

# REMANUFACTURING UPDATE DECEMBER 2012

## RESEARCH & DEVELOPMENT NEWS FROM BAYREUTH



### Editorial

Dear Readers,

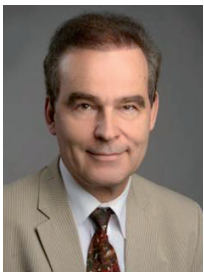
tomorrow, on 4th December after this our 7th R&D Newsletter has set sails, I am invited to speak at a major conference of German car service garage operators where the conference organizers have asked me to deliver a speech entitled:

"Total losses of 7 year old cars - because of electronic failures?"

I will tell the audience: no - if there are remanufactured parts available to fix the failure!

Enjoy reading!

*Rolf Steinhilper*



→ **Rolf Steinhilper**  
University Professor  
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### Save the Date

**10/12/2012, Shanghai (CN):**  
APRA International Remanufacturing Forum  
**13 - 14/03/2013, Almelo (NL):**  
APRA Europe Workshop with plant visits

**ReMaTec2013**  
**16-18 June** Amsterdam  
The Netherlands

### Successful Visit to BIG R Show in Las Vegas

From 27th to 29th of October the worldwide automotive and truck parts remanufacturing industry was united at 2012 APRA International BIG R Show at Bally's in Las Vegas.



Within the same exhibition hall the ATRA Powertrain Expo took place again this year which gave both organizations significant synergies.

We, as well, came back this year after our successful participations in the last years and we have not been disappointed. We had an excellent show with immense interest in our research activities and returned home very satisfied.

A great exhibition with many events gave the attendees a lot of opportunities to network with business partners and peers from all over the world. Experts from all categories of the branch enriched the BIG R Show by their well chosen speeches.

The interest of many visitors was raised by Sandra Seiferts speech "Black Magic or Rocket Science? Reman Research Results Down to Earth". The presentation gave an

overview of the most interesting research topics and projects worked on at Professor Steinhilper's Chair Manufacturing and Remanufacturing Technology at University of Bayreuth.

Also the European funded project reCORE attracted much interest. Complexity has many reasons and causes multiple challenges to remanufacturers. The presentation by Steffen Butzer and Hans-Henrik Westermann (University of Bayreuth) showed the results of their studies in this context and presented challenges as well as practical methods to manage complexity in remanufacturing companies. In regard to the presentation the attendees seized the chance



S. Butzer, R. Steinhilper, H. Westermann

and had exciting discussions with the speakers and Professor Steinhilper.

The numerous visitors of our lectures demonstrated the huge interest of the remanufacturing industry in our research activities and confirm us in our doings. Accordingly high is our motivation for generating new ideas and projects to face current and future challenges in remanufacturing.

→ **Steffen Butzer**  
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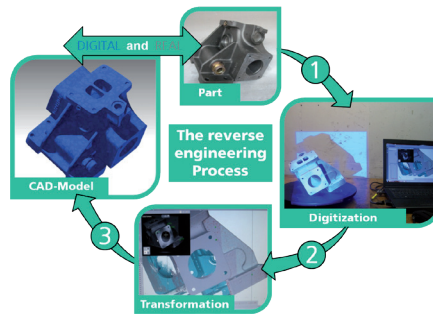




## Remanufacturing und Reverse Engineering – Meant for Each Other

During the introduction of new technologies OEM often take a leading role. So for example generative manufacturing methods like powder-based laser sintering or 3D printing were highly pushed by the demand of the automotive industry. A further new and innovative technology is in this respect the 3D scanning and optical metrology. Whereas highly time consuming tactile methods were required formerly to digitize components, today powerful and effective 3D scanners do the same work but in a far less time. Areas of utilization could be found today in tool and mould construction, the aerospace sector and of course in the automotive industry. An important application within these industrial sectors and also in remanufacturing is reverse engineering. Thereby optical digitization is a key technology and the first step towards a successful and cost efficient reverse engineering process. Within remanufacturing the reverse engineering process becomes interesting when technical drawings or CAD models for components are not present or unavailable. The Chair Manufacturing and Remanufacturing Technology at University of Bayreuth as a worldwide leading partner for innovative

and future oriented remanufacturing technologies owns such a state-of-the-art 3D scanner since the mid of 2012. In August 2012 the first successful practical application in industry took place. The company - a leading manufacturer of exchange parts - was supported by our experts to digitize engine components and attachment parts for which no technical drawings and CAD models were available. The figure below shows the reverse engineering process by using the optical digitization.



Reverse engineering process

1. In the first step a component is digitized as a point cloud by the 3D scanner using a stripe light projection principle.
2. A powerful software transforms the recorded point cloud into a highly accurate polygon mesh.

3. Using a reverse engineering software and setting specific parameters the creation of parametric surface models, e.g. CAD models becomes possible.

At the end of the reverse engineering process a highly accurate CAD model of the digitized component is available for the user. Within these 3D scanning process accuracy values down to 0.02 mm could be reached. Thereby the described method is in addition much faster in digitizing components than the tactile method. For example the complex engine component shown in the figure was digitized in only four hours.

Especially in remanufacturing this new 3D scanning process helps to save time and money. Get in contact with our experts and benefit from our know-how to discover your advantage in progress. Our expert Mr. Hans Westermann will be at your disposal to answer all questions regarding this innovative technology.



→ Hans-Henrik Westermann  
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## Meet one of our Experts - Today: Dipl.-Ing. Sandra Seifert

Today we would like to introduce Dipl.-Ing. Sandra Seifert to you. Sandra has expert knowledge in process optimization as well as factory planning and further specific areas of production technology.

### Sandra Seifert

Age: 35

Nationality: German



**Career:** 1997-2002 Technical Drawer  
2003-2008 Studies and degree in environmental engineering, since 2008 research assistant at Prof. Steinhilper's Chair Manufacturing & Remanufacturing Technology (Team Remanufacturing)

### What are your activities in remanufacturing research?

Currently I am managing a project called reCORE which deals with complexity management. I am also interested in core management as well as identification processes and also finding out about future challenges and their impact on the remanufacturing industry.

### How did you come to remanufacturing?

As a student I visited lectures of Professor Steinhilper where I learned about reman. I carried out my diploma thesis at Deutz and spent 8 month at their engine remanufacturing plant. Finally I started working at Prof. Steinhilper's Chair where I became a member of the team Remanufacturing.

### What do you do in your free time?

In enjoy being outdoors doing some sports like football, running or skiing.

### What gives you pleasure?

Completing „projects“ successfully - private or business.

### What are your wishes for the reman branch?

That more and more manufacturers realize the benefits of this great industry and make it part of their corporate strategy.

## Imprint

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