# Maintenance Instructions
# Checklist for Festoon Systems
# with wider tolerated Hinge Points

Program 0375

## Contents

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# with wider tolerated Hinge Points

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**NOTICE!**

**This Checklist does not replace the information given in the Operating Instructions for your system!**

It is a supplement to the Assembly Instructions “MAL0300-0004” and extends especially chapter 8 “Maintenance and service” from it. Additions to this chapter are highlighted in orange in this document.

## 1 Safety

**WARNING!**

**Danger of injury due to improperly executed maintenance tasks!**

Improper maintenance can result in serious injury to person and property.

→ Before starting work, ensure sufficient space for assembly

→ Maintain order and cleanliness in the assembly area! Loosely stacked or scattered components and tools are a source of accidents

→ If components have been removed, be careful to reinstall them properly, replace all fastening elements, and comply with screw tightening torques

**WARNING!**

**Danger of injury from moving components!**

Incautious handling of the festoon system can lead to severe injury or damage to the festoon system.

→ Be sure that the festoon system does not start by itself

→ While it is moving, do not reach into moving parts, particularly the interface between the buffer and buffer plate

→ Block off the dangerous area under the system

**CAUTION!**

**Danger of tripping on projecting parts!**

When working on the festoon system, there is a risk of tripping.

→ When walking in the work and danger area, be careful of projections and depressions in the floor. No loose objects may be left on the floor

**WARNING!**

**Danger of crushing!**

When moving the festoon system, there is a danger of crushing limbs between the buffer and buffer plate, as well as between the running gear and the track beam.

→ When the system is moving, do not enter the danger area of the festoon system

**WARNING!**

**Danger of crushing!**

During assembly of the festoon system, there is a danger of crushing limbs between load carrier and the track beam.

→ During assembly, do not enter the danger area of the festoon system

**CAUTION!**

**Danger of a Trap!**

When the festoon system is moving, there is a danger of being trapped within it.

→ When the system is moving, do not enter the danger area of the festoon system

# 2 Maintenance/Inspection Plan

The next sections describe the maintenance tasks required for optimum, trouble-free operation. If regular inspections reveal increased wear, the corresponding maintenance intervals should be shortened in accordance with the actual signs of wear. Where there are 2 **maintenance intervals** stated for one maintenance task, the maintenance interval which is reached first is valid:

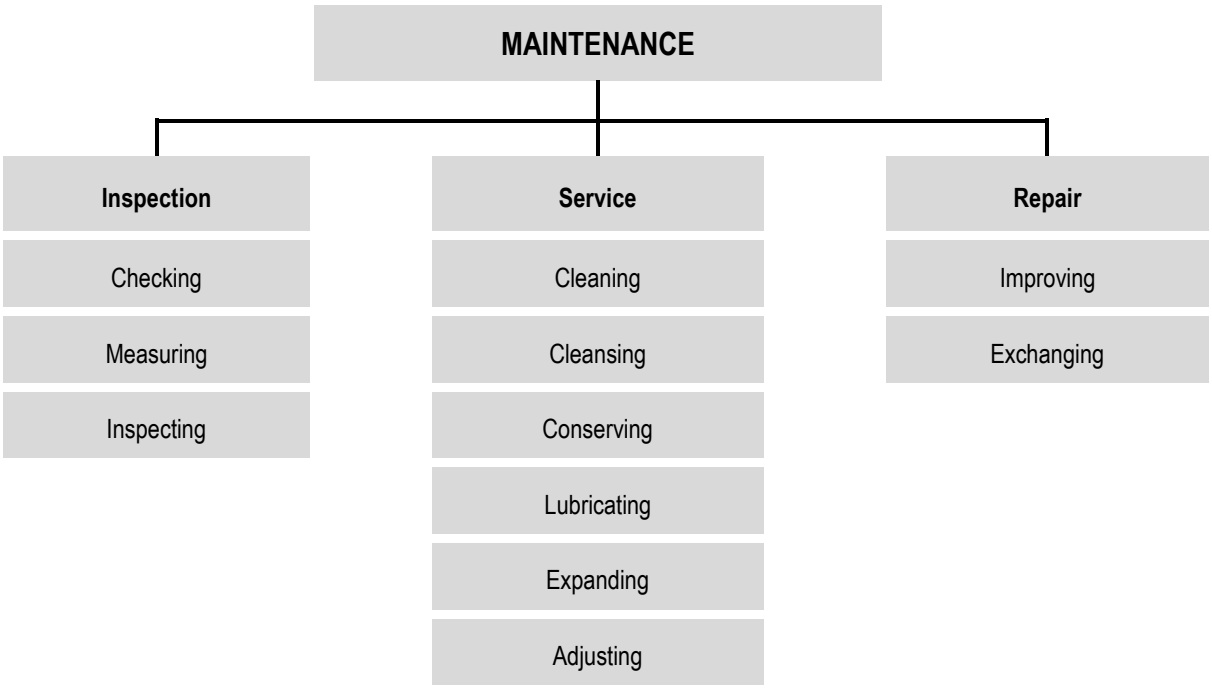
Example: Maintenance interval "After 300 hours of operation or every month".
If 300 hours of operation are reached before one month has elapsed, the maintenance task has to be performed after 300 hours. If the installation has been operated less than 300 hours in 1 month, the maintenance task has to be performed when 1 month has gone by since the last servicing.

Contact the manufacturer with any questions about maintenance tasks or intervals.
In order to retain the warranty rights and to avoid damage, the system operator is responsible for performing the following maintenance tasks. Inspection, service and repair are to be performed and documented by trained and qualified specialists.

**NOTICE!**

The intervals indicated for maintenance are dependent for the most part on operational conditions of the festoon system. Therefore only mean values can be indicated here.

**The following tasks fall under the category "Maintenance":**



## 2.1 Inspection on deactivated System

**CAUTION!**

**Protect the festoon system from inadvertent activation!**

Safety devices that were removed during inspection of the resting system must be immediately remounted and checked after completion of work.

→ Check measuring tools used after clean up/collection and inventory

→ Before approaching systems with damping devices, they must first be released

**Inspection measures**

| Interval | Component | Task Description | Description |
|---|---|---|---|
| After **300 hours** of operation or **every month** See chapter 2 | Rollers | Visual inspection | • for proper condition<br>• for proper function<br>• for proper mobility<br>• for firm seating<br>• for deformations<br>• for wear<br>• for damages<br>• for dirt<br>• for corrosion |
| | Buffers | | |
| | Center plate | | |
| | Cable supports | | |
| | Fasteners | | |
| | Cables | | |
| | Cable clamps | | |
| | Fixed installation length | | |
| | Installation connections | | |
| | Towing ropes | | |
| | Damping device | | |
| | Towing devices | | |
| | End stops | | |
| | Track beam | | |

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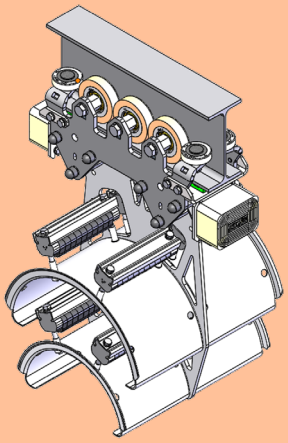
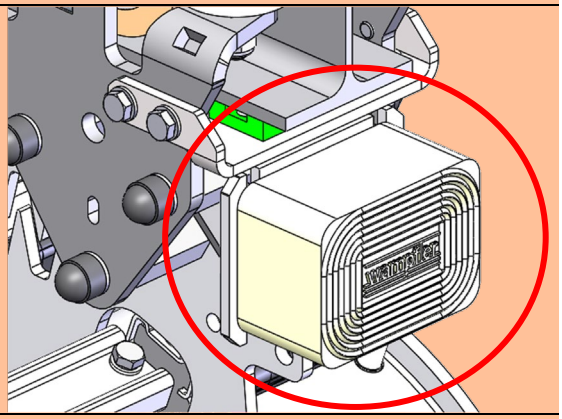
|  | | | **Recommended inspection interval**<br>**monthly**<br>  |
| **Assembly** | **Component** | **Indication of wear** | **Recommended measures** |
| Cable trolleys that cross the hinge point | Cell buffers | • Cracks, breaks and embrittlements on the buffer | Replace buffer |

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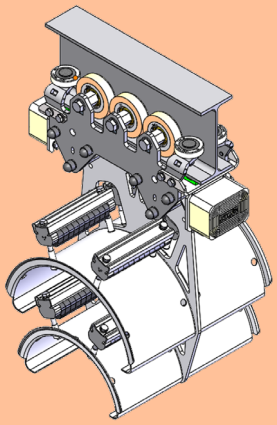
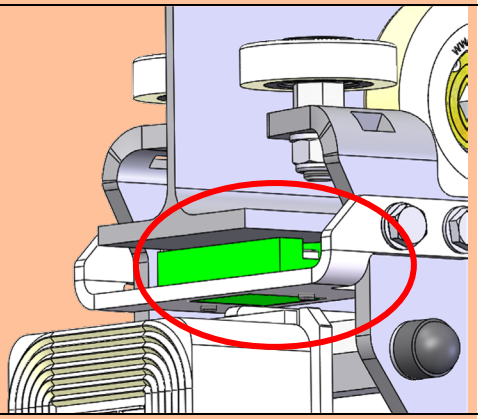
|  | | | **Recommended inspection interval**<br>**monthly**<br>  |
| **Assembly** | **Component** | **Indication of wear** | **Recommended measures** |
| Cable trolley with 6 rollers | Anti-lift plate | • Visible material wear/Gap between I-Beam and anti-lift plate > 8mm<br>• Mounting screws touch I-Beam | Replace anti-lift plate |

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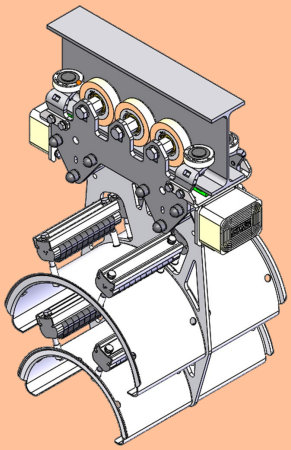
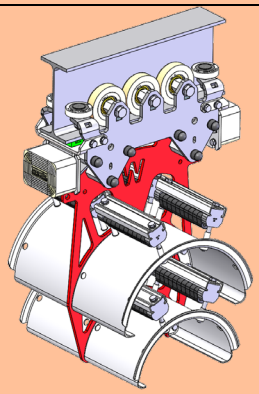
|  | | | **Recommended inspection interval**<br>**monthly**<br>  |
| **Assembly** | **Component** | **Indication of wear** | **Recommended measures** |
| Cable trolley with 6 rollers | Center plate | • Deformation or cracks on the center plate<br>• Cracks at the weld joints | Replace complete cable trolley (root cause analysis is mandatory) |

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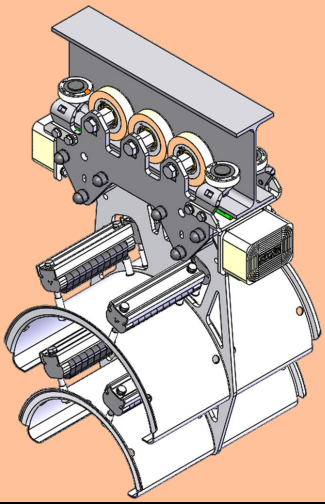
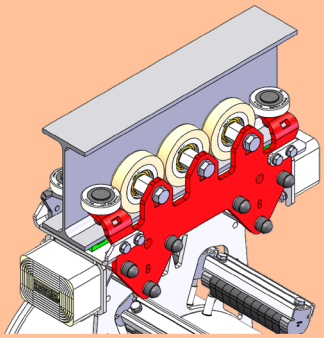
|  | | | **Recommended inspection interval**<br>**monthly**<br>  |
| **Assembly** | **Component** | **Indication of wear** | **Recommended measures** |
| Cable trolley with 6 rollers | Side shield | • Deformation<br>• Contact to I-Beam<br>• Grooves on the side shield | Replace side shield or complete running gear (root cause analysis is mandatory) |

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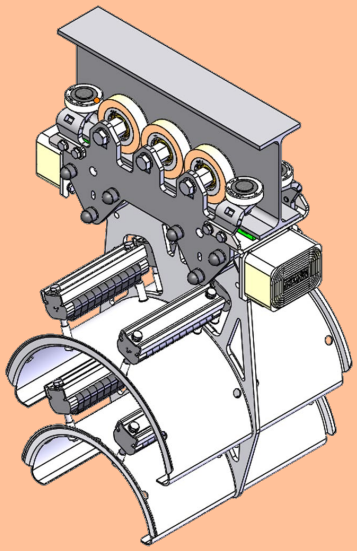
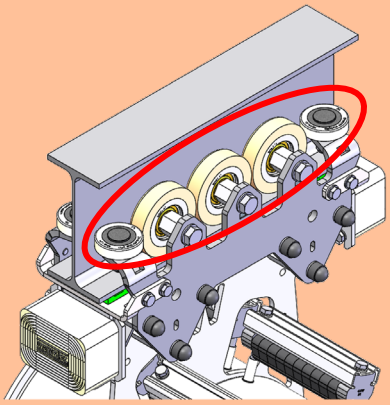
|  | **Recommended inspection interval**<br>**monthly**<br>  |

| Assembly | Component | Indication of wear | Recommended measures |
|---|---|---|---|
| Cable trolley with 6 rollers | Rollers | • Strong wear marks/visible damage<br>• Cracks, embrittlement or loose bandage<br>• Increased bearing clearance due to worn out ball bearing<br>• High leakage of lubricants, roller sluggish | Replace rollers with spare rollers |

## 2.2 Inspection of Towing Ropes and Criteria for Replacement

**CAUTION!**

**Defect towing ropes must be removed from use immediately!**

In case of defect, towing ropes must be removed from use immediately.

→ Replace the defect towing ropes

**A towing rope must be replaced if one or more of the following criteria are fulfilled:**

1. Wire breakage
2. Structural changes
3. Corrosion
4. Abrasion

**The following steel cable deformations are leading to a necessary replacement:**

| | |
|---|---|
| Corkscrew-like deformation: | Replace the cable if it has corkscrew deformations with waves that measure more than a third of the cable diameter. |
| Fraying: | Replace the cable if it starts to fray. |
| Loop formation: | Replace the cable if loop formation has led to significant changes in the cable structure. |
| Loosening: | Replace if wires are loosened due to rust or abrasion. |
| Node formation: | Replace if nodes- points where the cable is widened- form in the steel cable. |
| Constrictions: | Replace in case of severe constrictions in the cable. |
| Curling: | Replace the towing rope if permanent deformations are present such as those caused by being pulled over a corner. |
| Kinks: | Replace if kinks form after tension is applied to cable loops. |
| Bends: | Replace the towing rope if it has been bent by an external force. |

## 2.3 Inspection on Moving System

**CAUTION**

**Any procedures that could threaten safety are to be avoided!**

The system should only be commissioned with functional protective gear and safety devices. It is forbidden to enter the operating area of the festoon system.

**Inspection measures**

| Interval | Component | Task Description | Description |
|---|---|---|---|
| After **300 hours** of operation or **every month** See chapter 2 | Rollers | Function Test | For easy and unobstructed running of the main rollers, horizontal guide rollers and anti-lift rollers on the track beam. Visible wear, damage. |
| | Cable trolley | | For proper entry and exit of the cable trolleys in the storage area |
| | Towing device | | For reliable operation of the towing device based on the required horizontal and vertical balancing movements. |
| | Buffer unit towing or end clamp | | For functionality of the damping device, especially when the system is in the storage. |
| | Towing ropes Damping devices | | For functionality of the towing ropes and damping devices, especially when the system is completely extended. |
| | Track beam and system | | For the track beam and the entire system, for dirt and corrosion that influence functionality. |

Should problems be identified during inspection, service work is urgent.

## 2.4 Logging

The results of inspections as well as the remedies performed are to be documented in written reports. Conductix-Wampfler must be informed immediately of defects and malfunctions during the test phase and the warranty period.

## 2.5 Maintenance of the Festoon System

**CAUTION!**

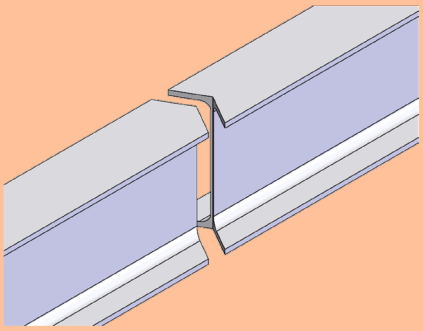
**Turn off power supply and ensure that no inadvertent activation is possible!**

When installation tasks are carried out above eye level, use proper climbing aids and working platforms.

- → Do not use machine components as climbing aids
- → Ensure that exhaust, collection and disposal of process materials is done in a safe and environmentally-friendly manner
- → Safety devices that were removed for installation, service or repair must be immediately remounted and inspected after work is completed
- → Observe the inspection and maintenance intervals described in the maintenance instructions
- → Ensure that sufficient space for maintenance work (danger area) is available
- → Ensure that the festoon system is not inadvertently activated during maintenance work
- → Ensure that detached parts do not fall
- → Screw joints that are disconnected during maintenance work are to be reattached (with suitable torque) and secured as instructed
- → Fasteners and seals that cannot be reused are to be replaced (such as self-locking nuts, disks, splints, O-rings, glued or microencapsulated screws)
- → Lubrication points that are cleaned or wiped during maintenance and repair work must be re-lubricated as instructed
- → After finishing work, collect all tools and materials and check that all are present
- → Disassembled parts and components that were exchanged are to be collected, stored in a safe place, recycled or sent back
- → Before approaching systems with damping devices, these must be released

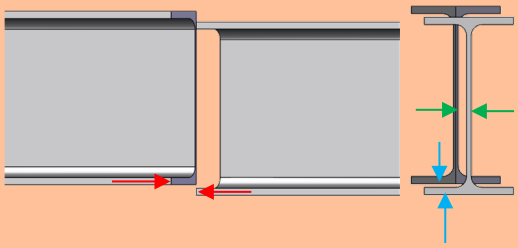
**Service measures**

| Interval | Component | Task Description | Description |
|---|---|---|---|
| After **300 hours** of operation or **every month** See Chapter 2 | Roller mounting | Service performed | Tighten all fasteners. |
| | Cable mounting | | Tighten all fasteners on clamping bars and cable clamps. |
| | Towing device | | Exchange worn parts if necessary. |
| | Damping device | | Exchange shock cords if necessary. |
| **Every 3 months** | Towing rope | | Tighten mounting screws.<br>Lubricate the contact surfaces of the shackles. |
| | Buffer unit<br>towing or end clamp | | Tighten all fasteners.<br>Exchange worn parts if necessary. |

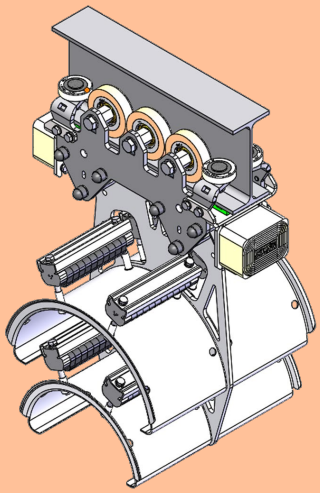


**Recommended inspection interval**

**Every 3 months**

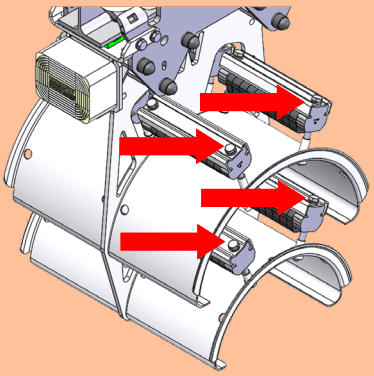


| Assembly | Component | Indication of wear | Recommended measures |
|---|---|---|---|
| I-Beam | Hinge Point | • Deformations<br>• Changes in Size of<br>  • Gap (red)<br>  • Step (blue)<br>  • Misalignment (green) | Repositioning/rework of hinge point |



**Recommended inspection interval**

**Every 3 months**



| Assembly | Component | Indication of wear | Recommended measures |
|---|---|---|---|
| Cable trolley with 6 rollers | Clamping bar | • Loose clamping bar<br>• Cables displaced or damaged | Reposition displaced cables<br>Tighten all fasteners on clamping bars<br>If necessary replace cables and/or clamping bars |

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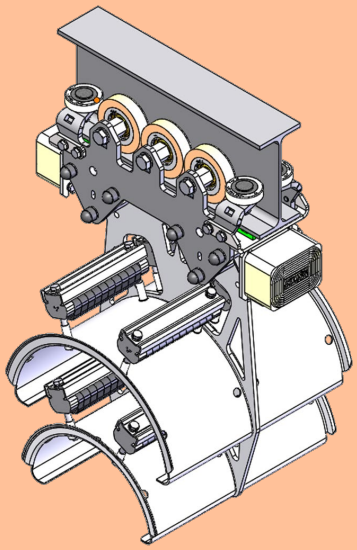
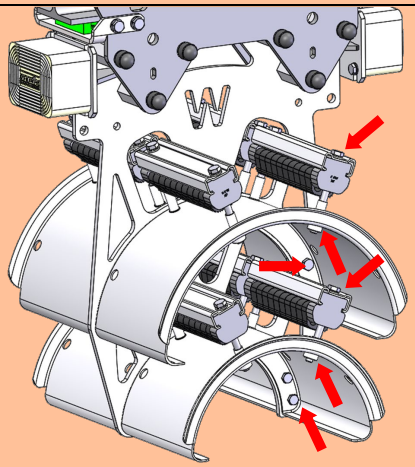
|  | | | **Recommended inspection interval**<br>**Every 3 months**<br>  |
| **Assembly** | **Component** | **Indication of wear** | **Recommended measures** |
| Cable trolley with 6 rollers | Cable support | • Loose cable support<br>• Early indications of fatigue such as cracks on supports<br>• Loose riveting nut<br>• Insufficient clamping of cables | Reposition displaced cables<br>Tighten all fasteners on cable supports<br>If necessary replace cables and/or cable supports |

| Interval | Component | Task Description | Description |
|---|---|---|---|
| **Annually** (depends on external influences) | Surface/corrosion protection<br>Corrosion coating | repair/ replace | Refinish hot-dip galvanized surfaces with zinc coating.<br>Refinish lacquered surfaces. |

## 2.6 Wearing Parts

**Wearing parts are excluded from the warranty. This includes:**

- All trolley rollers including main rollers, horizontal guide rollers, anti-lift rollers.
- Cable (expander and/or shock cord) on the damping devices.
- Special damping systems in the towing arm window.
- Rubber or cellular buffers.
- Other definitions require written documentation.

## 2.7 Wear Limits

| Component | Wear limit has been reached if |
|---|---|
| Rollers | • the diameter of the roller has been reduced from the nominal diameter by 2 mm<br>• sharp impressions can be seen<br>• cracks, broken-off pieces, or embrittlements have formed on PU rollers, or if initial signs that the outer section is disengaging from the core appear<br>• increased bearing play occurs due to worn ball bearings<br>• significant lubrication leakage is seen<br>• the rollers do not run smoothly |
| Buffers | • cracks, breaks or embrittlements are seen |
| Center plates and side shields | • corrosion protection has failed |
| Cable supports | • corrosion protection has failed<br>• initial signs of cracks in the supports are seen<br>• the riveting nut does not provide sufficient clamping for the cable clamp/cables |
| Fasteners | • corrosion protection has failed<br>• connection integrity (screw joints, clamp connections, glued connections) is no longer ensured |
| Cables | • wire, shielding or jacket breakage is seen<br>• corkscrews have formed |
| Cable clamps | • corrosion protection has failed<br>• cracks and embrittlements are seen in the clamp rubber<br>• the clamp does not hold cables sufficiently |
| Towing rope | • wires break, structural changes occur, corrosion and abrasion |
| Towing devices | • corrosion protection has failed<br>• the towing arm window is deformed<br>• cracks in the welding joints appear |
| End clamp | • corrosion protection has failed<br>• attachment to the track beam is no longer secure |

| Component | Wear limit has been reached if |
|---|---|
| Damping device and shock cords | • corrosion protection has failed<br>• severe constrictions in the shock cords occur<br>• the mantle of the shock cord is even partially torn<br>• fraying strands on the shock cord appear<br>• mechanical deformations appear on the shock cord brackets |
| Track beam | • corrosion protection has failed<br>• significant tracks from the rollers of the cable trolley system appear |

## 2.8 Repeat Inspections

**NOTICE!**

**Devices and systems are to be periodically inspected by an expert!**

In general, visual and functional checks are to be performed. The condition of components with regard to damage, wear, corrosion or other damage is to be determined. Generally speaking, the completeness and functionality of the safety equipment is evaluated. To better evaluate the wear and tear of parts, disassembly may be required.

→ All regular inspections are to be performed by the operator

Every operator is to record all inspection, service and maintenance tasks in a machine book in an orderly manner. This is to be confirmed by a technical expert. In case of inaccurate or missing entries, the warranty is rendered null and void.

## 2.9 Repair

Request a customer service technician from Conductix-Wampfler for all repairs.
If qualified service technicians from the system operator perform the repairs themselves, all information contained in these operating instructions must be observed.
Conductix-Wampfler accepts no liability or responsibility for damages and production faults that result from failure to follow these operating instructions.

**For maintenance and repair, only use:**

- suitable tools in good working order,
- only original spare parts from Conductix-Wampfler or spare parts explicitly authorized by Conductix-Wampfler.

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