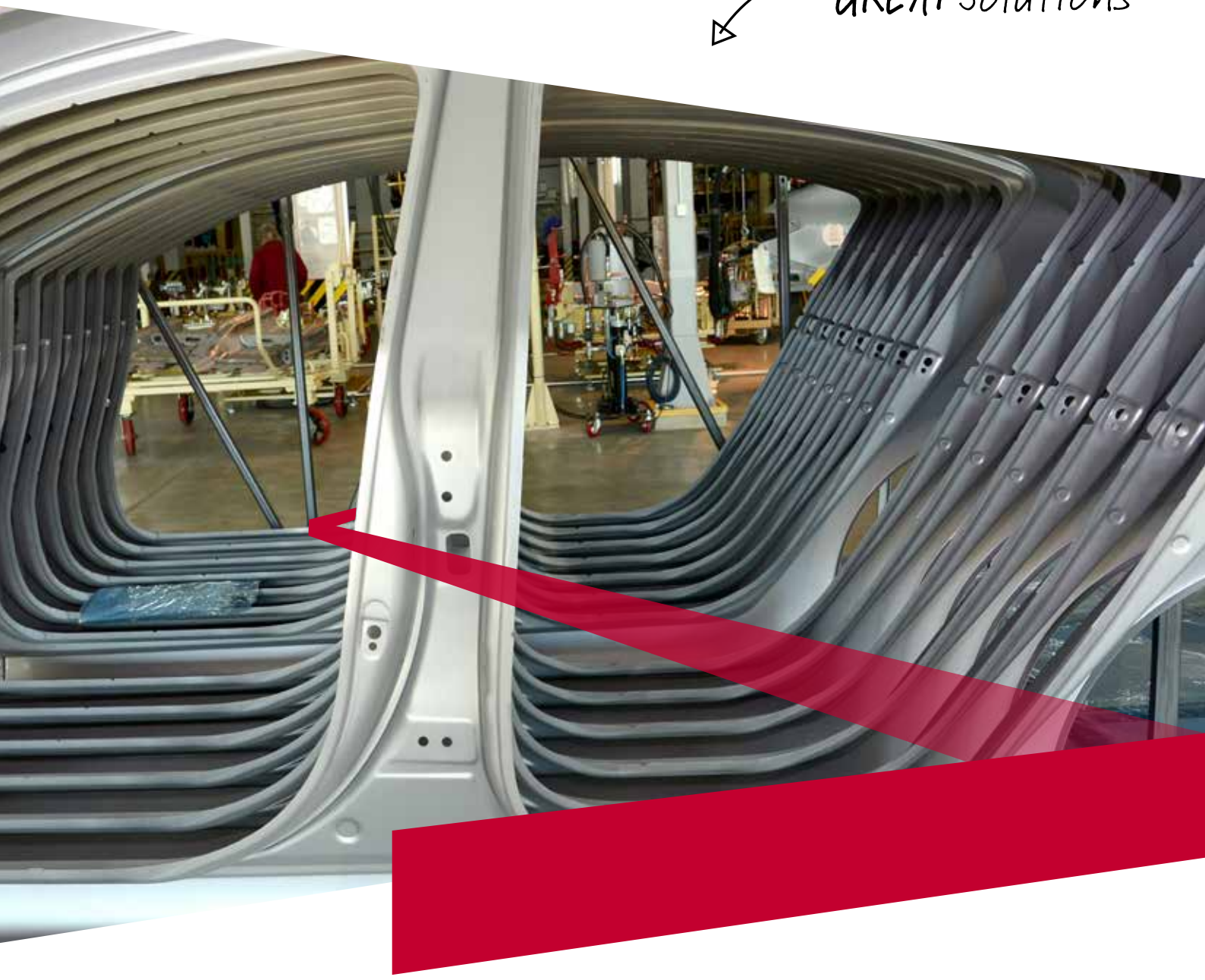
IMI
Precision Engineering

Engineering
GREAT Solutions



Automation Solutions
Die design
Tooling
Applications design

IMI NORGREN

Contents

Engineering GREAT solutions through people, products, innovation and service

IMI Precision Engineering is a world-leader in fluid and motion control. Building close, collaborative relationships with our customers, we gain a deep understanding of their engineering needs and then mobilise our resources and expertise to deliver distinctive products and solutions.

Wherever precision, speed and engineering reliability are essential, our global footprint, problem-solving capability and portfolio of high performance products enables us to deliver GREAT solutions which help customers tackle the world's most demanding engineering challenges.

> **Reliability**
We deliver and support our high quality products through our global service network.

> **High performance products**
Calling on a world-class portfolio of fluid and motion control products including IMI Norgren, IMI Buschjost, IMI FAS, IMI Herion and IMI Maxseal. We can supply these singly, or combined in powerful customised solutions to improve performance and productivity.

> **Partnership & Problem Solving**
We get closer to our customers to understand their exact challenges.

Innovative products and engineering services for your automation needs

Norgren Automation Solutions (NAS) is a world leader in providing superior solutions for all your automation needs. We combine the technology of ISI, Erie and Syron to form one of the world's most robust offerings of grippers, clamps, vacuum products and sensors. Drawing from decades of experience, NAS has the expertise and skill to provide you with a standard or custom product tailored specifically to your application requirements.

Our expertise in tri-axis, crossbar and tandem press line material handling and innovation in hot-metal grippers, integrated tooling, radial CAMs and press-line modeling is unparalleled.

Front of line to end of line, our sensors, grippers, carbon fiber components, finger tooling and vacuum cup solutions lead the industry.

> **Die Engineering**
After over 65 years of experience in die engineering, from stretch draw dies to complex radial cam flange dies, we've become the industry leader in both quality and performance with difficult panels and die processes.

> **Intergrated Tooling and Automation**
World class press automation requires the integration of die and tooling designs from the earliest stages of part development. Our applications group designs, builds and installs highly productive tooling packages that transfer at rate within hours of start-up.

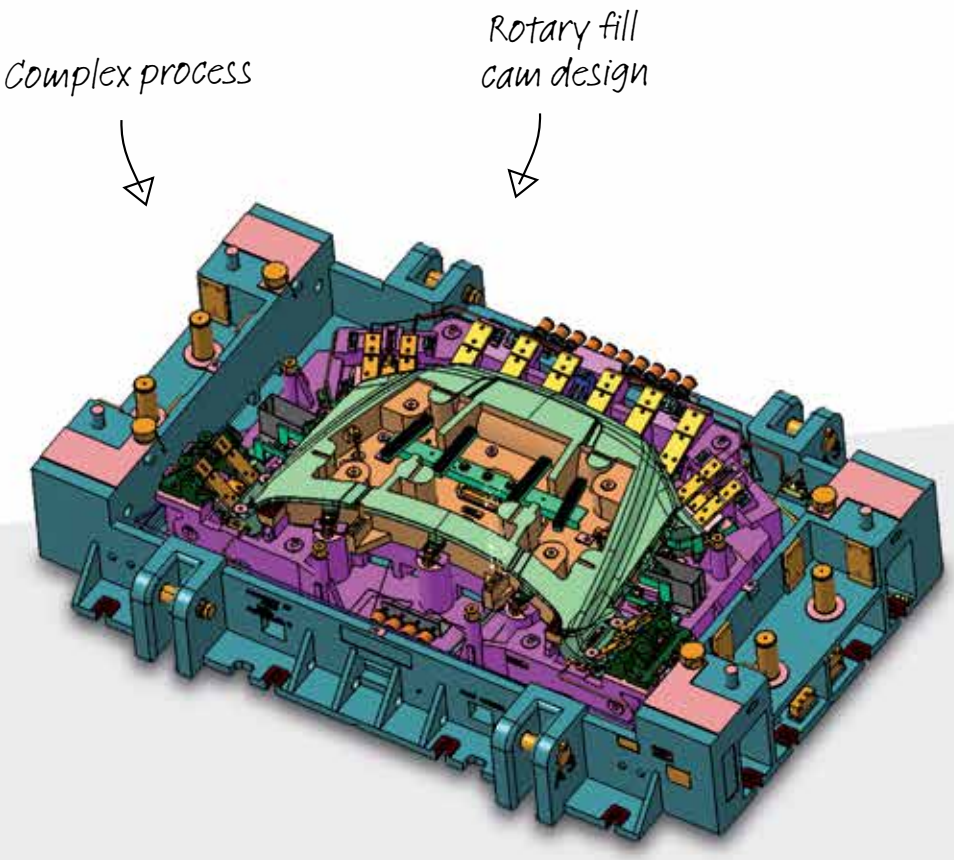
> **Engineering Solutions**
Engineering GREAT solutions for our customers is at the heart of everything we do. We help customers gain an advantage through increased output, reduced energy usage, lower cost of ownership and speed to market.

Sales & Service in 75 countries

- IMI Precision Engineering sales, manufacturing and technical centres
- IMI Precision Engineering sales locations
- IMI Precision Engineering manufacturing locations

Die Design

Norgren Automation Solutions is a world leader in providing GREAT solutions with die design. Our team of die engineers are experts at optimizing tandem, cross bar and tri-axis die designs and reducing the number of dies needed by customers. Our advanced 2D and 3D processing keeps die commissioning lean by trimming time needed from days to hours and eliminating last minute machining during time sensitive home line tryouts.



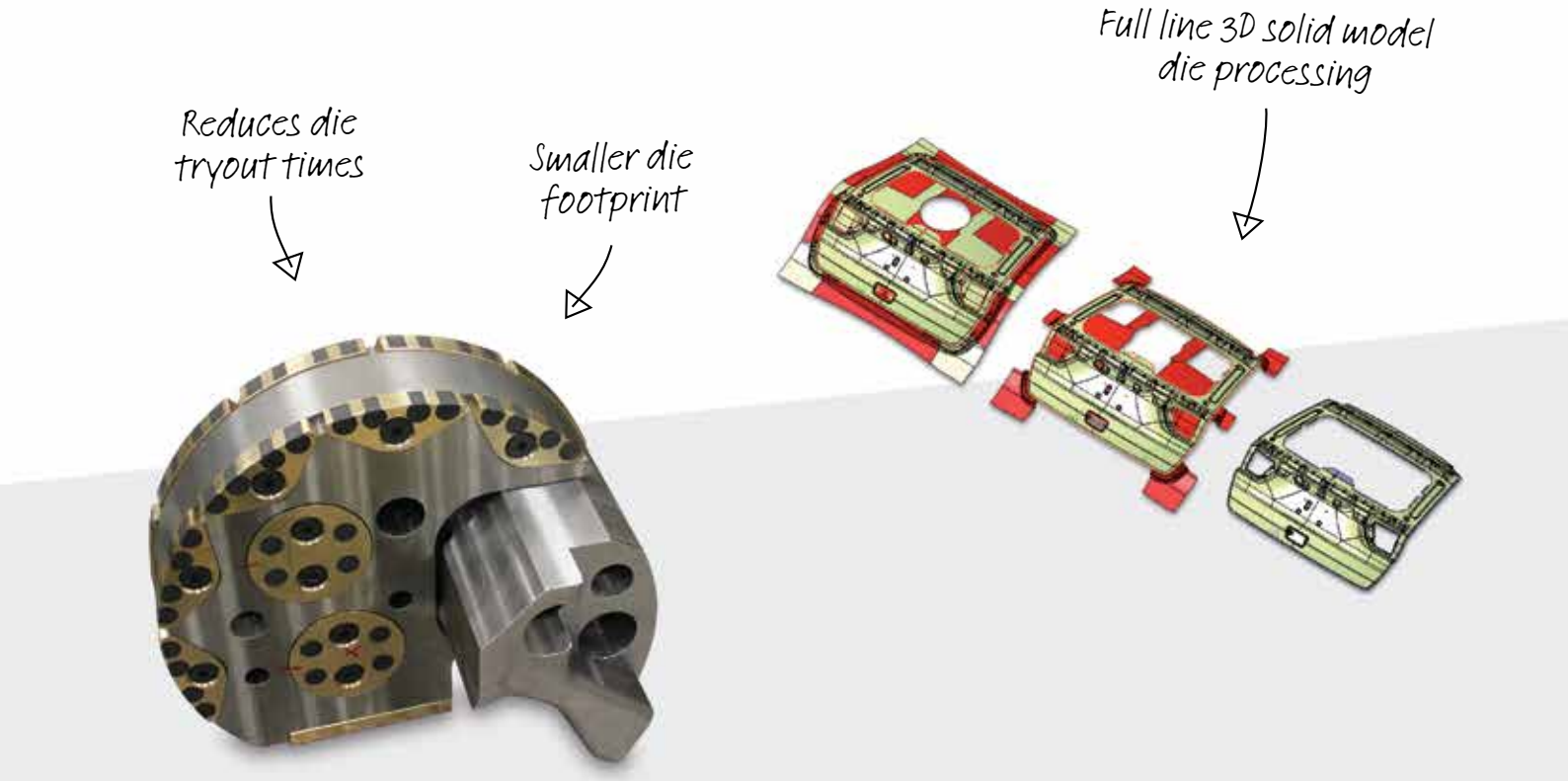
Radial Cam

The Radial Cam from Norgren Automation Solutions provides a new direction in metal forming.

- Contacts class-A surfaces completely at initial contact
- Improves panel quality, less scrap in production
- Adjust timing easily in the tryout press
- No machining required for timing adjustments
- Less maintenance in production
- Makes a longer flange at notch
- Built in CAD model

Die Processing

- 2D powerpoint processing
- 3D solid model processing
- Experienced in difficult panels
- Minimize number of operations
- Ability to colaborate with automation to ensure panel transfer



Tri-Axis Tooling

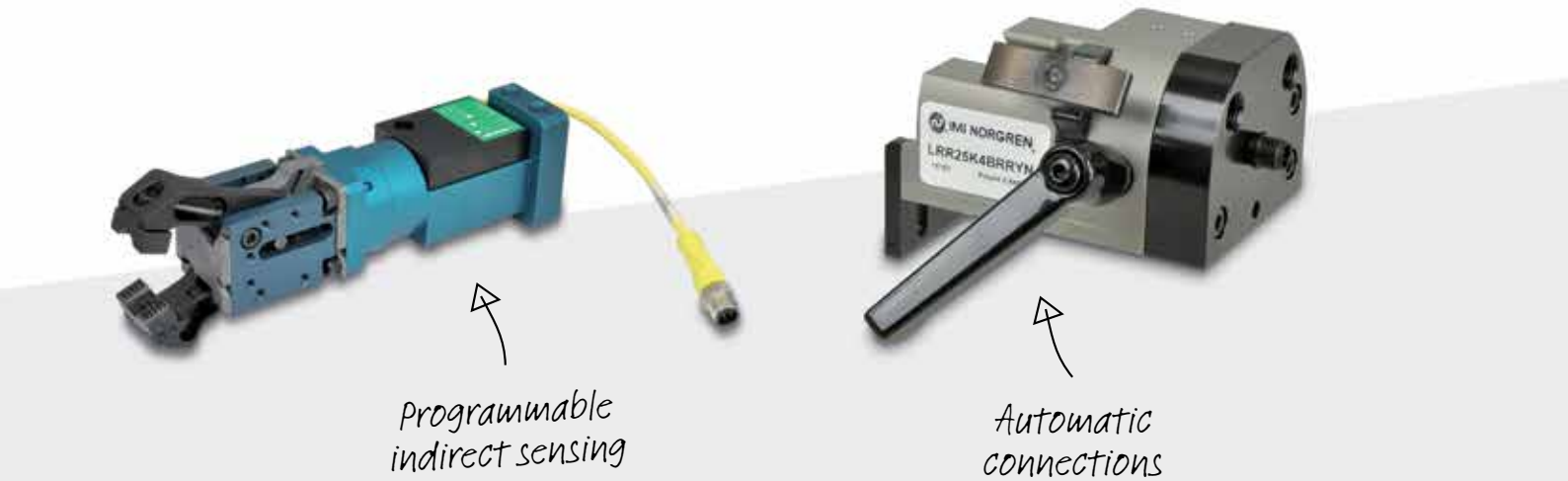
Our tri-axis tooling systems are engineered to provide precise and consistent part transfer using easy to maintain, modular components. Dial-a-Lok offers flexibility with rigidity in a locking tooling system. Fingers can be adjusted or built without special fixtures or skill due to its unique numbered component joints. Our time proven Versa system combines infinite adjustability and high strength. NAS Simplified tooling features right angle construction for simple adjustment.

Hot Metal Gripper

- Survivability in 1652oF (900ºC) temperatures providing customers a 25% increase in throughput over comparable grippers
- Rear-mounted pneumatics that get the fittings and air lines away from the heat source to resist air line splitting thus eliminating unplanned downtime and maintenance
- Specially tempered gripper pads that extend the service life by up to 3x that of standard pads available on comparable grippers

Rail Receiver

- Quick-change tooling mount bolts to transfer feedbar as docking device for transfer fingers
- All electrical and pneumatic connections are made automatically
- Steel locating pins on receiver adapter slide into sleeved holes on receiver face for superior rotational stability
- Finger held in receiver by simple one touch spring loaded latch. No locking handle required.



Double Blank Analyzer Sensor

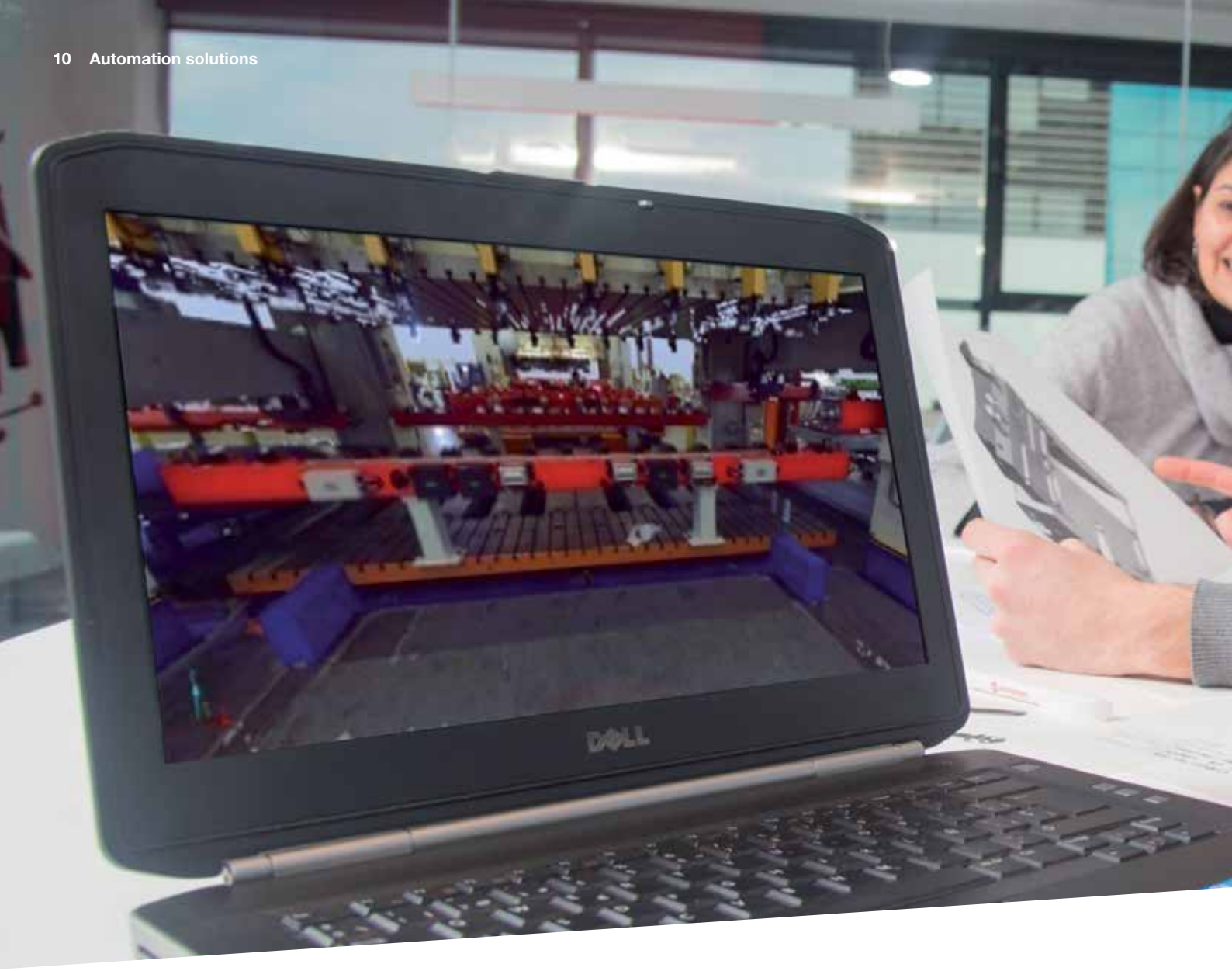
Our double blank detection sensors prevent damage to dies and presses by detecting multiple blanks during the load sequence. Contact style sensors detect multiple blanks in the destacker, allowing early rejection and removal. Pass-Thru sensors monitor sheet thickness in the magbelt, roller feed or centering station for additional protection throughout the feed process. Quality control checks can also be performed in-process to verify multiple components during assembly.

Inductive nut/thread detection sensors

NAS nut and thread detectors use patented proximity detection technology to sense the presence of welded nuts in sheet metal parts. Our unique radial detection sensing verifies that the nut totally surrounds the probe and is properly positioned. The system can also be tuned to verify thread presence and quality in tapped holes. Our all stainless steel probe resists weld splatter and its sensing circuitry is immune to weld field interference. This allows the sensor to be used very close to welding operations to detect incorrectly built parts early in the assembly process. NAS offers a complete line of sensor spring mounts, output monitors and cable accessories.

For automotive stamping applications

Robust Design



Application design Design - Build - Integrate - Support

Efficient and productive press operation begins with the seamless integration of part motion, die structure and finger tooling. To produce world-class panels and optimize productivity, the stamper, die source and tooling designer must work together from the earliest stages of part development. We offer a multi-step process that coordinates process, die and finger designs to produce tooling that consistently runs at rate within hours of installation and start-up.

Scanning

Press scanning gives NAS designers a true to life analysis of rail and bolster positions prior to tooling design. The press is scanned with a 3D laser to create a life-like model that can be used to detect any inconsistencies in standard documented press dimensions. Press scanning also aids in the diagnosis of set-up problems when the same Job is run over multiple press lines.

Press simulation

Press simulation replicates the motion of transfer tooling through a press line using CAD animation. This software allows designers to detect any clearance issues or flow interference to avoid crashes and insure the tooling performs to design specifications.

Finger integration package

NAS' finger integration package identifies interference areas and part flow issues at the start of die design. NAS is provided with process flow, panel position, rail position and press / transfer specifications. We then add tooling and motion curves to create a design envelope for the die source. NAS also verifies that the selected motion curves fall within press parameters and stamper specifications. The stamper signs off on the finished package before allowing die design to proceed.

IMI Precision Engineering operates four global centres of technical excellence and a sales and service network in 75 countries, as well as manufacturing capability in the USA, Germany, China, UK, Switzerland, Czech Republic, Mexico and Brazil.

For information on all IMI Precision Engineering companies visit **www.imi-precision.com**

Supported by distributors worldwide

Norgren, Buschjost, FAS, Herion and Maxseal are registered trademarks ©Norgren Limited 2015. Due to our policy of continuous development, IMI Precision Engineering reserve the right to change specifications without prior notice.

z7896BR en/05/15

IMI **Precision** Engineering

For further information, scan this QR code or visit **www.imi-precision.com**