higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

MOTOR BODYWORK THEORY N1

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This marking guideline consists of 6 pages.

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QUESTION 1

1.1 It means protecting yourself✓ and other workers from possible danger✓ and injury,✓ and always wearing full PPE.✓ (4)

1.2
- Close the acetylene valve in the blowpipe and then shut the oxygen valve.
- Shut off the cylinder control valve. (2)

1.3 To divide a small quantity of water into several small streams and expose these streams, in a suitable container, to the maximum amount of cooling air (2)

1.4
- Window regulator clutch gear
- Arm-control gear plate (2)

1.5
- It does not require great heat as welding.
- Dissimilar metals, e.g. brass and steel, may be joined by it.
- Small dents or deep scratches in components that have to be chromium-plated may be filled by means of brazing.
- Brazing may be employed for the repair of high-carbon steel, such as a bumper. (4)

1.6 Carburising flame:
- More acetylene than oxygen
- Three stages cone appearance

Oxygen flame:
- More oxygen than acetylene
- Two stages cone appearance (2 × 2) (4)

1.7
- Grinding off existing paint or unnecessary material
- Cleaning the job properly prior to filing
- Finishing off a completed panel properly
- Smoothing out synthetic materials
- Grinding off and smoothing a welded joint
- Neatly finishing off and smoothing a repaired panel (Any 2 × 1) (2)

[20]

QUESTION 2

2.1 Brazing:

- The metals are not melted together, but merely heated sufficiently for the brazing rod and flux to melt.
- The molten rod now penetrates into the metal for a certain depth. This forms a joint that is much stronger than a soft solder joint.

Welding:

- Two metals are melted together.
- The welding rod is used for filling up, so that the entire joint will be uniform and smooth. (2 × 2) (4)

2.2

- Neutral flame✓ – Welding sheet metal, e.g. mild steel✓
- Carburising flame✓ – Brazing steel pipes✓
- Oxidising flame✓ – Cutting sheet metal✓ (3 × 2) (6)

2.3 Hard surfacing is a process of depositing a special metal alloy that is very resistant to wear on a surface of steel or cast iron. (2)

2.4

- All valves and regulators must be free of grease or oil.
- Cylinder valves must be opened slowly to avoid damaging the regulator and gauges.
- A clogged nozzle may be cleared by means of nozzle cleaner of the correct thickness.
- Keep the flame away from the cylinders and hoses.
- Always use dark goggles to protect your eyes.
- Both cylinders should be kept in a cool place to avoid all heat or fire near the cylinders.
- Acetylene cylinders should always be placed in a vertical position.
- Handle the cylinders with care and avoid bumping them against others or dropping them. (8)

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QUESTION 3

3.1
- The spray gun should be held at 150 mm to 250 mm from the surface to be painted.
- If held too far from the surface, a vapour dust will be blown onto the wet paint. The surface will then be rough and have a gritty appearance.
- The spray gun should always be held at right angles to the work.
- The spray gun should not be moved too fast or too slowly. If moved too fast, the film of the paint applied will be too thin and vice versa. Furthermore, it should be moved parallel to the surface.
- If moved along an arc, the paint will be of uneven thickness.
- By a slight deflection of the wrist, the spray gun can be held straight from one end of the stroke to the other.
- Your shoulder could also be moved with your arm to get the desired effect.
- When you are spray painting a horizontal surface, spraying should be started at the side nearest to you.
- The spray should never be interrupted before the full stroke has been completed and the spray gun should be moved at an even tempo from one side to the other.
- At the end of the stroke, the spray gun is shut off. (10)

3.2
- Analyse the extent of the stretched area.
- Select all the required tools, e.g. welding plant, planishing or block hammer, flat dolly, water and wet rags.
- The area must be panel-beaten before the stretched section can be shrunk.
- The sound-proofing material must be removed from the inside.
- If the stretched area is about the size of the palm of your hand, then heat only one spot.
- Use a neutral flame when shrinking.
- The tip of the flame must not be held too close to the metal.
- The heated metal is heated to a red spot.
- The dolly is held underneath and the metal is hammered around.
- The excess metal is now connected on the centre, after which the metal is cooled slowly in a circle with a wet rag from the outside towards the centre. The process is repeated until a level area is obtained. (10)

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QUESTION 4

4.1
- On completion of spraying, immediately pour out the remaining paint.
- Clean the paint can thoroughly with thinners.
- Pour a small quantity of clean thinners in the can and blow it through the spray gun.
- This will aid in cleaning the small internal passages of the spray gun.
- Remove the spray head and clean it with thinners and blow it with air.
- Clean out the holes in the spray head with a hard brush and thinners if blocked.
- Lubricate the parts that have to be oiled and greased.
- The air control valve stem should be lubricated on a daily basis.
- Never immerse the entire spray gun in a basin containing thinners.
- Assemble the spray gun. (10)

4.2 Acetylene:
- Maroon in colour
- Left-hand threads
- Shorter than oxygen cylinders

Oxygen:
- Black in colour
- Right-hand threads
- Longer than acetylene cylinders (3 × 2) (6)

4.3
- Seal off the hose connection by means of special rubber plugs.
- The filler pipe is also sealed.
- The radiator is now placed in a bath of water.
- The compressed-air supply is connected to the overflow pipe.
- Air bubbles will indicate the leakages. (Any 4 × 1) (4)

[20]

QUESTION 5

- If a disc sander has been used on a panel, the ridge formed by the paint on the bare metal must be sanded off.
- It should be sanded with 150-grit water paper until the ridge cannot be felt.
- Lots of clean water produces a smooth finish and also prevents clogging of the sanding paper.
- The final finishing is done by means of 220-grit water paper, which will remove the marks left by the coarser paper.
- The surface is cleaned and dried off by means of a clean cloth.
- The surfaces around the portion to be sprayed must be covered by masking tape.
- The primer is mixed with equal parts of thinners and well stirred.
- The initial coat should be thin and when thoroughly dry, a thick second coat is applied to cover the fine scratches.
- Leave it to dry for 30 minutes.
- If some of the deeper scratches or marks made by the disc sander are still visible, they should be filled with spot putty.
- The putty should be applied in thin layers to dry quickly.
- If one layer is insufficient, a second one can be applied over the first one after the first layer has thoroughly dried.
- A thin spot putty layer may be sanded after about 30 minutes to sand the putty surface.
- Use 220-grit water paper fitted over a specially designed rubber block.
- After sanding, a coat of primer is again applied.
- Before applying the colour coat, the surface and the surroundings should be smoothed by rubbing with 400-grit water paper.
- When using cellulose lacquer, use a clean container and mix about one part of the paint with two parts of thinners.
- Test the spray pattern by spraying onto a test piece and make the necessary adjustments.
- The first coat must be thin and should be followed by three to four normal coats, applied at 15-minute intervals.
- Then allow it to dry at least four hours before rubbing with fine rubbing compound. **[20]**

TOTAL: 100

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