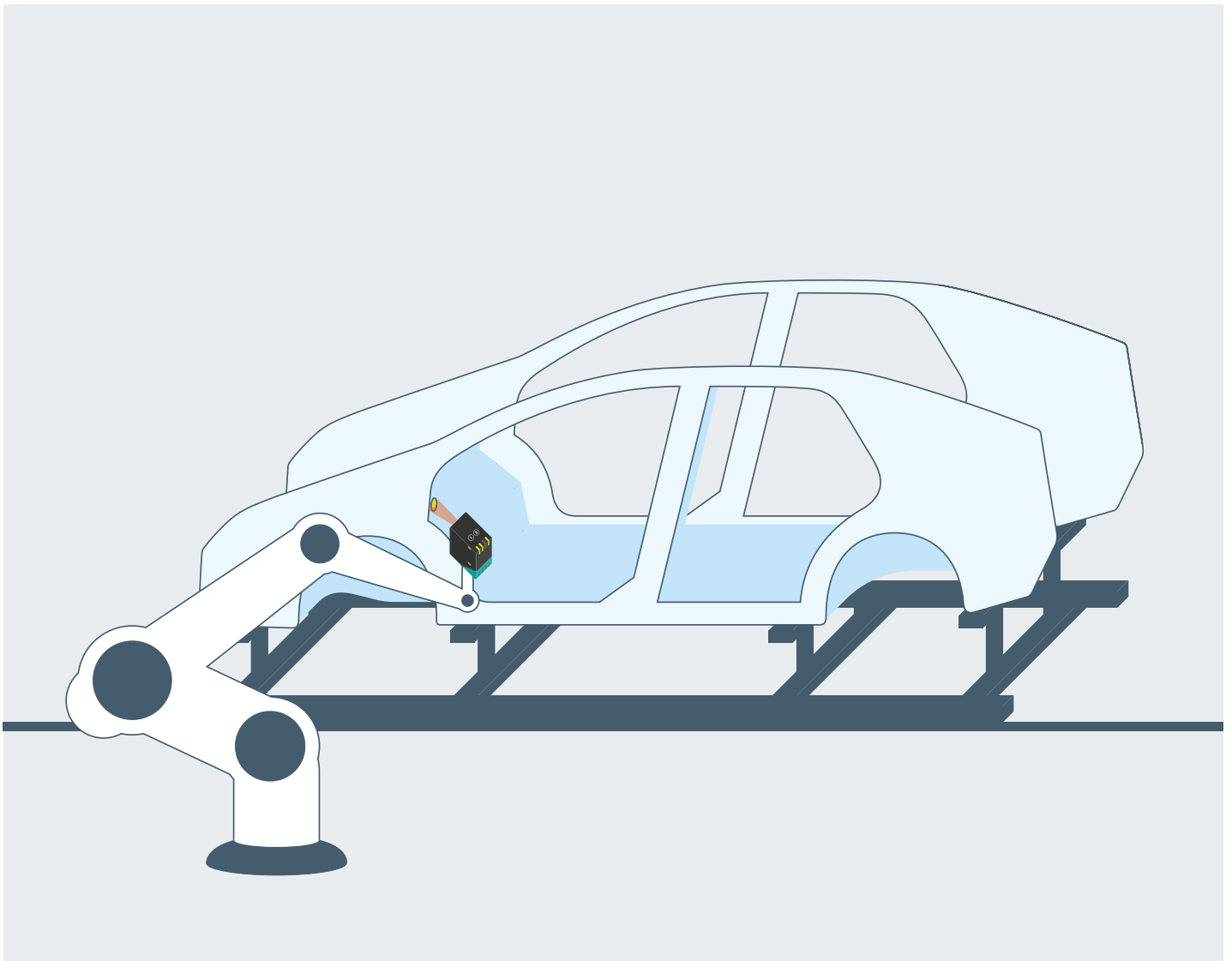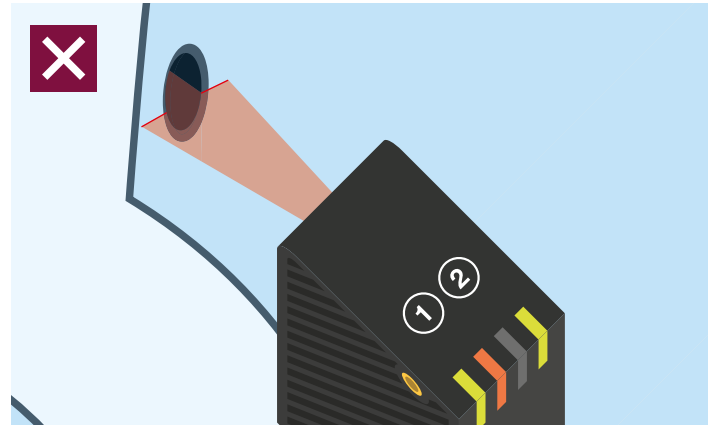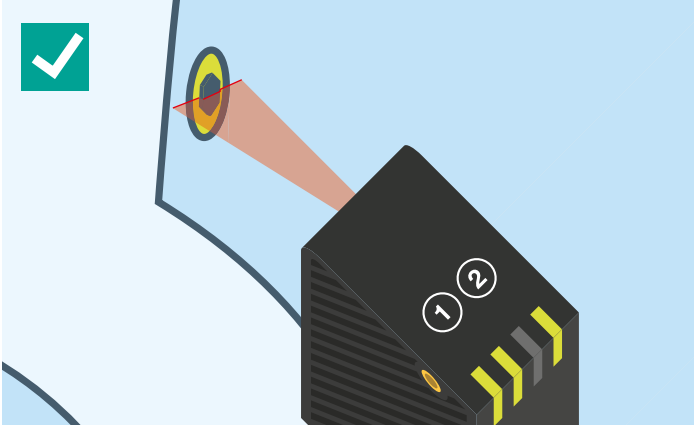# Reliable Detection of Fasteners in Automotive Manufacturing

Light Section Sensors Verify Presence of Studs, Screws, Clips, and Plugs

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The Application

In vehicle frame assembly, components are pieced together step by step to form a chassis. At various points during the process, the presence of critical fasteners such as studs, screws, clips, and blanking plugs is verified. Sensors mounted near the skid system or on a robotic arm detect whether these parts are present and in the correct location. Vehicles are positioned at a defined distance from a sensor, which then verifies the presence of the fastener.

The Goal

Studs, screws, and blanking plugs must be in the correct position before assembly can continue. There is often minimal contrast between the small parts being detected and the background. Despite this and other challenges, detection must be reliable and precise. If a fasterner is missing, a signal should be sent to the control system to trigger reworking.

The Solution

The SmartRunner Matcher section sensor simplifies presence verification. The compact sensor is preconfigured to detect height profiles and can be easily integrated into any control system. The sensor is installed in suitable locations along the conveyor line or on a robotic arm. Its beam is aligned with the target object, and the shape and contour of the object are taught in. During assembly, a trigger initiates detection.

If a component is present, the sensor sends a "good" signal, and the next step in the process can begin. If the component is missing, the SmartRunner Matcher detects a different height profile and sends a "bad" signal.

The Benefits

Costly vision systems can also handle these tasks, but light section technology offers distinct advantages. The SmartRunner Matcher reliably detects objects that are the same color as the background without external lighting— no contrast is needed. It can detect the target regardless of surface texture and color. The SmartRunner Matcher also outputs X and Z offset data, ensuring reliable object position detection. Simple configuration makes the SmartRunner quick and easy to set up and use. The sensor can also store up to 32 profiles, allowing multiple objects to be detected by one device.

At a Glance

- Reliable detection regardless of surface, color, or contrast

- No external lighting required

- Precise X and Z position data

- Quick configuration and commissioning

- Connectivity to all common fieldbuses

- Simple integration into control system

For more information, visit
www.pepperl-fuchs.com/smartrunner