

TRIDEC

Steering systems and axle suspensions

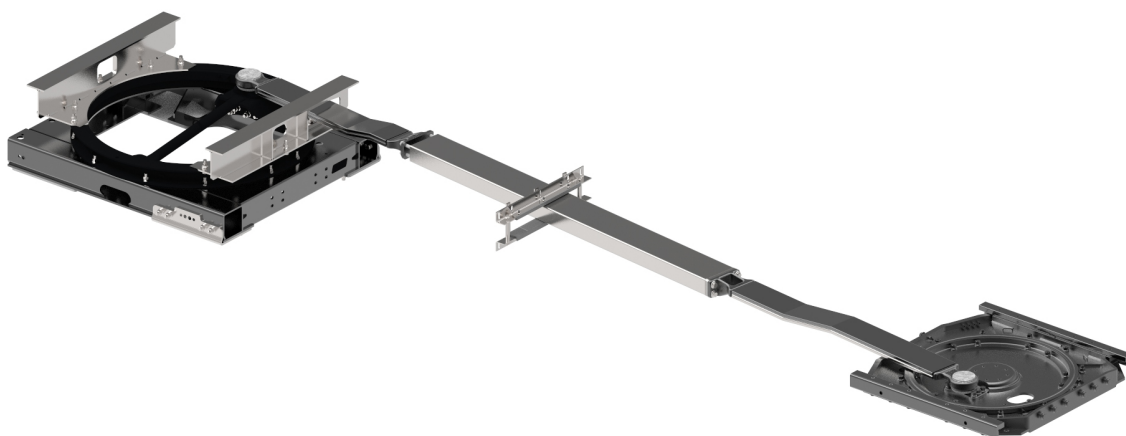


0100TD/0100TD-2/0300TD-X
(D)

User manual

Release (01/2021)

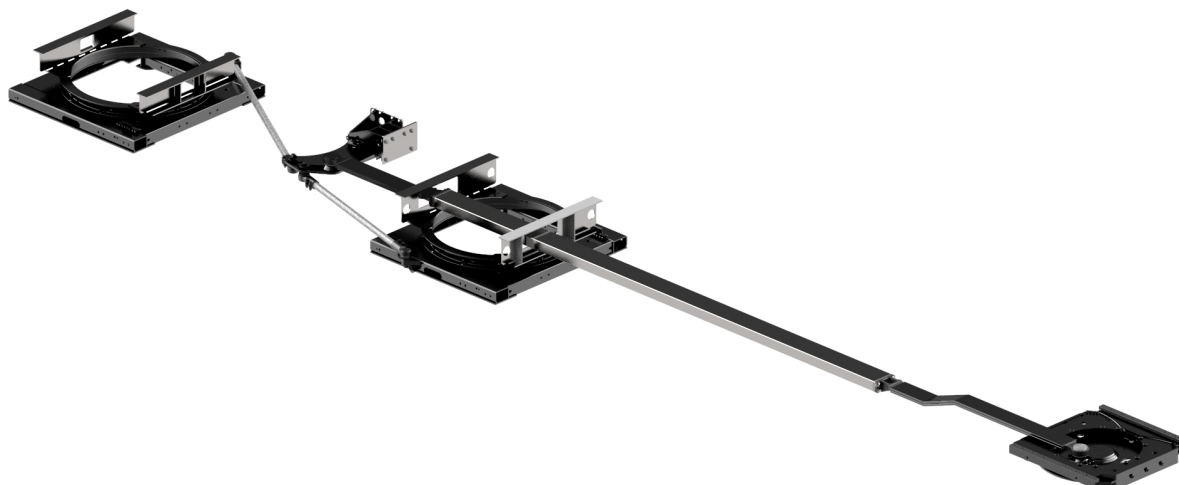




TD-System



TD-2 System



TD_X System

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Foreword



This guide is intended for drivers and/or other TD system users and contains the necessary TRIDEC information regarding the use of the TD system. This User manual must always be stored in the vehicle.

A separate maintenance and repair manual for service technicians is available on the website: www.tridec.com.

Separate installation instructions for the system are supplied upon delivery of the TD system.

Effective use:

The TD system is not designed to be used independently. It has been designed to be mounted as an external steering system to a trailer/semi-trailer. Any modifications whatsoever could compromise the safety of the system. Both the TRIDEC product guarantee and the homologation shall be rendered invalid if these products are modified without written consent from TRIDEC. All guarantee claims against TRIDEC or suppliers of the TD system shall be declared invalid if the TD system is not installed according to the instructions supplied by TRIDEC.

Prior to putting the system into service, compliance with the applicable national road traffic regulations must be established for the trailer on which the system is installed. The system may only be used in accordance with the manual for the truck and any other trailer manuals. The diagrams in this manual are only included as examples and are not intended for any other purposes. Images shown may vary slightly from the system supplied.



All safety information is outlined in chapter 9 (see "**Safety & environment**" on page 15). Safety risks are depicted using pictograms in all other chapters.

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1 Description

The following paragraphs contain information about the components that make up the TD system and how the system works.

1.1 Product variants

The TD..- series from the TRIDEC product range can be supplied as the following version(s), that is, the:

- TD steering system
- TD-2 steering system
- TD-X steering system
- TD-X(D) steering system

A TD..- steering system consists of:

- one fifth wheel unit
- one or more axle assembly frames (abbreviated to 'AAF')
- one or more steering rods
- one steering box section
- one or more rod guides

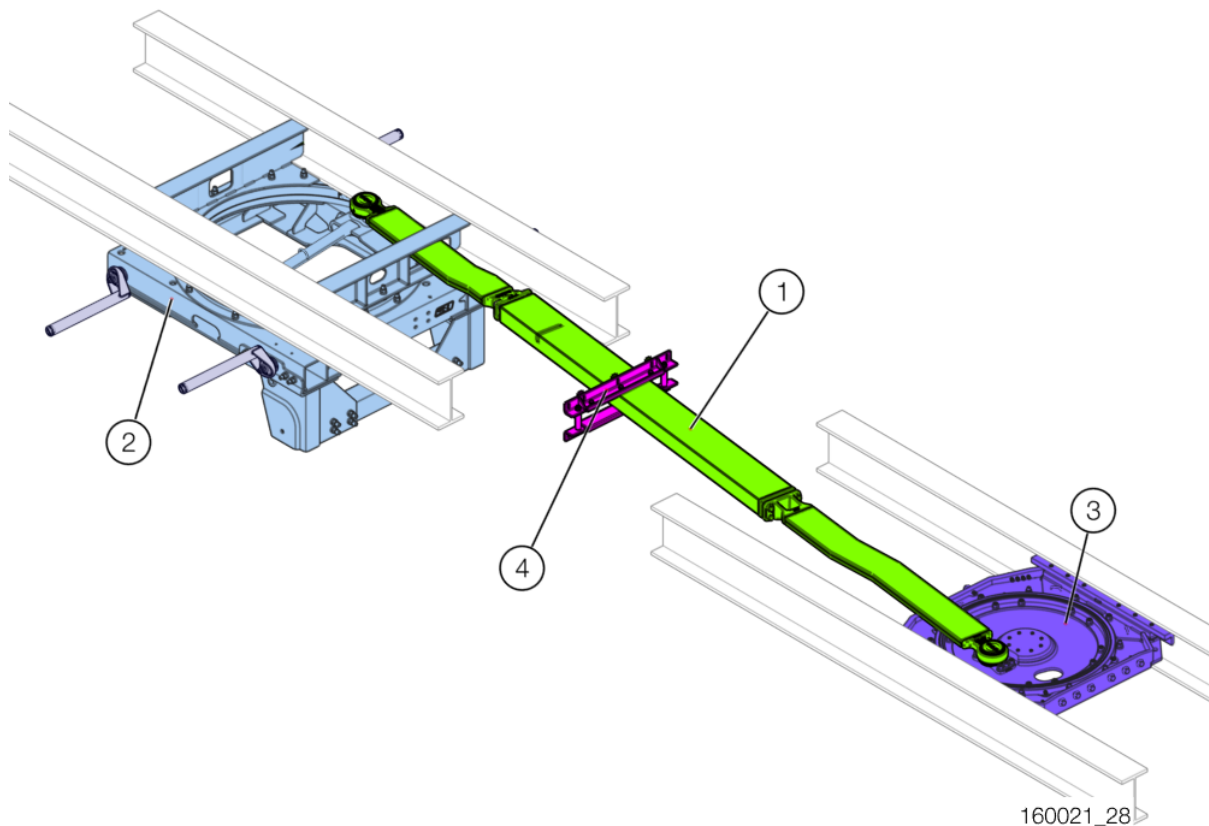


Figure 1-1

Aligned with the chassis width of the semi-trailer, several width variants of the fifth wheel unit (3) and the axle assembly frame (2) can be supplied. The fifth wheel unit is fixed to the chassis by means of brackets while the axle assembly frame with the installed slewing ring is fixed to the chassis by means of bolts also supplied by TRIDEC. The chassis must be reinforced by means of cross-members that can also be supplied where the axle assembly frame is located. The fifth wheel unit and the axle assembly frame are connected to each other via a steering box section (1). The steering box section is supported by one or more rod guides (4) depending on the length.

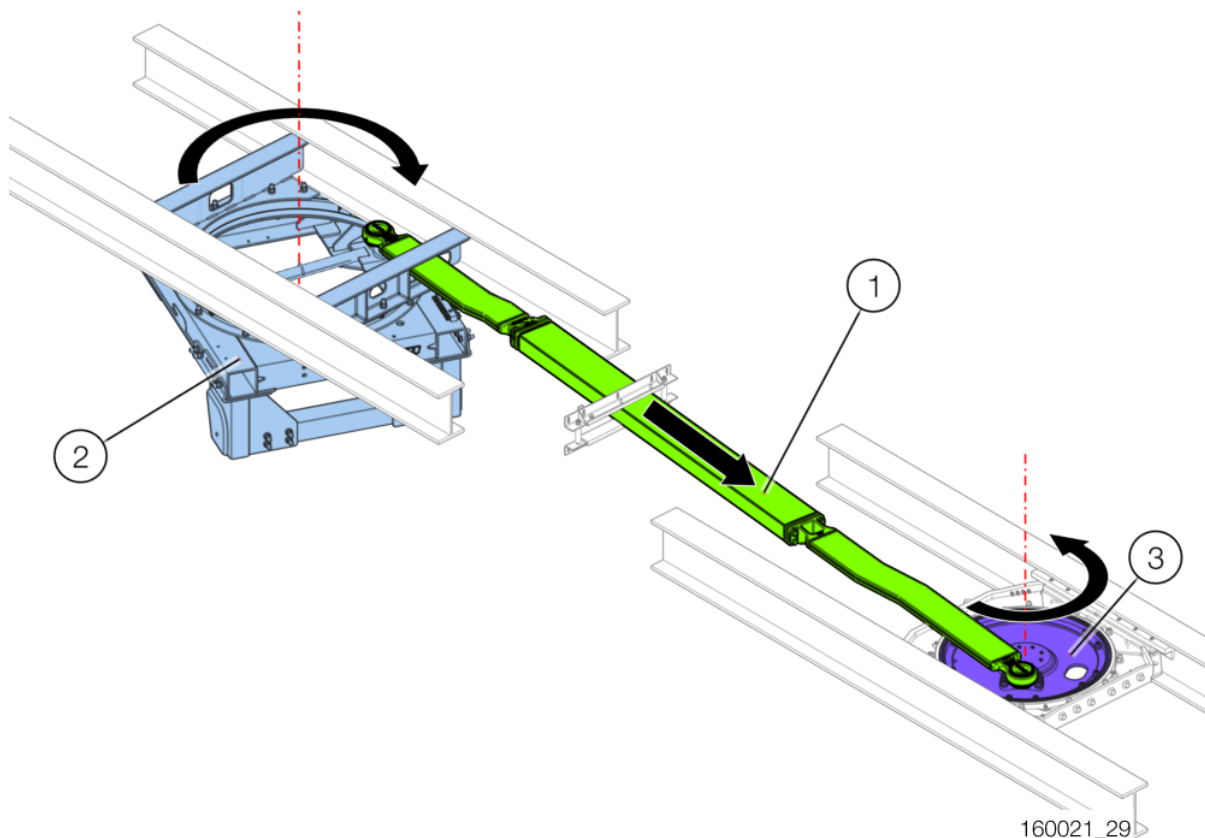
1.2 Operation

Below, the operational principle of the different TD.. systems is described. These steering systems minimise the path followed by tractor unit semi-trailer combinations when taking bends. The stability when driving in a straight line again is realised by giving wheels a caster structurally.

1.2.1 TD system

The TD system is a pull-push system and, in this form, the basic steering system. It is suitable for a semi-trailer with one steering axle. This steering system type consists of:

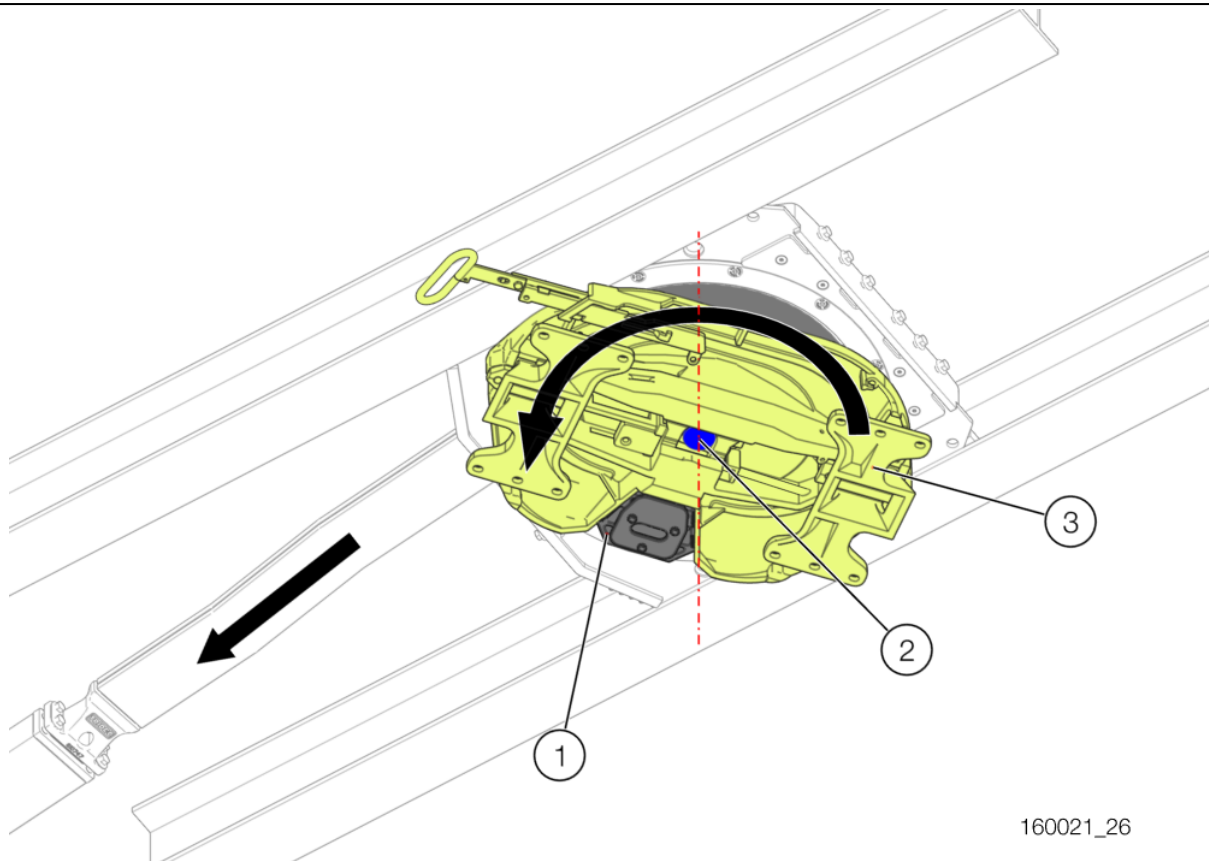
- one fifth wheel unit
- one steering box section (often referred to as the steering rod)
- one axle assembly frame



1. Steering box section
2. Axle assembly frame

3. Slewing ring

When the coupled tractor unit takes a bend to the left, the steering box section (1) is pulled forwards. The axle assembly frame (2) is connected with the rear part of the steering box section (1) and rotates clockwise.



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1. Wedge
2. Kingpin

3. Fifth wheel

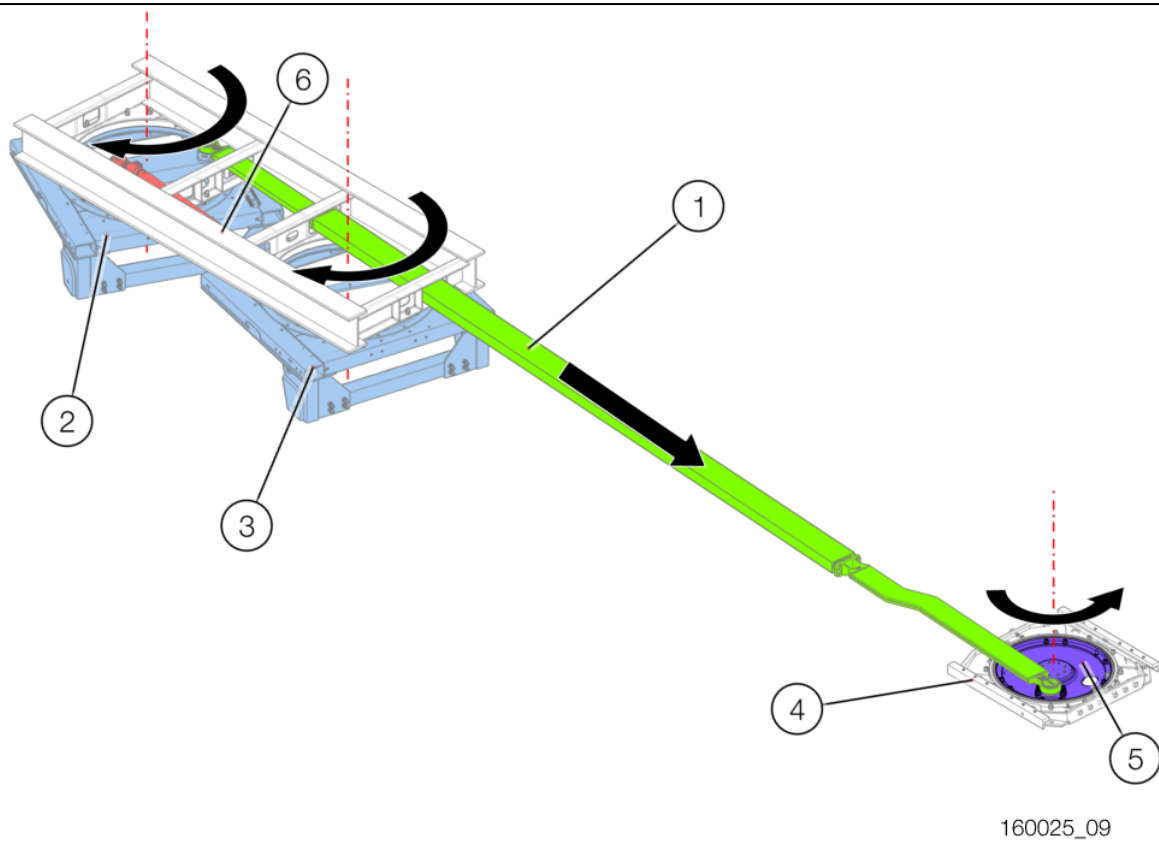
The kingpin is locked in the fifth wheel during coupling and the tractor unit is therefore connected to the trailer/semi-trailer. At the same time, the wedge (1) is enclosed by the fifth wheel (3). The fifth wheel takes the wedge too when starting to take a bend. A pulling or pushing force is exerted on the steering box section. This means that the axle assembly frame will start to move.

Depending on the length of the steering box section, it is supported with rod guides at one or more places.

The correct length must be achieved for the steering box section by using spacers in order to align the system. The spacers must be added to the steering box section at the side of the fifth wheel unit.

1.2.2 TD-2 system

In addition to a fifth wheel unit (4), two axle assembly frames (2)(3), a steering box section (1) and a steering rod (6) are used in relation to a TD system. In this steering system, the rear axle assembly frame (2) is connected to the slewing ring (5) in the fifth wheel unit (4) through the steering box section (1). Both axle assembly frames are connected by means of a steering rod (6).



When the coupled tractor unit takes a bend to the left, the steering box section is pulled forwards. Axle assembly frame (2) turns clockwise and pulls axle assembly frame (3) clockwise via steering rod (6).

The correct length must be achieved for the steering box section by using spacers in order to align the system. The spacers must be added to the steering box section at the side of the fifth wheel unit.

1.2.3 TD-X system

This TD system is mainly used on 3-axle semi-trailers. A transfer lever is used to steer both axle assembly frames. The semi-trailer's middle axle is rigid. This TD system consists of:

- one fifth wheel unit
- one steering box section (often referred to as the steering rod)
- two-axle assembly frame
- two steering rods
- one transfer lever

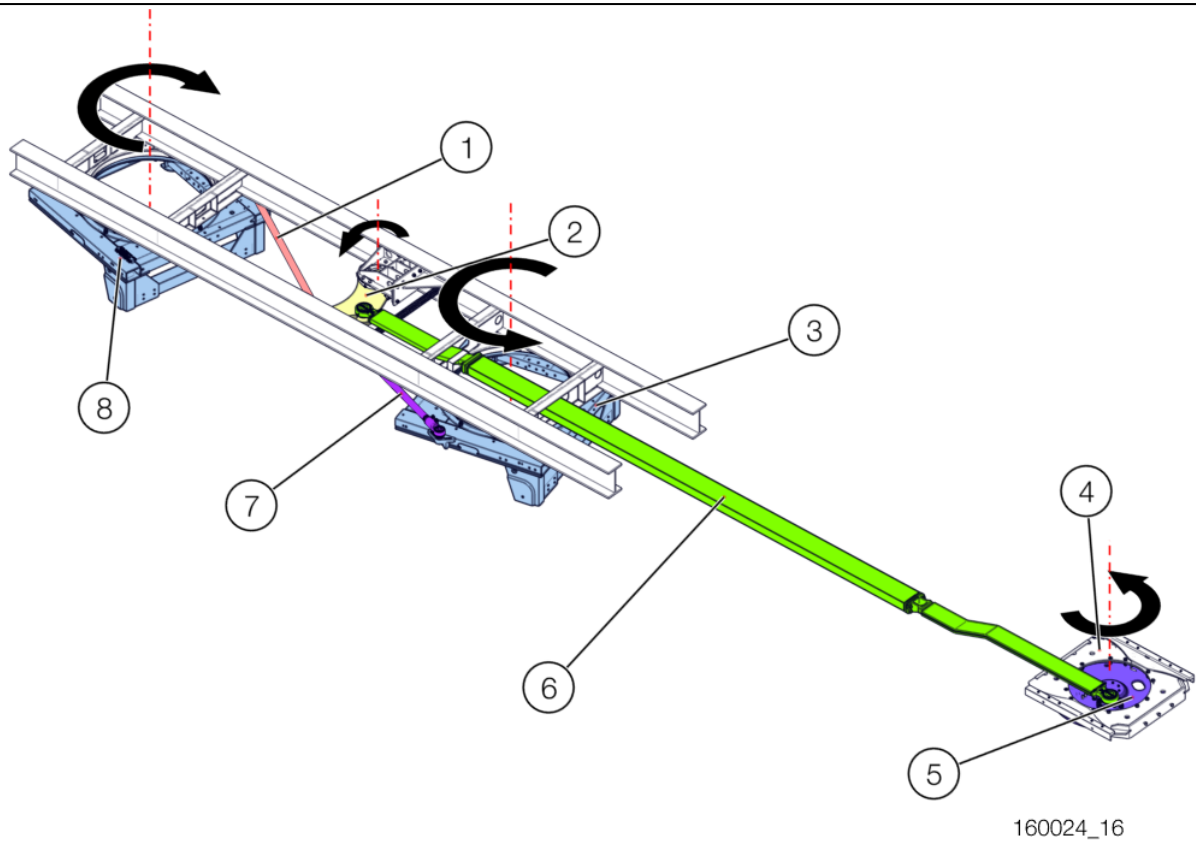


figura.1-2

When the coupled tractor unit takes a bend to the left, the steering box section (6) is pulled forwards by the slewing ring (5) on the fifth wheel unit (4). The transfer lever (2) turns left around its turning point. Axle assembly frame (3) is pushed forwards by the steering rod (7) and rotates anticlockwise. Axle assembly frame (8) is pulled forwards by steering rod (2) and rotates clockwise. This means that the 3-axle semi-trailer can be easily manoeuvred.

1.2.4 TD-X(D) system

This TD system is mainly used on 3-axle semi-trailers. Both axle assembly frames are connected by means of a steering rod. The front axle assembly frame is connected to the fifth wheel unit by means of a steering box section. The semi-trailer's middle axle is rigid. This TD system consists of:

- one fifth wheel unit
- one steering box section (often referred to as the steering rod)
- two-axle assembly frame
- one steering rod

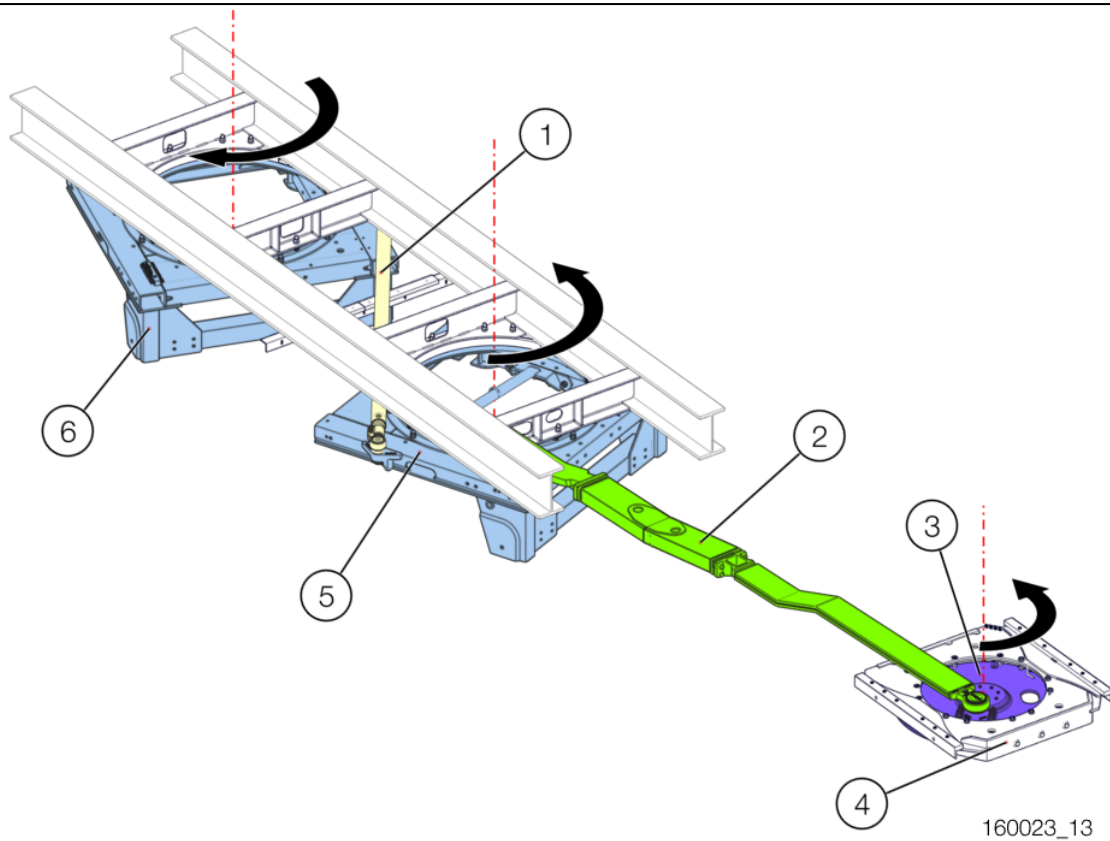



figura.1-3

When the coupled tractor unit takes a bend to the left, the steering box section (2) is pulled forwards by the slewing ring (3) on the fifth wheel unit (4). Axle assembly frame (5) is pulled forwards by the steering box section (2) and rotates anticlockwise. Axle assembly frame (6) is pulled forwards by steering rod (1) and rotates clockwise. This means that the 3-axle semi-trailer can be easily manoeuvred.

2 Putting into service

The following paragraphs contain information regarding putting the TD system into service.

2.1 Vehicle registration and delivery

 All associated documentation (vehicle registration certificate, user guide, service manual) for the relevant Tritronic system should be handed to the client upon delivery of a trailer with a TD system.



The vehicle may not be used until compliance with the applicable national road traffic regulations has been established for the trailer on which the TD system is installed.



The national road traffic regulations are specific to each country. Contact the national inspection authority in the relevant country for the necessary information.

Subject	Action
Vehicle Registration Certificate,	Submit the vehicle registration certificate to the national inspection authority of the country in which the trailer will be registered. The specifications and approval numbers necessary can be found on the vehicle registration certificate.
Warning sticker	Ensure that the warning sticker has been placed in such a way that it is clearly visible to the driver.
User guide	Provide the client with the TD system user guide. Instruct the client to keep the user guide with the trailer.

Table-1 Client documents

2.2 Coupling and uncoupling

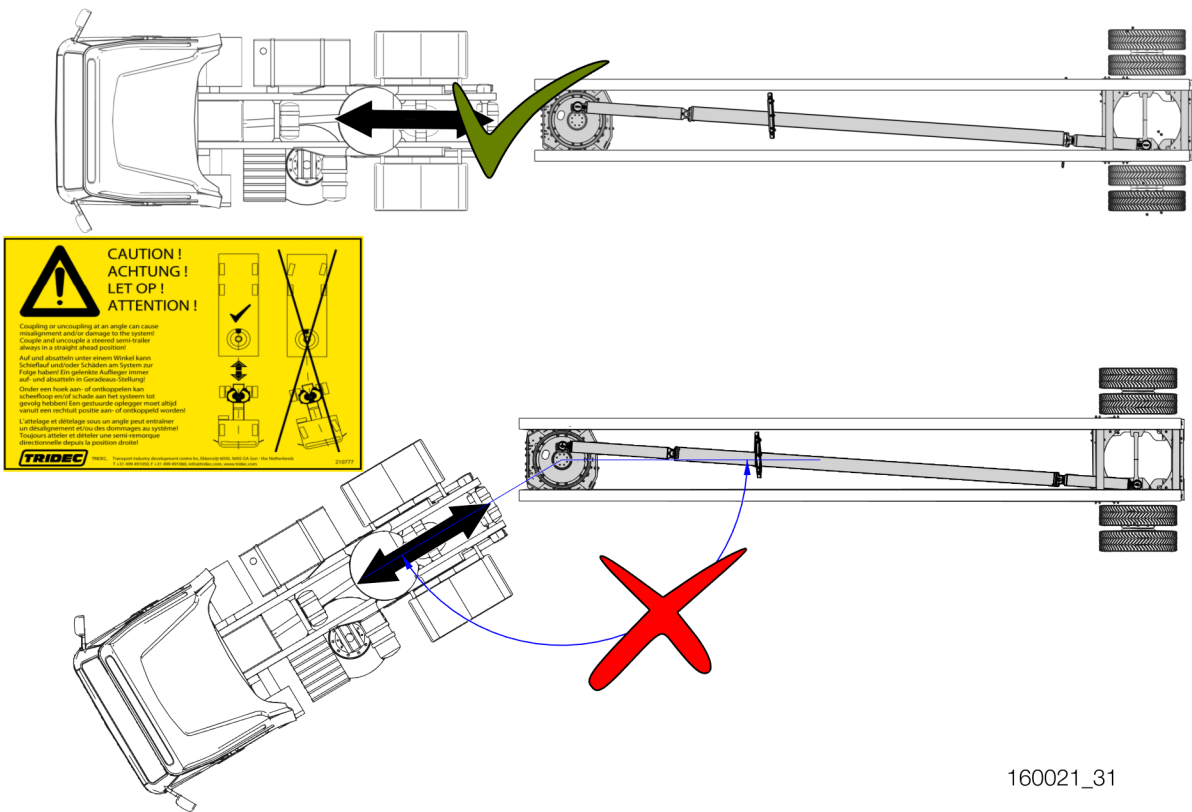


Figure 2-1

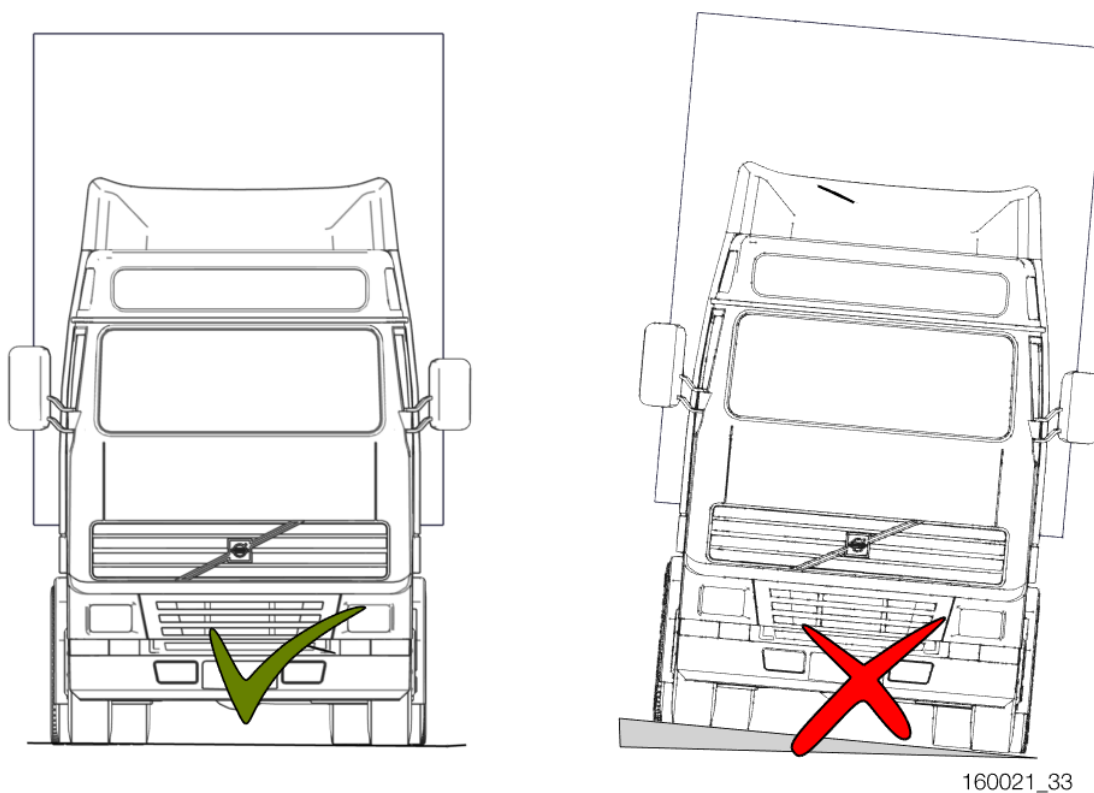


Figure 2-2



Ensure that both the tractor unit and semi-trailer are on the same horizontal surface when coupling and uncoupling.



NEVER park the semi-trailer with steered wheels.



Do not couple or uncouple when there are people or animals in the immediate vicinity of the semi-trailer and tractor unit.

2.3 Use of a steered semi-trailer

The steering behaviour of an unsteered semi-trailer deviates from the steering behaviour of a steered semi-trailer. The centre of rotation (A) of a steered semi-trailer is closer to the tractor unit. This has an impact on the turning radius (C) and the required space on the road. Manoeuvring through narrow streets is simpler with a steered semi-trailer/trailer.

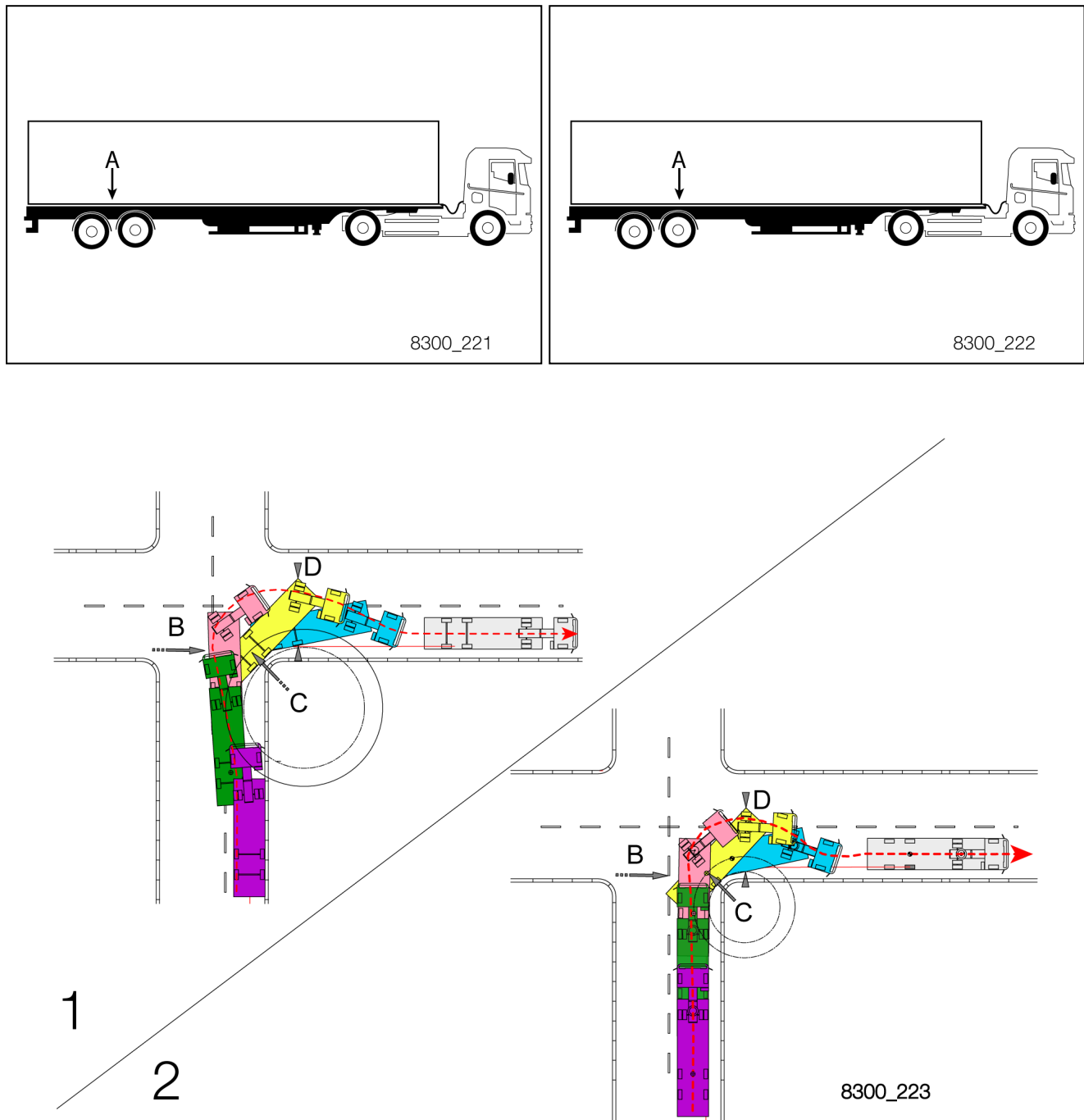


Figure 2-3

- | | |
|--|---|
| 1. Steering behaviour of an unsteered semi-trailer | 3. B = Required space for the semi-trailer swinging out |
| 2. Steering behaviour of a steered semi-trailer | 4. C = Turning radius of a semi-trailer |
| | 5. D = Required space on the carriageway |

The different phases during driving in a bend are shown using colours. The red dotted line shows the described path of the tractor unit and the semi-trailer. The figure (see Figure 2-3) shows that the unsteered semi-trailer has a larger turning radius and therefore needs more space on the carriageway to take a bend.



When taking a bend, the rear side (B) of a steered semi-trailer swings out further than the rear side of an unsteered semi-trailer.




If you do not have any experience with a steered semi-trailer, TRIDEC recommends gaining experience at a site to practice before you go on a public road with your tractor semi-trailer combination.

3 Safety & environment

The following paragraphs contain information regarding safe use of the TD system. It also describes what should be done when the TD system reaches the end of its lifespan.

3.1 Safety while operating

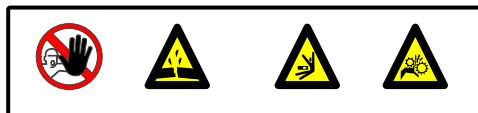
 Operating a trailer with a TD system installed may involve some possible risks. Consult the relevant regulations (for example: road traffic regulations, company procedures, health and safety regulations) which are applicable to the country where the trailer will be used.



General instructions for operating a trailer with a TD system:

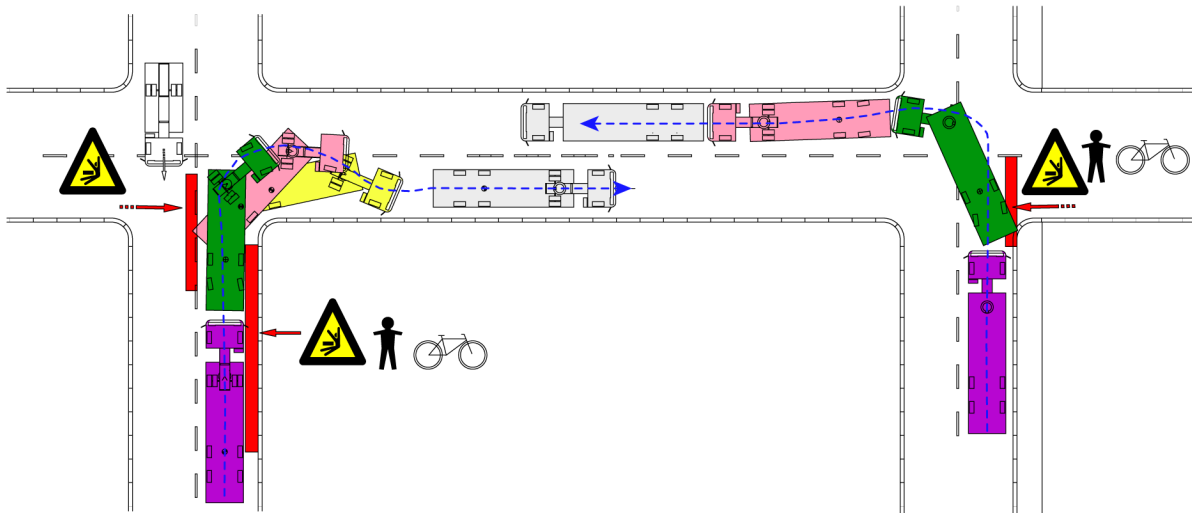
- **NEVER** use or put a trailer with an installed TD system on public roads until compliance with the national road traffic regulations has been established for the entire trailer.
- Read the user guide **BEFORE** coupling and using a trailer with a TD system.
- Execute the daily inspection **BEFORE** coupling and using a trailer with a TD system.
- The truck driver is **ALWAYS** responsible for the use of a trailer.
- **NEVER** drive with a trailer if a signal lamp is lit.
- Only steer the trailer using the TD system if there are **NO** people in the immediate vicinity of the trailer's moving parts.

The nature of possible dangers and restrictions during use are depicted below in the pictograms.



3.1.1 Danger zones for other road users

When a tractor unit with a semi-trailer takes a bend, more space on the carriageway is used. This means that the other road users such as, for example, oncoming vehicles and cyclists will have less space to manoeuvre. The driver of the tractor unit must be fully aware of this and pay extra attention.




8300_062

Figure 3-1

The red areas (see Figure 3-1) indicate where there is a potential danger for other road users when a tractor unit with a steered semi-trailer takes a bend. The red areas demand extra attention during the manoeuvre.

3.2 Environment

 The TD system must be dismantled and disposed of in accordance with local and national regulations once it has reached the end of its lifespan, regardless of the cause. Contact your local or national public services, waste management authority or the supplier you purchased the product from for more information regarding locations where the materials can be collected for recycling.

4 General information

The following paragraphs contain information regarding the delivery, storage and guarantee of the TD system.

4.1 Cleaning

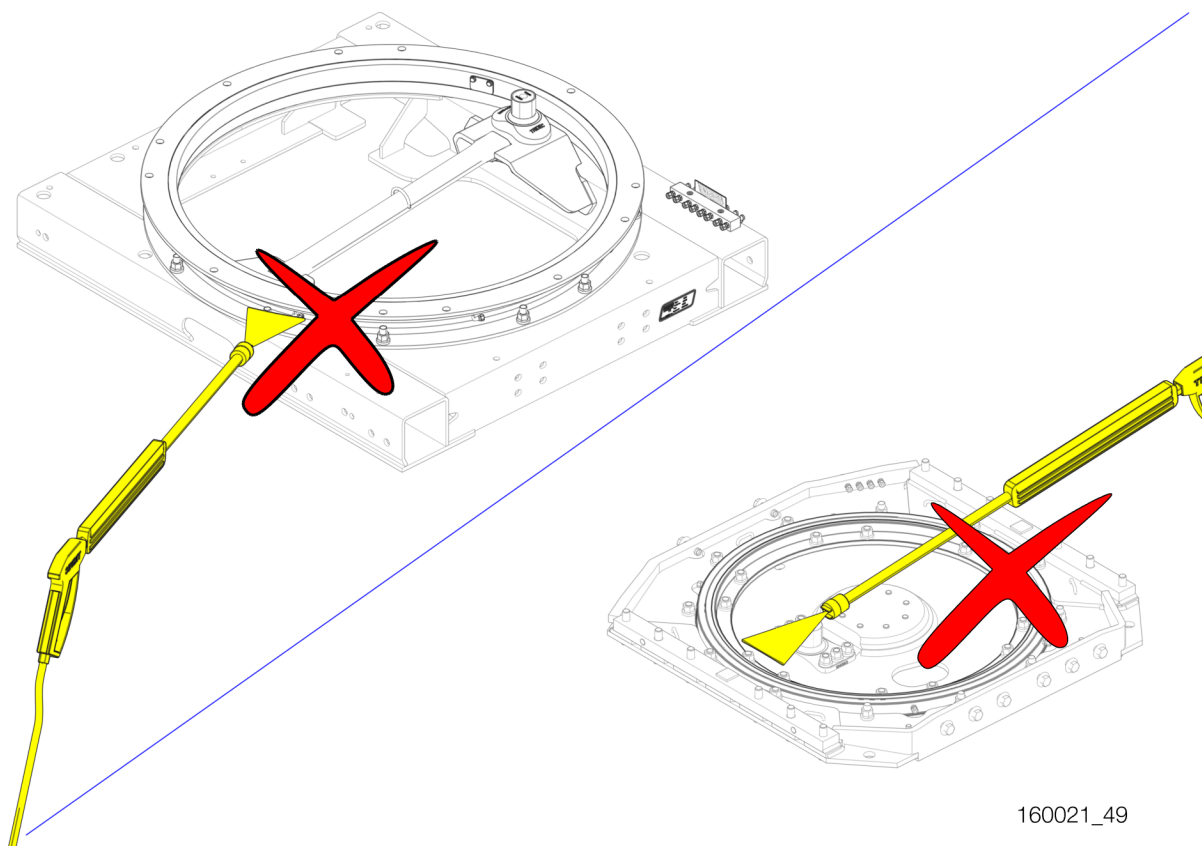


Figure 4-1

4.2 Pictograms

The following pictograms are used in this user guide:

















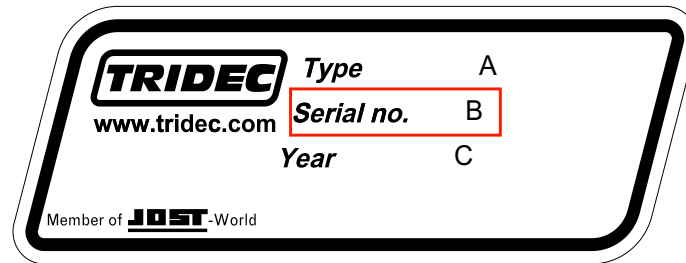
Description	Description	Description
 Important message!	 Tip	 Delivery information.
 Danger of becoming trapped!	 Read this information before you start!	 Information regarding use!
 Provisions set by TRIDEC.	 Recycle	 Alignment tool
 Tyre pressure	 Driving direction	 False
 Important restriction!	 Chance of damage to the system!	 Parts
 Lubricate		

Table-2 Pictograms

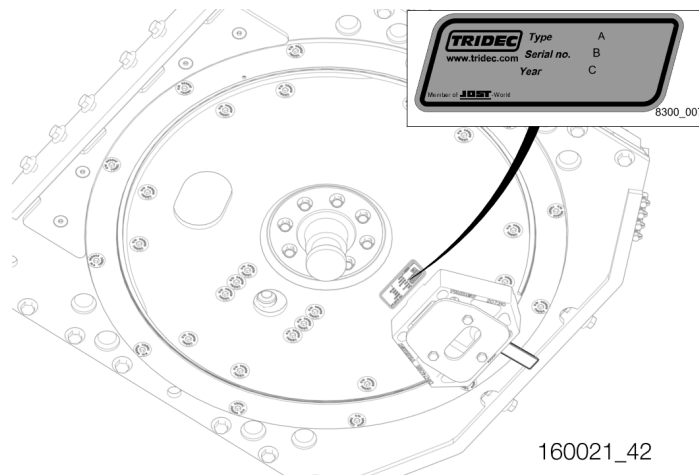
4.3 Type indication

Products manufactured by TRIDEC (see Figure 1-2), are given an identification sticker.



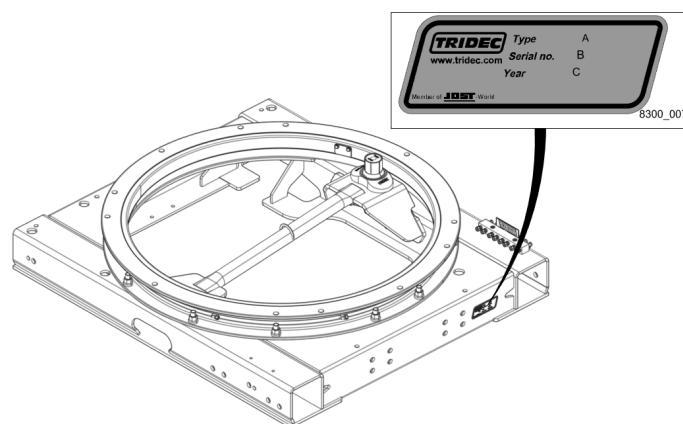
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Figure 4-2



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Figure 4-3



160021_40

Figure 4-4

The sticker provides essential information for ordering replacement parts. All product-specific information can be obtained by referencing the serial number on the sticker.

- Type: coding for the product version.
- Serial no.: the order number (required when ordering parts).
- Year: year of construction.



Never remove the sticker affixed by TRIDEC!



The serial number is required for obtaining the correct service information and for ordering parts.

The meaning of the type coding on the sticker is given in the table below (example).

SE 15 10 S TD G	Description
S	Steering system
E or T/D/V	Number of axles under the semi-trailer (E=1, T=2, D=3, V=4 or 5)
15/20 or 26.5	Maximum load (tonnes) on the fifth wheel unit (1 tonne = 1000 kg)
10	Number of steered axles (00=0, 10=1, 20=2, etc.)
S/T	Turntable type S=1200 T=1110
TD	Type of steering system
G/K/T	Type of fifth wheel unit (G= bolt connection K= extra-low version)
XXXXX-X-XXX	Serial number

Table-3 Type indication

5 Maintenance periods

TRIDEC		
Maintenance when commissioning		
Slewing rings	Lubricate the slewing rings	see the service manual

Table-4 Maintenance

TRIDEC		
Maintenance after 10,000 km or after 2 months at most		
Slewing ring	Lubrication	see the service manual
Kingpin	Retighten bolts and nuts	see the service manual

Table-5 Maintenance

TRIDEC		
Maintenance every 25,000 km or every three months. (Under extreme conditions* every 10,000 km or every 1.5 months.)		
Fifth wheel unit	Lubricate at all grease nipples.	see the service manual

Table-6 Maintenance

- If used in countries where it rains often and a lot and/or where a lot of salt is gritted in the winter on the roads such as in the UK, Ireland, Denmark, Norway, Sweden and Finland.
- If the vehicle is regularly cleaned using chemicals.

TRIDEC		
Maintenance after 100,000 km or after 12 months at most		
Slewing ring	Measure the axial/radial clearance.	see the service manual
Steering wedge	Free movement and wear	see the service manual
Kingpin	Wear	see the service manual
Ring plate	Deformations	consult the national regulations

Table-7 Maintenance

5.1 Daily maintenance

The TD system is basically maintenance free. TRIDEC, however, recommends that the visual checks below be performed before any use;






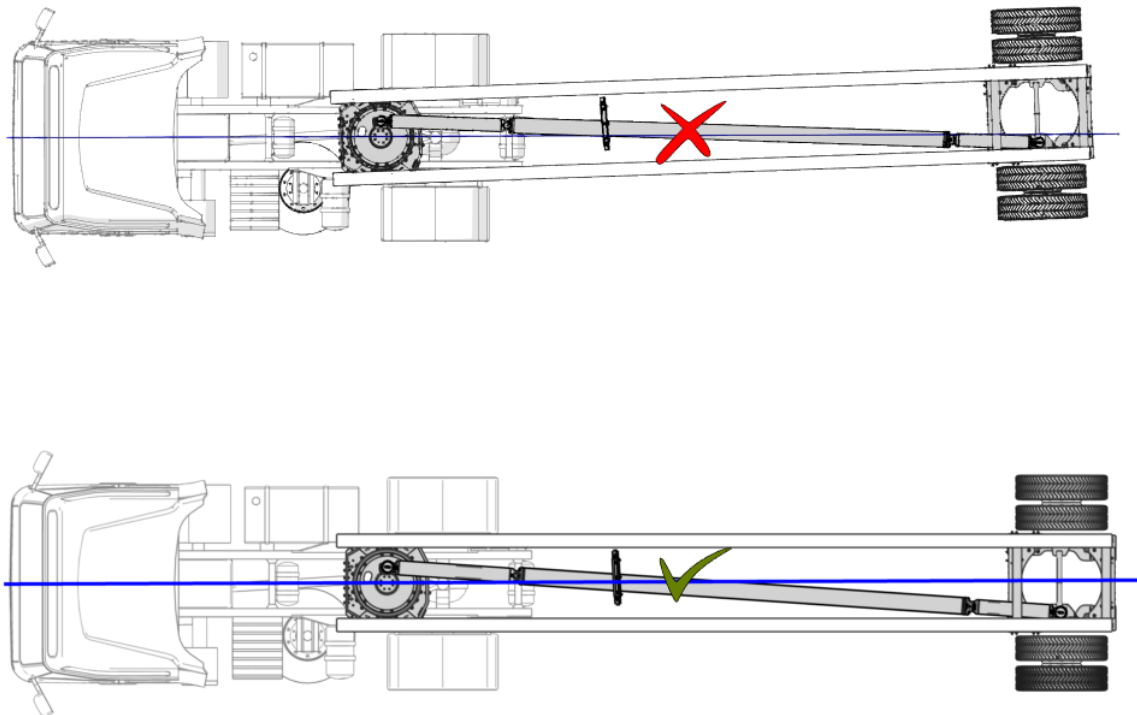
	Check	Action
	 Check for missing or loose bolts and nuts.	Tighten loose bolts or nuts using the correct tightening moment. If required, install new bolts and/or nuts.
	Check the semi-trailer for damage that may have an impact on the driving behaviour.	Contact the service workshop if there is damage.
	 Check that the semi-trailer/trailer follows the tractor unit in a straight line (see Figure 5-1).	Check for damage to the steering system and align the semi-trailer.

Table-8 Maintenance



160021_30

Figure 5-1

5.1.1 Lubricant

Lubricate a TD system using a lubricant that meets the NGLI class 2 specification. If a central lubrication system has been connected, a grease type may be used that meets the NGLI class 0 or NGLI class 2 specification. Verify this using the manual of the central lubrication system.



Only use lubricants that are prescribed by TRIDEC in a TD system. Other lubricants are **NOT** permitted.

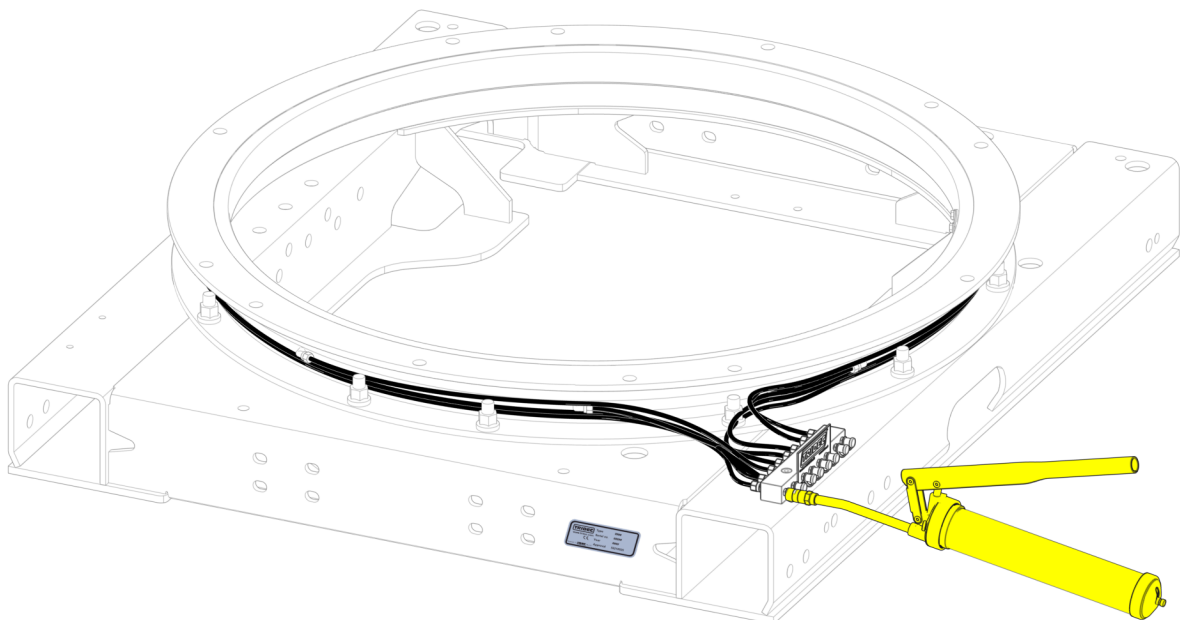
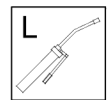


Caution! Replace lubricants of a TD system within the maintenance period set by TRIDEC.

Procedure

1. Uncouple the semi-trailer and lift the wheels of the steered axle(s) so that they no longer are in contact with the ground.
2. Turn the ring plate from left to right when lubricating the slewing ring to distribute the grease uniformly over the slewing ring.
3. Remove the surplus grease that comes out from under the seal of the slewing ring.

Lubrication points



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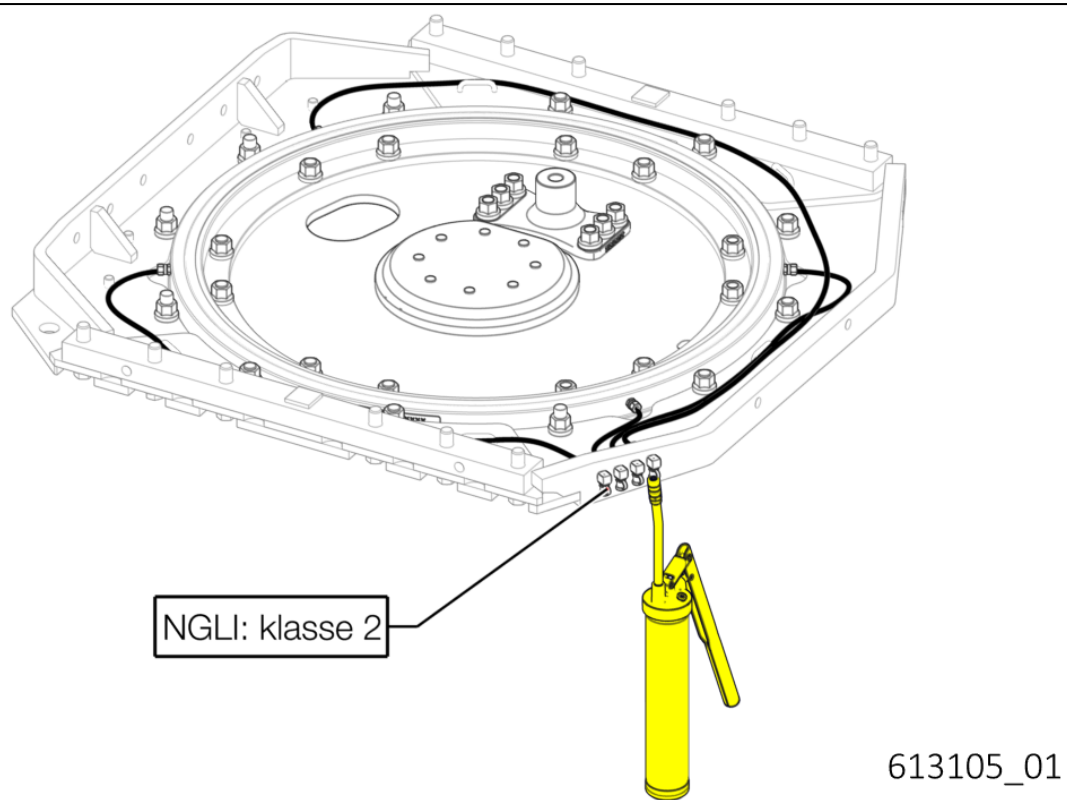
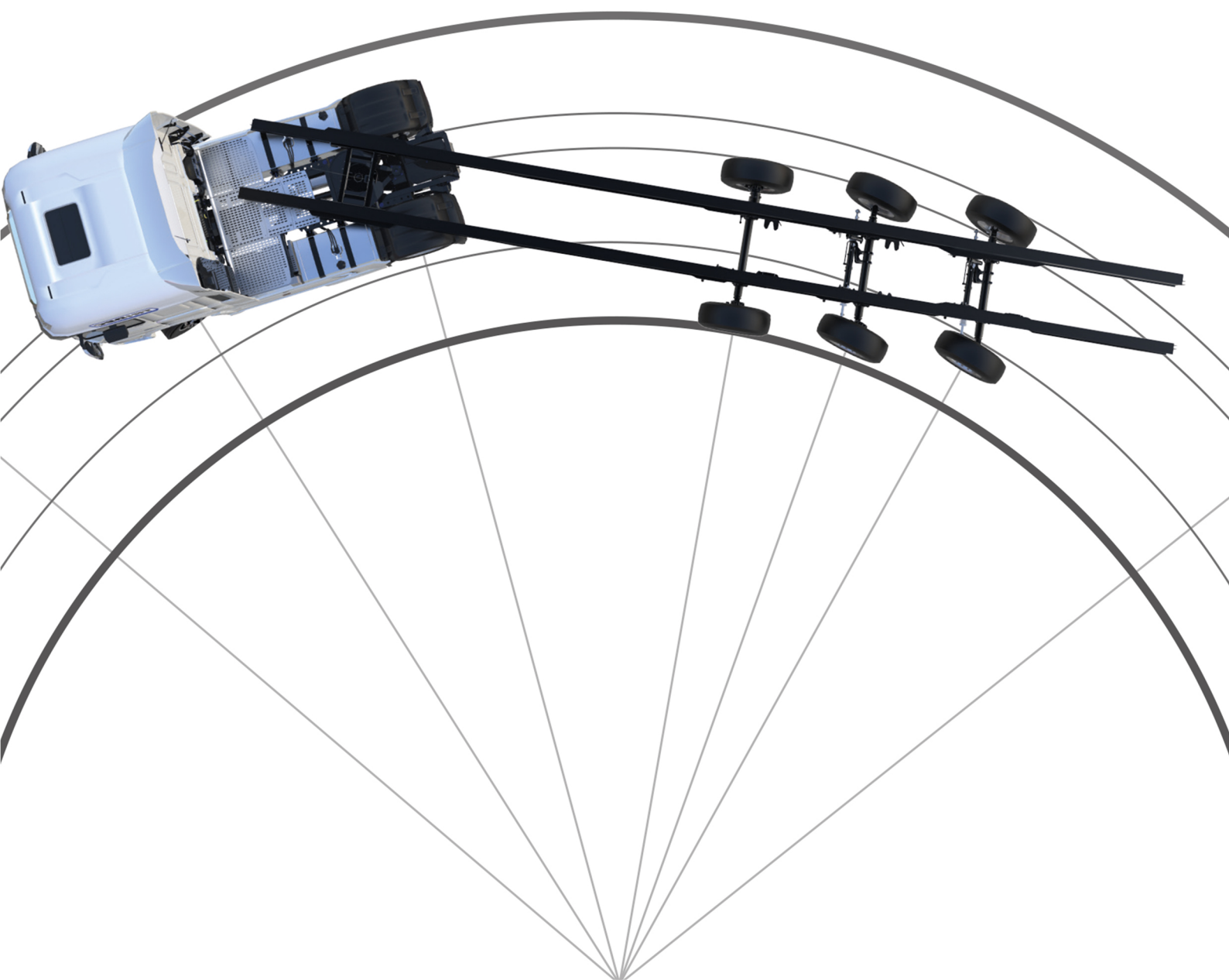


Figure 5-2

Notes

Excellent manoeuvrability



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