

Bruner's E4: Elaboration Lens

Process	4C Super Skill	Engine Management System Activity
<p>2-1. 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>2-2. Turn on the key switch, after turning on the emergency stop switch to clockwise direction, to activate the ECU, sensors, and actuator.</p> <p>2-3. 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>[Reference] - 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>	Communicating	<p>Discuss and elaborate on the process of activating the engine management system, emphasizing the importance of correctly positioning the TPS knob and the implications of adjusting TPS Vol. Talk formally about engine management concepts and processes, using technical language accurately.</p> <p>Describe and demonstrate the process of verifying sensor values, trouble codes, and system operations to classmates, ensuring a clear understanding of the steps involved in diagnosing engine performance issues. Create media-rich presentations to visually explain engine management concepts to peers.</p>
	Collaborating	<p>Challenge peers in a team to elaborate further on engine management concepts and processes, encouraging deeper discussions and exploration of related topics. Work collaboratively to broaden understanding of engine management systems and their implications for vehicle performance.</p> <p>Share understandings of engine management concepts learned in class and collaborate to solve problems related to engine performance optimization. Publish engine-related problems to a virtual community for assistance and collaborate on solutions.</p>
	Critical Thinking and Problem Solving	<p>Look for deeper meanings in engine management concepts introduced in class and search the internet for further points related to engine tuning strategies and their impacts. Challenge current understanding by questioning and correcting misconceptions about engine performance optimization.</p>

		<p>Apply theoretical knowledge of engine management to real-life experiences, such as troubleshooting engine issues in a practical setting. Practice critical thinking by applying engine tuning theory to solve new problems encountered during engine diagnostics and repairs.</p>
	<p>Creating and Innovating</p>	<p>Raise new issues for discussion regarding engine management, such as the integration of emerging technologies like electric propulsion systems. Apply skills learned in engine management to new contexts, such as optimizing engine performance for alternative fuels.</p> <p>Extend current learning about engine management to new areas, such as exploring the potential impact of autonomous driving technology on engine tuning strategies. Design and complete rich learning tasks related to engine performance optimization and document the process through multimedia presentations.</p> <p>Develop and use new terminology related to engine management, creating a shared vocabulary to facilitate deeper understanding and communication within the class. Practice new skills, such as data analysis and interpretation, to optimize engine performance and achieve learning objectives.</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>[Reference] How to set up – The trouble code is produced and the warning lamp lights up when the setting is inadequate.</p>	Communicating	<p>Discuss and elaborate further on previously discussed topics related to engine management, such as the functions of TPS, ATS, WTS, MAP, and O2 sensors. Practice using formal language correctly when explaining diagnostic procedures and trouble code interpretation to classmates.</p> <p>Describe and demonstrate the process of adjusting the variable control knobs of TPS, ATS, WTS, MAP, and O2 sensors to verify changes in engine operation and trouble code output. Share understanding of how digital learning games can simulate engine diagnostic scenarios and help in understanding troubleshooting techniques.</p>
	Collaborating	<p>Challenge peers in a team to provide more detailed explanations of engine management concepts and diagnostic procedures. Work collaboratively in a team to broaden understanding of engine diagnostics and share insights gained from adjusting sensor controls.</p> <p>Share understandings of engine management concepts and troubleshooting techniques with classmates, fostering collaboration and knowledge sharing. Work together in teams to solve engine performance issues by adjusting sensor controls and interpreting trouble codes.</p>
	Critical Thinking and Problem Solving	<p>Look for deeper meanings of engine management concepts and explore further points connected to troubleshooting procedures by conducting internet searches and consulting additional resources. Challenge current understanding by questioning and correcting misconceptions about engine diagnostics and tuning.</p> <p>Apply theoretical knowledge to real-life experiences by troubleshooting engine performance issues and applying diagnostic procedures learned in class.</p>

		Apply critical thinking skills to solve new engine performance problems encountered during diagnostic procedures.
	Creating and Innovating	<p>Raise new issues for discussion related to engine management and propose innovative solutions to engine performance problems. Apply engine diagnostic skills to new contexts, such as diagnosing performance issues in different vehicle models or engine types.</p> <p>Extend current learning about engine management to new areas by applying knowledge learned in one aspect of engine diagnostics to other areas, such as emissions testing or exhaust system diagnostics. Design and complete rich learning tasks related to engine diagnostics and troubleshooting techniques.</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 and elaborate on the importance of setting the TPS knob at the default position when the equipment stops. Practice using formal language correctly to explain the concept of proper shutdown procedures.</p> <p>Share your understanding of the TPS knob's role in engine management and how its correct adjustment affects system operation. Create media-rich presentations to visually demonstrate the process of setting the TPS knob at the default position.</p>
	Collaborating	<p>Work in teams to broaden the discussion about TPS knob adjustment and its significance in engine shutdown procedures. Share insights and understandings with team members to collectively solve any misunderstandings or challenges encountered.</p> <p>Challenge peers to delve deeper into the topic by asking questions and seeking clarification on the importance of setting the TPS knob correctly. Collaborate to solve any problems encountered during the learning process.</p>
	Critical Thinking and Problem Solving	<p>Look for deeper meanings behind the concept of setting the TPS knob at the default position and its implications for engine management. Search the internet for further information to broaden understanding and challenge current assumptions.</p> <p>Apply critical thinking skills to question and correct any misperceptions about the TPS knob's role in engine shutdown. Apply theoretical knowledge to real-life scenarios to understand the practical implications of correct TPS knob adjustment.</p>
	Creating and Innovating	Raise new issues for discussion related to TPS knob adjustment and its

		<p>impact on engine performance. Apply knowledge learned in engine management to other contexts, such as vehicle maintenance or mechanical engineering.</p> <p>Design and complete a rich learning task, such as creating an instructional video or manual, to guide others on the correct procedure for setting the TPS knob at the default position. Develop new terminology to describe engine management concepts accurately.</p>
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