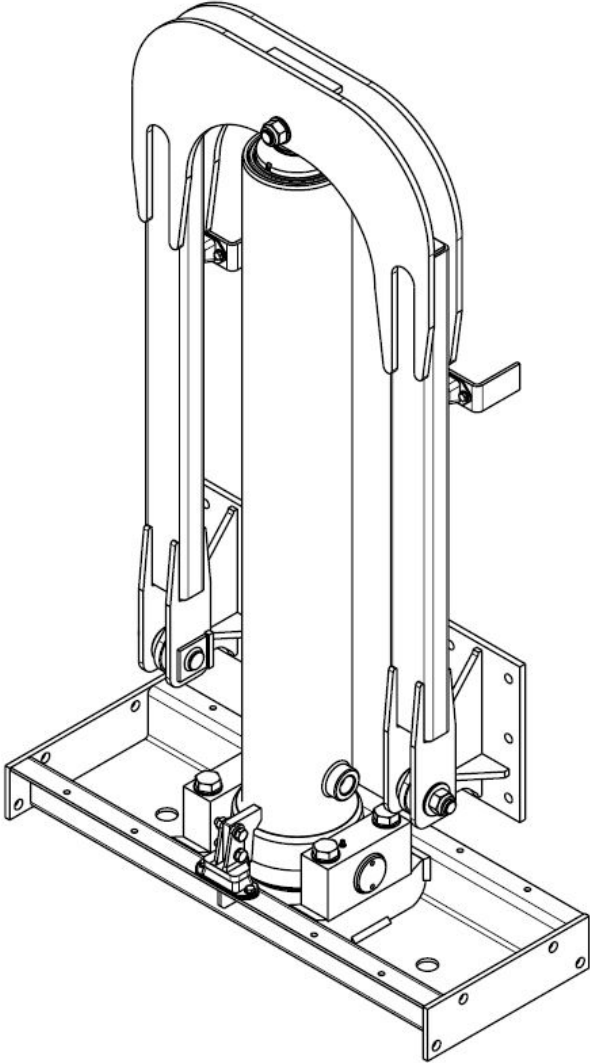


NUMMI JTC/JTD Tipping Cylinder

Installation Instructions



Version history

Version 1.0 28/08/2017

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1. Before installation

These instructions apply to vehicle superstructures that are intended for normal highway use.

NOTICE!

- **If the NUMMI JTC/JTD tipping cylinder is used in other conditions, the assembler must make sure that the structures and components are applicable for the given field of operation.**
- **Make sure that the manufacturer or importer has intended the chassis to be used with a tipping cylinder. If not, the retailer and the customer must agree on the responsibility for the assembly.**

Read these instructions and the official regulations before you start the installation:

- SFS 5339, Road vehicles, Tipping and cassette systems, constructional safety.
- SFS-EN 982, Safety of machinery. Safety requirements for fluid power systems and their components.
- SFS-EN 1050, Safety of machinery. Principles for risk assessment.
- The European Parliament and Council Directive 2006/42/EY (Machinery Directive).

Always obey the local laws and regulations.

The following instructions are of general nature. When you do the assembly, obey the model-specific instructions of the vehicle manufacturer.

2. Safety instructions

2.1. Safety messages

The safety messages shown on this page are used to identify safety messages in these instructions:



DANGER

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.



WARNING

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE!

NOTICE indicates a situation which, if not avoided, could result in material damage.



This general hazard symbol identifies important safety messages in this manual. Carefully read, understand and obey the messages.



2.2. General warnings and notices



DANGER

CRUSHING HAZARD!

Attach the body with a service prop before you go under a raised body.



WARNING

- The tipping cylinder is not designed for side loads and/or negative forces (pulling). Use the tipping cylinder only for tipping.
- Use safety straps and wires.
- The safety strap stretches. Confirm the stretch of the safety strap from the manufacturer before the assembly.



CAUTION

- Disconnect the negative battery cable before you start the installation. If the vehicle has ABS brakes, on-board computer or other electrical equipment, obey the instructions of the truck manufacturer to prevent damage to them.
- Use only applicable lifting devices to lift the tipping cylinder.

NOTICE!

- The tube speed is at maximum 0.5 m/s. Do not exceed the maximum speed.
- Use a constant flow valve or a hose brake valve in the tipping cylinder assembly.
- Make sure that the pressure relief setting is not more than the maximum cylinder pressure.
- Use a return filter and/or a pressure filter.
- The filling capacity of the oil tank must be a minimum of 20% larger than the displacement volume of the tipping cylinder.

2.3. Safety labels and product labels

Install the labels on the clean surface.

Keep the safety labels clean and visible at all times. Cover the labels during the painting or install the labels after the painting.

Do not wash the cylinder with solvents, high pressure or steam washer



Do not use a high pressure washer to clean a tipping cylinder.

This safety label is located on the subframe near by the cylinder or on the cylinder.

Do not go below the lifted body without service prop and never go below the body when the body is loaded



This safety label is located on the subframe near by the cylinder.





NUMMI logo is located on the subframe near by the cylinder.

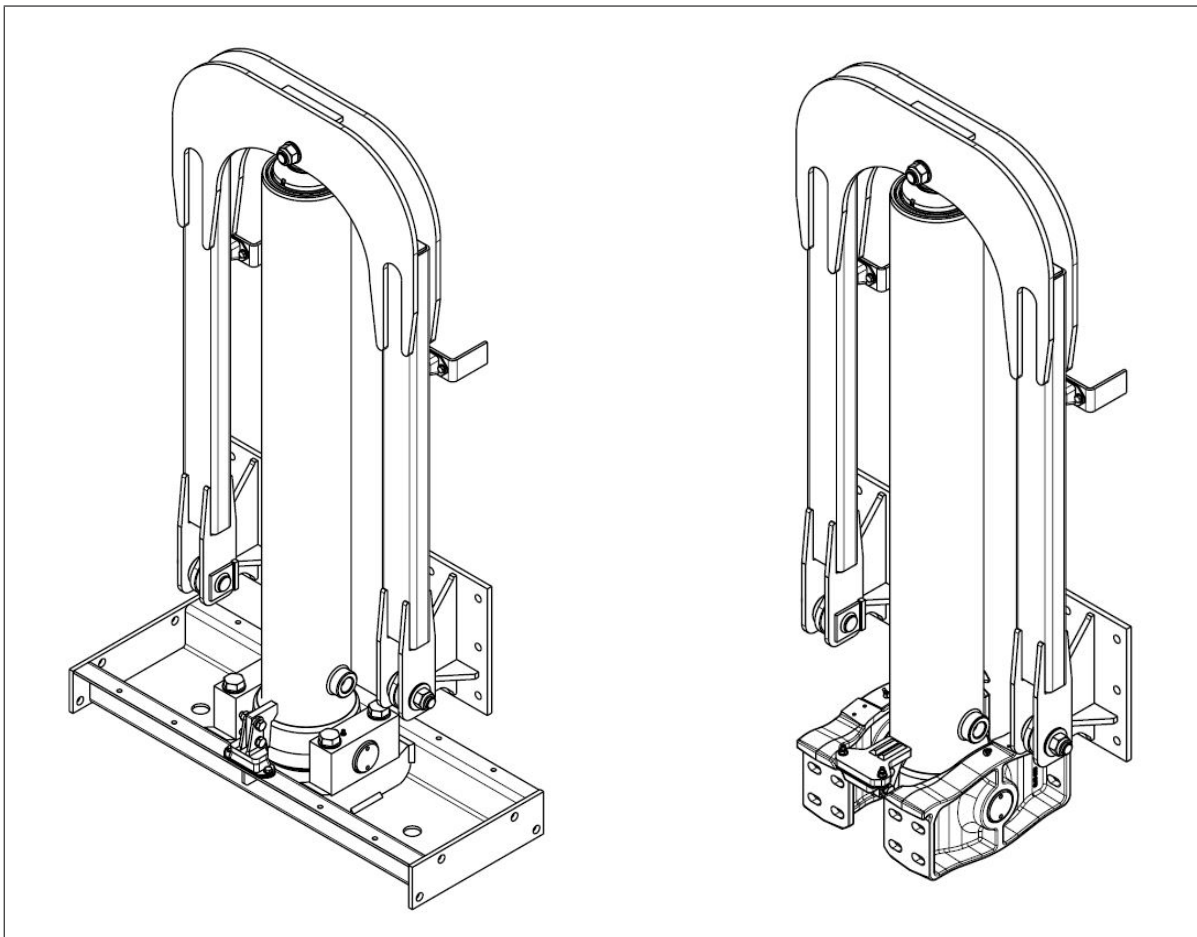
| | | |
|--|---------|--------------|
| NUMMI  | | |
| MODEL Wipro Infrastructure Engineering Oy | | |
| TELS 219/ 55X1962 ST,TT22 P70 PV | | |
| CODE | NO | MAX PRESSURE |
| 310206650-2 | 153527 | 25 MPa |
| CODE | YEAR | MAX THRUST |
| | 04 2015 | 25 TON |
| MADE IN FINLAND | | |

Product label is located on the subframe near by the cylinder or on the cylinder.

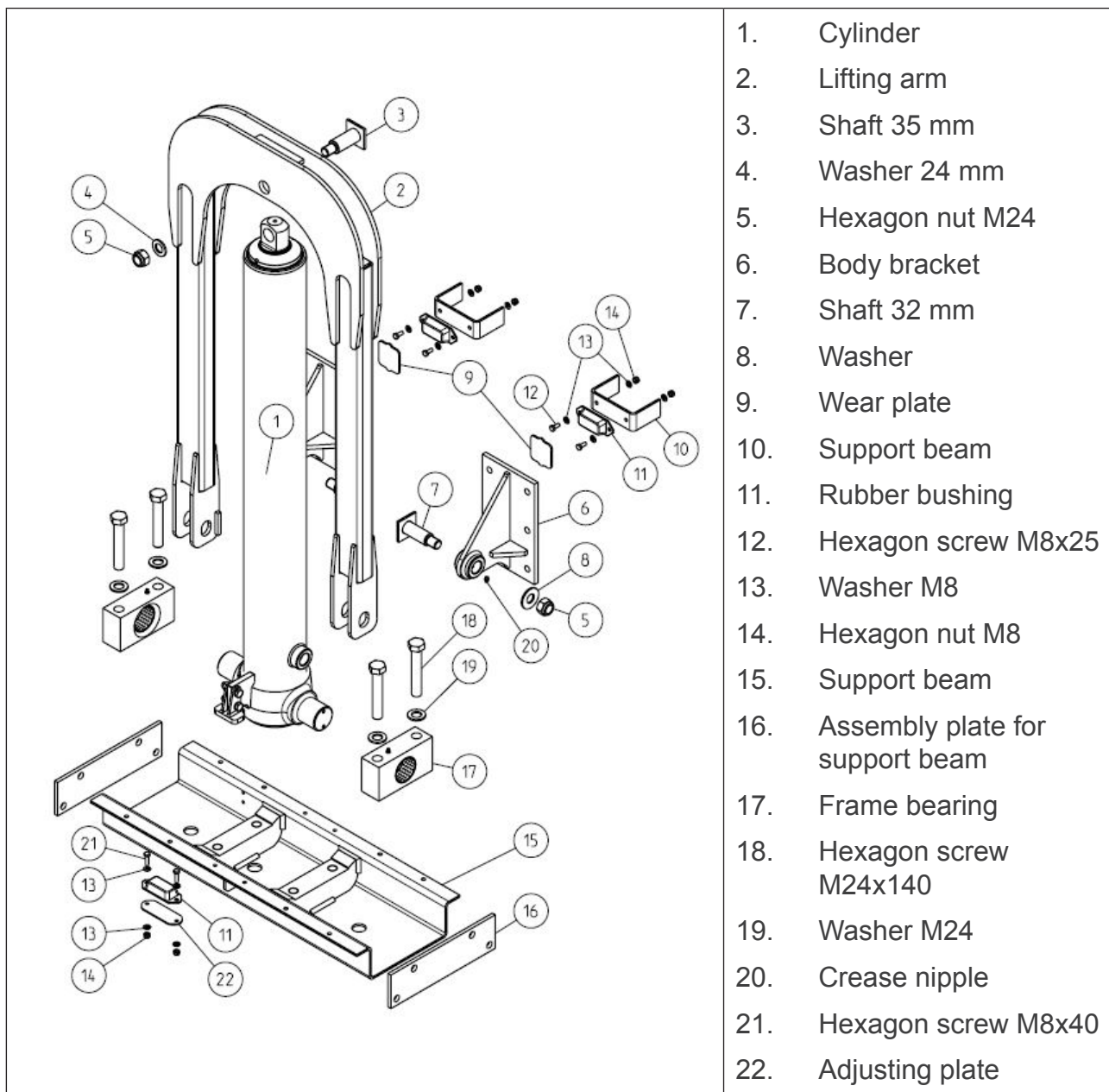
3. Introduction to the JTC/JTD tipping unit

NUMMI JTC/JTD tipping cylinder is suitable for rear-end tipping. The NUMMI JTC/JTD tipping cylinder is installed to a vehicle's subframe crosswise with a support beam JTC or bearing bracket JTD.

The tipping angle is limited with a hydraulic knock-off kit or with a pneumatic knock-off kit.



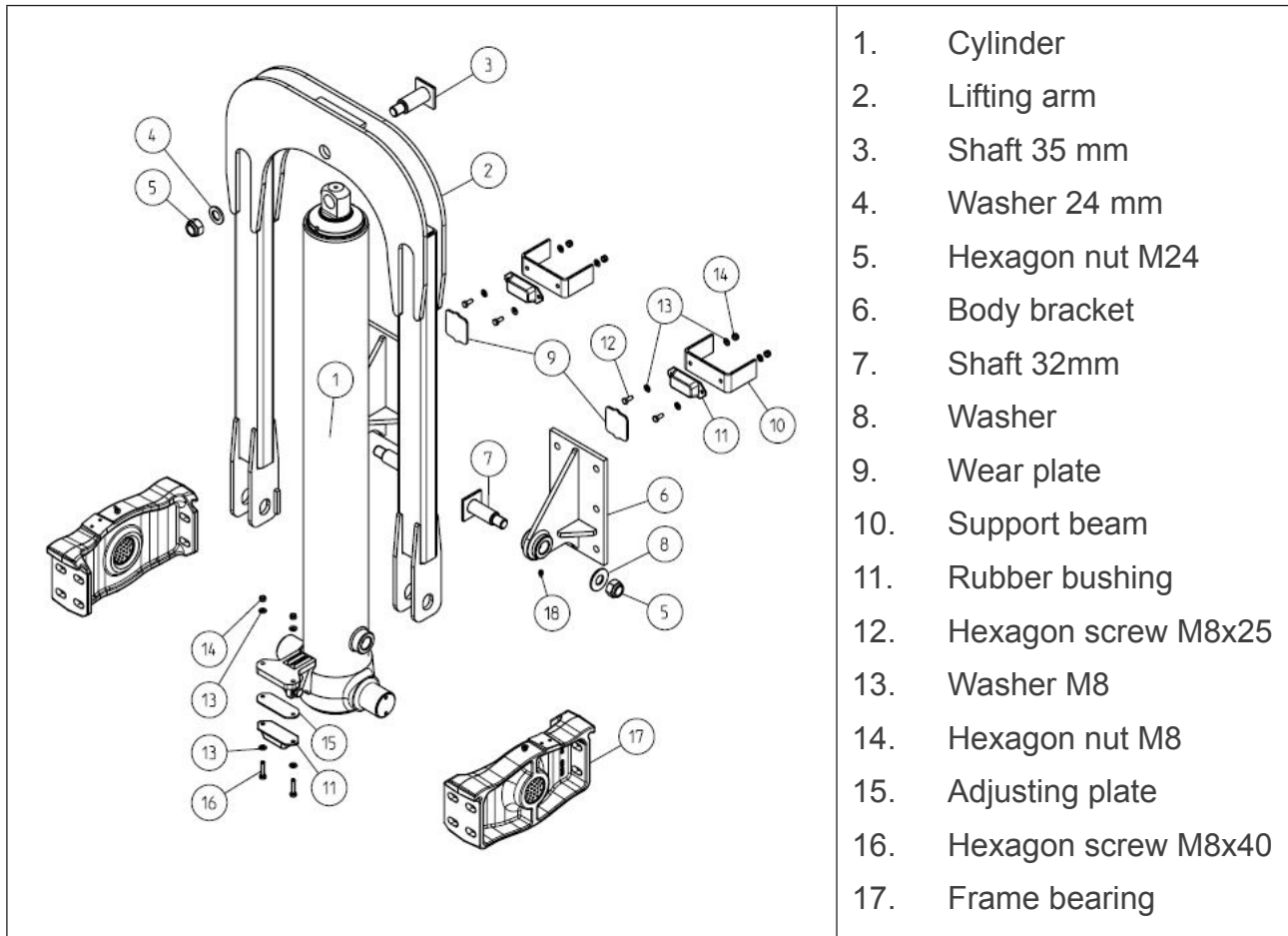
3.1. Delivery content of the JTC tipping unit



NOTICE!

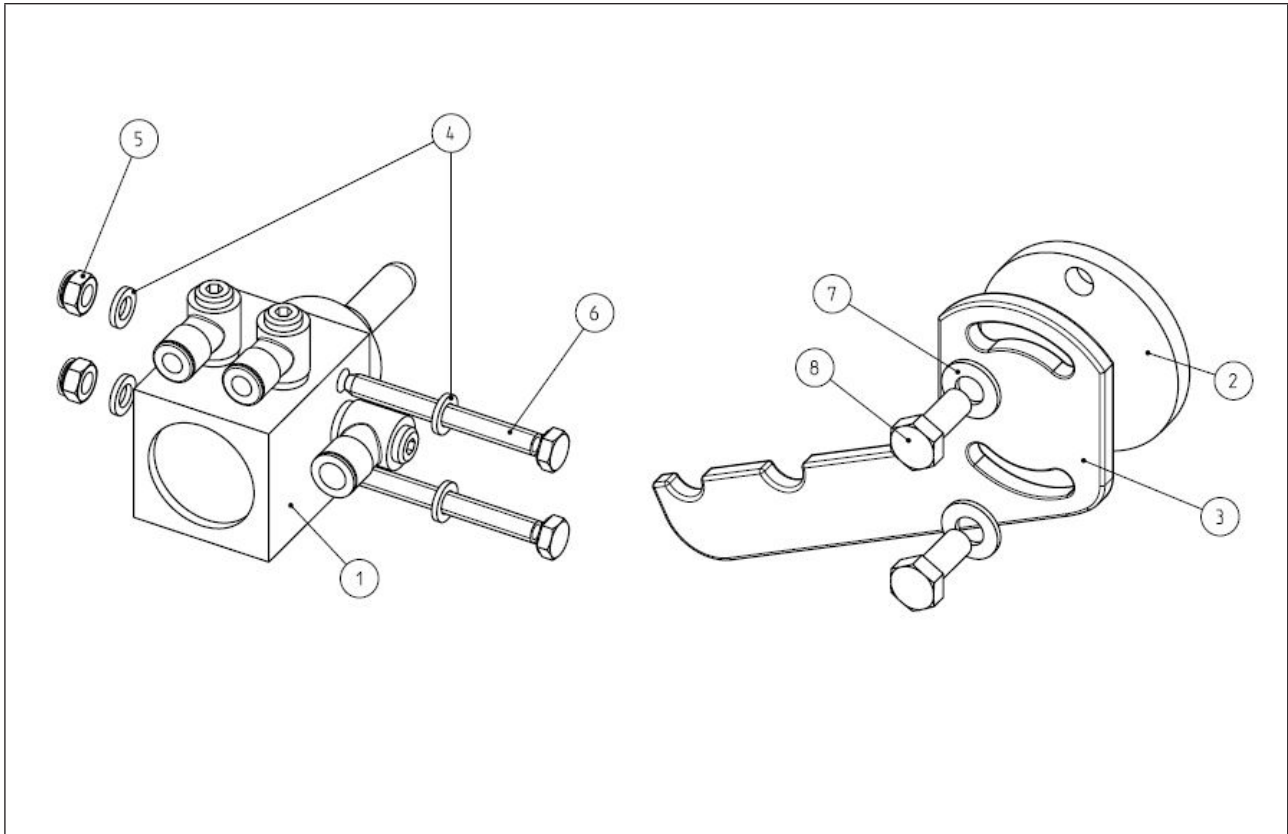
The pneumatic knock-off kit for JTC and JTD is not included in the delivery content.

3.2. Delivery content of the JTD tipping unit



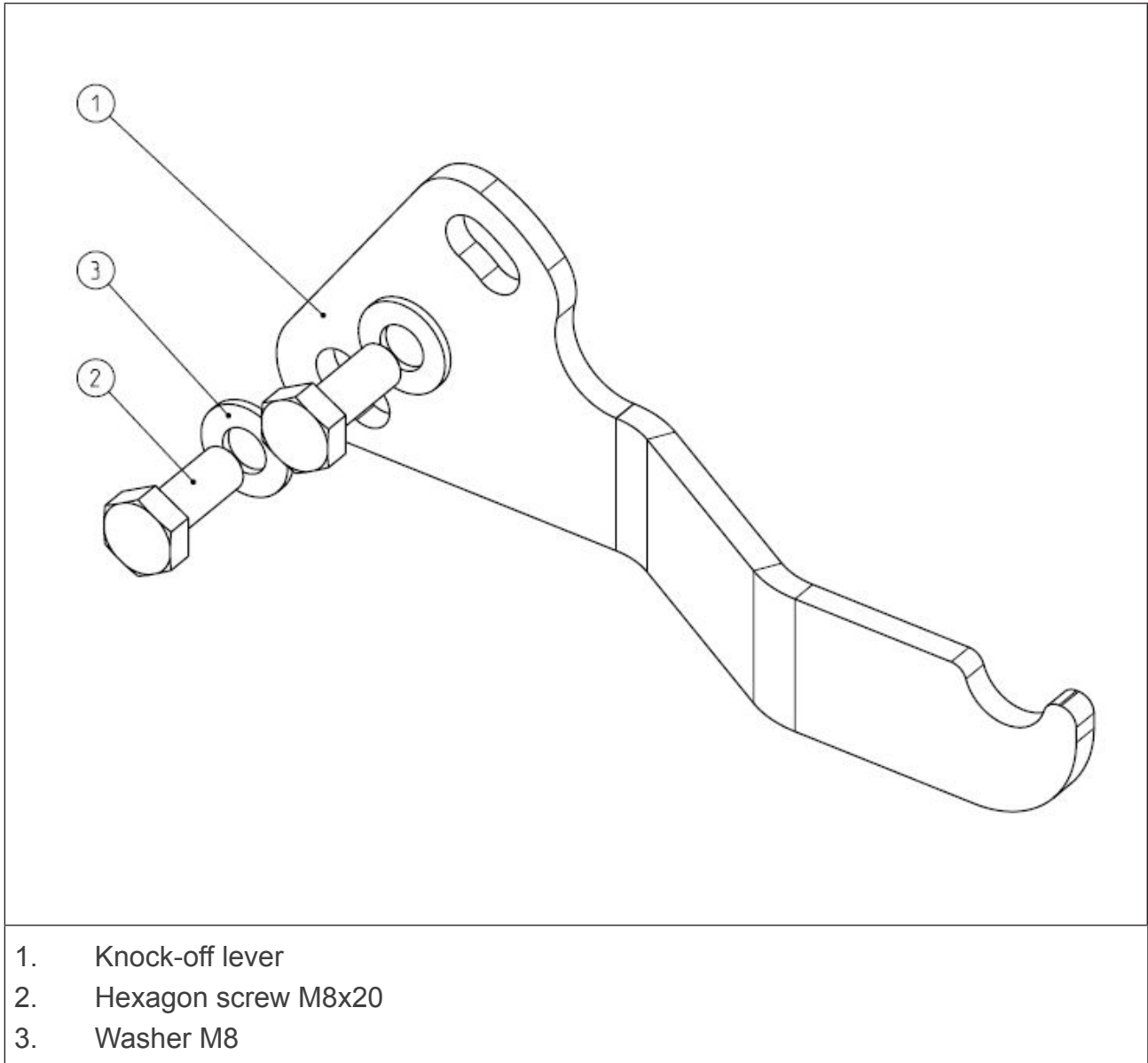
NOTICE! The pneumatic knock-off kit for JTC and JTD is not included in the delivery content.

3.3. Delivery content for the JTC knock-off kit



1. Pneumatic knock-off valve
2. Washer for the lever
3. Knock-off lever
4. Washer M6
5. Hexagon nut M6
6. Hexagon screw M6x60
7. Washer M8
8. Hexagon screw M8x20

3.4. Delivery content for the JTD lever

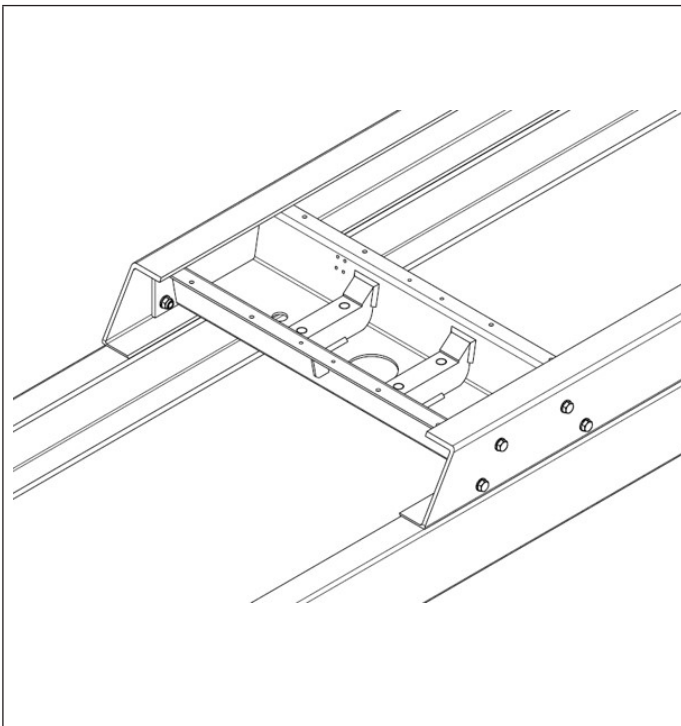
**NOTICE!**

The JTD lever can be used with pneumatic knock-off or with hydraulic knock-off valve.

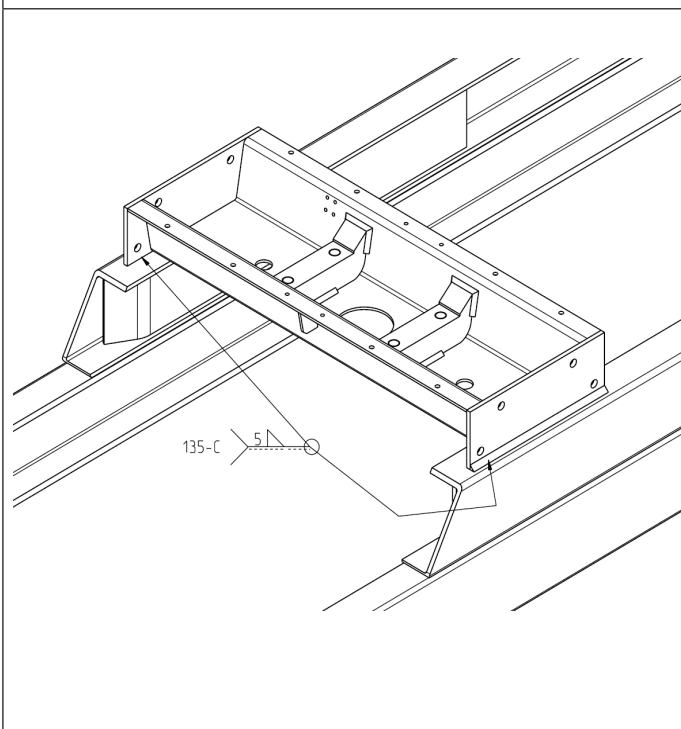
Knock-off valve must be ordered separately. Pneumatic knock-off valve p/n 360508437 and hydraulic knock-off valve p/n 360507832.

4. Mounting the JTC support beam

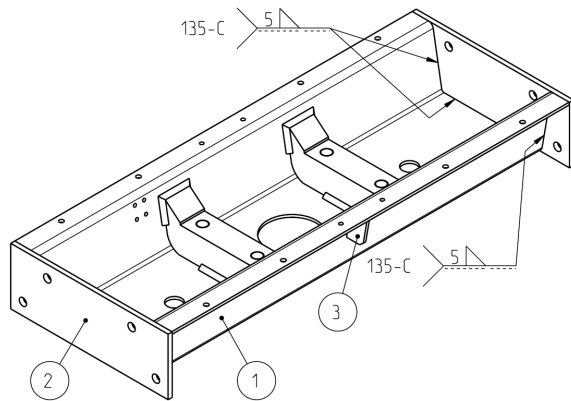
4.1. Support beam between the subframe or above the subframe



1. Support beam mounted between the subframe.



2. Support beam mounted above the subframe:
 - Attach the support beam from its support points as illustrated.



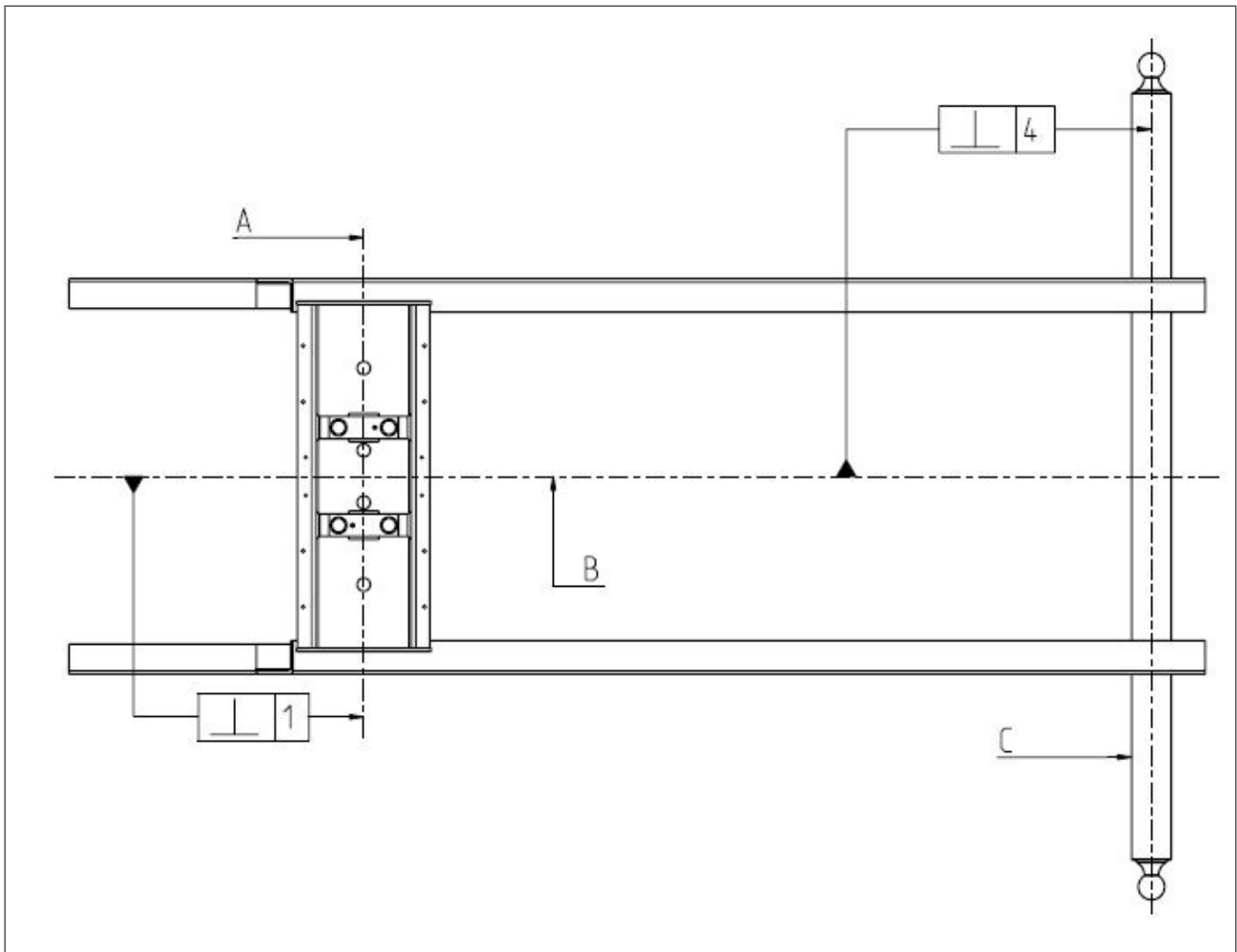
3. Shorten the support beam equally from both ends.
4. Weld the fastening plates part 2 from both ends to the support beam.

By doing this the support beam can be dismantled and mounted back quickly.

The support plate should be facing forward on the vehicle.

- Use bolts size M16 with minimum strength class 8.8. Tightening torque should be minimum 190 Nm.
- The support beam can also be fixed to vehicle by welding. Avoid transverse weld seams.





- A. Axis through cradle bearings
- B. Center line
- C. Rear tipping axle

WEAKENED STABILITY!

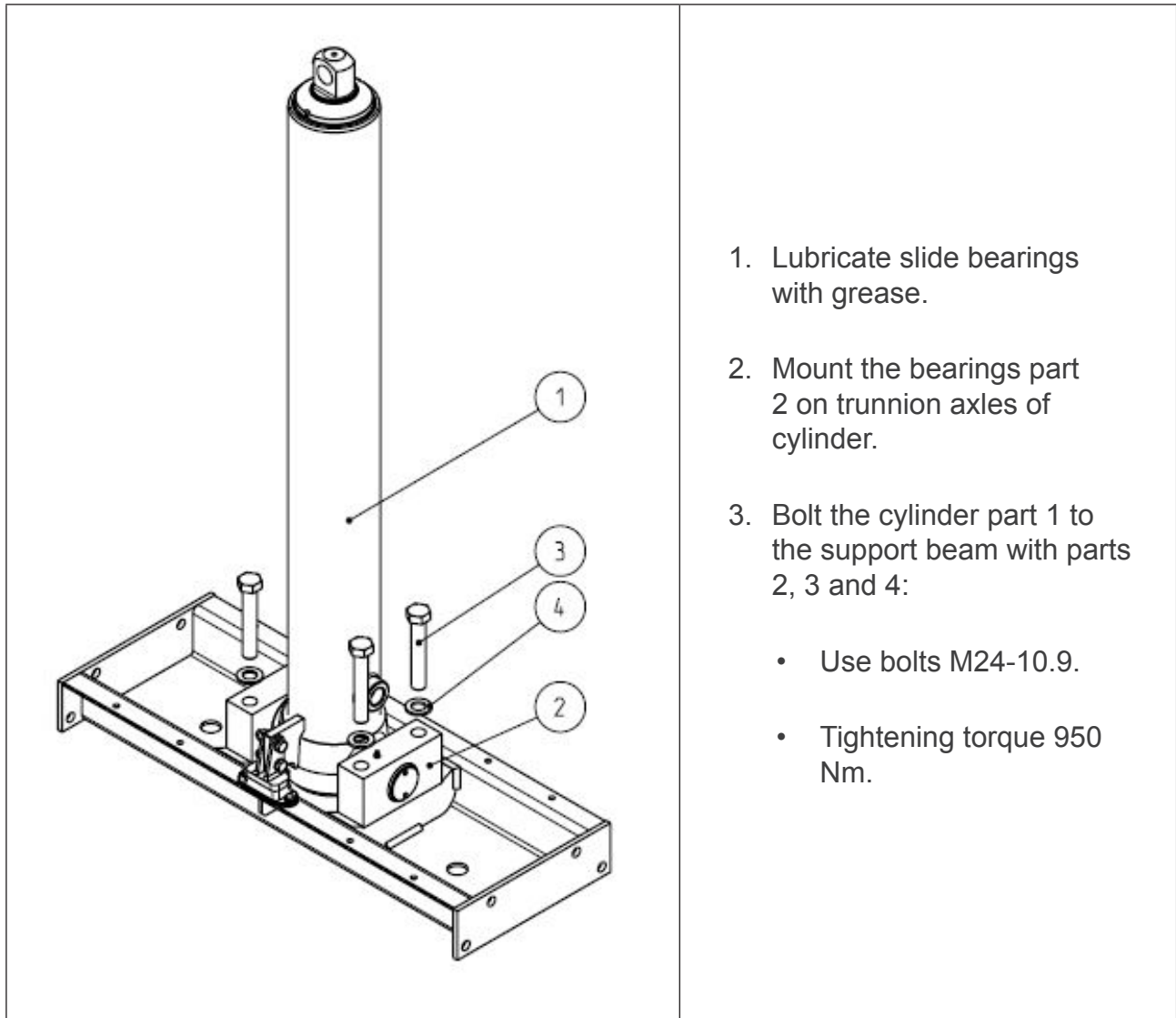


CAUTION

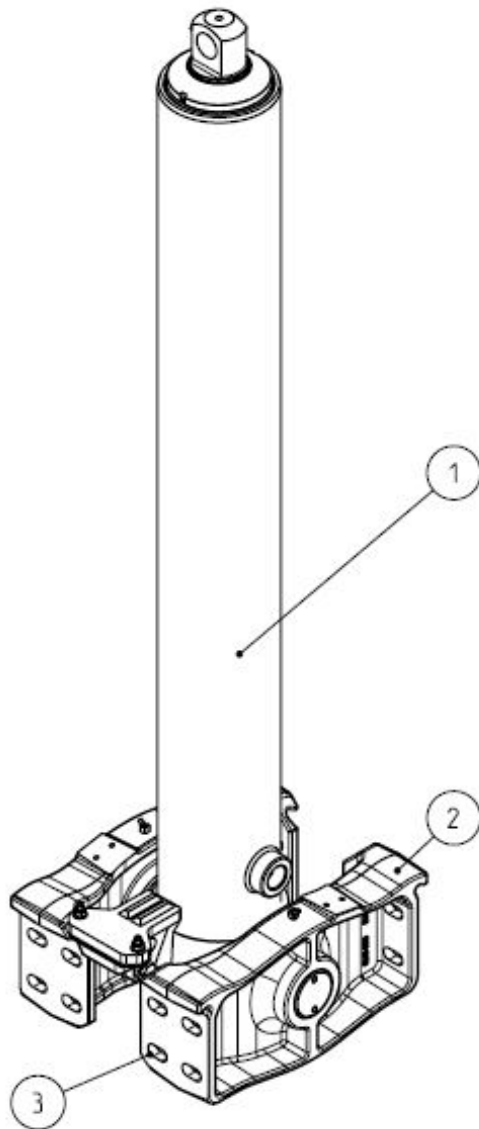
Secure that the support beam is on perpendicular position on the chassis and in line with the tipping hinge.

If the support beam and the tipping hinge are not in line the cylinder will get extra side force and the tipping stability can be weakened significantly.

4.2. Mounting JTC cylinder on the support beam



4.3. Mounting JTD bearing brackets



1. Attach the bearing brackets part 2 with bolts between two welded cross beams on subframe of vehicle.

2. Mount bearing brackets between two cross beams with 368 mm distance.

See the installation dimensions from the tipping unit drawing.

3. Lubricate slide bearings before mounting the brackets on trunnion axles:

- Use bolts M16 with minimum strength class 8.8.
- Tightening torque should be minimum 190 Nm.
- Use washers with bolts and nuts.
- Make sure that the transverse beams are strong enough to hold the tipping cylinder forces.



CAUTION

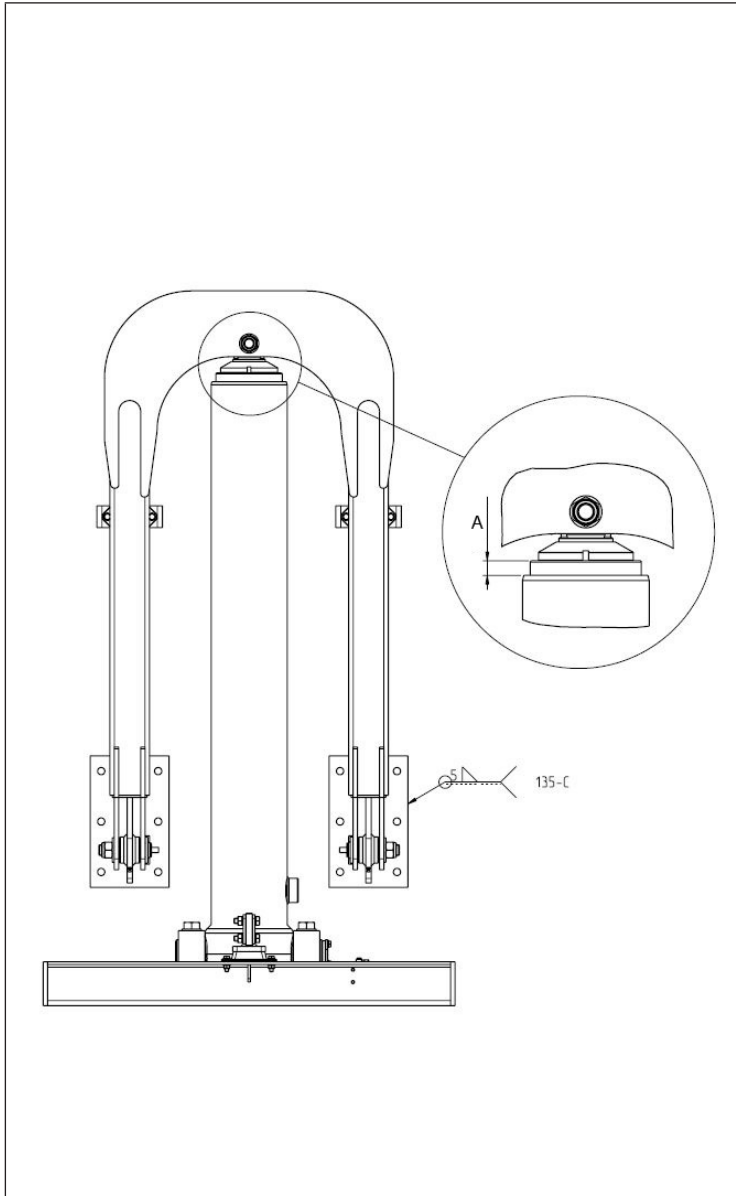
WEAKENED STABILITY!

Secure that the transverse beams are on perpendicular position on the chassis and in line with the tipping hinge.

If the support beam and the tipping hinge are not in line the cylinder will get extra side force and the tipping stability can be weakened significantly.



5. Mounting the body brackets for JTC/JTD



1. Attach the body brackets with bolts to the front end of the body.
2. Alternatively the body brackets can be attached by welding.

Leave a mounting space (A) minimum of 20 mm (recommendation 40 mm) to the cylinder so that forces while driving does not affect the cylinder.

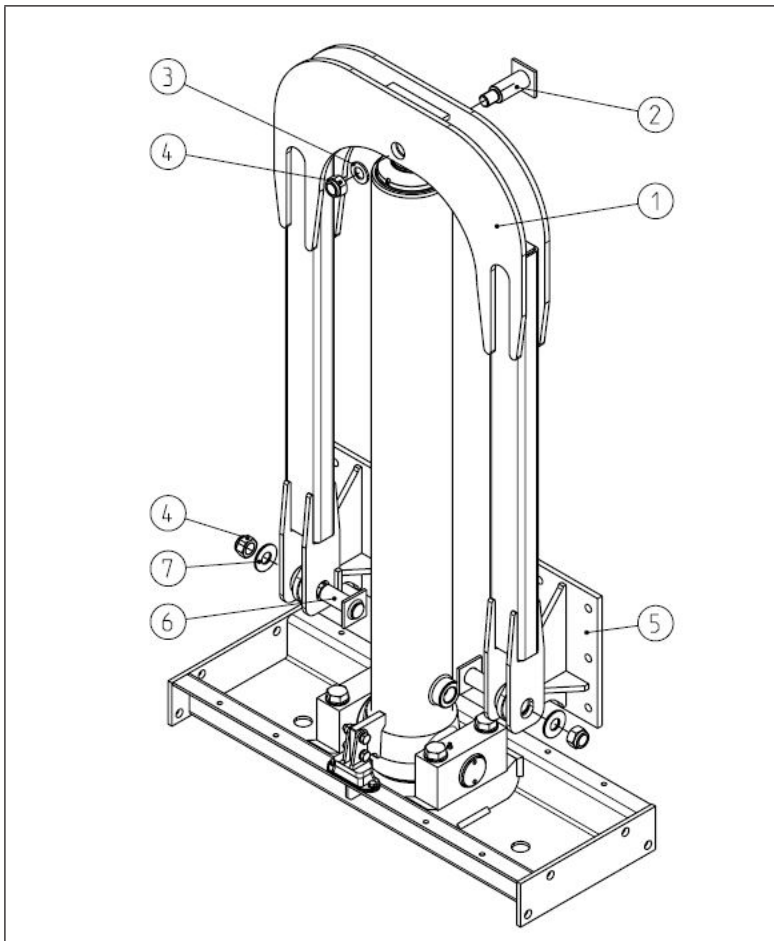
See the installation dimensions for the body brackets from the tipping unit drawing:

- Use bolts M16 with minimum strength class 8.8.
- Tightening torque should be minimum 190 Nm.

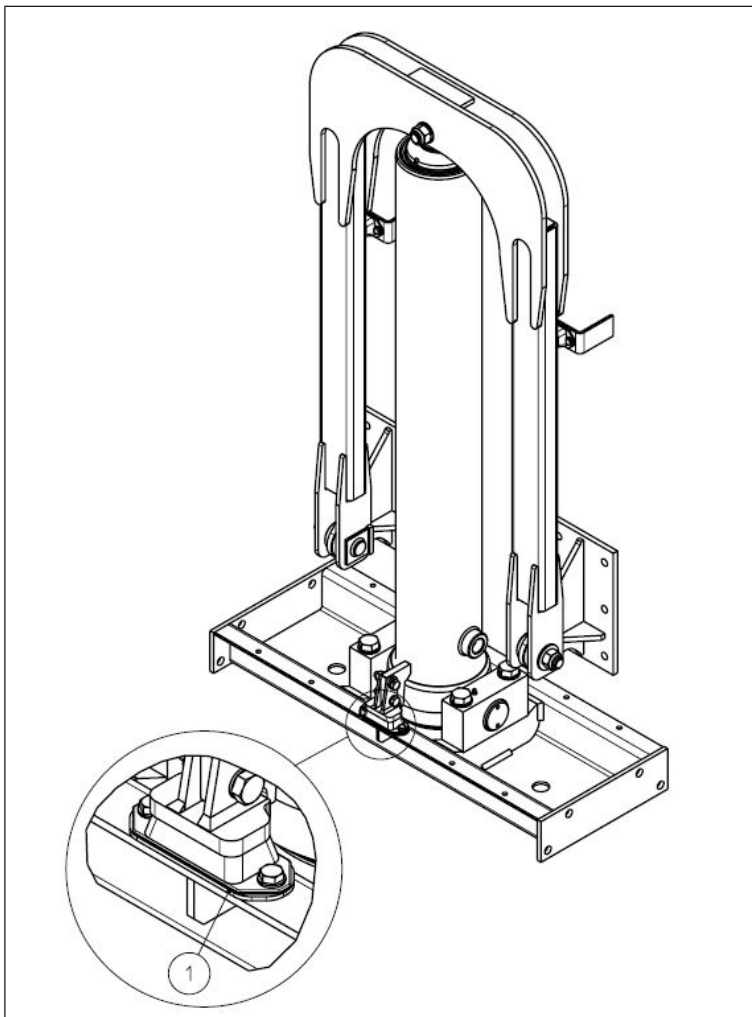
6. Mounting the lifting arm JTC/JTD

| | |
|--|--|
| | <ol style="list-style-type: none"> 1. Before mounting the lifting arm make sure that cylinder is installed on the support beam or in the bearing brackets. 2. Weld the wear plates for the rubber damper to the lifting arm. <p>See the illustration for the two welding places.</p> <p>Wear plates should be welded as high as possible to the front end of the body.</p> |
| | <ol style="list-style-type: none"> 3. Weld the support beams part 3 to body to same level as the wear plates part 2. |





1. Use crane to lift the lifting arm to the correct position.
2. Install parts 6, 7 and 4.
3. Install parts 2, 3 and 5.
 - Tightening torque for part 4 should be 500-650 Nm. Make sure that lifting arm is moving freely.
 - Tightening part 4 too tight might result cylinder tubes malfunction.



1. Adjustment for JTC-models 153-195:
 - Add extra adjusting plate between the rubber damper and the support beam.

2. Adjustment for JTD-models 153-219:
 - Add extra adjusting plate between the rubber damper and the cross beam.

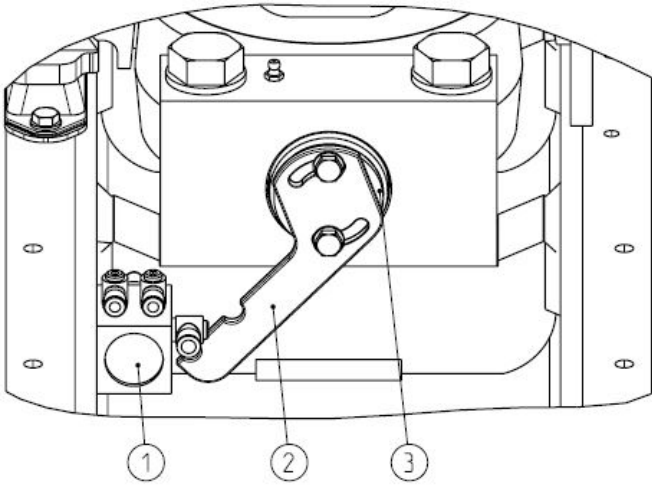
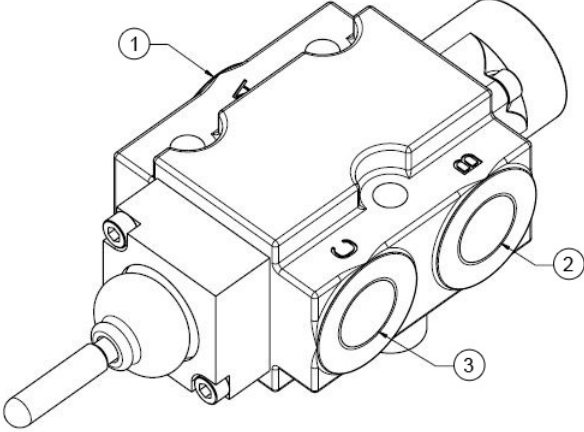
3. Check the adjustment of the cylinder and add adjustment plates if needed.

Adjust the pretension of the lifting arm so that the cylinder does not swing while driving.

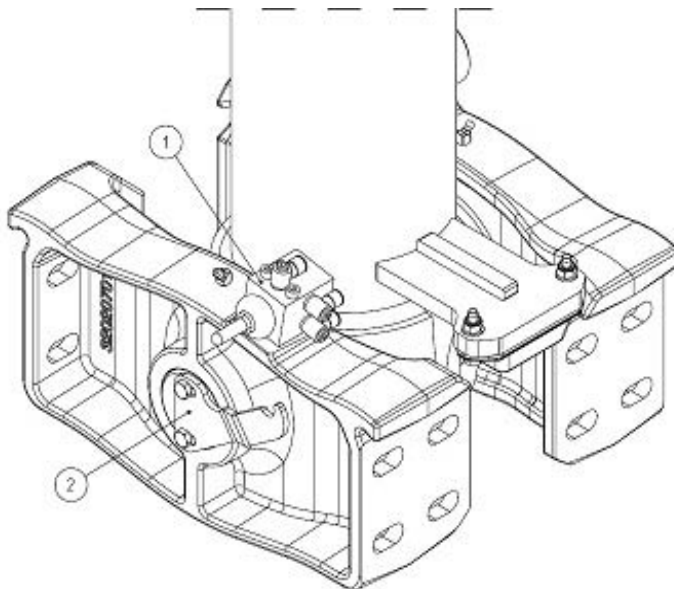


7. Mounting of the knock-off device

7.1. Mounting knock-off kit for JTC

| | |
|--|--|
|  | <ol style="list-style-type: none"> 1. Attach the pneumatic knock-off valve on the holes of support beam: <ul style="list-style-type: none"> • Use two M6x60 (hex-head) screws. • Tightening torque should be 8 Nm. 2. Mount the knock-off lever to the end of the trunnion axle with a washer: <ul style="list-style-type: none"> • Use two M8x20 screws. • Adjust the knock-off lever to achieve correct tipping angle. |
|  | <ol style="list-style-type: none"> 3. The same knock-off lever can be used together with the hydraulic knock-off valve: <ul style="list-style-type: none"> • Mount the hydraulic knock-off valve on support plate. • Weld the support plate on the support beam. |
| <ol style="list-style-type: none"> 1. In 2. Return / plug 3. Cylinder | |

7.2. Mounting knock-off kit for JTD



1. Attach the pneumatic knock-off valve part 1 on the holes of bearing bracket:

- Tightening torque should be 8 Nm.

2. Mount the knock-off lever part 2 to the end of the trunnion axle:

- Use two M8x20 screws.
- Adjust the knock-off lever to achieve correct tipping angle.

Notice! Use bent version of the knock-off lever with JTD-models.

3. The same knock-off lever can be used together with the hydraulic knock-off valve:

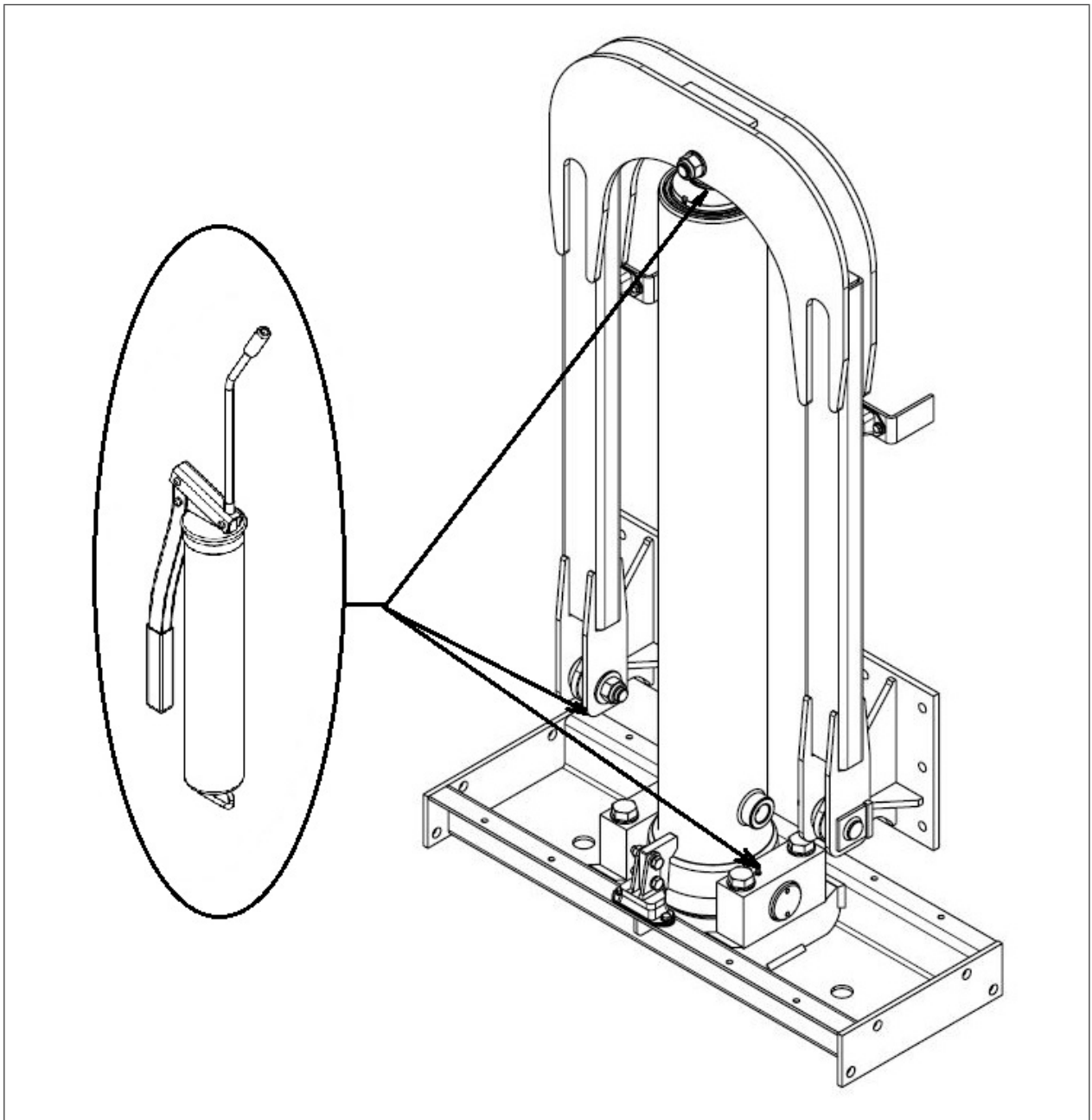
- Mount the hydraulic knock-off valve on support plate.
- Weld the support plate on the support beam.

The knock-off valves must be ordered separately with the lever.

8. Lubricating the lubrication points of the JTC/JTD tipping unit

Before you use the tipping unit, lubricate:

- lifting arm axle
- bearing brackets
- body bracket axles.



9. Connecting the hydraulics

9.1. Requirements for the hydraulic oil

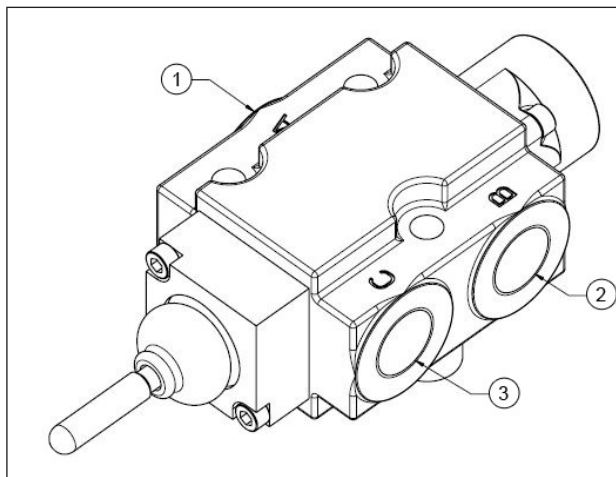
Wipro recommends the use of hydraulic oils that meet these standards in the ISO VG 22 viscosity class:

- ISO 11158 HV
- DIN 51524 HVLP.

The level of cleanliness must be as in the standard ISO 4406 18/16/13.

9.2. Connecting the hydraulic knock-off valve

9.2.1. With a 2-line connection



1. Pressure

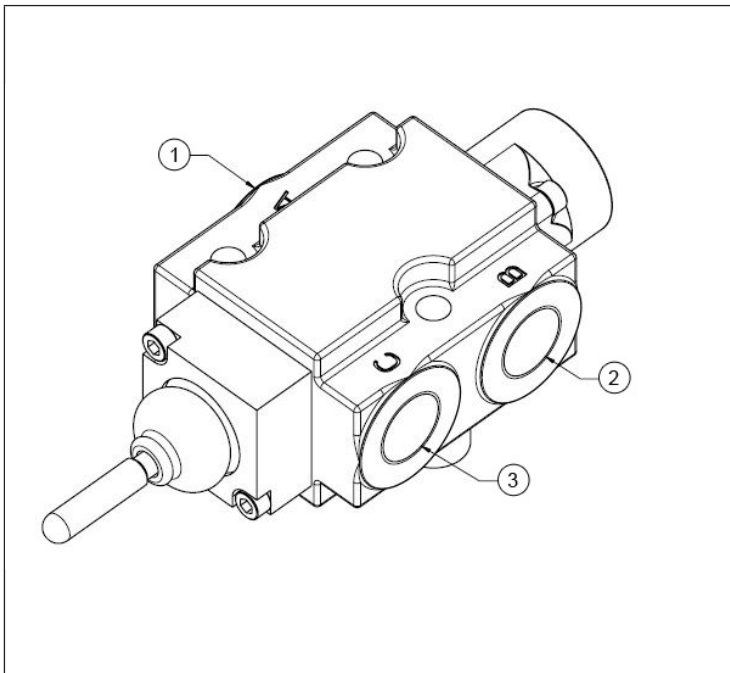
2. Return

3. Cylinder

- You can connect the hydraulic knock-off valve in two different ways.



9.2.2. With a 1-line connection



A. Pressure

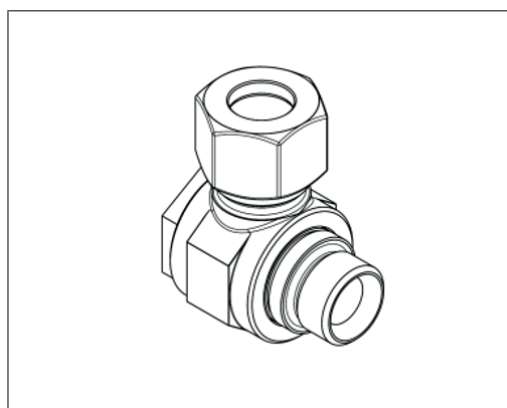
B. Plug

C. Cylinder

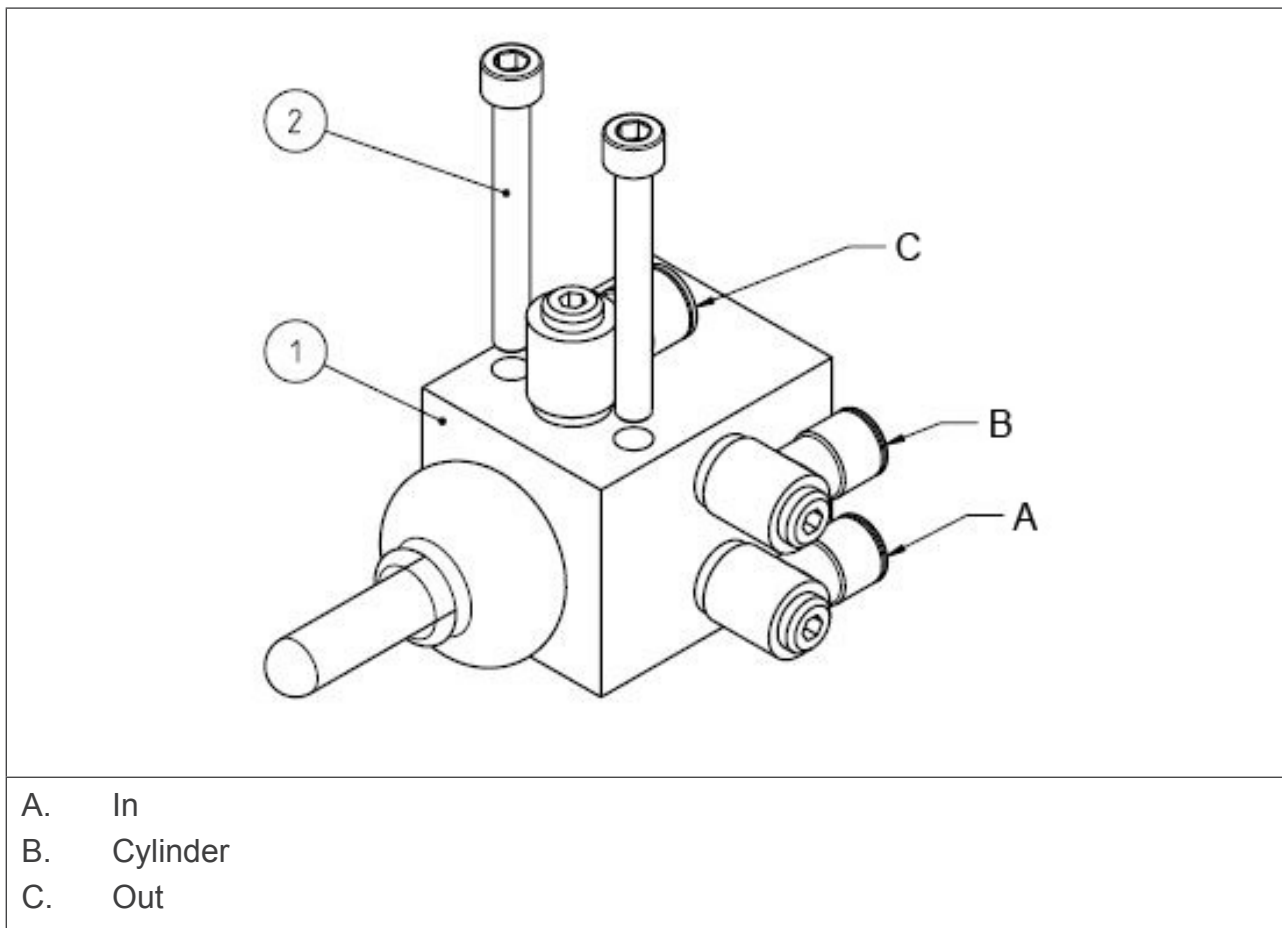
- The 1-line connection is used for example, in trailer installations, if the hydraulic connection is made without a separate return line.
- The return port (B) of the knock-off valve is sealed with a plug.

9.3. Connecting hydraulics to the tipping cylinder when using a pneumatic knock-off kit

When you use a pneumatic knock-off kit, connect the hose from the tipping valve with a swivel adapter p/n 360408844 to the oil connection of the tipping cylinder.



9.3.1. Pneumatic knock-off connection



10. Adjusting the tipping angle

10.1. Adjusting the safety strap or the safety wire

The function of the safety strap or the wire is to stop the movement of the tipper body and the tipping cylinder before the tipping cylinder has extended to its full length.

Make sure that the limiting device works before you tighten the safety strap or wire. There must be a lateral allowance of 2-4 cm in the line.



WARNING

The safety strap stretches. Confirm the stretch of safety strap from the manufacturer before the assembly.

10.2. Removing air with test tipping

Before you make adjustments to the tipping angle:

- Rear-tip the tipping cylinder to the full length 5 times carefully to remove air out from the system.
- Monitor that the tipping cylinder functions correctly.

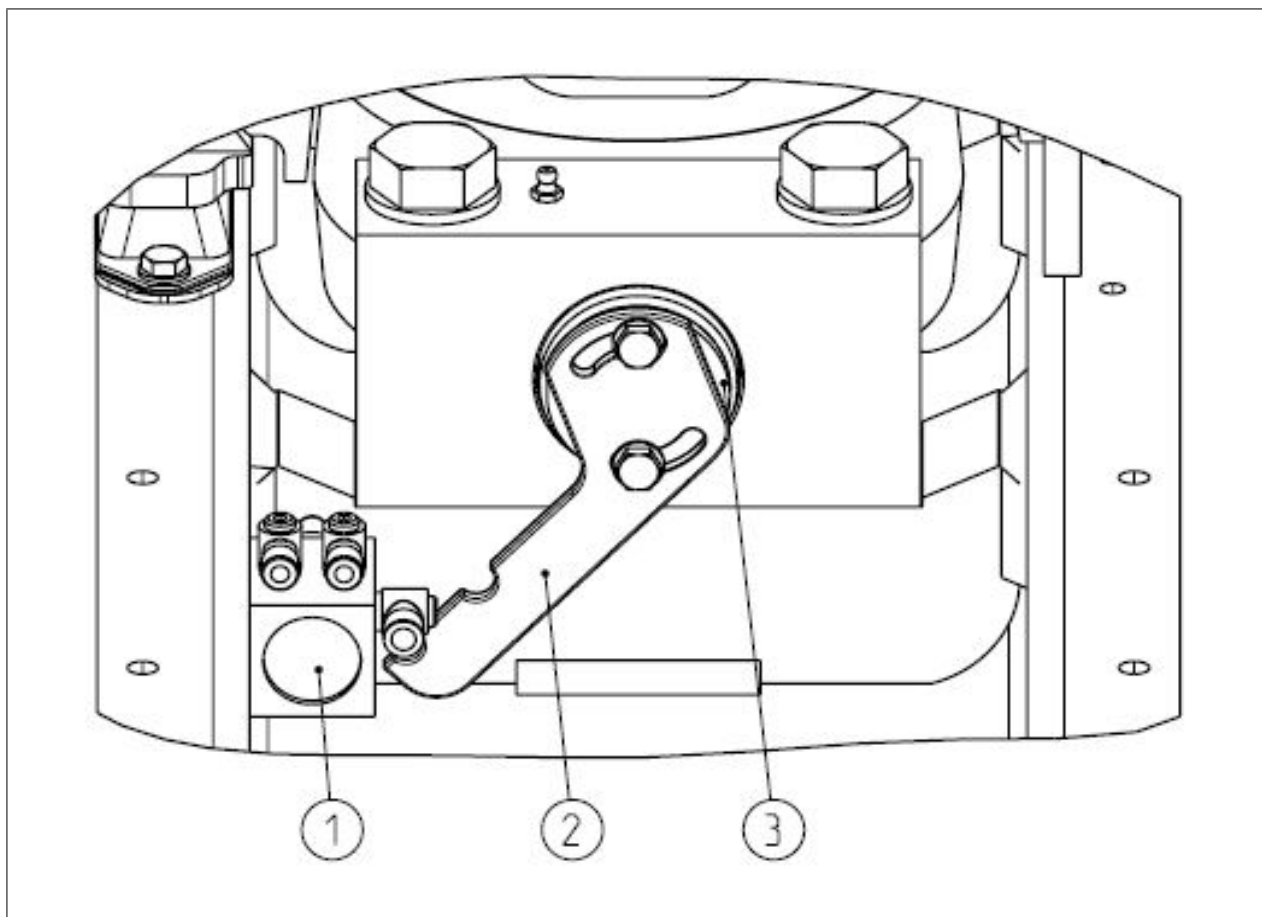
10.3. Adjusting the angle for rear tipping

Adjust the expected tipping angle.

NOTICE!

- **You must adjust all limiting devices to make sure that the tipping cylinder stops before the safety strap or wires tighten.**
- **Make sure that the strap or wires have a lateral allowance of 2-4 cm after the cylinder movement stops.**
- **Make sure that the tipping cylinder does not touch the frame or other solid structures during tipping.**
- **The maximum cylinder angle for the rear tipping is 32 degrees.**

1. Lift the body to the planned angle.
2. Tighten the lever adjustment screws to a position where the lever pushes the spool of knock-off valve.
3. Always do a test tipping to examine the adjustment of the tipping angle.

**WARNING**

The tipping cylinder is not designed for side loads and/or negative forces (pulling). Use the tipping cylinder only for tipping.



11. Final check

- Check all connections.
- Check all of the hydraulic system.
- Lubricate all lubrication points.
- Measure the oil level.
- Make sure that the tipping cylinder does not touch surfaces.
- Make sure that all bolts and nuts are correctly tightened.

12. Technical documents

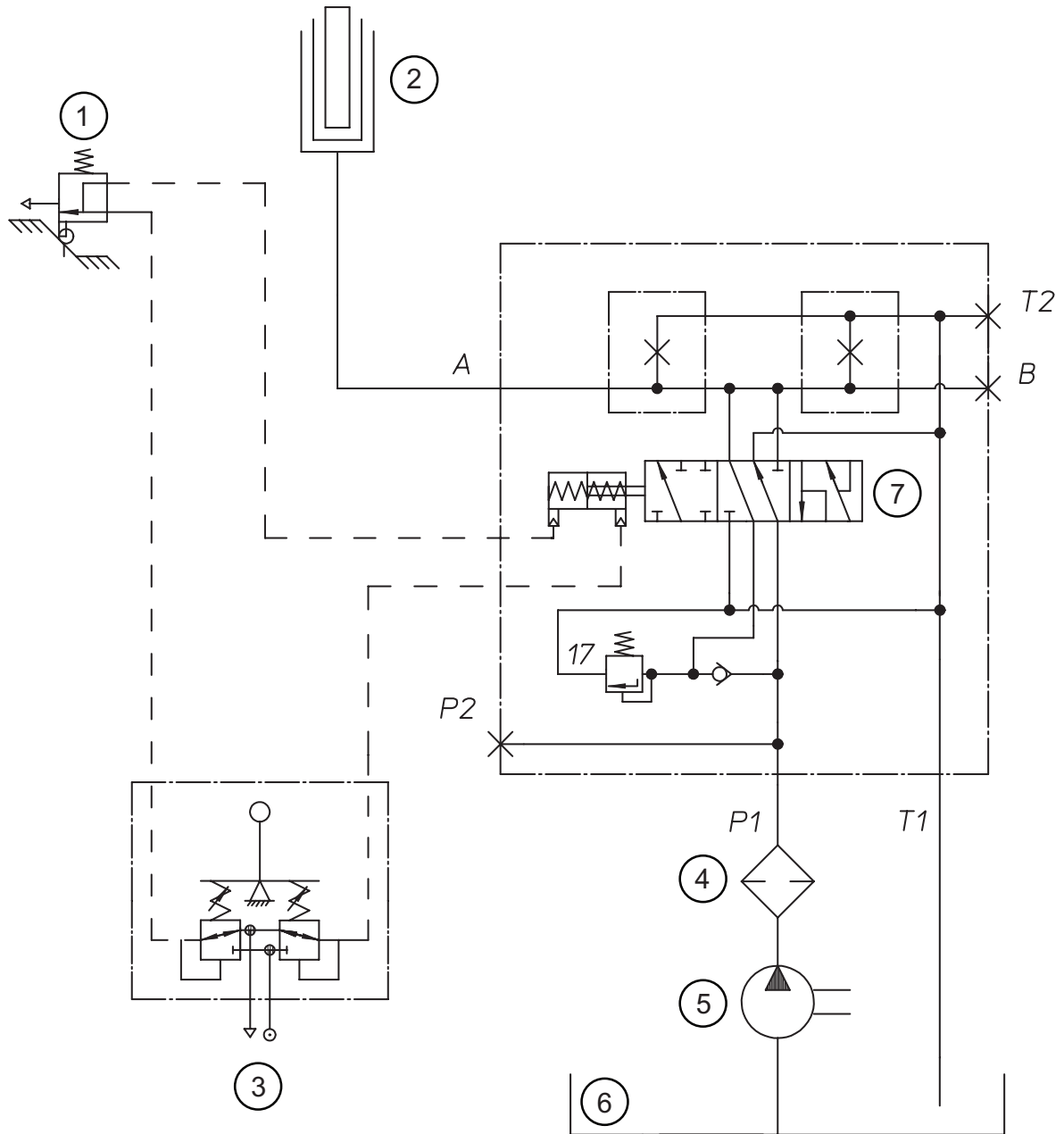
The tipping cylinder is delivered with an operator's manual and a warranty certificate. This certificate is also applicable for the EC Certificate of Conformity, as required by the Machinery Directive.

12.1. *Submitting the documents*

1. Fill in the form fully.
2. Send the page 1 back to Wipro.
3. Keep the page 2 with the vehicle's technical documentation.
4. Send the page 3 to the owner of the truck.
5. Make sure that all the type and warning signs that are provided with the tipper are attached to the superstructure in clearly visible places.

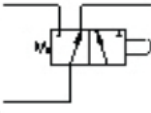
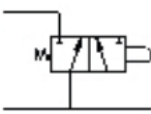
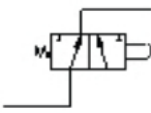


Appendix A. Example of a pneumatic knock-off connection



1. Pneumatic knock-off
2. Tipping cylinder
3. Cabin control
4. Pressure filter
5. Pump
6. Tank
7. Tipping valve

Appendix B. Example of a hydraulic knock-off connection

| | | | |
|---------------------|----------|---|----------|
| 2-LINE CONNECTION | |  | Cylinder |
| Return | Pressure | | |
| PARALLEL CONNECTION | |  | Cylinder |
| Return | Pressure | | |
| 1-LINE CONNECTION | |  | Cylinder |
| | Pressure | | |



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