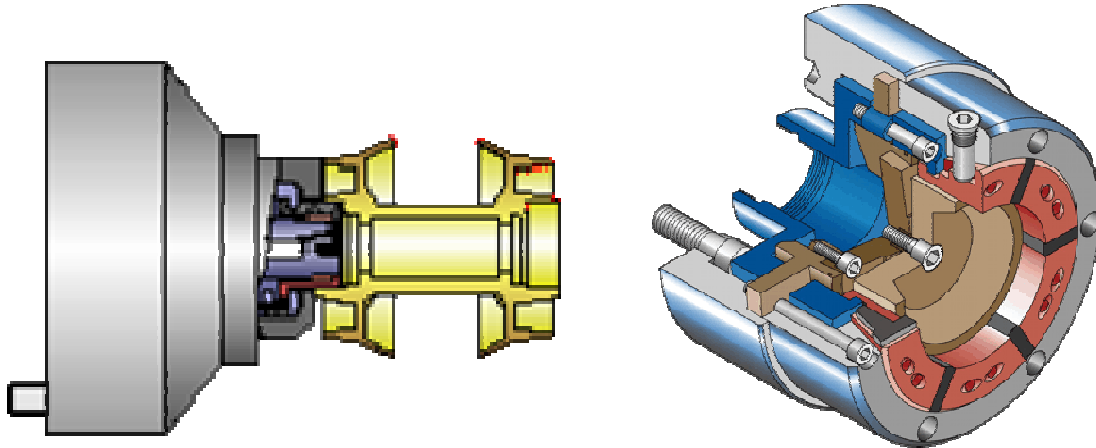


Hainbuch Chucking Solution – Harley Davidson Hubs

Pull-back chucking technology enables complete turning of Harley Davidson hubs in one operation !



Adelaide, South Australia is the manufacturing home for Harley Davidson alloy wheels with several second tier firms producing the complex alloy hubs.

The hubs are produced from aluminium die-castings and when finished must have an excellent machined surface finish prior to chrome plating.

As expected with high quality automotive parts, these hubs are manufactured to exacting tolerances, particularly for concentricity and run-out.

Numetric Manufacturing is just one of the Adelaide based firms that produce these hubs utilising chucking technology from Hainbuch GmbH. Numetric's high performance Okuma 4-axis CNC turning centre with sub-spindle is equipped with a Hainbuch pull-back chuck and mandrel to complete both first and second operations completely unattended.

The first operation involves gripping the raw cast hub on a nominal $\text{Ø}105$ OD with a combined taper angle of 6° in a 100mm capacity chuck. The unique solid wedge style of the Hainbuch collet allows stepped collets to clamp onto diameters considerably larger than the rated capacity of the chuck, something few other collet chucks are capable of. The 'bell mouthed' collet is serrated to provide bite on the cast taper and the pull back actuation ensures the component is held firmly and squarely against the internal endstop.

The taper which closes the collet intensifies the applied drawtube pull force by a considerable margin. The standard 100mm capacity chuck used in this project is capable of exerting a phenomenal radial grip force of 150kN (15 tonne) if required. The mandrel also packs a huge punch of up to 125kN radial grip force.

Heavy U drill cutting removes the solid core of the component prior to roughing and finish turning using diamond tooling.

When the first operation is completed the two spindles move together and the Hainbuch pull back expanding mandrel on the sub-spindle grips the component in the previously finished bearing bore without marking it – an important requirement of Harley Davidson.

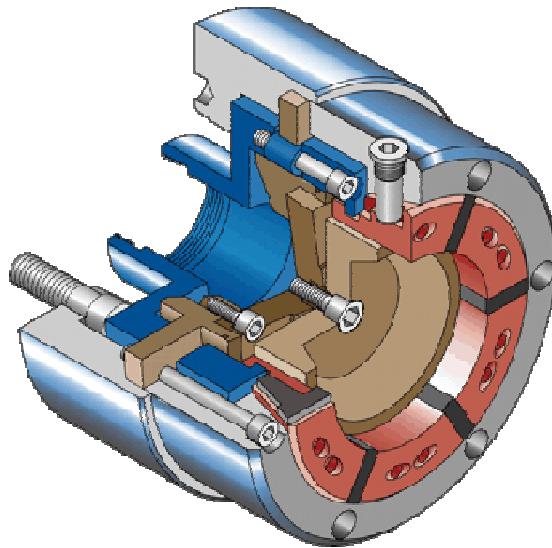
Conventional turning experience suggests it is not wise to grip on only 14mm of length in a Ø52 bore while taking 2.5mm cuts at the far end of a 165mm long component, but the extremely rigid clamping provided by the Hainbuch system means this type of work can be performed safely and reliably.

The concentricity requirement between the two bearing bores (one bore finished in the chuck and the other finished on the mandrel) was easily met with the production components running at 0.015 and better. A very high surface finish requirement does not permit any blend marks between the two operations – another easily met specification.

The combination of chuck and expanding mandrel have produced well over 250,000 components without any maintenance other than the occasional clean out of grit and debris, and, most importantly, Numetric engineers confirm they have NEVER thrown a component out of the chuck or the mandrel.

In a final operation the spoke holes are drilled and chamfered in the tapered flanges on a vertical machining centre with a Hainbuch stationary hydraulically actuated expanding mandrel mounted on the fifth axis and again gripping in the bearing bore. This operation generates bending moments which could force the component to move on a conventional mandrel with such short grip length, but the power generated by the combination of pull back and solid wedge expanding sleeve segments of the Hainbuch system ensure effortless, trouble free machining.

If you want to turn or mill faster and harder, with fewer, heavier cuts, improved surface finish and tool life, plus all the advantages of a 15 second collet change time, consider Hainbuch chucking systems from Romheld Australia – your one stop shop for Proven Productivity products.



For more information on how Hainbuch workholding solutions can help you, please contact:

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