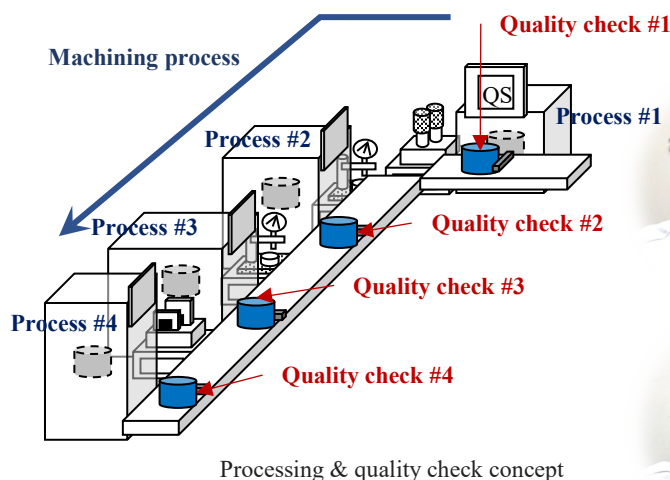


Helping maintain proper equipment operation through rapid condition assessment!



Powertrain Manufacturing Technology Department,
Toyota Motor Corporation

Machining Analysis
Promotion Office
Gauge Group
Mr. Takahashi,
Group Manager

Tool Maintenance
Department No. 2
Mr. Tsuzura,
Group Leader

Tool Maintenance
Department No. 2
Ms. Suzuki,
Team Leader

Tool Maintenance
Department No. 2
Gauge Management
Mr. Kobayashi,
Team Leader

◆What kind of work do you do?

Mr. Takahashi: As the planning department for machine gauges*, we work together with the process planning department when designing production lines, and are responsible for everything from planning the installation of machine gauges and reviewing specifications to arranging procurement. We are also responsible for standardizing machine gauges and managing their specifications and standards. More recently, responding to audits has also become an important part of our work.

Mr. Suzuki: After machine gauges are ordered, I am responsible for verifying and inspecting the accuracy and functionality of the machine gauges delivered by the manufacturers. At Toyota Motor Corporation, all machine gauges used in production are inspected by our team upon receipt, and we are responsible for ensuring their accuracy.

Mr. Kobayashi: I am responsible for supporting maintenance and repairs as the person supervising Toyota's gauge management operations and coordinating the activities of machine gauge management departments at other plants. Gauge management operations also include periodic inspections of the machine gauges used on production lines. I am also responsible for coordinating work outsourced to TTDC. As part of this work, they inspect more than 30,000 machine gauges each year and perform regular inspections of coordinate measuring machines used on production lines.

◆Tell us about the challenges you face in your work

Machine gauges are closely related to Toyota's production management methods. If machine gauges are not maintained at the proper level of accuracy, they can potentially lead to quality issues during production processes such as machining and assembly. To prevent these issues before they occur, machine gauges need to undergo regular accuracy inspections.

However, with a large number of gauges requiring inspection, and challenges such as the aging of experienced personnel and a decline in the number of available staff from a resource and training perspective, this has become an issue of major importance. When inspecting machine gauges, three key capabilities are particularly important. The first is knowledge of drawing tolerances and specifications. Although this is a basic skill, it is essential for correctly understanding the tolerance information indicated on engineering drawings. The second is the knowledge needed for measurement. It is also necessary to have a technical understanding of how measurement is performed and how to minimize variation in the results. Finally, it is also essential to have knowledge of the production line itself. By understanding the machining process, we can correctly understand the purpose and significance of the measurements taken at the locations and processes where machine gauges are used. If we cannot correctly understand this, we will not be able to identify issues with our inspection results or propose improvements. Since carrying out these operations also requires the transfer of these three skills, a major challenge is determining how to effectively pass on and preserve this knowledge.

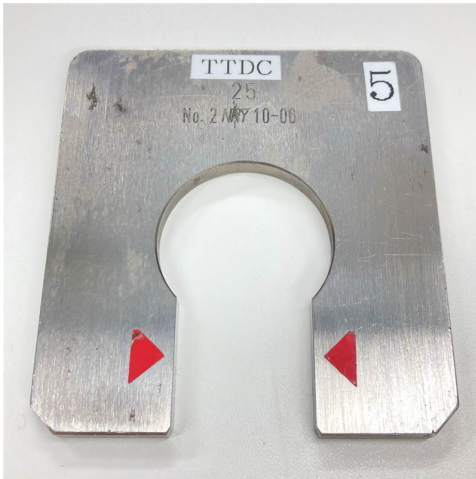
*About machine gauges

At Toyota, the Toyota Production System (TPS) is built on two pillars: system automation (jidoka) and just-in-time. One of the concepts that forms part of system automation is called "complete in-process quality control" (jikotaikanketsu). Jikotaikanketsu refers to the practice of building quality into each process based on the principle that defective products must never be passed on to the next process. In a typical production line, product quality is often checked collectively at the final stage of a multi-step process. At Toyota, however, quality is checked at every process to ensure that only good-quality products move on to the next process. If only good-quality products are consistently moving through the production line, it means the equipment is operating in the correct condition. Machine gauges are used as the tools for verifying that condition.

Protecting process quality through expertise in machine gauge inspection!

◆Could you tell us why you choose TTDC?

TTDC has a long history dating back to its predecessor companies, and we have built a strong relationship of trust over the years. On top of that, TTDC provides periodic on-site inspections and has developed technologies and improvement proposals that contribute to greater operational efficiency. Beyond their technical expertise, TTDC also works with us to share knowledge and provide training. I believe that is what forms the foundation of our close collaboration.



One example of a machine gauge

◆What were the benefits of adoption?

TTDC is an indispensable partner to us. Since inspections and measurements are carried out on the production floor, they require specialized expertise and practical skills. This is something that cannot be handled without years of accumulated experience, and TTDC has always supported us by bringing all of that together. With the aging workforce and a decline in staffing levels, it has become difficult to manage both periodic machine gauge inspections and planning activities using only Toyota's internal resources. By working together with TTDC, we are able to free up capacity among Toyota's internal members, which we are very grateful for. The capacity we have gained allows us to allocate Toyota's internal resources to solving newly emerging challenges and developing new technologies. Furthermore, since TTDC proactively continues to learn, we can expect them to provide valuable suggestions and results, creating benefits beyond what we would typically expect from an outsourced service. However, we recognize that the outsourced work happens mostly behind the scenes, and does not always stand out. As a result, there are times where it is necessary to make considerable efforts to coordinate with both internal and external parties. To improve the efficiency of our operations, we are also working to increase awareness within Toyota of gauge planning and inspection activities. At the same time, we will continue to communicate the knowledge, skills, and importance of TTDC's contributions.



Machine gauge inspection Source: Toyota Motor Corporation

◆Could you tell us about your plans for the future?

We hope to continue working closely with TTDC to support the planning and periodic inspection of machine gauges. The various machine gauge-related activities play an important role in supporting TPS. Since this work provides essential behind-the-scenes support, it is not something that will simply disappear. In addition to their existing responsibilities, we hope that TTDC will continue making valuable contributions to machine gauge planning for new projects, as well as periodic inspections and maintenance of mass-production lines. In particular, we will continue to rely on TTDC's support in areas such as addressing the aging workforce, workforce reduction, and the transfer of technical skills and know-how. At the same time, with advances in technology, we also need to continue improving our capabilities beyond our traditional scope of work. We are exploring the automation of machine gauges and the introduction of general-purpose measuring equipment in line with advances in information technology. We would greatly appreciate TTDC's support in making these initiatives a reality with the help of their development capabilities. In addition, TTDC's contributions are not limited to Toyota. Other companies within the Toyota Group are facing similar challenges, so we hope that opportunities such as technical exchanges will help them understand TTDC's capabilities and lead to new business opportunities. Ultimately, we hope TTDC will be able to support the Toyota Group as a whole.



Back row, from the left: Mr. Kobayashi, Mr. Takahashi, Mr. Tsuzura, and Mr. Suzuki
Front row, from the left: Mr. Naruse (TTDC), Mr. Shiimado (TTDC), and Mr. Kudō (TTDC)