

IMI Skills Competitions

Pre-Competition Activity Toolbox

Automotive Body Repair



Richard Hutchins

IMI Skills Competitions Manager

RichardH@theimi.org.uk

Contents:

IMI Skills Competitions Pre-Competition Activity Body Repair Overview	Page 3
Setting up Competition Tasks.....	Page 3
Preparing the competitors.....	Page 4
Assessing Task Results	Page 4
Competitors Instructions Task 1.....	Page 5
Judges Marking Sheet Task 1.....	Page 6
Judges Guidance Sheet Task 1.....	Page 7
Host Centre Brief Task 1.....	Page 8
Competitors Instructions Task 2.....	Page 9
Judges Marking Sheet Task 2.....	Page 10
Judges Guidance Sheet Task 2.....	Page 11
Host Centre Brief Task 2.....	Page 12
Competitors Instructions Task 3.....	Page 13
Judges Marking Sheet Task 3.....	Page 14
Judges Guidance Sheet Task 3.....	Page 15
Host Centre Brief Task 3.....	Page 16
Competitors Instructions Task 4.....	Page 17
Judges Marking Sheet Task 4.....	Page 18
Judges Guidance Sheet Task 4.....	Page 19
Host Centre Brief Task 4.....	Page 20
Competitors Instructions Task 5.....	Page 21
Judges Marking Sheet Task 5.....	Page 22
Judges Guidance Sheet Task 5.....	Page 23
Host Centre Brief Task 5.....	Page 24
Overall Competitor Score Sheet.....	Page 25

Overview:

These activities are intended to provide colleges and training centres with suitable tasks and guidance to use:

- As part of the process of identifying their champion
- As part of their competitor preparation prior to IMI Skills Competitions regional competitions
- In determining whether a prospective competitor is at the correct level
- In providing a different learning experience for vehicle paint technicians

While these sample tasks do not directly replicate the IMI Skills Competitions regional tasks, the skills tested do form an inherent part of the knowledge and expertise needed by skilled vehicle paint technicians and relate to the skills tested at regional and national competitions managed by IMI Skills Competitions.

In general regional, competitors are expected to have achieved as a minimum a level 2 NVQ/SVQ/VCQ/VRQ and/or be working towards their level 3. In the main the tasks are intended to be carried out in a practical situation but some testing of underpinning knowledge and problem solving can be included. Centres can devise their own additional tasks to replace or enhance the examples provided. You should adhere to the times suggested as performing under time constraints is an integral part of competitions.

Setting up the Tasks:

- The tasks should be arranged so that all materials and equipment needed to complete the tasks are available to competitors including any report sheets and explanatory task material.
- Expect the unexpected, consider each eventuality and how you'd deal with it. Breakages etc.
- Tasks should be strictly timed as time management is a skill that benefits competitors in gaining maximum marks at any competition. Timings should be challenging but not unachievable.
- Tasks can be "doubled up" where practical to enable more competitors to participate.
- There should be enough staff available to monitor progress, co-ordinate tasks and competitors and judge completed tasks.
- Maximum benefit for the competitors will be gained if the competition can be observed by an audience of fellow students and or staff/invited guests as this adds an extra pressure. The competition could form part of a college open day for example.
- Centres should run through the tasks themselves prior to the competition to ensure that tasks are of the correct timing and that they are able to be completed successfully.
- Health and safety should be maintained throughout the tasks.

Preparing Competitors:

Competitors should be encouraged to participate but not pressured into competing

- It should be explained beforehand that competitors should:
 - Concentrate on the task in hand and not get distracted
 - Think logically when a task involves a problem-solving element
 - Aim for excellence in their performance and not just competence
- Walk competitors through the tasks and task area outlining briefly what they are required to do and the results they are expected to achieve. They should check any points they are unclear about at this stage as minimum assistance will be available once the competition commences.

Assessing Task Results:

All marking is intended to be carried out on a purely objective basis and results obtained or witnessed will either be right or wrong. There are no half marks. Some tasks are processes which need to be monitored throughout and therefore a judge will need to be allocated throughout to such tasks. Judges need to be subject/skill specific but not necessarily have formal assessing qualifications e.g. local employers or technicians. They should however be briefed (preferably the day before the tasks are intended to be carried out) so that they can confirm the standards for each task. Centres are welcome to add their own marking criteria/make changes to those provided here to enhance their competition.

Standardisation

Standardisation is a process where a group of judges sets the standard, they require competitors to meet in order to gain the marks. e.g., acceptable tolerances for any measurements taken. These standards should be aiming for excellence but not be so high that no competitors can achieve, nor too low that all quality is omitted. Once set, these standards should be applied to EACH competitor equally and in the same way.

Above all the competition should be an enjoyable activity for those participating and enable them to experience what it is like to participate in a competitive arena with the pressures this brings. Their involvement will hopefully encourage them to move on to entering the online tests which lead to selection for the IMI Skills Competitions. <https://www.theimi.org.uk/landing/imi-skills-competitions/>

Further help and guidance on setting up and running your pre competition activity along with information on the IMI Skills Competitions please contact the IMI competitions team on 01992 511521 or email skillauto@theimi.org.uk

Have a great competition!

Competitors Instructions Task 1

Automotive Body Repair

Task 1 Repair Damaged Panel (Metal Finish)

Time allowed – 30 Minutes

- ❖ Use the body file to identify the extent of the damage pointed out to you. You should remove only enough material to identify damage.
- ❖ Use the correct dolly from those supplied and a bumping file or correct hammer to repair the damage.

Judges Marking Sheet Task 1

Task A – Repair Damaged Panel - Marking Schedule

Competitor name:

Type: Pre-Competition

Date:

Venue:

Aspect ID	Aspect of Criterion – Description	Max Mark	Requirement or Nominal Size	Mark Awarded
1.1.	Safe working practices adhered to throughout task	1		
1.2	Appropriate PPE used	1		
1.3	Correct body file is chosen	1		
1.4	Body file is adjusted to appropriate profile	2		
1.5	Body file is used in a 'controlled' manner	1	Proper control of the tool	
1.6	Damage is clearly identified	1		
1.7	A suitable amount of material is removed to identify damage	1		
1.8	Correct repair tool / dolly is chosen	1	0.5 per tool	
1.9	Damage is removed and contour regained	2		
2.0	Repair area is left in a suitable condition	2	No deep scratches	
2.1	Task completed in time allowed	1	30 Min	
		14		

	Print	Sign
Judge 1		
Judge 2		
Moderator		

Judges' comments (if applicable):

Judges Guidance Sheet Task 1

Automotive Body Repair

Task 1 Repair Damaged Panel (Metal Finish)

Judges Guidance Sheet

- ❖ One reminder to use PPE is permitted before deducting marks.
- ❖ One warning regarding safe practices permitted before deducting marks.
- ❖ Each section should be marked before competitor progresses to next step.

Host Centre Brief Task 1

Host Centre Brief:

- ❖ Centres should supply a painted panel into which they should place a SMALL dent or 'ding' type of damage as might be found in a new panel delivered to the workshop. A slow crowned panel would be best.
- ❖ The panel should be mounted on a panel stand (in its normal position) and secured with cable ties or clamps. Competitors should be encouraged to repair the panel in this position.
- ❖ The appropriate tools should be laid out, but this tool display should also include tools that are incorrect for the repair being tackled, e.g. engineers file as well as a body file, a convex body file if available, as well as an adjustable file, a hammer that would be totally unsuitable as well as the correct type.
- ❖ The best competitors will not only repair the damage, but they will use the body file correctly to leave as clean a finish as possible.

Infrastructure List:

Item Description	Number per competitor	Number per competition (6 competitors)
Panel – with damaged area introduced	1	6
Panel stand	1	1
Clamps or cable ties	1	Pack
Body File	1	6
Selection of dollies to include one suitable for contour of panel	selection	
Planishing Hammer	1	6
Pick Hammer	1	6
Engineers Hammer (distractor)	1	1
Engineers file (distractor)	1	1 set
Adjustable file (distractor)	1	1
PPE		

Competitors Instructions Task 2

Automotive Body Repair

Task 2 - MAG Welding

Time allowed – 30 minutes

- ❖ Check and set up the welding equipment for the weld type. Including gun tip, nozzle shield, power settings, wire type, speed, gas type and flow.
- ❖ Prepare sheet metal provided.
- ❖ Carry out a test weld and assess for strength and defects.
- ❖ Complete a horizontal butt weld.
- ❖ Carry out a quality check on the finished weld.
- ❖ Shut down welding equipment on completion of task.

Note:

Provided for you are 6 coupons to complete 2 weld test pieces and 1 setup/practice piece.

You should select which test piece to submit for marking.

Judges Marking Sheet Task 2

Task 2 – MAG Welding - Marking Schedule

Competitor name:

Type: Pre-Competition

Date:

Venue:

Aspect ID	Aspect of Criterion – Description	Max Mark	Requirement or Nominal Size	Mark
1.1	Safe working practices adhered to throughout task	1		
1.2	Appropriate PPE used	1		
Horizontal Butt weld set up				
1.3	Gas pressure is turned on and adjusted	1		
1.4	Gas pressure is set correctly to allow for change in position, to allow for drop off in gas	1	Max 20l/min	
1.5	Test weld is completed to establish machine settings	2		
1.6	Amperage is set/reset according to results of test weld	1	Decrease in amperage	
Horizontal Butt weld –test piece				
1.7	Weld joint is cleaned before welding	1		
1.8	Suitable gap is left to aid grab through	1	½ to 1 X metal thickness	
1.9	Weld joint is tacked prior to welding (at least FOUR, evenly spaced tacks and lightly sanded)	4	Grab through visible at each tack 1 mark each	
1.10	Samples are set up in the correct orientation	1	Horizontal/Butt	
1.11	Finished weld is continuous. Competitor is allowed a max of 3 start and stops	2	No gaps when held up to light	
1.12	Weld bead cap height not more than 3 x metal thickness.	1		
1.13	Grab through to root. 2 marks if present for at least 75%% of weld (continuous) 1 mark for 50%	3	See judges' guidance	
1.14	Weld remains together when a DT cup test is carried out.	3	See judges' guidance	
1.15	Complete task in time allocated	1	(30 Min)	
		24		

	Print	Sign
Judge 1		
Judge 2		
Moderator		

Judges' comments (if applicable):

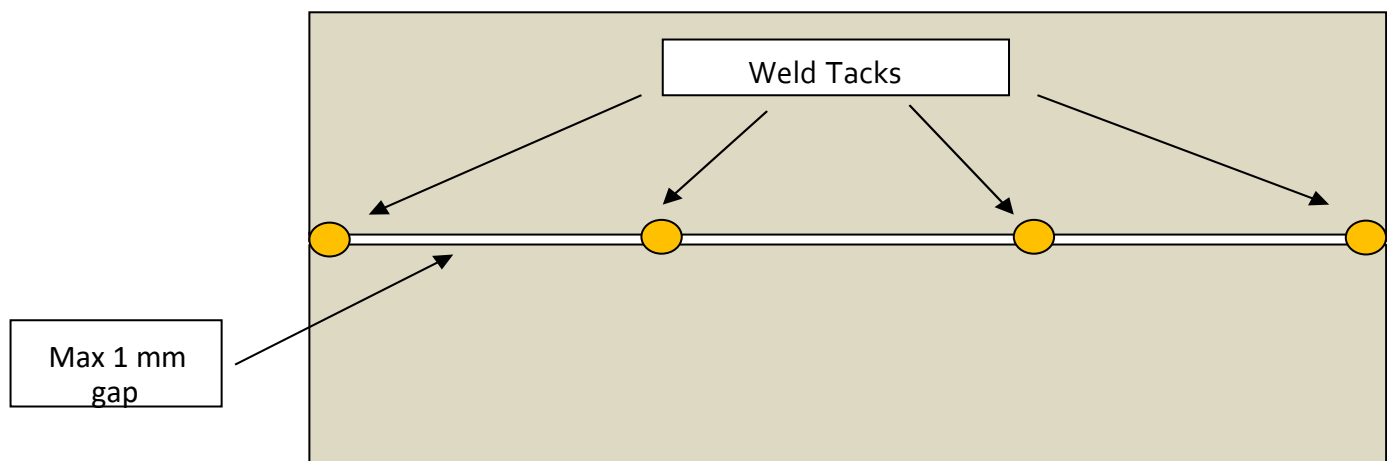
Judges Guidance Sheet Task 2

Automotive Body Repair

Task 2 MAG Welding

Judges Guidance Sheet

- ❖ One reminder to use PPE is permitted before deducting marks.
- ❖ One warning regarding safe practices permitted before deducting marks.
- ❖ Horizontal butt weld
 - Gas pressure set to max 20 litres per min
 - A gap of ½ to 1 times metal thickness is left to aid grab
- ❖ At least 4 evenly spaced, lightly sanded tack welds prior to welding (see drawing)
 - No gaps in continuous weld bead.
 - Maximum of 3 start/stops.
- ❖ Weld bead no more than 3 X metal thickness e.g. 3mm.
- ❖ Grab through to root of weld present for 75% - award 2 marks. 50% - award 1 mark. Less than 50% - award no marks.
- ❖ Weld must remain together when DT cup test carried out.



Host Centre Brief Task 2

Host Centre Brief:

- ❖ Competitors should be provided with 6 uncoated mild steel coupons measuring 200 X 75mm of 1 mm thickness.
- ❖ The welding plant should be in a shutdown condition with amperage settings above specification requiring the competitor to decrease the amperage for the butt weld.

Infrastructure List:

Item Description	Number per competitor	Number per competition (6 competitors)
MIG welder and accessories (Gas, wire, etc)	1	3
Welding screens	2	As set up needed
Fume Extraction	1	As set up needed
Welding bench c/w vice	1	As set up needed
Uncoated mild steel sheets 200mm X 75mm X 1mm	6	36 (minimum)
Finishing sander	1	3
Horizontal set up jig/welding frame	1	3
General hand tools	selection	
PPE		

Competitors Instructions Task 3

Automotive Body Repair

Task 3 – Panel Adjustment-Alignment

Time allowed – 30 minutes

- ❖ On the vehicle supplied, adjust the bonnet so that it is the correctly positioned.

Judges Marking Sheet Task 3

Task 3 – Panel Adjustment-Alignment - Marking Schedule

Competitor name:

Type: Pre-Competition

Date:

Venue:

Aspect ID	Aspect of Criterion – Description	Max Mark	Requirement or Nominal Size	Mark Awarded
1.1.	Safe working practices adhered to throughout task	1		
1.2	Appropriate PPE used	1		
1.3	Misaligned condition is detected and identified	1		
1.4	Bonnet Panel is adjusted in the correct manner	2		
1.5	Appropriate adjustment tools selected	2		
1.6	Wing is adjusted in the correct manner	1		
1.7	Gap between wing and bonnet is correct to within tolerance	2	+/- .25mm	
1.8	Gaps are correct after adjustment around rest of bonnet	2		
1.9	Vehicle is left in a clean condition and panels are undamaged	1		
2.0	Task is completed within the time	1	30 Min	
		14		

	Print	Sign
Judge 1		
Judge 2		
Moderator		

Judges' comments (if applicable):

Judges Guidance Sheet Task 3

Automotive Body Repair

Task 3 Panel Adjustment-Alignment

Judges Guidance Sheet

- ❖ One reminder to use PPE is permitted before deducting marks.
- ❖ One warning regarding safe practices permitted before deducting marks.

Host Centre Brief Task 3

Host Centre Brief:

- ❖ Centres should supply a suitable vehicle where the fixings for the bonnet and wing can be reached easily, and the wings / bonnet can be easily misaligned.
- ❖ Before the competitor begins the task the bonnet and one of the wings should be misaligned.
- ❖ The wing should be misaligned by moving it one direction either out or in.
- ❖ Suitable measuring equipment should be made available such as gap gauges or digital micrometer along with the tools and equipment required to adjust these panels.
- ❖ All signs of misalignment should be removed e.g., any/all old marks should be cleaned away.

Infrastructure List:

Item Description	Number per competitor	Number per competition (6 competitors)
Vehicle with adjustable wing and bonnet fixings	1	1
Appropriate tools to carry out adjustments	1	1
Gap gauges (or suitable measuring device)	1	1
PPE		

Competitors Instructions Task 4

Automotive Body Repair

Task 4 – Resistance Spot Welding

Time allowed – 30 minutes

- ❖ Check and set up the resistance spot welding equipment and produce two test nuggets for assessment.
- ❖ One coupon should be pulled, and one coupon should show the weld but not be pulled.

Note:

Provided for you are 10 samples to complete the weld practice and set up test pieces. You should select which two test pieces to submit for marking.

Judges Marking Sheet Task 4

Task 4 – Resistance Spot Welding - Marking Schedule

Competitor name:

Type: Pre-Competition

Date:

Venue:

Aspect ID	Aspect of Criterion – Description	Max Mark	Requirement or Nominal Size	Mark Awarded
1.1	Safe working practices adhered to throughout task	1		
1.2	Appropriate PPE used	1		
Weld set up				
1.3	Checks welding tips for condition	1	Visual check	
1.4	Makes any necessary adjustments to tips	1		
1.5	Sets up machine to produce first weld coupon	2		
1.6	Removes paint from samples before welding	1		
1.7	Applies weld through primer to test coupons prior to welding	1		
Weld –test piece				
1.8	Pulls first coupon and makes any adjustments to machine based upon the results	2	Further two tests are allowed	
1.9	Produces single spot weld coupon not pulled	2		
1.10	Produces single weld pulled	2		
1.11	Closes down equipment and leaves it in a clean condition	1		
1.12	Complete task in time allocated	1	30 Min	
		16		

	Print	Sign
Judge 1		
Judge 2		
Moderator		

Judges' comments (if applicable):

Judges Guidance Sheet Task 4

Automotive Body Repair

Task 4 Resistance Spot Welding

Judges Guidance Sheet

- ❖ One reminder to use PPE is permitted before deducting marks.
- ❖ One warning regarding safe practices permitted before deducting marks.

Host Centre Brief Task 4

Host Centre Brief:

- ❖ Competitors should be supplied with 10 spot weld coupons each along with an envelope.
- ❖ The coupons should be primed both sides and therefore abrasive or a suitable tool should be supplied in order for competitors to remove the primer.
- ❖ Suitable 'weld through' primer should be provided to candidates.
- ❖ If the centre has an automatic or semi-automatic welder some thought should be given to pre-setting the machine to test the competitors understanding of the process and introducing a problem-solving element into the task. This for example may involve using a poor profile or burned welding tip. This means that the task will have to be re-set after each competitor.

Infrastructure List:

Item Description	Number per competitor	Number per competition (6 competitors)
Spot welder and accessories	1	1
Welding screens	2	As set up needed
Fume Extraction	1	As set up needed
Welding bench c/w vice	1	As set up needed
Primed mild steel coupons	10	60
Sander or suitable abrasives to clean off primer coat	1	3
Set up jig/welding frame	1	1
General hand tools	selection	
PPE		

Competitors Instructions Task 5

Automotive Body Repair

Task 5 – Resistance Application of Sealer

Time allowed – 30 minutes

- ❖ Using the panel supplied, prepare the section indicated to you and place a sealer bead at least 300mm long to match the factory finish.

Judges Marking Sheet Task 5

Task 5 – Resistance Spot Welding - Marking Schedule

Competitor name:

Type: Pre-Competition

Date:

Venue:

Aspect ID	Aspect of Criterion – Description	Max Mark	Requirement or Nominal Size	Mark Awarded
1.1.	Appropriate vehicle care taken throughout task	1		
1.2	Safe working practices observed throughout task	1		
1.3	Section is examined and cleaned as necessary with appropriate cleaner	1		
1.4	Correct sealer is selected	2		
1.5	Sealer is loaded correctly	1		
1.6	Nozzle is selected and prepared	1		
1.7	Suitable profile is achieved at nozzle end	1		
1.8	Completed Sealer bead is continuous	1	No gaps	
1.9	Profile of bead closely matches factory finish	2	2 = exact match 1 = close match	
2.0	Rest of panel is left clean and free from sealer	2		
2.1	Task is completed in time allocated.	1	30 Min	
		14		

	Print	Sign
Judge 1		
Judge 2		
Moderator		

Judges' comments (if applicable):

Judges Guidance Sheet Task 5

Automotive Body Repair

Task 5 Application of Sealer

Judges Guidance Sheet

- ❖ One reminder to use PPE is permitted before deducting marks.
- ❖ One warning regarding safe practices permitted before deducting marks.

Host Centre Brief Task 5

Host Centre Brief:

- ❖ Centres should supply enough panels for the number of competitors.
- ❖ The sealer should be removed around the folded edge except for a section 100mm long which will allow competitors to view and match a factory finish.
- ❖ Enough clean nozzles should be made available (with or without guide sprue) along with tools to allow the competitor to profile the end of the nozzle.
- ❖ If possible, several different sealers (or sealer colours) should be made available along with data sheets for these products.
- ❖ Suitable applicators should be made available, and competitors should not be penalised if they use a mechanical applicator rather than a pneumatic type.

Infrastructure List:

Item Description	Number per competitor	Number per competition (6 competitors)
Vehicle panels (door, boot lid or bonnet)	1	1
Range of sealers/colours		
Range of applicators		
Adequate supply of clean nozzles		
Data sheets		
Cleaning fluids		
Cleaning cloths/wipes		
PPE		

Overall Competitor Score Sheet

IMI Skills Competitions – Automotive Body Repair

Pre-Competition Activity

Consolidated Score Sheet

Competitor	Task A (14 marks)	Task B (24 marks)	Task C (14 marks)	Task D (16 marks)	Task E (14 marks)	Total Marks	Max Marks	Score %
							82	
							82	
							82	
							82	
							82	
							82	
							82	
							82	
							82	
							82	

Average for all competitors = _____ %

Judge (print name)	Signature	Task(s)	Date