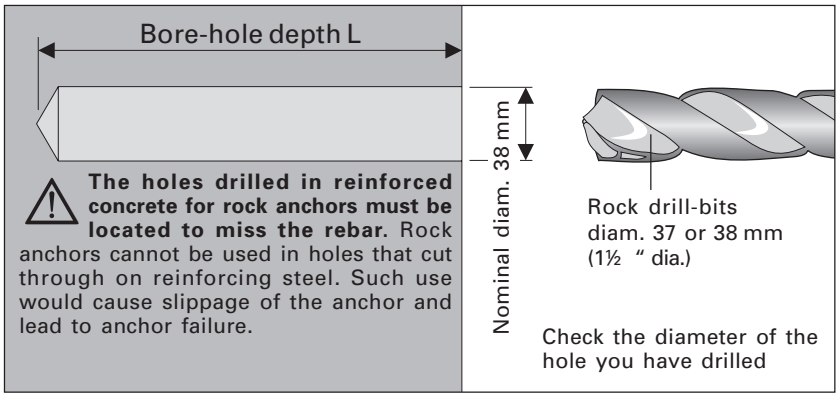
Installation instructions

Rock-anchor spreader unit 15.0

1) Drill bore-hole



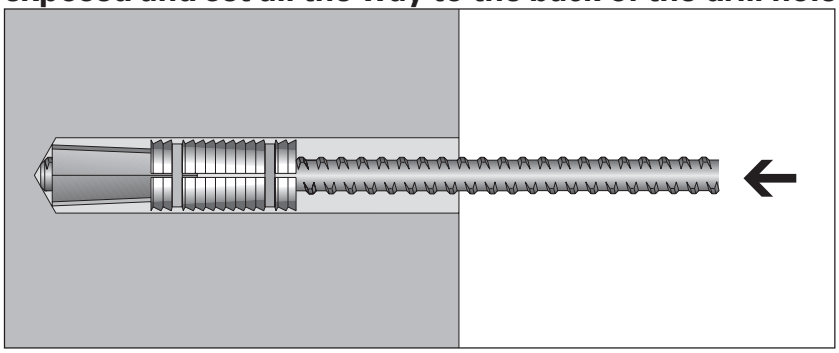
⚠ **The holes drilled in reinforced concrete for rock anchors must be located to miss the rebar.** Rock anchors cannot be used in holes that cut through on reinforcing steel. Such use would cause slippage of the anchor and lead to anchor failure.

- The bore-hole depth **L** will depend upon the characteristics of the rock or concrete: **L** min. = 200 mm (8").

  Actual pull testing results will determine if the hole depth needs to be increased.
- The drilling centre-line MUST be at an angle of 90° to the external surface.

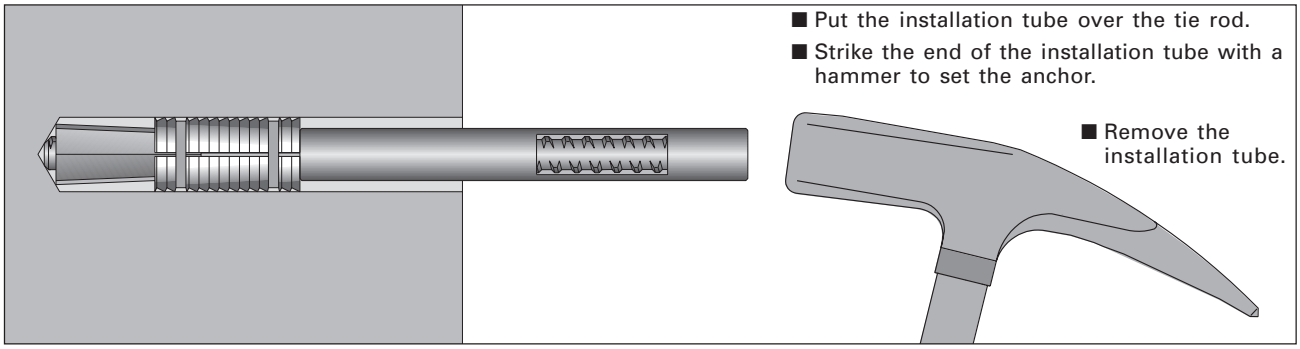
  The minimum spacing between anchors is equal to two (2) times the hole depth. The minimum spacing from the structure edge to the first bore hole is equal to the hole depth.
- Carefully clean the bore-hole, and blow out all the drill cuttings.

2) Screw the 15 mm tie rod all the way through the rock anchor leaving one thread exposed and set all the way to the back of the drill hole.



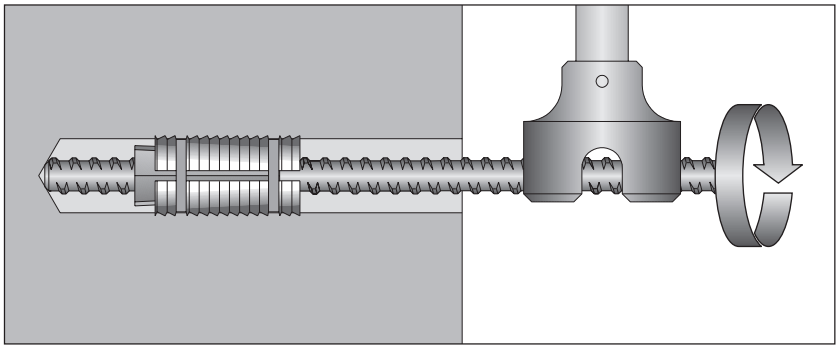
- Screw the tie rod into the spreader cone and insert it right down to the back of the bore-hole.

3) Setting the anchor



- Put the installation tube over the tie rod.
- Strike the end of the installation tube with a hammer to set the anchor.
- Remove the installation tube.

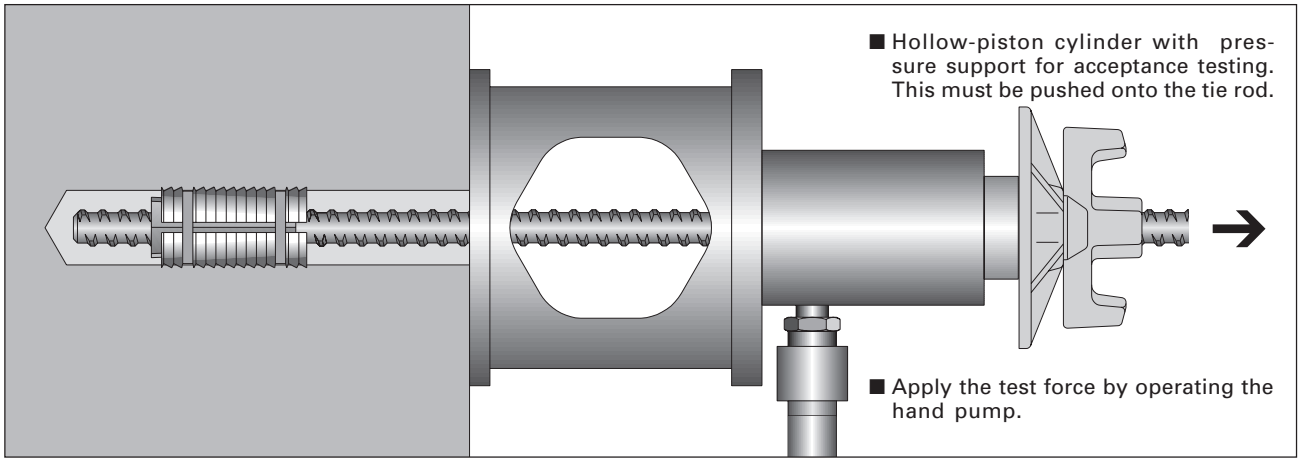
4) Tighten



- Turn the tie rod with the tie rod spanner - the spreading segments now press hard into the walls of the bore-hole.

Required torque: ~150 ft. lbs.
(This job can be made easier by attaching a tube-extension to the tie rod spanner e.g. 45 lbs for a 3.3 ft. long extension).

5) Perform the acceptance test*



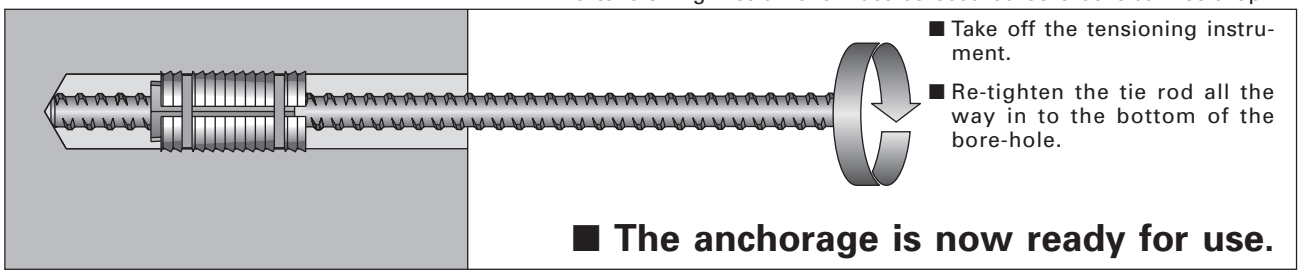
WARNING:

a) The load-bearing capacity of the anchorage will depend upon how well the rock-anchor was fitted.

b) The test-loading tests the loadability of the anchorage.

If the material into which the rock-anchor has been fitted does not have sufficient bearing capacity, the tensioning instrument may suddenly loosen during the suitability test and/or acceptance test. For this reason, it is forbidden to stand beneath or behind the testing equipment. The tensioning instrument must be secured so that it cannot drop.

6) Re-tighten the tie rod by turning the rod to bottom out in the hole



N.B.: After work is completed, the tie rod can be retrieved for re-use, while the spreader unit stays in the bore-hole.

6.1) If a 15 mm tie rod of a different length is needed for the actual assignment, then:

- unscrew the tie rod which was used for carrying out the pre-tensioning
- carefully screw in the new tie rod, of the desired length, by turning it until it bottoms out in the hole. Take care NOT to dislocate the rock-anchor spreader unit when you do this! If out of any reason the spreader gets loose, the installation procedure has to be redone from the beginning.
- If the tie rod is used as a reusable form tie see special instruction.

* **Determining the permissible load** in accordance with DIN 4125

1.) Suitability test

- On every building site, test at least 3 anchors at a location where unfavourable results may be expected.
- These test anchorages are now loaded **until the anchorage fails** - or up to a maximum of 135 kN (30 kips).
- The **permissible anchor force** is determined from the **load at failure** with a **safety factor of 1.5**.
- The **maximum permissible anchor force** is 90 kN (20 k).

2.) Acceptance test

- Every anchorage must be accepted to acceptance testing.
- The **test load** should be 1.25 times the **anchor force actually encountered**.

Sample calculation:

Suitability test:
Failure load: e.g. 110 kN
Max. anchor force: 110 kN/1.5 = 73.3 kN

With reference to the **permissible anchor force**, position the anchors and determine the **anchor force actually encountered** (e.g. 70 kN).

Acceptance test:
Test load: 70 kN x 1.25 = 87.5 kN

To make an anchorage, the following are needed:

Tensioning instrument B, art.n° 580570, comprising:

1 x hollow-piston cylinder 214 kN with 51mm stroke

1 x hydraulic hand-pump 700 bar incl. hose, fittings and manometer

1 x pressure support for loads of max. 220 kN
1 x carrying case

Rock-anchor spreader unit 15.0	Art. n°	581120
Rock-anchor installation tube	Art. n°	581123
Spanner for tie-rod 15.0/20.0	Art. n°	580594
Tie rod 15.0 (length as needed)		
N.B.: Only use approved tie-rods.		
Super-plate 15.0	Art. n°	581966
Rock drill-bits diam. 37 x 250 mm (1½ " x 10")	Art. n°	581124

Suitable for HILTI hammer drills with TE-Y, TE-F and SDS-MAX chucks

Special instruction for reusable 15 mm form tie

1. Slip flat washer 2” dia. O.D. ¾” dia. I.D. over tie rod to rock concrete face.
2. Install 22 mm plastic tube with cones on both sides.

   Note: 22 mm tube cut to 20 mm less than distance from washer to finished face of concrete pour.
3. Install forms and slip on super plate and tighten.
4. Pour concrete and allow to set.
5. Prior to stripping, remove the 15 mm tie rod using the tie rod key.

   Note: If you do not remove the panels and tie rods simultaneously, then leave some tie rods in place to hold formwork panels until you are ready to strip them.
6. Remove tie rod cone, insert 22 mm plug and patch hole.