

Case Study

Baumer Boosts Speed, Reliability, and Accuracy of Quality Assurance for Tier Automotive Supplier

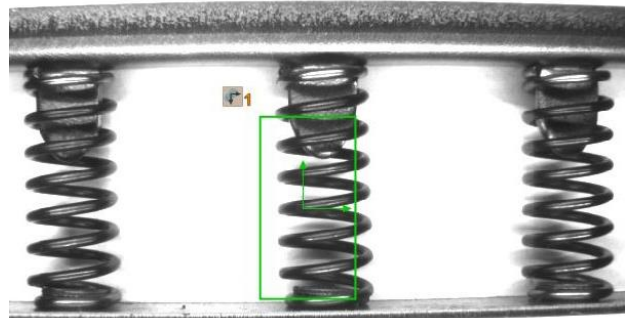
Baumer's hardware, software, and vision design expertise helps Tier shift from unreliable manual inspections of its clutch return spring packs to a fast, automated solution delivering 99.5% accuracy.

Product recalls have cost the automotive industry as much as \$22 billion in claims and warranty accruals during a single year, prompting many Tier suppliers to replace their manual quality assurance inspections with more consistent, thorough, and accurate machine vision solutions. Baumer's Vision Design Center helped one Tier 2 automotive supplier make its transition simple and effective with a machine vision system that performed seven inspection functions with a single algorithm.

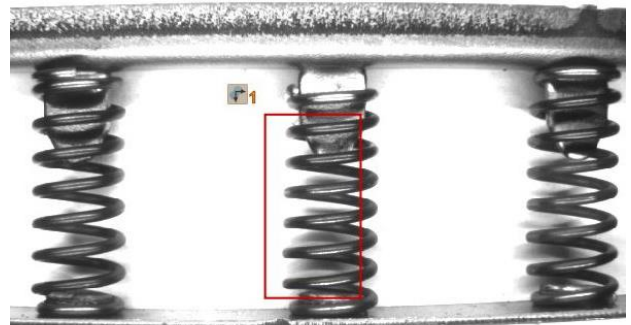
The customer, a leading industry supplier of clutch return spring packs, had previously relied on manual inspection to confirm that the multiple coils in its clutch return spring packs were properly shaped and seated and free from defects. This approach, however, produced unreliable results with expensive and dangerous consequences. A single flawed spring in these assemblies can adversely affect the quality of the full pack and, ultimately, the performance of an automotive clutch plate.

One Algorithm to Inspect Seven Features

The automotive supplier developed the inspection station but sought Baumer's expertise to incorporate the vision component. Its system requires an operator to load the spring packs and activate the inspection process, which rotates the assembly so a fixed camera can capture images of each spring. The Baumer Design Team backlit the assembly with an inexpensive diffuse LED lighting strip and selected a [VeriSens VGA camera](#) to optimize system speed and throughput.



Good Spring



Bad Spring

With the addition of a single, elegant algorithm, Baumer's versatile vision software completed seven inspection functions in a single stroke, helping one Tier 2 automotive supplier to automatically validate assembly of its clutch return spring packs with 99.5% accuracy.

Maintaining high throughput was a key challenge for the image analysis process. Specifically, the system needed to complete seven functions for each spring pack, including inspections for:

- 1) Missing springs
- 2) Springs unseated on the tab end
- 3) Springs unseated on the extrusion end
- 4) Improper seating on the tab or extrusion end
- 5) Incomplete seating on the tab or extrusion end
- 6) Double stamping
- 7) Correct assembly height

The inspection station needed only distinguish good assemblies from bad. So, using Baumer's free, [award-winning vision software](#), the Design Team was able to script a single, elegant algorithm that could quickly flag assemblies with any one of these seven possible flaws.

They built the algorithm on a product variant model based on the exact periodicity and contours of a correctly seated spring. The Baumer team then developed a software routine that compared assemblies against that model. If a camera image failed to show a statistical match with this one critical feature, then the inspection station would signify the assembly needed rework.

As a result of Baumer's hardware, software and vision expertise, the Tier 2 manufacturer was able to significantly improve the throughput of its inspection process and ensure 99.5% accuracy. The success of Baumer's Vision Design team on this project has led the manufacturer to further discuss how vision technology can improve the speed and accuracy of spring sortation.

Baumer Group

The Baumer Group is one of the worldwide leading manufacturers of sensors, encoders, measuring instruments and components for automated image processing. Baumer combines innovative technologies and customer-oriented service into intelligent solutions for factory and process automation and offers an unrivalled wide technology and product portfolio. With around 2,700 employees and 39 subsidiaries in 19 countries, the family-owned group of companies is always close to the customer. Baumer provides clients in most diverse industries with vital benefits and measurable added value by worldwide consistent high quality standards and outstanding innovative potential. Learn more at www.baumer.com on the internet.

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