

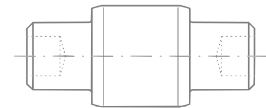
As a specialist for cold forming, **HONSEL** manufactures customised solid parts with close tolerances in a wide range of geometries. The specialised manufacturing depth and the 100 % quality control of the produced parts are the hallmarks of the company.

**HONSEL bolts**, installed in millions of clutch systems worldwide, are a first-class example of this.



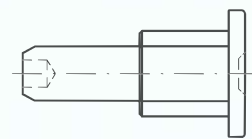
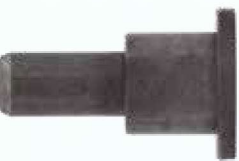
### Collar-type bolt

- Always riveted from both sides
- Shaft diameters up to 12 mm
- Variable shaft lengths
- Shaft with and without bore



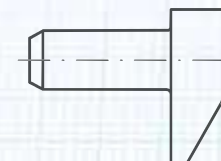
### Spacer bolt

- Riveted from one side
- Up to 28 mm head diameter with max. 12 mm shaft diameter
- Shaft and head round as standard
- Oval geometries possible
- Head punch designed individually to the customer's wishes



### Asymmetric bolts

- Up to 12 mm shaft diameter
- Variable shaft lengths
- Asymmetric head geometries possible to meet customers' wishes

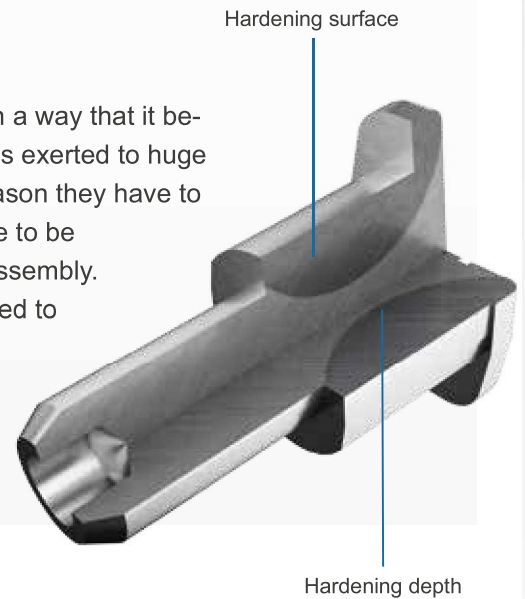




## Hardened to the point

The cold forming process alone changes the starting material in such a way that it becomes harder on its own. But this is generally not enough. The stud is exerted to huge forces when it is installed in the clutch of a motor vehicle. For this reason they have to be hardened so that they become more resistant. But they don't have to be hardened all over, because if a stud is too hard, it will break during assembly. Partial hardening is the solution. Predefined partial areas are hardened to a precisely defined material depth to a defined degree of hardness.

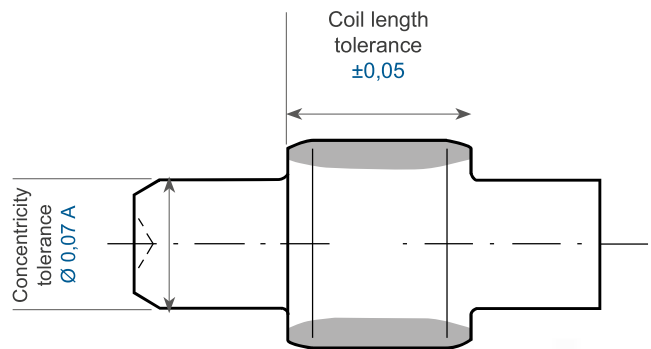
**HONSEL** has mastered the art of "hardening to the point" so well because this process takes place in-house.



## Tolerance optimised

The automotive industry accepts only minimal tolerances. Suppliers have to constantly ensure that every product supplied always meets these stringent specifications. Less than 0.07 mm – that is the concentricity tolerance that **HONSEL** can guarantee the automotive customer.

And **HONSEL** is less tolerant also when it comes to the length: A coil may deviate in length by only +/- 0.05 mm. **HONSEL** customers appreciate this precision.



## Barrel finishing

During the hardening process, scale forms on the outside of the stud because the glowing hot metal reacts with the oxygen in the air. These thin residues from the oxidation process can be barrel finished so that the stud has a glossy surface again.

At the same time, barrel finishing reduces the friction coefficient (COF) of the studs – a precondition for longer service lives of the finished products.

As with all other process steps, **HONSEL** attaches great importance here again to being able to carry out barrel finishing in-house.

## Eddy current testing

The eddy current test is a non-destructive testing method for detection of cracks and pores near the surface and of defects in electrically or magnetically conductive surfaces. During the test, the surface of the test specimen is scanned contact-free using a probe. The probe generates a magnetic field which induces eddy currents in the surface of the object to be tested. These eddy currents in turn generate electromagnetic fields which are detected by the receiver part of the probe.

