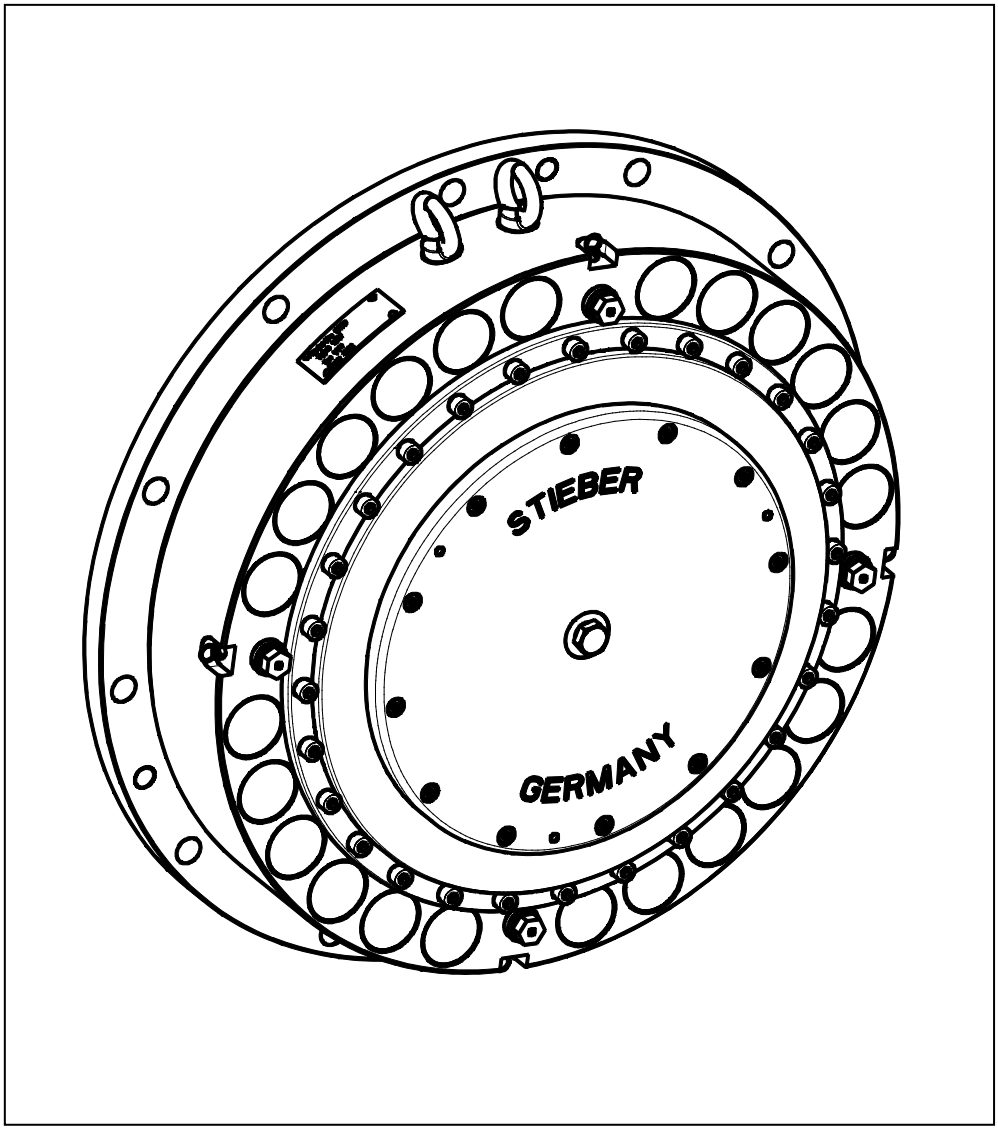
Assembly and maintenance manual

Type RSRT85-260



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General safety instructions

	**WARNING**	**Risk of injury due to moving components!** Rotating driven components can cause the most severe injuries. Therefore, during operation: ➢ It is strictly forbidden for persons to loiter in the danger zone or in its immediate vicinity. ➢ Do not disable, render unusable or circumvent safety equipment and / or safety functions. Prior to entering the danger zone: ➢ Switch off the power supply and secure it against being switched on again. ➢ Wait for lagging components to come to a standstill.

	**DANGER!**	**Danger due to improper operation!** ➢ Modifications to the backstop are not permitted and may impair safety. ➢ All tasks may only be performed by personnel with the requisite training and expertise. ➢ Repairs and maintenance tasks may only be performed when the machine is at a standstill. To this end, the machine is to be secured against a restart!

	**WARNING**	**Risk of injury due to the backstop falling down or tipping over!** The weight of the backstop can injure people and cause severe crushing. Therefore: ➢ Use a pallet on which the backstop can be moved with a forklift. ➢ Use a suitable lifting gear for lifting (slings, etc.) which is able to support the weight of the backstop.

	**WARNING**	**Risk of injury due to incorrect assembly!** Faulty installation and maintenance can cause severe property damage and personal injury. Installation, maintenance and repair work may only be performed by personnel with the requisite training and expertise!

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1 General

1.1 Information relating to the assembly and maintenance manual

This assembly and maintenance manual provides important information regarding the installation and commissioning of the backstop.

Prerequisite for safe operation is compliance with all of the stated safety and handling instructions.

Moreover, the relevant local accident protection guidelines and general safety provisions for the field of application of the backstop are to be complied with.

Read the assembly and maintenance manual carefully prior to installation and commissioning. It is a product component and must be kept in the immediate vicinity of the installation site and be accessible to personnel at all times. Furthermore, all safety instructions stated in the assembly and maintenance manual are to be observed.

1.2 Explanation of symbols

Warnings are marked throughout this assembly and maintenance manual by symbols. These warning symbols are introduced by signal words which indicate the extent of the danger. Comply with these warning symbols under all circumstances and act with due care and attention to avoid accidents, personal injury and property damage.

	**DANGER!**	...indicates an imminently dangerous situation which can be fatal or cause severe injuries if it is not averted.
	**WARNING**	...indicates a potentially dangerous situation which can be fatal or cause severe injuries if it is not averted.
	**ATTENTION**	...indicates a potentially dangerous situation which can cause minor or light injuries if it is not averted.
	**CAUTION**	...indicates a potentially dangerous situation which can cause property damage if it is not averted.
	**NOTE**	… highlights helpful tips and recommendations as well as information for efficient and fault-free operation.

1.3 Manufacturer

STIEBER GMBH, 69126 Heidelberg, Hatschekstr. 36, Germany
Phone: +49 (0) 6221 3047-0, Fax -31

1.4 Labeling

Front of the cover

- Manufacturer's name

Outer race on the circumference / Name plate with

- Type designation
- Slip torque T_R
- Date of manufacture (coded)

1.5 Environmental protection

Energy:	The backstop does not use any electrical energy
Materials:	Steel, organic matter
Recycling:	Steel parts are up to 100% recyclable, organic matter must be disposed separately.

2 Safety

2.1 Intended use

Backstops of Type RSRT85-260 are torque-limiting backstops, they switch back on again automatically dependent on the direction of rotation. They transmit the torque in a force-locked manner.

In addition, they can be progressively released under load by a mechanical device, e.g. in case of maintenance.

Backstops of Type RSRT85-260 will be used as torque-limiting backstop, as well as load balancing backstops in machinery and equipment.

Torque-limiting backstops may only be operated within the limitations of use outlined in section 2.5.

All of the specifications stated in the assembly and maintenance manual must be strictly adhered to.

Any claims due to damage arising from improper use are excluded. The operator carries sole liability for all damage arising from improper use.

2.2 Responsibility of the operator

The operator of the machine, in which the clutch coupling is installed, is subject to the legal obligations concerning occupational safety.

The valid provisions for the site of operation as well as the safety and accident prevention regulations of the trade associations are to be observed. This, in particular, means that the operator:

- is aware of the valid occupational safety provisions.
- implements the necessary behavioral requirements for operation of the machine, in which the clutch coupling is installed, at the site of operation.
- clearly defines responsibilities for installation, operation, maintenance and cleaning of the machine in which the clutch coupling clutch is installed.
- ensures that all staff members, who work at or with the machine in which the clutch coupling is installed, are employed and have read and understood the operating manual. Moreover, he must, at regular intervals, provide training for personnel on how to handle the machine, in which the clutch coupling is installed, and inform them of the potential dangers. In addition, the operator is responsible for ensuring that the machine in which the clutch coupling is installed:
  - is always in perfect technical condition
  - is maintained in accordance with the specified maintenance intervals
  - has all its safety equipment checked regularly for completeness and functionality

2.3 Assembly and maintenance personnel

⚠	**WARNING**	**Risk of injury for insufficiently qualified personnel!** Improper handling can cause significant personal injury and property damage. Therefore: ➢ Only ever have tasks performed by those persons to whom the tasks have been assigned.

Qualified personnel are those persons who, owing to their training, experience and instruction as well as their knowledge of relevant standards, provisions, accident prevention regulations and operating conditions, have been authorized by the person responsible for the safety of the plant to perform the requisite tasks and are able to recognize and avoid potential dangers in doing so. Knowledge of first-aid measures and on-site emergency equipment must also be included.

2.4 Personal protective equipment

It is necessary to wear personal protective equipment when handling the machine, in which the clutch coupling is installed, to minimize health risks.

The necessary protective equipment such as work shoes, gloves, safety goggles etc. is to be put on prior to all tasks and kept on during the task.

2.5 Limitations of use

Type	Size		Max. Slipping Torque	Speeds		Number of Fastening Bolts	Weight
		d H7 [mm]	T [Nm]	n_{min} [rpm]	n_{max} [rpm]	Z	[kg]
RSRT	85	50, 60	1400	490	5300	6	50
	100	60, 70	2300	480	4100	6	60
	120	70, 80	3400	370	3600	6	80
	140	65, 90	4500	420	2700	6	95
	170	90, 100	8000	400	2400	6	150
	200	130, 150	12500	370	2400	6	180
	240	150, 180	21500	310	1300	12	350
	260	150, 190	30000	275	1000	12	420

Table 1. Specificationen

- Limits for ambient temperature: –20°C to +45°C
- Maximum operating temperature: 90°C
- Required machine shaft tolerance: d = h6 or j6
- Permissible radial runout deviation of the housing centering to the shaft: 0,25 mm
- Permissible axial runout of the housing Centering to the shaft: 0,1 mm

3 Structure and function

3.1 Structure

Backstop	
Item 1	Outer race
Item 2	Inner race
Item 8	Cage
Item 9	Retaining ring
Item 10	Flange
Item 11	Basket
Item 12	Pressure plate
Item 13	Cover
Item 14	Friction lining
Item 20	O-Ring
Item 25	Cylinder screw
Item 29	Hexagon screw with seal
Item 35	Safety bolt
Item. 38	Mechanical release device
Item 39	Eyebolt

Table 2. Part list

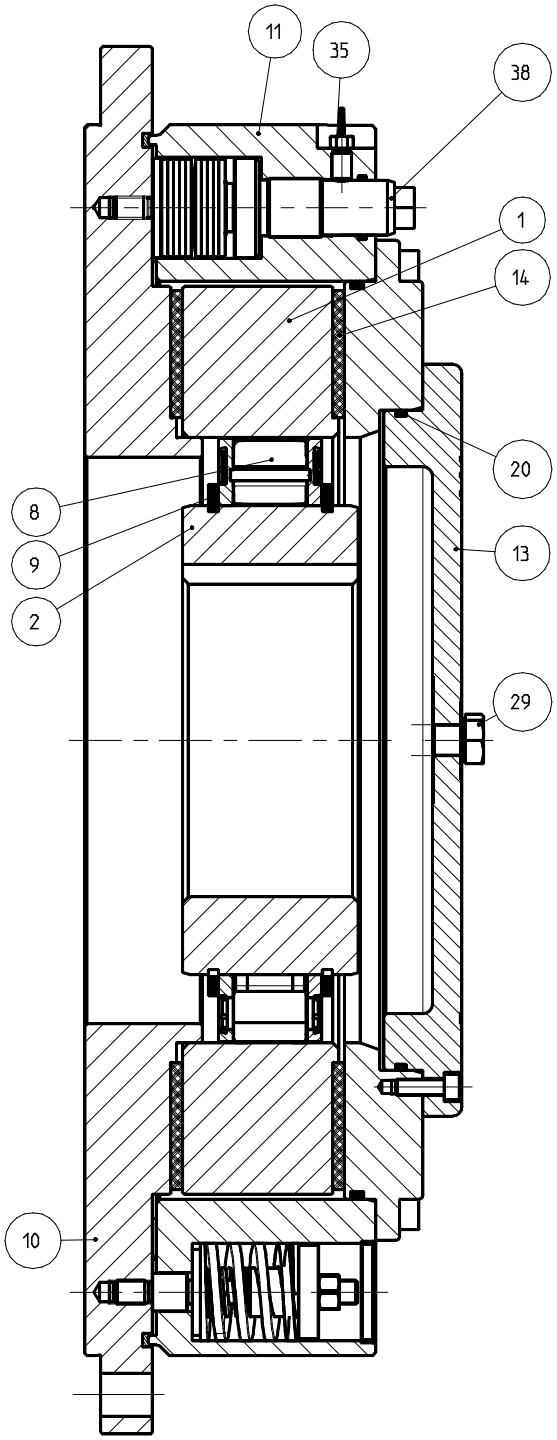


Fig. 1a Structure

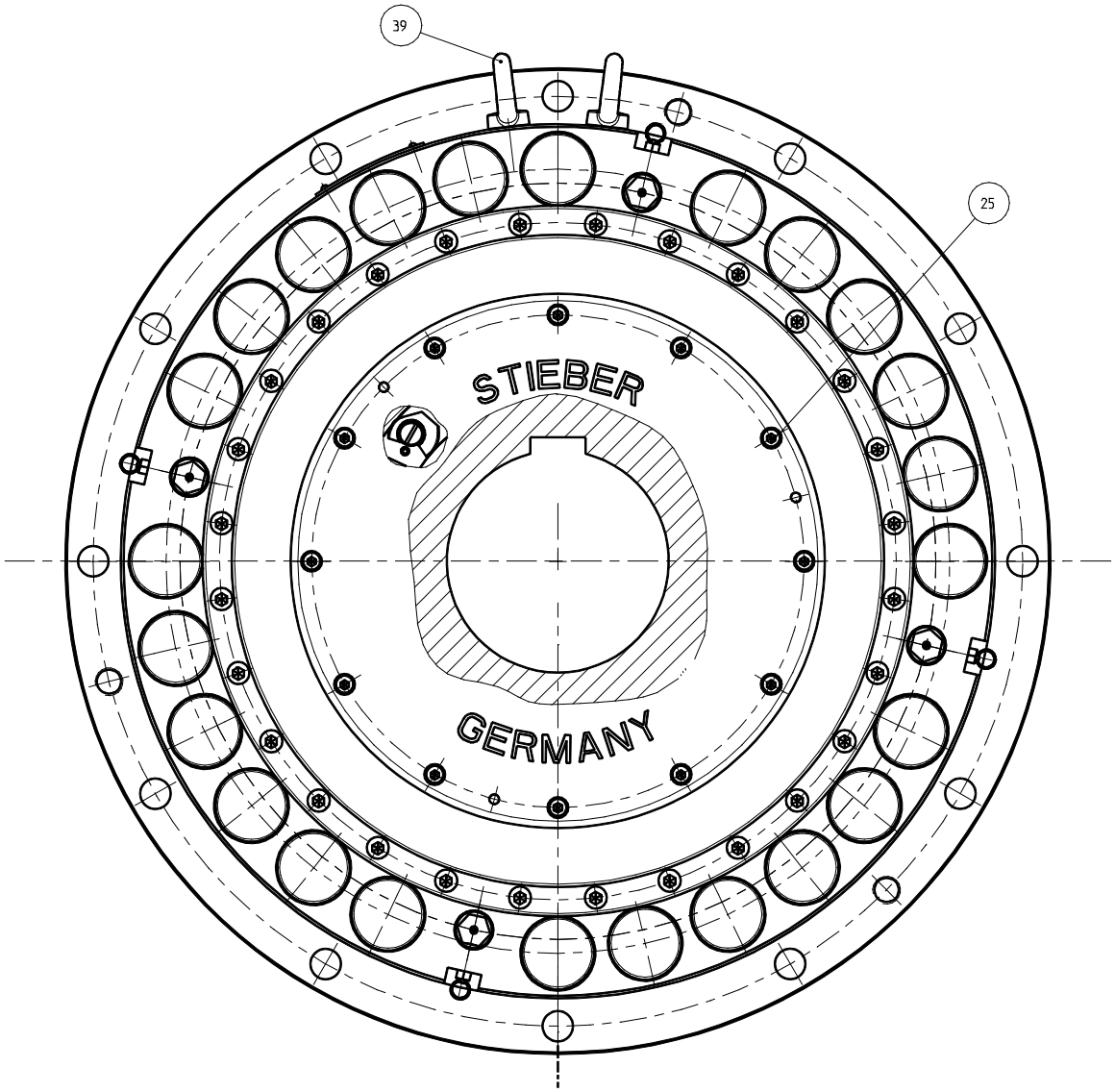


Fig. 1b Structure

3.2 Function

3.2.1 Torque-limiting lockout operation of a backstop:

When the machine shaft is operated in reverse direction, the machine shaft and the torque-supporting machine element are connected to each other in a force-locked manner by the backstop. A torque is transmitted in this operating condition.

The maximum torque to be transmitted is controlled through the operation of torque limiter which is set to a given value (slipping torque) in the factory.

3.2.2 Overrun operation of a backstop:

The torque-limiting backstop releases automatically the force-locked connection between the machine shaft and the torque-supporting machine element, when the machine shaft is operated in the overrunning direction. In this process, the contact-free operation inside the backstop is ensured above at a specified rotational speed, so that the freedom from wear and tear of all functionally relevant components is guaranteed as of this rotational speed

3.2.3 Operating mode

When the torque is transmitted through the backstop, the outer ring (Item 1) and the inner ring (Item 2) are coupled in a force-locked manner (see Fig. 2). For this purpose, clamp elements are used whose outer contours effect the force-locked coupling. The clamp elements are integrated into a cage (Item 8) and are pressed by springs into contact with the outer and inner ring. The springs ensure rapid responding behavior of the backstop at the start of torque transmission. The integrated torque limiting consists of a spring-preloaded brake, which transmits the torque in a form-locking manner, adjusted within wide limits up to a maximum set point (slipping torque). The brake is dry running and does not need any oil. On exceeding of the slipping torque, the force-locked connection will be removed and the machine shaft is rotating in the locking direction as long as the applied torque is smaller than the locking torque.

The torque-limiting backstops from type RSRT85-260 are fitted with a mechanical release device, which permits controlled reduction of the applied torque. The mechanical release device produces pressing force acting against the spring preload of the brake, thus reducing the locking torque.

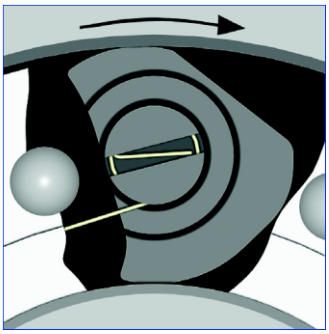
. 

Fig. 2 Torque transmission

In overrun operation, above the minimum permissible overrunning speed, the centrifugal force, in connection with the geometry of the clamp elements, effects a force which turns the clamp elements against the spring force (see Fig. 3). A contactless position is brought about in this way so that wear-free operation of the backstop can be achieved. The minimum permissible overrunning speed may only be lower for a short period during the start-up or shut-down stage as otherwise the damage to the contact partner caused by wear and tear may lead to the failure of the backstop.

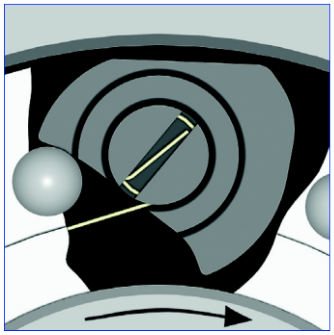


Fig. 3 Contactless position

4 Transport and packaging

⚠	**WARNING**	**Risk of injury due to the backstop falling down or tipping over!** The weight of the backstop can injure people and cause severe crushing. Therefore: ➢ Use a pallet on which the backstop can be moved with a forklift. ➢ Use suitable lifting gear for lifting (slings, etc.) which is able to support the weight of the backstop.

ℹ	**NOTE**	The local provisions regarding the disposal of transport and packaging materials are to be observed!

The backstops are supplied with a set slipping torque of the torque limiter.

The torque-limiting backstops of Type RSRT85-260 come partially assembled.

The inner race (Item 2) with the mounted cage (Item 8) is packaged separately.

All the components of the torque-limiting backstops of Type RSRT85-260 are packaged in plastic film which inhibits the formation of corrosion. All components are shipped in a box.

In addition, an O-ring as aids for easy mounting of the cage, an O-ring (Item 20) and a hexagon head screw with gasket (Item 29) are supplied in a bag attached to the backstop.

Transport damage to the packaging and / or the backstop is to be reported to the respective transit company.

The backstop must be unpacked in a clean and dry environment!

5 Storage

5.1 Short-term storage

The torque-limiting backstop of Type RSRT85-260 comes is packed in VCI bubble wrap.

The VCI bubble wrap is to be checked at regular intervals. The frequency of these intervals is dependent on the environmental conditions (temperature, moisture, salt content of the air, etc.) at the storage site:

The maximum storage period (short-term storage) is 6 months. Moreover, the backstop must have long-term storage corrosion protection applied to it.

Store packages under the following conditions:

- Do not keep outdoors.
- Keep dry and free from dust.
- Do not expose to aggressive media.
- Keep away from direct sunlight.
- Avoid mechanical shocks and vibrations.
- Storage temperature: −10 to +60 °C.
- Relative humidity: maximum 95%, non-condensing.

5.2 Long-term storage

To this end the backstop must be welded in PE foil with desiccant agent. The corrosion protection must be checked after a period not exceeding one year or else depending on the environmental conditions (temperature, moisture, salt content of the air, etc.) at the storage site.

Store packages under the following conditions:

- Do not keep outdoors
- Keep dry and free from dust
- Do not expose to aggressive media
- Keep away from direct sunlight
- Avoid mechanical shocks and vibrations
- Storage temperature: −10 to +60 °C
- Relative humidity: maximum 95%, non-condensing

6 Installation

6.1 Lubrication

The torque-limiting backstop of Type RSRT85-260 doesn't need any lubrication.

It is recommended to apply the outer race and cage with a thin grease film as anticorrosive agents.

6.2 Assembly

	**WARNING**	**Risk of injury due to incorrect assembly!** Faulty installation and maintenance can cause severe property damage and personal injury. Installation, maintenance and repair work may only be performed by personnel with the requisite training and expertise!

	**WARNING**	**Risk of injury due to moving components!** Rotating driven components can cause the most severe injuries. Therefore, during operation: ➢ It is strictly forbidden for persons to loiter in the danger zone or in its immediate vicinity. ➢ Do not disable, render unusable or circumvent safety equipment and / or safety functions. Prior to entering the danger zone: ➢ Switch off the power supply and secure it against being switched on again. ➢ Wait for lagging components to come to a standstill.

	**CAUTION**	**Risk of injury due to falling components!** The outer race or inner race can fall down if the transportation lock has been removed. Fasten the outer / inner race axially.

Procedural steps:

- Lift the inner race (Item 2) with assembled cage (Item 8) and the backstop out of its package (using eyebolts) and put down on a suitable assembly bench.
- Unscrew cover (Item 13).
- Lift up the backstop without inner race (Item 2) and cage (Item 8) using suitable lifting gear and push it onto the centering on the frame (e.g. as gearbox housing) which is used to support the torque. Screw the accompanying eye-bolt into the thread at the circumference of the housing.
- Fix the flange (Item 10) with Z fastening screws (e.g. as per standard DIN EN ISO 4762) and with screw quality 10.9.

Size	Strength standard 10.9
M6	16.5
M8	40.1
M10	79
M12	137
M16	338
M20	661

Table. 3. Tightening torque in [Nm]

- Preclean the inner diameter of the outer race with a petroleum-based industrial cleaning agent.
- The outer race and cage should be coated with a thin layer of grease.
- Secure (see Fig. 4 and 5) the clamp bodies in lift-off position (against the spring force) using an O-ring / cable connector as an assembly aid.

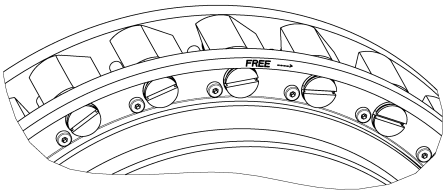


Fig. 4: Clamp bodies intervening

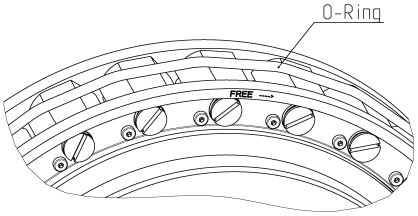


Fig. 5: Clamp bodies “after lift-off”“

- Insert the inner ring (Item 2) with cage (Item 8) onto the oiled shaft. Note the overrun direction of rotation. The direction of rotation of the inner race is marked as FREE on the cage. Insert the inner ring (Item 2) with cage (Item 8) into the outer ring (Item 1) until half of the clamp body is covered.

	NOTE	The assembly aid (O-ring) must be completely removed. Non-observance of this note can cause functional impairment and even failure.

- Remove the assembly aid (O-ring) completely and push the inner ring with cage (onto the shaft up to the stop.
- Fasten the inner race (Item 2) axially on the machine shaft.
- Check overrunning.
- Screw cover (Item13).

7 Start-up

The manufacturer examines the quality of the torque-limiting backstop by testing it with the customer-specific slipping torque.

No additional start-up measures are needed.

8 Operation

In the case of reducing lock-up torque e.g. after a voltage breakdown or repealing blocking effects e.g. for maintenance purposes, the mechanical release device can be used.

Procedural steps:

- Pull the spring-loaded safety bolt (35) and tighten all the 4 screws (38) clockwise with sensitivity, successively with maximum ¼ rotations until the locking torque has been completely reduced (the tightening torque could reach up to 500 Nm).
- To reactivate the lock-up torque and the pre-set slipping clutch function unscrew the screws (38) counterclockwise with sensitivity, successively with maximum ¼ rotations until the safety bolts (35) reengage.

9 Maintenance

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	**WARNING**	**Risk of injury due to the backstop falling down or tipping over!** The weight of the backstop can injure people and cause severe crushing. Therefore: ➢ Use a pallet on which the backstop can be moved with a forklift. ➢ Use suitable lifting gear for lifting (slings, etc.) which is able to support the weight of the backstop.

	**WARNING**	**Risk of injury for insufficiently qualified personnel!** Improper handling can cause significant personal injury and property damage. Therefore: ➢ Only ever have tasks performed by those persons to whom the tasks have been assigned.

	**WARNING**	**Risk of injury from hot surfaces!** There is a risk of sustaining burns or scalds on hot surfaces during operation. Therefore: ➢ Do not touch the clutch coupling during operation!

The torque-limiting backstop of Type RSRT85-260 must be checked for damage and serviced after an **operating period not exceeding 5 year**s.

Procedural steps:

- Unscrew cover (Item13).
- Remove the axial retention of the inner race (Item 2).
- Screw eyebolts Minto the thread of the inner race.
- Lift the inner race (Item 2) including the cage (Item 8) out of the outer race (Item 1). Use appropriate lifting gear for this.
- Place inner race (Item 2) including the cage (Item 8) facing upward the label "FREE" on an assembly table.
- Remove the retaining ring (Item 9) of the inner race (Item 2) and pull the cage (Item 8) off the inner race (Item 2).

- Screw the eye-bolt into the thread at the circumference of the housing. Use suitable lifting gear for this.
- Remove the remaining fastening screw on the flange (Item 10) and pull the backstop from centering location.
- Pre-clean the outer race (1), inner race (Item 2) and cage (Item 8) with a petroleum-based industrial cleaning agent and degrease with an acetone-based cleaning agent.
- Check for damage, wear and cracks (see the testing criteria):
    - The outer race track must not exhibit any signs of damage / ruptures
    - Increased diameter due to wear in the outer race track maximum 0.1 mm compared to the area free from wear
    - Traces of deformation / indentations to the track diameters of the inner and outer race maximum 0.1 mm deep
    - Completeness of all spring elements (2 per clamp body)
    - Spring elements free of damage / deformation
    - Smooth rotation of the clamp bodies from stop to stop
    - Maximum width of the wear facet on the clamp bodies (see Figure 6)

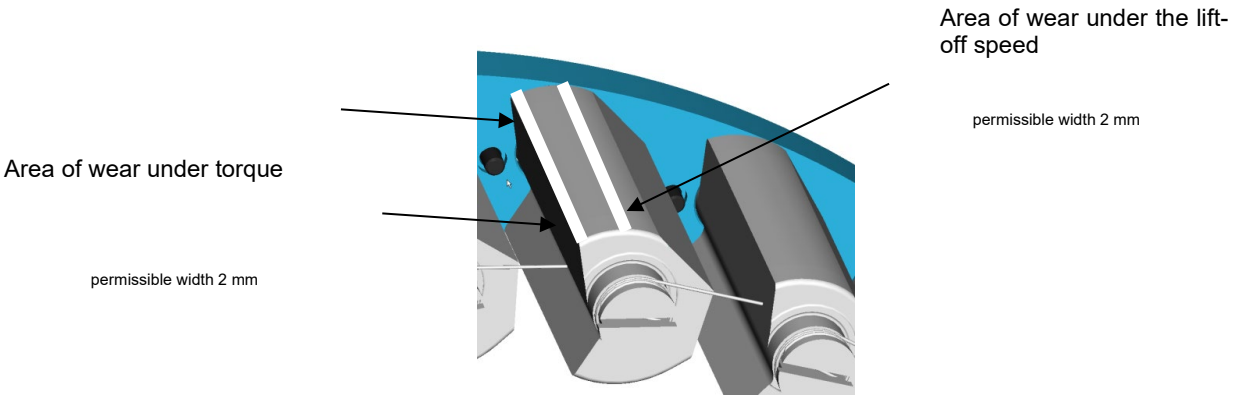

Figure 6: wear zones

    - The backstop can continue to be used only if all of the test criteria are met
- Lift up the backstop without inner race (Item 2) and cage (Item 8) using suitable lifting gear and push it onto the centering on the frame (e.g. as gearbox housing) which is used to support the torque. Screw the accompanying eye-bolt into the thread at the circumference of the housing.
- Fix the flange (Item 10) with Z fastening screws (e.g. as per standard DIN EN ISO 4762) and with screw quality 10.9 (see table 3. Tightening torque).
- Mount the cage (Item 8) on the inner race (2) and secure it axially using retaining ring (9).
- Secure (see Fig. 4 and 5) the clamp bodies in lift-off position (against the spring force) using an O-ring / cable connector as an assembly aid.

- Insert the inner ring (Item 2) with cage (Item 8) onto the oiled shaft. Note the overrun direction of rotation. The direction of rotation of the inner race is marked as FREE on the cage. Insert the inner ring (Item 2) with cage (Item 8) into the outer ring (Item 1) until half of the clamp body is covered.

	**NOTE**	The assembly aid (O-ring) must be completely removed. Non-observance of this note can cause functional impairment and even failure.

- Remove the assembly aid (O-ring) completely and lower the inner race and cage completely.
- Fasten the inner race (Item 2) axially on the machine shaft.
- Check overrunning.
- Screw cover (Item 13).

The torque-limiting backstops of Type RSRT85-260 must be inspected by Stieber GmbH after an **operating period of 10 years**. To this end, the backstop must be removed and sent to Stieber GmbH.

Procedural steps:

- Unscrew cover (Item 13).
- Remove the axial retention of the inner race (Item 2).
- Screw eyebolts into the thread of the inner race.
- Lift the inner race (Item 2) including the cage (Item 8) out of the outer race (Item 1). Use appropriate lifting gear for this.
- Screw the eye-bolt into the thread at the circumference of the housing. Use suitable lifting gear for this.
- Remove the remaining fastening screw on the flange (Item 10) and pull the backstop from centering location.

10 Disassembly

	**WARNING**	**Risk of injury due to moving components!** Rotating driven components can cause the most severe injuries. Therefore, during operation: ➢ It is strictly forbidden for persons to loiter in the danger zone or in its immediate vicinity. ➢ Do not disable, render unusable or circumvent safety equipment and / or safety functions. Prior to entering the danger zone: ➢ Switch off the power supply and secure it against being switched on again. ➢ Wait for lagging components to come to a standstill.

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	**WARNING!**	**Risk of injury for insufficiently qualified personnel!** Improper handling can cause significant personal injury and property damage. Therefore: ➢ Only ever have tasks performed by those persons to whom the tasks have been assigned.

Procedural steps:

- Unscrew cover (Item 13).
- Remove the axial retention of the inner race (Item 2).
- Screw eyebolts M8 into the thread of the inner race.
- Lift the inner race (Item 2) including the cage (Item8) out of the outer race (Item1). Use appropriate lifting gear for this.
- Screw the eye-bolt into the thread at the circumference of the housing. Use suitable lifting gear for this.

- Remove the remaining fastening screw on the flange (Item 10) and pull the backstop from centering location.

11 Disposal

	**NOTE**	The local provisions regarding the disposal of metallic components, organic matter and any lubricants present are to be observed!

The backstop is comprised of metallic and organic materials which are coated with grease or oil. Metallic materials are fully recyclable. Lubricants, anticorrosive agents and organic matter are to be disposed of separately. The local disposal provisions are to be observed in this regard.

12 Faults

The manufacturer is to be contacted immediately should any faults arise.

STIEBER GMBH, 69126 Heidelberg, Hatschekstr. 36, Germany
Phone +49 (0) 6221 3047-0, Fax -31

13 Spare parts

	**WARNING**	**Risk of injury by incorrect spare parts!** Incorrect or faulty replacement parts may cause damage, faulty function or total breakdown, as well as impairing safety. Therefore: ➢ Use only the manufacturer's original spare parts.

Procure spare parts from authorized dealers or directly from the manufacturer.