User manual for

Fast-decoupling module

Keep for future reference.

Edition V1.4/ as of 09-2022

For your notes:

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1. General

1.1 Purpose of the user manual

This "User Manual Fast-Decoupling Module" describes the design and function, mounting, disassembly as well as maintenance and cleaning of the fast-decoupling.
The device described therein can be used as an additional element to the vehicle fixation of S. Bleyer GmbH or other fixations.

The fast-decoupling was developed and manufactured by S. Bleyer GmbH.
The function is protected by patent law.

1.2 Target group

This "User Manual for Fast-Decoupling Module" is intended for operators of vehicle test benches with adequate technical knowledge.

1.3 Version

The footer on each page contains the current version of this user manual.

You can download the latest version of this user manual at any time from www.s-bleyer-gmbh.de.

1.4 Safekeeping

Make sure that you keep the user manual safely!

1.5 Copyright

The content of this edition has been carefully checked for accuracy. Nevertheless, errors cannot be completely excluded.
Subject to change without prior notification.

Layout and texts: S. Bleyer GmbH. All photos and drawings are the property of S. Bleyer GmbH. Photos and drawings need not reflect the current production status as long as the function illustrated is the same.

Printed on 100% recycled paper.

1.6 Language of the user manual

The original version of this user manual has been written in the EU official language of the manufacturer (German) of this incomplete machine. Translations into other languages are translations of the original version. The legal stipulations of the Machinery Directive are applicable.

1.7 Address of manufacturer

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1.8 Explanation of the symbols

Levels of danger are identified according to ISO 3864 or ANSI Z535.4

 **Danger**	The triangular warning symbol with the signal word "Danger" stands for an *imminent danger,* that definitively leads to serious injuries or death.
 **Warning**	The triangular warning symbol with the signal word "Warning" stands for a *potentially hazardous situation*, that could lead to *serious injuries or death*.
 **Caution**	The triangular warning symbol with the signal word "Caution" stands for a *potentially hazardous situation*, that could lead to *minor injuries.* The triangular warning symbol with the signal word "Caution" also stands for a *hazardous situation* in which the product or an object in the vicinity can be damaged (*material damage*).
 **Notice**	The circular warning symbol with the signal word "Notice" stands for a *potentially hazardous situation* in which the product or an object in the vicinity could be damaged *(material damage).*
 **Note**	The hand with the signal word "Note" gives advice and hints for use.

2. Description of the fast-decoupling module

2.1 Important notes

2.1.1 General view

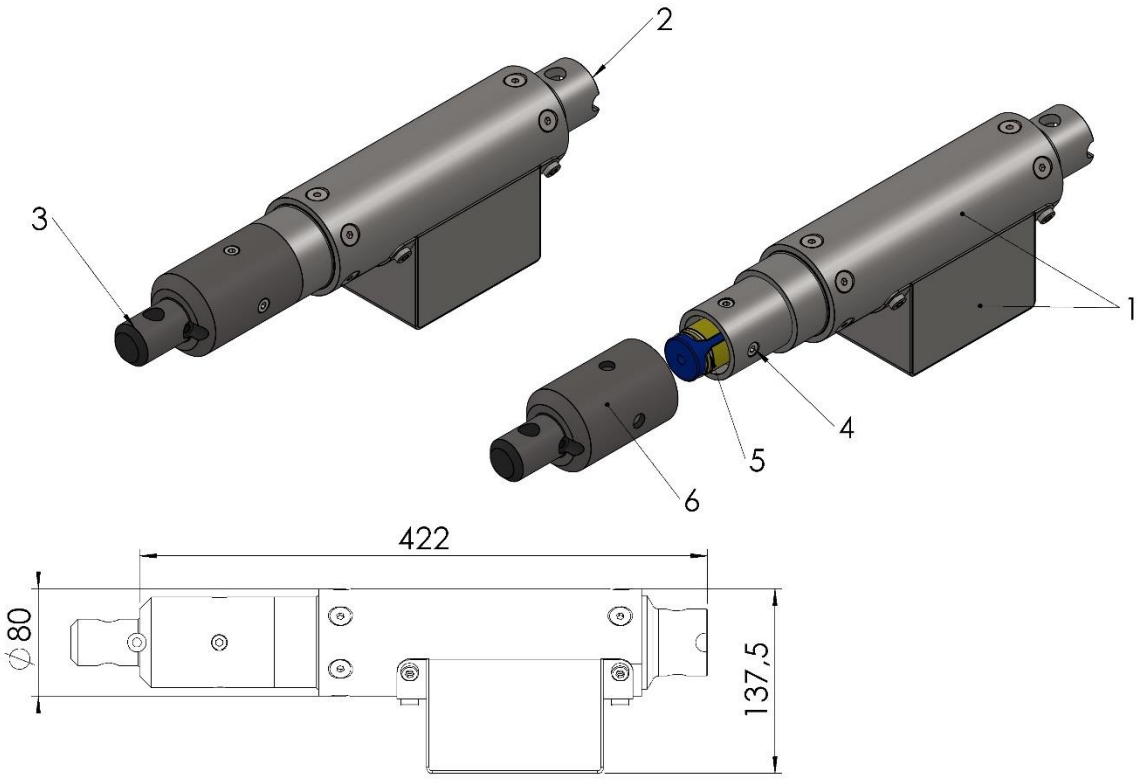

Figure 1: General view

[1] Motor housing
[2] Rear interface
(Here to the wheel hub rod)
[3] Front interface
(Here to the detachable forkhead)
[4] Shear bolts
[5] Double-wedge mechanism
[6] Head detached

2.1.2 Section view

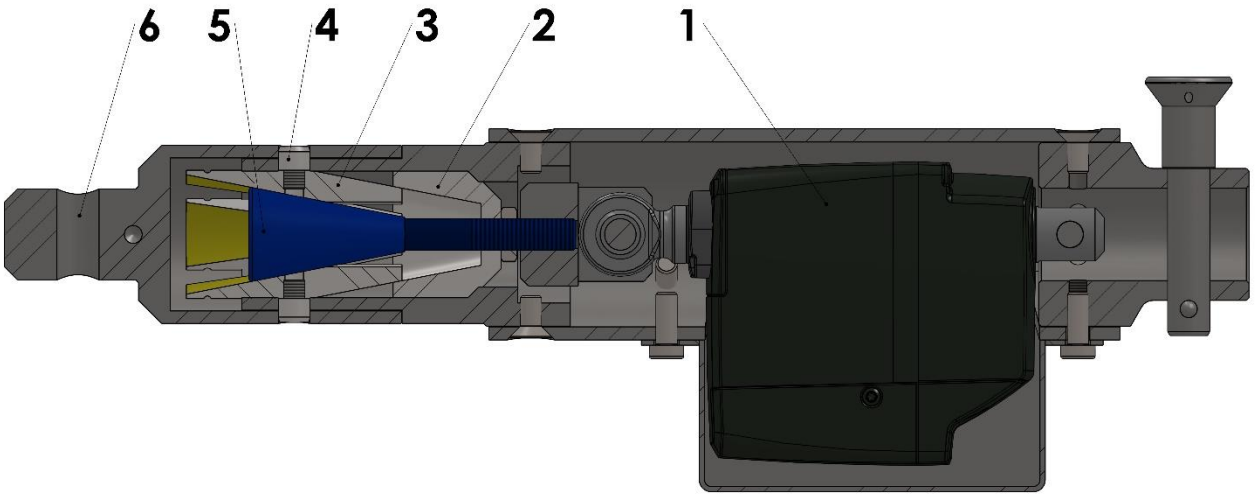

Figure 2: Section view

[1] Engine
[2] Closing wedge
[3] Double wedge
[4] Shear bolt
[5] Opening wedge
[6] Removable head

2.2 Intended use

The fast-decoupling module is an extension for operation in a vehicle fixation on a chassis dynamometer.

The present module serves for a fast decoupling of the fixation rods.
If the vehicle has to be removed quickly from the test bench in the event of a fire, for example.
Especially for electrically powered vehicles.
The vehicle with a burning battery must burn off in a controlled manner, which is not given in the test bench and leads to additional damage.
The fast-decoupling can be operated externally, promoting safe handling in case of fire.

Possible areas of use are:
- single roller dynamometers in uniaxial and biaxial use (e.g. 48-inch roller)
- double roller dynamometers in uniaxial and biaxial use (e.g. 20-inch roller)
- belt dynamometers

Intended use:
The quick decoupler was designed for operation with vehicle fixations for roller or belt dynamometer.
The use is designed for our wheel hub fixation but can also be integrated into other systems.

Intended use also includes:
- note and comply with the user manual
- follow maintenance instructions

 **Danger**	**Danger to life and risk of material damage around the vehicle!** Death, serious injuries or material damage due to improper use of the fast-decoupling! Follow all instructions for mounting and dismounting, maintenance and cleaning precisely, as well as all safety instructions!

2.2.1 Limits for tractive loads of the fast-decoupling module

Danger

Release possible up to 10,000N
This is the maximum pre-tensioning force that may be present when the test bench is at a standstill.

Maximum tractive load in operation up to 20,000N
The additional forces due to the dynamics during the test run add up.
⇨ The use of the wheel hub fixation is tension-free at idle
Here, the full load can be restrained by the test.
⇨ Pre-tensioned systems such as chains can be used with the fast-decoupling, but the pretension must be observed.

2.2.2 Danger Zone

The following areas are part of the danger zone:
- Area of 2m distance around the fixed vehicle
- Vicinity of the fixation triangles
- Generally in front and behind the vehicle

Danger

Danger to life within the danger zone during test operation!

People caught by the vehicle and thereby killed or seriously injured if the vehicle breaks loose due to improper fixation or breakage of the thread adapters!

Legs cut off or broken from deforming rods or rods breaking away.

Remain outside the danger zone during test operation!

2.2.3 Identification markings

The individual components are marked by engraving as follows:

Component	Marking	Location of engraving
Fast-decoupling unit	SE21 / number	Base body and decoupling head

2.3 Configuration

2.3.1 Scope of delivery when used with wheel hub fixation

Per rotating axle, the following components are included within the scope of delivery:

- 4 fast-decoupling modules (SE21)
- 2 wheel hub rods separable (RST12)
- 2 diagonal wheel hub rods separable (DRST12)

If not present:

- 4 plug-in anchors *or* 4 sliding anchors
- 2 wheel rim adapters with thread adapters in the version as per agreement (more versions upon request)
- 2 fixation bearings
- 1 adjusting tool for correctly adjusting the clamping force of the anchors

 **Note**	The system is delivered with 2.0-meter-long rods. You can shorten the rods individually to the required length as necessary and desired. The free end of the rod must project at least 10cm out of the clamping collet (KR12) in all applications.
 **Note**	To use the standard components of the vehicle fixation, please refer to the associated user manual.

3. Design and function

3.1 Overview

The fast-decoupling module is integrated into the existing vehicle fixation.

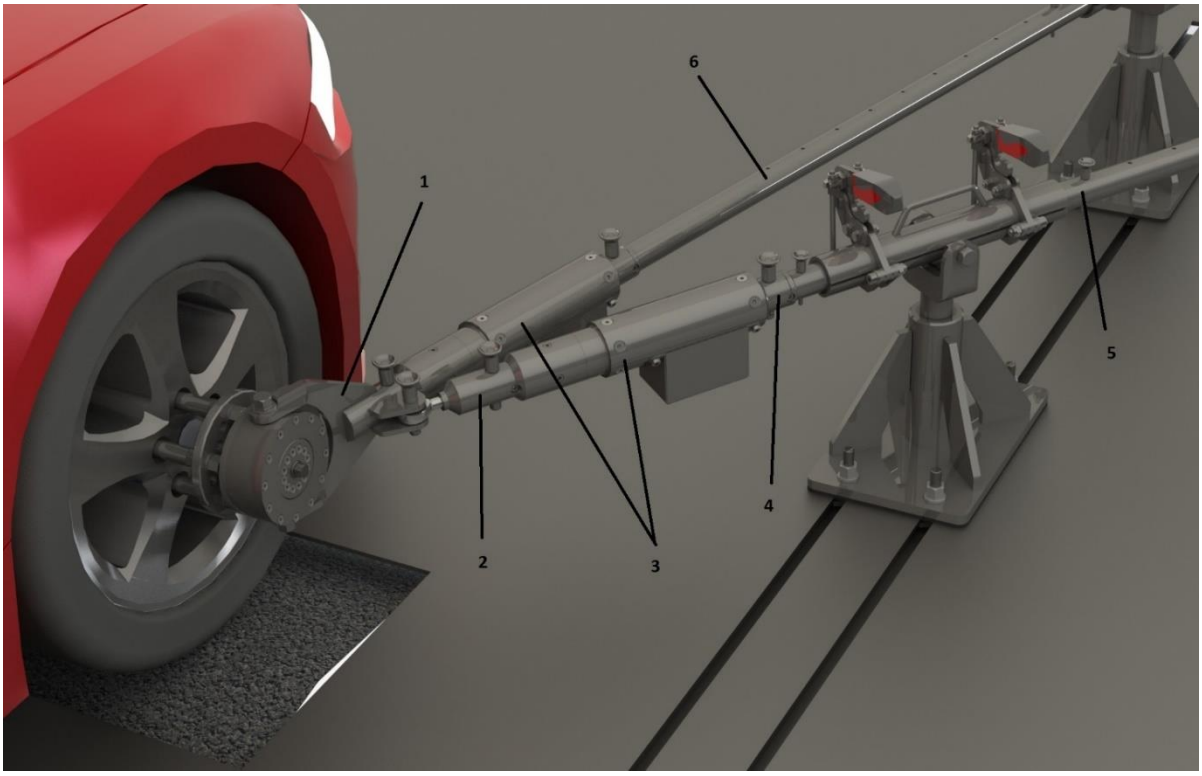

Figure 3: Integrated fast-decoupling

[1] Wheel hub rod (RST12) (divisible variant)
[2] Diagonal wheel hub rod (DRST12) (divisible variant)
[3] Fast-decoupling unit (SE21)
[4] Coupling for divisible rods (including ball lock pins)
[5] Base rod DRST12
[6] Base rod DST12

3.2 Fixation rods

3.2.1 Divisible wheel hub rod (RST12) with fast-decoupling

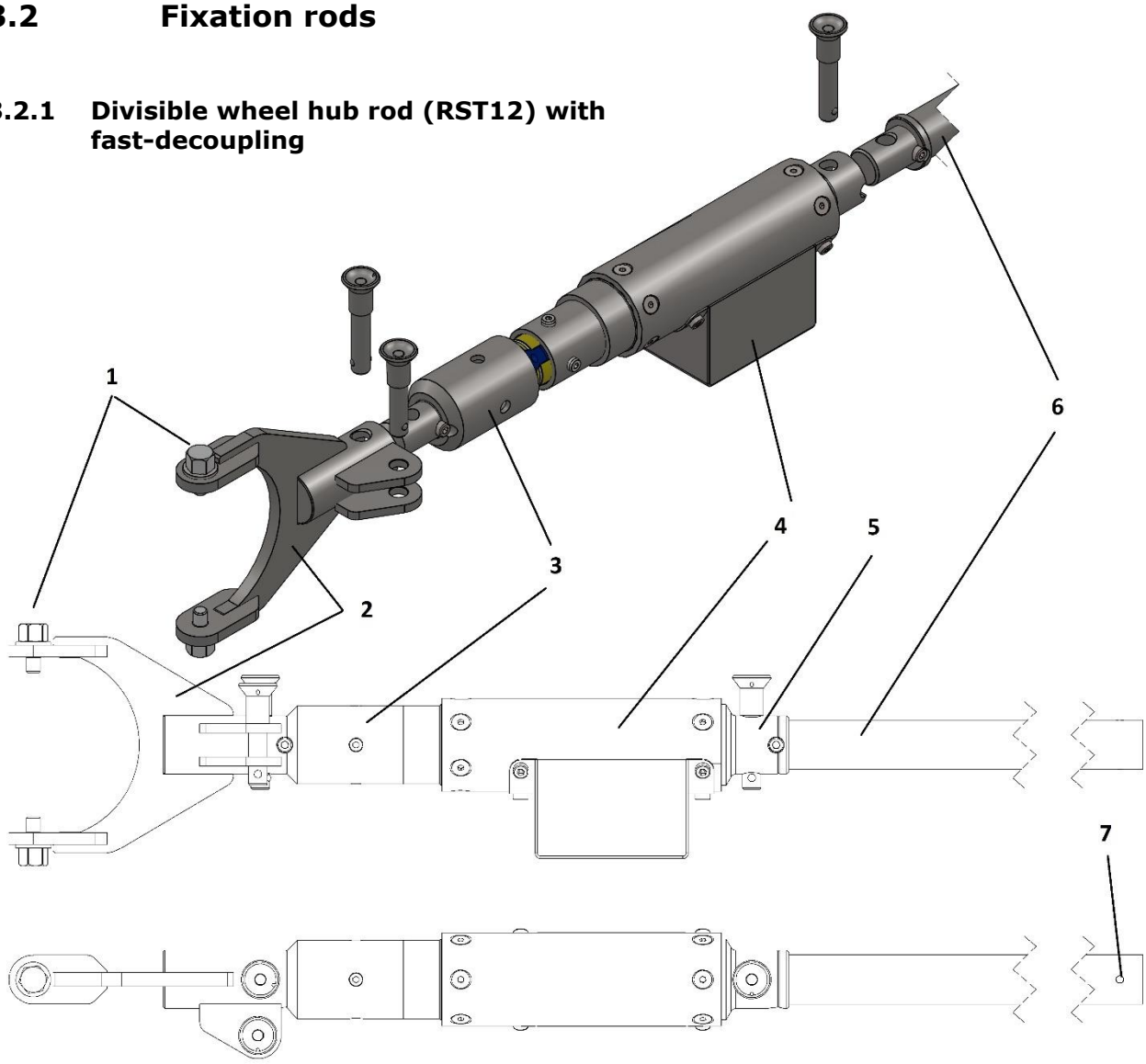

Figure 4:divisible wheel hub rod with fast-decoupling

[1] Fixation screw and spring washer for fixation bearing
[2] Detachable fork head (RST12)
[3] Head of the fast-decoupling
[4] Base body and motor housing of the fast-decoupling
[5] Coupling of the divisible rod incl. ball lock pin
[6] Wheel hub rod base rod (RST12)
[7] Borehole for securing pin

The fixation bearing, inserted in the fork head, is attached with the fixation screws.

Note	**The tightening torque of the fixation screws is 170Nm**

3.2.2 Divisible Diagonal Wheel Hub Rod (DRST12) with fast-decoupling

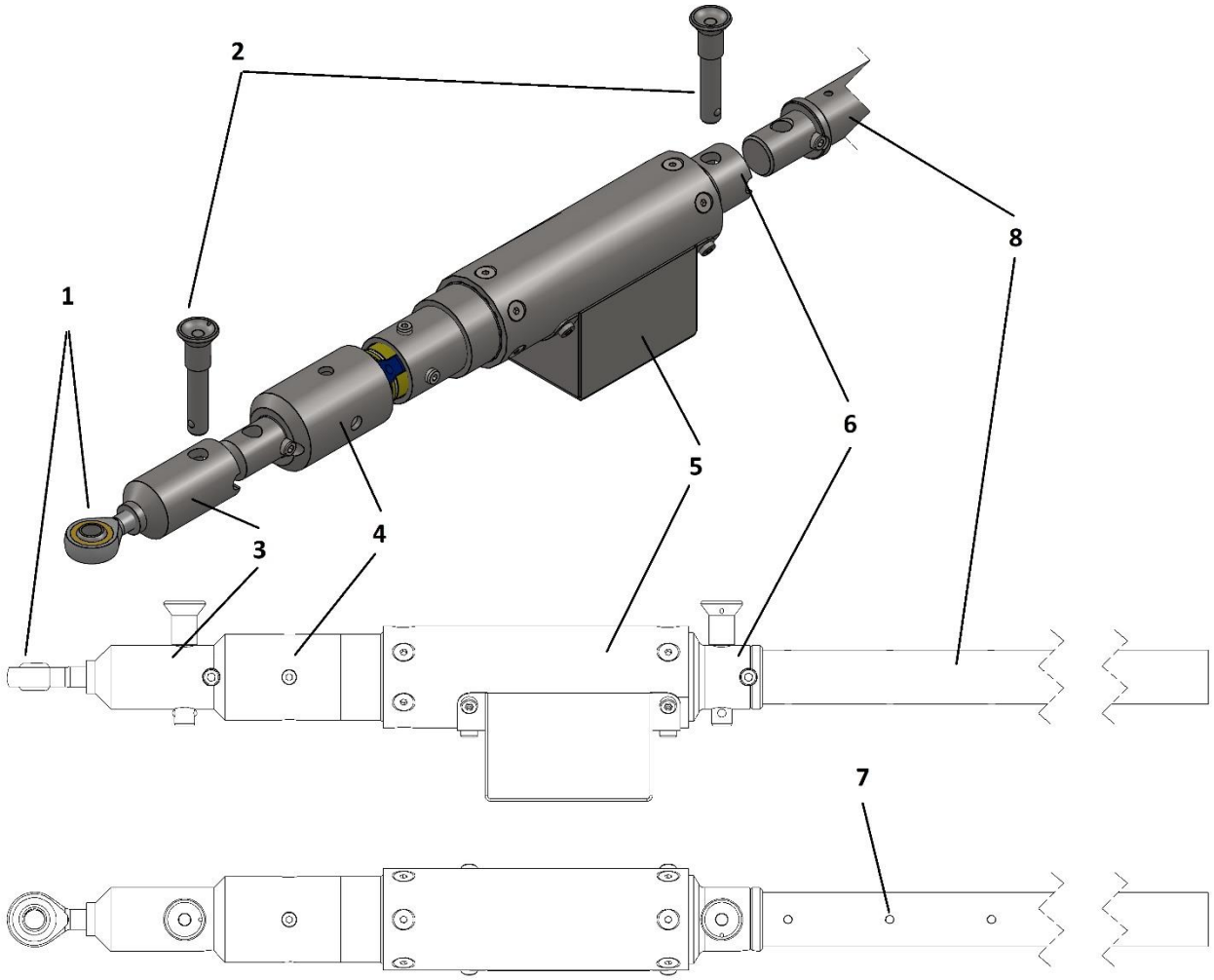

Figure 5: divisible diagonal wheel hub rod with fast-decoupling

[1] Swivel head
[2] Ball lock pin
[3] Divided DRST head
[4] Head of the fast-decoupling
[5] Base body and motor housing of the fast-decoupling
[6] Coupling of the divisible rod incl. ball lock pin
[7] Borehole for securing pin
[8] Diagonal wheel hub rod Basic rod (DRST12)

4. Operation with fast-decoupling

4.1 Overview

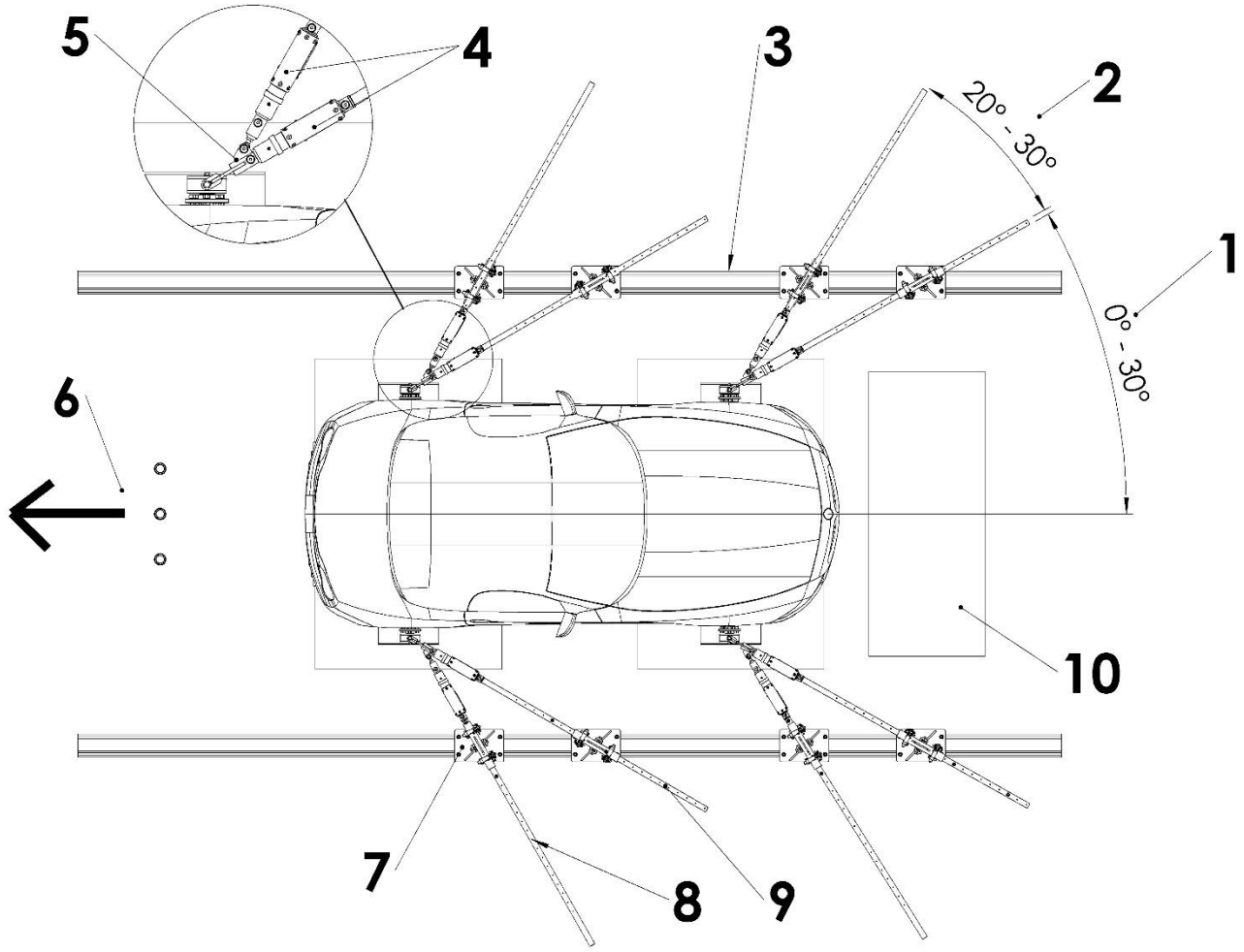

Figure 6: Operation with fast-decoupling overview

[1] Wheel hub rod as parallel as possible to the longitudinal axis of the vehicle max. 30°
[2] Diagonal wheel hub rod angle approx. 30°
[3] T-rail
[4] Fast-decoupling module
[5] Divisible rod heads
[6] Pulling direction to the gate
[7] Sliding anchor
[8] Divisible diagonal wheel hub rod
[9] Divisible wheel hub rod
[10] Driving wind blower

Note	**Ensure that the position of the fixation allows the vehicle to be pulled out of the test bench!** **For the function, all triangles must be in the direction of the test bench gate. The vehicle must be moved about 10cm for a complete decoupling.** **Incorrect arrangement causes blockage or wedging and prevents removal of the vehicle**

4.1.1 Connecting components with ball lock pins

1. Pre-assemble the bearing with detachable fork head
2. Pre-assemble the wheel hub rod (RST) with fast-decoupling.
   Connected with ball lock pin Ø16×50
3. Insert wheel hub rod into open clamping collet (KR12).
4. Connect wheel hub rod with detachable fork head.
5. Pre-assemble diagonal wheel hub rod (DRST) with ball lock pin 2× Ø16×50.
6. Mount DRST with rod end on fork mount with ball lock pin Ø16×40

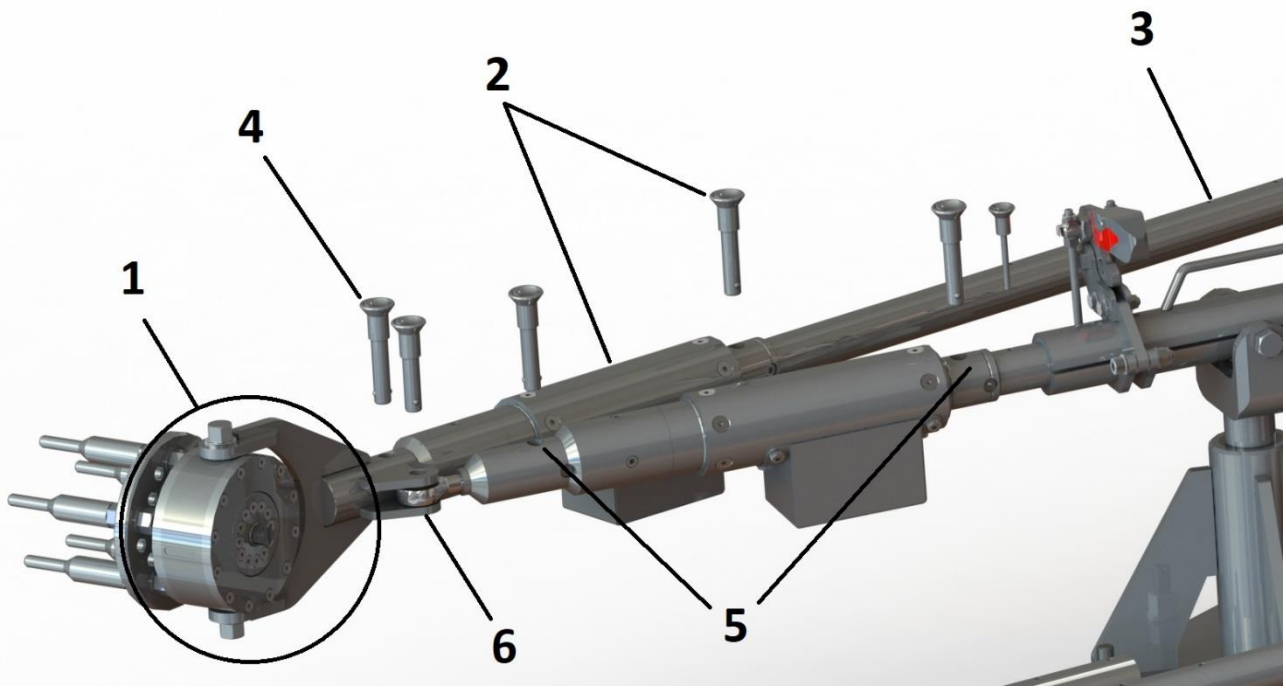

Figure 7: Connecting components

4.2 Test operation of the fast-decoupling

1. Leave the handbrake or centering device activated
2. Perform a visual inspection to ensure the shear bolts are seated correctly
3. Activate fast-decoupling and let it decouple
4. Check if all modules have decoupled
   (Visual inspection of the position of the shear bolts)
5. Close the fast decoupling again
6. Check if all units are closed
7. Release the handbrake or centering device
8. Perform test run

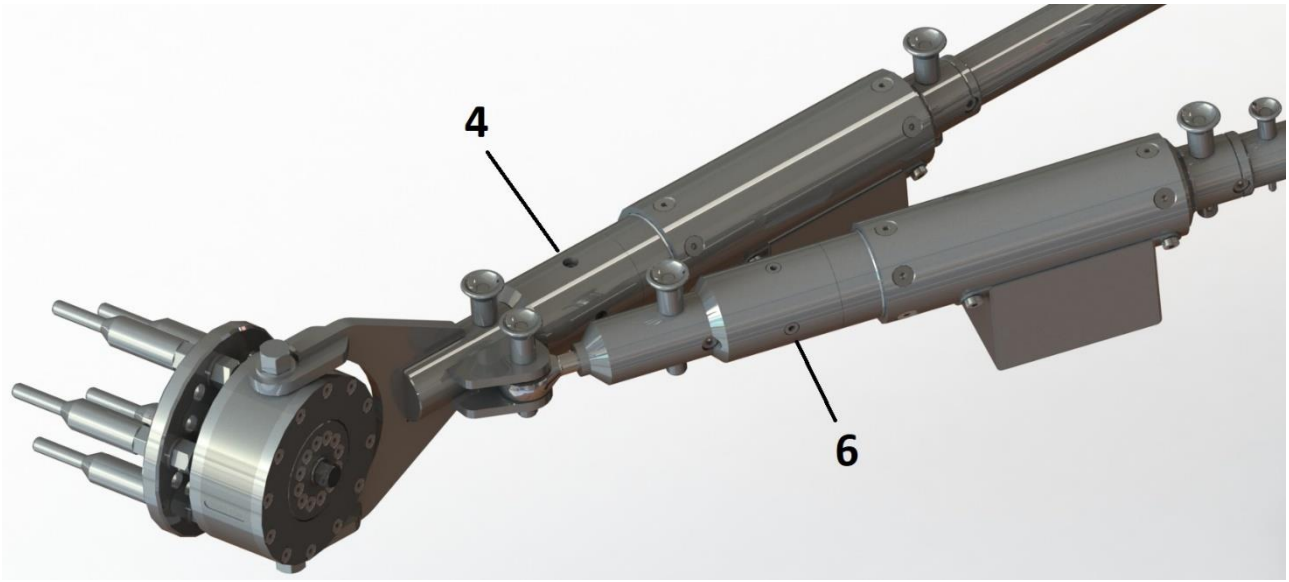

Figure 8: Test operation

4.3 Emergency decoupling

In case of an emergency, especially battery fire, the decoupling is activated from the test bench control room.

1. Brake the roller and ensure that it is stationary.
2. Activate decoupling and wait for the status message "open" via the end position signals
3. Recover vehicle

 **Note**	If a module is not decoupled properly, it can be reactivated. Clear error by driving command in the opposite direction and reactivate the decoupling direction after 0.5 sec. As a result, the overload protection triggers later and the motor is able to release any increased tension as well.

5. Maintenance and cleaning

5.1 General maintenance instructions

Perform the inspections and, if necessary, the maintenance work described here on all components of the fast-decoupling regularly before each mounting.

This chapter only describes inspection, maintenance and cleaning work that can be performed individually by the operator of the test bench. Further maintenance jobs must be carried out by specially trained service personnel or by the manufacturer.

Always keep all parts of the fast-decoupling clean, dry and free of grease during mounting and storage.

Check the shear bolts regularly for proper operation; clean & re-grease if necessary.

5.2 Care

Always keep the fast-decoupling clean and dry. This ensures operational safety and fault-free long-term functional capability of the fixation as well as of the test bench.


Note

Regularly wipe the fixation elements with a soft, lint-free cloth. Only use water and all-purpose cleaner. Thoroughly wipe off residual moisture after cleaning or allow to dry.

Do not use steam jet cleaning machines, high-pressure cleaning equipment or chemically aggressive agents to clean the components of the wheel hub fixation!

5.2.1 Visual inspection of the surfaces

All surfaces should be free of ridges or burrs.
In particular, the guide surfaces of the plug-in connections, ball lock pin bores and the shear bolts.
Relevant damage is clearly visible and recognizable for users with technical know-how.
In case of doubt, contact the manufacturer.

5.3 Maintenance

5.3.1 Replace shear bolts

If the shear bolts show burrs and wear, they can be replaced independently. An occasional visual inspection is sufficient.
The head of the coupler is removed and bolts are extended, then the relevant surfaces are clearly visible.

5.3.2 Greasing the shear bolts

The shear bolts can be removed with a size 5 Allen key.
Never remove all bolts at the same time!
During this time, only place the fast-decoupling horizontally.
Clean the removed shear bolts, inspect surfaces and re-grease.
For greasing, we recommend a special grease “MOBILITH SHC 100”, which can be obtained from us.

5.3.3 Fitting the shear bolts

Hand-tighten all pins for pre-assembly.
Torque for tightening is 10Nm.

After tightening the shear bolts, turn them in the opposite direction with little force. The shear bolts use their play when tightening and cant.
This canting is noticeably loosened again as a result.
The screw connection is not loosened, but the wedge is thereby re-centered in position.

5.3.4 Maintenance of fixation rods

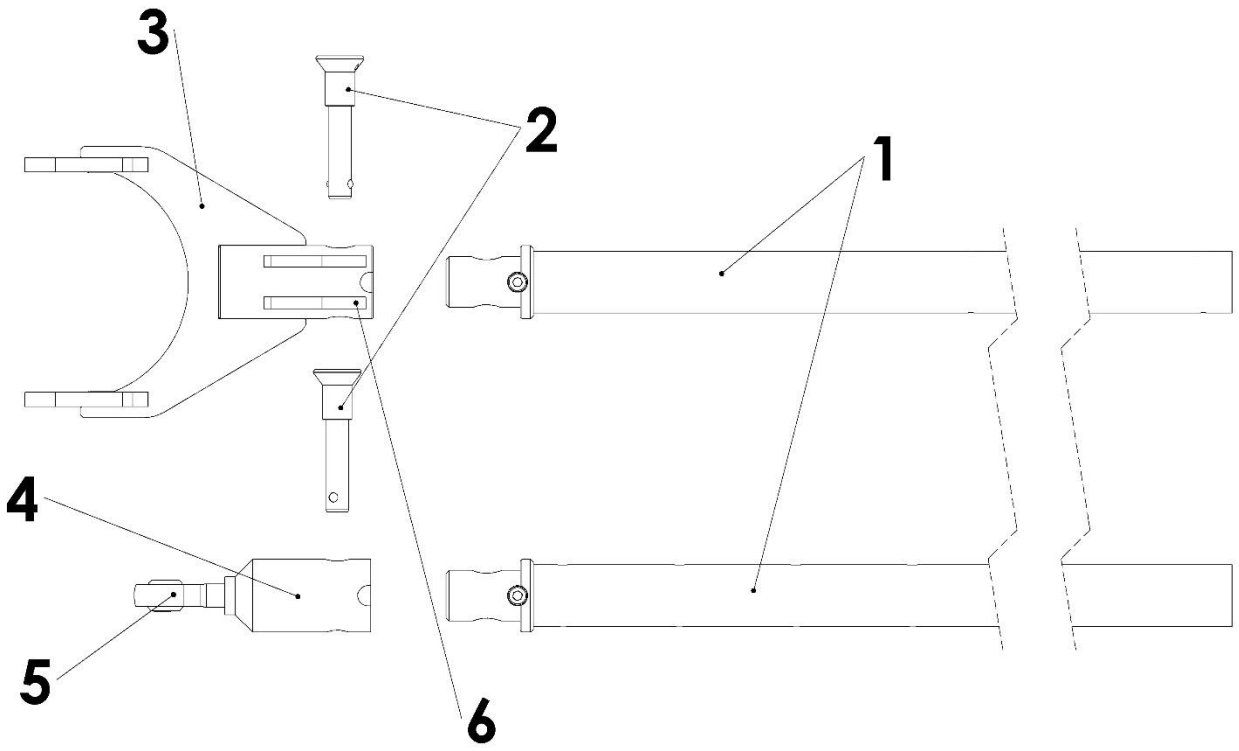

Figure 9: Maintenance of fixation rods

[1] Base rod for divisible rods
[2] Ball lock pin
[3] Fork head from wheel hub rod
[4] Diagonal wheel hub rod head
[5] Swivel head
[6] Docking unit for diagonal wheel hub rod

1. Check if rod is damaged or bent (see BA for wheel hub fixation)
2. Replace damaged or sluggish ball lock pins
3. Checking the surfaces for ball lock pins and insertion of base rods
4. Replace damaged or bent rod head
5. Checking the surfaces for ball lock pins
   If the brackets of the mounting unit are bent, replace the entire head

6. Spare parts and accessories

Spare part/accessory part	Order number
Shear bolts	521 021 SE21-02-14
Fork head of detachable wheel hub rod	521 041 RST12-01-10
Head of divisible diagonal wheel hub rod	521 042 DRST12-01-10
Base rod divisible	521 043 RST12-01-20
Swivel head M16	SBHF17-40
Ball lock pin Ø16	SBHF 17-20

Danger

Safety warning!

For safety reasons, the vehicle fixation devices from S. Bleyer GmbH may only be used as a complete unit.

Mixing with components from other manufacturers is not permitted.

7. Technical information

7.1 Vehicle and wheel hub fixation test parameters

Permissible vehicle mass	max. 3,500kg
Permissible axle weight	max. 2,000kg
Permissible acceleration/braking deceleration	max. 10.0m/s²
Permissible tractive force	max. 30,000N
Kick-down	permitted
Full braking	permitted
Anchor height	300mm up to 400mm
Permissible speed	max. 300km/h
Wheel rim diameter of the vehicle	10-inch to 22-inch
Distance between vehicle and plug-in or sliding anchor	min. 1.0m max. 2.0m
Temperature range	-40°C to +60°C

7.2 Fast-decoupling module

7.2.1 General

Length	470mm
Mass	10 kg
Load limit single system	Decoupling: 10.000 N
	Max. Total load 20,000 N
Time to decouple	At full load approx. 6 sec.
Temperature range	-40°C to +60°C

7.2.2 Electrical data

Rated Voltage	24V
Rated current consumption	2,3A
Peak load	Up to 10A
Normal load	Up to 5A

7.2.3 Parallel system connection diagram

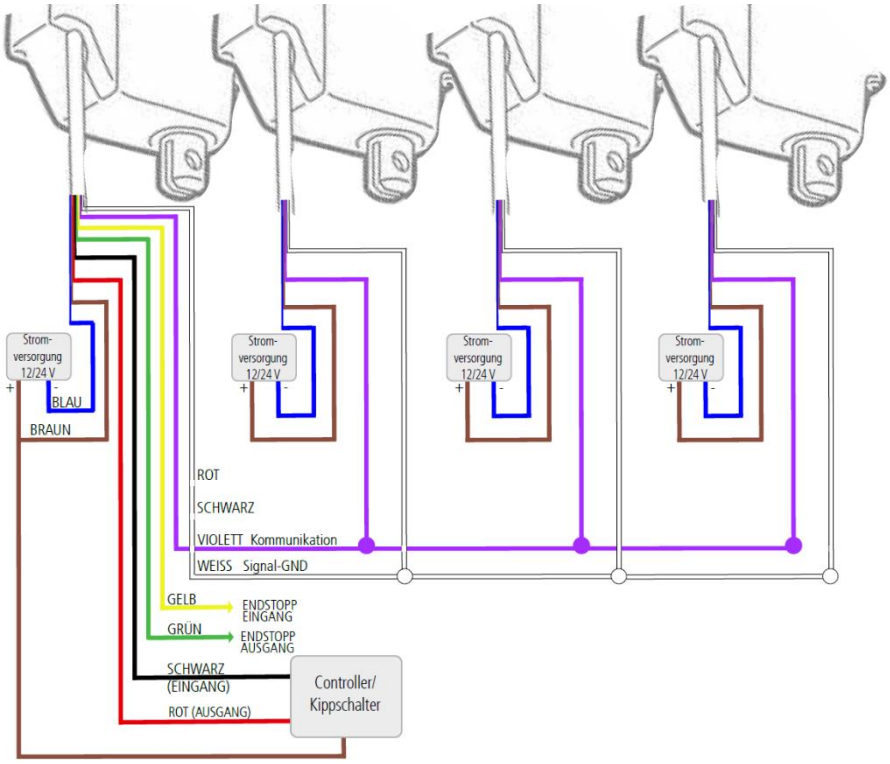

Figure 10: Connection diagram Linak motors

Figure 11: Connection diagram Linak motors *Source: Linak GmbH*

https://cdn.linak.com/-/media/files/connection-diagrams/la25/actuator-with-parallel.pdf

blue	24V negative pole	green	End position signal "extended"
brown	24V positive pole	yellow	End position signal "retracted"
red	24V Plus for "Extension"	white	Bus communication
black	24V Plus for "Retraction"	purple	Bus communication

Engine extension leads to decoupling, the shear bolts retract.
Engine retraction leads to coupling, the shear bolts extend.

The units can be configured as a parallel system.
E.g. as a unit of 2 or 4. Individual control is also possible.
Depending on customer requirements and situation on the test bench.

7.3 Fixation rods

7.3.1 Wheel hub rod divisible (without fast-decoupling)

Length of rod without fork head	2,000mm
Length of fork head	135mm
Mass	Approx. 9.5kg

7.3.2 Diagonal wheel hub rod divisible (without fast-decoupling)

Length of rod without swivel head	2,000mm
Length of swivel head	70mm
Mass	Approx. 7.5kg

8. Declaration of conformity

S. Bleyer GmbH

www.s-bleyer-gmbh.de

Konformitätserklärung

gemäß EG-Maschinenrichtlinie 2006/42/EG, Anhang II A

Hiermit erklären wir:

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dass die von uns hergestellte Ausrüstung

- ***Schnell-Entkoppelungs-Modul***
- *Funktion: Schnellentkoppelungseinheit zur Integration in Fahrzeugfixierungen auf Rollenprüfständen*

Den Anforderungen der EG-Maschinenrichtlinie 2006/42/EG entspricht.

Hinweis: Die Ausrüstung wird mit einer Betriebsanleitung ausgeliefert, die wichtige Hinweise zur bestimmungsgemäßen Verwendung, ggfs. Einsatzbeschränkungen, Montage- Verwendungs- und Wartungshinweise sowie wichtige Sicherheitshinweise enthält, auf deren Einhaltung unbedingt zu achten ist!

Die Person oder Organisation, die bei der **S. Bleyer GmbH** bevollmächtigt ist, die technischen Unterlagen zusammenzustellen bzw. zur Verfügung zu stellen:

- Dr. Jens Bormann / Geschäftsführer

Schorndorf 30.08.2021 Bormann

Ort, Datum Unterschrift

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