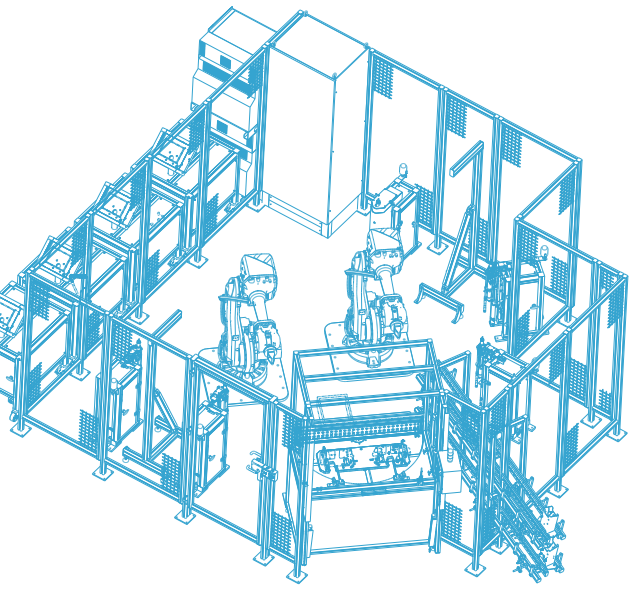
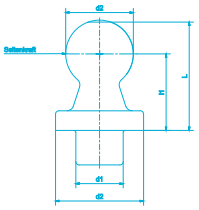
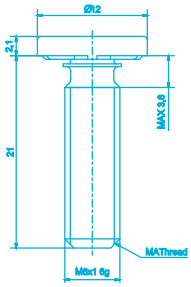
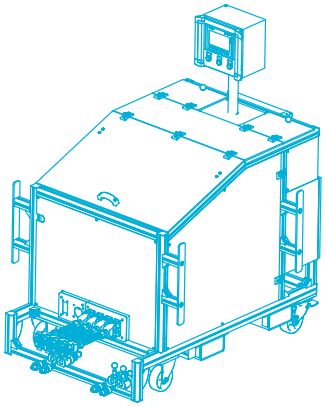
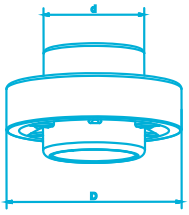
MDS | AUTORIV®
Fasteners + Assembly Systems

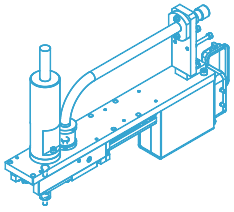












Fasteners ⊕ Assembly Systems ⊖ AUTORIV

MDS | AUTORIV®
Fasteners + Assembly Systems

AUTORIV: A brand of the MDS Fastening Systems

For over 45 years, MDS has developed and manufactured turnkey automated solutions for the automotive, heavy truck and white-goods industries. MDS systems represent Quality, Cost Effectiveness, Precision and Reliability under the brand **AUTORIV**.

AUTORIV works with the basic principle that only the right combination of fastener and automated system will deliverperfect results.

AUTORIV offers a complete solution from application concept, fastener selection/supply (including prototype), design & development, integration, production start-up and support.

"We see our customers as partners, who we support through our innovative solutions".

Dieter Schmidt, Managing Director

MDS quality management is certified according to DIN ISO 9001 and VDA 6.4: 2005

AUTORIV: Advantages of a Comprehensive Solution

What makes AUTORIV unique is our expertise in the areas of fastening & feeding technology, automated assembly solutions, transfer and progressive dies - with a focus on the area of automated joining technology.

The ability to combine these capabilities enables AUTORIV to consider every aspect of your application - from concept through production.
As a result of this streamlined process, we are able to deliver the best solution quickly and efficiently.

Fasteners	+ Assembly Systems	= AUTORIV
Extensive range of fasteners & small parts	Automated solutions for fasteners with various joining processes	Proven solutions for serial production
New development & consulting	Automation modules	One point of contact
Standard and specialty fasteners	Transfer and progressive dies	Maximum Reliability
100 % quality tested	Custom & Standard	High cost savings
	Automation	

AUTORIV: The Fastener Plays a Critical Role in Your Solution

If a fastener is chosen based solely on the required performance, it may not be suitable for an automated system.
A small modification of a fastener may lead to increased system reliability and faster assembly speeds resulting insignificant cost-savings.

Our unique expertise in all of the above areas and how they relate to one another enables us to select or modify the fastener for the most effective processing.

MDS | AUTORIV®
Fasteners + Assembly Systems

AUTORIV: The Complete Range of Services

Cost Saving Evaluation via Product teardowns

Product teardowns are an excellent way to increase your efficiencies. Working with your application, our engineers can often find ways to consolidate the total number of fasteners you need, in addition to recommending more effective fastening and automated assembly solutions. Product teardowns can save thousands in costs, along with providing increased end-product reliability.

Analysis of Assembly Processes

In cooperation with your manufacturing team, we analyze the fasteners in combination with the assembly process. We can offer potential opportunities to reduce overall manufacturing cost. Furthermore, we look to identify potential quality improvements through appropriate process controls. We present these results in the form of a cost saving evaluation.

Design & Development Support

We use a variety of methods to evaluate the many different aspects of an application. Simultaneous engineering, application analysis and hands-on testing are all used to examine material, assembly requirements and proper attachment design. We can then work with you to help ensure maximum performance from every fastener you require. For the best results, we recommend that you utilize an AUTORIV specialist in the initial phase of your product design.

Comprehensive Examination of Your Application

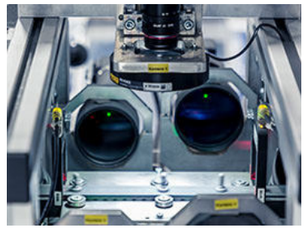
With our unique capabilities we are not just looking at the best fastening solution and method, but also on the most efficient way for the fastening assembly. We understand that the fastener price is a small part of the total in place cost of the fastener and the majority of the cost is in the assembly of the fastener. Our expertise combines every aspect of your production needs. As we are not only a fastening company we offer a comprehensive approach ensuring minimized production costs by increasing product quality, thus helping you compete and win in a global market.

Application Test

AUTORIV's test labs have the ability to set fasteners in your application in a way that simulates your production environment. We perform push out and torque out tests for every application before we specify a fastening system. At the end of our application testing, we will issue a report that gives you our recommended fastening system and the performance numbers that we can guarantee. This will allow you to confidently propose cost savingideas to your customers.

100% Sorting

Our fasteners are 100% vision inspected before they are packaged. These inspections ensure that the fasteners are dimensionally stable and will function well in our equipment.
Saving money by eliminating inspection will result in spending more money due to decreased reliability in production. This is the main reason why we prefer to offer both fasteners and automation as a complete system.

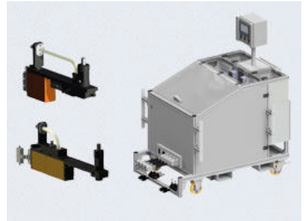


Extensive Portfolio of Fasteners

We have established a unique network of fastener manufacturers around the globe that manufacture quality fasteners to our design specifications. If you have a preferred fastener source, we are willing to work with them on every aspect that is needed to get a reliable fastener for your application. You also have the option of whether you want us to supply the fastener directly to you, or work with our certified local fastener source. In either case we will be your first point of contact, if you need assistance. When we work with acertified fastener source delivery, and quality of the fastener will be their responsibility.

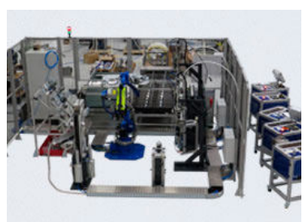
Automation Modules

We will work directly with your integrator or die shop and supply them with all necessary automation modules tailored to the specific application and fastener. We will supply 3D models, prints and any other information they need to successfully integrate our modules into their systems.



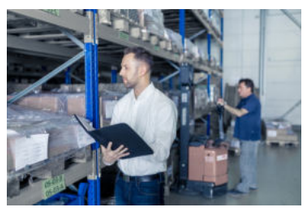
Turnkey Systems

We can supply turn-key automation solutions consisting of automated hand tools, semiautomated work stations, dies with integrated automated assemblies, transfer-lines and rotary table automation as well as full robotic cells.



VMI (Vendor Managed Inventory)

We offer a very comprehensive VMI program for special customer products. For example, we not only deliver the required fastener for the manufacturing of hinges, but also offer comprehensive supplemental development support (appropriate automation design of fasteners, the joining method, the automation method, and the automation concept) and even the complete delivery of the automation system. As a result, we are a single-source partner for all areas of production.



MDS | AUTORIV®
Fasteners + Assembly Systems

AUTORIV: More Than Just a System Solution

	System Supplier	Tools & Die Shop	Custom Machine Builder	AUTORIV
Fasteners	✓			✓
Automation modules	✓			✓
Transfer and progressive dies		✓		✓
Custom automation			✓	✓

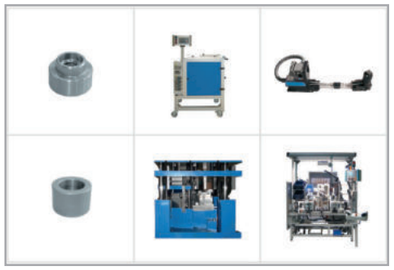
A cost effective application can only be achieved, when combining every aspect of your production needs.
The AUTORIV concept goes beyond a regular system solution consisting of fasteners and automation modules. In addition, we can offer transfer & progressive dies and custom automation eliminating multi-vendor issues.

AUTORIV can be a "One-Stop" for your fastener application requirements.

More Than Just a System Solution

Development, production and delivery of:

- Fasteners (nuts and spacer)
- Feeders
- Setting heads
- Automated transfer-die modules for nut & spacer assemblies
- Turn-key final assembly equipment with complete process control for the I-panel carrier (Multiple systems within North America, Europe & Asia)



AUTORIV: More Than Just One Single Fastening Method

	Supplier A	System Supplier B	System Supplier C	AUTORIV
Orbital riveting	✓			✓
Screwing		✓		✓
Blind riveting				✓
Clinching			✓	✓
Riveting, flanging, clip-on, heat staking				✓

Complex products generally require more than one fastening method such as orbital riveting, screwing, blind riveting, clinching etc.

AUTORIV is your optimal partner for implementing more than one fastening process in one application.

An AUTORIV solution offers a turn-key system from one source. Due to our vertical integration, you get the best solution with an outstanding cost-to-benefit ratio.

More Than Just One Single Fastening Method

Magnesium trunk door: Fully automated turn-key robotic cell containing the following fastening methods:

- Automated magazine feeding of 6 sheet-metal parts
- Automated setting of 6 high-strength blind rivets with AUTORIV setting heads and feeders
- Automated spin-pull riveting of 18 blind rivet nuts (M5, M6, M8) with AUTORIV setting heads and feeders
- Automated setting and spin-pull riveting of 4 rivet/groundingbolts with AUTORIV setting heads and feeders
- Automated feeding and screwing of 4 special nuts ontogrounding bolts with AUTORIV nut runners
- Product testing and quality control
- RAUTORIV Viso software for product tracking & traceability

AUTORIV: More Than Just Standard Solutions

	Fastener Manufacturer A	Fastener Manufacturer B	System Supplier	AUTORIV
Custom automation				✓
Special fasteners	✓			✓
Standard automation			✓	✓
Standard fasteners	✓	✓	✓	✓

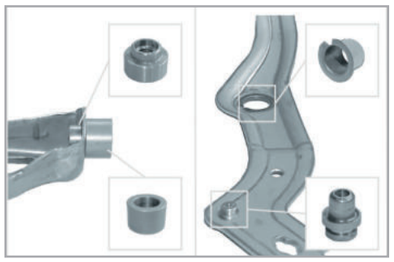
AUTORIV offers more than just system solutions for standard fasteners and standard automation. With our expertise and development capacity, we manufacture customized special fasteners and custom automation for any fastener application.

Over the past few decades, AUTORIV's modular systems have been successfully proven to work within a high volume production environment. Applying our system to your application will result in shortened lead times while maintaining high reliability at a competitive price.

More Than Just Standard Solutions

Special Fasteners and Custom Automation:

- Automated assembly of spacer and rivet nut in a transfer die. The assembly of the fasteners happens in only one die station which is 90° degrees to the punch direction. This is performed in a very small work envelope.
- Automated assembly of a special rivet designed by AUTORIV and a glide bushing (wall thickness of 0.5 mm) by flanging with calibration of the internal diameter in a progressive die.



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Fasteners + Assembly Systems

AUTORIV: Overview of Fasteners

CP

Clinching, Self-Piercing and Riveting Fasteners

- Self-pierce studs
- Clinch studs
- Ball studs (S)
- Guide pins (S)
- Orbital rivets (S)
- Self-pierce nuts (N)
- Rivet nuts (N)
- Specials (SP)

BI

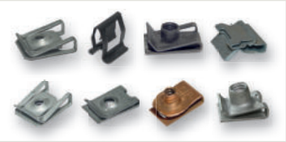
Blind Rivet Fasteners

- Blind rivet studs (S)
- Blind rivet nuts (R)
- Breaksteam rivets (N)
- Specials (SP)

CU

Clips

- U-Nuts (N)
- Mid panel nuts (N)
- Plastic clips (SP)
- Speed nuts (SP)



GB

Bearings/Bushings

- Teflon glide bushings
- DU bushings
- Plastic glide bushings
- Steel bushings

SN

Screws/Nuts

- Screws (S)
- Nuts (N)
- Specials (SP)

TI

Threaded Inserts

Internally threaded (N)
- Hot stake
- Press fit
- Self tapping

Externally threaded (S)
- Hot stake
- Press fit
- Self tapping

WP

Weld Fasteners

- Weld studs (S)
- Ball studs (S)
- Guide pins (S)
- Weld nuts (N)
- Specials (SP)

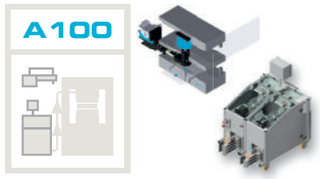
SP

Special Parts (Made of)

- Plastic
- Aluminium
- Stainless steel
- Steel
- Other materials

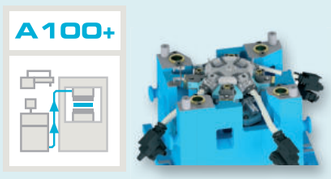
AUTORIV: Overview of Automation Concepts

A100



Automated system for in-die use comprising of feeder and setting heads. The system is suitable for prog- and transfer dies.

A100+



Die stations with integrated fully automated fastener assembly for difficult applications, e.g. insertion under an angle or flanges with cams.

A210

Hand tools with automated feeding of fasteners or small parts.

A220

Stationary workstations with manual or automated feeding of small parts or fasteners. The machine operator handles the component.

A230

Robot mounted tools with automated feeding of fasteners or small parts.

A240

Stationary robotic workstations with automated feeding of small parts or fasteners. The robot handles the part.

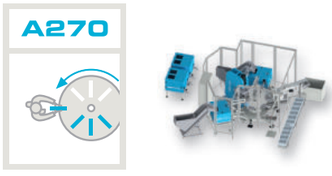
A250

Stationary systems with automated feeding for simultaneous setting of multiple fasteners. The handling of the component is performed by the machine operator or a robot.

A260

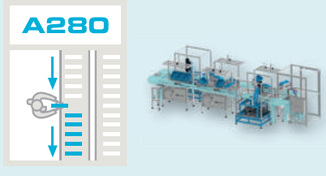
Stationary CNC systems with automated feeding of components.

A270



Rotary table systems with standardized automation modules and various assembly methods such as screwing, clinching, orbital riveting, blind riveting etc.

A280



Transfer systems with standardized automation modules and various assembly methods such as screwing, clinching, orbital riveting, blind riveting etc.

A290

Robotic systems with standardized automation modules and various assembly methods such as screwing, clinching, orbital riveting, blind riveting etc.

A300

Automation modules for the integration in robot, transfer or rotary table systems, e.g. hoppers, step feeders, bowl feeders, C-frame presses, setting heads etc.

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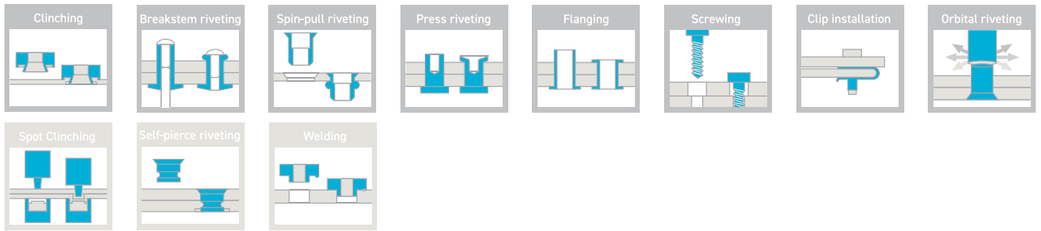
AUTORIV: Standard Fastener Automation

A100	Fully Automated Assembly of Fasteners In-Die	for progressive dies for transfer dies
A100 +	Fully Automated Die Stations	for difficult setting conditions under an angle to punch direction for constricted space, setting in flanges
A210	Mobile Hand Tools	for parts that are hard to handle manually for large and heavy parts
A220	Stationary Workstations	for parts that are easy to handle manually for small and light parts
A230	Mobile Robotic Tools	for large or very heavy parts for joints with more than two components
A240	Stationary Robotic Work-stations	for 2-component joints for parts that are suitable for robot handling
A250	Stationary Multi-Setting Systems	for short cycle times for precise joining processes, when no toleranz compensation is possible
A260	Stationary CNC Systems (X, Y, Z)	for applications with high flexibility for applications in small batch sizes
A270	Rotary Table Systems	for complex assembly processes with different contents and joining methods
A280	Transfer Systems	for complex assembly processes with different contents and joining methods
A290	Robotic Systems	for complex assembly processes with different contents and joining methods
A300	Automation Modules without Control	for custom machine builders for integrators

AUTORIV: Overview of Joining Processes

Main Process Sub-Process



AUTORIV: Automation and Fastener Combination

	Clinching, Self-Piercing and Riveting Fasteners	Blind Fasteners	Clips	Bearings/Bushings	Screws/Nuts	Threaded Inserts	Weld Fasteners	Special Parts
	CP	BI	CU	GB	SN	TI	WP	SP
Elimination of secondary operations Considerable cost savings	+	+	+	+			+	+
Simplification of project handling Clear definition of responsibilities for the fastener assembly	+	+	+	+			+	+
Shorter cycle times through automated feeding Flexible use for multiple applications		+	+		+			+
Shorter cycle times through automated feeding Flexible use for multiple applications	+	+	+	+	+	+	+	+
Short cycle times with the use of feeding fasteners from magazines or continuous feeding system	+	+	+	+	+	+	+	+
Short cycle times and high level of reliability Consistent enviroment for feeding fasteners	+	+	+	+	+	+	+	+
High output for applications with very large annual volumes	+	+	+	+	+	+	+	+
Assemby of various fasteners and components without tool change	+	+	+	+	+	+	+	+
Customized rotary tables	+	+	+	+	+	+	+	+
Customized transfer lines	+	+	+	+	+	+	+	+
Customized robotic assembly systems	+	+	+	+	+	+	+	+
Standardized modules for integration in rotary table and robotic cells	+	+	+	+	+	+	+	+

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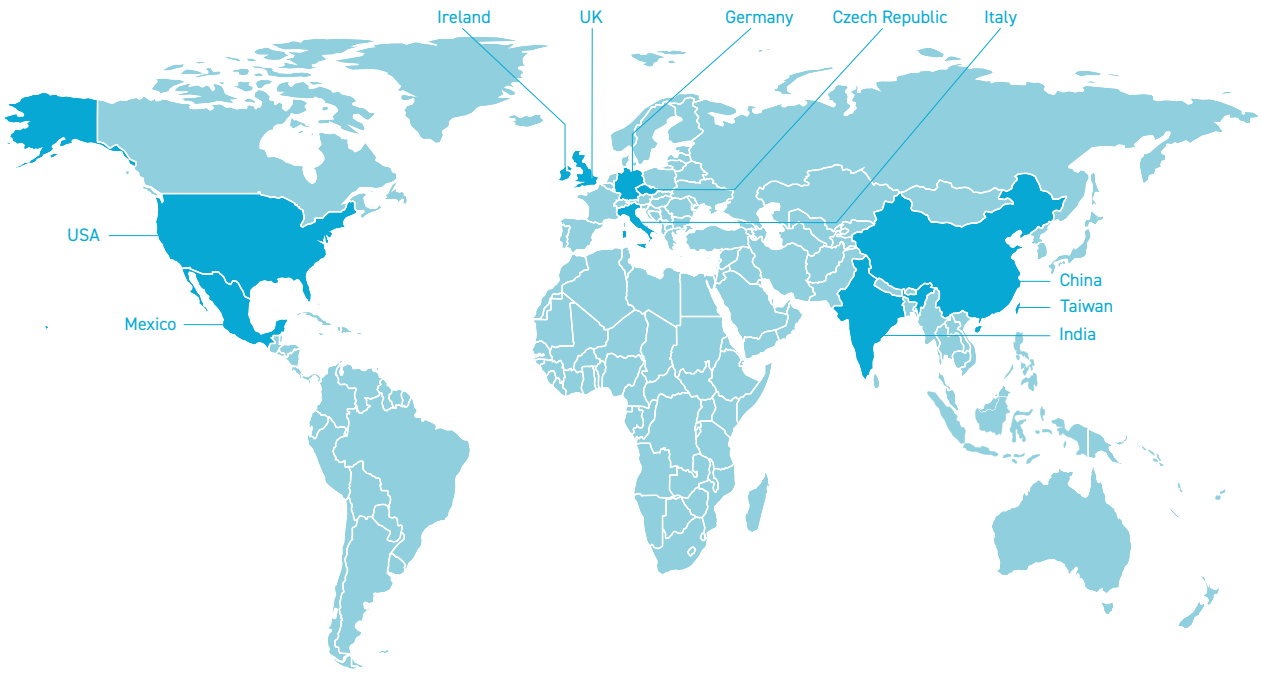
Fasteners + Assembly Systems

Automated Fastener and Assembly Systems (A-FAS Group)

MDS is a shareholder of the A-FAS Group, which includes a total of nine companies throughout Europe, Asia, and North America. Legally and economically independent, each of these companies has a very specialized skillset. The Board of Directors of the A-FAS combines these synergetic specializations and creates a uniform strategy. The result is a globally unique product portfolio with significant customer benefits. Complete systems, consisting of automation and fasteners are offered from one source on a global scale.



AUTORIV: A brand of the MDS

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