

TETRA®-H Manhole Cover with Lifting Aid Installation Instructions

Preparation

Installation must be carried out in accordance with the installation guidelines for manhole covers set out in ÖN/EN 124 and the supplementary requirements of ÖNORM B 5110.

For handling, transport, loading, unloading and positioning work, use only suitable lifting equipment, including lifting slings or lifting clamps where appropriate. The load limits of gully tops and manhole tops must be observed during the construction phase.

Check that the cover and frame are in good condition before installation. Do not install damaged parts. Covers intended for vehicular traffic must be installed with the lifting opening positioned at the rear in the direction of travel (**Fig. 1**). **TETRA® class D400 covers are not suitable for direct installation in regular traffic lanes in public traffic areas.**

Covers with a lifting aid (gas springs and hinges) must be installed as complete assemblies, with the cover securely attached to the frame by the hinges. **Hinges and gas springs must not be removed (Fig. 2)!** No warranty can be given for the correct operation of lifting aids that have been dismantled.

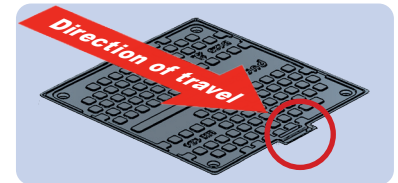


Fig. 1: Orientation of the lifting opening relative to the direction of travel

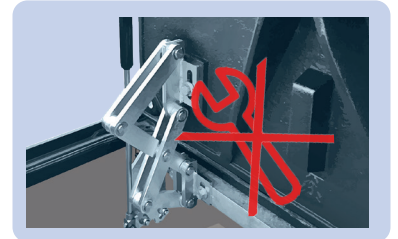


Fig. 2: DO NOT remove hinges or gas springs

Installation of the Manhole Cover

Construct the supporting structure between the top of the manhole shaft and the frame so that the top of the manhole cover is at the specified road level (**Fig. 3**). Allow for the mortar bed thickness required for installing the frame (**Fig. 4**).

The opening in the supporting structure must be formed so that the frame's bearing surface is continuously supported. Ideally, the dimensions of the opening should correspond exactly to the specified clear opening (LW) of the manhole cover.

Clean the contact and bearing surfaces. Moisten concrete components before installation (**Fig. 3**). **With the cover open and the bolts loosened, temporarily cover the threaded holes in the frame to prevent contamination, particularly during mortar work!**

Set the frame in a full bed of mortar, ensuring stable, load-bearing support across the entire bearing surface (mortar bed thickness: min. 20 mm, max. 50 mm). Align the frame in plan (e.g. parallel to the edge of the carriageway). Adjust the height so that the manhole cover sits slightly above the planned road level. This allows surface water to drain from the cover onto the carriageway, preventing ponding and ice formation (**Fig. 4**).

To improve anchorage to the supporting structure, we recommend additionally securing the frame to the substrate with anchor bolts (HILTI or equivalent). TETRA® frames have widened, perforated bearing flanges on two opposite sides. We recommend fitting two anchor bolts per flange through the flange openings, or three per flange for side lengths of 1000 mm or more (**Fig. 5**). Anchor bolts, locknuts and washers are not included in the scope of supply.

Form a concrete surround around the top of the manhole shaft, the supporting structure and the frame, extending up to the underside of the wearing course. This ensures that the manhole structure is sealed up to road-surface level and that the individual components are securely connected and prevented from shifting (**Fig. 6**).

CAUTION: Expanding foam and silicone adhesive are not suitable fixing materials for manhole covers and must not be used instead of mortar!

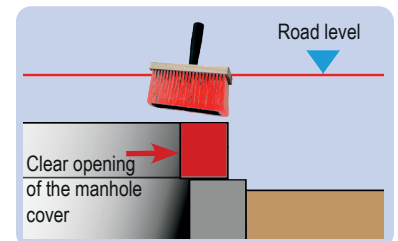


Fig. 3: Supporting structure – clean and moisten the bearing surface

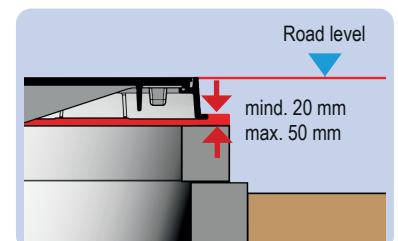


Fig. 4: Installing the frame in the mortar bed

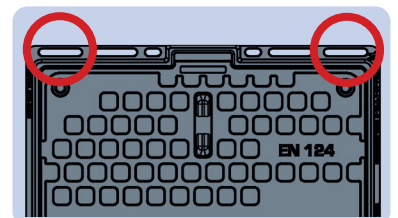


Fig. 5: Fixing points for anchor bolts

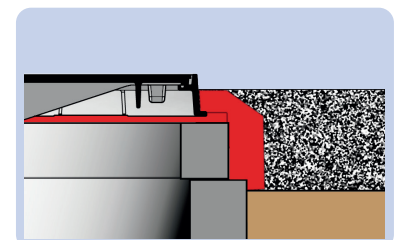


Fig. 6: Concrete surround around the shaft top, supporting structure and frame, up to the top of the first pavement course

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Final Installation Work

Allow the mortar to cure for the required time. Remove the temporary coverings from the threaded holes in the frame and blow out the holes with compressed air. **Under no circumstances may blocked threaded holes be “cleaned” with a drill, as this will destroy the threads!** Close and bolt down the cover. Lay and compact the first pavement course.

Lay and roller-compact the wearing course. Provide any necessary separation joints in the pavement around the manhole cover (Fig. 7).

Loosen the bolts and open the cover until the safety stay engages (Fig. 8). Clean the contact surfaces between the cover and frame, the seals and the bolted connections. In particular, remove any small stones, sand and gravel particles from all gaps between the cover and frame and from the seal. Check the threaded holes in the frame and clean them with compressed air if necessary. Also remove mortar and asphalt residues from the lifting openings and the joints between the frame and cover (Figs. 9 and 10).

Pull the safety stay upwards, close the cover and bolt it down:

The bolt threads and all rubber seals must be greased (Fig. 11)!

Tighten the bolts to a torque of at least 100 Nm (Fig. 12).

Covers fitted with a lifting aid that are NOT BOLTED DOWN pose a serious hazard to members of the public using traffic areas (pedestrians and all other road users), as well as to employees. Covers with a lifting aid can be opened very easily and may even lift slightly out of the frame on their own!

Construction workers or maintenance personnel may be held personally liable for property damage and personal injury resulting from failure to bolt down the cover.

The enclosed operating instructions must be handed over to the responsible operator. The handover must be documented!

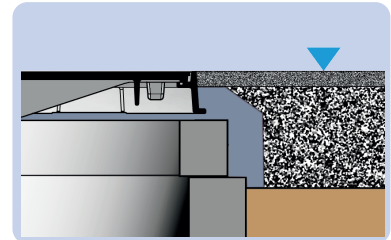


Fig. 7: Laying the wearing course

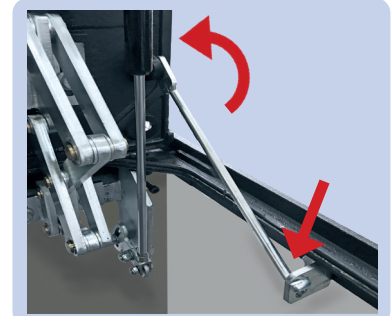


Fig. 8: The safety stay must engage in its lower position when the cover is opened

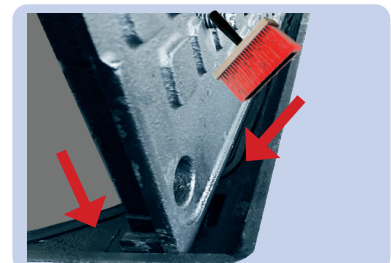


Fig. 9: Clean all gaps between the frame and cover, and clean the seal



Fig. 10: INCORRECT: Sand on the seal and bearing surface

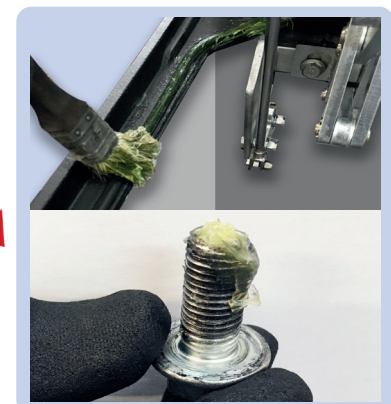


Fig. 11: Grease the bolt threads and rubber seal

Service & Maintenance
service@pwn.at
+43 (0) 505 13 - 222

Workshop & Custom Fabrication
sonderbau@pwn.at
+43 (0) 505 13 - 266

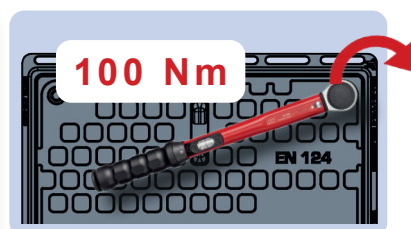


Fig. 12: Tighten the bolts

TETRA®-H Manhole Cover with Lifting Aid

Operating Instructions

Information

All manhole covers must be opened and inspected at least once a year. Manhole covers must be kept freely accessible at all times (Fig. A). Suitable tools, such as lifting keys or operating keys, must be used for operation and maintenance. For locking systems, only original keys may be used. Before opening the cover, secure the hazardous area with suitable barriers (Fig. B).

All work on manholes and manhole covers must be carried out by at least two people working together!



Fig. A: Keep access clear!



Fig. B: Secure the hazardous area!

Opening, Maintenance and Closing

Loosen the bolts and open the cover until the safety stay engages (Fig. C).

Hinges and gas springs must not be removed.

The following checks and maintenance tasks must be carried out each time the cover is opened:

Clean the contact surfaces between the cover and frame, and clean the seals. In particular, remove any small stones, sand and gravel particles from all gaps between the cover and frame and from the seal. Check the threaded holes in the frame and clean them with compressed air if necessary (Figs. D and E).

Check the hinges and safety stay for smooth operation and signs of corrosion. Clean and lubricate them, and replace them if damaged. Check that the gas springs of the lifting aid function correctly. They must provide sufficient assistance for one person to open the cover fully without significant effort. If the lifting assistance decreases or visible corrosion damage is present, all gas springs must be replaced immediately.

Check the seals for damage or material fatigue and replace them if damaged. Pull the old seal out of the groove, then remove adhesive and rubber residues and rust from the groove. Secure the new seal in the groove using contact adhesive (e.g. Pattex Kraftkleber). Cut the replacement seal to length so that no gap remains between the two ends.

Before closing the cover, we recommend spraying the safety stay, hinges and gas springs, including their fixings, with a multi-purpose spray to protect against corrosion.

Rubber seals and bolt threads must be greased!

Closing the cover: Release the safety stay (Fig. C), close the cover against the force of the gas springs, and screw in the bolts without fully tightening them. Finally, use a torque wrench to tighten the bolts crosswise to a torque of at least 100 Nm (Fig. F).

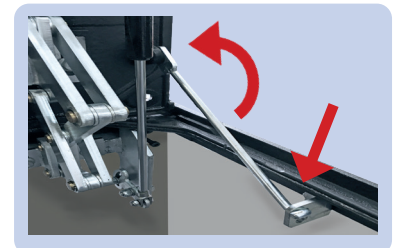


Fig. C: The safety stay must engage in its lower position when the cover is opened; pull it upwards to close the cover

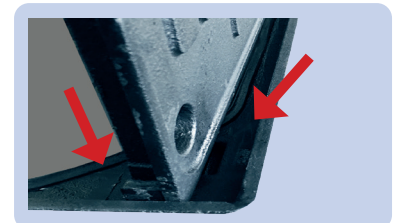


Fig. D: Clean all gaps between the frame and cover, and clean the seal



Fig. E: INCORRECT: Sand on the seal and bearing surface



Fig. F: Tighten the bolts

WARNING

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