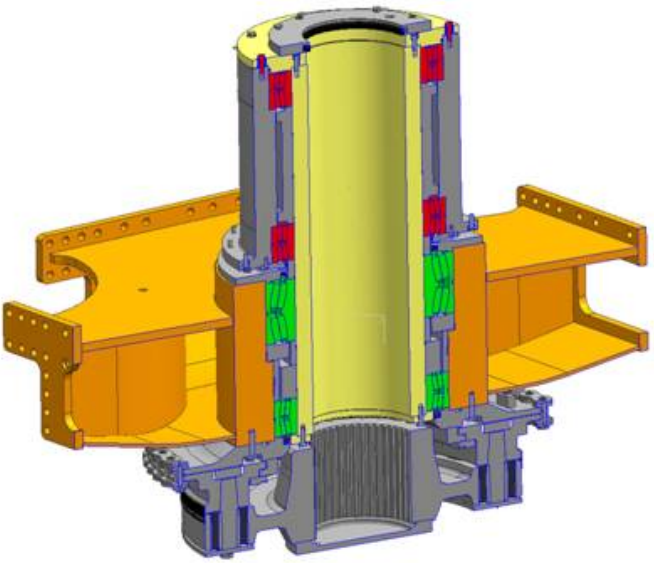
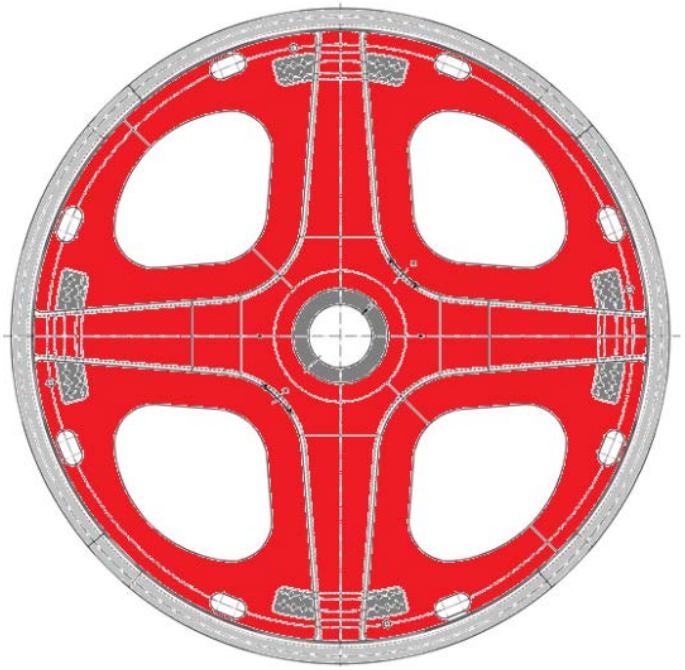
Inspection Specification

Bullwheels and Tensioning Units
Periodic Inspection / Special Inspection

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1. Application

Content of this inspection specification are supplementary information for the non-destructive testing of bullwheels that must be performed following defined intervals (e.g. according to the operation and service manual, regulations, etc.) (such as special inspections, additional inspections, etc.).

The annex to this inspection specification contains additional information for the ocular inspection of the bullwheel bearing assembly and bullwheel coupling, in the event that the maintenance manuals for those refer to this inspection specification.

This inspection specification **does not apply** for tensioning units subjected to rotating bending stress.

2. Applicable Standards and Documents

PSVT0100 Visual Inspection – Periodic Testing and Inspection

PSVT0101 Ocular Inspection

PSMT0100 Magnetic Particle Testing – Periodic Testing and Inspection

Maintenance manual specific to the installation

Bulletins specific to the individual installation

3. Inspection: Bullwheel

3.1 Visual Inspection

Requirements set for the inspection personnel

The inspection personnel must meet the requirements set forth in the inspection specification **PSVT0100** for the visual inspection.

Areas to be submitted to visual inspection

The **complete surface** of the bullwheel must be subjected to an **overall inspection**.
In case of bullwheels with cavities, the cavities must be inspected as well.

All weld seams must be subjected to a **detailed inspection** in their entirety.

The **bearing seat** of the bullwheel must be subjected to an ocular inspection as part of the inspection of the bullwheel inspection (see annex).

Acceptance criteria for visual inspection

	Acceptance level	Further measures
Crack-like, rusty indications	impermissible	Impermissible indications: – MT according to item 3.2
Damage to the organic coating and cavity protection	impermissible	Damage: – Must be repaired professionally

3.2 Magnetic Particle Testing (MT)

Requirements set for the inspection personnel

The inspection personnel must meet the requirements set forth in the inspection specification **PSMT0100** for magnetic particle testing.

Areas to be submitted to magnetic particle testing

All indications which must be subjected to magnetic particle testing (MT) according to item 3.1.

Acceptance criteria for magnetic particle testing

	Acceptance level	Further measures
Crack-like, rusty indications	1.5 mm	Impermissible indications: – Inform the manufacturer

4. Documentation

4.1 Non-Destructive Testing Personnel of Doppelmayr Seilbahnen GmbH

Testers of Doppelmayr Seilbahnen GmbH shall document the tests and inspections using the template **PDSS0104**.

4.2 Non-Destructive Testing Personnel of Accredited Testing and Inspection Authority

The inspection and test records must include the below information:

1. Name, order number and date of start-up of the installation
2. Name and address of the ropeway operator
3. Name and address of the testing and inspection laboratory
4. Name and qualifications of testing and inspection personnel involved (tester and supervisor)
5. Date of testing and inspection
6. Number of operating hours at the time of testing and inspection
7. Test data for visual inspection as per PSVT0100
8. Test data for magnetic particle testing as per PSMT0100
9. Number of tested and inspected components
10. Test results
11. Signature of a tester with the authority to release reports

5. Changes Compared to Last Revision

- Amendments in item 3.2: Requirements Set for the Inspection Personnel
- Item 4.1: Change from PDAL0129 into PDSS0104

Annex A: Ocular Inspection of the Bullwheel Bearing Assembly

A1. Application

The below information applies for the **ocular inspection** of the bullwheel bearing assembly and bullwheel coupling in the event that the maintenance manual stipulates non-destructive testing (special inspection).

Important:

The special inspections for the bullwheel bearing assembly possibly stipulated in the maintenance manual do **not** refer to a **special inspection pursuant to EN 1709** as both the support hub of the drive bullwheel and the axle of the return bullwheel are components subject to low dynamic stress.

A2. Time and Scope of Inspection

Provided that, based on supplementary regular inspections (e.g. lubricating grease analysis or SPM), no change in the condition of the bearing is found, the inspection intervals for special inspections of the bullwheel bearing assembly specified in the inspection manuals can be disregarded.

In case of **replacement** of the **anti-friction bearings**, the **complete bearing seat** of the bullwheel and the **support hub** or the **bullwheel axle** must be subjected to an **ocular inspection** in their mounted position (as far as they are accessible).

A3. Ocular Inspection (Bullwheel Bearing Assembly)

Requirements set for the inspection personnel

The inspection personnel must meet the requirements set forth in the inspection specification **PSVT0101** for the ocular inspection.

Areas to be inspected (mounted condition):

The complete **support hub** resp. the complete **bullwheel axle** must be subjected to a **detailed inspection** in mounted condition (as far as they are accessible).

Acceptance criteria for the ocular inspection:

	Acceptance level	Further measures
Fretting corrosion	impermissible	Impermissible indications: – Repair according to item A4
Localized surface damage (notches, score marks) and two-dimensional rusty indications	depth ≤1.5 mm	Indication depth <1.5 mm: – Repair according to item A4 Impermissible indications: – Inform the manufacturer
Extensive surface damage (notches, score marks) and extensive rusty indications	impermissible	Impermissible indications: – Inform the manufacturer

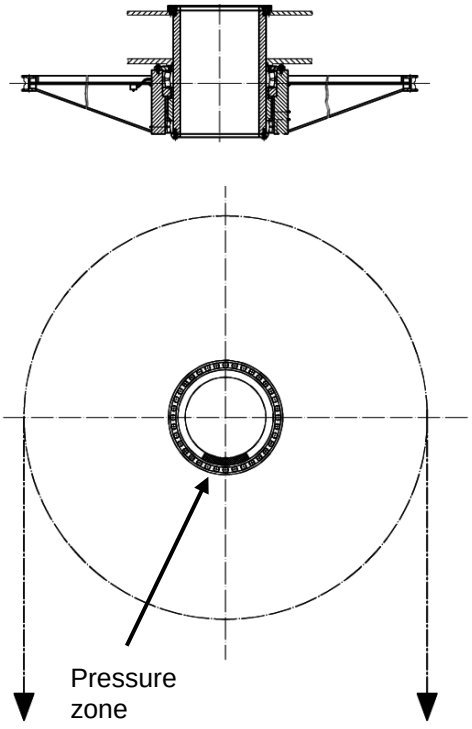
A4. Repair

	Max. grinding depth	Design
Fretting corrosion	0.5 mm	- Fretting corrosion must be removed using a suitable abrasive and/or polish.
Localized surface damage (notches, score marks) and two-dimensional rusty indications	1.5 mm (only locally permitted)	- With little notching (surface quality Ra 0.8, ISO 1302) - Hardenings and hardening cracks caused by overheating are not permitted!

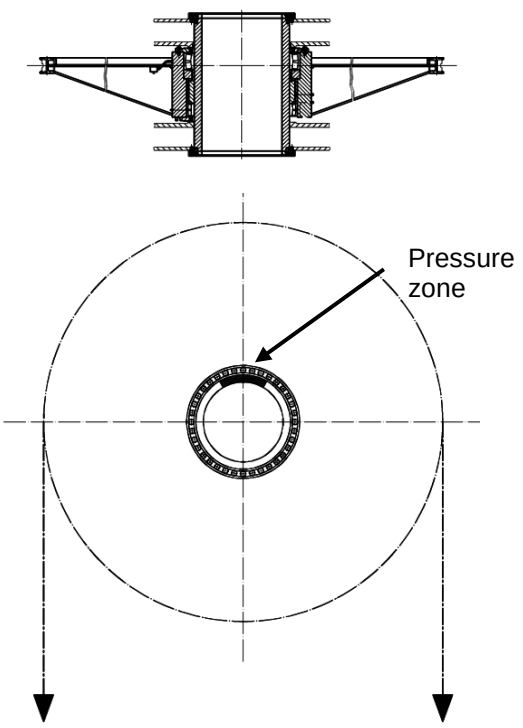


The repaired area of the support hub must be relocated to the pressure zone:

<u>Single-end mounted bearing:</u>



<u>Double-end mounted bearing:</u>



Annex B: Ocular Inspection of the Bullwheel Coupling

B1. Application

The below information applies for the **ocular inspection** of the bullwheel coupling in the event that the maintenance manual stipulates non-destructive testing (special inspection).

Important:

The special inspections for the bullwheel coupling possibly stipulated in the inspection manuals do **not** refer to a **special inspection pursuant to EN 1709** as a possible failure of the bullwheel coupling during operation is not relevant to the safety of the installation.

B2. Time and Scope of Inspection

The inspection intervals for the special inspections of the bullwheel coupling specified in the inspection manuals refer to an ocular inspection in **mounted condition** (separated bullwheel coupling).
Additional demounting and visual inspection of the stripped down bullwheel (including the torsion shaft) is only necessary, if there is suspicion of excessive wear.

In case of **replacement** of the **anti-friction bearings**, the **bullwheel coupling** and the **torsion shaft** must be subjected to an ocular inspection.

B3. Ocular Inspection (Bullwheel Coupling)

Requirements set for the inspection personnel

The inspection personnel must meet the requirements set forth in the inspection specification **PSVT0101** for the ocular inspection.

Areas to be inspected (mounted condition):

Separate and clean the bullwheel coupling.
The **complete (accessible) surface** of the bullwheel coupling must be subjected to an **overall inspection**.

All (accessible) weld seams and the complete **teeth** must be subjected to a **detailed inspection**.

Areas to be inspected (demounted condition):

All **components** of the bullwheel coupling must be subjected to a **detailed inspection** in case of replacement of the anti-friction bearings.

Acceptance criteria for the ocular inspection:

	Acceptance level	Further measures
Fretting corrosion	impermissible	Impermissible indications: – Repair according to item B4
Localized surface damage (notches, score marks) and two-dimensional rusty indications	depth ≤1.5 mm	Indication depth <1.5 mm: – Repair according to item B4 Impermissible indications: – Inform the manufacturer
Crack-like, rusty indications	impermissible	Impermissible indications: – Inform the manufacturer
Deformation of the teeth	impermissible	Impermissible indications: – Inform the manufacturer

B4. Repair

	Max. grinding depth	Design
Fretting corrosion	0.5 mm	- Fretting corrosion must be removed using a suitable abrasive and/or polish.
Surface damage (notches, score marks) and two-dimensional rusty indications	1.5 mm (only locally permitted)	- With little notching (surface quality Ra 0.8, ISO 1302) - Hardenings and hardening cracks caused by overheating are not permitted!