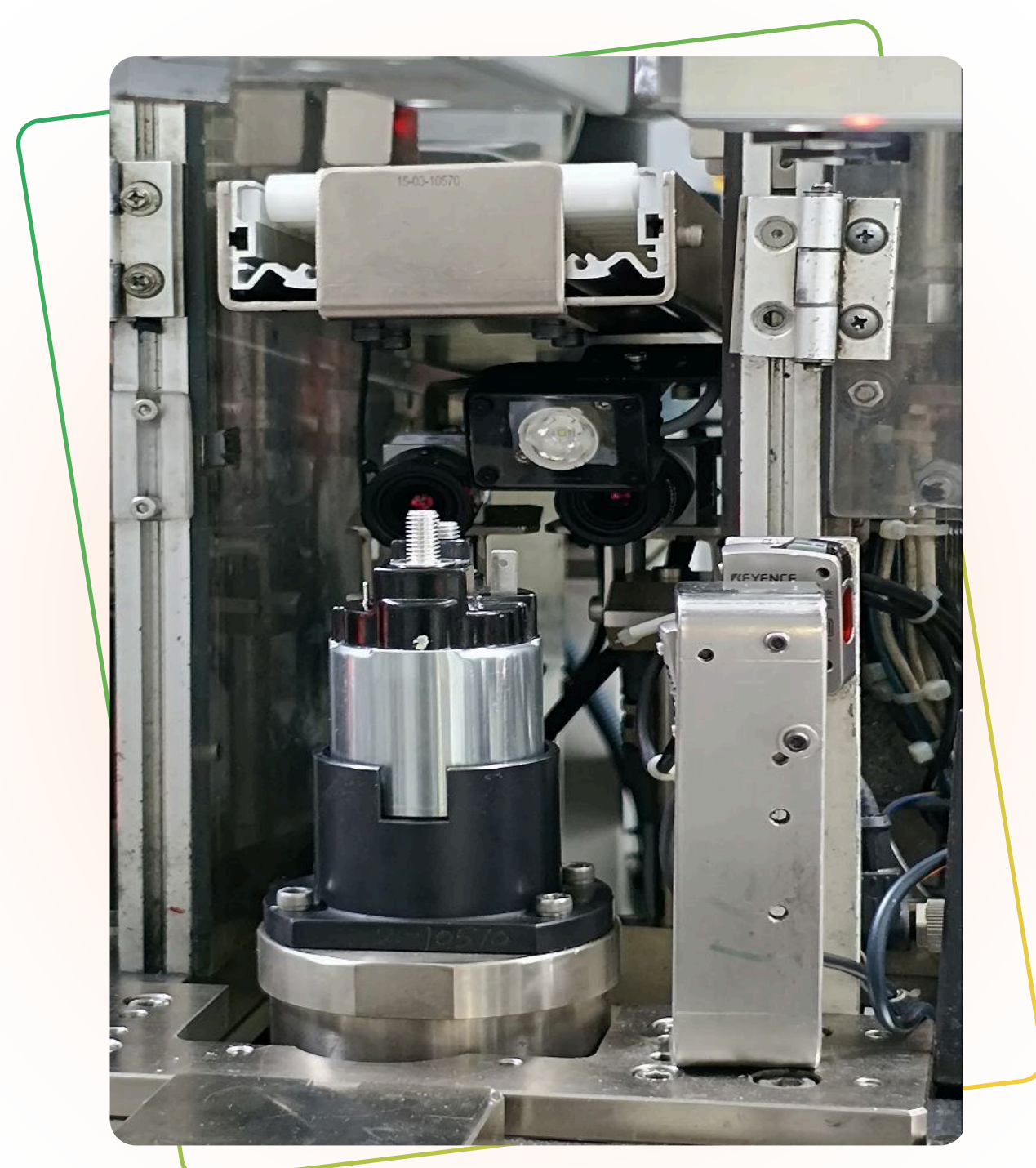# switchon

AI-Powered Defect Detection for
STARTER SWITCHES

Industry : **AUTOMOTIVE**

Client : **DENSO CORPORATION**

Summary: Denso Corporation, headquartered in Kariya, Japan, is a leading global supplier of automotive components with a strong presence in Asia, North America, and Europe. They develop technologies for hybrid and electric vehicles, autonomous driving, and connected cars. To detect defects in starter switches' caulking, Denso used the **SwitchOn DeepInspect system**. This automated system identified defects as small as 100-150 microns in under 11 seconds per part, improved defect detection, maintained quality, reduced labor costs, and increased efficiency.

CASE STUDY

Challenges

Denso Corporation, required a solution to identify defects in their starter switches.

Caulking Technique

The specific area of concern was the **caulking**- a process where the metal parts get blended into the starter switches.

Potential Defects

The process could lead to defects such as cracks at the edges and knots (corners) of the switches.

Impact on Integrity & Performance

These defects could compromise the integrity and performance of the starters and lead to product recalls and customer complaints.

System 1: For Edge Crack Detection

The primary challenge was identifying and disregarding acceptable (good) scratches, which we successfully overcame with our proficiency.

System 2: For Knotch Folding Detection

The main challenge was the lack of contrast, which we successfully overcame with our expertise.

Solution

To address these challenges, Denso used the SwitchOn DeepInspect system. DeepInpect was integrated to the existing system using a PLC to communicate with the robot for picking and placing parts, as well as controlling a rotating motor. There were two subsystems integrated to identify defects in the edges and corners of the Starter Switch:

The Setup

The setup consists of the listed items with DeepInspect software at the heart.

- Camera: Basler acA2440-35uc Camera
- Industrial Lighting: TMS Lights
- Robo Assisted Pick and Drop
- PLC Integration

Impact

Following the implementation our customer experienced significant improvements in their operations

01

Utilizing DeepInspect's advanced vision technology, defects as small as 100-150 microns were able to detect.

02

The entire inspection process was automated with a robotic arm removing the rejected parts, reducing 2 dedicated manpower.

03

Inspection completed in less than 11 seconds per part, ensuring high efficiency.

04

DeepInspect was able to identify the defects caused by the wear and tear of caulking tools. This enabled Denso to address the issue promptly and reduce defects.

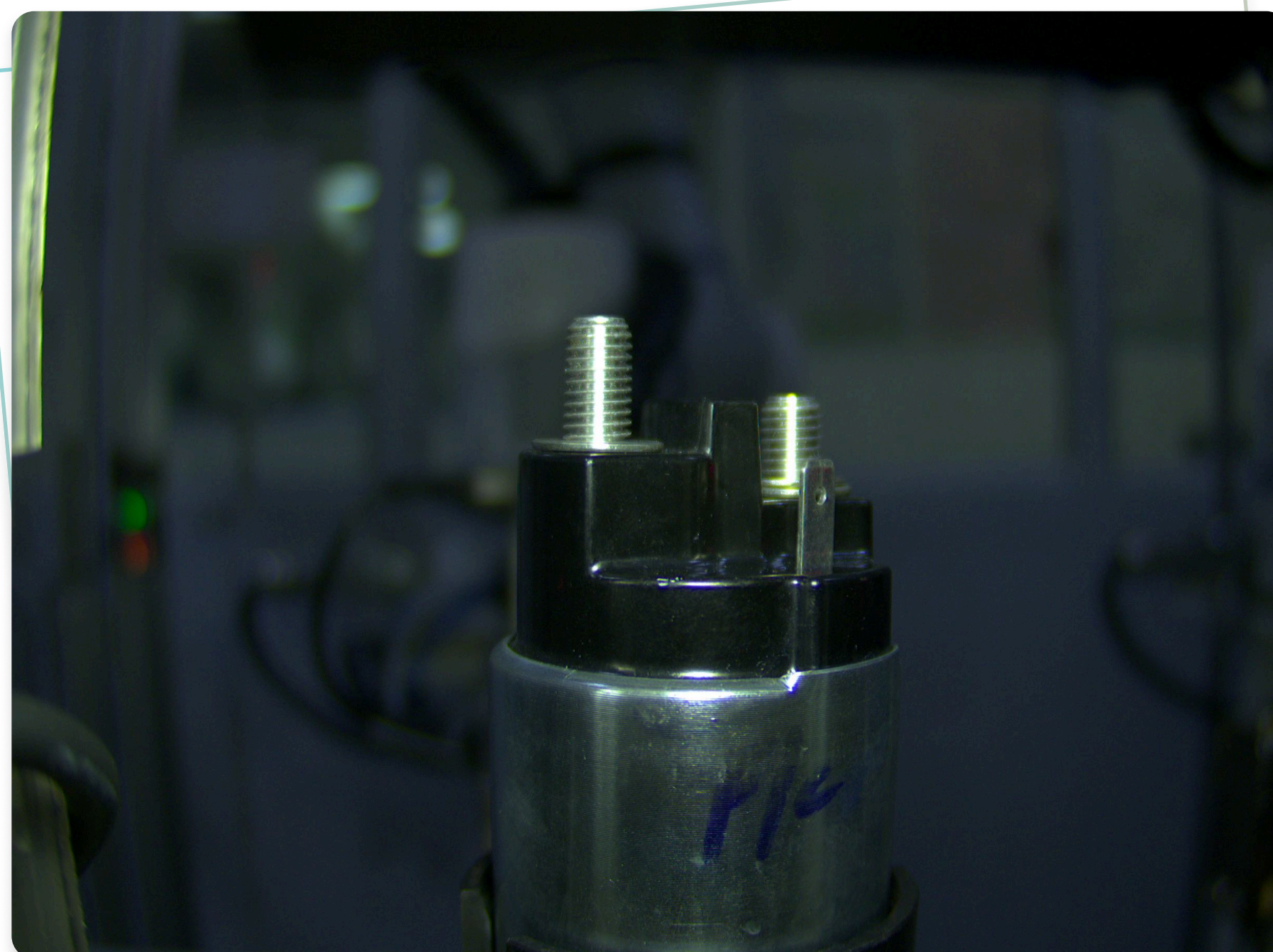**05**

DeepInspect was able to seamlessly inspect two variants of starters, one with 4 knotches and the other with 6 knotches.

06

The system ensured that the starter switches met the required quality standards by detecting and rejecting defective parts.

Conclusion

The implementation of SwitchOn's DeepInspect system at Denso significantly improved the defect detection process for starter switches. By automating the inspection process and utilizing advanced vision technology, Denso was able to maintain high-quality standards, reduce manpower costs, and increase production efficiency. This case study highlights the effectiveness of integrating automated defect detection systems in the automotive manufacturing process.

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