

# 10 Examples of Poka-Yoke in Action



One of the most practical tools in the Lean toolbox is the Poka-Yoke. Poka-yoke (ポカヨケ, [po-kah yo-kay]) is a Japanese term that means "mistake-proofing" or "error prevention". A poka-yoke is any mechanism in a process that helps someone avoid (yokeru) mistakes (poka) and defects by preventing, correcting, or drawing attention to human errors as they occur. The concept was formalized, and the term adopted, by Shigeo Shingo as part of the Toyota Production System.

This document will share ten commonly used examples of Poka-Yoke to give you an idea how you might apply this powerful concept in your work.

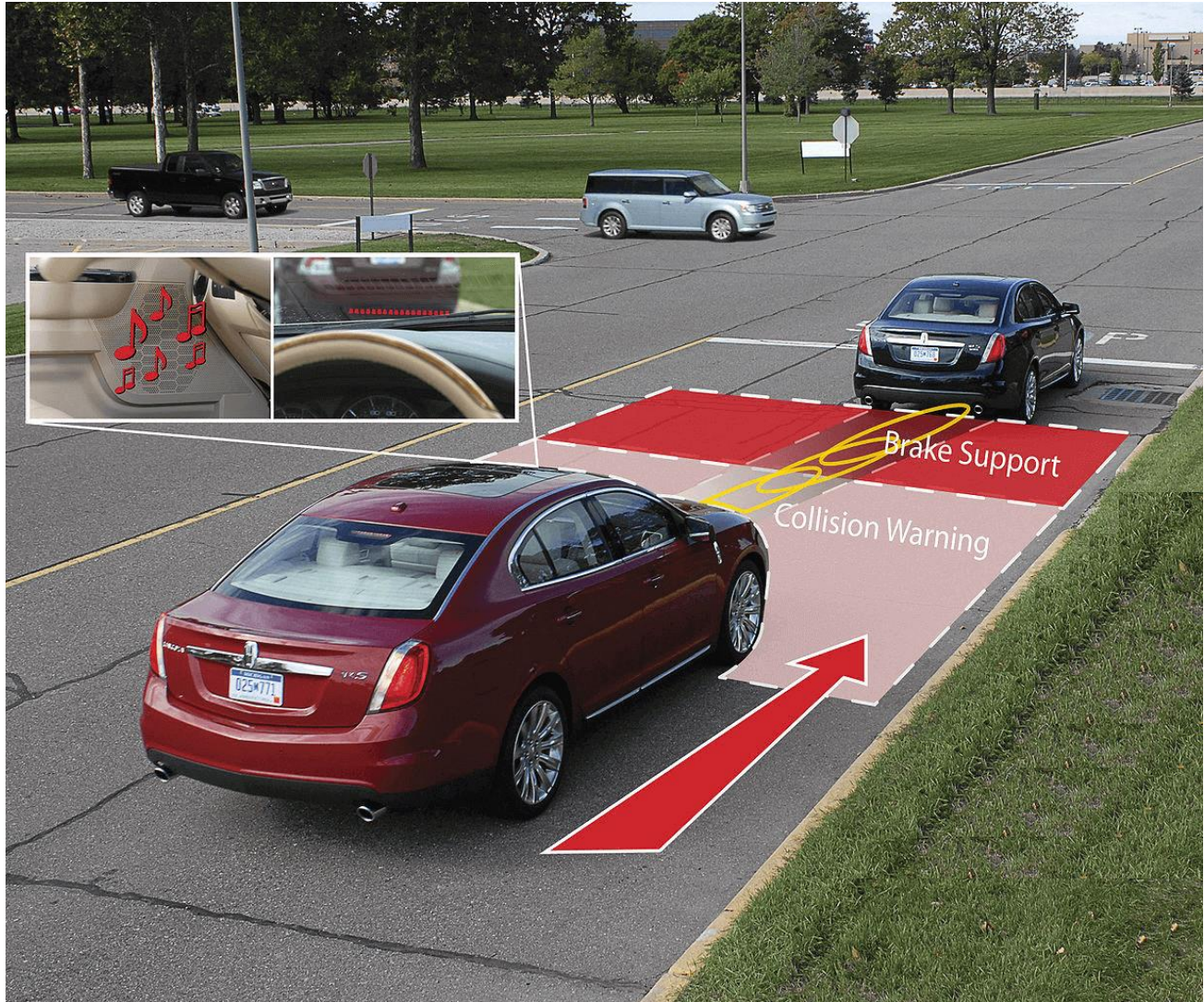
## #1) Centerlining



Centerlining, also known as match marking, is the process of using a visual indicator to show when a mechanism such as a tightened bolt or equipment setting has reached the proper configuration. For a mechanic or someone who works with wrenches, this technique takes much of the guesswork out of applying just the right amount of torque to bolts and other fasteners.

This technique is also frequently used in the practice of autonomous maintenance (AM) step 1 where machine operators mark the proper machine set-up parameters under base, or ideal, condition. Over time, processes tend to deviate from base condition. Centerlines indicate the level of deviation from base condition as equipment that need maintenance requires operating out-of-standard to meet production demands. This should trigger operators to perform the necessary maintenance to bring the process back into base condition.

## 2) Autonomation



This is a technique for applying technology and automation to prevent human error. In the example above, the target vehicle is set up with sensors to detect the distance to the previous car to reduce the likelihood of a rear-end collision. If the gap between cars becomes concerning, the car will play a sound to alert the driver, providing a collision warning. If the gap between the cars becomes dangerously narrow, the car will automatically apply the brakes to avoid a collision.

This technique can also be applied in manufacturing environments to kick out products that do not meet specifications. It also applies to academic testing programs designed to disqualify students who do not meet standards of learning and education.



### 3) Standardizing on Dimensions



Many gas stations offer both diesel and gasoline options. For drivers of non-diesel fuel cars, a routine stop at a gas station means filling up the tank with the various types of gasoline available. Gas stations handle hundreds of these transactions every single day. What happens if you accidentally put diesel into a gasoline car though? There would be some pretty serious consequences. It will clog up the fuel filter. Whatever amount of diesel that then makes its way to the engine will clog the fuel injectors, making them inoperable. This will result in the engine gumming up and seizing.

To prevent this from happening, fuel companies apply a Poka-Yoke that standardizes on the nozzle diameters of gasoline versus diesel fuel. Diesel fuel nozzles are made larger so that they cannot fit into gasoline car tanks, making it impossible to make this critical mistake.

#### 4) Notching / Slotting



If you've ever tried changing the SIM Card on a mobile device, then you know that it's difficult to tell if it's being inserted with the right orientation. To help with this, device manufacturers have designed SIM Cards with a small, dog ear-style notch on one of the corners of the rectangular chip to correspond with the slot on the carrier. This Poka-Yoke requires the SIM Card to be placed into the carrier right-side-up and facing the proper direction. Furthermore, the carrier must be inserted into the device right-side-up, making it practically impossible to get it wrong.

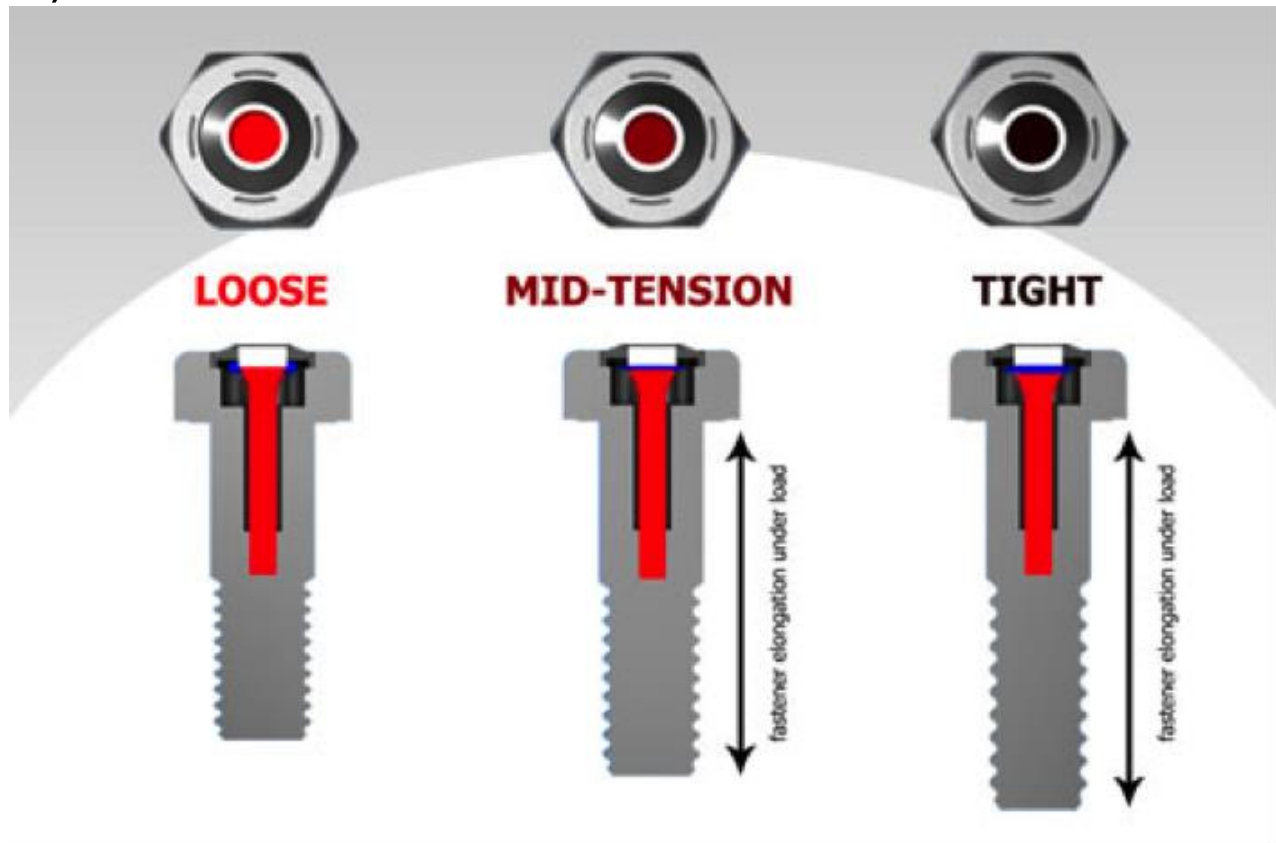
This technique can be applied in any case where two parts or pieces will be joining together. As with any Poka-Yoke effort, it's best to start with areas where the most errors are produced with strong consideration of the magnitude of consequences of mistakes.

## 5) Go / No-Go Gauge



This simple and handy tool is a favorite of manufacturers of devices or other products that require high precision. The Go / No-Go Gauge easily stores near the point of inspection and can be used to quickly measure hole diameters and depths to determine if minimum or maximum tolerances are exceeded. This is a tried and true Poka-Yoke tool, although digital technology is enabling more reliable, accurate, and 100% inspection across various applications.

## #6) Smart Bolts



Humans are visual creatures first and foremost. Bolt tightening has historically been applied based on feeling and judgement. An emerging technology is the use of Smart Bolts to provide a visual indicator of the level of tightness, removing some of the subjectivity from the process. This also allows “passersby” to quickly observe the tightness of bolts so that those that have become loose can be promptly restored. This can prevent sub-optimal and even dangerous working conditions from occurring due to bolts coming loose.

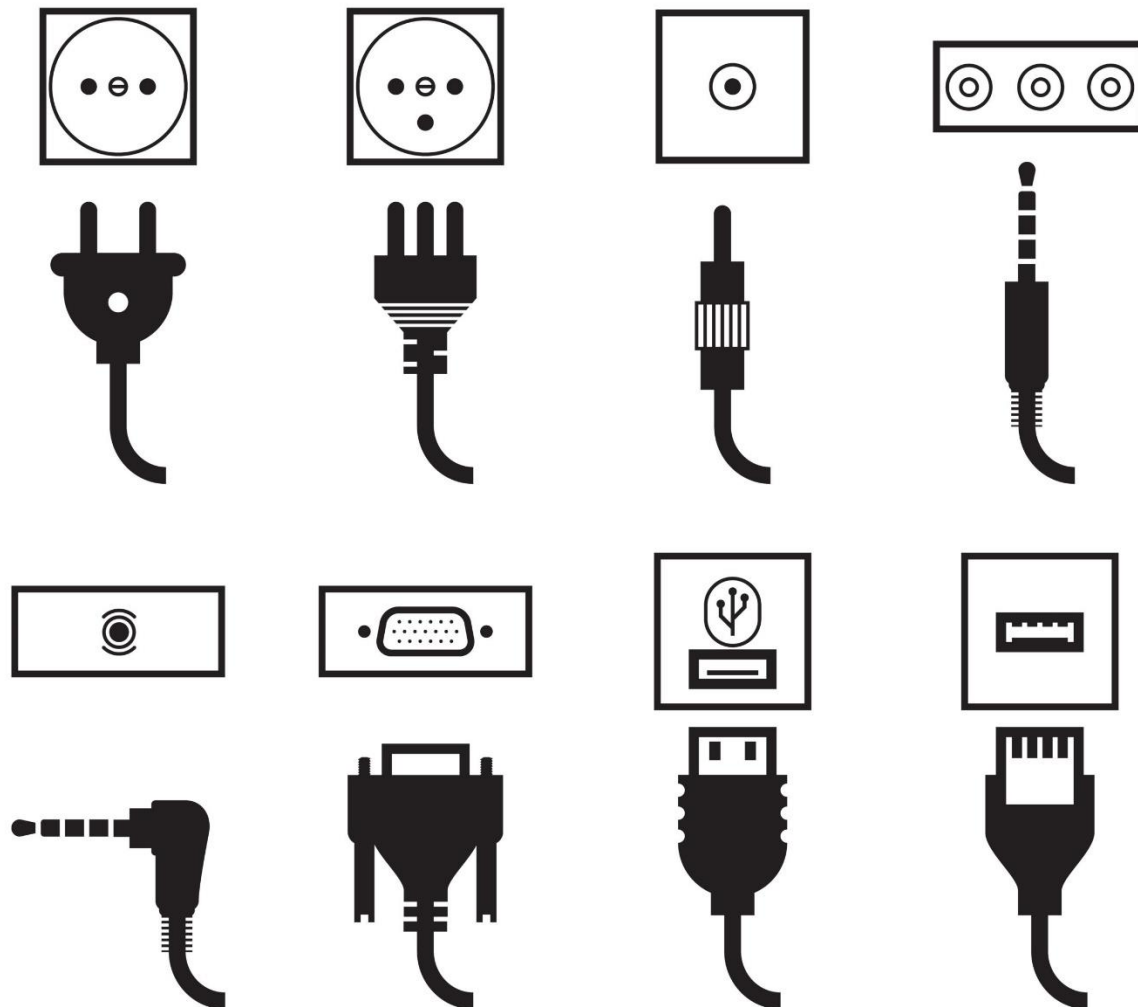
## #7) Signage and Labeling



One effective approach to implementing poka-yoke is by utilizing signs and labels. These visual cues serve as reminders, instructions, or warnings, helping people to perform tasks correctly and avoid mistakes. Signs and labels can be strategically placed near equipment, machinery, or workstations, providing clear instructions, safety guidelines, or indicating proper procedures. By incorporating well-designed signs and labels into the work environment, organizations can enhance operational efficiency, reduce errors, and improve overall quality and safety standards.



## #8) Plugs / Outlets



In the context of poka-yoke, plugs and outlets play a crucial role in preventing errors and ensuring safe and efficient operations. By designing plugs and outlets with unique shapes, sizes, or configurations, organizations can implement a foolproof system that minimizes the risk of incorrect connections or mismatches. These distinctive features allow workers to easily identify the correct plug and outlet combination, preventing errors that could lead to equipment damage, electrical hazards, or production delays. Additionally, color-coding or labeling plugs and outlets further enhances their usability and eliminates confusion. By incorporating poka-yoke principles into plug and outlet design, organizations can streamline processes, enhance reliability, and promote a safer working environment.

## #9) Warning Tape



Warning tape is a valuable tool in implementing poka-yoke strategies to prevent errors and promote safety in various settings. The bright and highly visible tape can be strategically placed to indicate hazards, restricted areas, or cautionary zones. Its vibrant colors and bold patterns serve as visual cues, alerting workers to potential risks and reminding them to take appropriate precautions. By clearly demarcating hazardous areas or indicating the need for specific actions, warning tape helps prevent accidents, injuries, and equipment damage. Its application is particularly beneficial in environments where human error can have severe consequences. Overall, warning tape is a simple yet effective poka-yoke solution, enhancing situational awareness and minimizing the likelihood of mistakes or mishaps.

## #10) Lock and Key



The use of locks and keys in poka-yoke applications is an effective method to prevent errors and ensure proper procedures. By implementing unique locks and corresponding keys, organizations can ensure that only authorized personnel can access specific equipment, areas, or resources. This prevents unauthorized access, reduces the risk of tampering or misuse, and enhances security measures. The lock and key system can also be designed with features such as color coding, specific key shapes, or numerical codes to further minimize the chances of mistakes or confusion. By incorporating this poka-yoke approach, organizations can maintain operational integrity, safeguard sensitive information, and improve overall efficiency and accountability.

## Conclusion

Poka-yokes are powerful tools for error prevention and process improvement. Examples such as using automation, standardizing dimensions, and lock and key systems demonstrate the diverse applications of poka-yoke principles. These techniques not only minimize the likelihood of errors but also enhance operational efficiency, promote safety, and ensure quality standards. By incorporating poka-yokes into various aspects of work environments, organizations can proactively address potential mistakes, eliminate waste, and foster a culture of continuous improvement. Ultimately, the implementation of poka-yokes contributes to increased productivity, reduced costs, and improved customer satisfaction, making them valuable assets for any industry or organization.

To develop a more in-depth understanding of Poka-Yoke and how this method could help you improve quality through error and mistake-proofing, take this insightful course at Impruver University. There, you can network, learn, and share best practices on Lean Six Sigma and other Continuous Improvement approaches.

Here's the link to the Poka-Yoke Course at Impruver University:

<https://university.impruver.com/courses/poka-yoke/>