

## Bruner's E1: Engagement Lens

Process	4C Super Skill	Engine Management System Activity
<p><b>2-1.</b> Plug the single-phase 2P 240V power cord and apply to the normal power line DC 12V, which is rectified through direct-current power supply.</p> <p><b>2-2.</b> Turn on the key switch, after turning on the emergency stop switch to clockwise direction, to activate the ECU, sensors, and actuator.</p> <p><b>2-3.</b> Verify the sensor value change, trouble code, and system operation change (ignition time and fuel injection amount), when the injector is operated and a spark is formed at the ignition plug with adjustment of variable output control knob of TPS Vol.</p> <p><b>[Reference]</b>          - TPS Knob should be positioned at "0".          (end to counterclockwise direction)          - When TPS Vol. is turned to clockwise direction, the acceleration speed of intake/exhaust air is increased, and the injector and ignition plug, operation is changed.</p>	<p>Communicating</p>	<p>Discuss the importance of understanding the engine's power requirements and how the power supply works. Actively listen to each other's explanations. Ask questions about different components of the engine management system.</p> <p>Illustrate and communicate the process of rectifying DC power using digital technologies. Communicate troubleshooting steps for engine management systems to increase efficiency.</p>
	<p>Collaborating</p>	<p>Work as a team to create a flowchart illustrating the power flow from the 240V AC input to the 12V DC output in the engine management system. Each team member contributes to the K-W-H-L chart: K (what each knows about engine management systems), W (what each wants to know about engine management systems), H (how each member will find relevant data about engine management systems), L (what each team member has learned about engine management systems).</p> <p>Engage in a discussion about how different components of the engine management system function together.</p>
	<p>Critical Thinking and Problem Solving</p>	<p>Discuss how prior knowledge of electricity and electronics is relevant to understanding the engine management system's power requirements. Connect previous learning about power supplies to the present topic. Agree or disagree on the effectiveness of different engine management system components and provide reasons for each stance.</p>

		Conduct a debate on the importance of engine management systems in modern vehicles and defend your position with logical arguments. Use internet resources to find examples of innovative engine management system designs.
	Creating and Innovating	<p>Engage in inquisitive activities about how different components of the engine management system interact with each other. Respond to "what if" questions about potential modifications to the engine management system and discuss the potential outcomes.</p> <p>Design your own questions about engine management systems for the class to answer and discuss. Work individually or in teams to create digital presentations showcasing innovative approaches to engine management system design</p>

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<p>2-4. Verify the output value change, trouble code output, and system operation change (ignition time and fuel injection amount), using variable control knob of TPS, ATS, WTS, MAP and O2.</p> <p><b>[Reference] How to set up</b> – The trouble code is produced and the warning lamp lights up when the setting is inadequate.</p>	Communicating	<p>Discuss the importance of previous knowledge in understanding engine management systems and troubleshooting procedures. Actively listen to each other's experiences with engine diagnostics and ask questions to clarify concepts.</p> <p>Illustrate and communicate original ideas for optimizing engine performance using digital technologies such as diagrams or presentations. Communicate information to help fellow students troubleshoot engine management software and increase its efficiency.</p>
	Collaborating	<p>Work as a team to complete a K-W-H-L chart for engine management systems: K (What each member knows about engine diagnostics), W (What each team member wants to know about troubleshooting procedures), H (How each member will find relevant data on engine issues), L (What each team member has learned about engine diagnostics).</p> <p>Collaborate in teams to search the web for data on engine management systems and discuss how it relates to optimizing engine performance. Engage in learning activities with students from other countries to gain diverse perspectives on engine diagnostics and repair</p>
	Critical Thinking and Problem Solving	<p>Explain how and why previous learning about engine systems is relevant to understanding engine management procedures. Connect previous knowledge to new learning experiences to deepen understanding. Analyse and debate issues related to engine performance and environmental impact, defending positions with evidence and reasoning.</p> <p>Use internet resources to illustrate and communicate original ideas for improving engine performance or</p>

		troubleshooting common issues. Engage in inquisitive activities and respond to "what if" questions about engine diagnostics, exploring alternative diagnostic approaches.
	Creating and Innovating	<p>Design questions for the class to answer about engine management systems, encouraging critical thinking and problem-solving. Work individually or in teams to compose digital stories or presentations about innovative approaches to engine diagnostics and repair.</p> <p>Come up with answers different from those given in class discussions, fostering creativity and exploration of multiple solutions. Use digital tools to compose and share stories about personal experiences with engine diagnostics and repair, demonstrating innovative thinking.</p>

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2-5. When the equipment stops, set the TPS knob at the default position and turn the ignition key off.	Communicating	<p>Discuss why it's important to set the TPS knob at the default position when the equipment stops, linking it to the stability of engine performance. Actively listen to different viewpoints on the significance of this step and its implications for system operation. Ask questions to clarify any misconceptions and illustrate the process using diagrams or digital simulations.</p> <p>Communicate information on troubleshooting engine stalling issues to help fellow students understand the importance of setting the TPS knob correctly for efficient engine restart and prevent potential damage.</p>
	Collaborating	<p>Work collaboratively in teams to complete a K-W-H-L chart about engine management system shutdown procedures. Each team member contributes what they know (K), what they want to know (W), how they will find relevant data (H), and what they have learned (L) about setting the TPS knob and shutting down the engine safely.</p> <p>Engage in group activities to search the web for data on engine shutdown protocols and discuss how it relates to maintaining engine reliability and safety. Collaborate with students from overseas countries to exchange insights and best practices for engine management system shutdown procedures.</p>
	Critical Thinking and Problem Solving	<p>Apply critical thinking skills to explain the relevance of previous learning about engine management to the present topic of setting the TPS knob during equipment shutdown. Connect past experiences with engine malfunctions to identify potential risks of not following proper shutdown procedures.</p> <p>Engage in debates defending different</p>

		<p>approaches to engine shutdown procedures, considering factors such as energy conservation and environmental impact. Utilize internet resources to gather evidence supporting specific shutdown protocols and communicate original ideas about optimizing engine performance.</p>
	<p>Creating and Innovating</p>	<p>Explore innovative solutions to improve engine shutdown procedures by responding to "what if" scenarios and brainstorming alternative methods. Propose novel approaches to setting the TPS knob during equipment shutdown and design questions for the class to encourage critical thinking about engine management practices.</p> <p>Work individually or in teams to develop digital stories or simulations illustrating the consequences of improper engine shutdown procedures and the benefits of following correct protocols. Use creative tools to compose engaging narratives that emphasize the importance of setting the TPS knob at the default position.</p>