

Smartbore

Industry: Automotive

Component: Gear Housing, Die Cast Aluminium with 12% Silicon.

Annual Production: (Undisclosed)

Customer: (Undisclosed)

Machine Spindle: HSK63A

Completion Date: July 2015

Tool Brief

Before this Winsconsin based second tier automotive supplier started using Rigibore tooling, it purchased all its boring tools from one well known supplier. For the gear housing part this tooling used carbide support pads to stabilise the bar and counteract deflection.

Over several months, the manufacturer was experiencing problems with accuracy that resulted in high scrap rates, wasting both valuable time and money.

When Rigibore was asked to look at the problem and come up with a new solution, it designed and manufactured boring tools that could operate at higher speed and feed rates, reducing cycle time and through increased accuracy helped to minimise scrap.



Rigibore's Smartbore technology simplifies the adjustment process and provides unparalleled accuracy.

Process

Rigibore used its specialised in house design facility RADS to design, manufacture and deliver a tool made up of the following components which would help the manufacturer to achieve its operational goals:-

- Smartbore Cartridge**- The tool was fitted with a Smartbore Cartridge, allowing simple, micron-accurate adjustment.

The handheld Smartbore Adjuster contributed to speeding up the operation, and offering adjustment down to 0.001mm on diameter

- Hydrostatic Tooling**- Rigibore's hydrostatic tooling allowed through coolant to effectively evacuate chips between the bar and component.

- Special Insert Geometry**-Rigibore's special insert geometry smooths the surface simultaneously whilst machining. While the cutting tool is operating, wiper inserts burnish to provide a smooth surface finish. This method contributes to greater quality and accuracy of finish.



Speeds and Feeds

All Rigibore tooling ran at S6000RPM at a feed rate of 1000 mm/min.

HSK63A Finishing Tool with Smartbore Cartridges built in.



Results

Our customer has benefited from introducing Rigibore tooling in a number of ways. Firstly, Smartbore technology allows adjustments to be made to the tool whilst in the machine spindle, which helps to minimise spindle downtime in operation, and reduce cycle time.

Smartbore is ideal for tight tolerance applications, applying micron-accuracy in adjustment.

Rigibore drilled three hydrostatic coolant holes into the bar. This through-coolant formed a reservoir between the bar and component.

Running at a higher speed with a lower feed rate helped maintain stability in the cut, this combined with application of the special insert geometry produced a better quality of finish with rounder and more accurate bores.



CP Data

Since the introduction of Rigibore tooling, parts are now being produced within the customer's Cpk requirements.

Scrap Rate

Prior to the introduction of Rigibore tooling, out of every 100 parts produced, 7 were scrapped. Rigibore improved this figure with 100 parts being produced only 1 was scrapped.



Finish Quality

Rigibore tooling managed to maintain the required finish quality in operations, by vastly increasing the feed rate from S1800 @ 600mm/min with the padded style of tooling to S6000 @1000mm/min with the Smartbore solution.