

<b>Training Package</b>	N/A	<b>HSC Indicative Hours</b>  <b>25</b>
<b>Title</b>	<b>Automotive systems and components</b>	
<b>Unit descriptor</b>	This is not an industry-developed unit of competency. It is a set of topics to provide students with the knowledge and understanding to identify and outline the purpose of automotive systems and components. Students will also develop an understanding of the importance to customers of the preparation and presentation of vehicles and related information.	<b>HSC Requirements and Advice</b>
		<b>Key Terms and Concepts</b> <ul style="list-style-type: none"> <li>• braking systems</li> <li>• classifications of engine systems</li> <li>• clean-up procedures</li> <li>• electrical systems</li> <li>• gear ratios</li> <li>• engine operating cycles</li> <li>• engine systems</li> <li>• engine types</li> <li>• final inspection</li> <li>• material composition</li> <li>• power transmission methods</li> <li>• preparation and presentation of vehicles for return to customer</li> <li>• purpose, function and location of major components of automotive systems</li> <li>• service, operating and warranty requirements</li> <li>• standard operating procedures</li> <li>• steering and suspension systems</li> <li>• tyres</li> <li>• vehicle body components</li> <li>• vehicle body repair procedures</li> <li>• vehicle spray painting/finishing systems</li> <li>• workplace documentation</li> <li>• work records.</li> </ul>

Topics	HSC Requirements and Advice
1 Automotive systems and components	<p><b>Learning experiences for the HSC must address:</b></p> <p>A basic understanding of the similarities and differences of a range of engine systems for:</p> <ul style="list-style-type: none"> <li>• light vehicles</li> <li>• heavy vehicles</li> <li>• motorcycles</li> <li>• recreational marine craft</li> <li>• outdoor power equipment.</li> </ul> <p>An awareness of how engine systems are classified including:</p> <ul style="list-style-type: none"> <li>• number of cylinders</li> <li>• arrangement of cylinders <ul style="list-style-type: none"> <li>- in-line</li> <li>- V</li> <li>- opposed</li> <li>- radial</li> <li>- rotary</li> </ul> </li> <li>• engine capacity</li> <li>• valve arrangement <ul style="list-style-type: none"> <li>- overhead valve</li> <li>- side valve</li> <li>- overhead cam</li> </ul> </li> <li>• type of fuel used <ul style="list-style-type: none"> <li>- petrol</li> <li>- diesel</li> <li>- LPG</li> </ul> </li> <li>• type of cooling system <ul style="list-style-type: none"> <li>- air</li> <li>- liquid</li> </ul> </li> <li>• operating cycle <ul style="list-style-type: none"> <li>- two-stroke</li> <li>- four-stroke.</li> </ul> </li> </ul> <p>An understanding of the features, components and function of a range of engine types and operating cycles including:</p> <ul style="list-style-type: none"> <li>• internal combustion</li> <li>• rotary engine</li> <li>• spark ignition <ul style="list-style-type: none"> <li>- four-stroke</li> <li>- two-stroke</li> </ul> </li> <li>• compression ignition <ul style="list-style-type: none"> <li>- four-stroke</li> </ul> </li> <li>• alternative systems <ul style="list-style-type: none"> <li>- solar</li> </ul> </li> </ul>

Topics	HSC Requirements and Advice
	<ul style="list-style-type: none"> <li>- electric</li> <li>- hybrid.</li> </ul> <p>An understanding of essential processes in engine systems including:</p> <ul style="list-style-type: none"> <li>• lubrication</li> <li>• cooling <ul style="list-style-type: none"> <li>- air</li> <li>- liquid</li> </ul> </li> <li>• fuel <ul style="list-style-type: none"> <li>- petrol</li> <li>- diesel</li> <li>- LPG</li> </ul> </li> <li>• starting</li> <li>• charging</li> <li>• ignition</li> <li>• intake</li> <li>• exhaust</li> <li>• induction.</li> </ul> <p>Awareness of power transmission methods from engine to load including:</p> <ul style="list-style-type: none"> <li>• clutch</li> <li>• shaft</li> <li>• chain</li> <li>• belt</li> <li>• gear</li> <li>• cable</li> <li>• propeller</li> <li>• hydraulic.</li> </ul> <p>An understanding of the purpose of gear ratios in the drive train including:</p> <ul style="list-style-type: none"> <li>• reduction</li> <li>• overdrive.</li> </ul> <p>Knowledge of the purpose, functions and location/layout in vehicles and other applications of major components of automotive systems including:</p> <ul style="list-style-type: none"> <li>• drivetrains <ul style="list-style-type: none"> <li>- clutches</li> <li>- torque converter</li> <li>- transmissions/transaxles <ul style="list-style-type: none"> <li>▪ manual</li> <li>▪ automatic</li> </ul> </li> <li>- drive lines and final drives</li> </ul> </li> <li>• steering and suspension systems</li> </ul>

Topics	HSC Requirements and Advice
	<ul style="list-style-type: none"> <li>• braking systems               <ul style="list-style-type: none"> <li>- service and park brake</li> <li>- anti-lock braking system</li> </ul> </li> <li>• electrical systems               <ul style="list-style-type: none"> <li>- automotive battery</li> <li>- charging system</li> <li>- starting system</li> <li>- lighting and warning systems.</li> </ul> </li> </ul> <p>Knowledge of the features and characteristics of tyres.</p> <p>An understanding of the service requirements of tyres including:</p> <ul style="list-style-type: none"> <li>• tread wear measurement</li> <li>• tyre inflation               <ul style="list-style-type: none"> <li>- implications of under- and over-inflation</li> </ul> </li> <li>• wheel rotation.</li> </ul>
2 Vehicle body, panel, paint and repair	<p><b>Learning experiences for the HSC must address:</b></p> <p>Knowledge of the structure, function and interrelationship of vehicle body components including:</p> <ul style="list-style-type: none"> <li>• body panels</li> <li>• trim               <ul style="list-style-type: none"> <li>- exterior</li> <li>- interior</li> </ul> </li> <li>• accessories.</li> </ul> <p>An awareness of the material composition of common vehicle body components including:</p> <ul style="list-style-type: none"> <li>• steel</li> <li>• plastic/composite.</li> </ul> <p>An awareness of standard operating procedures when working with vehicle body components including:</p> <ul style="list-style-type: none"> <li>• removal</li> <li>• tagging</li> <li>• replacement/refitting</li> <li>• measuring and alignment.</li> </ul> <p>An awareness of the range of common vehicle body repair procedures including:</p> <ul style="list-style-type: none"> <li>• small panel repairs</li> <li>• filler repairs</li> <li>• filling operations</li> <li>• metal shaping</li> <li>• minor welding operations.</li> </ul>

Topics	HSC Requirements and Advice
	<p>An awareness of vehicle spray painting/finishing systems including:</p> <ul style="list-style-type: none"> <li>• surface preparation procedures</li> <li>• paint types and mixing procedures</li> <li>• application methods</li> <li>• drying methods</li> <li>• finishing techniques.</li> </ul>
<p>3 Preparation of vehicle for return to customer</p>	<p><b>Learning experiences for the HSC must address:</b></p> <p>Preparing vehicles for presentation to customers including:</p> <ul style="list-style-type: none"> <li>• pre- and post- service inspection and report describing condition and operational status of the vehicle</li> <li>• cleaning prior to handover without causing damage to component or system</li> <li>• ensuring that vehicle is secured in preparation for customer pick-up</li> <li>• processing of workplace documentation.</li> </ul> <p>An understanding of the importance of undertaking a final inspection before returning the vehicle to the customer.</p> <p>Standard procedures for undertaking final inspection including:</p> <ul style="list-style-type: none"> <li>• vehicle is started and checked for leaks and noises</li> <li>• vehicle is test driven</li> <li>• visual inspection of all components</li> <li>• fluid levels are checked and topped up as required</li> <li>• comparison of servicing and repair against checklist and repair quotation.</li> </ul> <p>Clean-up procedures with proper consideration for the environment and OHS.</p> <p>A range of cleaning techniques including:</p> <ul style="list-style-type: none"> <li>• wiping</li> <li>• washing</li> <li>• brushing</li> <li>• sweeping</li> <li>• use of cleaning agents (chemicals, solvents and detergents).</li> </ul> <p>An understanding of service, operating and warranty requirements and customer rights with regard to services provided.</p> <p>An understanding of:</p> <ul style="list-style-type: none"> <li>• the purpose of work records</li> <li>• workplace/organisation expectations for the maintenance of work records</li> <li>• types of work records <ul style="list-style-type: none"> <li>- used in an automotive work environment</li> <li>- required by industry regulation(s)</li> </ul> </li> <li>• methods for work records <ul style="list-style-type: none"> <li>- manual</li> <li>- electronic.</li> </ul> </li> </ul>

Topics	HSC Requirements and Advice
	<p>Knowledge of the features and purposes of workplace documentation including:</p> <ul style="list-style-type: none"> <li>• job card</li> <li>• work order</li> <li>• vehicle service handbook</li> <li>• warranty documentation</li> <li>• vehicle lubrication sticker.</li> </ul> <p>Information to be included in workplace documentation including:</p> <ul style="list-style-type: none"> <li>• documenting service and repair actions <ul style="list-style-type: none"> <li>- additional items/parts used</li> <li>- additional repairs needed</li> <li>- future repairs needed</li> <li>- all lubricants/fluids and parts</li> <li>- estimate of cost of future repairs</li> </ul> </li> <li>• manufacturer/supplier details</li> <li>• all relevant vehicle details <ul style="list-style-type: none"> <li>- make</li> <li>- model</li> <li>- year</li> <li>- rego/VIN numbers.</li> </ul> </li> </ul> <p>The importance of recording information that is:</p> <ul style="list-style-type: none"> <li>• clear</li> <li>• legible</li> <li>• accurate</li> <li>• concise</li> <li>• appropriate in terms of industry terminology.</li> </ul>