We bring out the genius in you.

STEINER™

INGENIOUS CUTTING TOOLS

The KA Series Modular Autofacer® The most robust seat pocket tool available anywhere!

INCREASED PRODUCTIVITY

REDUCED INVESTMENT

IMPROVE PART PROFITABILITY BY:

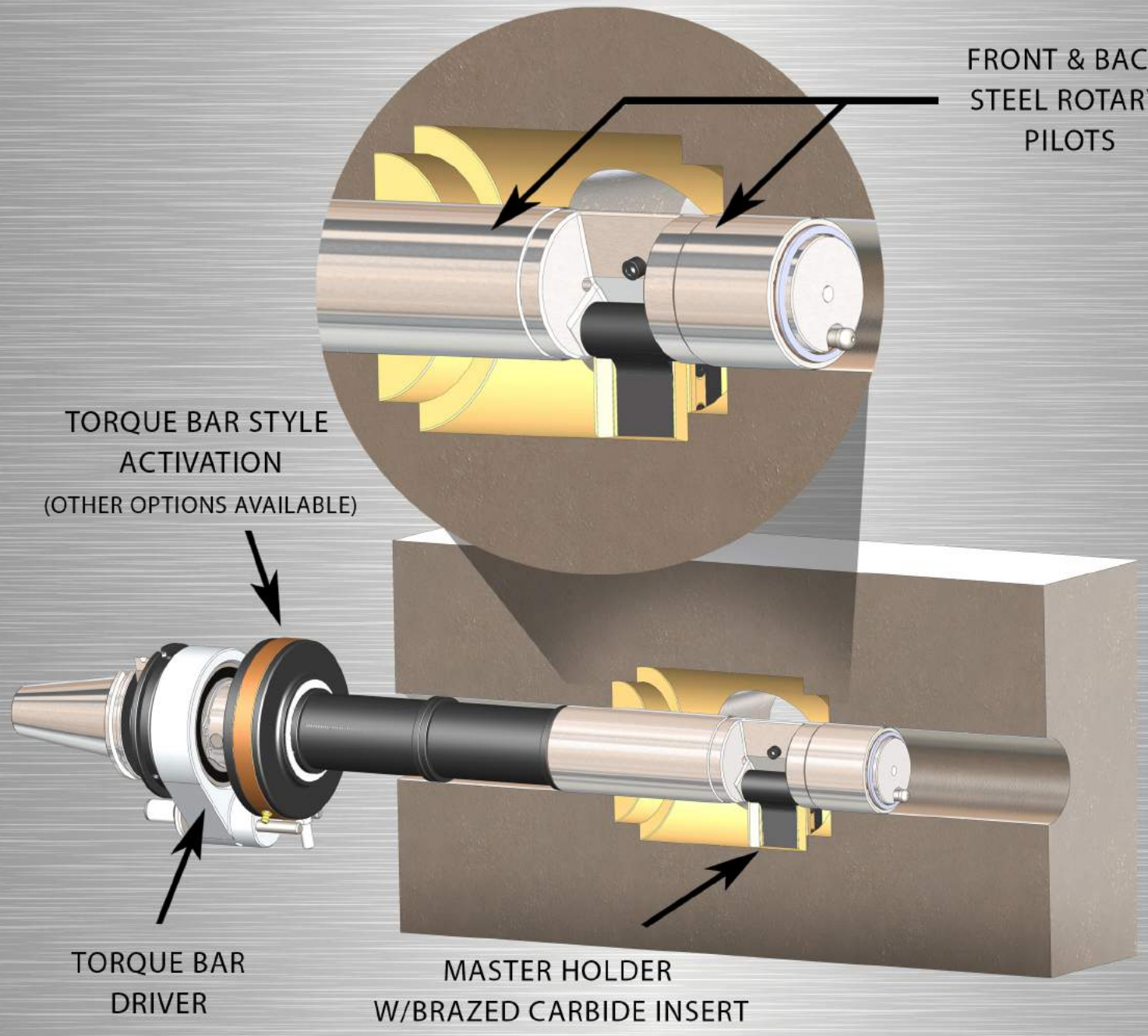
- Reducing Cycle Times by 80% or more
- Automating the Manufacturing Process
- Eliminating the Secondary Operation
- Enhancing Worker Safety

STEINER
INGENIOUS CUTTING TOOLS

The most ingenious
Automatic Back Boring Tools
on the planet

TO BORE — *Torque Bar Activated Autofacer®*

- Must machine part bore to specified tolerance
- Support bushing is integral component of Autofacer® assembly
- Autofacer® is designed for specific application (Hole ø / Part length)
- Variety of available sizes (1/4" to 8"hole ø)
- Mechanical activations + supported cutting = High metal removal rates



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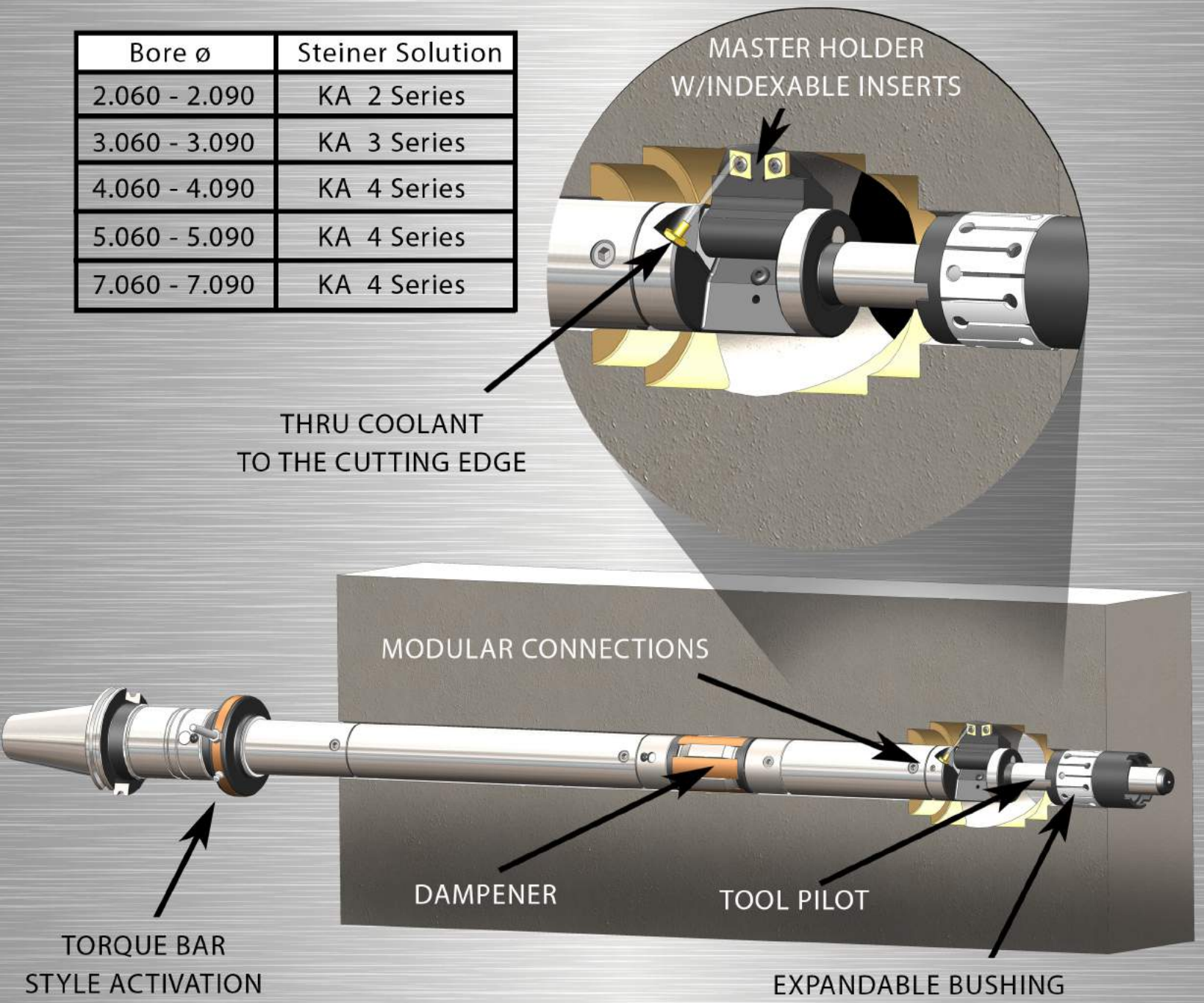
OR NOT TO BORE

KA Series Modular Autofacer®

- Expandable bushing is installed into part bore which provides support while cutting
- Modular design offers flexibility for multiple application lengths
- Dampener assembly provides additional support for extra long length applications
- Can be used on standard CNC machine tools - No "W" axis required
- Gate valve flow bore ø's

Bore ø	Steiner Solution
2.060 - 2.090	KA 2 Series
3.060 - 3.090	KA 3 Series
4.060 - 4.090	KA 4 Series
5.060 - 5.090	KA 4 Series
7.060 - 7.090	KA 4 Series



CASE STUDY

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INGENIOUS CUTTING TOOLS

CASE STUDY 1

Machine Shop Drastically Reduces Back Boring Cycle Times!

Challenge:

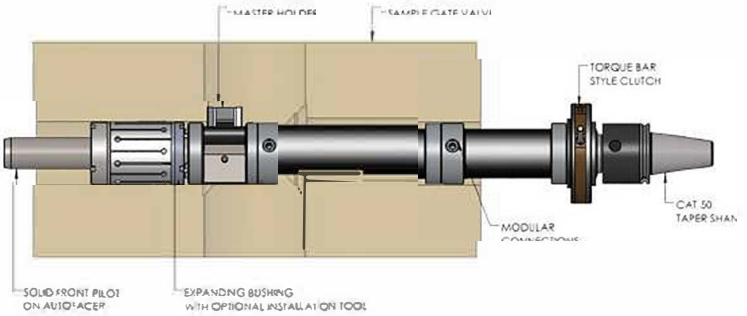
Determine the most cost effective process for machining seat pockets on re-work gate valves with Inconel inlay.

Application Details:

4", 5", and 7" Gate Valves w/ variety of seat pocket features. Material is Inconel 718 inlay weld. The industry "standard" solution is an expensive generating head with 24 week delivery and requires a machine tool with a "W" axis spindle.

Steiner Solution:

Utilize Steiner KA style modular Autofacer® to automatically front and back bore seat pocket features. Modular design allowed for quick change from roughing to finishing heads. Adjustability of finish boring head provides quick & reliable functionality. Modularity also allowed modification of tool lengths and cutter heads for use in the different valve sizes. Expandable bushing supports Autofacer® in the bore and adjustable insert cartridge allows for precise diameter adjustment. The Steiner Autofacer® does not require a "W" axis spindle..



Results:

The industry "standard" cycle time on these large valves is approximately 4-6 hours per seat pocket. The Steiner Autofacer cycle time was 30 minutes per seat pocket on the 4" gate valve. The tooling investment was half the cost of the generating head and delivery was 6 weeks.

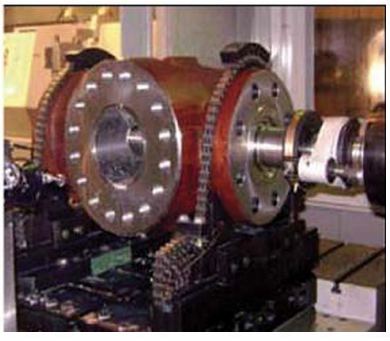
Additional Benefits:

The Steiner Autofacer® does not require a CNC boring mill with an expensive "W" axis. The customer was able to use KA4 Series to machine all the 4", 5" & 7" gate valves by easily changing out expanding bushings and cutting heads.

CASE STUDY 2

Quality Oil Tools, Inc. Cuts Machining Time by 95% with the Steiner Autofacer®

Challenge: Develop a new process to increase production throughput and profitability on their gate valve product lines.



Application Details: These valves had a 3" flow bore and maximum reach requirement of 12" with a variety of seat pockets up to 5" Ø. Tightest finish tolerance was +/-.003" and surface finish of 32. Existing processes were machining most of the features on a Haas EC300 HMC and then finish the seat pockets on a manual lathe. The materials were either medium alloy steels or stainless steel. The original process was 1 hour cycle time per seat pocket back boring on the standard manual lathe. Maintaining finish & size control was a challenge.

Steiner Solution: The robust and reliable torque bar activated Autofacer® with a CT50 shank was determined to be the best fit on the Haas EC300. For the steel gate valves the Autofacer® was run at 250 RPM with a feed rate of .003 IPR. The customer was required to machine the flow bore to a +/-.002" tolerance to provide proper support to the Autofacer® while cutting. The Autofacer® rotary pilot was designed to this bore size.

Results: The seat pocket machining cycle time was reduced to 3 minutes per pocket. The surface finish requirement is held consistently because of the supported cutting. The seat pocket bore tolerance of +/- .003 is met consistently because of guided cutting and adjustability of the finishing Master Insert Holder.

Additional Benefits: Eliminated costly secondary operation on manual lathe. Greatly reduced scrap rate by eliminating manual operation. The large heavy valves were difficult to load and unload from the lathe also and causing problems for the operators back.

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