

2016 HSC Automotive Vehicle Body Marking Guidelines

Section I

Multiple-choice Answer Key

Question	Answer
1	A
2	D
3	A
4	C
5	D
6	C
7	C
8	B
9	B
10	B
11	D
12	B
13	C
14	A
15	B

Section II

Question 16 (a)

Criteria	Marks
<ul style="list-style-type: none"> Correctly names tool shown 	1

Answers could include:

Torx bit or torx attachment
Star bit or star screwdriver

Question 16 (b)

Criteria	Marks
<ul style="list-style-type: none"> Correctly states a range of advantages of the bolt design 	2
<ul style="list-style-type: none"> States one advantage of the bolt design 	1

Sample answer:

Increase surface area for tool to engage with the bolt, which allows higher tension to be applied to the bolt making it less likely to strip the bolt.

Question 16 (c)

Criteria	Marks
<ul style="list-style-type: none"> Identifies a majority of the tools and steps required to remove the damaged fastener correctly Uses industry terminology 	3
<ul style="list-style-type: none"> Identifies some tools and steps required to remove the damaged fastener correctly Limited industry terminology used 	2
<ul style="list-style-type: none"> States one step or tool Little or no terminology used 	1

Sample answer:

- Protect all surrounding paint/area
- Pilot drill centre and head
- Increased hole and easy out
- Drill head and bolt out.

Tools could include: hammer, centre punch, dremel, slot head screwdriver.

Steps/Procedures:

- Use centre punch and hammer to create an indentation so that the screw can be rotated using the centre punch and hammer rotating the bolt in an anti-clockwise direction.
- Use a dremel to cut a slot in the bolt so a blade screwdriver can be inserted as the tool to remove the bolt.

Question 17 (a)

Criteria	Marks
<ul style="list-style-type: none"> Correctly states the importance of replacing electrical components with one of the same specification 	2
<ul style="list-style-type: none"> Provides a general response relating to electrical component selection and replacement 	1

Sample answer:

Correct component selection is important to ensure the replacement parts are correct for the vehicle and do not cause damage to other components or systems within the vehicle, to ensure other components within the vehicle continue to work and operate correctly. Also ensures the replacement components fit in the correct location. Ensures the components last. Fewer workshop comebacks and warranty claims.

Question 17 (b)

Criteria	Marks
<ul style="list-style-type: none"> Identifies a number of procedures required to remove and replace the battery correctly States WHS precautions Uses industry terminology 	3
<ul style="list-style-type: none"> Identifies a limited number of procedures required to remove and replace the battery correctly States some WHS precautions Limited industry terminology used 	2
<ul style="list-style-type: none"> States one basic procedure required to remove and replace the battery correctly States few or no WHS precautions Little or no terminology used 	1

Sample answer:

When removing a battery care must be taken to follow manufacturer's procedures for shutting down the vehicle and ensuring it remains safe to service. The negative lead should be removed first and, when replacing the battery, the negative lead fitted last. The battery must be the same specifications and be fitted securely. If the vehicle has information in the comfort devices (infotainment, A/C) that will be lost a 'battery minder' can be used but only in conjunction with manufacturer specs.

Question 17 (c)

Criteria	Marks
<ul style="list-style-type: none"> Clearly identifies a range of benefits of using sealed batteries Uses industry specific terminology 	3
<ul style="list-style-type: none"> Identifies some benefits of using sealed batteries Limited industry terminology used 	2
<ul style="list-style-type: none"> States one benefit of using sealed batteries Little or no terminology used 	1

Answers could include:

Benefits of sealed batteries:

- Less likely to explode due to containment of hydrogen gas
- Less likely to corrode the battery terminals and surrounding equipment
- Longer shelf life hence less recharging
- Greater CCA for the same size
- Can be used inside the cabin/boot area without a containment box with external ventilation.

Question 18 (a)

Criteria	Marks
<ul style="list-style-type: none"> Correctly states a number of reasons why a cracked windscreen is considered a defect 	2
<ul style="list-style-type: none"> Correctly states one reason why a cracked windscreen is considered a defect 	1

Answers could include:

- Structural integrity of windscreen
- Impaired vision
- Safety protection.

Question 18 (b)

Criteria	Marks
<ul style="list-style-type: none"> • Outlines a clear procedure to remove the cracked windscreen • Clearly states the WHS precautions • Identifies the tools required • Uses precise industry-specific terms 	4
<ul style="list-style-type: none"> • Outlines a suitable procedure to remove the cracked windscreen • Makes reference to the WHS precautions • States some of the tools required • Uses some industry terms 	2–3
<ul style="list-style-type: none"> • Outlines a basic procedure to remove the cracked windscreen • Uses general terms 	1

Answers could include:

- Protection of vehicle paint work and interior
- Removal of wipers
- Removal of windscreen trim
- Seal retainer removal
- Cutting of windscreen seal
- Lift out windscreen
- Clean content areas
- Check for damage or rust.

Question 19

Criteria	Marks
<ul style="list-style-type: none">• Develops a clear description of strategies that could be used to communicate with the customer• Uses industry-specific examples	3
<ul style="list-style-type: none">• Develops a description of strategies that could be used to communicate with the customer• Uses general examples	2
<ul style="list-style-type: none">• Develops a basic description of a strategy that could be used to communicate with the customer• Uses limited examples	1

Answers could include:

- Locate a translator
- Images/sketches
- Hand signals and gestures
- Inspection or test drive
- Computer translation
- Relaxed attitude and patience.

Communication Strategies

- Use signs and gestures
- Smart phone translator apps
- Have them call an English literate family member to act as a translator possibly on the phone
- Encourage the customer to demonstrate to you what is the problem.

Question 20

Criteria	Marks
<ul style="list-style-type: none">• Develops a clear description of the difference between a hazard and a risk• Uses precise industry-specific examples• Uses precise industry-specific terminology	4
<ul style="list-style-type: none">• Develops a description of the difference between a hazard and a risk• Uses industry-specific examples• Uses industry terminology	2–3
<ul style="list-style-type: none">• Develops a basic description of a hazard or a risk• Uses limited industry examples	1

Sample answer:

A hazard is a location where an accident has a high probability of occurring eg a wet floor or oil on the floor if not identified could result in a slip.

A risk is usually applied to a process that usually occurs in a workplace. This could be lifting boxes or using an electric drill. Here proper processes are used to mitigate the risk of injury.

Question 21 (a)

Criteria	Marks
<ul style="list-style-type: none"> The majority of areas of inspection, possible problems and tools required correctly stated Correctly shows clear links between areas of inspection and problems Precise industry-specific terminology used 	6
<ul style="list-style-type: none"> The majority of areas of inspection, possible problems and tools required correctly stated Correctly shows clear links between most areas of inspection and problems Industry terminology used 	4–5
<ul style="list-style-type: none"> Some areas of inspection, possible problems and tools required correctly stated Shows some links between areas of inspection and problems Some industry terminology used 	2–3
<ul style="list-style-type: none"> A basic area of inspection, possible problem and tools required correctly stated Demonstrates limited links between areas of inspection and problems 	1

Sample answer:

<i>Area of inspection</i>	<i>Possible problems</i>	<i>Tools required</i>
Tyre	Worn tread	Tread depth gauge
Undercarriage	Body damage, engine damage, exhaust	Jack and stands
Alignment, worn suspension, tyre wear, brakes	While driving, vehicle pulls left	Wheel brace, jack, stands
Charging system	Battery condition, faulty alternator	Hydrometer and load tester
Exhaust	Damage, rust, wear of holes	Jack and stands, creeper
Body alignment	Door hard to close	Visual inspection of closure and body gaps
Windows	Alignment, damage, worn motors	Visual and manual operation of windows

Question 21 (b)

Criteria	Marks
Correctly states two or more pieces of information required	2
Correctly states one piece of information required	1

Answers could include:

- Model
- Make
- Year of manufacture
- Body style/trim level
- VIN Number.

Section III

Question 22 (a)

Criteria	Marks
<ul style="list-style-type: none">Clearly describes why the whole vehicle should be inspectedMakes clear links to how damage on one part of a vehicle can affect other componentsUses industry-specific terminology	3
<ul style="list-style-type: none">Describes why the whole vehicle should be inspectedMakes a link to how damage on one part of a vehicle can affect other componentsUses industry terminology	2
<ul style="list-style-type: none">Makes a relevant pointUses general terms	1

Sample answer:

Vehicle may have suffered damage to other areas. Panel gaps and alignment may have changed and or paint damage due to panels touching.

Question 22 (b)

Criteria	Marks
<ul style="list-style-type: none">Clearly describes damage that may be present but only visible once disassembledMakes clear links between frontal damage and damage in internal areas and componentsUses precise industry-specific terminology	4
<ul style="list-style-type: none">Describes damage that may be present but only visible once disassembledMakes some links between frontal damage and damage in internal areas and componentsUses some industry terminology	2–3
<ul style="list-style-type: none">Makes a relevant pointUses general terms	1

Answers could include:

Vehicles may have sustained damage to inner panels moulding and mountings, headlight bracketing and wiring looms. Vehicles may have damage to sensors for airbags, parking, exhaust temperature, cameras etc. Vehicles may have sustained damage to air conditioning components, transmission coolers and fans, horns etc.

Question 22 (c)

Criteria	Marks
<ul style="list-style-type: none"> Provides a detailed explanation of how the damage can be evaluated Clearly identifies issues that could arise if the damage isn't corrected during the repair Provides a logical and cohesive response Uses industry-specific terminology 	8
<ul style="list-style-type: none"> Provides a sound explanation of how the damage can be evaluated Identifies issues that could arise if the damage isn't corrected during the repair Provides a logical response Uses industry-specific terminology 	6–7
<ul style="list-style-type: none"> Provides an explanation of how the damage can be evaluated Identifies some issues that could arise if the damage isn't corrected during the repair Uses industry terminology 	4–5
<ul style="list-style-type: none"> Provides a basic explanation of how the damage can be evaluated Identifies an issue that could arise if the damage isn't corrected during the repair Uses general terms 	2–3
<ul style="list-style-type: none"> Makes a relevant point 	1

Sample answer:

A vehicle may have sustained structural damage that affects suspension points and mountings, as well as chassis alignments.

Vehicles can be evaluated by mounting car on a chassis alignment machine and taking measurements inline with manufacturers' specifications. Alignment issues can be remedied by applying hydraulic rams and jacks.

A vehicle not correctly repaired may have issues with panel alignment, doors closing, wind noise and service issues with not driving straight. Inability to do wheel alignments and being weakened in the damaged areas.

Section IV

Question 23

Criteria	Marks
<ul style="list-style-type: none"> Provides a highly detailed explanation of the implications facing the automotive industry from manufacturers implementing alternative fuels to power their vehicles Demonstrates clear links to the effects that the alternative-fuelled vehicles may have within various sectors of the automotive industry Provides a detailed and cohesive response Uses precise industry-specific terminology 	13–15
<ul style="list-style-type: none"> Provides a sound explanation of the implications facing the automotive industry from manufacturers implementing alternative fuels to power their vehicles Demonstrates links to the effects that the alternative-fuelled vehicles may have within various sectors of the automotive industry Provides a detailed response Uses sound industry-specific terminology 	10–12
<ul style="list-style-type: none"> Provides an explanation of the implications facing the automotive industry from manufacturers implementing alternative fuels to power their vehicles Demonstrates some links to the effects that the alternative-fuelled vehicles may have Provides a descriptive response Uses industry terminology 	7–9
<ul style="list-style-type: none"> Provides a basic explanation of the effect on the automotive industry of manufacturers implementing alternative fuels to power their vehicles Demonstrates some relevant points Uses some industry terminology 	4–6
<ul style="list-style-type: none"> Provides a limited explanation of the effect on the automotive industry of manufacturers implementing alternative fuels to power their vehicles Uses general terms 	1–3

Sample answer:

Implications that alternative fuels and renewable resources have on the industry could include:

- employment
- repair
- infrastructure
- social.

Employment

Issues of employment will mean that mechanical trained repairers will need to be retrained. As the workforce is aging older mechanics may see having to learn new technologies being too hard or being unwilling to retrain. This will cause them to need to find employment in other areas or not at all.

Also, as vehicles become more complex, investment in diagnostic tools specific to the drive type will need to be purchased. This will force small workshops out of the market as the investment in equipment will not necessarily be cost beneficial.

If vehicles are to become fully electric, service costs and intervals are significantly reduced. For example, servicing a Tesla is 40 k intervals. Electric vehicles have a significantly simple drive/power train that has simple and small components compared to petrol engines. This will mean that a smaller workforce will be required to service a larger number of vehicles. As these vehicles become more popular older service centres will become less necessary.

Repair

The repair industry will require new training programs and training facilities. This will require significant investment from government and industry to skill the new workforce required to diagnose faults in computer control systems and high voltage electric motors in the case of electric. Also suitable charging stations will need to be serviced to enable a countrywide coverage.

Hydrogen powered vehicles will require a network of filling stations that have a significantly different safety requirement from petrol or LPG. Vehicles that are powered by hydrogen are typically fuel cell vehicles that are a new technology that will also require a different level of training and investment.

The safety aspect will need to be considered when servicing these hydrogen powered vehicles as it cannot be held in a liquid form (such as for LPG) but needs to be stored as a gas under very high pressure.

Vehicles that are hydrogen powered will need to be safety certified regularly by qualified experts to maintain the quality of vehicles on our roads. As the roll out of electric and hydrogen vehicles is going to occur very quickly in the near future, aspects of training and safety will all require significant investment from vehicle manufacturers and repairers. The downside to the local repairer is that most of the repair work will be completed by manufacturer dealers as they will be the only ones able to afford the training/diagnostic equipment for these vehicles.

Infrastructure

Both hydrogen and electric vehicles in Australia will require significant investment in infrastructure.

Hydrogen

This will require new storage tanks/bowsers and filling stations dedicated to hydrogen. As this is a problem of 'chicken and egg' fuel distributors are unlikely to invest the large amount of cash for such a long-term investment, which will cost in maintenance long before it becomes profitable or mainstream. With such large areas of unpopulated land in Australia, government will need to invest in this or give significant tax benefits.

2016 HSC Automotive Vehicle Body Mapping Grid

Section I

Question	Marks	HSC content – focus area	Employability skills (Please put an X where appropriate)							
			Communication	Teamwork	Problem-solving	Initiative and enterprise	Planning and organising	Self-management	Learning	Technology
1	1	(Stream) – Vehicle Body – Carry out pre-repair vehicle body operations – page 63					X			X
2	1	(Mandatory) – Working in the automotive industry and workplace – Work effectively with others – page 48	X	X						
3	1	(Stream) – Vehicle Body – Prepare vehicle components for paint repair – page 71			X		X			X
4	1	(Mandatory) – Apply safe working practices in an automotive workplace – page 31	X					X		
5	1	(Mandatory) – Working in the automotive industry and workplace – Work effectively with others – page 46	X				X			
6	1	(Stream) – Vehicle Body – Carry out pre-repair vehicle body operations – pages 69–71			X		X			
7	1	(Stream) – Vehicle Body – Carry out pre-repair vehicle body operations – page 69			X		X			X
8	1	(Mandatory) – Working in the automotive industry and workplace – Work effectively with others – page 47	X				X	X		
9	1	(Stream) – Vehicle Body – Use and maintain workplace tools and equipment – page 68						X		
10	1	(Stream) – Vehicle Body – Prepare vehicle components for paint repairs – pages 69 and 71			X				X	X
11	1	(Mandatory) – Apply safe working practices in an automotive workplace – WHS compliance – page 28	X			X		X	X	
12	1	(Stream) – Vehicle Body – Use and maintain workplace tools and equipment – page 68			X		X	X	X	X
13	1	(Stream) – Vehicle Body – Apply automotive electrical system fundamentals – page 67	X		X	X				

Question	Marks	HSC content – focus area	Employability skills (Please put an X where appropriate)							
			Communication	Teamwork	Problem-solving	Initiative and enterprise	Planning and organising	Self-management	Learning	Technology
14	1	(Stream) – Vehicle Body – Prepare vehicle components for paint repairs – page 71			X		X			X
15	1	(Stream) – Vehicle Body – Apply automotive electrical system fundamentals – page 67			X	X	X			X

Section II

Question	Marks	HSC content – focus area	Employability skills (Please put an X where appropriate)							
			Communication	Teamwork	Problem-solving	Initiative and enterprise	Planning and organising	Self-management	Learning	Technology
16 (a)	1	(Stream) – Vehicle Body – Use and maintain tools – page 67			X			X		X
16 (b)	2	(Stream) – Vehicle Body – Use and maintain tools – page 67						X		X
16 (c)	3	(Stream) – Vehicle Body – Use and maintain tools – page 67			X			X	X	X
17 (a)	2	(Stream) – Vehicle Body – Apply electrical system fundamentals – page 66			X		X			X
17 (b)	3	(Stream) – Vehicle Body – Apply electrical system fundamentals – page 57			X	X	X	X		X
17 (c)	3	(Stream) – Vehicle Body – Apply electrical system fundamentals – page 57								X
18 (a)	2	(Stream) – Vehicle Body – Prepare vehicle components for paint repairs – page 69							X	
18 (b)	4	(Stream) – Vehicle Body – Prepare vehicle components for paint repairs – page 70			X		X	X		X
19	3	(Mandatory) – Working in the automotive industry and workplace – Communicate effectively in an automotive workplace – page 48	X			X	X	X		
20	4	(Mandatory) – Safety – Apply safe working practices – pages 26 and 36					X		X	
21 (a)	6	(Mandatory) – Troubleshooting and problem solving – Solve routine problems in an automotive workplace – page 39				X	X	X		X

Question	Marks	HSC content – focus area	Employability skills (Please put an X where appropriate)							
			Communication	Teamwork	Problem-solving	Initiative and enterprise	Planning and organising	Self-management	Learning	Technology
21 (b)	2	(Mandatory) – Work tasks – dismantling and removing components – page 69			X		X	X		

Section III

Question	Marks	HSC content – focus area	Employability skills (Please put an X where appropriate)							
			Communication	Teamwork	Problem-solving	Initiative and enterprise	Planning and organising	Self-management	Learning	Technology
22 (a)	3	(Stream) – Vehicle Body – Carry out pre-repair vehicle body operations – pages 68 and 69			X		X	X		
22 (b)	4	(Stream) – Vehicle Body – Carry out pre-repair vehicle body operations – pages 68 and 69			X	X	X			X
22 (c)	8	(Stream) – Vehicle Body – Carry out pre-repair vehicle body operations – pages 68 and 69 (Stream) – Vehicle Body – Prepare vehicle components for paint repairs – page 70			X		X			X

Section IV

Question	Marks	HSC content – focus area	Employability skills (Please put an X where appropriate)							
			Communication	Teamwork	Problem-solving	Initiative and enterprise	Planning and organising	Self-management	Learning	Technology
23	15	(Mandatory) – Sustainability – Apply environmental and sustainability best practice in an automotive workplace – pages 35 and 36	X						X	X