

LESSON 4: USE AND MAINTAIN MEASURING INSTRUMENTS



LEARNING OUTCOMES

By the end of this lesson, you should be able to:

- LO 1: Select the appropriate measuring instruments for the task.
- LO 2: Use measuring instruments correctly and accurately.
- LO 3: Maintain and store measuring instruments properly after use.

INTRODUCTION

In the automotive field, accurate measurements are essential for diagnostics, repairs, and installations. A small miscalculation can result in performance issues or safety hazards. This is why measuring instruments must not only be used correctly but also be maintained in top condition. This lesson focuses on the proper selection, usage, care, and storage of various measuring tools used in automotive service.



TYPES OF MEASURING INSTRUMENTS

Common measuring instruments in automotive work include:

- Vernier Caliper
- Micrometer
- Steel Ruler
- Dial Gauge
- Feeler Gauge
- Torque Wrench
- Pressure Gauge
- Tire Pressure Gauge

Each of these tools serves a specific purpose, from measuring thickness and diameter to checking torque or air pressure.



PROPER USE OF MEASURING INSTRUMENTS

1. Always clean the instrument before and after use.
2. Ensure the instrument is calibrated correctly before measurement.
3. Handle with care to avoid shock or dropping.
4. Read the scale properly, ensuring correct alignment of the measuring lines.
5. For digital instruments, check the battery level and reset to zero before starting.
6. Do not apply excessive force while measuring.

MAINTENANCE OF MEASURING INSTRUMENTS

- Clean using a dry, lint-free cloth.
- Apply light machine oil on metal surfaces to prevent rusting.
- Store in a dry and dust-free environment.
- Keep in protective cases when not in use.
- Calibrate regularly based on manufacturer instructions or usage frequency.
- Do not expose to extreme temperatures or moisture.



COMMON ERRORS AND HOW TO AVOID THEM

1. Parallax Error— Ensure your eye is directly in line with the scale.
2. Zero Error – Always check and reset to zero before measuring.
3. Improper Pressure – Avoid forcing the tool; apply consistent light pressure.
4. Tool Wear— Replace damaged or worn-out tools immediately.
5. Incorrect Tool Selection – Match the tool to the job to ensure accuracy.



APPLICATION IN THE WORKPLACE

- During engine assembly, a micrometer ensures correct shaft diameter.
- Vernier calipers are used to measure brake rotor thickness.
- A torque wrench applies precise tightening force to cylinder head bolts.
- A tire pressure gauge checks and adjusts pressure for safe driving.

Using the wrong tool or improper technique can result in engine damage, brake failure, or tire blowouts.



CONCLUSION

Understanding and correctly using measuring instruments is crucial in automotive service. It ensures accurate diagnostics, safe operation, and reliable performance. Proper maintenance not only extends the life of the instruments but also guarantees their accuracy and safety in the workshop.

REFERENCES

Source: Automotive Servicing Module, K to 12 Technology and Livelihood Education, Department of Education, Philippines

Aligned with: TESDA Training Regulations – Automotive Servicing NC I

Module Coverage: Pages 144–165 including tool descriptions, maintenance procedures, and workplace application examples.

