



Permanent Safety Barriers

Maintenance Manual

Documentation for License Partners

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General

All relevant guidelines as well as the technical terms of delivery and contract are to be adhered to.

Maintenance terminology

- ▶ **Maintenance** is the combination of all measures carried out to maintain the functionality of a system. It can be divided into the basic steps of *maintenance*, *inspection* and *repair work*.
- ▶ **Maintenance:** Maintenance is a periodically recurring measure to maintain the target state.
- ▶ **Inspection:** Inspection is a measure carried out to ascertain the current state. It generally refers to an inspection in the sense of a check carried out by an inspector or supervisor. The aim is to determine that an object is of sound condition. Repair measures are to be initiated wherever necessary.
- ▶ **Repair work:** Measures to restore the target state of an object via refurbishment or replacement of parts on the basis of the inspection results.

Maintenance and inspection

General

According to the requirements of the EN 1317, the DELTABLOC® restraint system is maintenance-free with regard to its function as a traffic restraint system.

Drainage openings

To guarantee unhindered drainage of water (rain water or melt water), the drainage channels must be inspected once a year and if necessary cleaned using high-pressure cleaning equipment.

Reflectors

To ensure proper functioning, the fitted reflectors have to be regularly cleaned, depending on the environmental conditions at the site. This can be done with the aid of high-pressure cleaning equipment or mobile cleaning vehicles.

Inspection

An inspection of the entire system will be required in the event of an impact (accident). Depending on the intensity of the collision, repair measures may have to be initiated (see chapter *Procedure after an impact*).

Inspection activities

The inspection of DELTABLOC® restraint systems has to take place in two steps:

1. Inspection of total system: see *Table 1*
2. Inspection of individual components: see *Table 2*

Completeness of the restraint system

When inspecting the DELTABLOC® restraint system as to completeness, the presence of the following individual components must be verified:

- ▶ couplings between consecutive elements
- ▶ elastomer inserts on both sides at the butt joint between elements
- ▶ elastomer ring to fix the elastomer inserts
- ▶ screw connections of anchors for terminals

Table 1: Inspection activities for the entire system

Component	Inspection activity	Measure
entire system	<ul style="list-style-type: none"> ▶ inspection of couplings for evident damage ▶ check for any displacement of elements following each collision within the range 50m before and after the point of impact 	where necessary, initiate repair measures

Table 2: Inspection activities for individual components

Component	Inspection activity	Measure
restraint element	<ul style="list-style-type: none"> ▶ visual inspection for cracks or spalling ▶ check for correct positioning of elements 	where necessary, initiate repair measures
coupling element	check for completeness and damage	where necessary, replace elements
butt joint inserts*	check for completeness and damage	replace where necessary
elastomer ring	check for completeness and functionality	replace where necessary

* Only for systems where butt joint inserts are required. See product data sheet.

Procedure after an impact

To ensure durable effectiveness of the DELTABLOC® system after a crash, please read the recommendations below. In case of doubt, the system supplier should be asked for an expert evaluation!

The condition of the safety barrier elements, after a crash, is described as follows:

No displacement of the safety barrier

Damage pattern: The concrete elements do not show visible cracks or spalling. Moreover, no deformation of the soil anchorages or coupling elements occurs. Tyre abrasion as well as scratch and lacquer marks are the only signs for a vehicle contact.

Measure: There is no need for action.

Slight displacement of the safety barrier

Displacement < 6cm

Damage pattern: The concrete elements show little visible damage like cracks, concrete breakings etc. and noticeable impact marks. Soil anchorages and coupling elements are not affected by deformation.

Measures: Little damage which does not occur in the area of coupling elements can be repaired on the spot with refurbishment mortar. The affected DELTABLOC® elements are to be lifted according to the installation instructions by suitable hoisting equipment. In case of cracks in the coupling area or if the coupling elements are deformed, the affected elements have to be replaced.

Considerable displacement of the safety barrier

Displacement ≥ 6cm

Damage pattern: Elements show clearly visible damage like cracks, concrete breakings etc. and clearly visible deformation of the soil anchorages and/or coupling elements.

Measures: If there is only little visible damage, the refurbishment of elements takes place on the spot by using refurbishment mortar. If it comes to a clearly visible damage and deformation, the affected DELTABLOC® elements and their connecting parts have to be replaced. The displacement and the alignment have to take place in accordance with *chap. Installation*.

Remark on the repair mortar to be used

Commercial repair mortar is to be used to repair minor damage. The type of mortar to be used is hydraulically setting, polymer-modified dry mortar. Preparation of the surface and processing of the mortar must be done in accordance with the processing instructions of the mortar manufacturer.

Operational safety

General

Please refer to all the relevant national regulations regarding occupational safety. The information below should be regarded as an addition to these national regulations.

Material, tools and equipment

Care must be taken that all materials, tools and equipment correspond to the safety regulations and are suitable for the purpose they are used for.

Securing the construction site

Safe access to the construction site must be guaranteed.

The construction site must be secured against unauthorised access by third parties by putting up the corresponding signs and barriers. Care must be taken that the general traffic can safely pass the construction site. Sources of danger should be identified while setting up the construction site, with suitable measures being taken.

A suitable traffic control plan is to be developed in good time and implemented at the site. All site employees should be constantly aware of the risks posed by the traffic flow and must wear high-visibility vests.

Cleaning

Protective goggles and a dust mask are to be worn when cleaning DELTA BLOC® elements, thus avoiding injuries caused by small airborne particles.

Clearing the construction site

High-visibility vests must also be worn when leaving or clearing the construction site. When removing traffic lights and signs, corresponding precautionary measures must be taken in order to avoid accidents with passing traffic. Any waste and dirt on the construction site must be removed.

Additional information

Documents to apply

- ▶ Product Information DB 80 / DB 80AS
- ▶ Product Information DB 100S
- ▶ Product Information DB 100
- ▶ Installation Instructions Permanent Safety Barriers

Internet

- ▶ For detailed information, photos and videos of crash tests please visit www.deltabloc.com



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