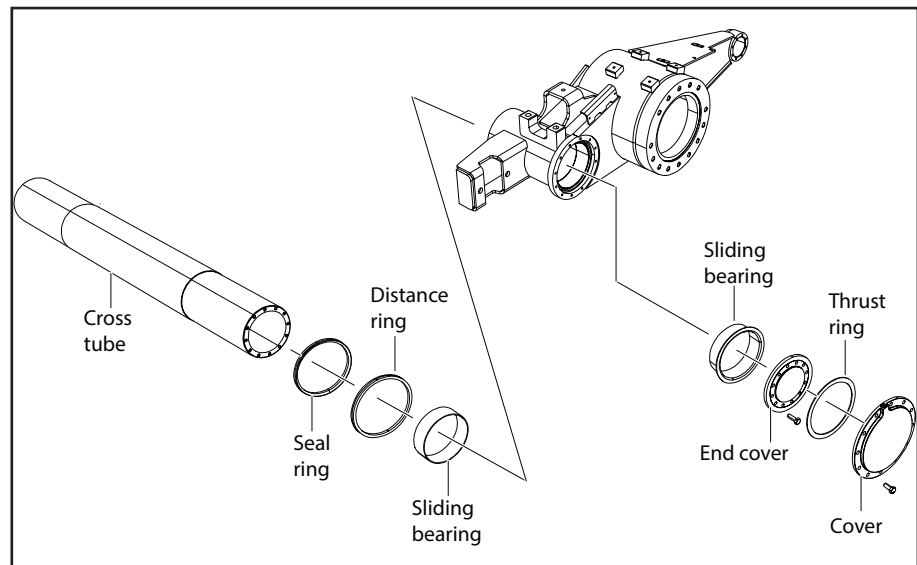


Figure 26

7.3 Articulation Hinge System

The Articulation Hinge System consists of the Articulation Hinge, and the Articulation Bearing. The articulation hinge is the turning point of the steering motion, and the articulation bearing permits the front wagon and the rear wagon to roll relative to each other during driving.

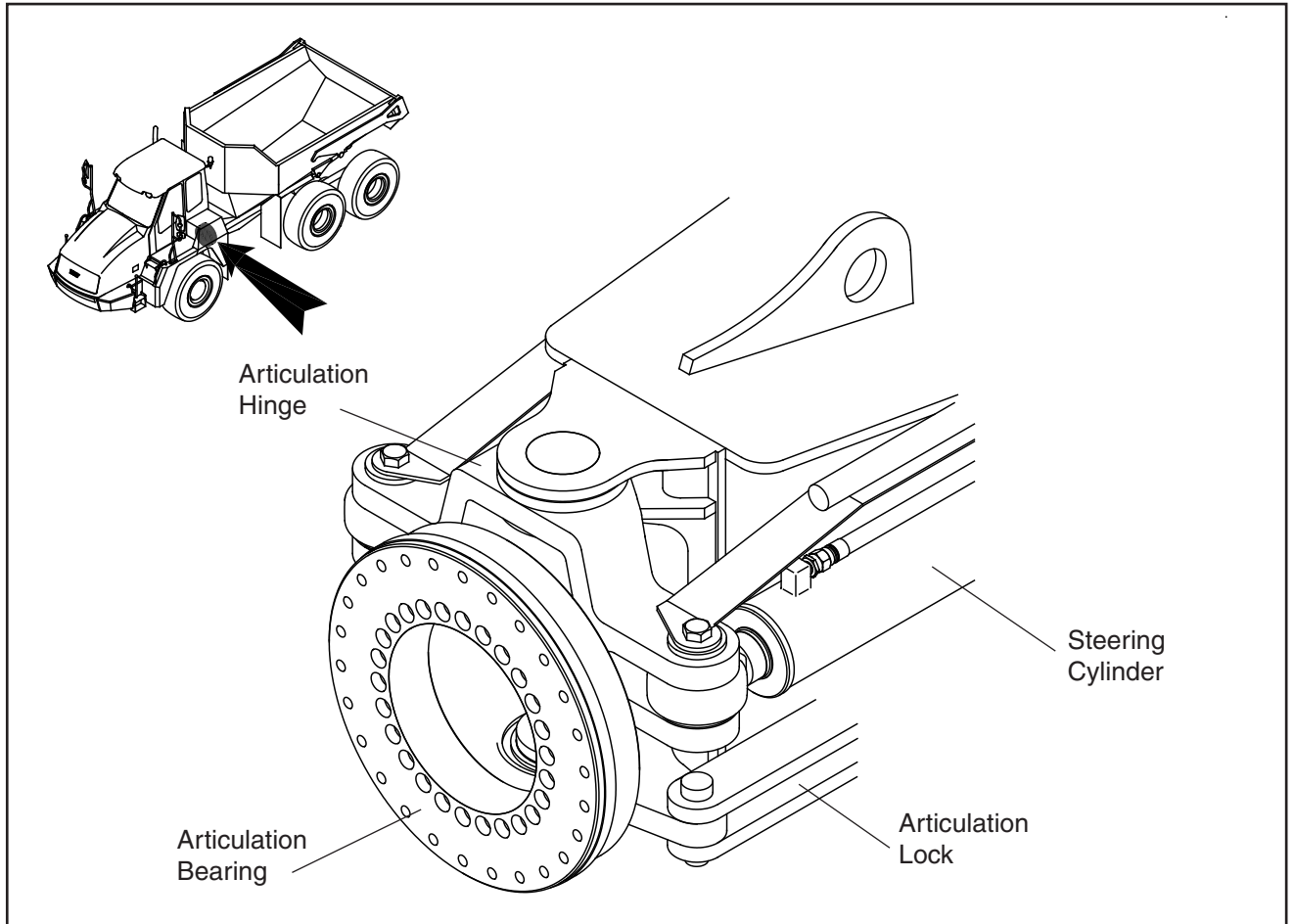


Figure 27

Articulation Hinge System

Articulation Bearing

To measure the wear on the articulation bearing, place the truck on level ground, with front and rear frame in line. If assembled, disassemble body heating for better access. For axial measurement place a dial indicator on the articulation bearing as shown in Figure 28.

Open the bonnet and lift the front wagon in the lifting points with 800 kg. Read the dial indicator.

Acceptable value max. 1.50 mm.

For radial measurement, place the dial indicator as shown in Figure 29.

Using a floor jack, lift the rear wagon in the articulation hinge with approx. 2000 kg. Read the dial indicator.

Acceptable value max. 1.50 mm.

Standard value	Nom. clearance (New bearing)	Max. Clearance (Used bearing)
Tot. Clearance	0,10 mm	1,50 mm

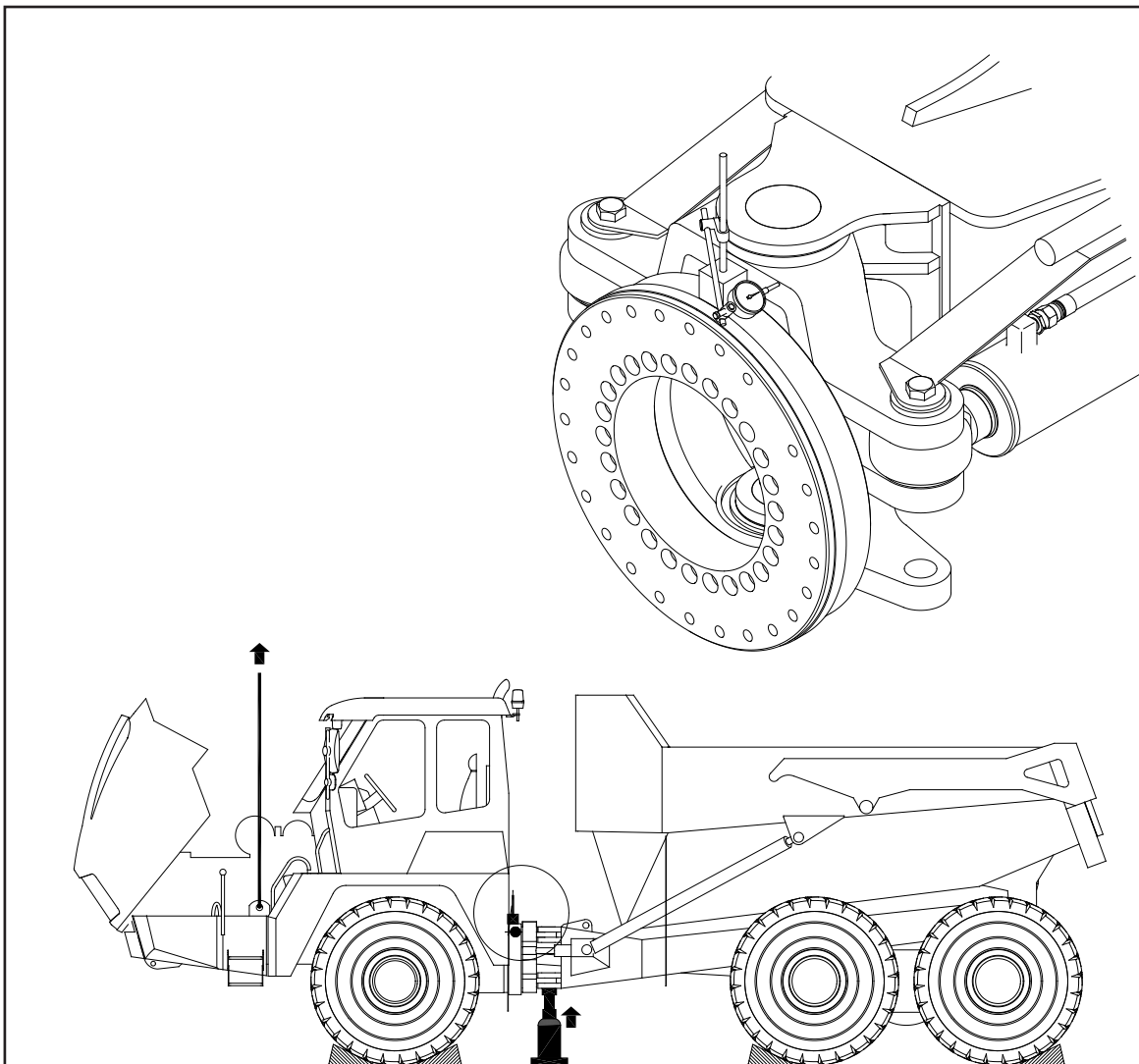


Figure 28

Articulation Hinges System Vertical Check

Removal:

- Thoroughly clean the articulation bearing and the area around for accumulated dirt.
- Disconnect the intermediate drive shaft in the articulation hinge. Support the drive shaft, as it rotates when rear wagon is moved.
- Release the hose support to gain more movement on hoses and cables.
- Support the front wagon on safety stands, and block the wheels. (Stand must handle a minimum capacity of 3000kg)
- Support the rear wagon front end to release the pressure on the articulation bearing on a roll able stand, and block the rear wheels.
- Manually release the emergency brake
- (Ref. Operation & Maintenance Manual)
- Disconnect the lubrication line to the articulation bearing if fitted.
- Unscrew the 26 bolts securing the bearing to the front wagon frame.
- Move the blocks behind the rear wheels, and carefully move the rear wagon away from the front wagon to access the bolts fastening the bearing to the articulation hinge.

**WARNING**

Be aware of the risk of injury to people and equipment when handling heavy objects!

- Place pallets and a pallet jack under the bearing.
- Unscrew the 26 bolts securing the articulation bearing to the hinge and remove bearing.

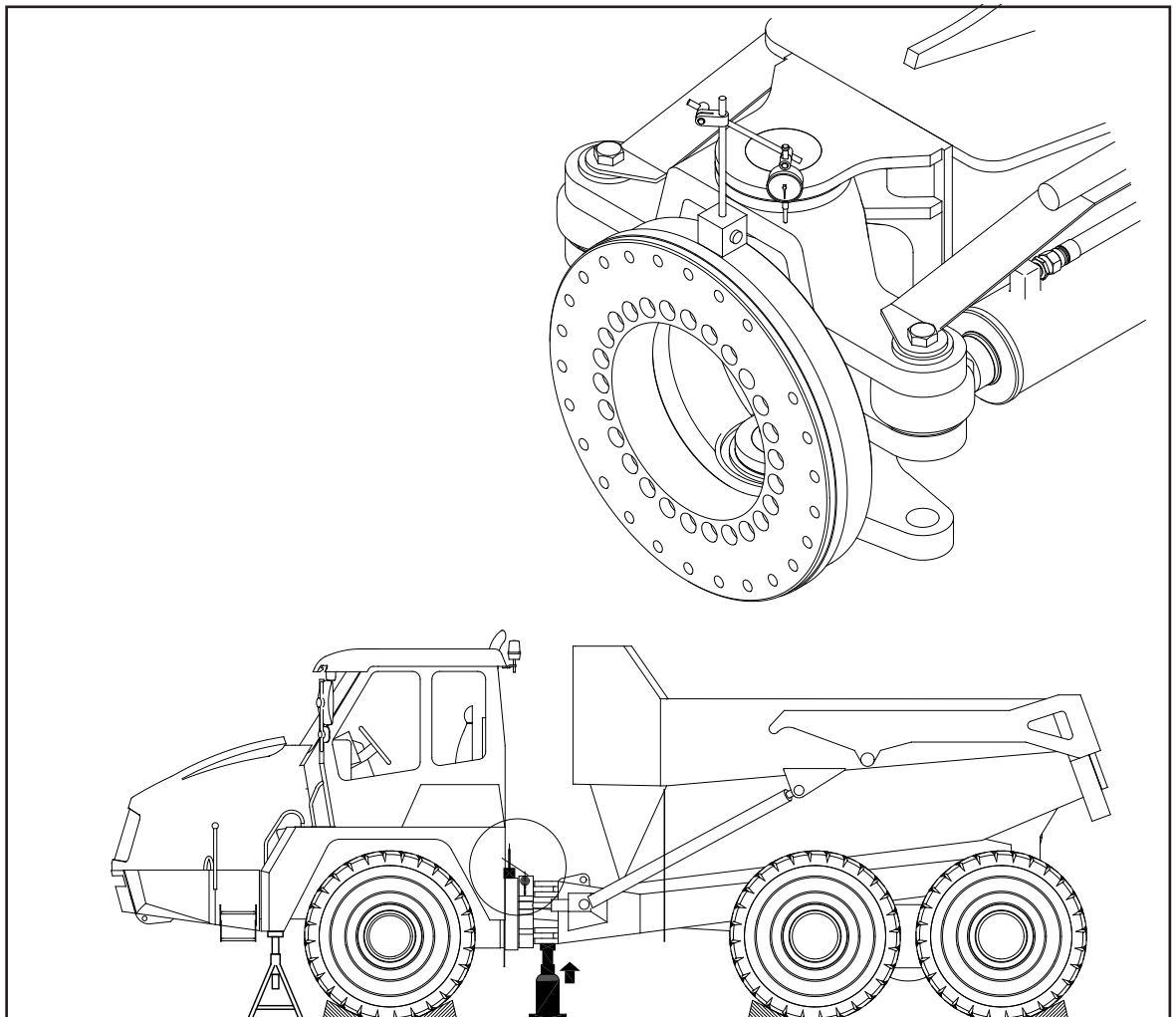


Figure 29
Articulation Hinges System Horizontal Check

Articulation Bearing assembly

NOTE

The following steps for the copper thrust rings and bearing are only applicable for HA30 & HA45 (up to 8x1701). For HA45 models beyond 8x1701, jump to page 24 for seal installation and measurement.

Clean parts with a solvent.

Locktite™ 7063



Figure 30



Figure 31

Use high pressure air to clean parts, removing particles that may have occurred in the machining process.



Figure 32

Assemble inner ring.

Use plastic hammer to carefully fit the inner ring.



Figure 33

Assemble thrust ring to inner and outer ring. (Up to 7x1724 / 8x1701)

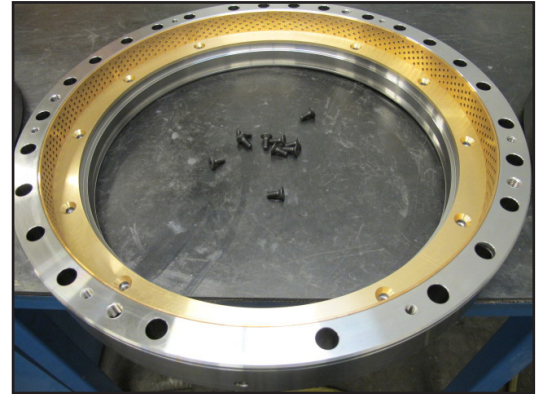


Figure 34

Apply locktite™ 2701 to threaded holes.

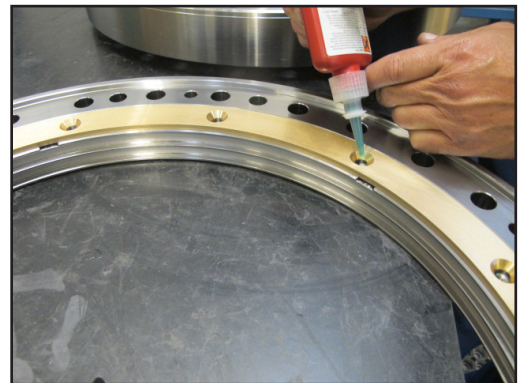


Figure 35

Assemble and tighten bolts: 30Nm



Figure 36

Measure outer rings and inner ring.

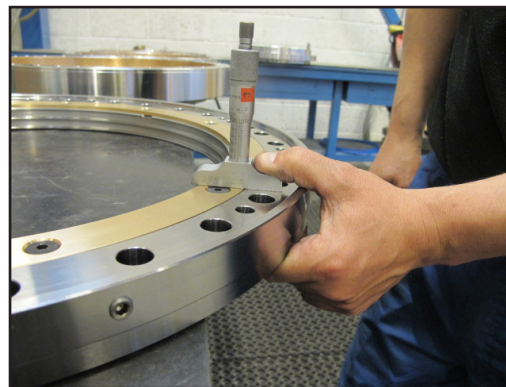


Figure 37



Figure 38



Figure 39

Insert seal rings to outer rings and lubricate them with grease. The seal rings must be assembled correctly for maximum lubrication flow.



Figure 40

Bearing Clearance HA30 & HA45 (up to 7x1724 / 8x1701)

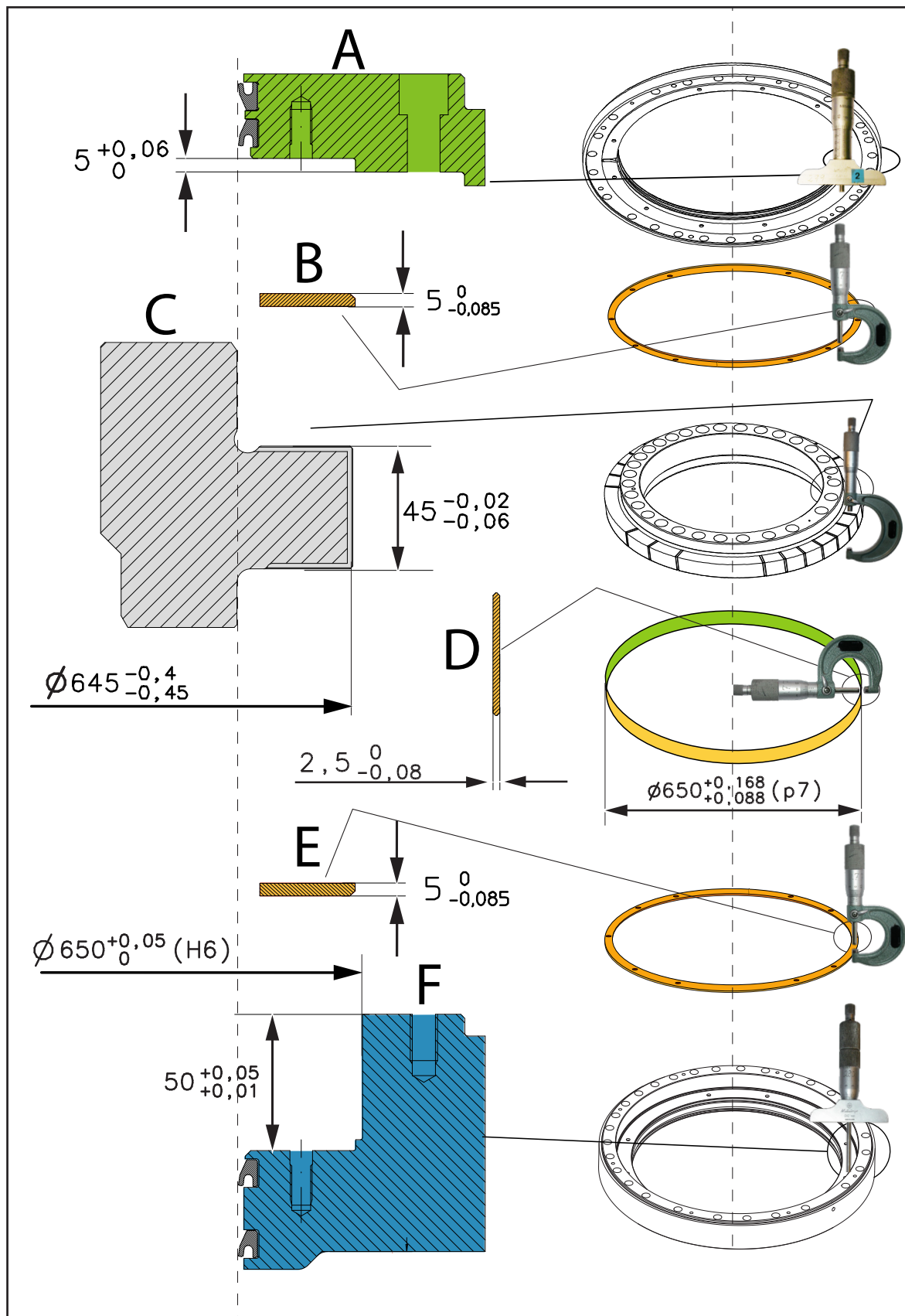


Figure 41

Calculation of the Tandem bearing

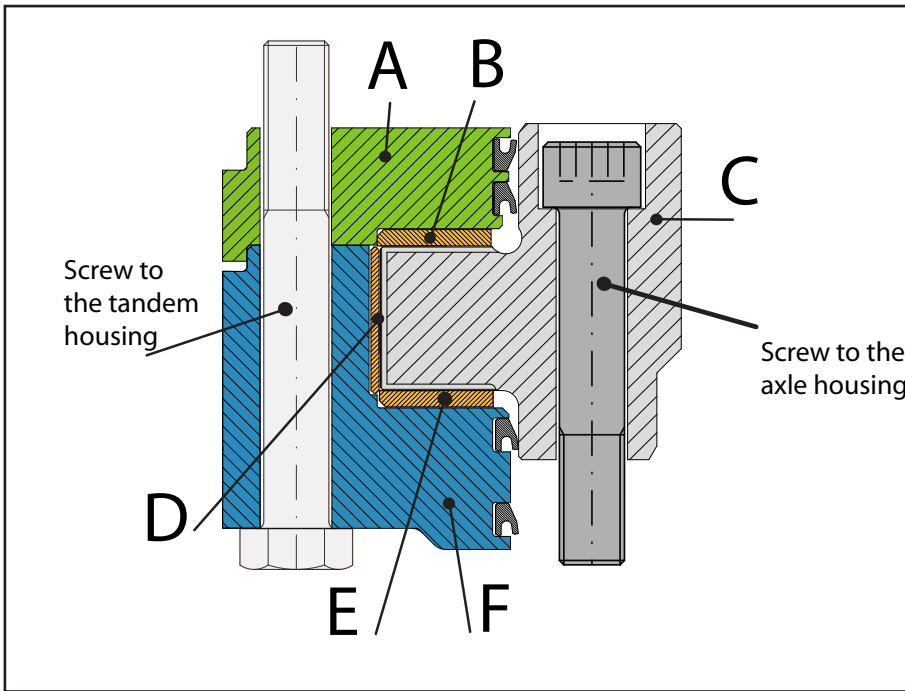


Figure 42

New vs, axial clearance example:

Measure A:	5,01	
Measure F:	50,02	
<u>Sum A,F,:</u>	<u>55,03</u>	<u>55,03</u>
Measure B:	4,98	
Measure C:	44,98	
Measure E:	4,95	
<u>Sum B,C,E,:</u>	<u>54,91</u>	<u>-54,91</u>
Clearance:	<u>0,12</u>	

Insert the measuring out values

Min: 0,08 mm
Max: 0,15 mm

See the Parts Catalogue for other sizes of the thrust bearing (B and E). Available from 4,9 - 5,3 mm.

New bearings, diametrical clearance example:

Measure F	650,02	
Measure D (thickness x 2)	4,84	
Measure C (diametric)	+ 644,99	
<u>Sum D+C</u>	<u>= 649,83</u>	<u>-649,83</u>
Sum clearance:	= 0,19	

Insert the measuring out values

Min: 0,10 mm
Max: 0,40 mm

Bearing Clearance HA30 / HA45 (from 7x1725 / 8x1702)

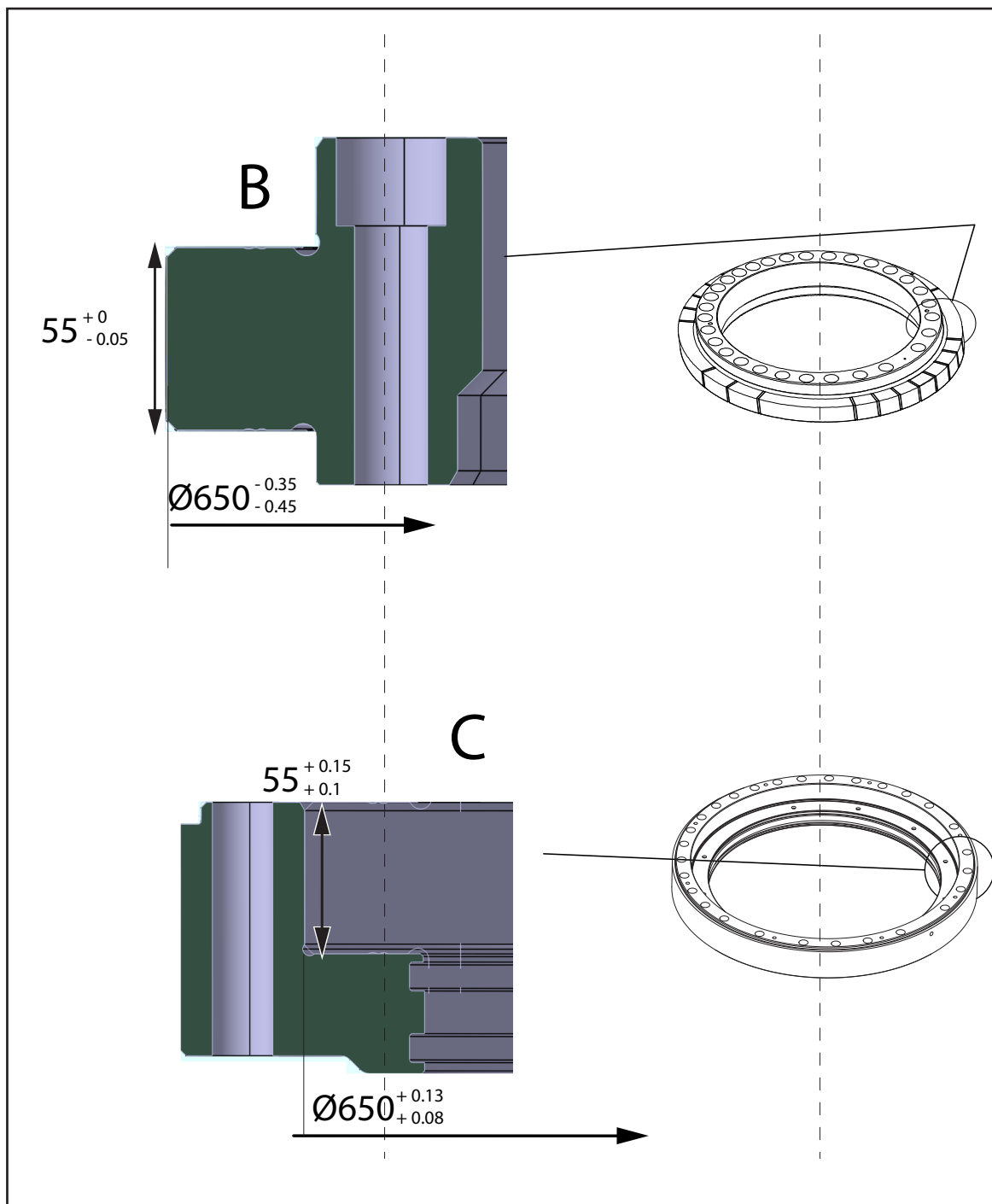


Figure 43

Axial Measurements (mm)			
Signature	Basis dim	Tolerance	
		max	min
809896 - Inner ring	55	0	-0.05
809898 - Outer ring	55	0.15	0.1
New from factory max		0.2	
New from factory min		55	
Limit before worn out		55	

Radial Measurements (mm)			
Signature	Basis dim	Tolerance	
		max	min
809896 - Inner ring	650	-0.35	-0.45
809898 - Outer ring	650	0.13	0.08
New from factory max		0.58	
New from factory min		0.43	
Limit before worn out		0.8	

Make sure all surfaces are clean.

Apply molokote to all metallic contact surfaces. Avoid the seal rings.

Apply grease to all contact surface. (Atop the molokote on the metallic contact surfaces, and the applied seal rings)

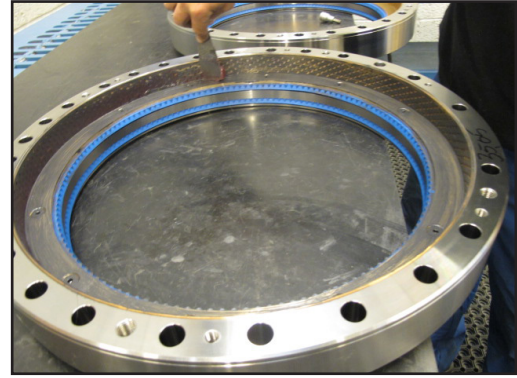


Figure 44

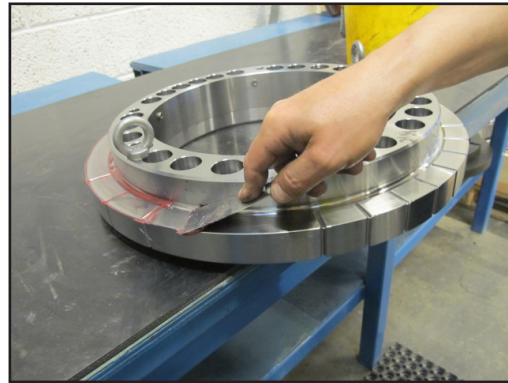


Figure 45



Figure 46

Fit inner ring and outer ring. Indentation on inner ring should align with the top plug hole on the outer ring.

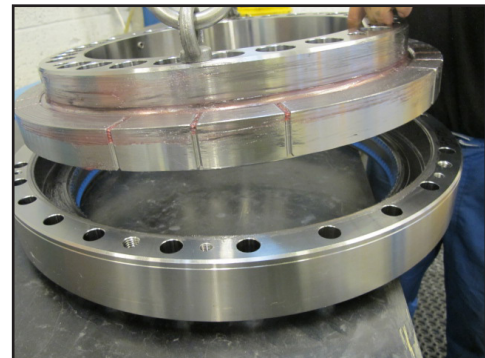


Figure 47

Mount cover ring, use a flat screwdriver to push in the sealing while pressing down the ring. Tighten crosswise.

Plug one of the two lub.holes on the inner ring and inject grease in the other until it penetrates through gaps



Figure 48



Figure 49

See chapter 3. Drive line for detailed information about bearing measurement.

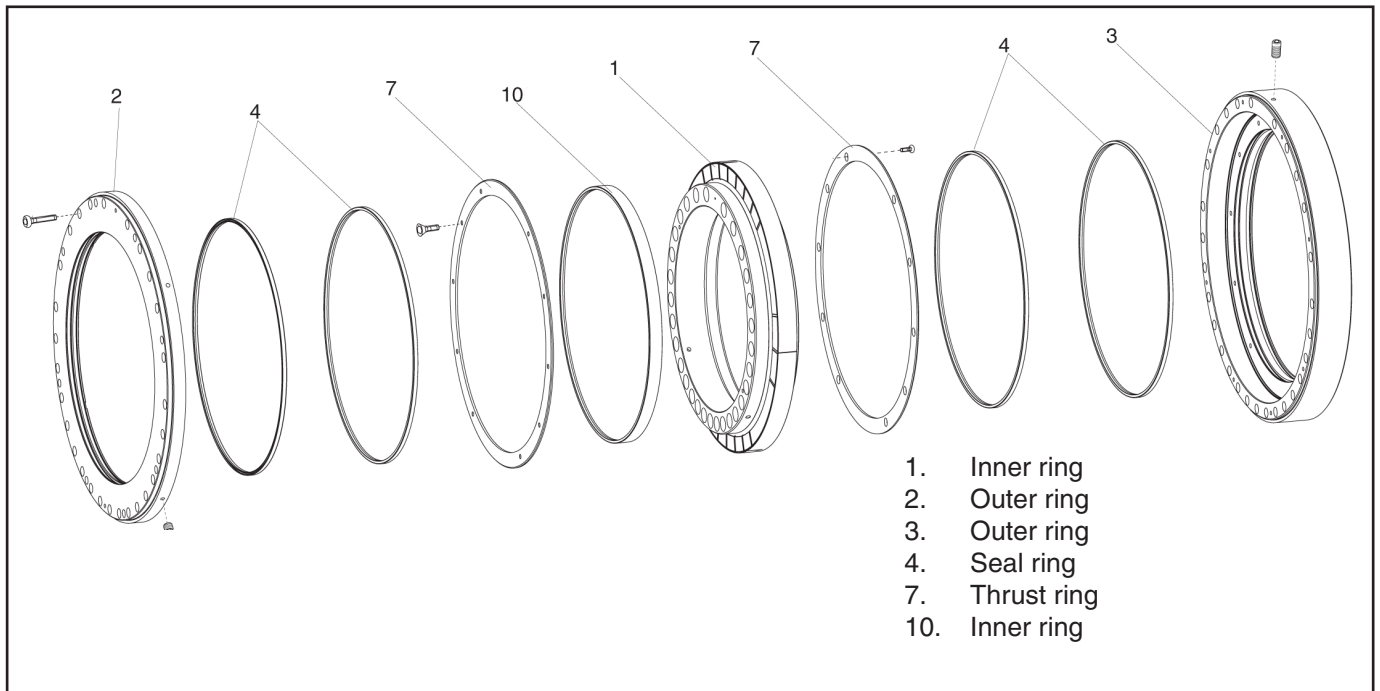


Figure 50

HA30 HA45 (from 7x1725 / 8x1702)

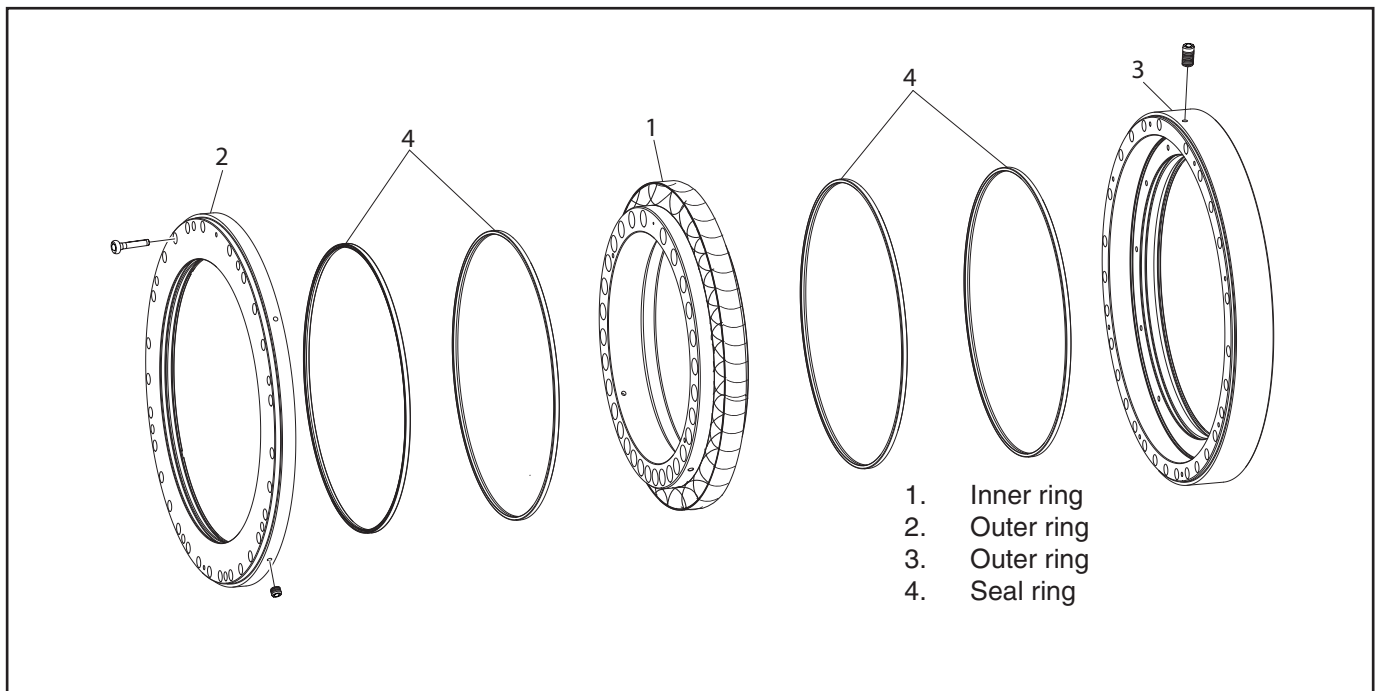


Figure 51

Installation:

- Position articulation bearing on articulation hinge flange
- Tighten the 26 bolts.
- Move the rear wagon into position to enter the bolts fastening the bearing to the front frame.
- Tighten the 26 bolts.
- Connect the lubrication line.
- Manually engage the parking brake.
- Install hoses and cables in the hose support.
- Connect the intermediate drive shaft.
- Remove safety stands.
- Operate the central lubrication system to ensure proper lubrication of bearing.

Control:

- Check that all components are located as when removed.
- Perform a test drive to check that the articulation bearing is functioning properly.

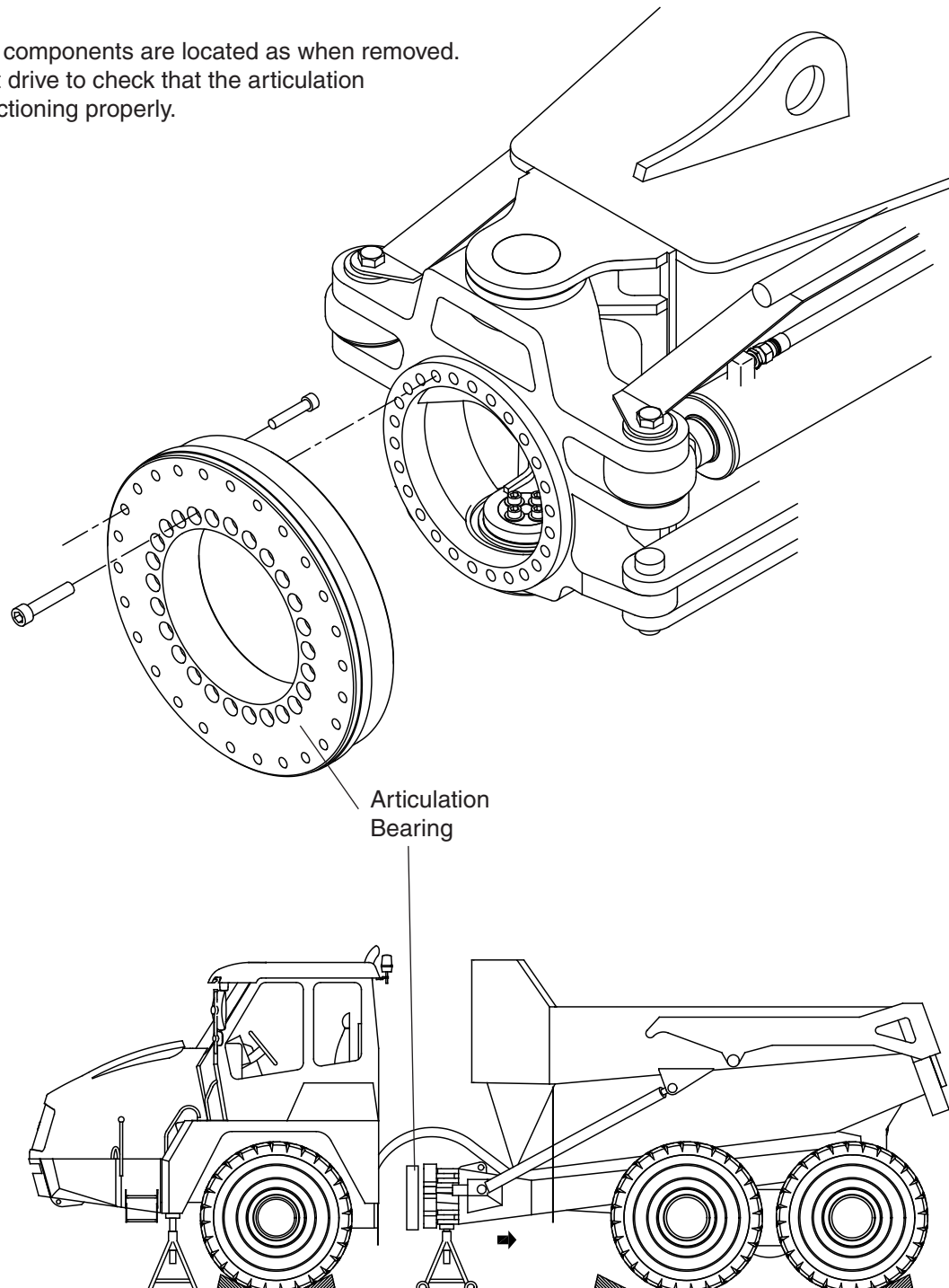


Figure 52
Articulation Bearing

Articulation Hinge

To measure the wear on the articulation hinge, place the truck on level ground, with front and rear frame in line. Place a hydraulic jack under centre of lower articulation hinge bolt according to Figure 52.

Lift with a force of 1800 kg, and read the dial indicator.

Max diametric clearance: 1.50 mm

Max axial clearance: 1.00 mm

Removal:

- Separate the front wagon and the rear wagon.
- Disconnect the steering cylinders from the articulation hinge, by removing the front pivot bolts.
- Release articulation lock (Ref. Operation & Maintenance Manual 2-42)
- Place pallets and a pallet jack under the articulation bearing and hinge.
- Disconnect hinge bolts lubrication lines.
- Unscrew the four bolts securing each hinge bolt, save the shims for re-use.
- Tap the bolts out using a soft mallet.
- Free the hinge by pulling forwards, and out from the rear wagon.



WARNING

Be aware of the risk of injury to people and equipment when handling heavy objects!

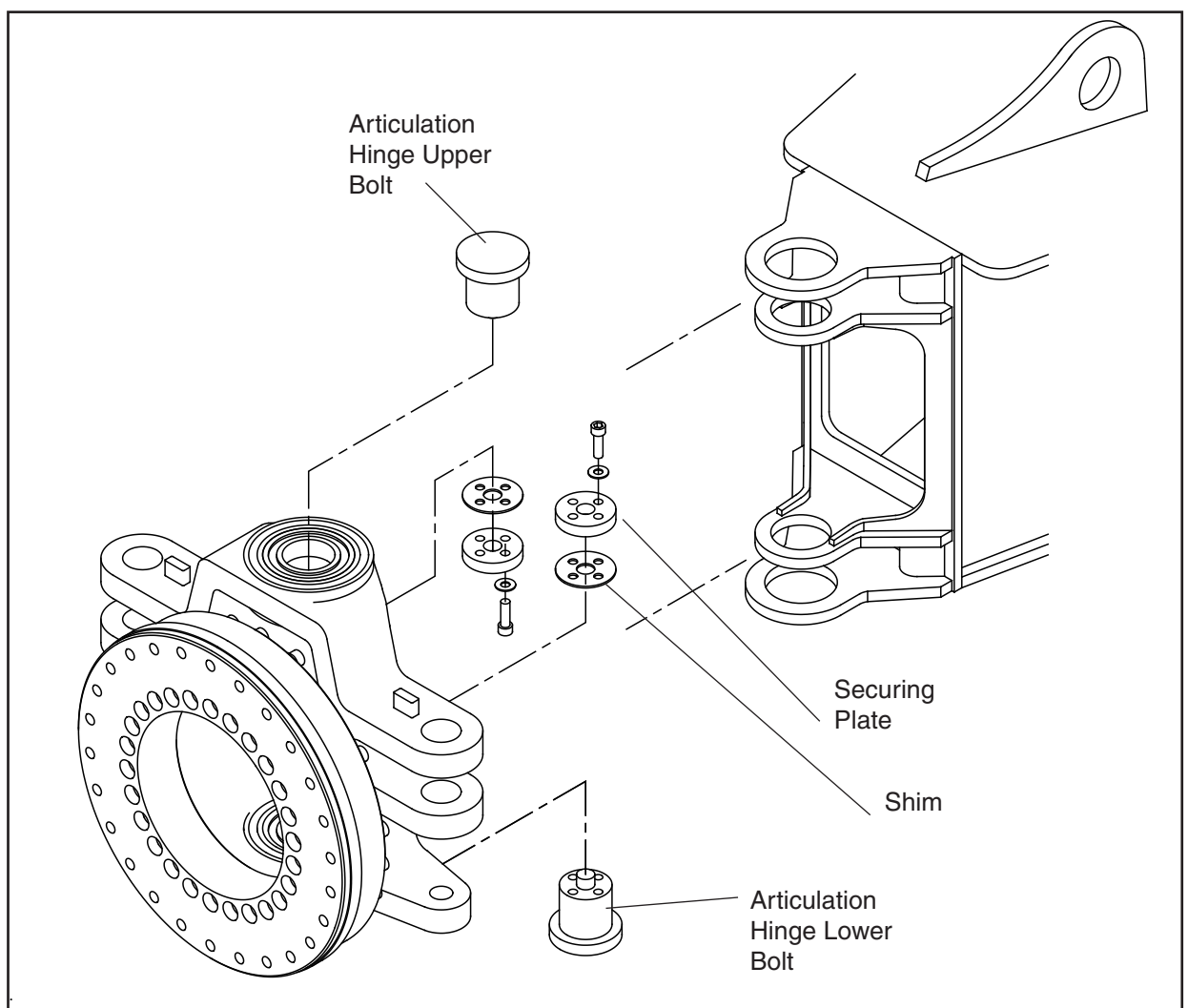


Figure 53
Articulation Hinge Bolts
SHOP MANUAL

Disassemble the screws from the upper and lower articulation hinge bolt. Save the shims for re-use.



Figure 54

Tap the upper and lower bolt using a soft mallet.

If necessary, use a hydraulic cylinder, press out the upper and lower bolt. Bolts approximately 15kg.

CAUTION
Be aware of personal injury

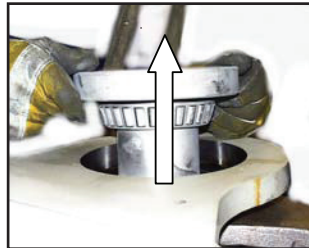


Figure 55

Free the hinge by pulling forwards, and out from the rear wagon. Separate and lift the articulation hinge of the rear frame.

Remove the four bearings and the distance ring from the hinge.

Check the condition of the seal rings for possible re-use.

NOTE

Catch the lower bearing for the upper and lower bolt when removing the articulation hinge.



Figure 56

Clean the articulation hinge and the front end of the rear frame.



Figure 57

Remove the four bearings and the distance ring from the hinge.
Check the condition of the seal rings for possible re-use.

Installation:

- Install new seal rings if necessary.
- Install the four bearings and the distance ring in the hinge.
- Position the articulation hinge on rear frame, and install the hinge bolts.
- Secure the bolts by installing shims and retainers.
- Tighten the four bolts on each hinge bolts.
- Replace lubrication lines.
- Engage articulation lock.
- Connect the steering cylinders by installing the front pivot bolts.
- Join the front wagon and the rear wagon.

Control:

- Check that all parts are located as before removal.
- Perform a test drive to check that the articulation bearing is functioning properly.

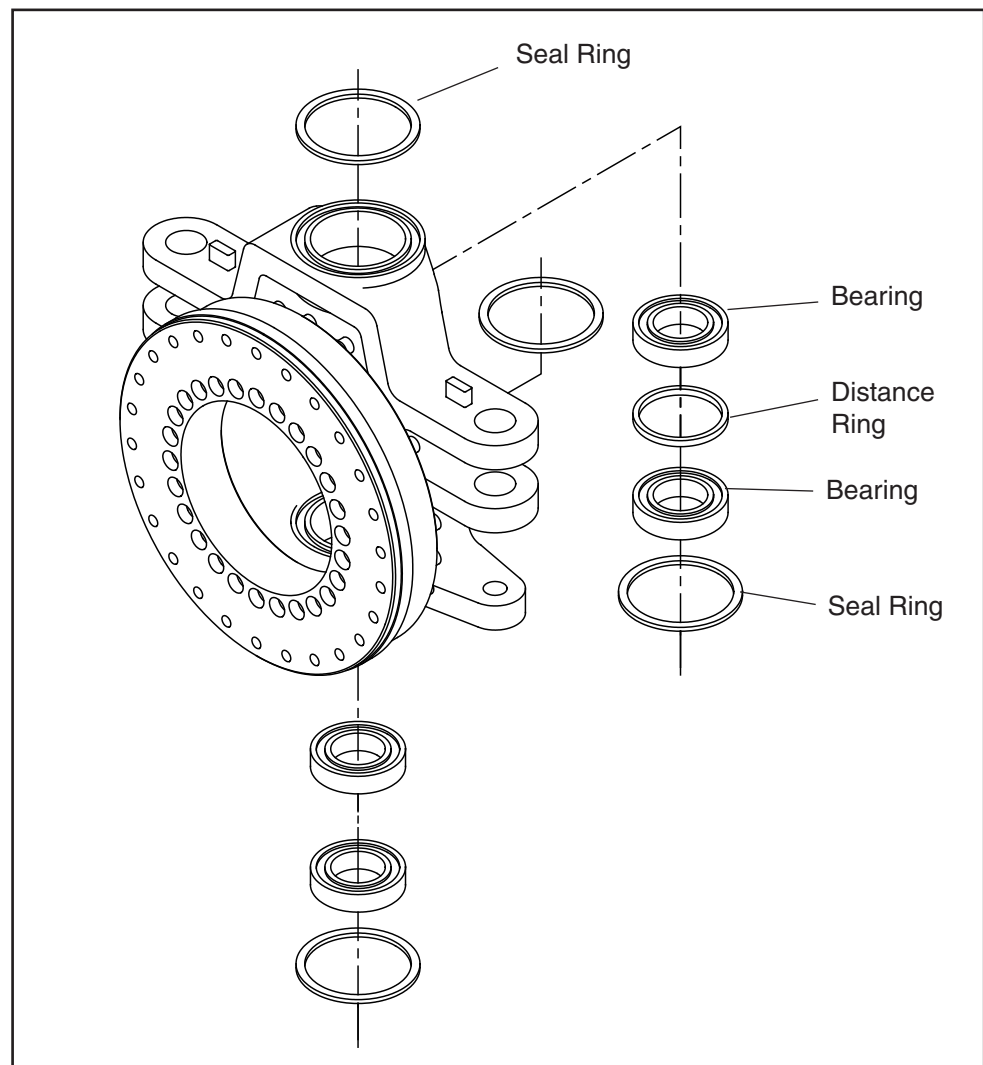


Figure 58
Articulation Hinge Bearings

Assemble the bearing in the upper part of the articulation hinge.

See Figure 58 on previous page.

Cool down the bearing cup (-20°C)
(See figure Figure 59 for correct position of the bearing cup and V-ring)

Insert the bearing cup Pos.3
Insert the distance ring Pos.2
Insert the bearing cup Pos.3

Assemble the V-ring, Pos.5
Apply glue in the groove
Glue: Loctite™ 406
Insert the V-ring in the groove

The distance ring, Pos 2, in the lower ear, is a part of the articulation hinge and it is not movable.

When inserting the two bearing cups, press the bearing cups until they stops onto the ring Pos.2.

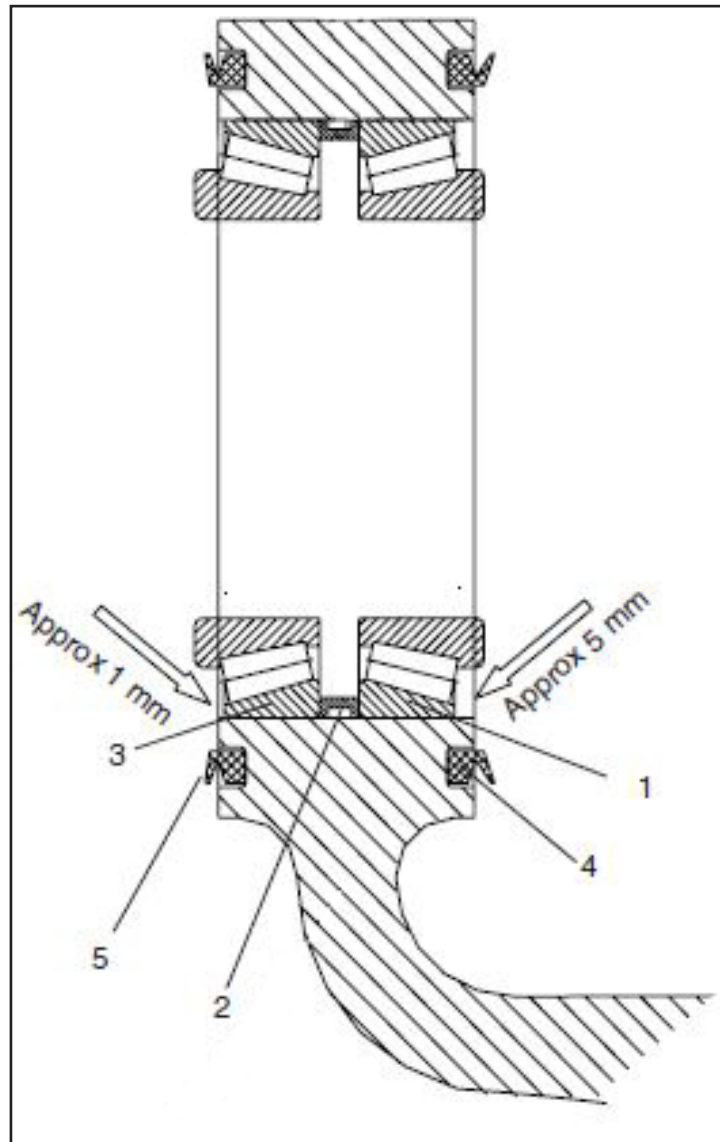


Figure 59

Cool down the bearing cups (approx -20°C) 4 pcs. Insert the outer bearing cup.



Figure 60

Press the bearing cup into the articulation hinge. With the plate, press the bearing cup approx 1 mm under the outer surface.

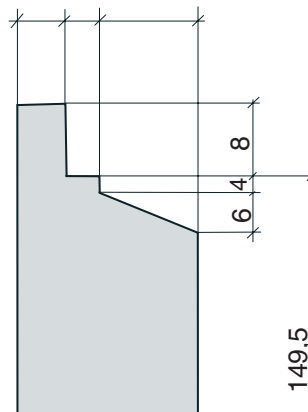


Figure 61

By hand, place the distance ring in the articulation hinge upper ear.



Figure 62



Figure 63



Figure 64

Clean the groove.
Cleaning liquid: Loctite™ 7063



Figure 65

Assemble the V-rings 4pcs.
Apply glue in the groove.
Glue: Loctite™ 406



Figure 66

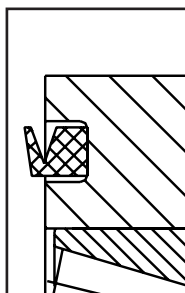


Figure 67



Figure 68

Press well around the V-ring in bottom
of the groove.



Figure 69

Preassemble the articulation hinge bolt

Assemble the bearing cone on the bolt.
Cool down the bolt (Approx -20°C).

Assemble the bearing.



Figure 70

Tool for assemble the bearing:
Pipe $\text{Ø} 110 \times \text{Ø}101 \times 130 \text{ mm}$.
At the top, a plate $\text{Ø}110 \times 20 \text{ mm}$.

Use hydraulic press or plastic hammer.



Figure 71

Check that the bearing cone is in contact with the
bolt flange.

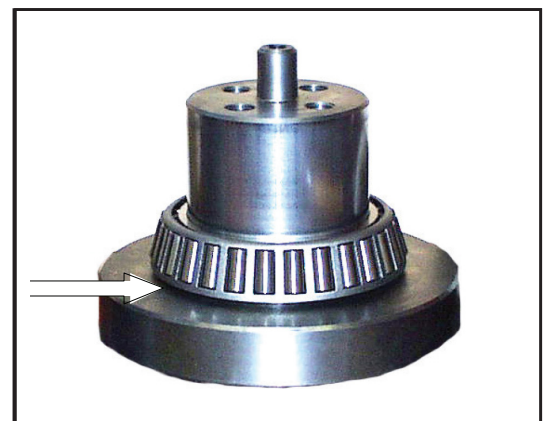


Figure 72

Cool down the bolt with bearing cone.

(Approx -20°C)

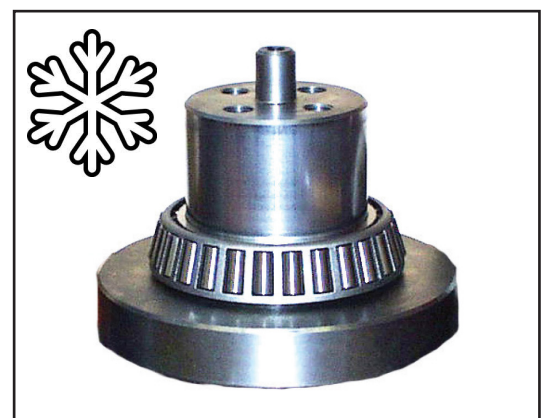


Figure 73

Apply grease in the bearing cup.

Grease type:

See the Operating and Maintenance Manual lubrication list 6-1.

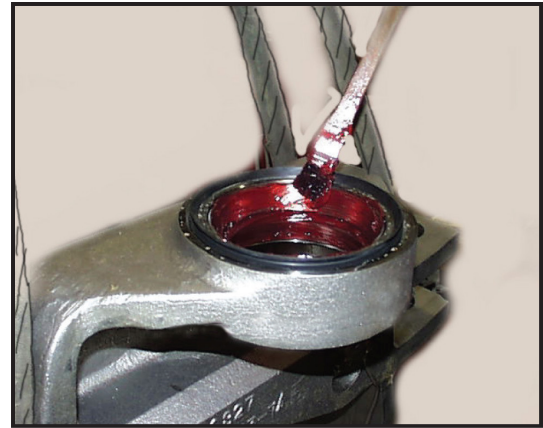


Figure 74

Assemble the upper bearing cone at both ears.

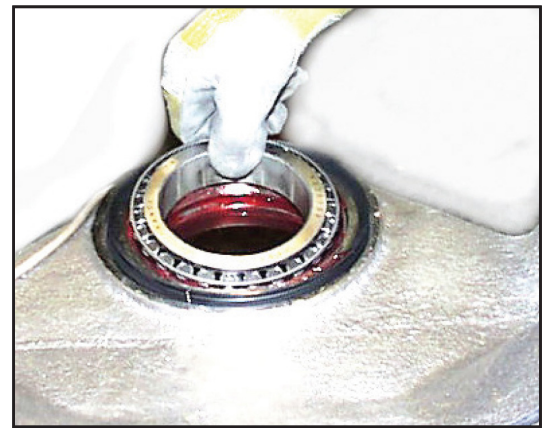


Figure 75

By crane, lift the articulation hinge and carefully connect the articulation hinge to the rear frame.

Be careful with the V-ring when moving the articulation hinge towards the rear frame.

Place the lower bearing at the upper and lower ear on the articulation hinge.



Figure 76



CAUTION

Crushing hazard

Check that the lip on the V-ring is not squeezed.

See arrow.

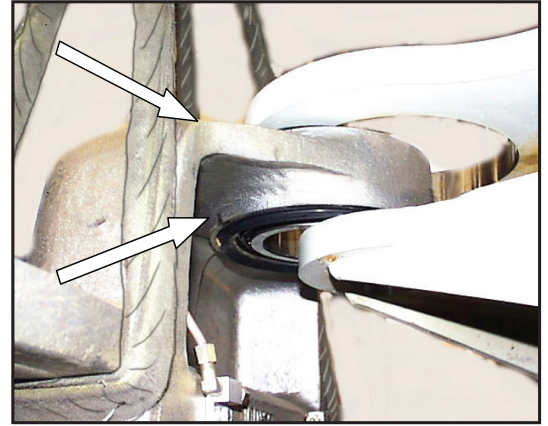


Figure 77

With a thin (1 mm) rounded tool, check that the V-ring is in its position.

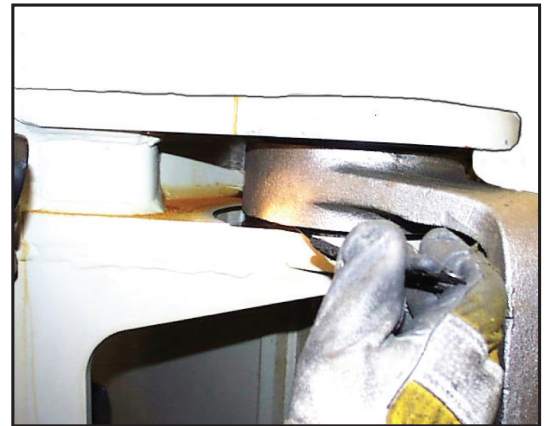


Figure 78

Line up the bore and assemble the upper bolt with the bearing cone.

Use protection gloves.

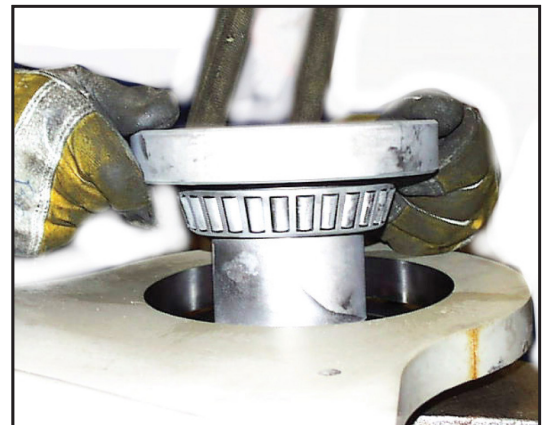


Figure 79

Use plastic hammer when assembling bolt.



Figure 80



CAUTION

The articulation hinge bolt is heavy, use caution when assembling

1. Assemble the plate, Pos 1. (see Figure 59)
2. Assemble 2 pcs washers and 2 pcs screws. Pos 2 and 3. (see Figure 59)
3. Torque limit of the M16 screws 333 Nm.
4. Loosen the screws and pre-torque the screws to 30 Nm.
5. Use a depth meter and measure the distance from the plate to the end of the bolt. This is Dimension A. See (Figure 83)
6. Use a micrometer to measure the distance from the micrometer plane to the underside of the plate. This is Dimension B. See (Figure 83)
7. Follow the calculation example below.

Calculation: $A - B - 0.1\text{mm} = \text{Shim}$

Check the pre-stressing:

1000 mm. from center pull/push 150 - 200 Nm

(The steering cylinder is not connected to articulation hinge at this time)

If hinge is to loose: Remove Shims

If hinge is to tight: Add shims



Figure 81

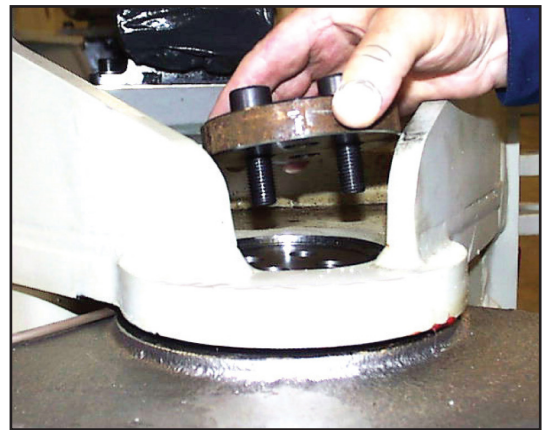


Figure 82

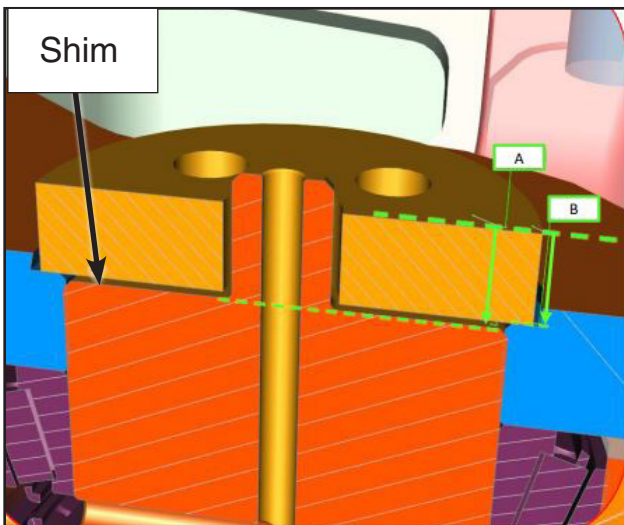


Figure 83



Figure 84

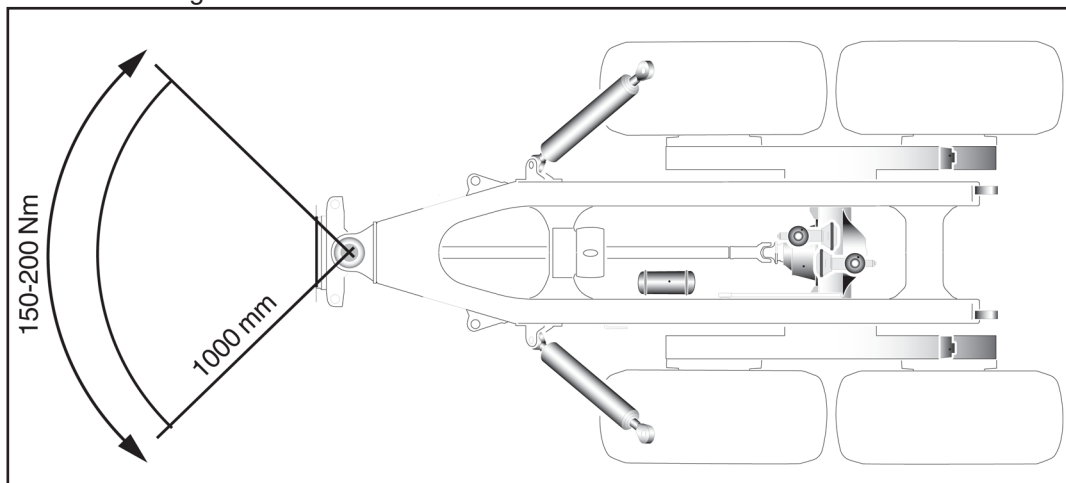


Figure 85

7.4 Fenders, Mudguards and Bonnet

Fenders, Mudguards and the Bonnet are together with the hydraulic tank, diesel fuel tank and cab, the bodywork of the dumper.

Fenders and mudguards are exposed parts which are likely to be beaten up under heavy use, and should be replaced if damaged, as misalignment will reduce the protection for the internal parts, and reduce service life. Damages also reduce the general appearance of the dumper.



CAUTION

To disassemble either of the following components, attain service position for the vehicle, and remove the actual wheels. (See Operation & Maintenance manual)

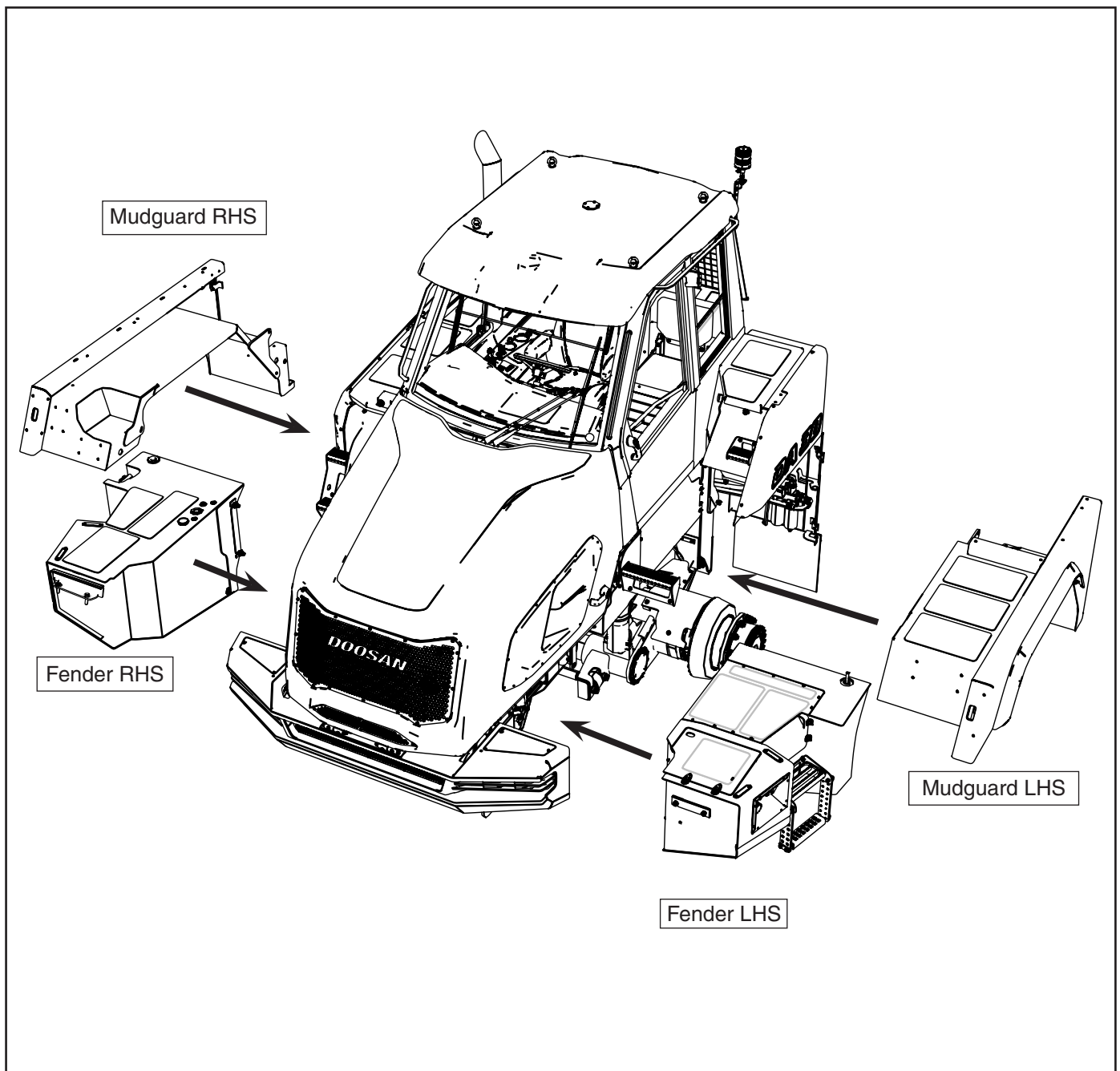


Figure 86

Fender RH

The right hand fender is the fuel tank for the truck.



WARNING

Never turn off battery main switch when engine is running.
Never turn off battery main-switch when ignition is on.
Leave battery main switch on for at least 3 minutes after engine has completely stopped.

Removal

- Thoroughly clean the fender and the area around for accumulated dirt.
- Make sure the main battery switch is turned off.
- Open the bonnet.
- Open the fender hatch.
- Disconnect the electrical cable to the fuel level sensor, and unplug the fuel pump and suction hose connected to the fender from inside of the bonnet.
- Attach a lifting tool, or support the fender with pallets and a lifting truck.
- Unscrew the bolt connecting the fender to the mudguard behind the short mudflap.
- Unscrew the three allen screws on the panel above the headlights
- Unscrew the two bolts under the panel cover, to loosen the front of the fender
- Unscrew the two bolts on the back- end of the fender, below the front- end of the mudguard to release the fender from the truck.
- Release the four bolts securing the fender to the front frame, and lower fender to ground.
- Check attachment points, and repair any damages to ensure proper fit of the new fender.

Installation

- Position the fender on the front frame, and secure by tightening the four fastening bolts. (Two at the front, two at the rear and one in between the fender and the mudguard. Replace the external parts. New parts when necessary, or re-use from the old fender where possible.

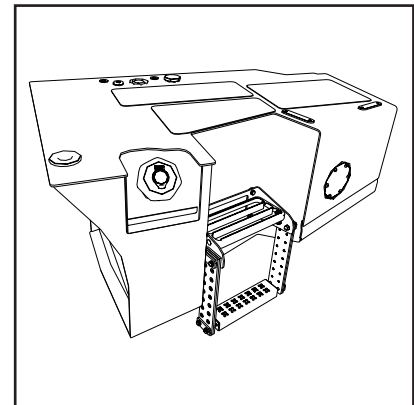


Figure 87

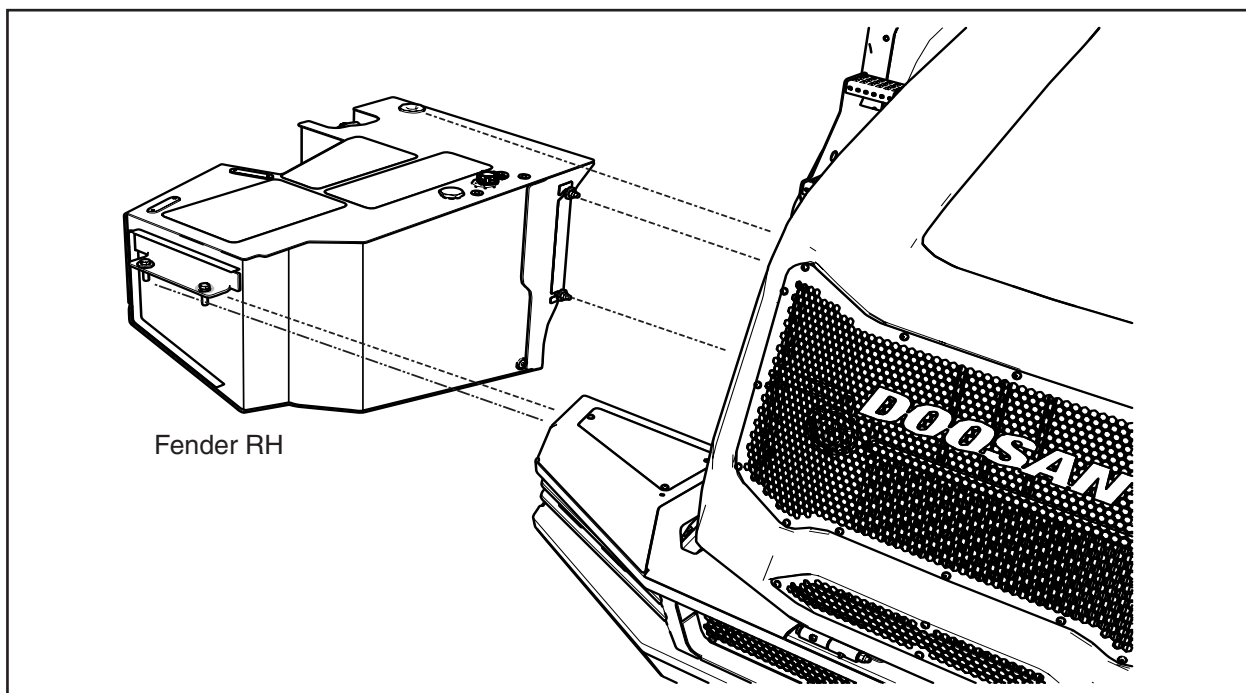


Figure 88

Control

- Check that all parts are located as before removal
- Close hatch, and close the bonnet.
- Turn the main battery switch on, and check the function of the lights.
- Adjust head lamp if necessary.

Fender LH

The left hand Fender contains the battery main switch and the batteries, accessible by a hatch. And the urea (AdBlue) tank, accessible by a swing door mounted on the stairs.



WARNING

Never turn off battery main switch when engine is running.

Never turn off battery main-switch when ignition is on.

Leave battery main switch on for at least 3 minutes after engine has completely stopped.

Removal

- Thoroughly clean the fender and the area around for accumulated dirt.
- Make sure the main battery switch is turned off.
- Open the bonnet.
- Open the fender hatch.
- Disconnect the electrical cable harness from the fender
- Remove batteries, main battery switch and battery cables.
- Remove external parts that will be re-used if fender is going to be replaced by a new.
- Unscrew the 9 allen screws to remove the panel above the urea tank.
- Attach a lifting tool, or support the fender with pallets and a lifting truck.
- Unscrew the bolt connecting the fender to the mudguard behind the short mudflap.
- Unscrew the two bolts at the front- end of the fender, under the battery hatch. (the nuts on the other end might need to be held by a wrench, accesible under the headlight panel)
- Unscrew the two bolts at the back- end of the fender to release it from the truck.
- Lower the fender before pulling it out, to avoid colliding with the urea tank.
- Check attachment points, and repair any damages to ensure proper fit of the new fender.

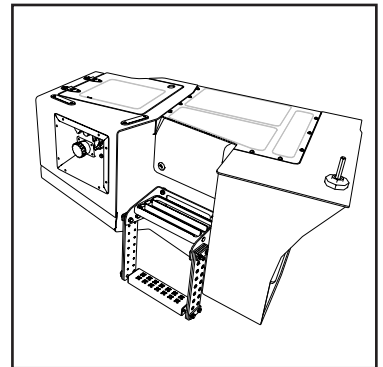


Figure 90

Installation

- Position the fender on the front frame, and secure by tightening the four fastening bolts. (Two at the front, two at the rear and one in between the fender and the mudguard).
- Replace the external parts. Use new parts when necessary, or re-use from the old fender where possible.
- Replace the batteries, battery cables and the battery main switch.

Control

- Check that all parts are located as before removal. Close hatch, and close the bonnet.
- Turn the main battery switch on, and check the function of the lights.
- Adjust head lamp if necessary.

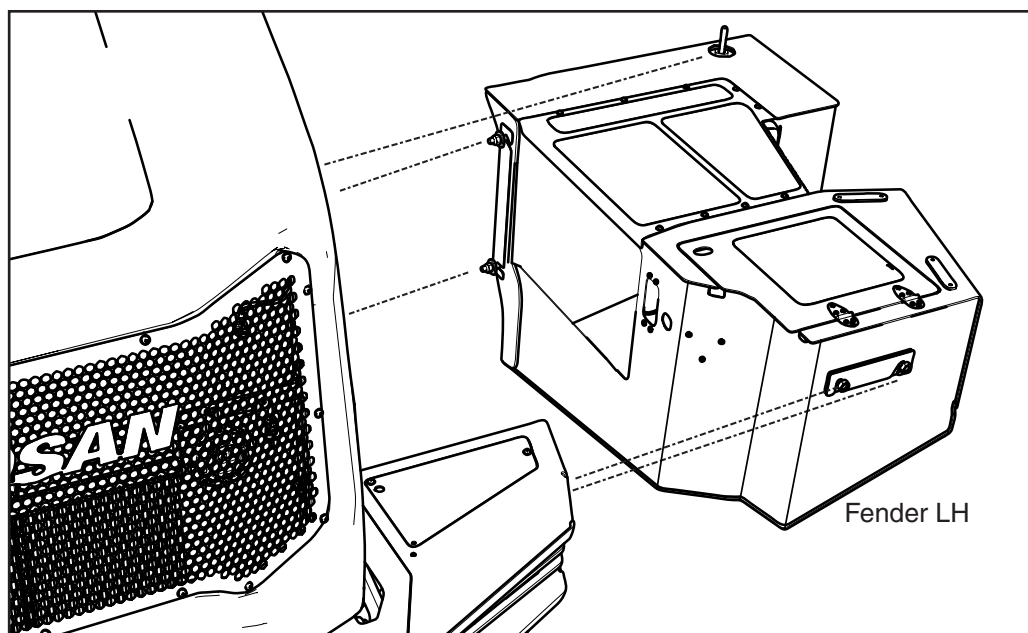


Figure 89

Mudguard

The mudguards cover the front halves of the front wheels, and also act as a bridge from the fender working platform towards the diesel fuel tank on the right side, and to the cab door and hydraulic tank/central lubrication on the left side.



WARNING

Never turn off battery main switch when engine is running.

Never turn off battery main-switch when ignition is on.

Leave battery main switch on for at least 3 minutes after engine has completely stopped.

Removal:

- Thoroughly clean the mudguard and the area around for accumulated dirt.
- Make sure the main battery switch is turned off.
- Remove actual wheel.
- Open the bonnet.
- Remove any electrical connection, and remove clamps.
- Remove the mirror bracket.
- Remove external parts that will be re-used if mudguard is going to be replaced by a new.
- Release the three bolts securing each mudguard to the front frame.
- One is accessible from the wheel well, one is accessible from the engine compartment, and one is accessible from the underside of the front frame.
- Lift mudguard off the dumper.
- Check attachment points, and repair any damages to ensure proper fit of the new mudguard.

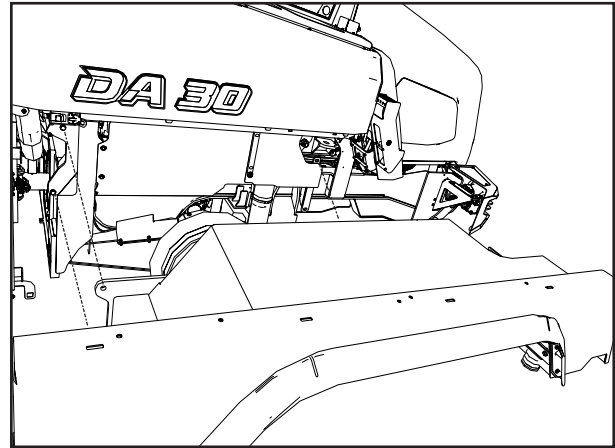


Figure 91

Installation:

- Position the mudguard on the front frame, and secure by tightening the three fastening bolts.
- Replace the external parts. Use new parts when necessary, or re-use from the old mudguard where possible.
- Replace the mirror bracket.
- Replace any electrical cables and clamps removed, and connect.
- Close the bonnet.
- Replace the wheel.

Control:

- Check that all parts are located as before removal.
- Turn the main battery switch on, and check the function of electrical components affected.

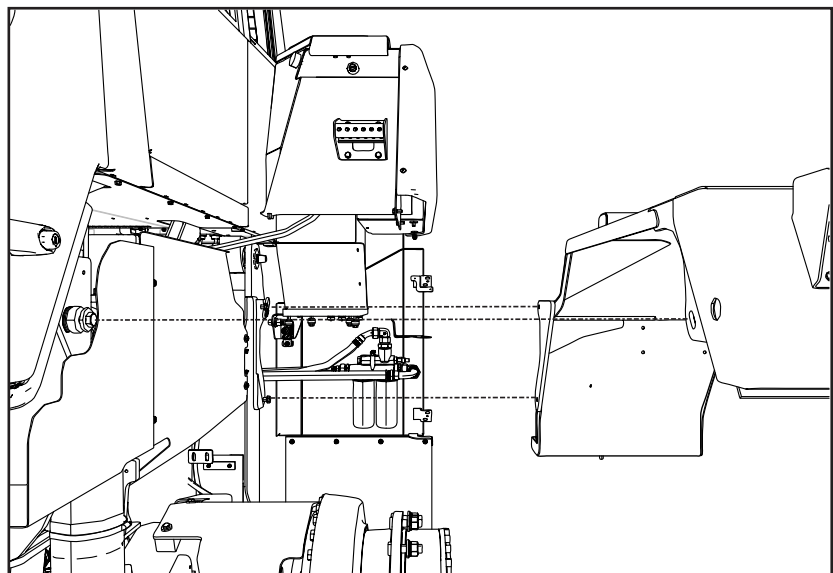


Figure 92

Bonnet Lock

The Bonnet Lock keeps the bonnet closed under all driving conditions, the bonnet is released with the handle on the left side. The bonnet can also be locked with the key to keep unauthorized personnel from opening.

For maintenance on the bonnet lock and release mechanism, the bonnet must be opened.

If the bonnet can not be opened due to a malfunction in the mechanism, contact Doosan Infracore Norway AS for information on how to proceed.

Removal

- Thoroughly clean the bonnet and the area around for accumulated dirt.
- Open the bonnet.
- To remove the wire, release lower wire end by unscrewing two nuts. One fastening the wire to the release arm, and one securing the wire sleeve to the bracket.
- Remove the clamp supporting the wire to the bonnet shell.
- Then unscrew the wire from the upper bracket by loosening the adjusting nut, and unhook the wire end from the bonnet lock.
- To remove the handle and release mechanism, remove the wire lower end as described, and unscrew the two nuts securing the handle and the mechanism to the bonnet shell.
- Separate and remove.
- To remove the bonnet lock, unhook the upper wire connection as described.
- Unscrew the two bolts securing the bonnet lock to bracket, and remove.

Installation

- Replace the two bolts securing the lock to the bracket.
- Place the release mechanism and handle in position, and tighten the two nut securing the two parts together on the bonnet shell.
- Replace the wire as described for removal, and adjust the wire to engage and disengage the lock properly.

Control

- Re-check that the lock can be disengaged by the handle, and close the bonnet.

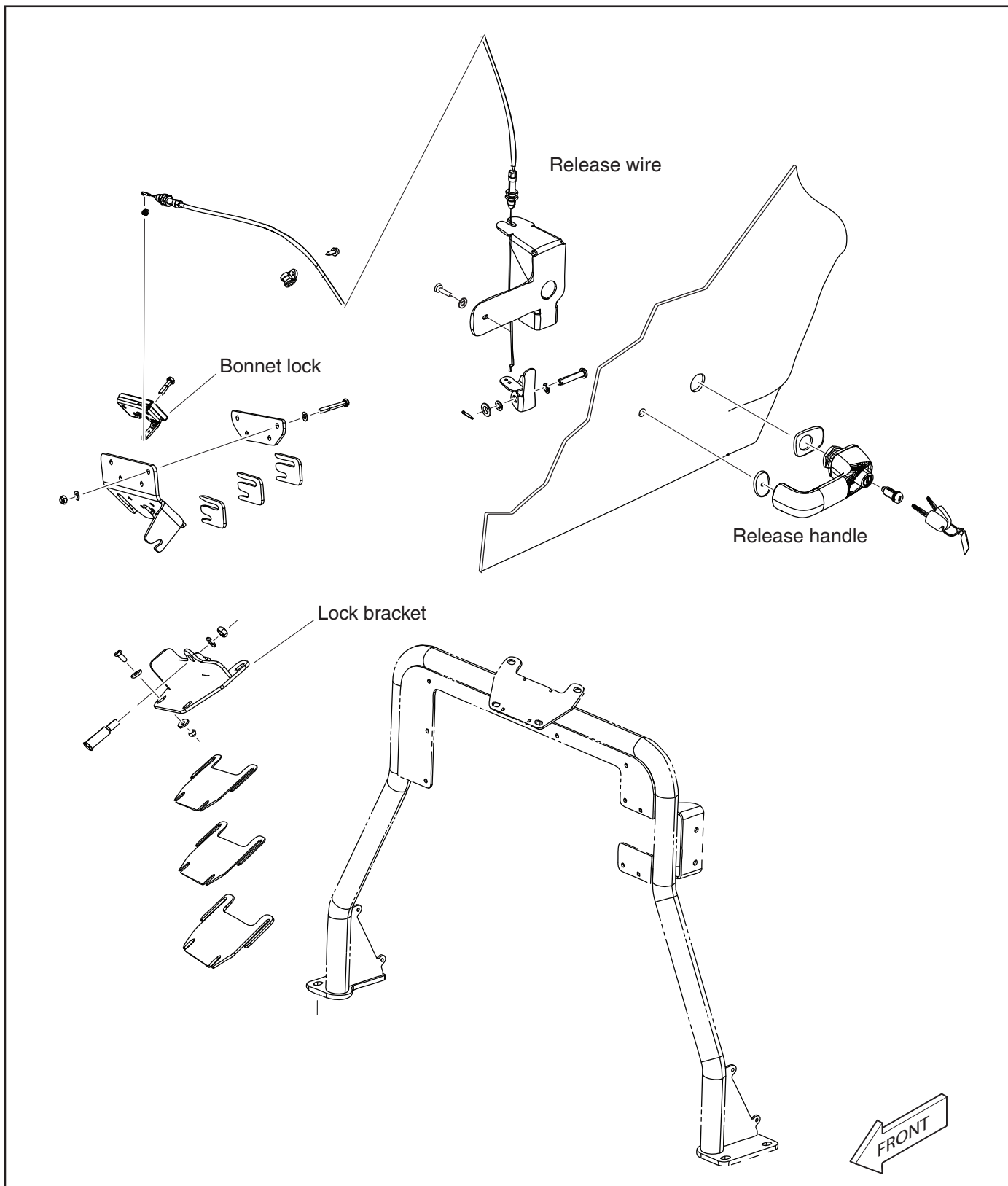


Figure 93

Bonnet

Removal:

- Thoroughly clean the bonnet and the area around for accumulated dirt.
- Open the bonnet.

- Attach lifting device in the two lifting eyes, (see Figure 94) and use a crane to support the weight of the bonnet.

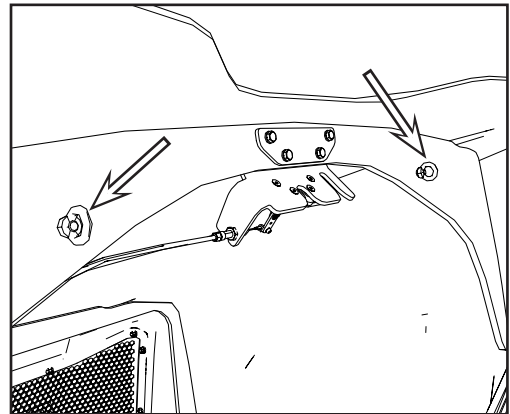


Figure 94

- unscrew the hydraulic dampers on each side of the bonnet.
- Remove the sub- grille by unscrewing the four fastening screws.

- Remove the four bolts securing the bonnet to the bonnet hinge.
- Lift bonnet off the dumper and place on the ground in a safe place.

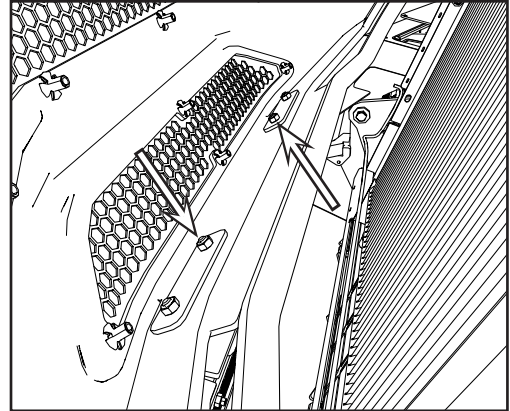


Figure 95

Replacement:

- Lift the bonnet and position on the bonnet hinge.
- Replace the four bolts, and tighten.
- Hook the two springs in position.
- Remove the lifting device and the lifting eyes, and replace with nuts.

Bonnet adjustment and control

Bonnet should not extend beyond bonnet beam.
Tighten the two foremost screws.



Figure 96

Check the sides, bonnet should extend the same amount
on both sides



Figure 97

Measure gap between cab and bonnet, it should be around
33mm. (both sides)

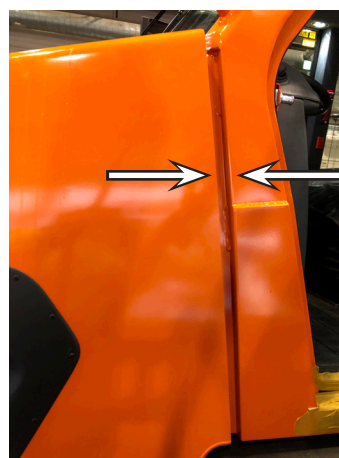


Figure 98

Ensure the lock is functioning properly.

7.5 Cooling system

Safety Instructions



WARNING

Instructions are necessary before operating or servicing machine. Read and understand the Operation and Maintenance Manual and signs (decals) on machine. Follow warnings and instructions in the manuals when making repairs, adjustments or servicing. Check for correct function after adjustments repairs or service. Untrained operators and failure to follow instructions can cause death or serious injury.

Disassembly of the cooling system

Before disassembly of the cooling system, the bonnet removal procedure must be performed. Follow its instructions at "Bonnet" on page 47, followed by equalizing the pressure in the hydraulics, by disconnecting the accumulators, and draining the hydraulic circuit. (See subchapter: Main pump pressure adjusting, in chapter 5 Hydraulics).



CAUTION

The cooling system is pressurized by the natural heat production of the engine. Ensure the engine is cold (at ambient temperature) to equalize the pressure in the cooling system, before disassembling any hoses.



WARNING

Disconnecting Air Conditioning and/or Hydraulic circuits has to be performed by authorized specialists.

NOTE

For coolant risks and protective measures, see "Coolant" in chapter 0.

Before disassembling the cooling system:

- Discharge all accumulators (Authorized personnel only).
- Thoroughly clean the cooling system and the area around it.
- Drain the engine coolant.
- Drain the AC circuit (Authorized personnel only).

2. Disassemble the wiring and hoses, remove the wiring strips and clamps from the brackets.
3. Disconnect the cooling hoses from the thermostat housing and transmission oil cooler.
4. Disassemble the charge air hose.
5. Disconnect hoses between the expansion tank and the engine. Remove clamps.
6. Disassemble oil hoses from fan motor, hydraulic oil cooler and brake oil cooler. remove clamps.

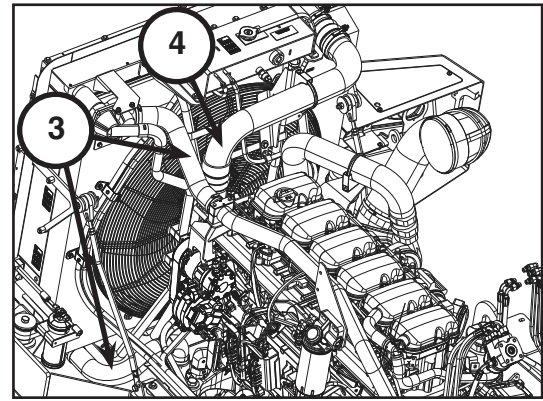


Figure 99

NOTE**Oil under hydraulic pressure !**

The oil system for the fan motor is in the same oil system as the brake, therefore it is recommended when disassembling hoses or units from this system, always to eliminate pressure in the accumulator, located on the right side, under the cab. This can be done by operating the brake pedal several times. (Approx 15-20 times)

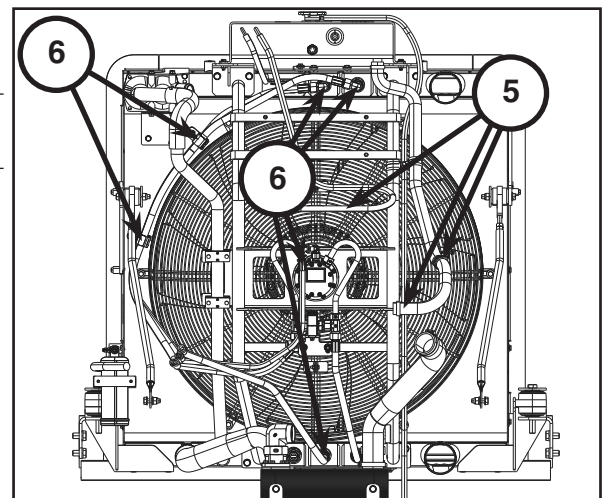


Figure 100

7. Fasten 2 pcs M10 lifting eyes on top of the cooling unit, and attach the lifting device to these.

Check that all cooling pipes and hoses are disassembled

8. Disassemble the stay bars from the frame (both sides).
9. Disassemble lower fastening 2 screws (left and right hand side).
10. Check again that all wiring and hoses are disassembled.

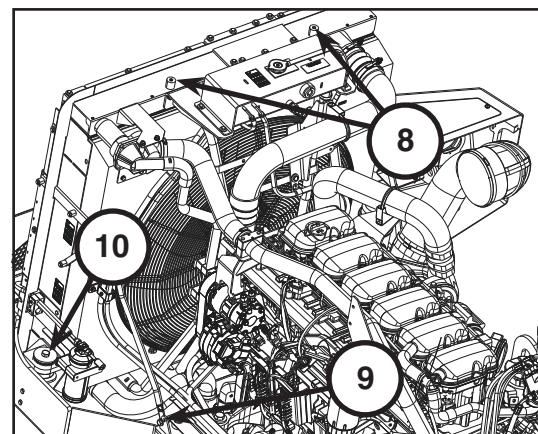


Figure 101

Carefully lift the cooler unit out from the frame.

Disassembly of the separate coolers



WARNING

Ensure the bonnet has been removed and the pressure of the hydraulics system has been depressurized. Disconnect any other hoses connected to the cooling system. i.e. Air conditioning, coolant.

AC condenser can be disassembled in the truck. For all other coolers, lift out the cooling pack, see previous procedure.

AC condenser:

- Disassemble AC condenser by unscrewing the 4 bolts (1) holding it to the frame.
- If further disassembly of coolers is planned, disassemble frame for condenser by unscrewing the 4 bolts (2).

Other coolers:

- Disassemble the sealing plates around the cooling pack. 4 bolts (3) and 6 bolts (4).
- Remove the fan beam (see procedure below)
- Disassemble thermostat, 4 bolts (5)
- Disassemble brackets for staybar and fan cowl, 8 bolts (6)
- Disassemble bracket, 16 bolts (7)
- Coolers are now free to move independently, and can be disassembled by hand with caution, or by any means of lifting equipment.

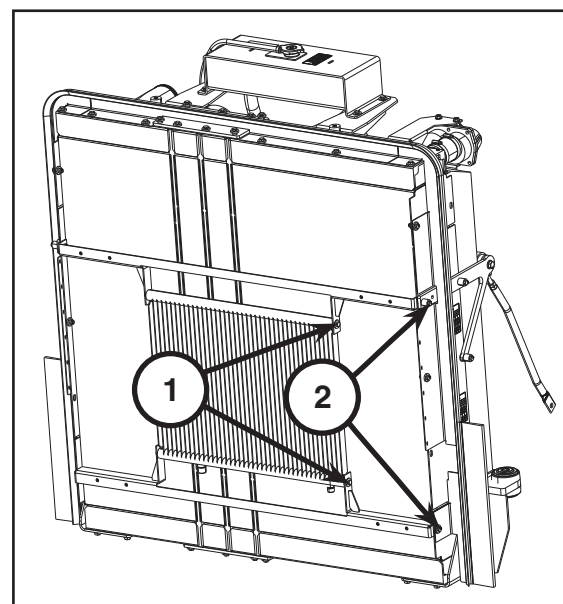


Figure 102

To assemble the coolers, follow these steps in the reverse order.

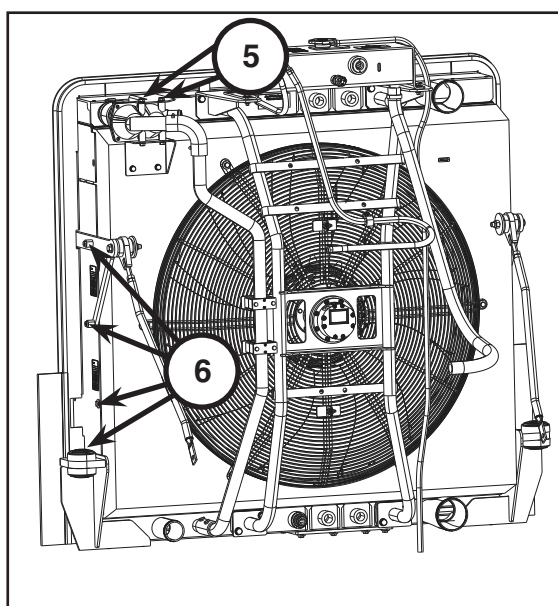


Figure 104

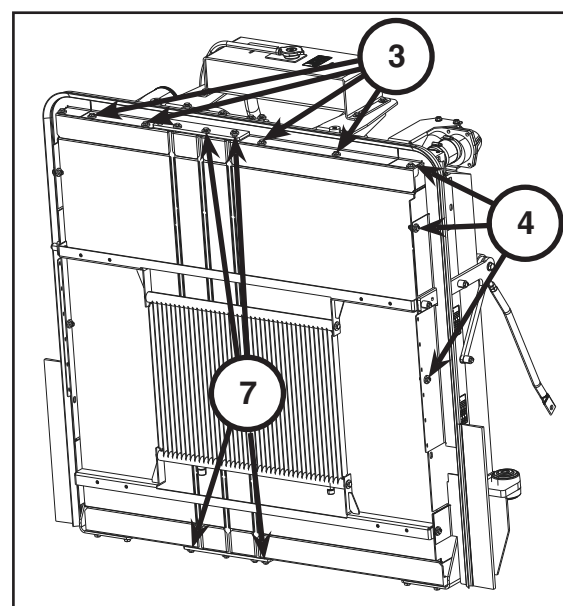


Figure 103

Disassembly of the cooling systems hydraulic motor

Disassembling the hydraulic motor propelling the fan, requires the procedure “Disassembly of the cooling system” on page 49 to be performed.

Disconnect the following hoses

- (1). The coolant bypass hose,
- (2). The pressuresafety hose
- (3). Engine breather hose.
- (4). Static line hose.

Continue by unscrewing the brackets on both sides of the cooling system, with hose clamps fastening the just uncoupled rubber tubes.

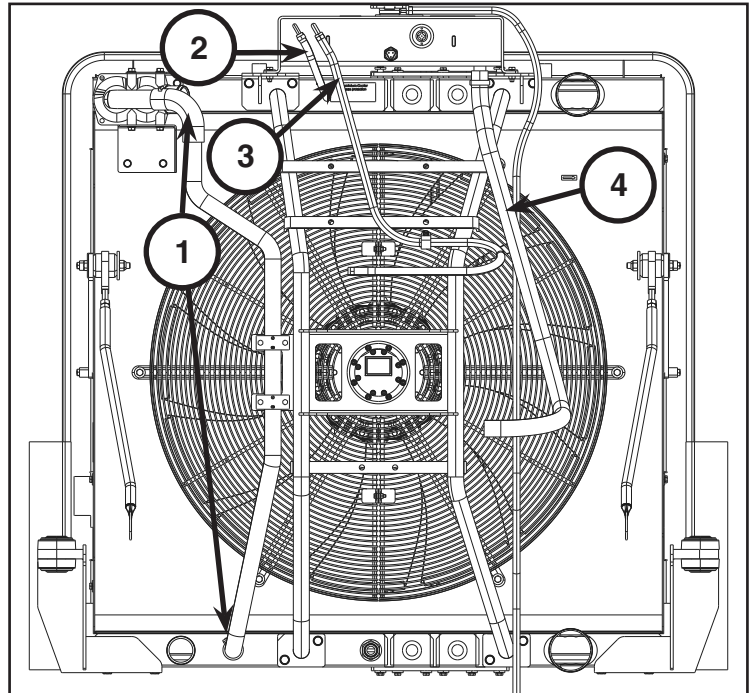


Figure 105



CAUTION

The entire frame including the fan and motor will come apart from the cooling system body. Find a solution to counteract the fall of the fan beam structure with a hoist or similar tool.

Disassemble the fan guard by unscrewing the 6 fastening bolts (5) and the 2 bolt connections (6).

Disassemble the fan beam by unscrewing the 4 bolts at the top rear end (7) and the 4 bolts at the bottom (8).

Optionally, the expansion tank can be removed from the fan beam.

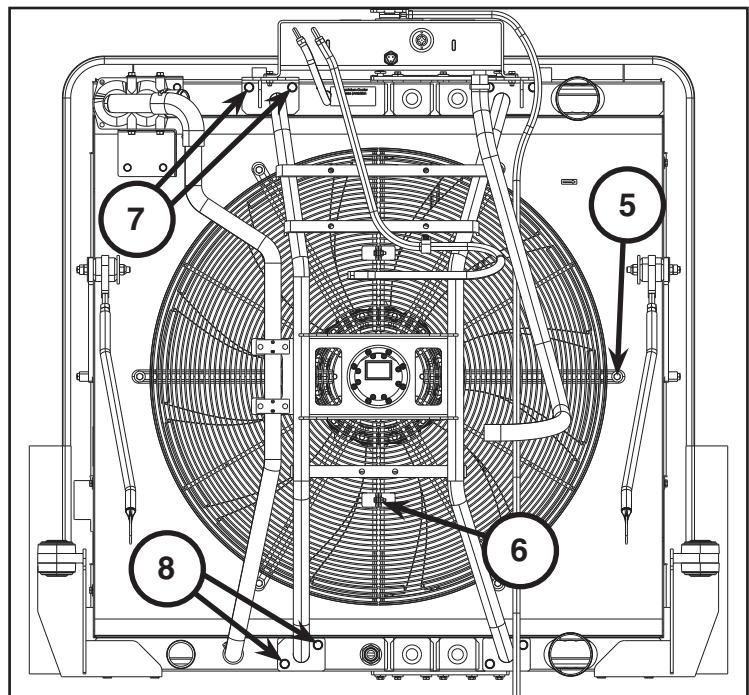


Figure 106

Place the fan beam strategically with the fan blade facing up, and remove the hexagon nut and washer securing the fan to the hydraulic motor casing.

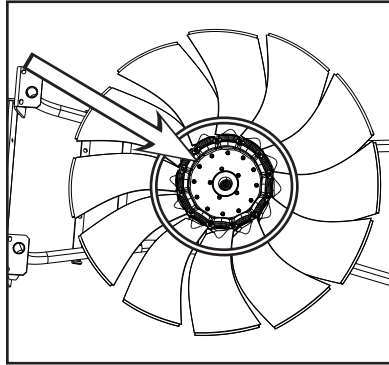


Figure 107

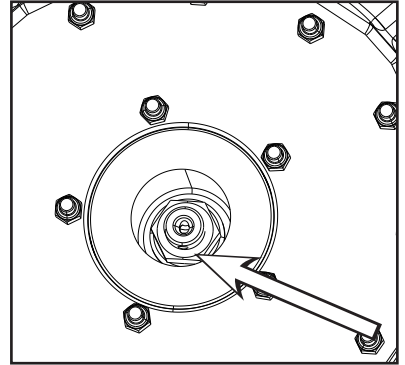


Figure 108

loosen the 8 bolts securing the motor to the fan beam.

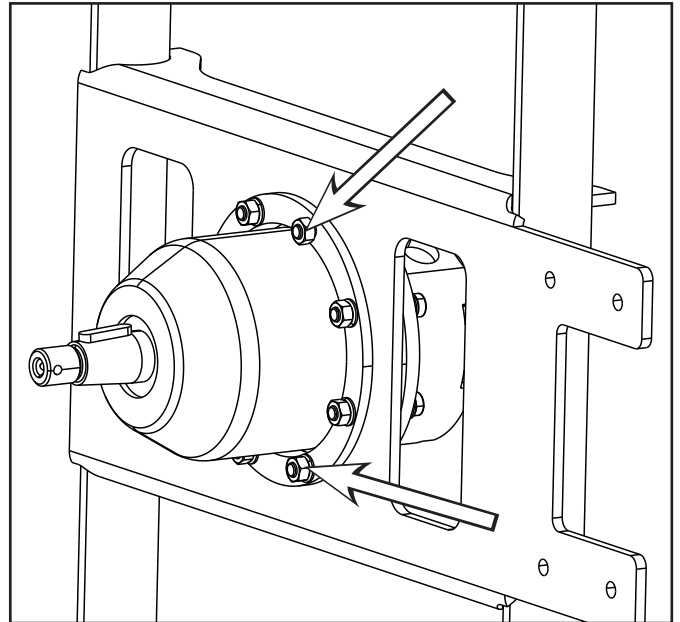


Figure 109

To assemble the motor and fan beam, follow these steps in the reverse order.

7.6 Cab

The cab is tilted to gain access for maintenance, but if the cab has to be removed from the dumper for some reason, proceed as follows.

Cab Removal

- Discharge all accumulators.
- Thoroughly clean the cab and the area around for accumulated dirt.
- Check that the battery main switch is turned off.
- Disconnect all connections from the left hand side of the electrical central. Disconnect the ground connections to the cab and check that cables are free to be pulled out from cab.
- Drain the engine coolant.
- Tilt the cab fully. (Ref. Operation & Maintenance Manual 2-43)
Apply tilt support. Tilt support is located on air filter beam LHS.
- Remove the cover plates under the cab for access to cables and hoses.
- Mark each removed part for proper location.
- Disconnect the electrical cables.
- Disconnect and remove the cables to the reduction valves, and to the pressure switches.
- Disconnect and plug the two brake lines hoses at the rear of the cab.
- Disconnect and plug the five hydraulic hoses at the steering servo valve, orbitrol.
- Disconnect and plug the two air conditioning hoses, one at the AC compressor, and one at the AC filter located on the cooler package.



WARNING

Never turn off battery main switch when engine is running

Never turn off battery main-switch when ignition is on

Leave battery main switch on for at least 3 minutes after engine has completely stopped



WARNING

If AC system is leaking, or if any part of the Air conditioning circuit has to be disconnected or replaced, contact authorized specialists.

- Unhook the two springs holding the hose support over the articulation bearing.
- Lower the cab slightly and place on safety stand.
- Disconnect cab hydraulic tilting cylinder, if fitted, by removing the bolt and nut.
- Attach a crane to the lifting eyes on top of the cab.
- Lift and remove the safety stand and tilt support, then lower slowly to normal position.
- Maintain enough lifting force to release the weight on the rear cab hinge bolts.

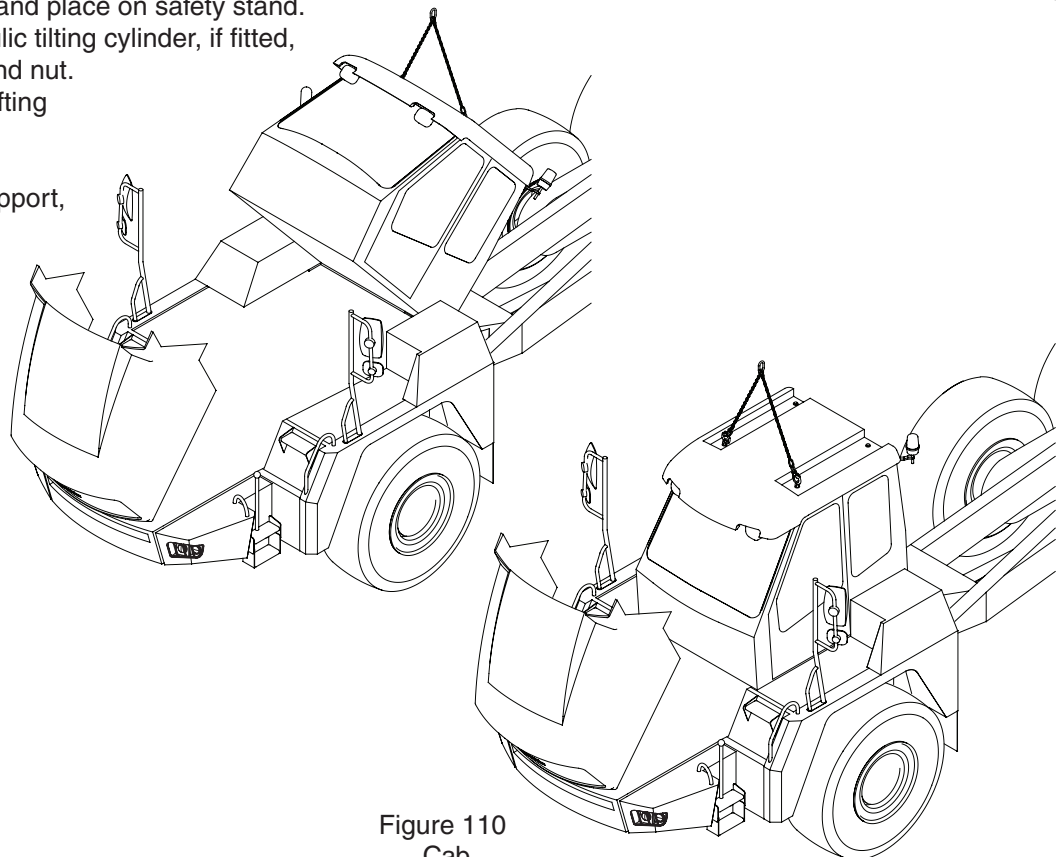


Figure 110
Cab

Remove the locking rings and drive the hinge bolts inwards to free the cab from the front frame. Retrieve the bolts.

Lift the cab off the dumper, and place on woodblocks, resting on the mounting brackets.



WARNING

Be aware of the risk of injury to people and equipment when handling heavy objects!

Check the cab bolt rubber bushings for wear, and replace if necessary.

If the cab is going to be replaced with another unit, parts have to be moved over until the new cab has the same configuration as the one removed.

The amount is determined by the configuration of the new cab supplied.

Installation:

- Lift the cab onto the dumper, using the crane, and position the cab to enter the two rear mounting/hinge bolts. Drive the bolts in position from inside.
- Replace the locking rings.
- Tilt the cab with the integrated lifting jack, high enough to place on safety stand.
- Replace the hydraulic tilting cylinder in the cab bracket, if fitted, by installing the bolt and nut.
- Tilt the cab fully.
- Apply safety bar. Safety bar is located below the cab.
- Hook the two springs, holding the hose support, back into position.
- Replace hoses and cables in opposite order of what described for removal.
- Replace the cover plates under the cab.
- Lower the cab to normal position, and install the front cab bolts. Bolt torque: 277Nm
- Replace the electrical connections.
- Replace ground connections.
- Refill AC system. (Authorized personnel only)
- Refill engine coolant. (For fluid type and specifications, refer to the Hyundai Operating & Maintenance Manual Chapter 6)

Control:

- Check that all parts are located as before removal.
- Turn the main battery switch on, and check the function of electrical components affected.
- Start the engine and check that the hydraulic system is functioning properly.
- Bleed the brake circuits. (See ch. 1)
- Perform a test drive.

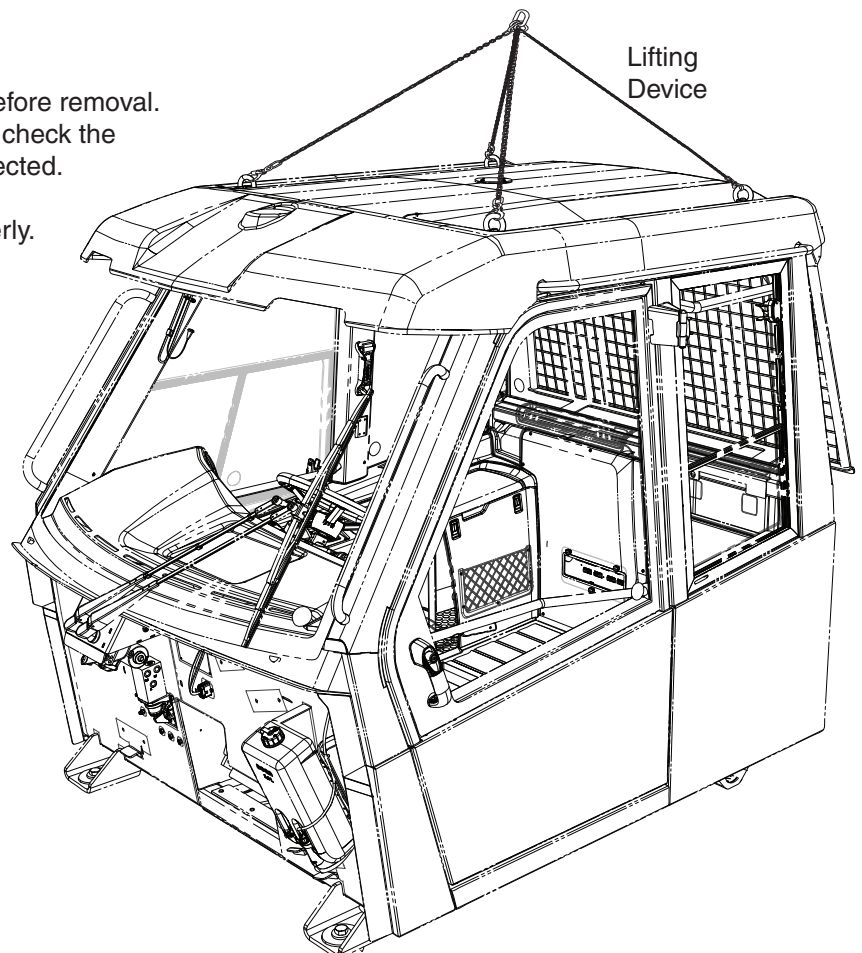


Figure 111

Cab Ventilation Control Panel

The Cab Ventilation Control Panel is located in the driver's front , upper in the roof, right side.



WARNING

Never turn off battery main switch when engine is running.

Never turn off battery main-switch when ignition is on.

Leave battery main switch on for at least 3 minutes after engine has completely stopped.

Removal:

- Make sure the battery main switch is turned off.
- The control panel is fastened in similar manner as a car radio, and can be removed inserting special tools to release the locks. Lift the panel from console to access the different connectors and control wires.
- Mark each cable connection for correct location and disconnect.
- Mark and disconnect the two control wires.

Installation:

- Connect to wiring harness, and adjust to obtain full travel of control arms according to marking on control handles.
- Connect electrical cables as removed.
- Position the control panel in the console and push down until the two tabs snaps into locked position.

Control:

- Check that all parts are located as before removal.
- Start the engine and check that the ventilation system is functioning properly according to the Operation & Maintenance Manual 3-28.



Figure 112

Cab Ventilation Unit

The Ventilation Unit provides temperature regulated air to all outlets in the cab ventilation system. Heat is provided from the engine cooling system, circulating through the heater unit, and cooling is provided from the air conditioning vaporizer.

The ventilation unit is located in the front right corner of the cab, inside the drivers side console.

Removal:

- Make sure the battery main switch is turned off. Drain the A/C and engine cooling system.



WARNING

Never turn off battery main switch when engine is running.

Never turn off battery main-switch when ignition is on.

Leave battery main switch on for at least 3 minutes after engine has completely stopped.



WARNING

If any part of the Air Conditioning circuit has to be disconnected, contact authorized specialists.

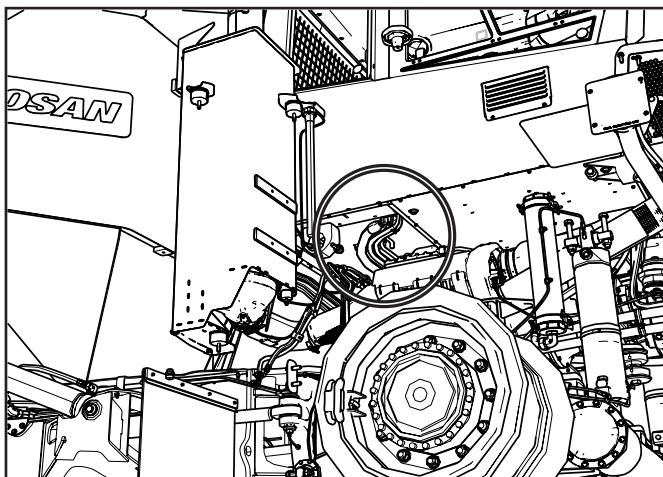


Figure 114

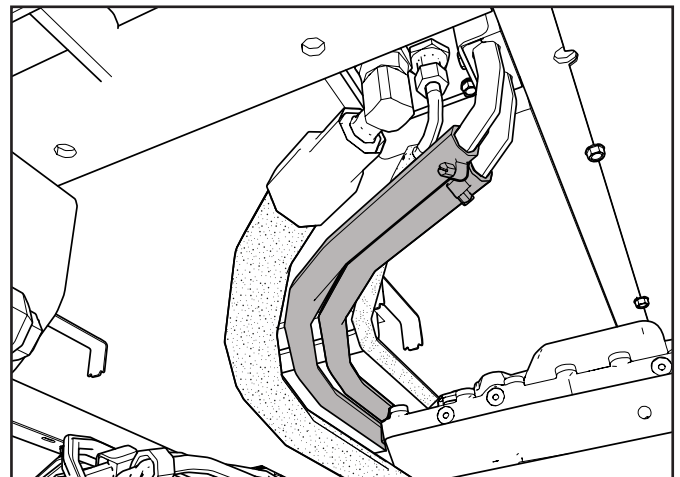


Figure 113

- Disconnect the coolant hose connected directly to the ventilation unit from the underside of the cab. (AC fluid Colored in grey, and coolant dotted in "Figure 113").
- Remove the floor mat.

- Remove the driver seat by removing the four bolts securing the seat to the seat console.

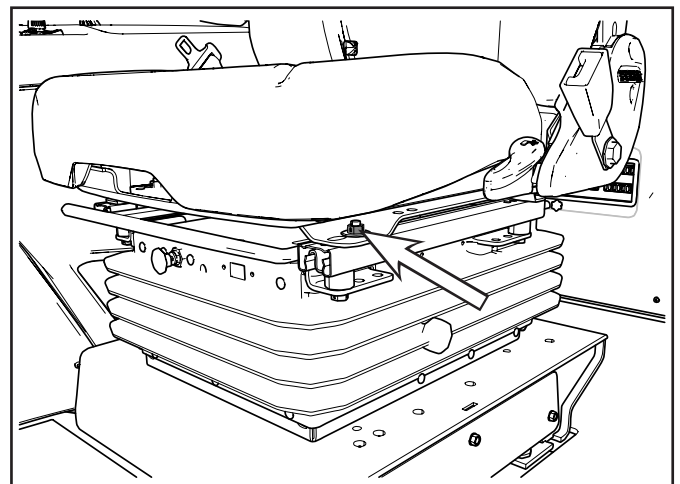


Figure 115

- Remove seat console by unscrewing the side cover (1) to access the four bolts securing the console to the cab floor (2).

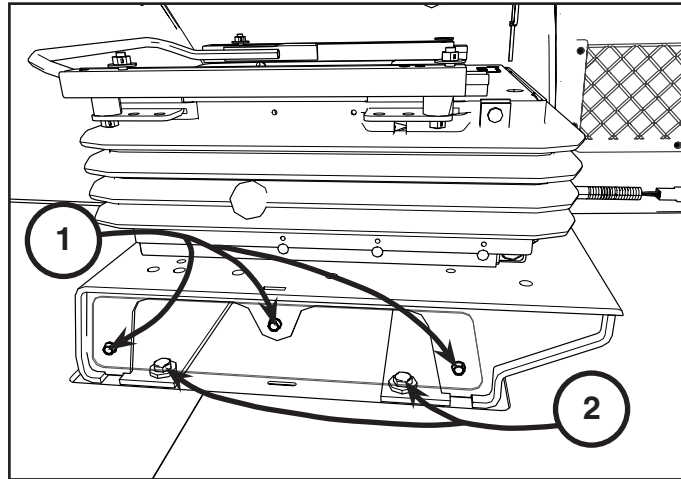


Figure 116

- Undo the screws along the edges of the side panel plastic covers, and remove them.

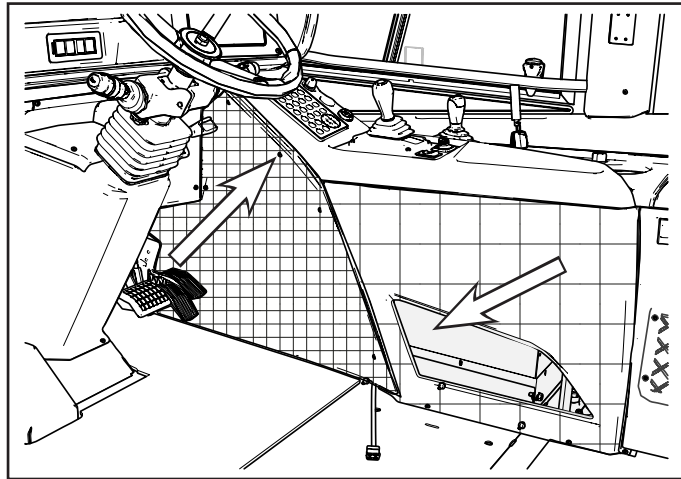


Figure 117

- unscrew the two bolts securing the safetyrail (1), and the three bolts securing the AC unit to the cab (2).
- Disconnect the electrical cables, water supply and air hoses around the component to pull out the unit.

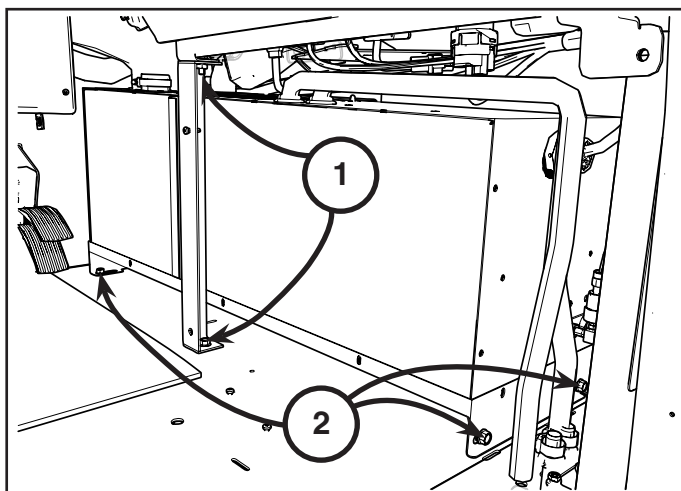


Figure 118

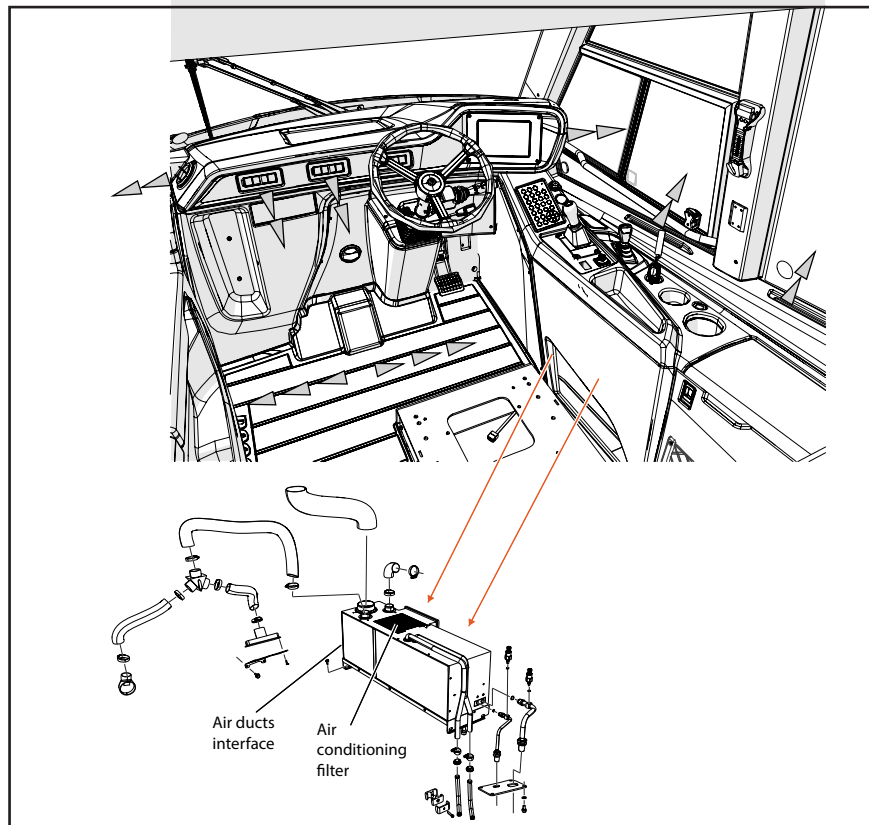


Figure 119

The air heating filter can be accessed from outside the cab; to disassemble it, unscrew the vent on the right hand side of the cab.

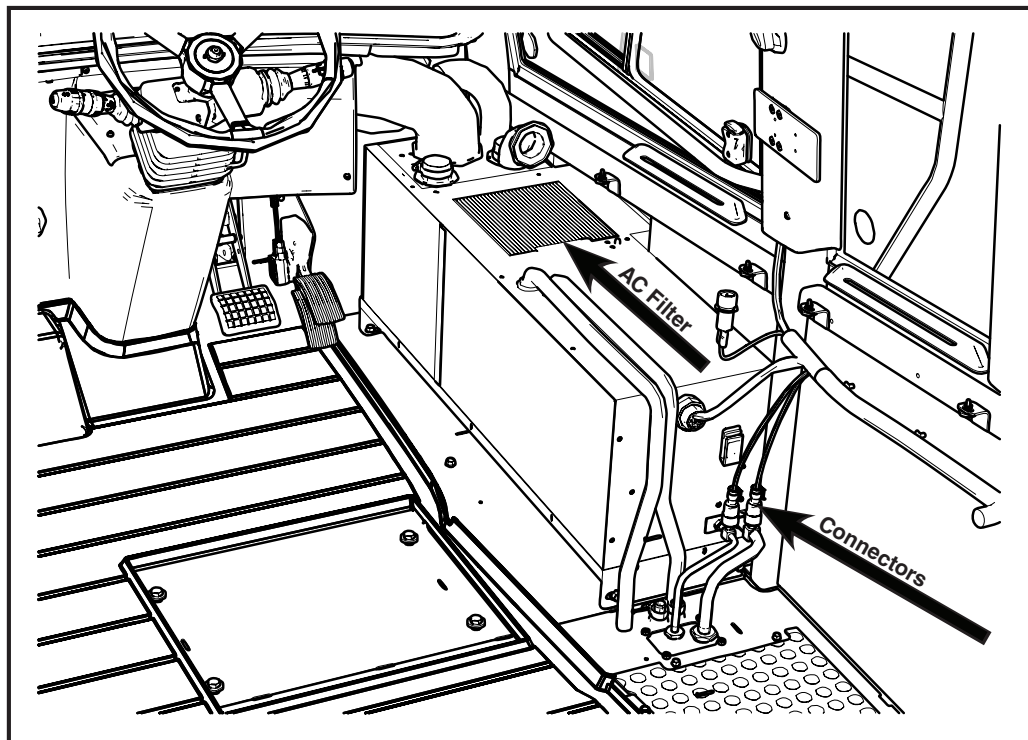


Figure 120

Cab Door

- The Cab Door is the only entry to the cab, and should close properly to ensure driver safety and comfort.
- If the door for some reason has to be removed, proceed as follows.
- Open door fully and start unscrewing the screws drilled in the plastic cover and pry open the velcro fasteners securing the cover from the inside of the door, to get access to the four bolts fastening the door check arm to the door. Remove the four bolts.
- Have someone to support the door, and remove the four bolts fastening the hinge to the door.
- Remove the door.
- If the door is going to be replaced with a new unit, the configuration of the new unit will indicate which parts that should be moved over from the old door.

Installation:

- If the same door as removed are going to be refitted, the procedure will be the same as for removal, in opposite order.
- If a new door is going to be fitted, only the rubber strip should be attached before door is replaced in cab.
- Door can be installed with glass and locking mechanism pre assembled.
- Lubricate and adjust locking mechanism for firm closing and easy opening. Lubricate the hinges.
- Adjust the mudguard mounted door bumper if necessary.

Remove the pins from the door hinges

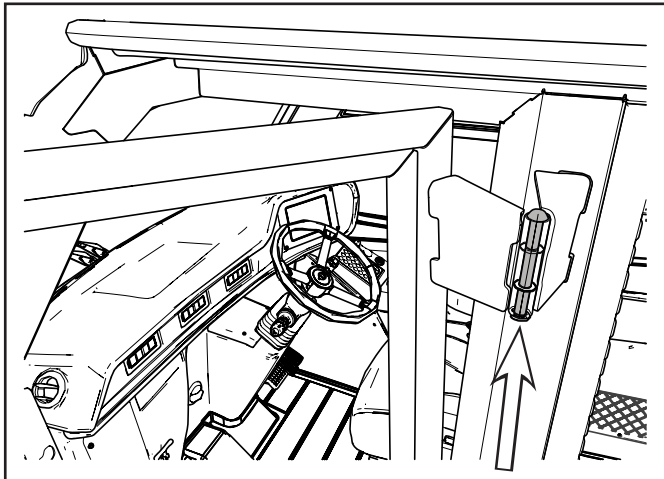


Figure 122

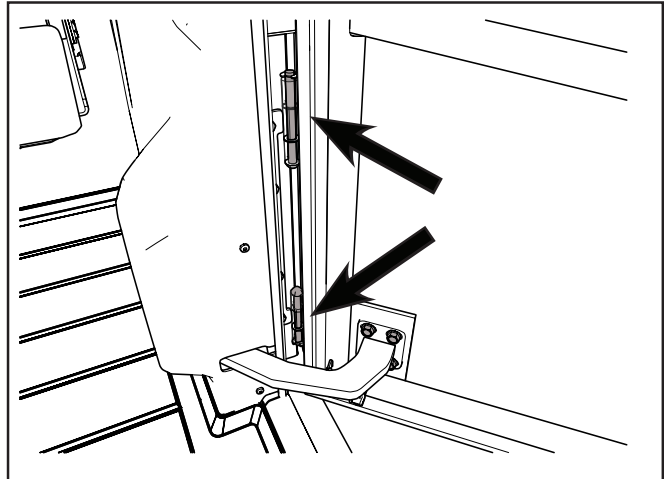


Figure 123

Figure 121

Door Damper Cylinder

The Door Damper Cylinder keeps the door in open position when opened, and dampens the door movement.

Removal:

- Remove floor mat and rear kick panel.
- From outside, pull out the expansion lining from the sliding window channel, starting from the end at bottom center.
- Remove sliding window.
- Pull out the left wall panel by unscrewing the screws on the plastic cover, and prying loose the velcro fasteners behind it.
- Strap the door in open position.
- Remove the door damper cylinder, by loosening the two nuts.

Installation:

- Adjust the length of the damper cylinder by pushing it together, and position in the mounting holes.
- Tighten the two nuts.
- Push the wall panel back in position to engage the velcro locks.
- Replace sliding window.
- Put back rear kick panel and floor mat.

Control:

- Check the operation of the door, and that no parts are binding.

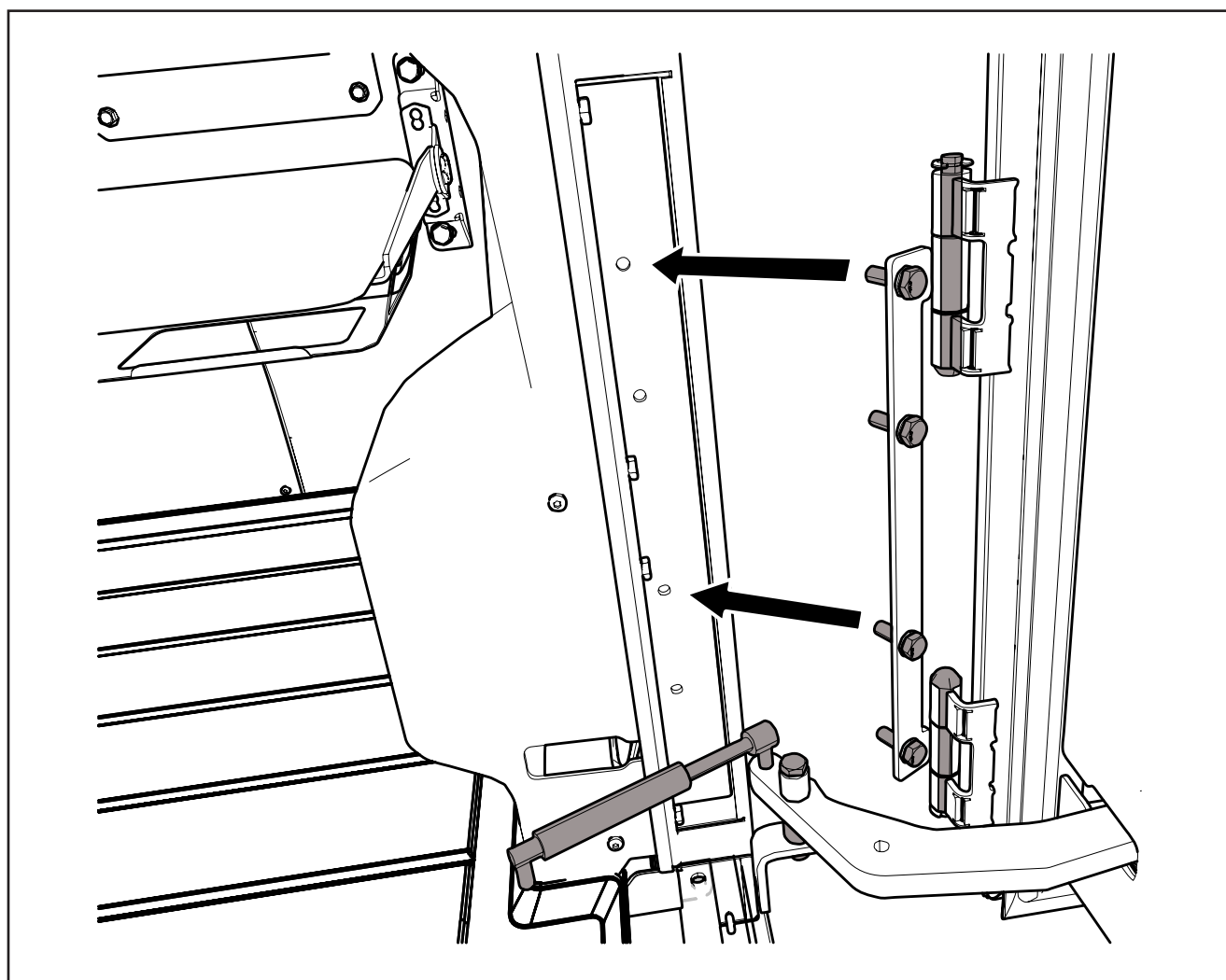


Figure 124

Door sensor

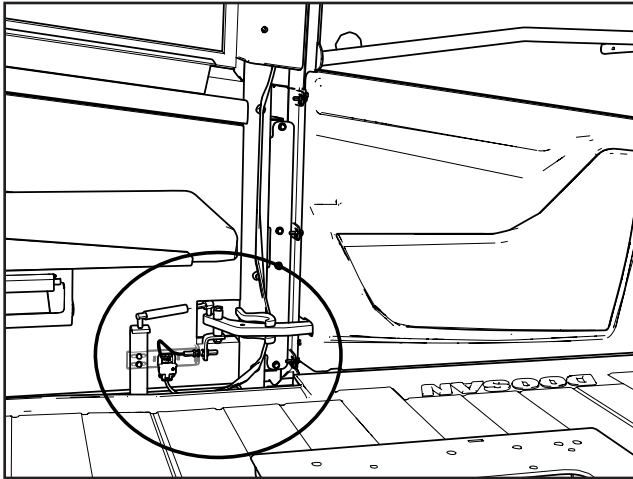


Figure 125

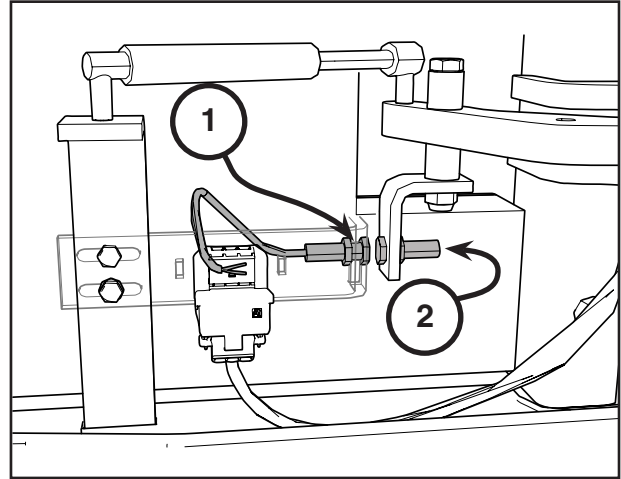


Figure 126

The open/close door sensor (1) is located below the door damper cylinder, and is actuated by the metal bolt (2), which pulls on the magnetic tip of the sensor.

Adjustment:

- Loosen the terminals of the sensor
- Unscrew the bolts (1) on the bracket, and remove the bracket. The sensor will come along with it.
- Unscrew the hex rings on the sensor to loosen it.
- Add or remove plastic washers (as spacers) in between the outmost hex ring and the bracket, to adjust the reach of the sensor tip.

Steering Column

The adjustable steering column comprises the steering wheel and the control handle for lights, turn signals, horn and windscreen wiper/washer.

Removal:

- Check that the steering is in neutral position, and ensure that the articulation lock is engaged.
- Make sure the battery main switch is turned off.



WARNING

Never turn off battery main switch when engine is running.

Never turn off battery main-switch when ignition is on.

Leave battery main switch on for at least 3 minutes after engine has completely stopped.

- Disconnect the electrical connection for the steering column behind the instrument panel.
- Remove the four bolts securing the steering column to the cab floor.
- Remove the clamp securing the steering column to the instrument panel, and lift out of cab.

Installation:

- Position the steering column in the floor bracket engaging the splines into the orbitrol steering servo valve and enter the mounting bolts.
- Make sure the steering wheel has the orientation wanted for neutral position.
- Replace the clamp securing the column to the instrument panel, and tighten the nuts loosely.
- Tighten the four bolt in the floor bracket.
- Tighten the two nuts on the clamp.
- Replace the electrical connections.

Control:

- Check that all parts are located as before removal, and that all functions controlled by steering column controls are functioning according to the Operation & Maintenance Manual.

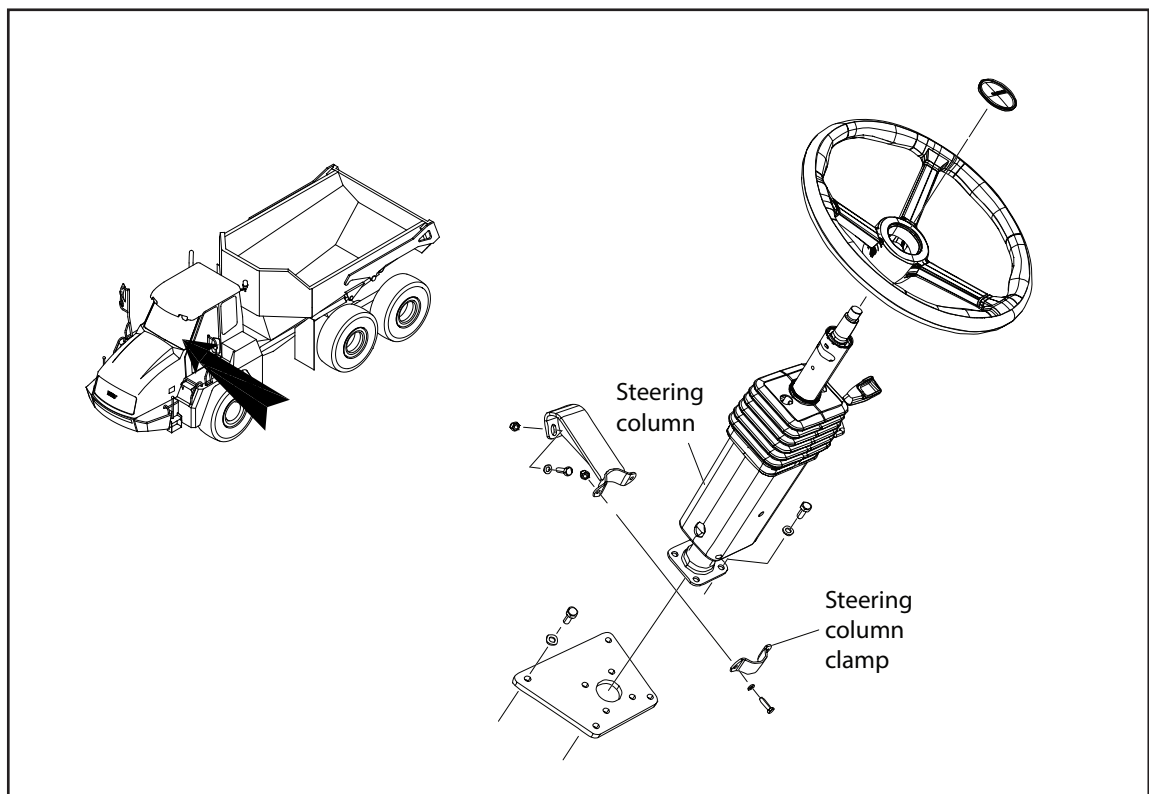


Figure 127

Removal/installation of hydraulic tank

Removal:

- Thoroughly clean the mudguard and the area around for accumulated dirt.
- Make sure the main battery switch is turned off.
- Remove the guardrail(s).

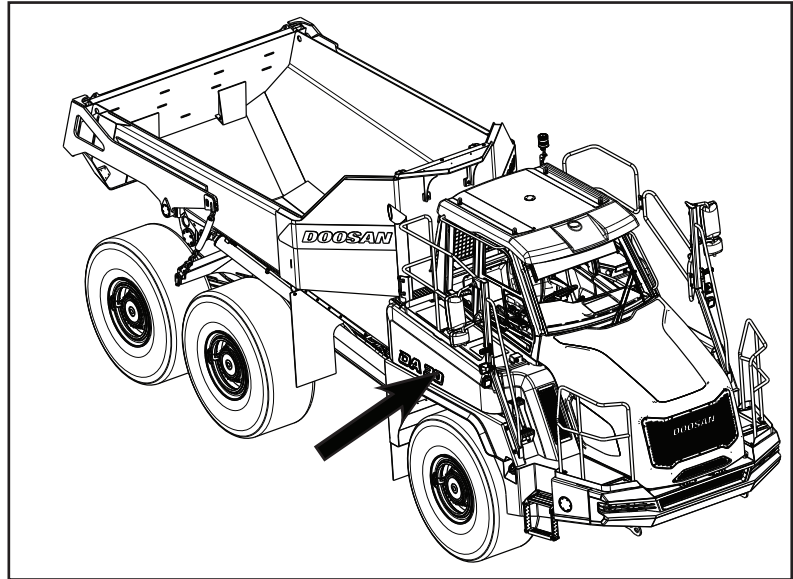


Figure 128

- Remove outer cover.
- Disconnect gas-spring from hydraulic tank.
- Lift inner cover w/hatch of the dumper.

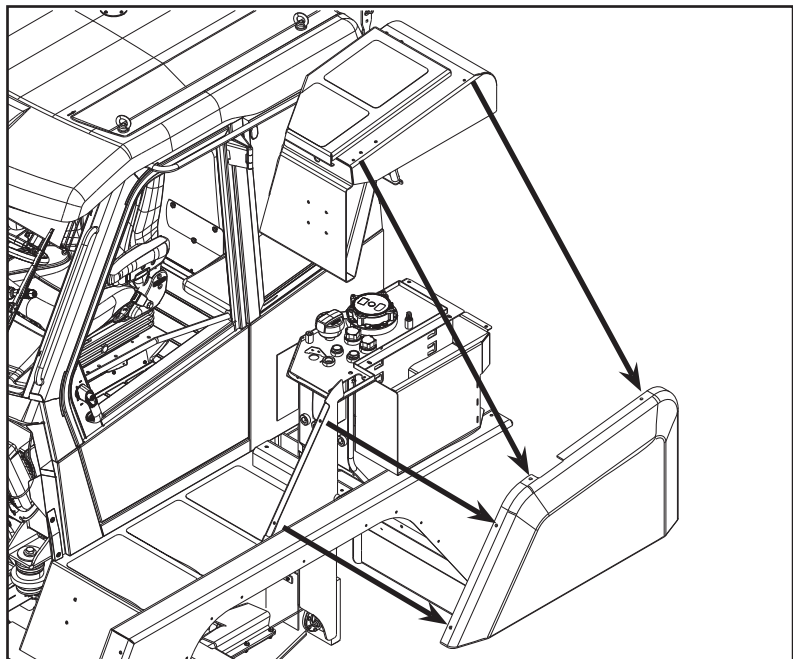


Figure 129

- Disconnect electrical connections from return filter, test block, two level sensors and temperature sensor.
- Drain all three chambers on hydraulic tank.

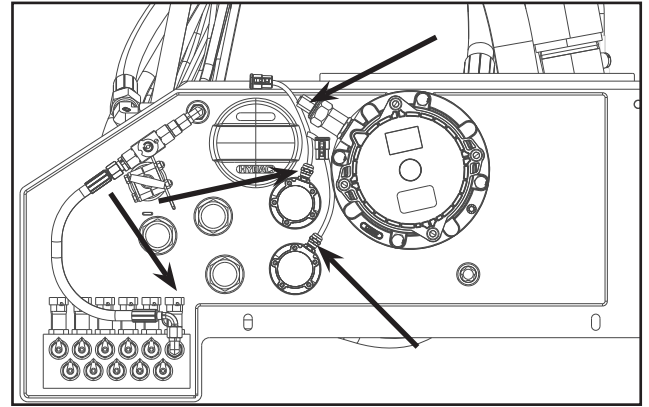


Figure 130

- Disconnect all hydraulic hoses underneath and front of the hydraulic tank.
- Disconnect all hoses underneath the test block.
- Remove the pipe clamp holding the dip stick.

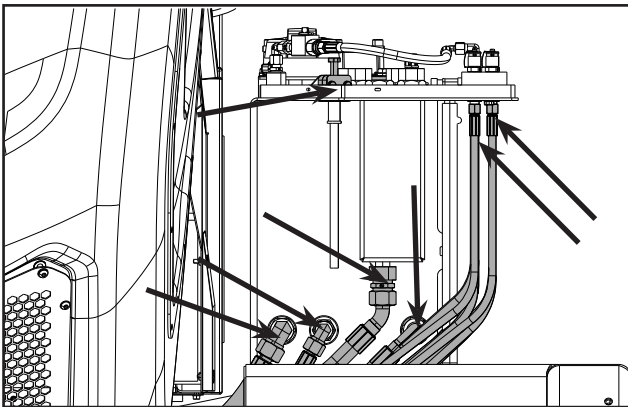


Figure 131

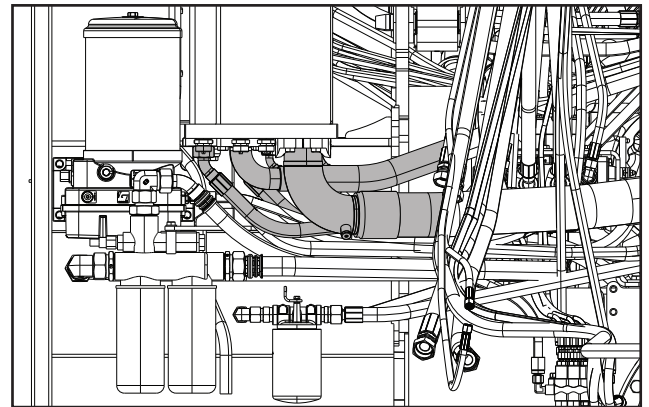


Figure 132

- Remove two bolts securing hydraulic tank to the storage box.

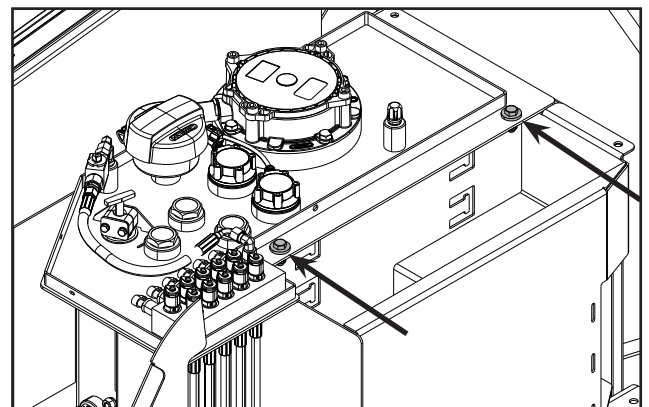


Figure 133

- Remove four bolts securing the hydraulic tank to the mudguard.

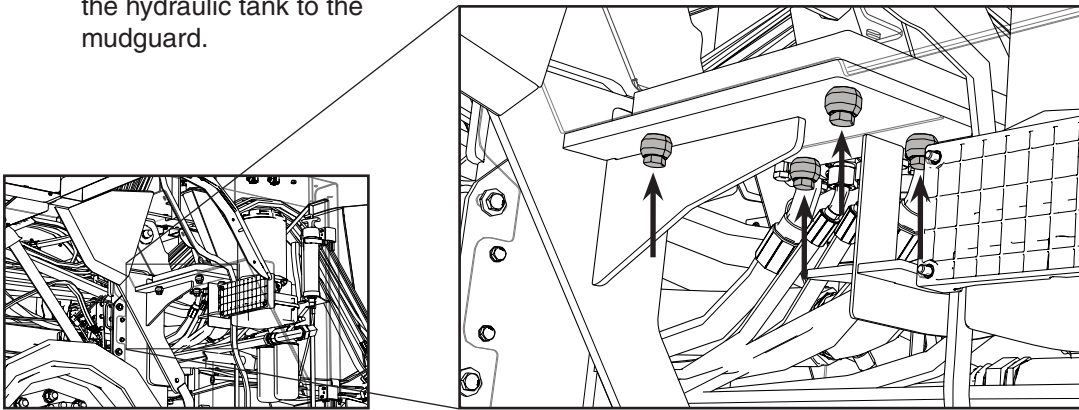


Figure 134

- Lift hydraulic tank off the dumper. Back door must be in open position when lifting

Installation:

Follow the previous steps in the reverse order to install the hydraulic tank as following:

- Position the hydraulic tank on the mudguard, and secure it with the four fastening bolts.
- Mount the two bolts securing hydraulic tank to the storage box.
- Mount the hoses underneath tank. Start from front end.
- Mount the hoses in front of tank.
- Make sure that all hoses are in right place.
- Mount the hoses to the test block. Start from rear end.
- Make sure that all hoses are in right place.
- Mount the pipe clamp to the dip stick.
- Connect electrical cables and clamps removed.
- Lift inner cover w/hatch on the dumper and secure it with the four fastening bolts.
- Connect gas-spring on hydraulic tank.
- Mount outer cover.
- Mount the guardrail(s).

Control:

- Check that all parts are located as before removal.
- Turn the main battery switch on, and check the function of electrical components affected.
- Fill up hydraulic system tank and brake cooling tank with oil specified. Check the level on the level gauge.

Removal of mudguard LHS:

- Thoroughly clean the mudguard and the area around for accumulated dirt.
- Make sure the main battery switch is turned off.
- Remove actual wheel.
- Open the bonnet.
- Disconnect electrical connections to the mirror holder.
- Remove the mirror holder. Be careful when pulling the cables through the mudguard.
- Remove hydraulic tank (See description above).
- Disconnect hoses and electrical connection from grease pump.

- Remove bolts securing transmission filter and brake cooling filter to the mudguard.

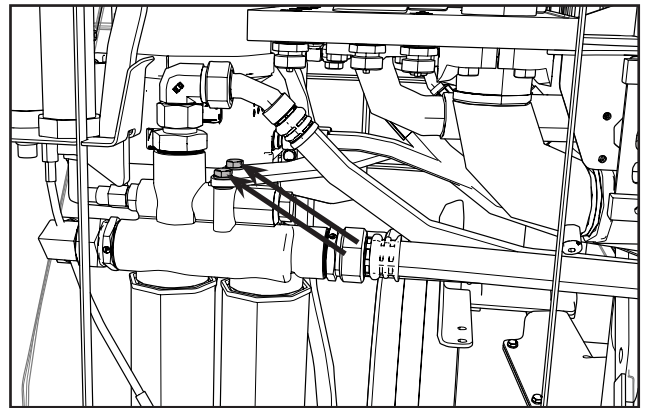


Figure 135

- Remove external parts that will be re-used if mudguard is going to be replaced by a new.
- Remove the rubber mounting between fender and mudguard.

- Remove three bolts/nuts securing mudguard to the front frame.

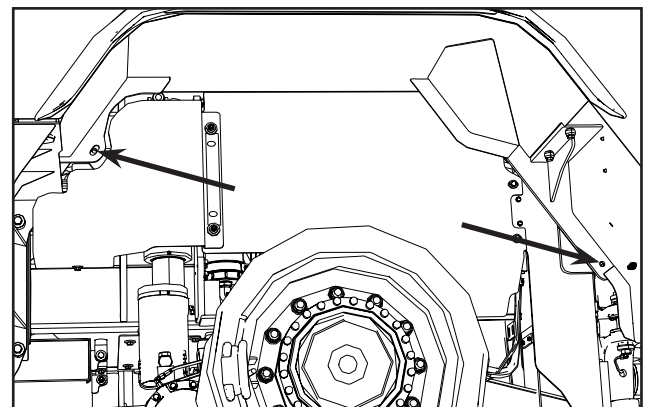


Figure 136

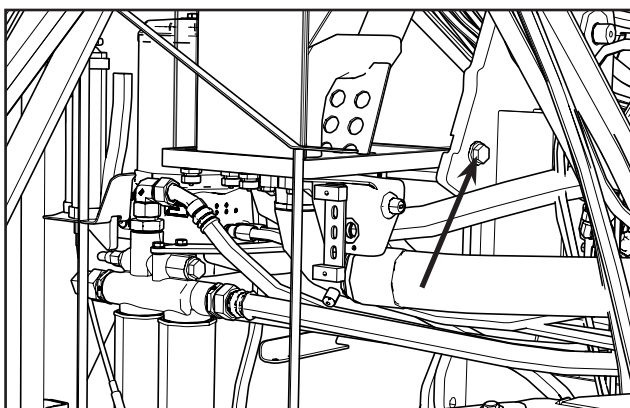


Figure 137

Hind RHS of mudguard

- Lift mudguard off the dumper.
- Check attachment points, and repair any damages to ensure proper fit of the new mudguard.

Installation:

Follow the previous steps in the reverse order to install the hydraulic tank as following:

- Position the mudguard on the front frame, and secure by tightening the three fastening bolts/nuts.
- Mount the hydraulic tank on the mudguard. (See description above).
- Connect hoses to the grease pump.
- Mount the bolts securing transmission filter and brake cooling filter to the mudguard.
- Mount the external parts if removed. Use new parts when necessary.
- Mount the mirror holder. Be careful when pulling the cables through the mudguard.
- Connect electrical cables and clamps removed.
- Close the bonnet.
- Replace the wheel.

Control:

- Check that all parts are located as before removal.
- Turn the main battery switch on, and check the function of electrical components affected.

Removal of mudguard RHS:

- Thoroughly clean the mudguard and the area around for accumulated dirt.
- Make sure the main battery switch is turned off.
- Remove actual wheel.
- Open the bonnet.
- Disconnect electrical connections to the mirror holder.
- Remove the mirror holder. Be careful when pulling the cables through the mudguard.
- Remove guardrail.

- Unscrew the 9 nuts to loosen the outer cover. Remove it by lifting it vertically out of its resting slots.
- Unscrew the 6 nuts around the air inlet grille, and the two bolts at the top to disassemble it.

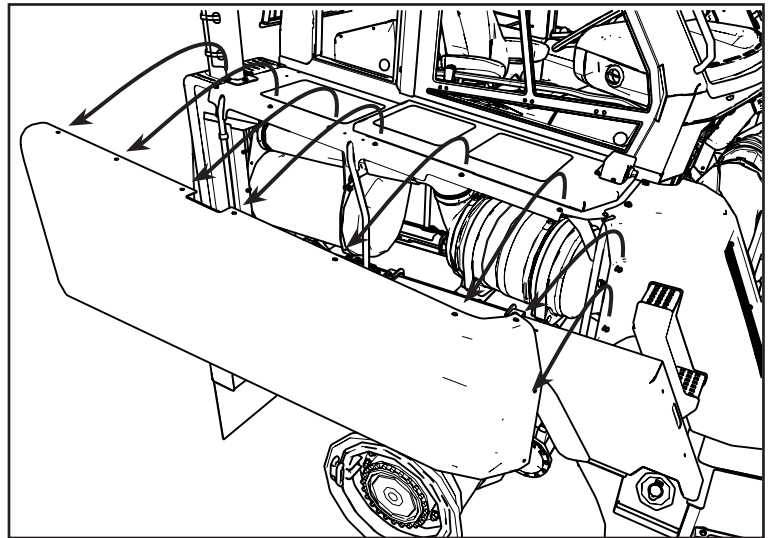


Figure 138

- Unscrew the 6 bolts behind the air inlet grille (3 on each side), and Unscrew the hose clamp on the air inlet funnel to disassemble the unit.

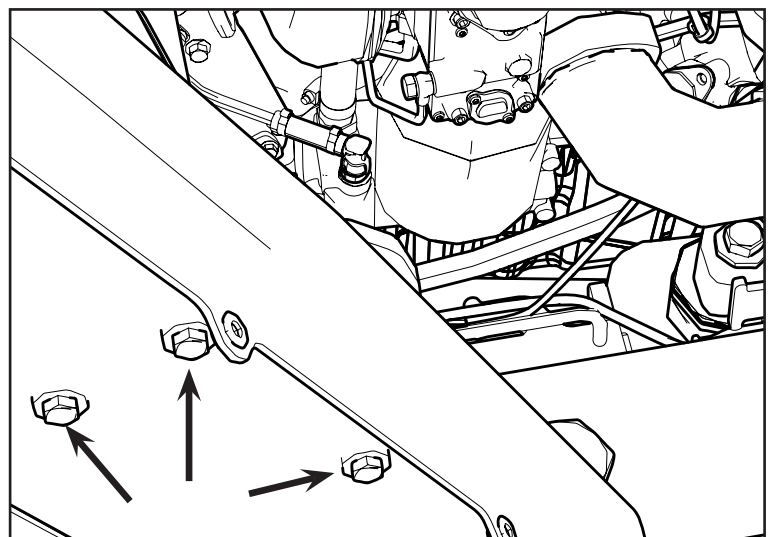


Figure 139

- Unscrew the 5 bolts to remove air guide plate.

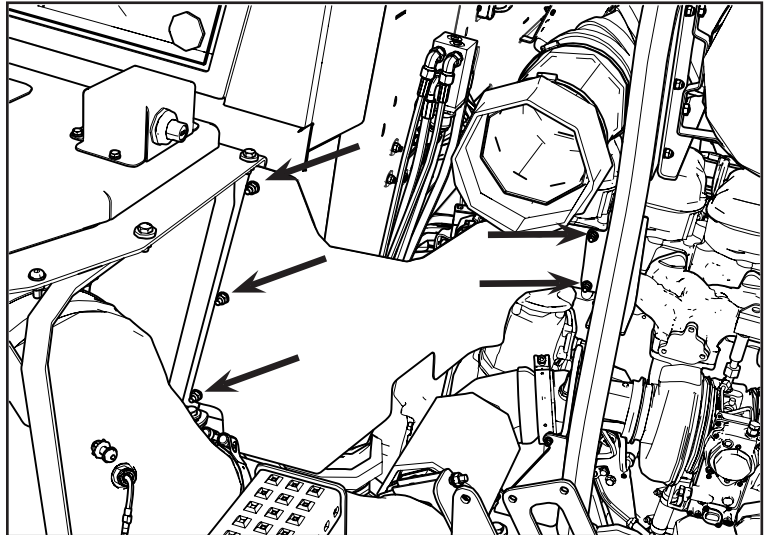


Figure 140

- Unscrew the 5 screws to remove air exhaust rear cover.
- Unscrew the 5 bolts to remove the heat shield connections, releasing it from the mudguard.

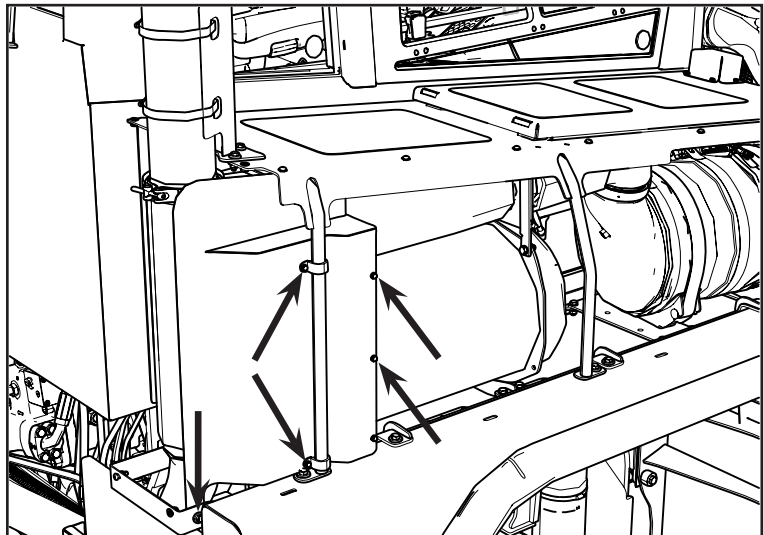


Figure 141

- Disconnect exhaust pipe from engine.
- Remove outlet exhaust pipes included bracket.
- Remove the 6 bolts at the feet of the support beams, and lift inner cover w/hatch off the dumper.
- Remove the adjacent 6 bolts, and lift exhaust system off the dumper.
- Disconnect electrical connections and hoses from Webasto unit if this is mounted.
- Remove external parts that will be re-used if mudguard is going to be replaced by a new.
- Remove the rubber mounting between fender and mudguard.
- Remove three bolts/nuts securing mudguard to the front frame.
- Lift mudguard off the dumper.
- Check attachment points, and repair any damages to ensure proper fit of the new mudguard.

Installation:

Follow the previous steps in the reverse order to install the hydraulic tank as following:

- Position the mudguard on the front frame, and secure by tightening the three fastening bolts/nuts.
- Mount the exhaust system on the mudguard. See page xx.
- Connect hoses and electrical connections to the Webasto unit. See page xx.
- Mount the external parts if removed. Use new parts when necessary.
- Mount the mirror holder. Be careful when pulling the cables through the mudguard.
- Connect electrical cables to the mirror holder.
- Close the bonnet.
- Replace the wheel.

Control:

- Check that all parts are located as before removal.
- Turn the main battery switch on, and check the function of electrical components affected.