



**POWER  
TRAIN  
TECHNOLOGIES**

professional PARTNERSHIP



# HEAVY TEC PEOPLE.

The CAT 3500<sub>professional</sub> and C-Series<sub>professional</sub>

# BENEFIT FROM REMANUFACTURING<sup>professional</sup>

**Engineering at its best.** Individual requirements and tough conditions demand tailored solutions. That's why we have started to optimize components and services for your special needs.

## PUTTING TECHNOLOGY TO THE BEST

We have researched and identified all the parts, which due to the temperature, stresses or fatigue, they are subjected to during their life cycle, cannot be reused. These parts are always replaced with new products of the highest technology and quality, in terms of material, processes and enhanced design. In order to achieve these performance levels, several factors need to be taken into

account, such as service life, pulverization, timing, injected litres and Trim codes.

We are constantly researching and updating these parameters, enabling us to stay at the forefront of this technology.



## POWERFUL PERFORMANCE FOR YOUR BUSINESS

As our expertise and experience have shown, different applications require special solutions to grant the best possible performance of the engine and thus the complete systems.

## SOLUTIONS THAT FIT YOUR BUSINESS



**Power  
Generation**



**Mining**



**Rail**



**Marine**

# PARTNER WITH A PASSION FOR DETAIL

**Crucial for any application**, there is one high-value benefit included in the use of the *professional* injectors: Quality Management to the detail; each single component is measured and laser-marked with an unique number, which allows for individual tracking through the integrated systems. To ensure best repeatable quality, we always follow strict processes and automated test procedures.

## CONTROL-ABILITY

Not only the toughest to reach tolerances for the mechanical parts are part of the control-ability of the *professional* injectors; as the injection actions starts with the electronic signals, we have introduced a 1% tolerance for the Trim code as well. Electronics and mechanics at top level result in the ultimate control-ability of the engine with the result of best performance.

## PROGRESSING STEP BY STEP

To meet any challenge, we first analyze parts and systems and then develop solutions for use in special applications. These challenges range from solutions for steady rpm applications to high-altitude mining applications. All of them requiring optimizations in more or less related parts.

Finally, any new injector version is tested on an engine and, after successful results, mounted on an applications and analyzed during an extensive field test. These processes have led to several thousands of high-performance injectors in the field.



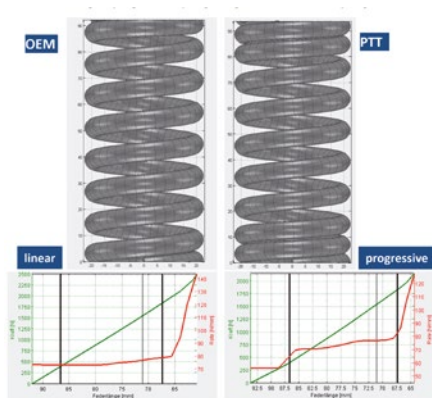
### Poppet Valves

The set of pieces that makes up the high-pressure zone was redesigned in order to avoid cavitation, which was identified as a recurring issue for these EUI, and to allow for the fastest response-time of the system.



## Springs

Working with one of the world market leaders from Germany the design of all springs has been subjected to a rigorous R&D process. The result is a progressive spring to improve its performance and resistance to fatigue!



## Solenoid Valves

New high quality solenoids to improve durability and ensure fastest possible signal processing times. Result: best control-ability of the system.



## Nozzles

Carefully selected, upgraded materials to improve erosion resistance as well as new design (radius rather than angle) to improve flows of the fuel in the system. The results are a longer lifetime, better control-ability and fuel savings.

## Trim code

The extensive setting of the Trim code for each injector with a tolerance of just  $\pm 1\%$ , combined with the advantages of the enhanced mechanical parts, results in the optimization of the engines' performance, durability, fuel savings and emission-reduction.



# BUILT-IN BENEFITS

**Advantages to trust in.** Due to our high understanding of specific needs in your business, any PTT Injector aims at two major benefits: improving the performance, efficiency and durability of your engines and at the same time lowering your costs and the carbon footprint.



## Engine Performance

- ECU Synchronization
- Fuel consumption optimization
- Emission reductions
- Longer product lifetime



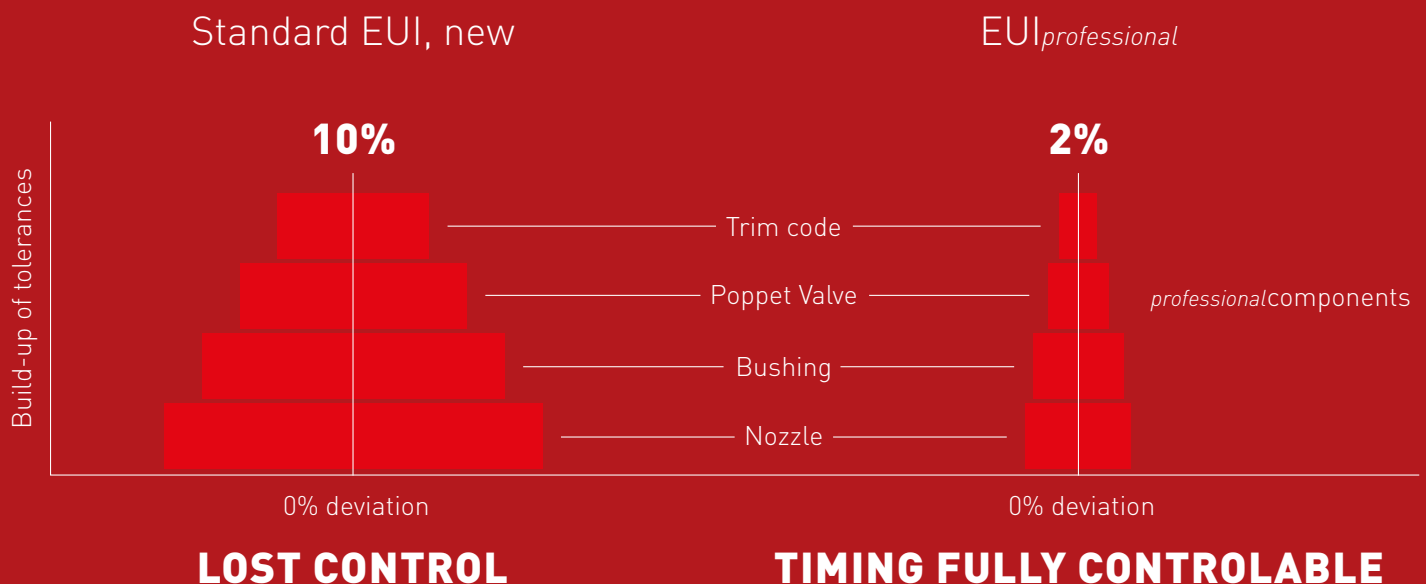
## Cost Advantages

- Savings on fuel bills
- Reduced service intervals
- Lower service cost
- Higher system efficiency through longer running time
- Extended life time of entire system by achieving an EPA class

## OPTIMIZE YOUR ENGINE'S PERFORMANCE

By selecting a Trim code for each EUI, which allows for a tolerance of just  $\pm 1\%$ , combined with the electrical and mechanical properties of our high end *professional* components, the timing of each single injection process is as perfect as technically possible.

Compared to standard EUI Trim code settings and installed components, the listed benefits multiply each action of the injection system.



# ADVANTAGES TO TRUST IN

From our longtime experience we know too well that technical perfection needs high-class support to make a difference in your business.



## Production

- Made in Germany
- Installation of upgraded parts and components
- Fully-automatic testing procedures, calibration, setting of Trim codes and final test
- Tracking of each component possible



## Support

- Technical consultancy on site
- On-site service for ECU synchronization
- Training
- Customized projects for optimizing engine performance
- Hotline for application and product support



## Availability

- All Injectors are supplied from our warehouse in Germany
- Practically every part number is available



## REFERENCES

- Antofagasta Minerals
- AngloAmerican
- Centinely (AMSA)
- Escondida (BHP)
- Freeport-McMoran
- Mantos Copper (PE Fund)

- Secco
- Soenergy
- Spence (BHP)
- Sumitomo Group

*... and many more references for marine,  
power generation and locomotive applications*



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