

# Manual



## Temporary Safety Barriers **Maintenance Manual**

---

Documentation for License Partners

General	2
Maintenance and inspection	3
Procedure after an impact	4
Operational safety	5
Tools and equipment	6
Additional information	7

## General

The choice which DELTABLOC® system to use depends on the specifications defined by the contracting body according to EN 1317, with regard to the placement situation (location).

For the temporary safeguarding of construction sites on the side of the road and on oncoming-traffic areas, the DELTABLOC® systems DB 50SL and DB 65S are mainly used. They are however also suitable for permanent use, especially where place is reduced, as they only need a small base area due to their small system width.

The installation of the DELTA BLOC® systems DB 80, DB 100 etc. is described in the installation instructions for permanent systems, although they can be used temporarily as well.

Relevant national regulations as well as technical terms of delivery and contract have 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 outlets

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, 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 chap. 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 DELTA BLOC® restraint system for completeness, the presence of the following individual components must be checked:

- ▶ coupling between successive elements
- ▶ 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"> <li>▶ checking the couplings for visible damage</li> <li>▶ checking for displacement of elements after each impact in the area of 50m before and after the impact point</li> </ul>	where necessary, repair measures must be initiated

**Table 2: Inspection activities for individual components**

Component	Inspection activity	Measure
restraint element	<ul style="list-style-type: none"> <li>▶ visual inspection for cracks or spalling</li> <li>▶ checking the correct positioning of the element</li> </ul>	where necessary, initiate repair measures
coupling	checking for completeness and damage	where necessary, replace elements
clamping bolts	checking for completeness and damage	where necessary, replace elements

## Procedure after an impact

Adhering to the following recommendations, the DELTABLOC® systems DB 50SL and DB 65S remain permanently effective, even after impact events. In case of doubt, the system supplier should be consulted for a professional assessment.

The condition of the safety barrier elements after an impact can be categorised as follows:

### No displacement of the safety barrier

**Damage pattern:** No visible cracks or spalling on the concrete elements. No deformations of the ground anchors or the couplings. Tyre abrasion as well as possible scratches or traces of paint are the only signs of a vehicle contact.

**Measure:** There is no need for action.

### Slight displacement of the safety barrier

Displacement < 6cm

**Damage pattern:** Slight visible damage on the concrete elements, such as small cracks, concrete breaking etc. There are clear signs of vehicle contact. No visible deformations of the ground anchors, clamping bolts and coupling elements.

**Measure:** Minor damages can be repaired on the spot, using repair mortar. The displaced DELTABLOC® elements can be realigned using suitable lifting equipment. If possible, bolts have to be retightened, otherwise exchanged.

If cracks appear in immediate proximity of the ground anchors or the couplings, the affected DELTABLOC® elements are to be replaced and aligned in accordance with the installation instructions! The installation of new elements is to be carried out as in the initial installation.

### Considerable displacement of the safety barrier

Displacement  $\geq$  6cm

**Damage pattern:** Significant visible damage on the elements, such as cracks, concrete breaking etc. Visible deformations of the ground anchors, the coupling elements or the clamping bolts.

**Measure:** If only minor damage is evident, the elements can be repaired on the spot, using repair mortar – otherwise they have to be replaced. Clamping bolts and couplings have to be replaced as well, if they are significantly deformed. In case of concrete breaking or cracks in the area of the ground anchors, the affected DELTABLOC® elements absolutely have to be replaced. Installation and alignment of new DELTABLOC® elements have to be carried out in compliance with *chap. Installation*.

### Remark on the repair mortar to be used

Commercial repair mortars are to be used for the repair of minor damages. They are hydraulically hardening, polymer-modified dry mortars. Preparation of the surface and application of the mortar must be carried out 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.

### Loading and unloading

The driver is responsible for securing the load! Before loosening the straps that are securing the load, it must be ensured that the load is still stable.

Lifting equipment such as cranes, concrete barrier grabs, straps, ropes, chains etc. must be maintained in a good condition. It must be ensured that all lifting equipment has been tested and certified.

There may be no people in the danger zone of the hoisting equipment.

It must be ensured that all employees are wearing suitable work clothing, including their personal protective equipment (safety shoes, helmet, high-visibility jacket, gloves).

### Crane

Cranes may only be operated by suitably trained staff.

The crane must be set up in accordance with the requirements. Special care must be taken that there are no power cables within the operating range of the crane. All overhead cables should be regarded as high-voltage cables and both the crane and the load should be kept at a safe distance. In the event of problems with overhead cables, work must be discontinued and the responsible authorities are to be contacted.

### Cleaning

Protective goggles and a dust mask are to be worn when cleaning DELTABLOC® 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.

## Tools and equipment

### Required equipment

1. Lorry with loading crane or mobile crane, excavator or forklift
2. Concrete safety barrier grab
3. Crowbars and lifting rods
4. 24mm spanner
5. Drill (with drill head)
6. Electricity supply
7. Tape measure or distance meter

### Material

1. Elements, terminals, transitions
2. Bolts and nuts M16 for terminal anchoring
3. Clamping bolts M16
4. Couplings
5. Reflectors (if required)
6. Mechanical anchor for terminals or resin-bedded anchor

### Transport

1. Suitable lorries
2. Load-securing straps

## Additional information

### Other relevant documents

- ▶ Product Information DB 50SL
- ▶ Product Information DB 65S
- ▶ Product Information DB 80
- ▶ Damage classification – temporary safety barriers
- ▶ Repair manual – temporary safety barriers

### Normative references

- ▶ European Standard EN 1317 part 1 “Terminology and general criteria for test methods”
- ▶ European Standard EN 1317 part 2 “Performance classes, impact test acceptance criteria and test methods for safety barriers”

### Internet

- ▶ For further information, photos and videos of crash tests please visit [www.deltabloc.com](http://www.deltabloc.com)



### DELTA BLOC International GmbH

Industriestrasse 28

2601 Sollenau

Austria

Tel: +43 57715 / 470 473

Fax: +43 57715 / 470 474

office@deltabloc.com

www.deltabloc.com

DELTABLOC® is a registered trademarks of DELTA BLOC International GmbH | © 2016 DELTA BLOC International GmbH