basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

MECHANICAL TECHNOLOGY

GUIDELINES FOR PRACTICAL ASSESSMENT TASKS

2015

These guidelines consist of 32 pages and a 1-page annexure.

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ANNEXURE A: Rubric (Tolerances)

1. INTRODUCTION

The 16 Curriculum and Assessment Policy Statements subjects which contain a practical component all include a Practical Assessment Task (PAT), i.e. a Practical or Performance Assessment Task. These subjects are:

- AGRICULTURE: Agricultural Management Practices, Agricultural Technology
- ARTS: Dance Studies, Design, Dramatic Arts, Music, Visual Arts
- SCIENCES: Computer Applications Technology, Information Technology
- SERVICES: Consumer Studies, Hospitality Studies, Tourism
- TECHNOLOGY: Civil Technology, Electrical Technology, **MECHANICAL TECHNOLOGY** and Engineering Graphics and Design.

A practical assessment task (PAT) mark is a compulsory component of the final promotion mark for all candidates offering subjects that have a practical component and counts 25% (100 marks) of the end-of-year examination mark. The PAT is implemented across the first three terms of the school year. This is broken down into different phases or a series of smaller activities that make up the PAT. The PAT allows for learners to be assessed on a regular basis during the school year and it also allows for the assessment of skills that cannot be assessed in a written format, e.g. test or examination. It is therefore important that schools ensure that all learners complete the practical assessment tasks within the stipulated period to ensure that learners are resulted at the end of the school year. The planning and execution of the PAT differs from subject to subject.

Any profession requires of its members a thorough grounding in both practice and theory, and **MECHANICAL TECHNOLOGY** is no exception. It is emphasised that the goal of the practical assessment task is not to produce a skilled craftsperson but a Mechanical Technology learner in the broadest sense. A nation's true wealth is in its manpower and education should aim to develop the talents of the learner so that he/she can contribute to the well-being of society by using scientific and technological resources with the greatest efficiency and by continuing to develop them.

To prepare a learner in **MECHANICAL TECHNOLOGY** for one or more of these activities his/her education should develop in him/her:

- An attitude where the learner can selectively assimilate ideas, gather evidence and facts, draw logical conclusions and put them to good use creatively and with imagination
- A capability to express ideas and information clearly by speech, writing, sketching or drawing
- A willingness and capability to accept and exercise responsibility, to make decisions and to learn by experience

Attributes such as these cannot all be achieved in a classroom. A sound knowledge of engineering science is essential to the **MECHANICAL TECHNOLOGY** learner, so too is the close practical acquaintance with the processes. There is no substitute for acquiring the feel of making things on the shop floor. Training in the art of making things is the essential bridge between trade theory and trade practice.

Practical application in the workshop must therefore be made an interesting and challenging experience, mentally and physically, with encouragement to the learner to use his/her initiative, curiosity and persistence in finding things out for him/her. Learning by watching should be kept to the bare minimum. Giving some degree of responsibility during practical application is very important as a stimulus and to develop self-confidence.

The first three phases of the PAT must not be confused with the capability task (Phase 4) during workshop practice sessions.

2. TEACHER GUIDELINES

2.1 Administration of the PAT

Teachers are requested to make copies of the different **phases** and the assessment criteria of the PAT document. These documents need to be distributed to the learners at the beginning of the year. The practical assessment task for Grade 12 is externally set and moderated, but internally assessed.

Teachers must attach due dates for the different phases of the PAT task (refer to the CAPS document). In this manner, learners can easily assess their progress. Where formal assessments take place, it is the responsibility of the teacher to administer assessment.

The PAT (all phases) should be completed in the first three terms. The PAT should be based and completed under controlled conditions. (Refer to the Mechanical Technology CAPS Grade 10–12.)

2.2 Assessment of the PAT

Frequent and developmental feedback is needed to guide and give support to the learner to ensure that the learner is on the right track.

Both formal and informal assessment should be conducted on the different phases that constitute the PAT. Informal assessment can be conducted only to monitor progress of the phase in which the learners are engaged. Formal assessment should always be conducted by the teacher and must be recorded.

2.3 Moderation of the PAT

During moderation of the PAT the phase tasks (Phases 1 to 3) and the project (Phase 4) will be presented to the moderator with the assessment criteria and marks obtained.

Where required the moderator should be able to call on the learner to explain the function and principles of operation and also request the learner to demonstrate the skills acquired through the capability tasks for moderation purposes.

Upon completion the moderator will, if needed, adjust the marks of the group up- or downwards depending on the decision reached as a result of moderation.

3. LEARNER GUIDELINES

3.1 Instructions to the learners

- The practical assessment task (PAT) consists of four phases, one per term over terms 1 to 3. Phase 4 must be started in the first term and completed in the third term.
- All phases must be completed. In phase 1 learners have the option to choose either the soft-face hammer head or the cross-peen hammer head. The corresponding handle will be manufactured in phase 4 (terms 1 to 3).
- Learners are required to actively engage in all practical assessment tasks.
- Learners who are un-cooperative will receive demerits or a zero mark allocation for that particular section of the work.
- Learners who act unsafely in the workshop and place other learners in danger will be removed from the workshop and given additional corrective tasks to improve their safety awareness.

3.2 PHASE 1: TERM 1: OPTION 1: SOFT-FACE HAMMER HEAD

FIGURE 1 below shows a soft-face hammer head.

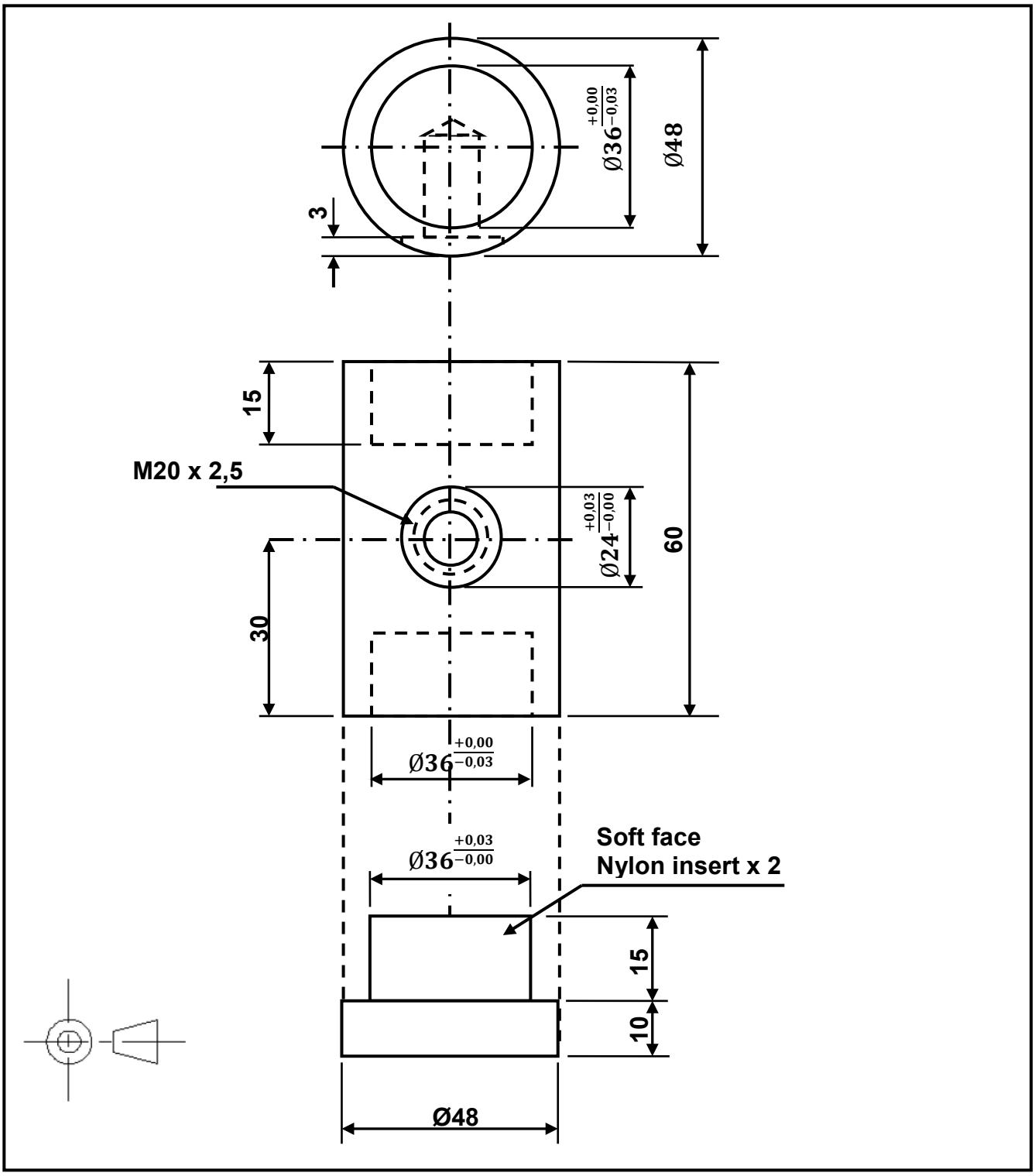

FIGURE 1: SOFT-FACE HAMMER HEAD

3.2.1 Phase 1: Specification: Soft-face hammer head

ITEM NO.	DESCRIPTION	MATERIAL	SIZE	QUANTITY
1.	Soft-hammer head	Any of the following: • Aluminium • Mild steel	Ø50 x 65 mm	1
2.	Hammer head insert	Nylon	Ø50 x 30 mm	2

3.2.2 Phase 1: Processes: Soft-face hammer head

- Face both ends of the hammer head
- Drill and bore for plastic insert
- Drill and tap for handle
- Mill flat surface on head (Name or initials of learner)
- Face both ends of the plastic insert
- Turn plastic insert to required size (press fit into head)

3.2.3 Phase 1: Time Frame: Soft-face hammer head

- Commencement date: January 2015
- Completion date: March 2015

3.2.4 Phase 1: Assessment: Soft-face hammer head

- Mark sheet: TABLE 1
- Rubric: ANNEXURE A

SUBJECT: MECHANICAL TECHNOLOGY	SCHOOL:
YEAR: 2015	TEACHER:
GR: 12	NUMBER OF LEARNERS:
DATE STARTED:	DATE COMPLETED:
PROJECT: PHASE 1 : SOFT-FACE HAMMER HEAD	PAGE: OF

NAMES OF LEARNERS																
FACETS	**MARKS**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Facing	**5**															
Set-up in milling machine for facing (lettering)	**10**															
Cut of flat surface	**5**															
Use lathe and drill and bore hole for nylon insertion	**10**															
Facing of nylon insert	**5**															
Turn nylon insert to fit head	**10**															
Press fit nylon insert	**5**															
Time (-1 for every day late)																
Total	**50**															

SIGNATURE OF TEACHER:	
SIGNATURE OF HEAD OF DEPARTMENT:	
SIGNATURE OF PRINCIPAL:	
SIGNATURE OF MODERATOR:	

TABLE 1: MARK SHEET: SOFT-FACE HAMMER HEAD

3.3 PHASE 1: TERM 1: OPTION 2: CROSS-PEEN HAMMER HEAD

FIGURE 2 below shows a cross-peen hammer head.

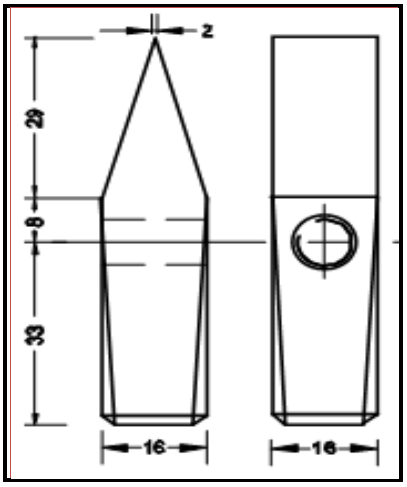

FIGURE 2: CROSS-PEEN HAMMER HEAD

3.3.1 Phase 1: Specifications: Cross-peen hammer head

ITEM NO.	DESCRIPTION	MATERIAL	SIZE	QUANTITY
1.	Cross-peen hammer head	Any of the following: • Aluminium • Mild steel	16 x 16 x 75 mm	1

3.3.2 Phase 1: Processes: Cross-peen hammer head

- Mill the cross-peen section of the head
- File cross-peen edges
- Drill and tap for handle

3.3.3 Phase 1: Time Frame: Cross-peen hammer head

- Commencement date: January 2015
- Completion date: March 2015

3.3.4 Phase 1: Assessment: Cross-peen hammer head

- Mark sheet: TABLE 2
- Rubric: ANNEXURE A

SUBJECT: MECHANICAL TECHNOLOGY	SCHOOL:
YEAR: 2015	TEACHER:
GR: 12	NUMBER OF LEARNERS:
DATE STARTED:	DATE COMPLETED:
PROJECT: PHASE 1 : CROSS-PEEN HAMMER HEAD	PAGE: OF

NAMES OF LEARNERS																
FACETS	**MARKS**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
File one end and one side flat	**5**															
Mark off the hole to be drilled and the profile of the cross-peen	**10**															
Drill hole and tap to fit handle	**10**															
Set-up in milling machine	**10**															
Mill the cross-peen	**5**															
Mark off and file the bottom and sides according to drawing	**5**															
Finishing	**5**															
Time (-1 for every day late)																
TOTAL	**50**															

SIGNATURE OF TEACHER:	
SIGNATURE OF HEAD OF DEPARTMENT:	
SIGNATURE OF PRINCIPAL:	
SIGNATURE OF MODERATOR:	

TABLE 2: MARK SHEET: CROSS-PEEN HAMMER HEAD

3.4 PHASE 2: TERM 2: JOINING: STATIONERY HOLDER

3.4.1 Phase 2: Specifications: Stationery Holder

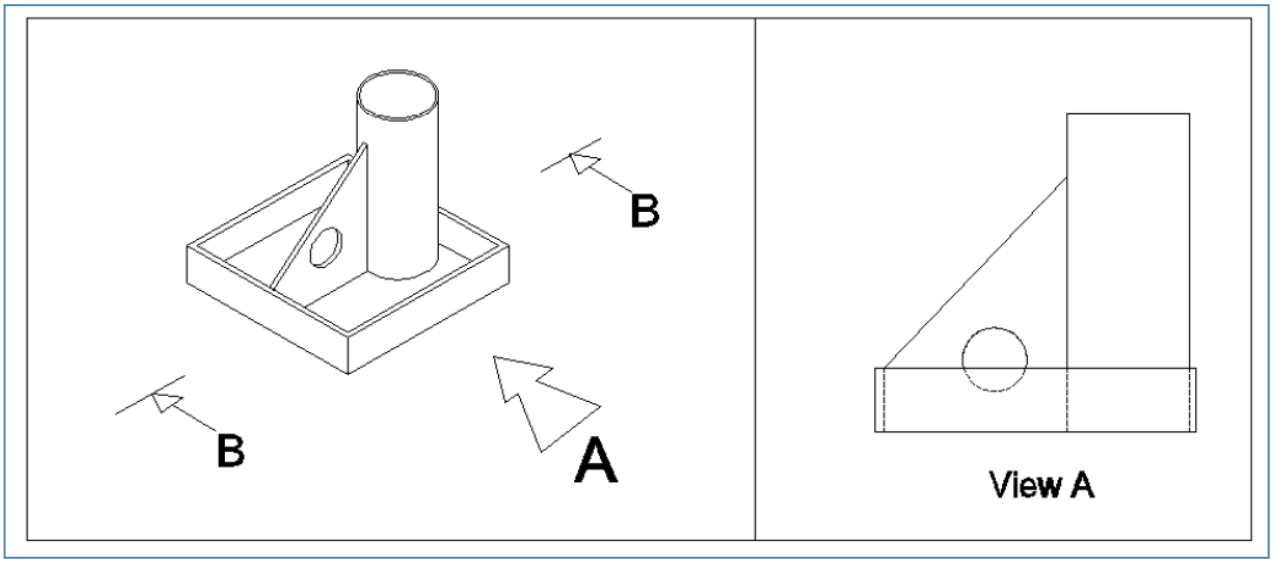

FIGURE 3: STATIONERY HOLDER: ISOMETRIC VIEW

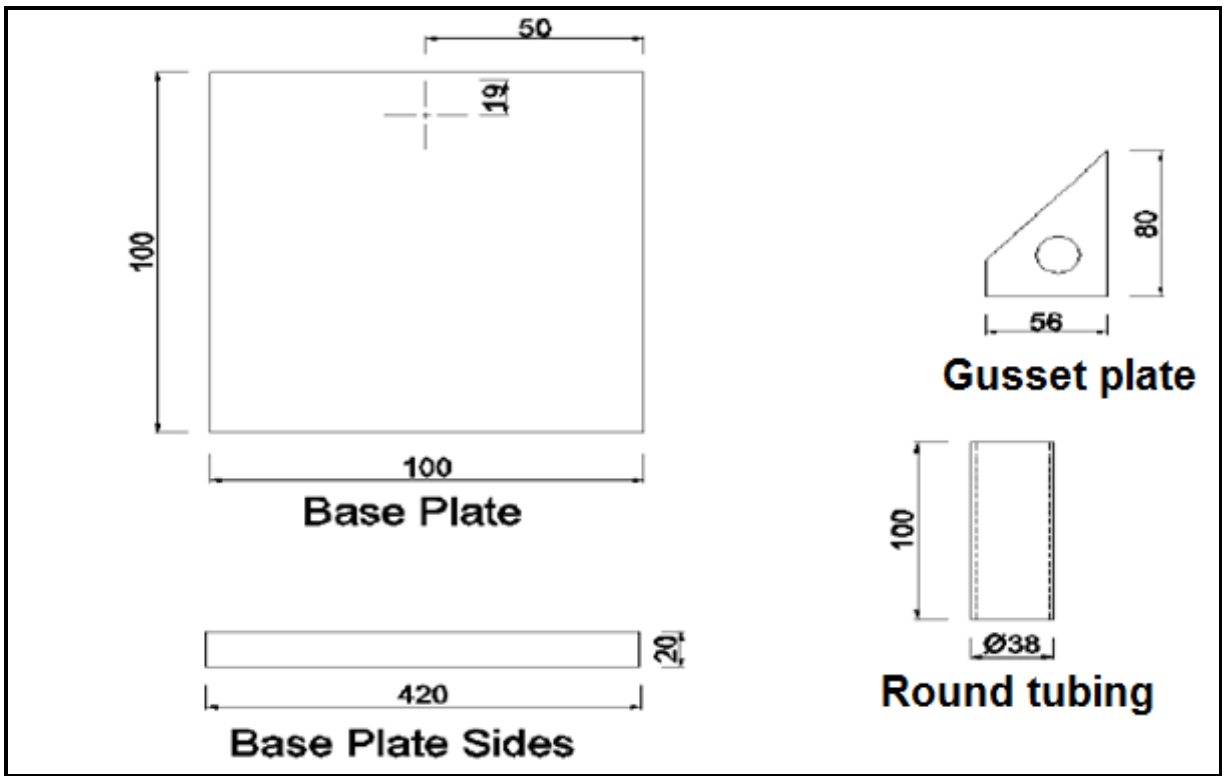

FIGURE 4: STATIONERY HOLDER: PARTS DIAGRAM

Safety precautions must be adhered to at all times.

Material list:

- 100 mm x 100 mm x 3 mm or thicker mild steel plate (base plate)
- 420 mm x 20 mm x 3 mm mild steel sheet metal (base plate sides)
- Ø38 mm x 100 mm x 1,6 mm round tubing (pipe)
- 80 mm x 56 mm x 3 mm or thicker (angle plate)

Base plate:

- Marking off
- Cut to size according to FIGURE 4
- Finishing off sharp edges
- Bending
- Tack welding

Welding work: Arc or MIGS

- Final fillet weld according to FIGURE 5
- Work piece can be positioned in an easy manageable position for welding

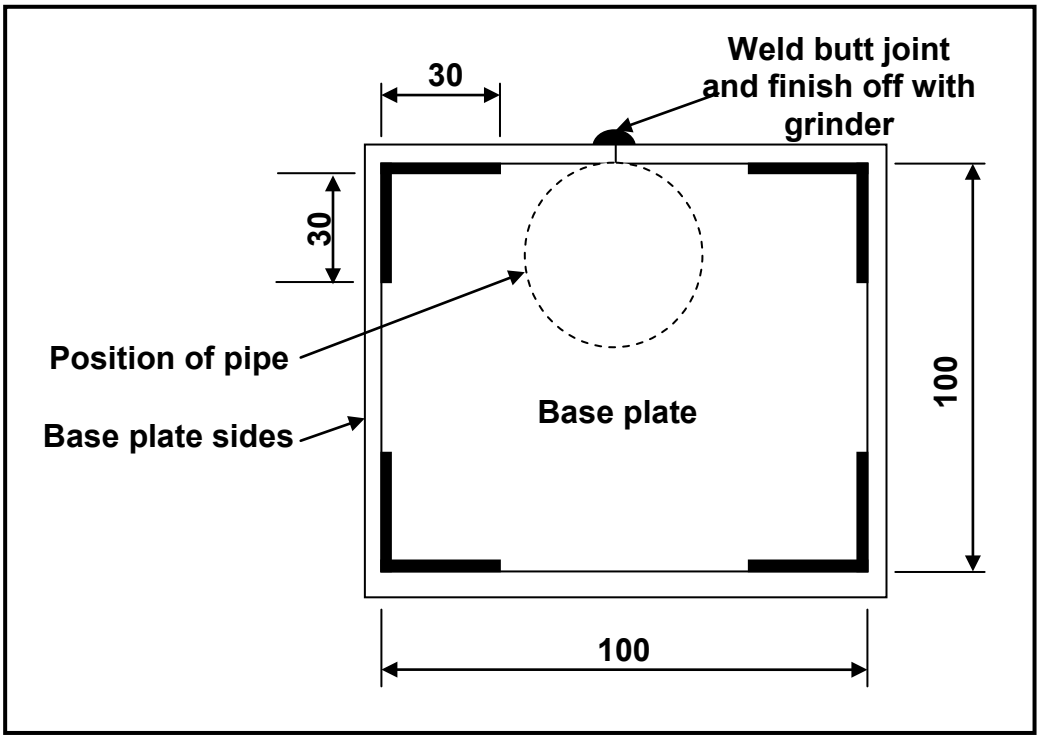

FIGURE 5: STATIONERY HOLDER: TOP VIEW

Pipe and angle plate:

- Marking off
- Cutting to size according to FIGURE 5
- Finishing off sharp edges
- Drilling (one or more holes can be drilled)
- Tack welding

Welding work: Arc or MIGS

- Final fillet weld according to FIGURE 6
- Work piece can be positioned in an easy manageable position for welding

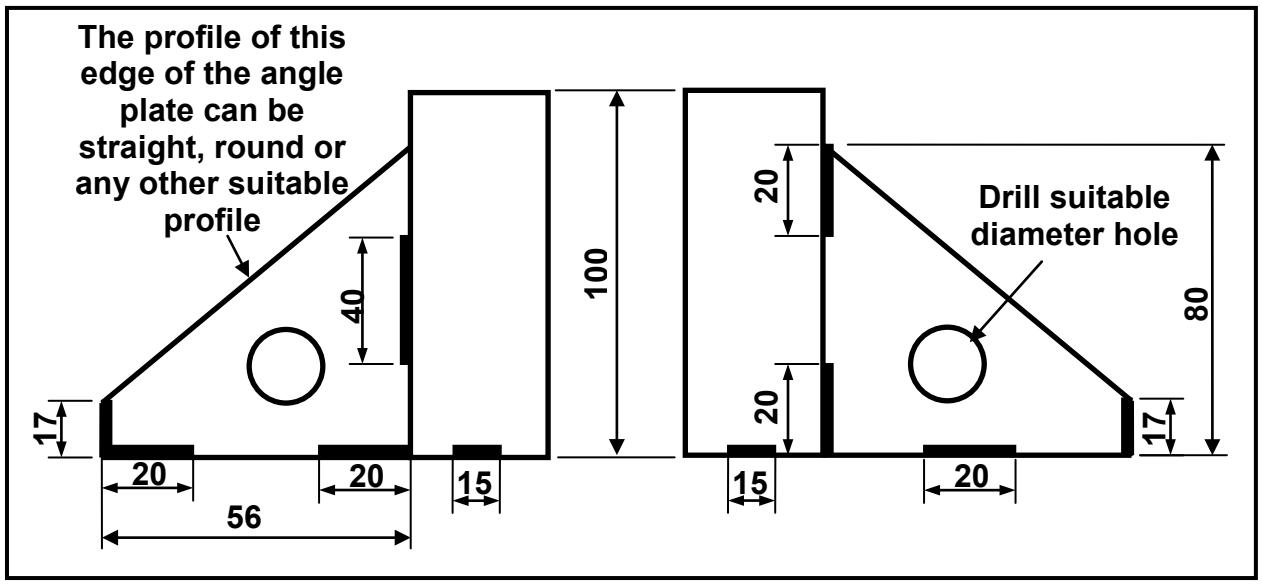

FIGURE 6: STATIONERY HOLDER: SIDE VIEW OF WELDING

Visual inspection:

- Poor penetration
- Undercutting
- Cracks

Accuracy:

- Base plate and sides to be at 90° to each other.
- Angle plate and pipe to be at 90° to the base plate

3.4.2 Phase 2: Processes: Stationery Holder

- Permanent joining methods (Staggered fillet welding)
- Manufacturing competency (Addressing the requirements)
- Fitness for purpose
- Finishing

Tools and equipment needed:

- MIG/MAG welding machine
- Drill press
- Drill bit
- Ball-peen hammer
- Centre punch
- Engineering square
- Steel rule
- Scriber
- Marking blue
- Grinder
- Guillotine
- Wire brush
- File
- Safety accessories

3.4.3 Phase 2: Time Frame: Stationery Holder

- Commencement date: April 2015
- Completion date: June 2015

3.4.4 Phase 2: Assessment: Stationery Holder

- Mark sheet: TABLE 3
- Rubric: ANNEXURE A

SUBJECT: MECHANICAL TECHNOLOGY	SCHOOL:
YEAR: 2015	TEACHER:
GR: 12	NUMBER OF LEARNERS:
DATE STARTED:	DATE COMPLETED:
PROJECT: PHASE 2: STATIONERY HOLDER	PAGE: OF

FACETS	MARKS	NAMES OF LEARNERS														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Preparation of base plate and sides	5															
Marking-off angle plate lines and hole	5															
Drill hole in angle plate	5															
Tack weld base plate and sides in position	5															
Tack weld angle plate and pipe in position	5															
Stagger weld of pipe, angle plate, sides and base plate	10															
Visual inspection for under cutting and poor penetration	5															
Accuracy – base plate, sides, angle plate and pipe at 90°	5															
Finishing	5															
Time (-1 for every day late)																
TOTAL	50															

SIGNATURE OF TEACHER:	
SIGNATURE OF HEAD OF DEPARTMENT:	
SIGNATURE OF PRINCIPAL:	
SIGNATURE OF MODERATOR:	

TABLE 3: MARK SHEET: STATIONERY HOLDER

3.5 PHASE 3: TERM 3: MAINTENANCE

COMPRESSION- AND CYLINDER-LEAKAGE TESTS

3.5.1 Introduction

The teacher must explain to the learners which knowledge and skills are being assessed during this phase as well as the duration for the completion of this phase.

Activity outcome:

- Learners apply theoretical knowledge into practice
- Safety, tools, maintenance and systems and control
- Correct use of tools and equipment
- Use equipment to diagnose low compression or other faults in the engine cylinder

Take note:

- These tasks must be done under supervision of the teacher and the learner is to be assessed while performing these tasks.
- The learner must answer questions, record findings and give reasons for certain actions on the work sheet provided when completing this task.

3.5.2 Phase 3: Compression-test questions

- Answer the following questions on **WORK SHEET 1**.

Phase 3: Compression-test procedure

- Use the specification booklets to obtain readings for the engine that you will use.
- Do a dry compression test on a four-cylinder four-stroke petrol engine and record the findings on **WORK SHEET 2**.
- Take note: The learner must record and give reasons for certain actions when completing this task.

3.5.3 Phase 3: Specifications: Cylinder-leakage test

- Use the specification booklets to obtain readings for the engine that you will use.
- Carry out the experiment/simulation on the next page and record findings on **WORK SHEET 3**.
- Take note: The learner must record and give reasons for certain actions when completing this task.

WORK SHEET 1

PHASE 3: COMPRESSION TEST QUESTIONS

NAME: _____

EXAMINATION NUMBER: _____

QUESTION	ANSWER	MARK	TOTAL
1. What is engine compression and how does it work?		**4**	
2. What might the effect be of low and high compression in an engine?		**4**	
3. When should the compression be checked in an engine and why?		**4**	
4. State the TWO compression tests carried out on petrol engines.		**2**	
5. What is the purpose of squirting oil in the cylinder?		**2**	
TOTAL: Compression test questions		**16**	

WORK SHEET 2

PHASE 3: COMPRESSION TEST PROCEDURE

NAME: _____

EXAMINATION NUMBER: _____

PROCEDURE	REASON	MARK	TOTAL
Get engine to running temperature		**2**	
Loosen spark plugs		**2**	
What action should take place before spark plugs are removed?		**2**	
Remove air filter and spark plugs		**2**	
Remove HT lead from coil		**2**	
Open accelerator fully		**2**	
Do compression test on each cylinder and record reading		**4**	
Compare to manufacturer's specifications		**2**	
What is the difference between a compression test and a leakage test?		**2**	
TOTAL: Compression-test procedure		**20**	

WORK SHEET 3

PHASE 3: CYLINDER-LEAKAGE TEST PROCEDURE

NAME: _____

EXAMINATION NUMBER: _____

PROCEDURE	REASON	MARK	TOTAL
Turn engine to TDC No. 1 cylinder firing		**2**	
Connect leakage tester pipe to cylinder		**2**	
Open compressed air		**2**	
Take reading from gauges		**2**	
Listen at air intake		**2**	
Listen at exhaust		**2**	
Listen at oil filler hole		**2**	
TOTAL: Cylinder leakage test procedure		**14**	

TOTAL – Compression test questions (WORK SHEET 1)	**16**	
TOTAL – Compression test procedure (WORK SHEET 2)	**20**	
TOTAL – Cylinder-leakage test procedure (WORK SHEET 3)	**14**	
GRAND TOTAL	**50**	

Tools and equipment needed:

- Hand tools
- Four-cylinder four-stroke petrol and diesel engine
- Compression tester
- Cylinder-leakage tester
- Oil and oil can
- Manufacturer's specifications for the engine

3.5.3 Phase 3: Time Frame: Compression- and cylinder-leakage tests

- Commencement date: July 2015
- Completion date: August 2015

3.5.4 Phase 3: Assessment: Compression and cylinder leakage tests

- Mark sheet: TABLE 4
- Rubric: ANNEXURE A

SUBJECT: MECHANICAL TECHNOLOGY	SCHOOL:
YEAR: 2015	TEACHER:
GR: 12	NUMBER OF LEARNERS:
DATE STARTED:	DATE COMPLETED:
PROJECT: PHASE 3: COMPRESSION- AND CYLINDER-LEAKAGE TESTS	PAGE: OF

NAMES OF LEARNERS																
FACETS	**MARKS**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
COMPRESSION-TEST QUESTIONS																
What is engine compression and how does it work?	**4**															
What might the effect be of low and high compression in an engine?	**4**															
When should the compression in an engine be checked and why?	**4**															
State the TWO compression tests carried out on petrol engines.	**2**															
What is the purpose of squirting oil in the cylinder?	**2**															
TOTAL	**16**															

TABLE 4: MARK SHEET: COMPRESSION- AND CYLINDER-LEAKAGE TESTS: QUESTIONS

NAMES OF LEARNERS																
FACETS	**MARKS**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
COMPRESSION-TEST PROCEDURE																
Get engine to running temperature	**2**															
Loosen spark plugs	**2**															
What action should take place before spark plugs are removed?	**2**															
Remove air filter and spark plugs	**2**															
Remove HT lead from coil	**2**															
Open accelerator fully	**2**															
Do compression test on each cylinder and record reading	**4**															
Compare to manufacturer's specifications	**2**															
What is the difference between a compression test and a cylinder leakage test?	**2**															
TOTAL	**20**															

TABLE 5: COMPRESSION- AND CYLINDER-LEAKAGE TESTS: PROCEDURE

NAMES OF LEARNERS																
FACETS	**MARKS**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
CYLINDER-LEAKAGE TEST PROCEDURE																
Turn engine to TDC No. 1 cylinder firing	**2**															
Connect leakage tester pipe to cylinder	**2**															
Open compressed air	**2**															
Take reading from gauges	**2**															
Listen at air intake	**2**															
Listen at exhaust	**2**															
Listen at oil filler hole	**2**															
TOTAL	**14**															
GRAND TOTAL	**50**															

SIGNATURE OF TEACHER:	
SIGNATURE OF HEAD OF DEPARTMENT:	
SIGNATURE OF PRINCIPAL:	
SIGNATURE OF MODERATOR:	

TABLE 6: MARK SHEET: CYLINDER-LEAKAGE TEST

3.6 PHASE 4: TERMS 1 TO 3: OPTION 1: SOFT-FACE HAMMER HANDLE

Hand tools are often the simplest and safest way to complete a light job. Whether you are assembling a bookshelf from a kit, hanging a picture frame or building a birdhouse, you will need to be familiar with the proper operation of a few basic hand tools. If you keep some simple rules of thumb in mind, you will be able to operate your hand tools efficiently and safely, making short work of a variety of projects in and around the house.

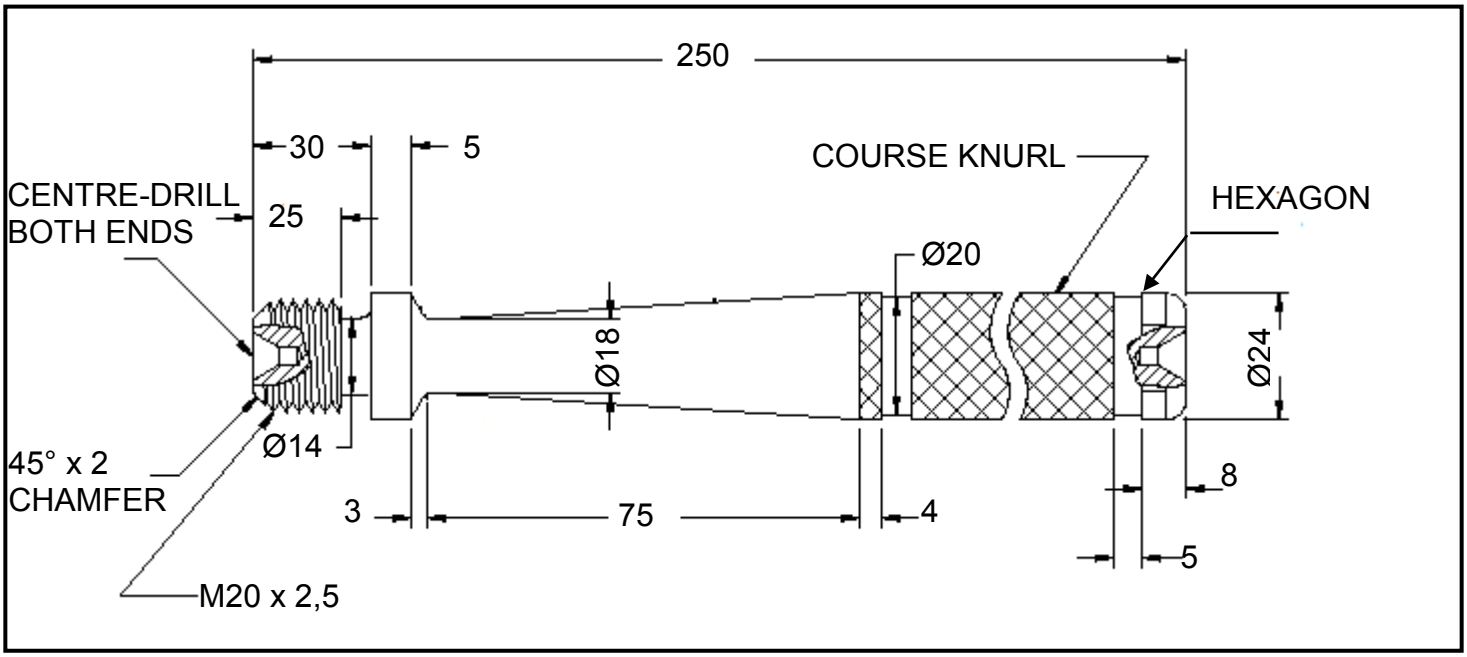

FIGURE 7: SOFT-FACE HAMMER HANDLE

3.6.1 Phase 4: Specifications: Soft-face hammer handle

ITEM NO.	DESCRIPTION	MATERIAL	SIZE	QUANTITY
1.	Soft-face hammer handle	Any of the following: • Nylon • Aluminium • Mild steel	Ø25 x 255 mm	1

3.6.2 Phase 4: Processes: Soft-face hammer handle

- Face both ends of the shaft
- Centre drill both ends
- Turn to required diameters
- Mill hexagon on one end
- Knurl, taper turn and cut threads according to drawing

3.6.3 Phase 4: Time Frame: Soft-face hammer handle

- Commencement date: January 2015
- Completion date: August 2015

3.6.4 Phase 4: Assessment: Soft-face hammer handle

- Mark sheet: TABLE 7
- Rubric: ANNEXURE A

SUBJECT: MECHANICAL TECHNOLOGY	SCHOOL:
YEAR: 2015	TEACHER:
GR: 12	NUMBER OF LEARNERS:
DATE STARTED:	DATE COMPLETED:
PROJECT: PHASE 4: SOFT-FACE HAMMER HANDLE	PAGE: OF

NAMES OF LEARNERS																
FACETS	**MARKS**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Facing and centre drill	**5**															
Turn ø24, Turn ø20, Turn ø14	**10**															
Calculate taper	**5**															
Turn taper	**5**															
Calculate thread depth M20 x 2,5	**5**															
Cut M20 x 2,5 thread on centre lathe	**15**															
Calculate indexing	**5**															
Calculate depth of cut	**10**															
Cut hexagon	**15**															
Drill ø8 mm hole and remove sharp edges.	**10**															
Chamfer	**5**															
Collar	**5**															
Assembly	**5**															
Time (-1 for every day late)																
TOTAL	**100**															

SIGNATURE OF TEACHER:	
SIGNATURE OF HEAD OF DEPARTMENT:	
SIGNATURE OF PRINCIPAL:	
SIGNATURE OF MODERATOR:	

TABLE 7: MARK SHEET: SOFT-FACE HAMMER HANDLE

3.7 PHASE 4: TERMS 1 TO 3: OPTION 2: CROSS-PEEN HAMMER HANDLE

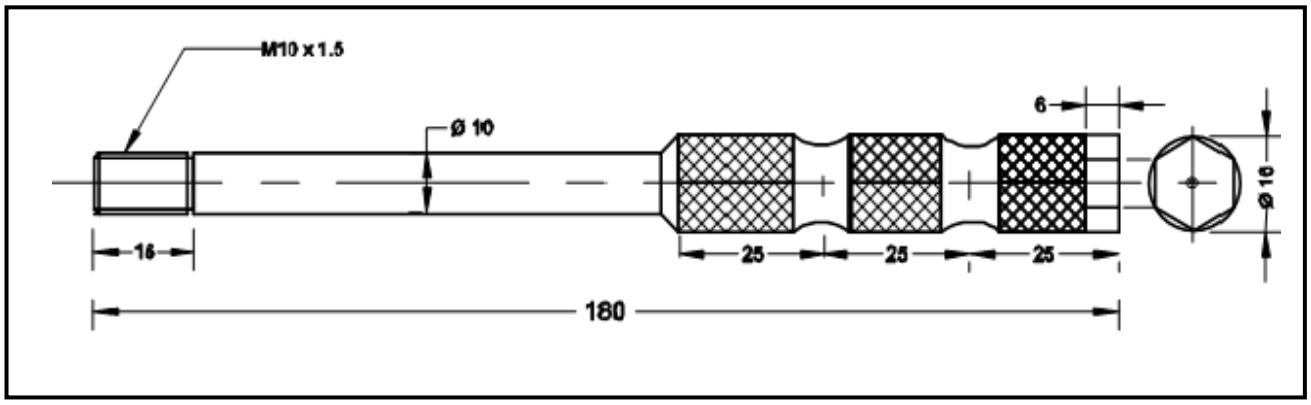

FIGURE 8: CROSS-PEEN HAMMER HANDLE

3.7.1 Phase 4: Specification: Cross-peen hammer handle

ITEM NO.	DESCRIPTION	MATERIAL	SIZE	QUANTITY
1.	Cross-peen hammer handle	Any of the following: • Aluminium • Mild steel	Ø16 x 185 mm	1

3.7.2 Phase 4: Processes: Cross-peen hammer handle

- Face both ends of the shaft
- Centre drill both ends
- Turn to required diameters
- Mill hexagon on one end
- Knurl, taper turn and cut threads according to drawing

3.7.3 Phase 4: Time Frame: Cross-peen hammer handle

- Commencement date: January 2015
- Completion date: August 2015

3.7.4 Phase 4: Assessment: Cross-peen hammer handle

- Mark sheet: TABLE 8
- Rubric: ANNEXURE A

SUBJECT: MECHANICAL TECHNOLOGY	SCHOOL:
YEAR: 2015	TEACHER:
GR: 12	NUMBER OF LEARNERS:
DATE STARTED:	DATE COMPLETED:
PROJECT: PHASE 4: CROSS-PEEN HAMMER HANDLE	PAGE: OF

NAMES OF LEARNERS																
FACETS	**MARKS**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Facing and centre drill	**5**															
Diameter turning	**15**															
Round nose cutting	**5**															
Knurling	**15**															
Calculate thread depth M10 x 1.5	**5**															
Cut M10 x 1.5 thread on centre lathe	**15**															
Calculate indexing	**5**															
Calculate depth of cut	**10**															
Cut hexagon	**15**															
Assembly	**10**															
Time (-1 for every day late																
TOTAL	**100**															

SIGNATURE OF TEACHER:	
SIGNATURE OF HEAD OF DEPARTMENT:	
SIGNATURE OF PRINCIPAL:	
SIGNATURE OF MODERATOR:	

TABLE 8: MARK SHEET: PHASE 4: CROSS-PEEN HAMMER HANDLE

4. ABSENCE/NON-SUBMISSION OF TASKS.

If a learner's practical assessment task is incomplete or unavailable for a valid reason, the learner will be given three weeks before the commencement of the end-of-year examination to submit the outstanding task. Should the learner fail to fulfill the outstanding PAT requirement the learner will be awarded a zero for that PAT component.

A learner's results are regarded as incomplete if he/she does not offer any component of the PAT task. He/she will be given another opportunity based on the decision of the Head of the assessment body.

Should the learner fail to fulfill the outstanding PAT requirement, the marks for these components will be omitted and the final mark for Mechanical Technology will be adjusted for promotion purposes in terms of the completed tasks.

5. TIMEFRAMES

January:	Phase 1:	Start the manufacturing task (terminology)
	Phase 4:	Although Phase 1 task, the soft-face hammer head, forms part of the Phase 4 PAT task, it will only be assessed once in term 1 for 50 marks.
March:	Phase 1:	Complete the manufacturing task at the end of term 1
April:	Phase 2:	Start the welding task (joining)
	Phase 4:	Project under construction
June:	Phase 2:	Complete the welding task at the end of term 2
July:	Phase 3:	Start the maintenance task
	Phase 4:	Project under construction
August:	Phase 3:	Complete the maintenance task at the end of term 3
	Phase 4:	Complete at the end of term 3

6. DECLARATION OF AUTHENTICITY

NAME OF THE SCHOOL: _____

NAME OF LEARNER: _____
(FULL NAME(S) AND SURNAME)

EXAMINATION NUMBER: _____

NAME OF TEACHER: _____

SCHOOL STAMP

I hereby declare that the project submitted for assessment is my own, original work and has not been previously submitted for moderation.

_____ _____
SIGNATURE OF CANDIDATE DATE

As far as I know, the above declaration by the candidate is true and I accept that the work offered is his or her own.

_____ _____
SIGNATURE OF TEACHER DATE

7. LIST OF RESOURCES

7.1 References:

Goodwin, C, Lategan, A & Meyer, D. 2013. *Mechanical Technology Grade 12.* Future Managers: Cape Town.

7.2 Equipment and Machines:

- Lathe
- Milling
- Drilling
- MIG welder
- Arc welder
- Power saw
- Grinding
- Four-stroke petrol engine
- Guillotine
- Angle grinder
- Air compressor
- Air gun
- Safety equipment

7.3 Tools:

- Hand tools
- Marking-off tools
- Compression tester
- Cylinder-leakage tester
- Precision measuring tools (micrometer; vernier; dial gauge indicator)
- Taps and dies
- Milling cutters
- Lathe tools

7.4 Material list:

ITEM NO.	DESCRIPTION	MATERIAL	SIZE	QUANTITY
1.	Soft-face hammer head	Any of the following: • Nylon • Aluminium • Mild steel	Ø50 x 65 mm	1
2.	Hammer head insert	Nylon	Ø50 x 30 mm	2
3.	Cross-peen hammer head	Any of the following: • Aluminium • Mild steel	16 x16 x 75 mm	1
4.	Soft-face hammer handle	Any of the following: • Nylon • Aluminium • Mild steel	Ø25 x 255 mm	1
5.	Cross-peen hammer handle	Any of the following: • Aluminium • Mild steel	Ø16 x 185 mm	1
6.	Base plate	Mild steel sheet	100 x 100 x 3	1
7.	Box/frame	Mild steel sheet	420 x 20 x 3	1
8.	Cylinder/holder	Mild steel round tubing	100 x Ø38 x 1,6	1
9.	Angle plate	Mild steel sheet	80 x 56 x 3	1

8. CONCLUSION

Upon completion of the practical assessment task learners should be able to demonstrate their understanding of the industry, enhance their knowledge, skills, values and reasoning abilities as well as establish connections to life outside the classroom and address real-world challenges. The PAT furthermore develops learners' life skills and provides opportunities for learners to engage in their own learning.

ANNEXURE A

RUBRIC (TOLERANCES)

TOLERANCE		TURNING		FILING Measured at 4 places	MILLING Measured at 4 places for flat surfaces
		DIAMETER	LENGTH		
		+ 0,03	+ 0,09	+ 0,09	+ 0,09
		- 0,03	- 0,09	- 0,09	- 0,09
DEVIATION	7	0,03 = 100%	0,09 = 100%	0,09 = 100%	0,09 = 100%
	6	0,06 = 80%	0,18 = 80%	0,18 = 80%	0,18 = 80%
	5	0,09 = 70%	0,22 = 70%	0,22 = 70%	0,22 = 70%
	4	0,12 = 60%	0,27 = 60%	0,27 = 60%	0,27 = 60%
	3	0,18 = 40%	0,36 = 40%	0,36 = 40%	0,36 = 40%
	2	0,21 = 20%	0,45 = 20%	0,45 = 20%	0,45 = 20%
	1	0,24 = 0%	0,54 = 0%	0,54 = 0%	0,54 = 0%