TRIDEC

Steering systems and axle suspensions

0700TF/0723TF-V

User manual

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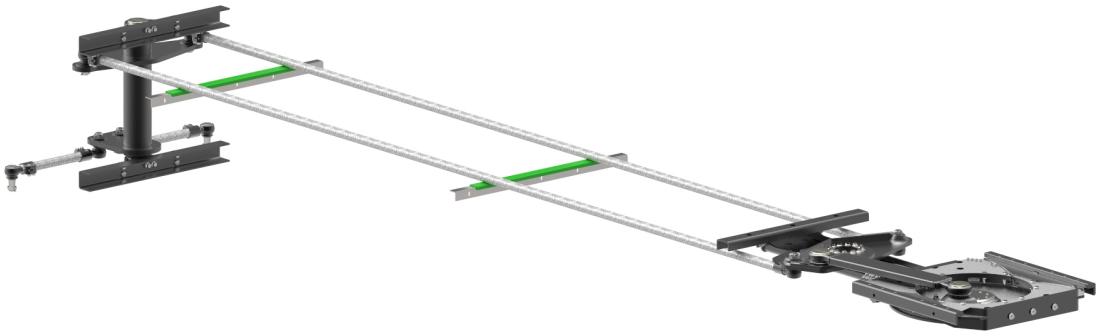
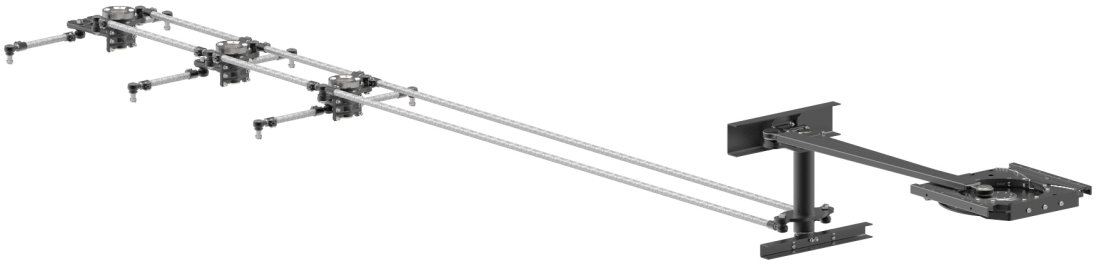


TF with linear attachment



TF-V

Table of contents

Foreword

This guide is intended for drivers and/or other TF steering system users with a "Compact" control system and contains the necessary TRIDEC information regarding the use of the TF steering system. This User manual must always be stored in the vehicle.
A separate maintenance, settings 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 TF steering system.

Effective use:

The TF steering 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 TF steering system shall be declared invalid if the TF steering 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 11). 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 TF steering system and how the system works.

1.1 Product variants

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

- TF steering system
- TF-V steering system

A TF-.. steering system consists of:

- one fifth wheel unit
- one attachment
- one or more steering rods
- one steering box section
- one or more rod guides
- one or more steering knuckles

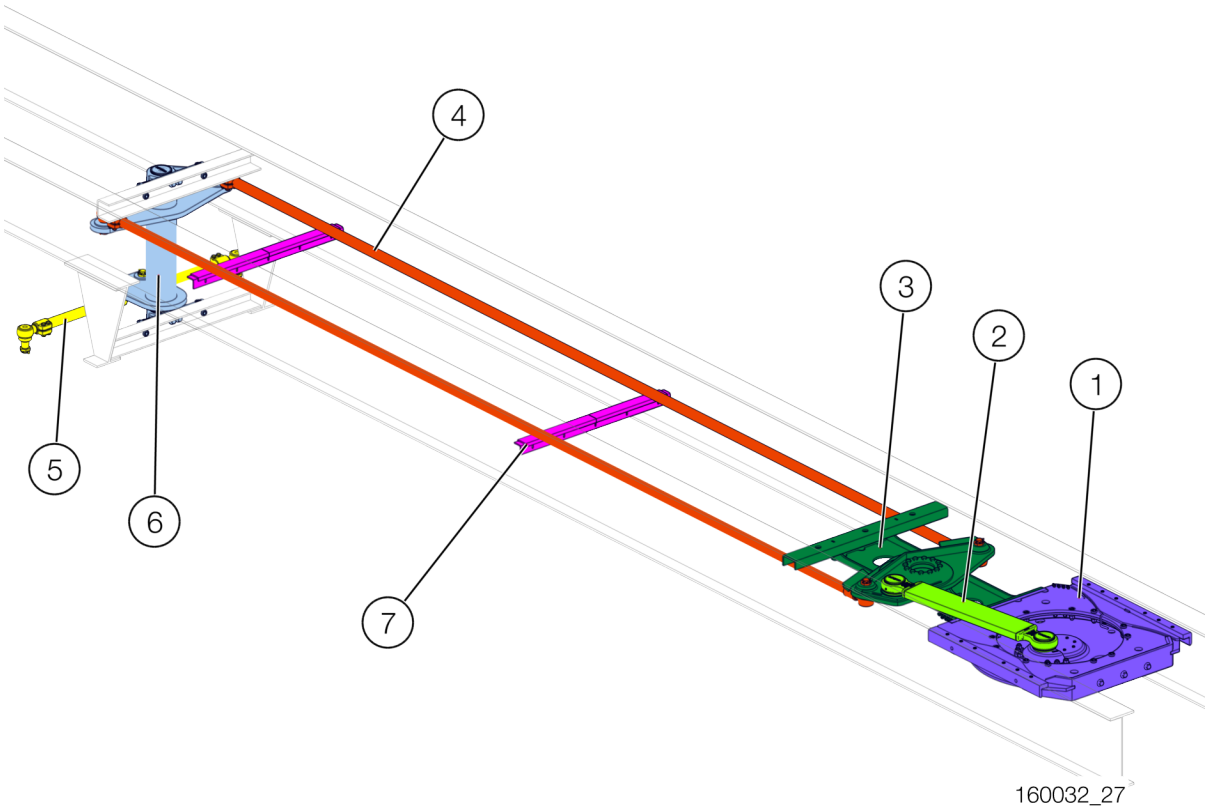


Figure 1-1

Aligned with the chassis width of the semi-trailer, several width variants of the fifth wheel unit (1) can be supplied. The length of the track rods (5) has been aligned to the required track width for the chassis. The fifth wheel unit has a linear attachment (3) and is fixed to the chassis by means of brackets. The steering knuckles (6) are fixed to U-profiles that are welded in the chassis by using

bolts also supplied by TRIDEC. The attachment can be supplied as a horizontal or vertical construction (for a semi-trailer with a goose neck).

1.2 Operation

Below, the operational principle of the different TF.. 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 TF steering system

The TF steering system on semi-trailers where there is no room for turntable steering. The steering knuckles are connected to a steering rod. The TF steering system is delivered with a linear attachment. The angle tightening of the wheels of the semi-trailer is constant while driving in relation to a linear system.

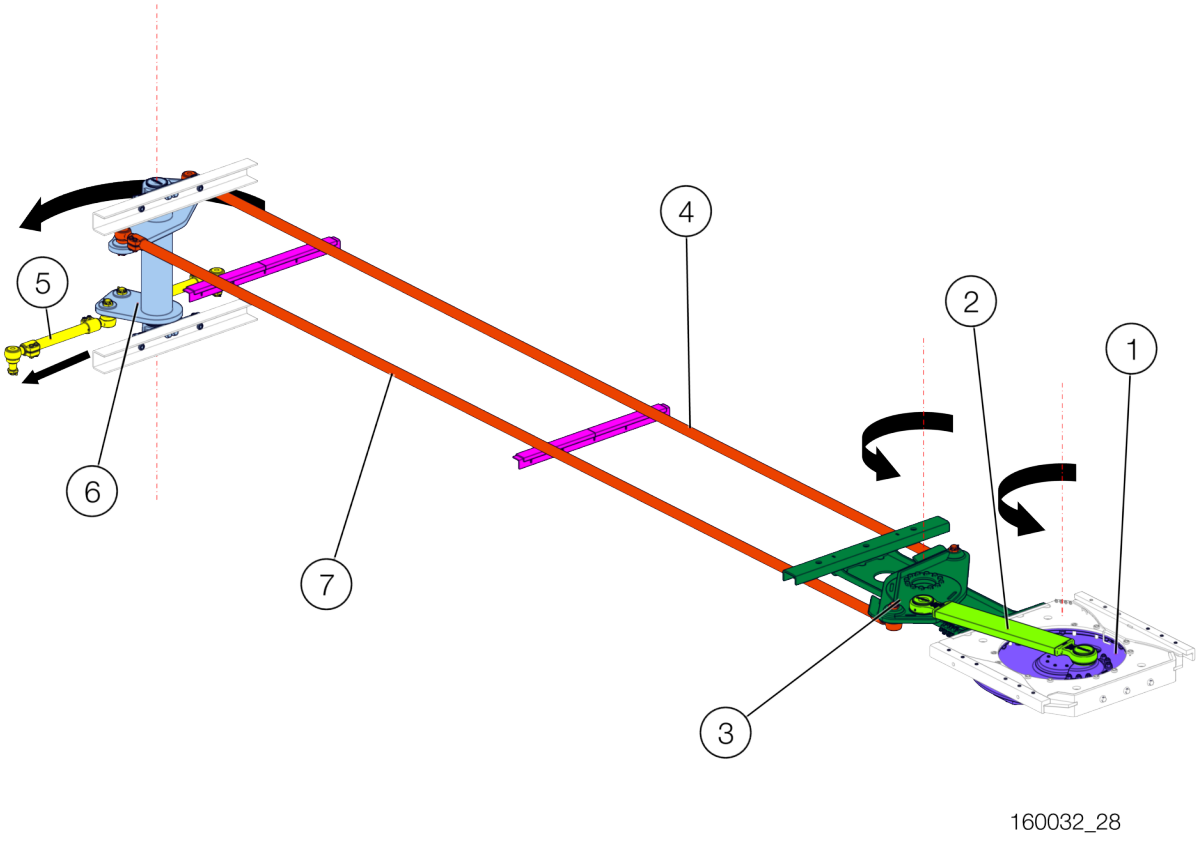


Figure 1-2

When the coupled tractor unit takes a bend to the left, steering box section (2) is pulled forwards by slewing ring (1) on the fifth wheel unit. This means that the lever (3) of the attachment rotates anticlockwise. Steering rod (4) pushes on one side against the steering knuckle (6). The steering rod (7) pulls on the other side. This means that the steering knuckle turns anticlockwise. The track rod (5) moves to the right and the semi-trailer will, subsequently, steer anticlockwise.

2 Putting into service

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

2.1 Vehicle registration and delivery

All associated documentation (vehicle registration certificate, CE declaration, user guide, service manual) for the relevant TF steering system should be handed to the client upon delivery of a trailer with a TF steering 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 TF steering 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.
CE declaration of compliance	Store the CE declaration with the vehicle documents in accordance with applicable guidelines.
User guide	Provide the client with the TF steering system user guide. Instruct the client to keep the user guide with the trailer.
Maintenance and repair manual	Provide the client with the TF steering system maintenance and repair manual. This manual contains the necessary information needed for the workshop to maintain the system.

Table-1 Client documents

2.2 Coupling and uncoupling

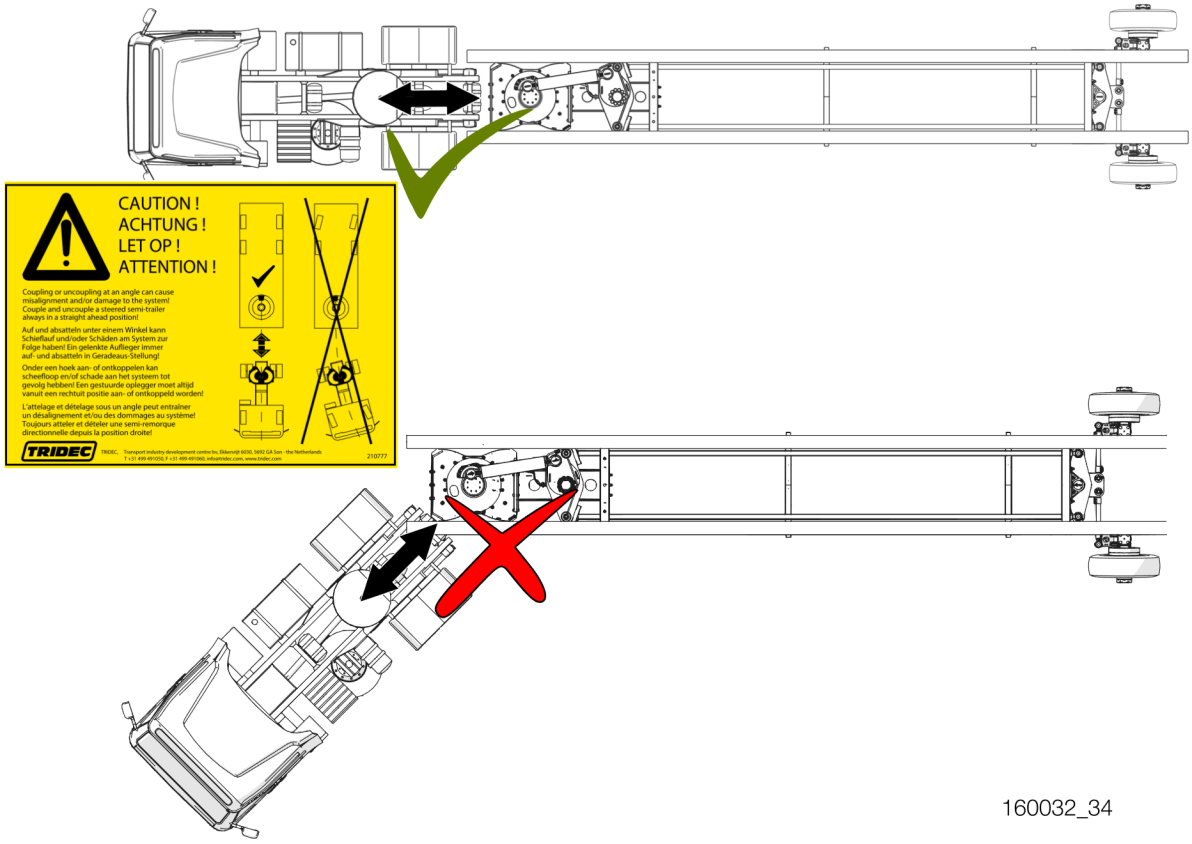


Figure 2-1

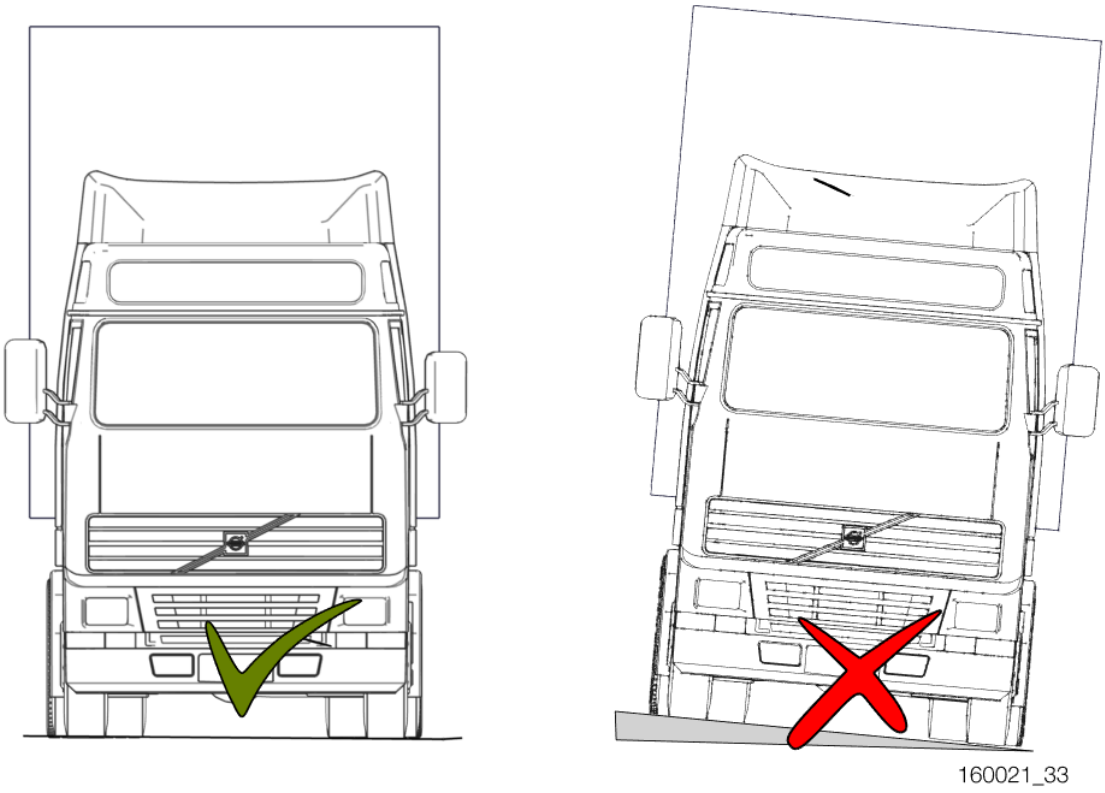


Figure 2-2

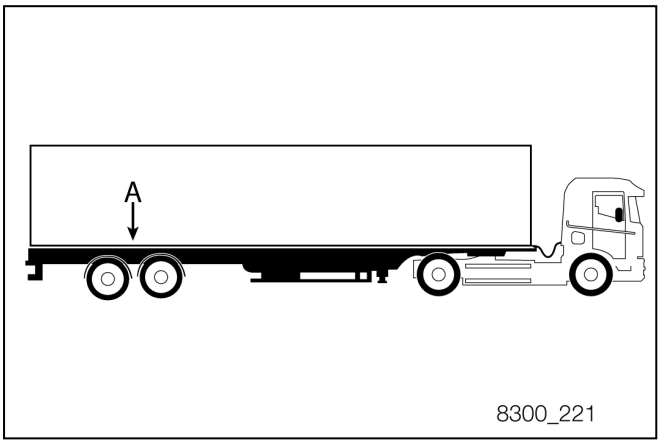
Ensure that both the tractor unit and semi-trailer are on the same horizontal surface when coupling and uncoupling.

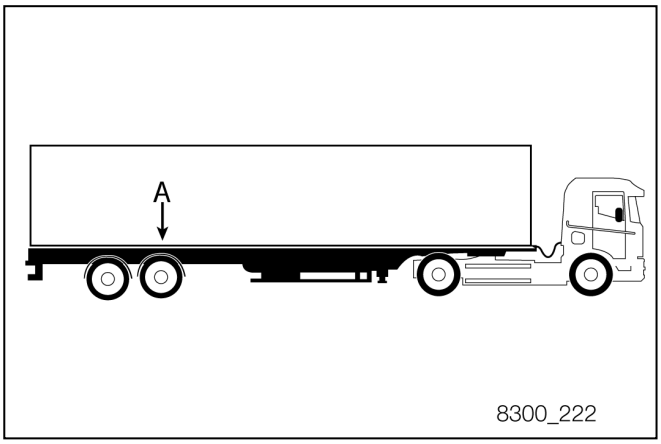
NEVER park the semi-trailer with steered wheels.

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.





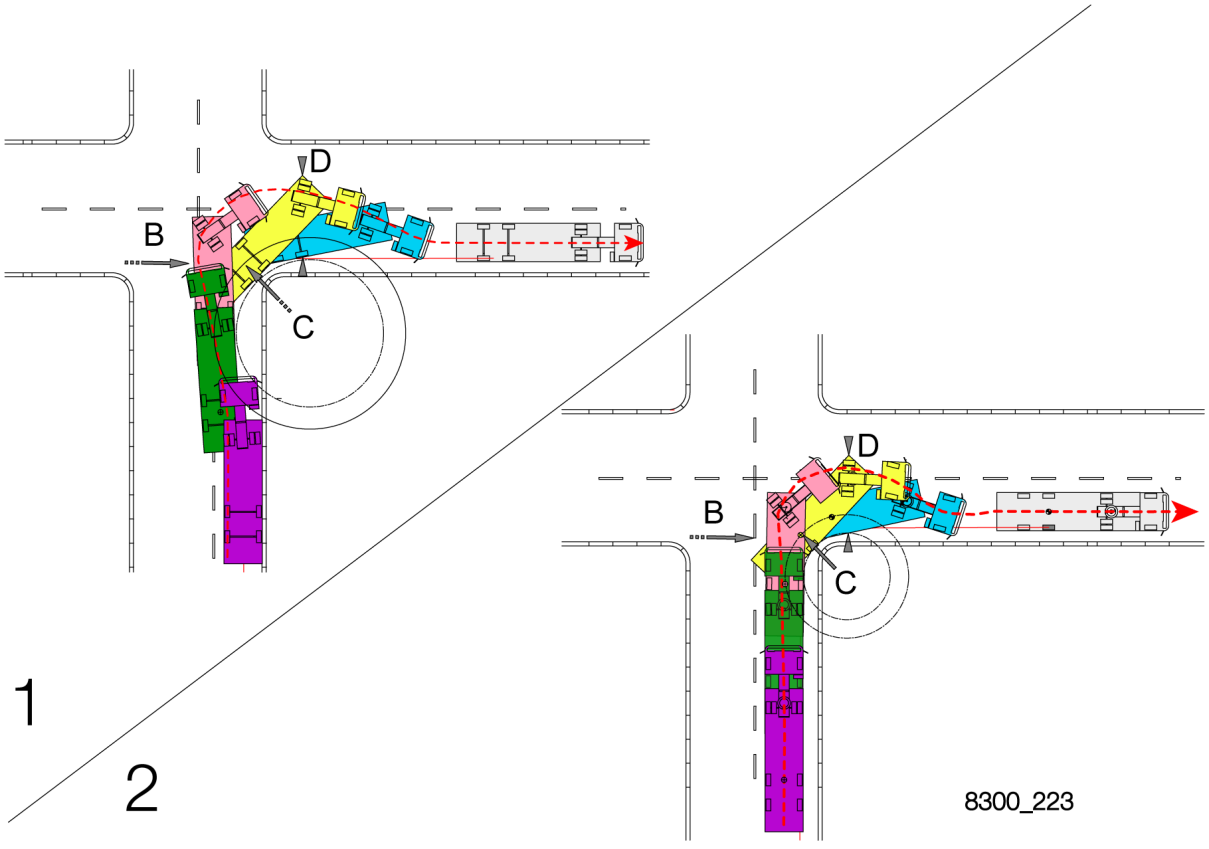


Figure 2-3

1. Steering behaviour of an unsteered semi-trailer
2. Steering behaviour of a steered semi-trailer
3. B = Required space for the semi-trailer swinging out
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 TF steering system. It also describes what should be done when the TF steering system reaches the end of its lifespan.

3.1 Safety while operating

Operating a trailer with a TF steering 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 TF steering system:

- NEVER use or put a trailer with an installed TF steering 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 TF steering system.
- Execute the daily inspection BEFORE coupling and using a trailer with a TF steering 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 TF steering 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.

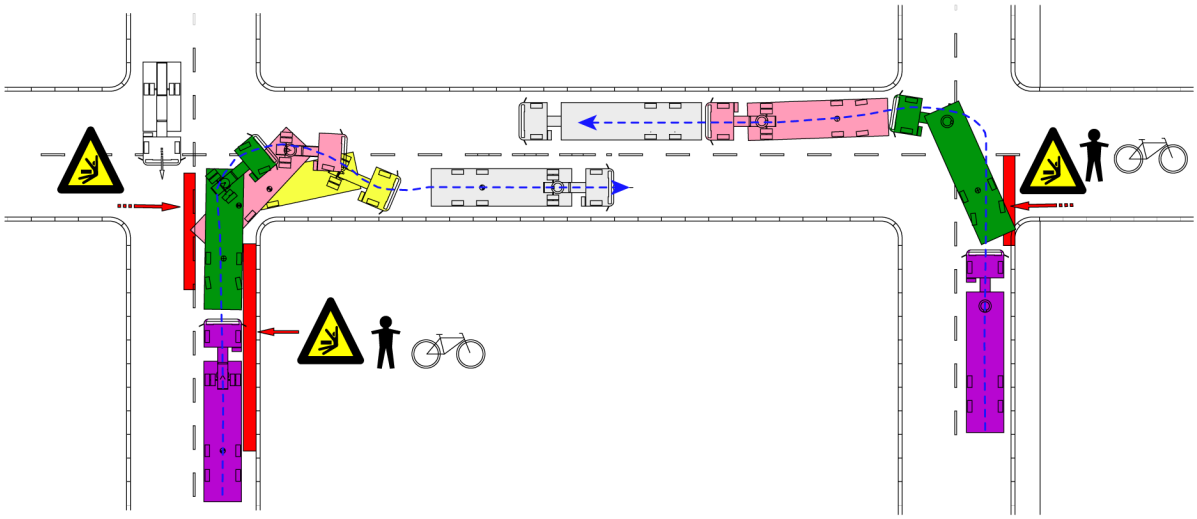


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Figure 3-1

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 TF steering 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 TF steering system .

Read the following paragraphs when products are delivered!

4.1 Cleaning

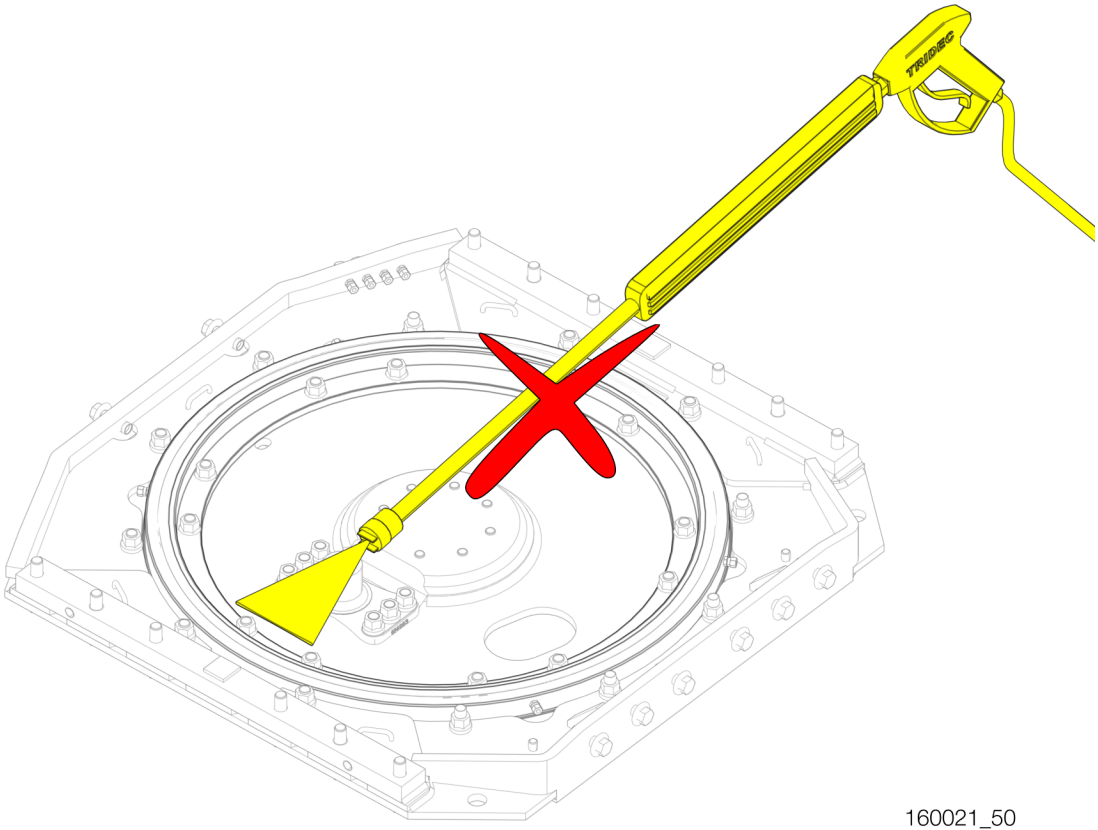

Figure 4-1

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 pres-sure		Driving dir-ection		False
	Important restriction!		Chance of damage to the system!		Parts
	Lubrucate				

Table-2 Pictograms

4.3 Type indication

Products manufactured by TRIDEC (see 4.3), are given an identification sticker.

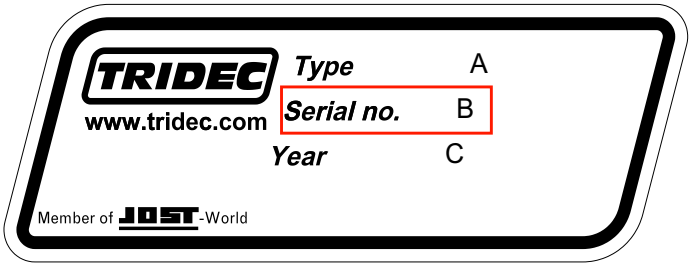

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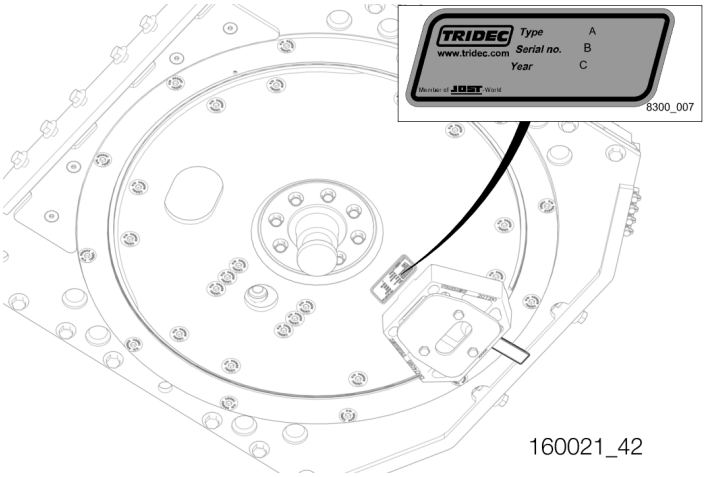
Figure 4-2



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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

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

Table-4 Maintenance

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

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.

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.

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	see the service manual

Table-7 Maintenance

5.1 Daily maintenance

The TF steering 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

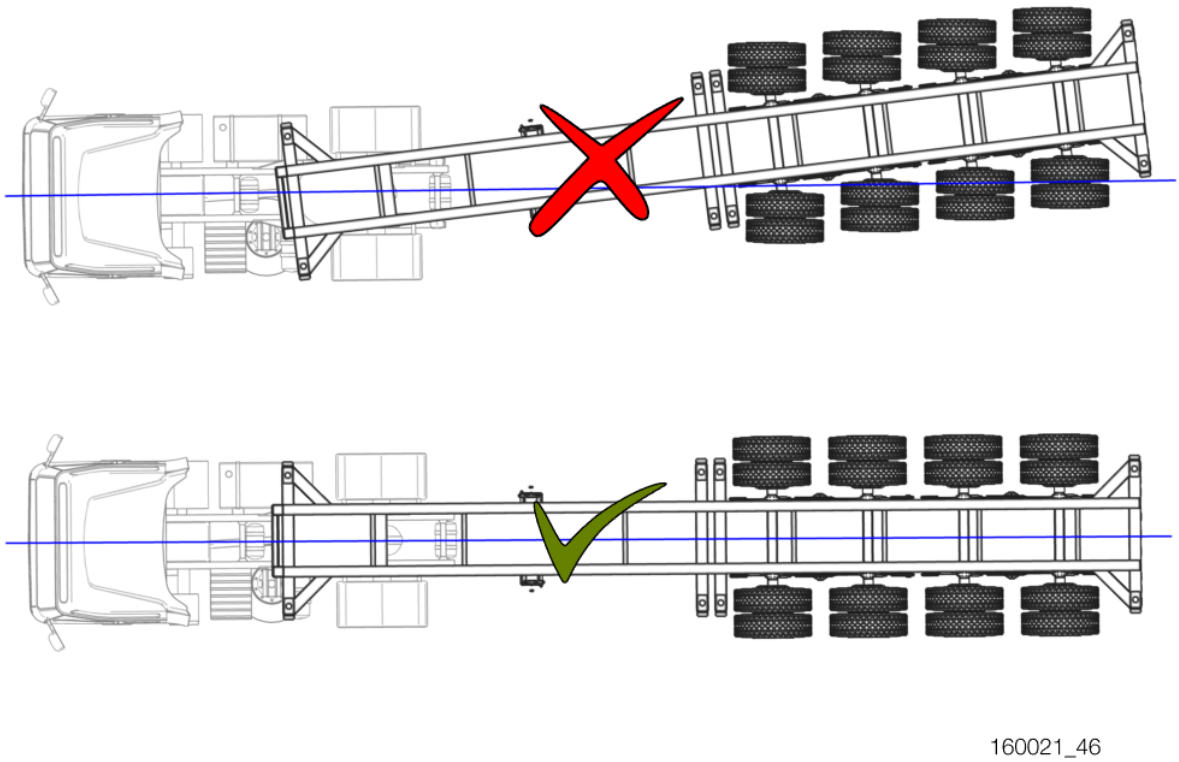


Figure 5-1

5.1.1 Lubricant

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

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

Caution! Replace lubricants of a TF steering 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

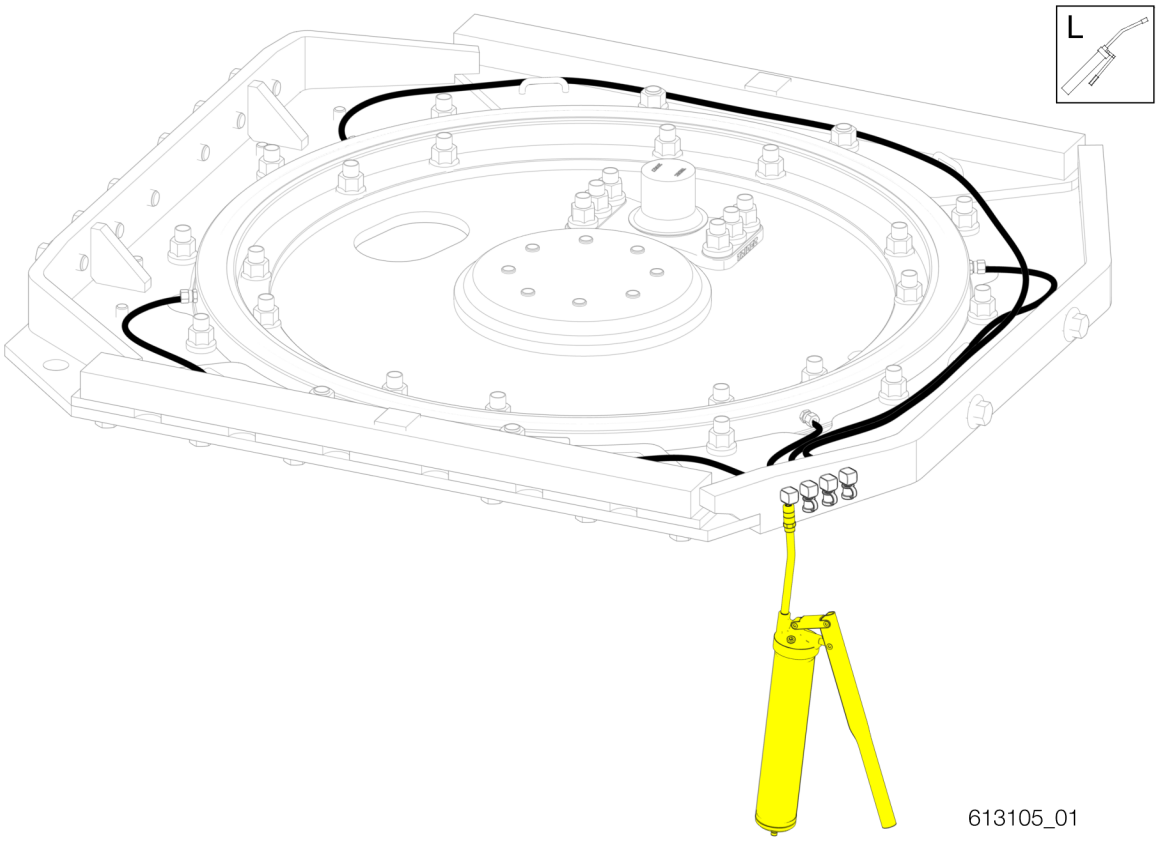


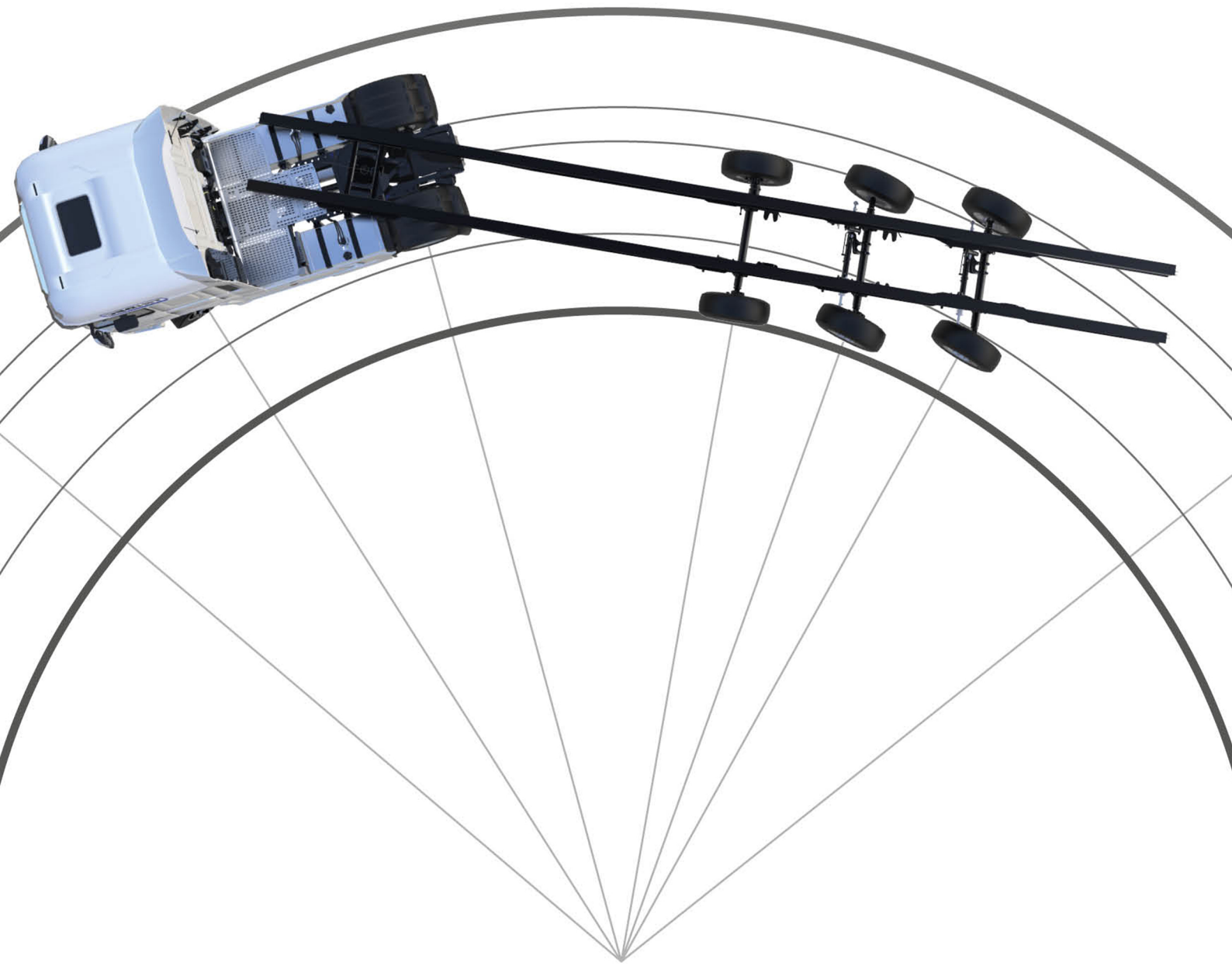
Figure 5-2

Notes

Notes

Notes

Excellent manoeuverability



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