ARS AUTOMATION Application Notes



Assembly Island for Seat Belt Locking Devices – Automotive Sector

Industry Insights

In the automotive sector, **automation** is no longer just a lever of efficiency—it is **essential** to ensure quality, high production volumes, and competitiveness. When it comes to assembling safety devices, each component must be handled with the utmost precision to ensure reliable and consistent performance over time.

This project, developed by **SAMAC** for a major player in the sector, was born from the need to assemble a pin into a metal latch component, offered in two mirror-image versions: right and left. The main challenge lay in **achieving an extremely competitive cycle time** of 0.9 seconds per piece, corresponding to a total productivity of 4,000 pieces/hour.

The project became even more complex due to the customer's request to automatically manage the transition between the two models, **minimizing downtime and retooling activities**. This required the development of a compact, flexible, high-throughput line capable of combining speed, precision, and continuous operation, even with product variability.

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Handled Parts

The components managed by this application are **latch components**, metal elements intended for seat belt locking systems, available in two mirror-image versions: right and left. Although similar in shape, the two variants require dedicated handling strategies, particularly during feeding and orientation.

The metallic nature and geometry of the parts require careful handling to prevent overlaps and damage, while also ensuring compliance with extremely short cycle times. The parts must always be presented to the robot in the correct orientation and in stable conditions to allow for smooth, continuous pick-up without slowdowns or rejects.



The Configuration

The real key to success for this automated island is the **flexible feeding system**, designed to ensure reliability, constant throughput, and total absence of mechanical setup, even when handling two different component models.

The system consists of:

- A central bulk feeder
- Two **FlexiBowl® 500** units, one for each channel, used for part separation, orientation, and distribution





FlexiBowl® 500 Traditional Operating Mode **FlexiBowl®** plays a fundamental role in the process: it separates parts evenly, prevents overlaps, and ensures continuous availability for pick-up. An **Epson robot**, guided by a vision system, is responsible for recognizing and picking the part, maintaining the position and orientation references needed for correct pin insertion.

The configuration is completed by:

- A rotary table where pressing and unloading operations take place
- Devices for the selective discharge of good and rejected parts
- An automatic pallet cleaning station

Precision and Efficiency

The system guarantees a feeding rate of 1.5 seconds per channel, perfectly in line with the assembly cycle time. Transitioning from one model to the other does not require any machine downtime.

The use of FlexiBowl® brought several benefits:

- Handling of multiple models with a single system
- Elimination of mechanical retooling
- Compact and tidy layout

Results

The project was successfully completed, validated, and tested. The assembly island is now in production at the customer's facility, ensuring continuity, precision, and full compliance with time and quality specifications. In addition to full **customer satisfaction**, the project contributed to enriching internal know-how, generating expertise ready to be applied to similar future projects.

Key points



Automotive Industry



Assembly Process



FlexiBowl® 500



EPSON Robot



High cycle time