

Bruner's E2: Exploration Lens

Process	4C Super Skill	Engine Management System Activity
<p>1) After connecting the scan-tool with a scope probe, insert the probe into a check terminal wish to measuring. (Be sure to connect the grounding cable).</p> <p>2) On the initial main screen, enter [SCOPE] and select [SINGLE AUTO SET (CH1)].</p> <p>3) The wave form is measured according to the adjustment of time axis and voltage axis.</p>	Communicating	<p>Discuss the relationships among different engine diagnostic concepts and ideas, such as waveform interpretation and troubleshooting methods.</p> <p>Engage in class discussions to identify and correct any misconceptions about using the scan-tool and scope probe for engine diagnostics.</p> <p>Watch instructional videos demonstrating the proper use of diagnostic tools and discuss the key messages conveyed regarding safe and effective diagnostic procedures.</p>
	Collaborating	<p>Work collaboratively in teams to study engine diagnostic techniques and share insights and findings with classmates, fostering peer learning networks within the classroom.</p> <p>Utilize online platforms such as Google Circles to form virtual learning communities where students can collaborate, share resources, and support each other in understanding engine diagnostic processes.</p> <p>Collaborate with learners from different countries via the internet to complete assessment tasks related to engine diagnostics, promoting cross-cultural collaboration and knowledge exchange.</p>
	Critical Thinking and Problem Solving	<p>Venture into new areas of engine diagnostic research, exploring advanced diagnostic methods and techniques to deepen understanding and improve diagnostic accuracy.</p> <p>Conduct internet searches to gather data on engine diagnostic procedures, analyze the data collected, and apply critical thinking skills to solve complex diagnostic problems encountered during the diagnostic process.</p> <p>Conduct studies of nature strips to apply diagnostic principles learned in the classroom to real-world scenarios, developing problem-solving skills in</p>

		diagnosing engine issues in various environmental conditions.
	Creating and Innovating	<p>Reflect on current engine diagnostic practices and brainstorm innovative ideas to improve diagnostic efficiency and accuracy, encouraging creativity and innovation in diagnosing engine-related problems.</p> <p>Use digital resources to design and create curriculum-specific simulations that simulate engine diagnostic scenarios, providing hands-on practice opportunities for peers to enhance their diagnostic skills and critical thinking abilities.</p>

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<p>1) Turn on the 'IGNITION KEY' and activate the system.</p> <p>2) Locate the scanner in better place to measure and insert the connector into the D.L.C terminal.</p> <p>3) When power on the scanner, the initial main screen will be displayed.</p>	Communicating	<p>Discuss the relationships among the steps involved in activating the system. Correct any misconceptions about the process and probe for deeper understanding.</p> <p>Conduct a whole-class discussion on the importance of properly activating the engine management system. Watch a video clip illustrating the activation process.</p>
	Collaborating	<p>Work collaboratively in teams to study the engine management system activation process. Monitor and scaffold each other's understanding to ensure successful activation.</p> <p>Use the Internet to form peer learning networks and virtual communities to share knowledge and resources related to engine management systems.</p>
	Critical Thinking and Problem Solving	<p>Venture into new areas of research about engine management systems and explore different methods of activation. Conduct internet searches to gather relevant data.</p> <p>Attempt new experiments or simulations to understand the consequences of improper system activation. Conduct a study or analysis of various activation techniques.</p>
	Creating and Innovating	<p>Reflect on the activation process and come up with innovative ideas for improving system activation methods. Use new URLs and digital resources to design novel activation procedures. Create simulations or models to encourage critical thinking about system activation.</p>

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<p>1) Select [Scan] on the main screen, then select [ENHANCED SCAN] on the selection screen.</p> <p>2) Select [KOREAN] in the country selection screen, then select [HYUNDAI] in the manufacturer selection screen.</p> <p>3) Select [HYUNDAI MOTORS], then select [EF SONATA] on the vehicle model selection screen.</p> <p>4) Select [ENGINE CONTROL DOHC] on the vehicle selection submenu screen. The following screen will appear if the communication with the engine ECU is successful.</p> <p>5) A communication error screen will appear if the diagnostics cable connection is faulty or if the system malfunctions. Check the related wiring and circuits and try again.</p> <p>6) Click [SELF DIAGNOSIS] to display the trouble codes.</p> <p>7) Press [ESC] to leave the screen, then select [CURRENT DATA] to check the system's service data.</p> <p>Checklist for addressing a communication error</p>	Communicating	<p>Discuss the relationships between the selected options on the scanner's screen and their relevance to the diagnostic process.</p> <p>Clarify any misconceptions about the diagnostic procedure and ensure a shared understanding among team members.</p>
	Collaborating	<p>Work collaboratively in teams to explore the diagnostic process and troubleshoot potential issues with the scanner or vehicle connection.</p> <p>Utilize the Internet to research and gather information about engine diagnostics, sharing findings with teammates to enhance understanding.</p>
	Critical Thinking and Problem Solving	<p>Apply critical thinking skills to analyze the effectiveness of different diagnostic procedures and select the most appropriate options on the scanner.</p> <p>Use problem-solving techniques to address communication errors, such as checking wiring connections, verifying vehicle type selection, and ensuring the ignition key is in the ON position.</p> <p>Experiment with different diagnostic settings and procedures to understand their impact on the accuracy of the diagnostic data.</p>
	Creating and Innovating	<p>Develop innovative strategies for diagnosing engine issues more efficiently using the available diagnostic tools and technologies.</p> <p>Design and conduct simulated diagnostic experiments to explore various scenarios and improve diagnostic skills.</p>

<p>1) Check the wiring connections.</p> <p>2) Verify that the vehicle type selected corresponds to the actual vehicle.</p> <p>3) Check if the ignition key is in the ON position.</p>		
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<p>1) When the engine warning lamp continuously lights up, solve the problem by using the scanner. When they are not erased, set the variable control knob for major sensors to normal value, and erase them again.</p> <p>2) When the engine alarm lamp keeps lighting up and in an emergency condition without scanner, push the emergency stop switch and turn it on after 15 seconds to clear the memory</p>	Communicating	<p>Discuss the relationships between different engine warning lamp signals and their corresponding system malfunctions.</p> <p>Clarify any misconceptions about engine warning lamp troubleshooting methods and discuss the correct procedures.</p>
	Collaborating	<p>Work in teams to study the functionality of engine warning lamps and brainstorm potential solutions for persistent warning lamp issues.</p> <p>Utilize online resources and peer networks to gather information about common engine warning lamp problems and their resolutions.</p>
	Critical Thinking and Problem Solving	<p>Venture into new areas of engine diagnostics research to understand the underlying causes of persistent warning lamp illumination.</p> <p>Analyze data from previous engine warning lamp incidents to develop hypotheses and experiment with different troubleshooting methods.</p> <p>Conduct a study of various engine components to understand their role in triggering warning lamp signals and potential fail-safe modes.</p>
	Creating and Innovating	<p>Design and conduct experiments to simulate emergency conditions and test the effectiveness of alternative memory-clearing procedures.</p> <p>Develop new strategies and protocols for addressing engine warning lamp issues without the use of a scanner in emergency situations.</p>

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<p>1) When there is any trouble in the system, the ECU senses it, lighting the warning lamp.</p> <p>2) ECU changes the mode of troubled sensors and actuators into Fail Safe to control them, when engine warning lamps light up.</p>	Communicating	<p>Discuss the relationships among different engine components and how they contribute to the overall system function.</p> <p>Address any misperceptions students may have about engine warning lights and clarify their understanding through discussion.</p>
	Collaborating	<p>Work in teams to study the functions of different sensors and actuators in the engine management system and how they interact.</p> <p>Form peer learning networks with classmates to share resources and insights about troubleshooting engine warning systems.</p>
	Critical Thinking and Problem Solving	<p>Venture into new areas of research related to engine management systems to deepen understanding and explore innovative troubleshooting methods.</p> <p>Conduct internet searches to gather information about common engine problems and their solutions, applying critical thinking to evaluate sources.</p> <p>Conduct a study or experiment to investigate the effectiveness of different diagnostic techniques for engine warning lights.</p>
	Creating and Innovating	<p>Use new online resources and tools to design simulations or interactive activities that simulate engine warning light scenarios for practice.</p> <p>Create a curriculum-specific simulation that allows students to practice diagnosing and troubleshooting engine warning light issues.</p>

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Process	4C Super Skill	Engine Management System Activity
<p>1) Check terminal is connected to sensors, actuators of EMS control circuit.</p> <p>2) Trainee exercises test of voltage, current and resistance of each check terminal of EMS with multi-tester.</p>	Communicating	<p>Discuss the relationships between sensors, actuators, and the EMS control circuit, explaining how they interact to regulate engine performance.</p> <p>Clarify any misconceptions trainees may have about the function and operation of EMS components and systems, ensuring a clear understanding of testing procedures.</p>
	Collaborating	<p>Work collaboratively in teams to study the EMS control circuit and its components, sharing insights and knowledge to deepen understanding and troubleshoot issues.</p> <p>Utilize the Internet to access resources and form virtual learning communities, allowing trainees to exchange ideas, discuss challenges, and share solutions.</p>
	Critical Thinking and Problem Solving	<p>Venture into new areas of research regarding EMS diagnostics, exploring advanced testing methods and emerging technologies for improved troubleshooting.</p> <p>Conduct experiments with multi-testers to analyze voltage, current, and resistance across EMS check terminals, identifying irregularities and diagnosing faults.</p> <p>Apply critical thinking skills to interpret data gathered from EMS testing, identifying patterns, anomalies, and potential causes of engine malfunctions.</p>

	Creating and Innovating	<p>Develop innovative solutions and simulation models to simulate EMS diagnostic scenarios, providing practical training opportunities for troubleshooting exercises.</p> <p>Use digital tools and resources to design new learning activities and exercises that encourage trainees to think creatively and explore EMS testing concepts deeply.</p>
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