

Body & Paint Estimator Training

Damage Analysis
Outer Panel Repair



Workbook

Damage Analysis

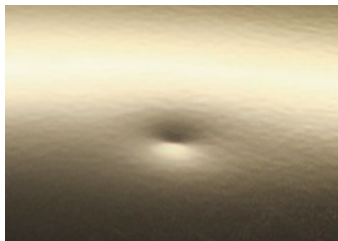
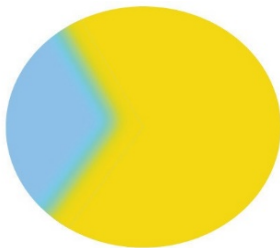
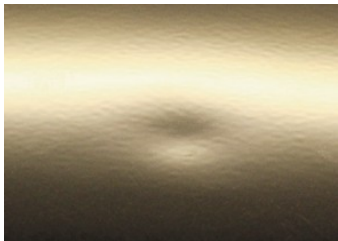


Classroom exercise - Types of deformation

Rationale: Identify the features of elastic and plastic deformation.

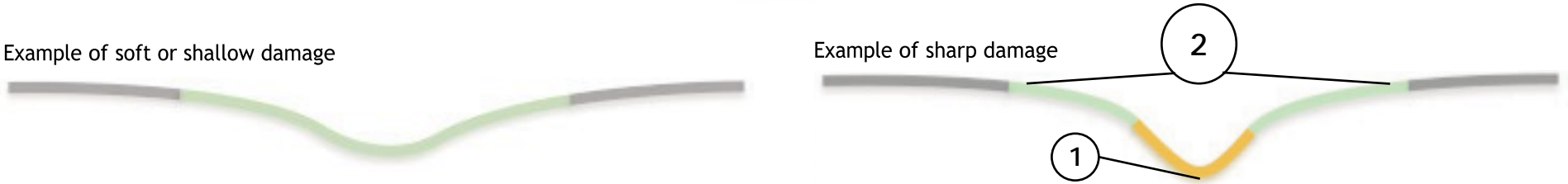
Task instructions: Take note of the aspects that should be considered for each type of dent.

What is the most important aspect to look at when analysing a dent?



Example of soft or shallow damage

Example of sharp damage



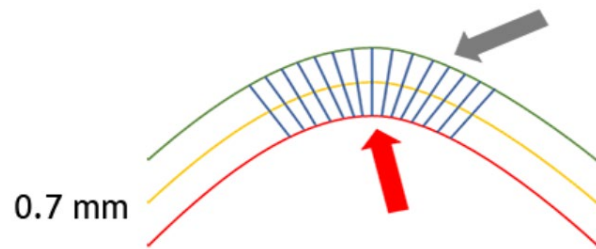
Explanation	
1	
2	



Classroom exercise - Marterial Properties

Rationale: Understand the different molecular changes.

Task instructions: Identify the different areas.



Notes on damage zones:

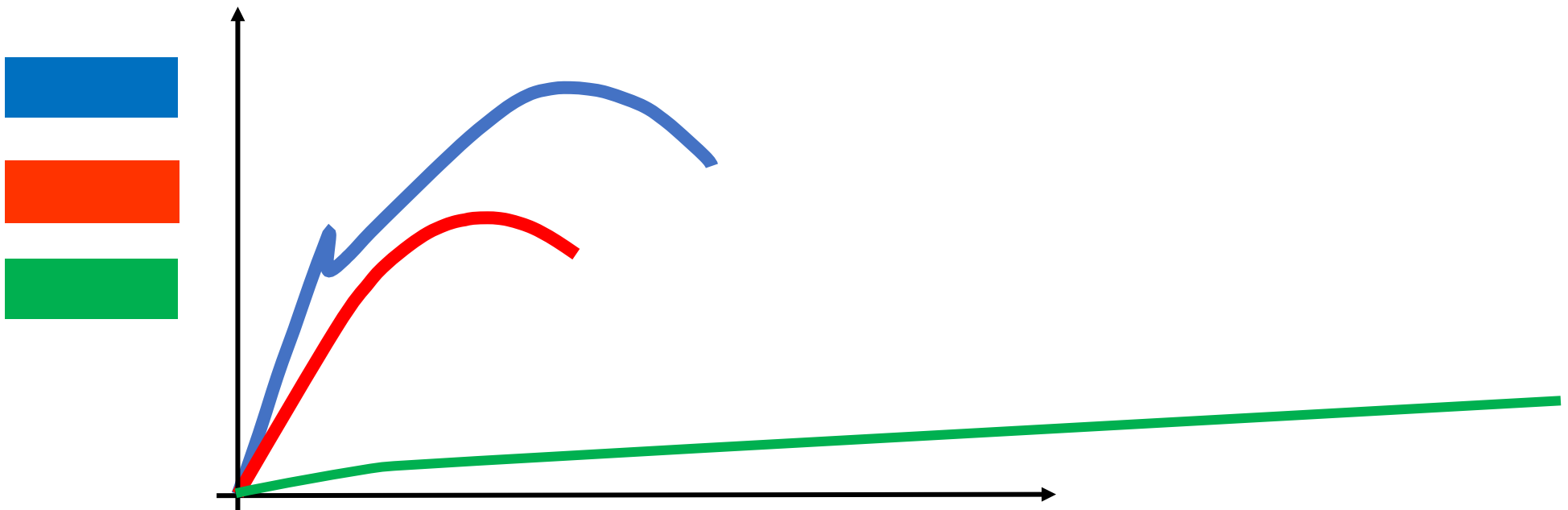




Classroom exercise - Yield - Tensile - Elongation

Rationale: Identify the different aspects of a material.

Task instructions: Mark the yield, tensile strength, elongation of the different materials.

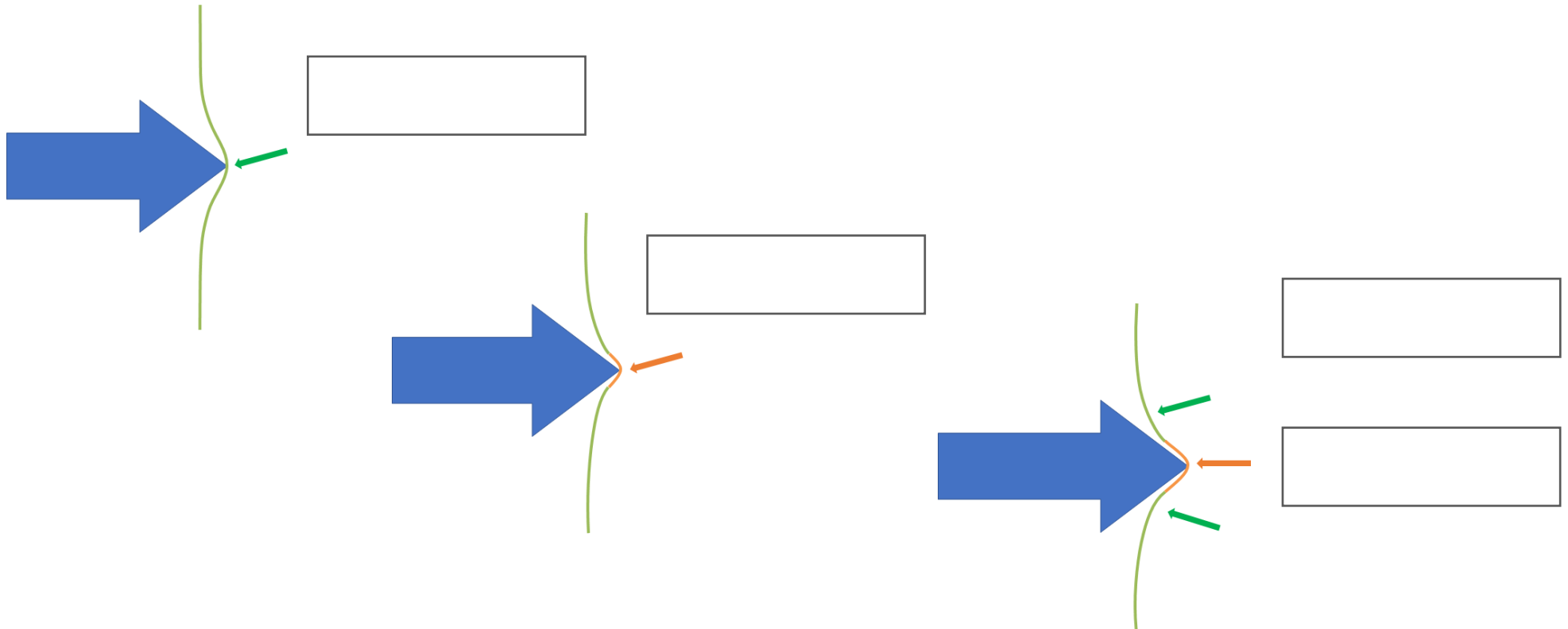




Classroom exercise - Elastic and plastic deformation

Rationale: Identify the different stages in a deformation.

Task instructions: Mark the elastic and plastic deformation.

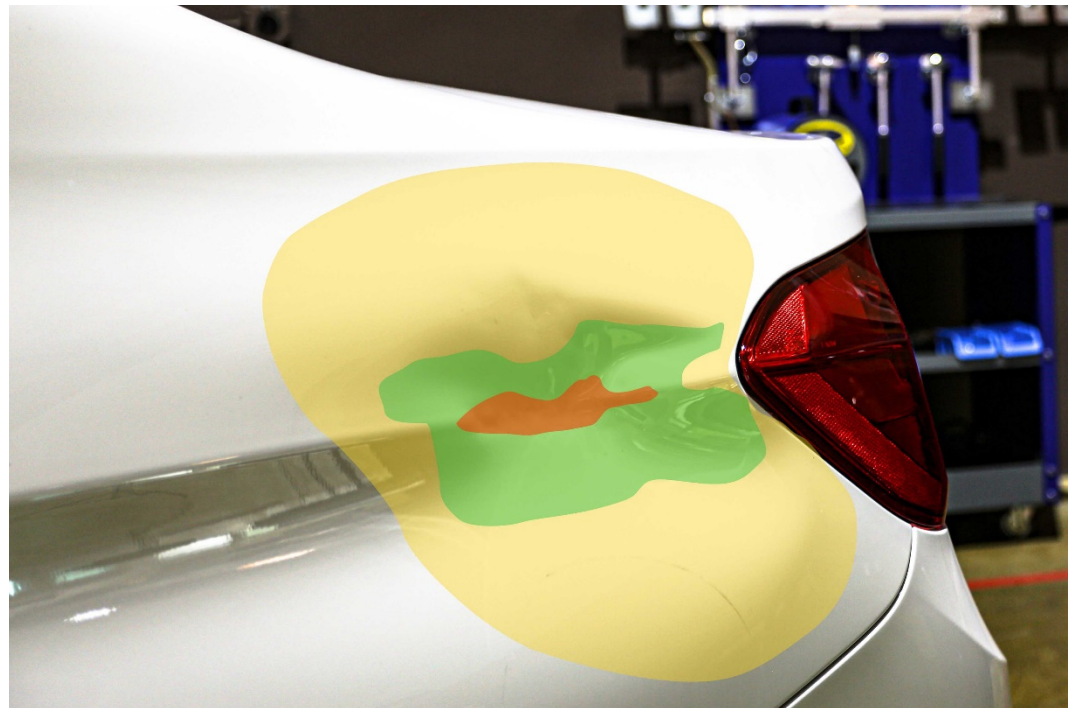




Classroom exercise - Elastic and plastic deformation

Rationale: Identify the different damage zones.

Task instructions: Mark or identify the elastic and plastic deformation, and the crown.



a Activate - Elastic and plastic deformation

Rationale: Identify the different zones.

Task instructions: Assess whether the damage is elastic or plastic.

Car 1



	Elastic
	Plastic

Car 2



	Elastic
	Plastic

Car 3



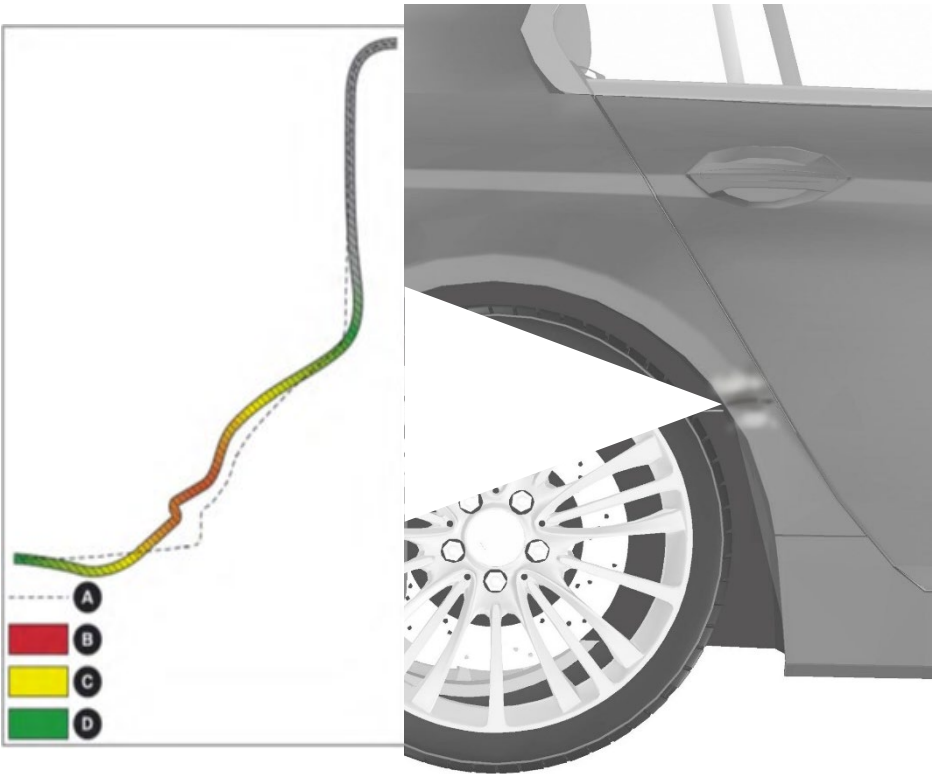
	Elastic
	Plastic



Classroom exercise - Different damage zones

Rationale: Identify the different damage zones.

Task instructions: Note the different zones.

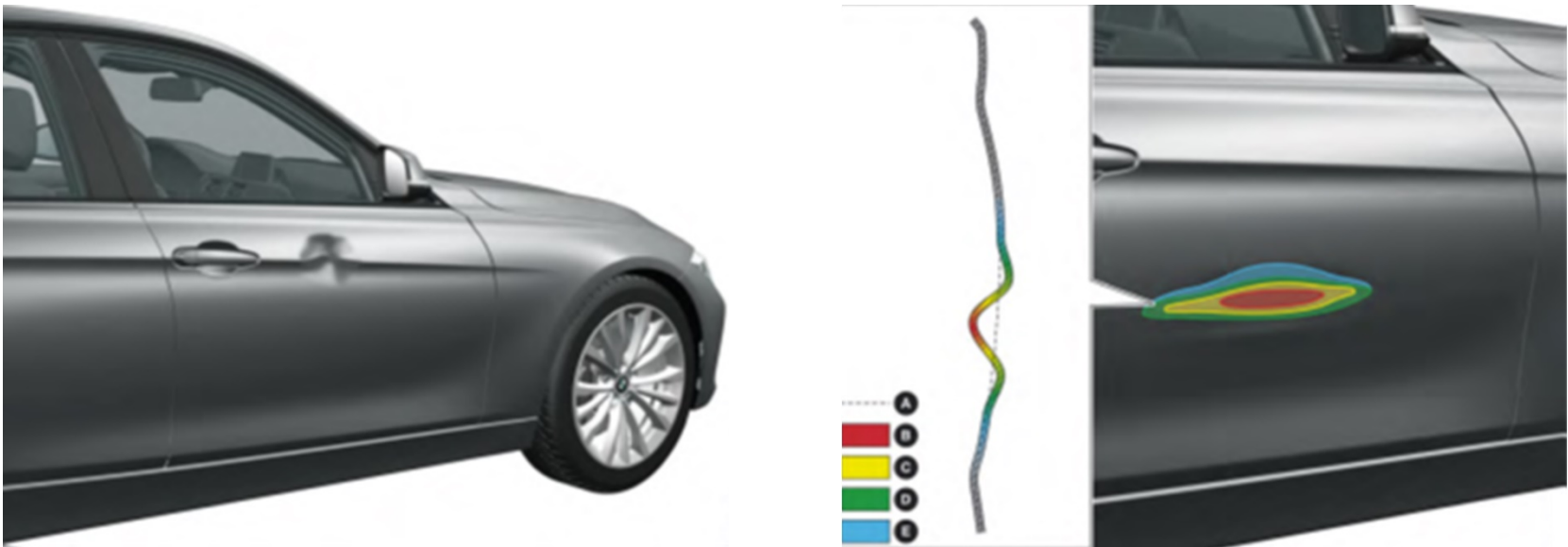


Explanation	
A	
B	
C	
D	

i Classroom exercise - Different Damage zones

Rationale: Identify the different damage zones.

Task instructions: Note the different zones.



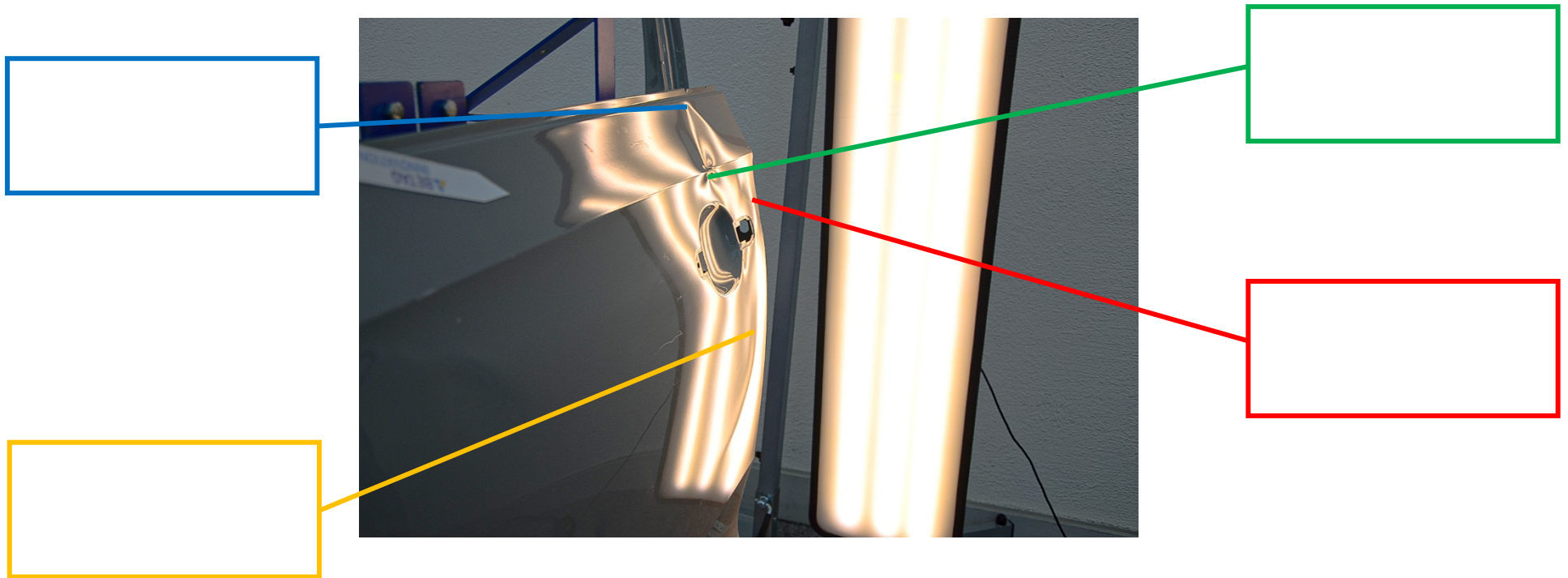
Explanation	
A	
B	
C	
D	
E	



Classroom exercise - Marking damage 3

Rationale: Identify the different damage zones.

Task instructions: Note the different zones.

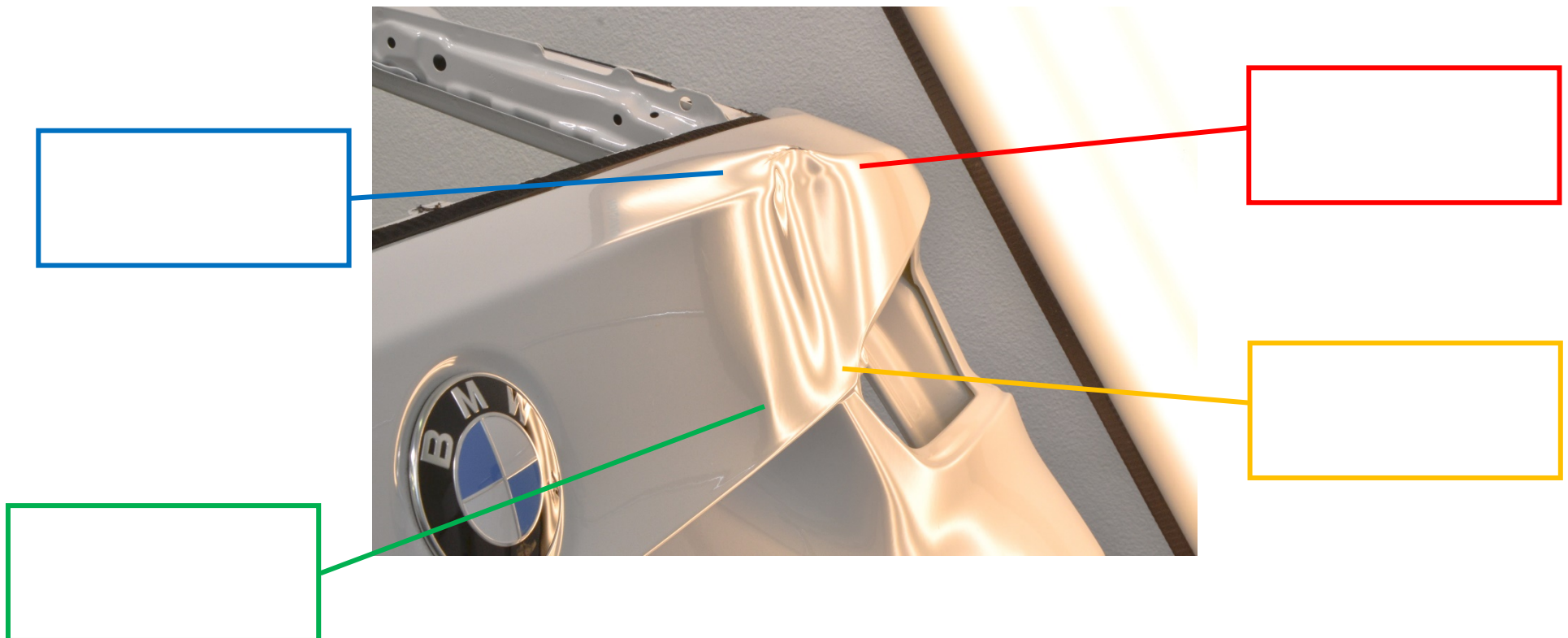




Classroom exercise - Marking damage 4

Rationale: Identify the different damage zones.

Task instructions: Note the different zones.



a Activate - Marking damage

Rationale: Identify the different damage zones.

Task instructions: Note the different zones.



Crown

Direct Damage

Body Line

Energy Zone

**Associated
Deflection**

a Activate - Marking damage

Rationale: Identify the different damage zones.

Task instructions: Note the different zones.



Crown

Energy Zone

Direct Damage

**Associated
Deflection**

Body Line

a Classroom exercise - Marking damage

Rationale: Identify the different damage zones.

Task instructions: Note the different zones.



Crown

Energy Zone

Direct Damage

**Associated
Deflection**

Body Line

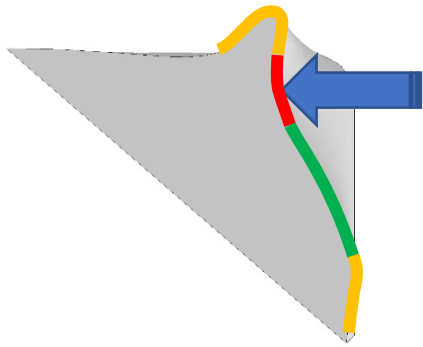
Medium Damage Repair



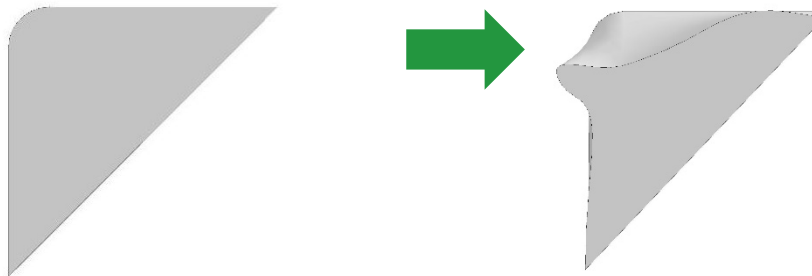
Information - Damage analysis - Impact direction

Rationale: Understand the impact direction and how the different damage zones weere created.

Task instructions: Take notes on the different damage zones and impact direction.



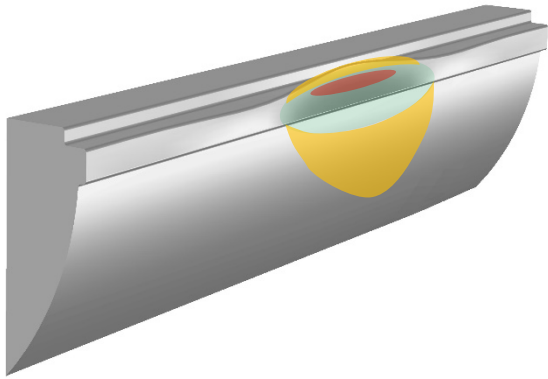
Which is the impact direction?



a Activation - Damage zones

Rationale: Understand the different damage zones on a 90-degree edge.

Task instructions: Take notes on the different damage zones.

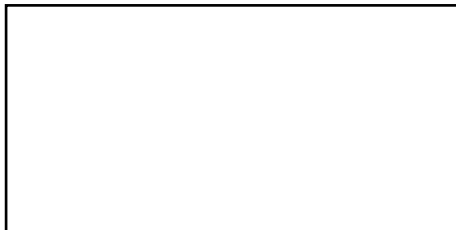
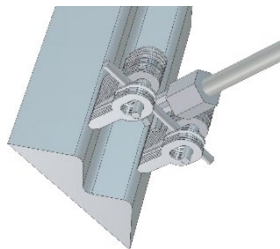
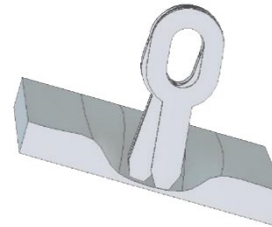
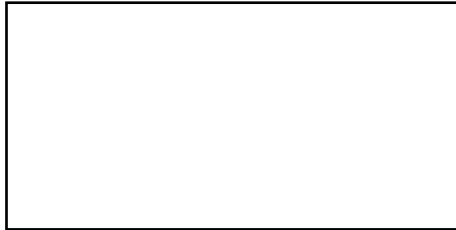
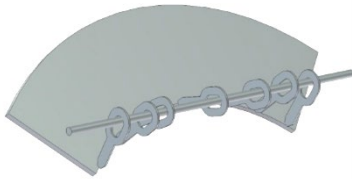
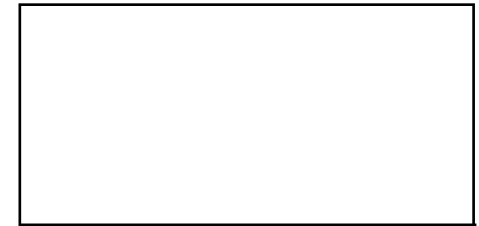
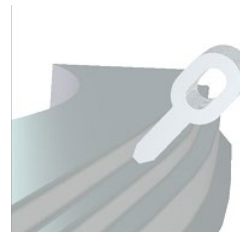
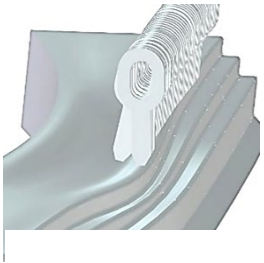


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Information - Tool selection

Rationale: Outline the types of tools which are required for the different repairs.

Task instructions: Identify the right tool for the 90-degree edge repair.





Information - Welding on bits

Rationale: Outline the considerations when welding on bits.

Task instructions: Take notes on the correct use of each application.

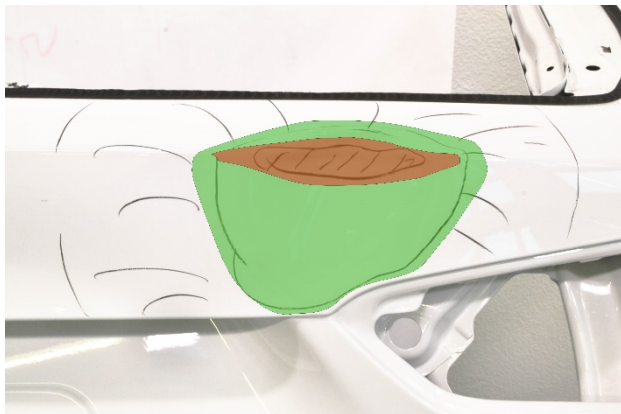




Information - Planning for removal of coatings

Rationale: Outline the zones of the damage that will need to be cleaned to the bare substrate, and the two steps that will improve the ability to see the damage during the repair.

Task instructions: Identify the areas that should be cleaned before and after the first phase of the repair.



Tips for removing coatings:

1. Clean only the _____ zone and body line during the first phase of the repair process.
2. After the majority of the damage has been removed, clean only the areas needed for further finishing.



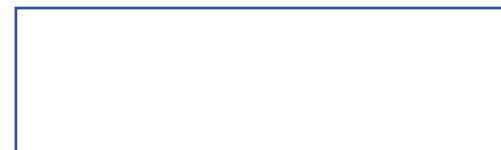
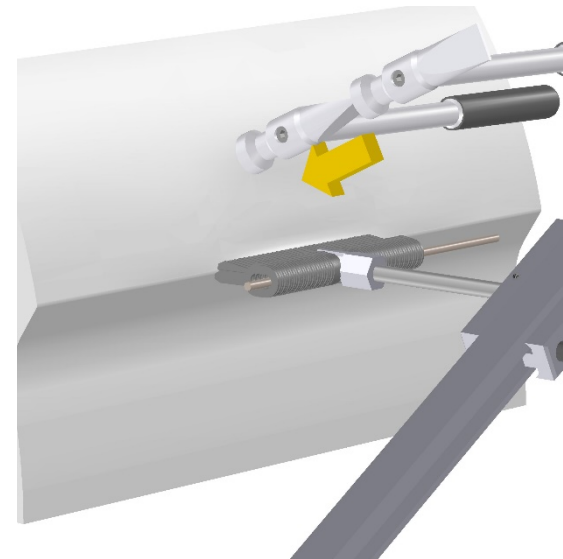
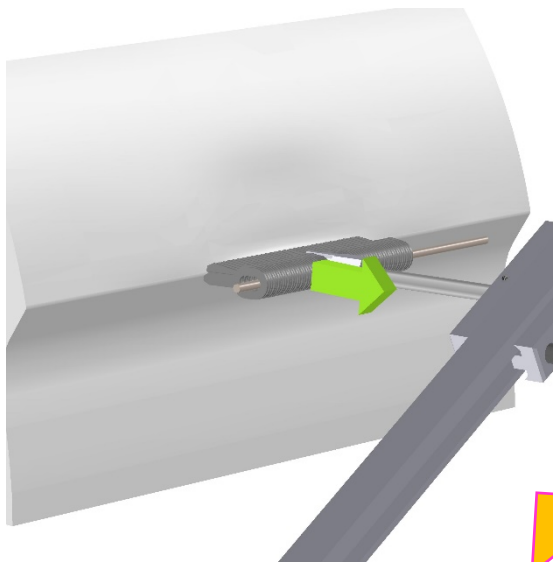
3. Keep as much of the factory coating in place as possible. This will help you use _____ to help visualize the damage.



Information - Pulling, stress relief and stabilizing

Rationale: Outline the main repair steps for an edge repair.

Task instructions: Identify and note the different steps and their correct order.





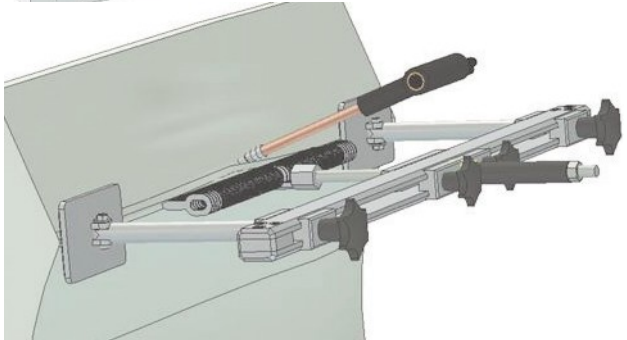
Information - Stabilizing an edge & pulling the damage (lower body line)

Rationale: Outline the procedure for stabilizing an edge & pulling damage.

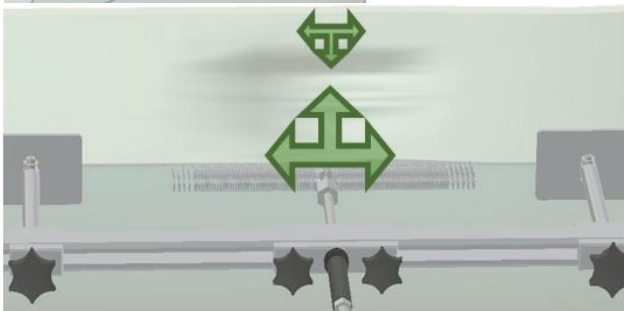
Task instructions: Take notes on the process of pulling damage while stabilizing an edge.



Notes on pulling:



Notes on stabilizing an edge:



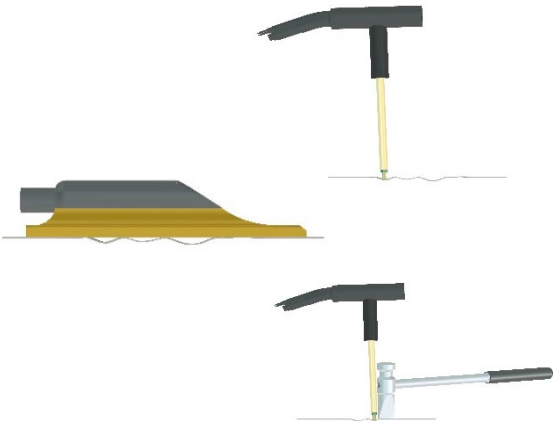
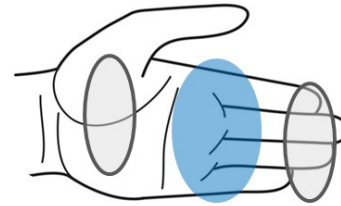
Notes on visualizing for final finish:



Information - Finishing process

Rationale: Understand the different tools and methods required to achieve a high-quality metal finish.

Task instructions: Identify and note the different tools and methods.



i Information - Finishing work using the Innopuller

Rationale: Understand the operation and application of the Innopuller.

Task instructions: Take notes on the use of the Innopuller while performing finishing work.

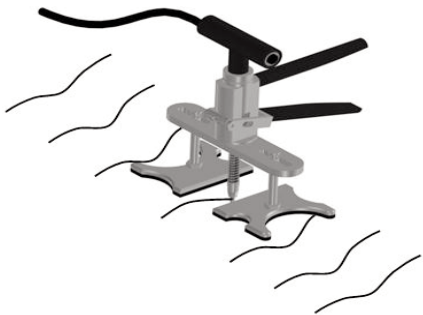
Innopuller



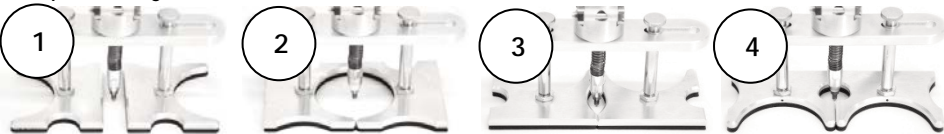
Stress relieving with hammer



Feet placement over body line damage



Innopuller adjustable feet



Notes on Innopuller use:

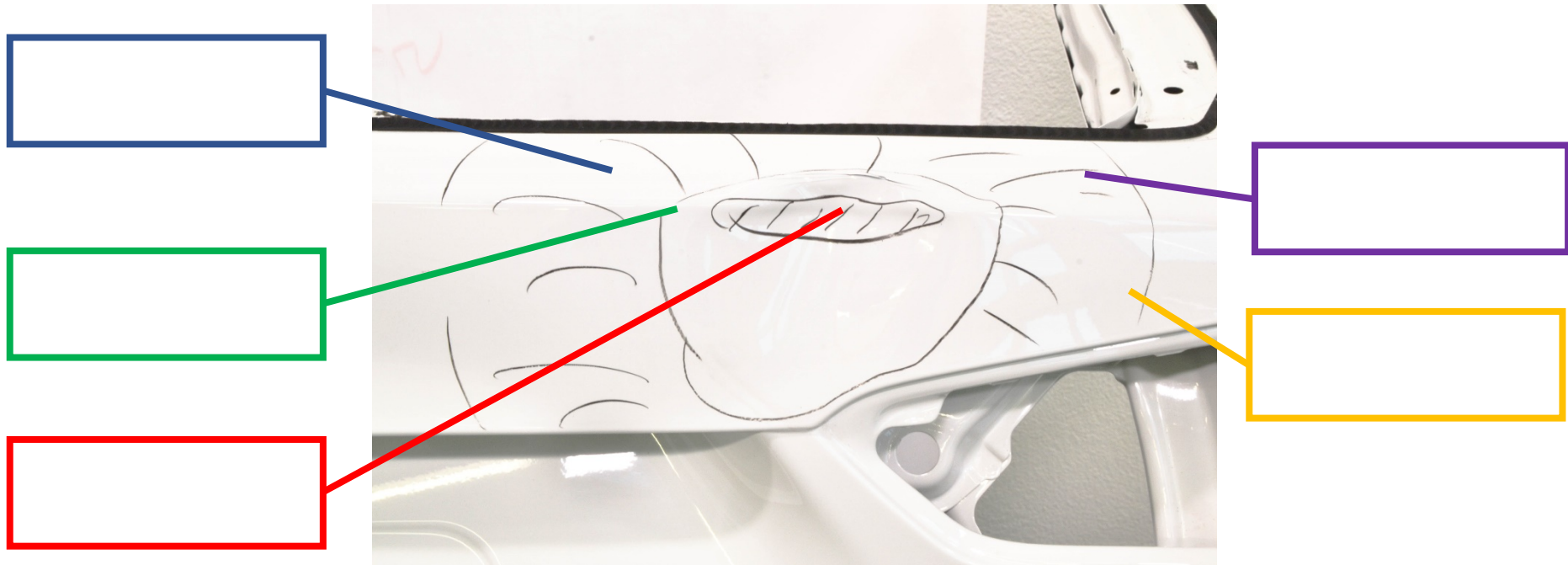
Explanation	
1	
2	
3	
4	



Information - Repair Steps

Rationale: Identify the different repair steps

Task instructions: Note the different steps





Information - Damage 4

Rationale: What are the challenges

Task instructions: Note the different steps and identify the nerve point.





Information - Body line stretched zone and crown

Rationale: Perform straightening of a body line, stretched zone, and crown.

Task instructions: Take notes on the correct procedures to perform the repair.



Sample repair areas

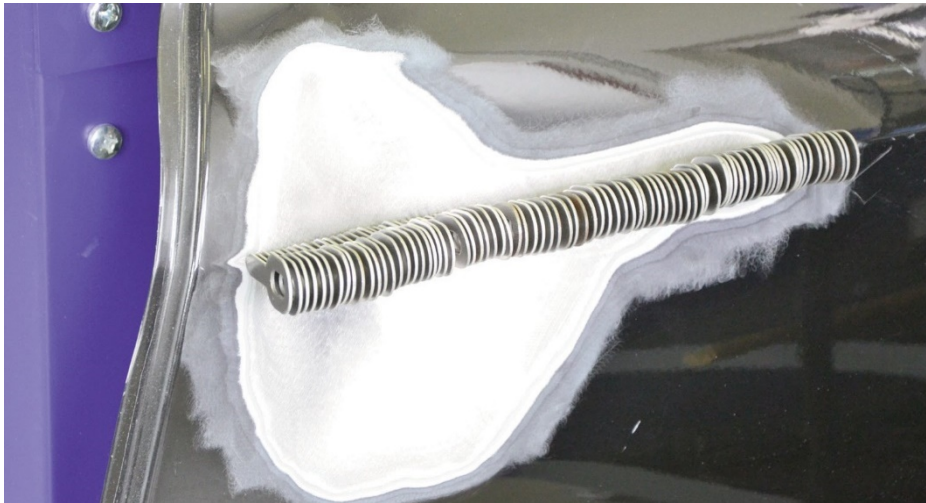




Information - Large area damage with soft body line

Rationale: Perform repair of a larger area, while minimising deformation to surrounding areas.

Task instructions: Take notes on the correct procedures to perform the repair.



Sample repair areas



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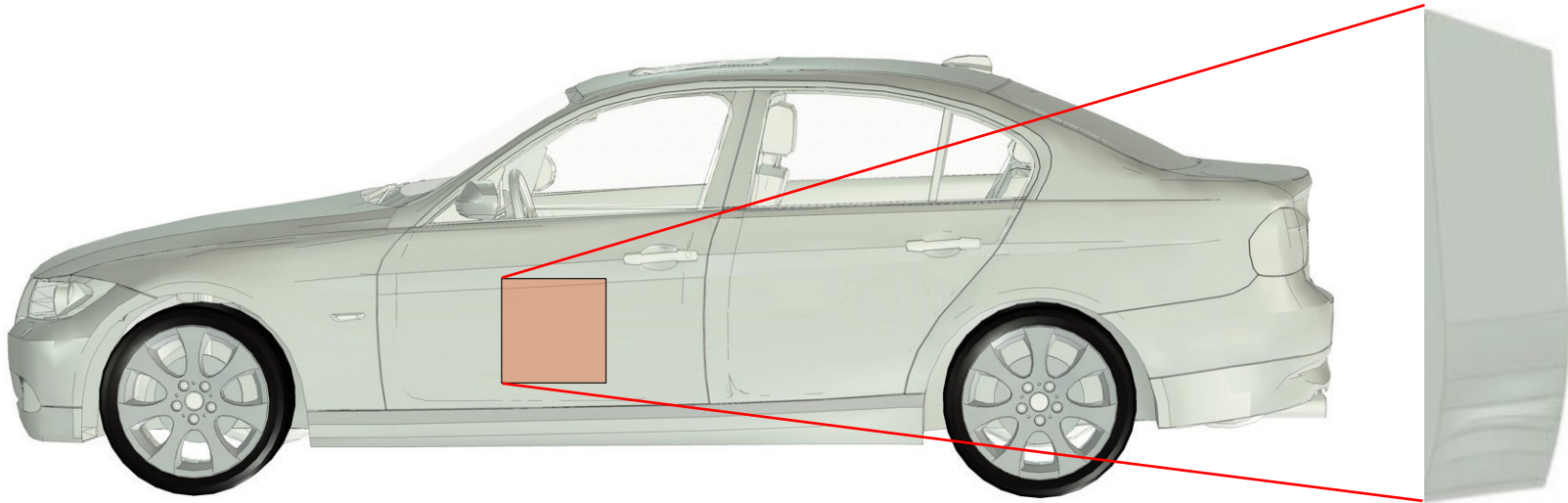
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Information - Flat surface damage

Rationale: Perform repair on a flat surface.

Task instructions: Take notes on the correct procedures to perform the repair.





Information - Door handle area

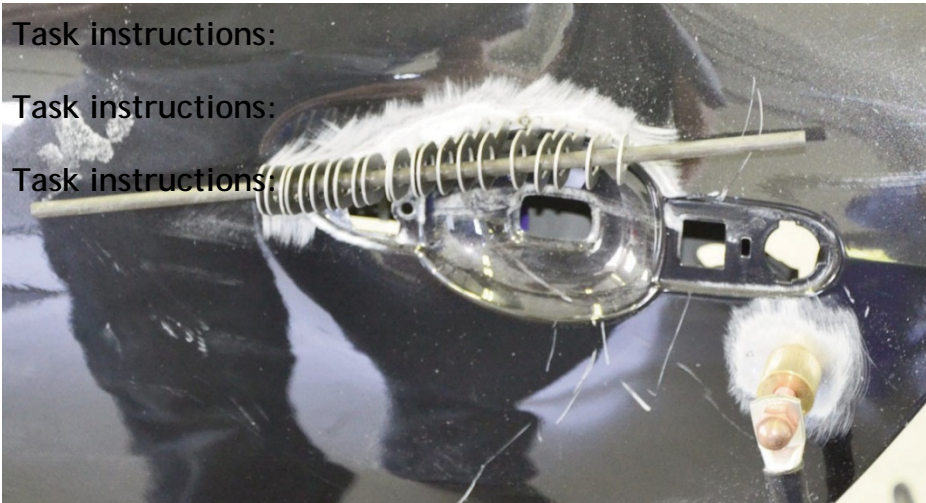
Rationale: Demonstrate the ability to repair round or odd shaped damage.

Task instructions: Take notes on the correct procedures to perform the repair.

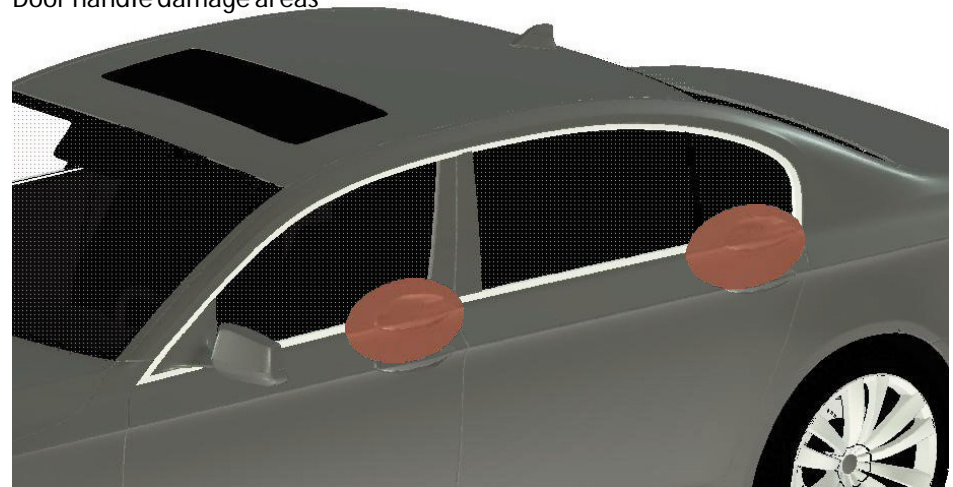
Task instructions:

Task instructions:

Task instructions:



Door handle damage areas

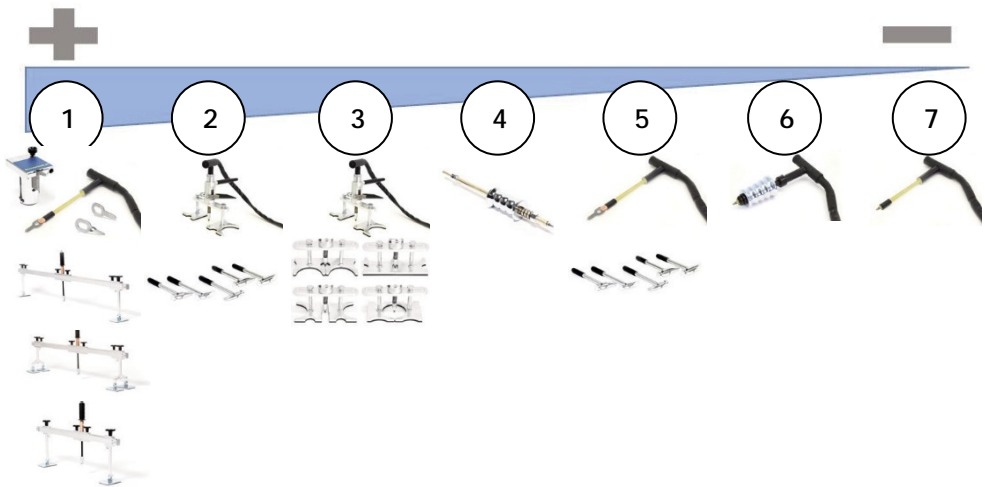




Information - Tool dynamics

Rationale: Describe the different tool variations for the Flatliner and the associated power level (strength) of each option.

Task instructions: Identify the different tool variations and the characteristics of each option pictured below.



Explanation	
1	
2	
3	
4	
5	
6	
7	





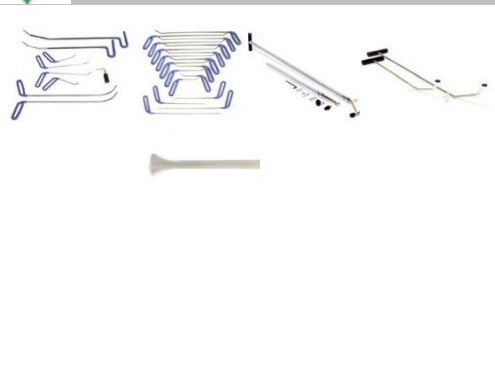

Additional notes on tool dynamics:

Power levels for all repair options (small and medium damage)

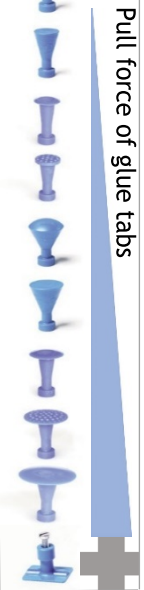


Sharp damage
More invasive repair options

Soft damage
Least invasive repair options

 No access to backside of panel	 Access to backside of panel	 No access to backside of panel
		

Additional notes:





Information - Bit applications and pulling methods

Rationale: Explain the different bit applications and pulling methods that can be used based on the damage being repaired.

Task instructions: Take note of the special information with regards to the pulling method used for each bit application pictured below.

FL80 (80 cm long)



FL120 (120 cm long) and FL160 (160 cm long)

