

Small Gasoline Engine Mechanic

Study Guide

Assessments:
2401 Small Gasoline Engine Mechanic



Overview

This study guide is designed to help students prepare for the Small Gasoline Engine Mechanic assessment. It includes information about the assessment, the skills standards upon which the assessment is based, resources that can be used to prepare for the assessment, and test taking strategies.

Each of the four sections in this guide provides useful information for students preparing the Small Gasoline Engine Mechanic assessment.

- CareerTech and Competency-Based Education: A Winning Combination
- Small Gasoline Engine Mechanic Assessment
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 - ▶ Standards and Test Content
 - ▶ Sample Questions
 - ▶ Abbreviations, Symbols, and Acronyms
- Strategies for Test Taking Success
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CareerTech and Competency-Based Education: A Winning Combination

Competency-based education uses learning outcomes that emphasize both the application and creation of knowledge and the mastery of skills critical for success. In a competency-based education system, students advance upon mastery of competencies, which are measurable, transferable outcomes that empower students.

Career and technology education uses industry professionals and certification standards to identify the knowledge and skills needed to master an occupation. This input provides the foundation for development of curriculum, assessments and other instructional materials needed to prepare students for wealth-generating occupations and produce comprehensively trained, highly skilled employees demanded by the work force.

Tools for Success

CareerTech education relies on three basic instructional components to deliver competency-based instruction: skills standards, curriculum materials, and competency assessments.

Skills standards provide the foundation for competency-based instruction and outline the knowledge and skills that must be mastered in order to perform related jobs within an industry. Skills standards are aligned with national skills standards and/or industry certification requirements; therefore, a student trained to the skills standards is equally employable in local, state, and national job markets.

Curriculum materials and textbooks contain information and activities that teach students the knowledge and skills outlined in the skills standards. In addition to complementing classroom instruction, curriculum resources include supplemental activities that enhance learning by providing opportunities to apply knowledge and demonstrate skills.

Certification Assessments test the student over material outlined in the skills standards and taught using the curriculum materials and textbooks. When used with classroom performance evaluations, certification assessments provide a means of measuring occupational readiness.

Each of these components satisfies a unique purpose in competency-based education and reinforces the knowledge and skills students need to gain employment and succeed on the job.

Measuring Success

Evaluation is an important component of competency-based education. Pre-training assessments measure the student's existing knowledge prior to receiving instruction and ensure the student's training builds upon this knowledge base. Formative assessments administered throughout the training process provide a means of continuously monitoring the student's progress towards mastery.

Certification assessments provide a means of evaluating the student's mastery of knowledge and skills. Coaching reports communicate assessment scores to students and provide a breakdown of assessment results by standard area. The coaching report also shows how well the student has mastered skills needed to perform major job functions and identifies areas of job responsibility that may require additional instruction and/or training.

Small Gasoline Engine Mechanic Assessment Information

What is the Small Gasoline Engine Mechanic assessment?

The Small Gasoline Engine Mechanic assessment is an end-of-program assessment for students in Power Products programs. The assessments provide an indication of student mastery of knowledge and skills necessary for success in careers in this area.

How was the assessment developed?

The assessment was developed by the CareerTech Testing Center. Items were developed and reviewed by a committee of subject matter experts.

The committee assigned frequency and criticality ratings to each skill, which determines the significance of each task for test development.

- **Frequency:** Represents how often the task is performed on the job. Frequency rating scales vary for different occupations. The rating scale used in this publication is presented below:

1 = less than once a week 2 = at least once a week 3 = once or more a day

- **Criticality:** Denotes the level of consequence associated with performing a task incorrectly. The rating scale used in this publication is presented below:

1 = slight 2 = moderate 3 = extreme

What does the assessment cover?

Specifically, the test includes multiple-choice test items over the following areas:

Small Gasoline Engine Mechanic

Perform Administrative Functions	11%
Perform Preventative Maintenance for Small Engines	26%
Maintain Engine Fuel Systems	16%
Maintain Charging and Starting Systems	11%
Maintain the Ignition System	9%
Overhaul Small Gasoline Engines.	27%

What are the benefits of using this assessment?

Students receive a certificate for each assessment that they pass. This certificate is included in the student's portfolio and used to communicate their mastery of the subject matter to potential employers.

When should the assessment be taken?

The CareerTech Testing Center recommends that students take this assessment as soon as possible after receiving all standards-related instruction, rather than waiting until the end of the school year.

Is the assessment timed?


No. However, most students finish the assessment within one hour.

What resources can students use on these assessments?

Students are allowed to use calculators and scratch paper on CTTC assessments; however, these items must be provided by the testing proctor and returned to the proctor before the student's exam is submitted for scoring. Calculator apps on cell phones and other devices may not be used on these assessments.

What accommodations can be made for students with Individualized Education Plans (IEPs)?

Accommodations are allowed for students with an IEPs or 504s. Examples of allowable accommodations include:

- Extended time — This assessment is not timed; therefore, students may take as much time as needed to finish. The assessment must be completed in one testing session.
- Readers — A reader may be used to read the assessment to a student who has been identified as needing this accommodation.
- Enlarged text — Students needing this accommodation can activate this feature by clicking the  icon in the upper right corner of the screen.

What can students expect on test day?

All CTTC assessments are web-based and delivered exclusively by a proctor in the school's assessment center. The proctor **cannot** be an instructor or anyone who was involved with the student during instruction.

Assessments are delivered in a question-by-question format. When a question is presented, the student can select a response or leave the question unanswered and advance to the next question. Students may also flag questions to revisit before the test is scored. All questions must be answered before the test can be submitted for scoring.

After the assessment is scored, the student will receive a score report that not only shows the student's score on the assessment, but also how the student performed in each standard area.

Can students retake the test?

Students may retake the test unless their school or state testing policies prohibit retesting. Students who can retest must wait at least three days between test attempts.

Standards and Test Content Small Gasoline Engine Mechanic

Frequency (F): Represents how often the task is performed on the job. Frequency rating scales vary for different occupations. The rating scale used in this publication is presented below:

- 1 = less than once a week
- 2 = at least once a week
- 3 = once or more a day

Criticality (C): Denotes the level of consequence associated with performing a task incorrectly. The rating scale used in this publication is presented below:

- 1 = slight
- 2 = moderate
- 3 = extreme

Duty A: Perform Administrative Functions (6 questions)

CODE	TASK	F	C
A.01	Complete customer work order form <ul style="list-style-type: none"> • Utilize appropriate parts identification media • Utilize appropriate service identification media • Communicate with customer and /or supervisor to determine service requested • Maintain work records to account for parts and labor 	3	2
A.02	Inspect equipment for safety component presence and functions <ul style="list-style-type: none"> • Product liability • Shop liability 	2	3
A.03	Prepare customer bill/receipt <ul style="list-style-type: none"> • Math skills 	3	2
A.04	Apply human relations skills in the power products repair shop	3	2

Duty B: Perform Preventative Maintenance for Small Engines (14 questions)

CODE	TASK	F	F
B.01	Clean engine exterior and cooling fins	2	2
B.02	Service an air filter assembly	3	3
B.03	De-carbonize combustion chamber on a four-cycle engine	1	2
B.04	Inspect and/or service ignition system	2	3
B.05	Service lubrication system	2	3
B.06	Adjust valves	2	2
B.07	Remove carbon deposits from exhaust ports and muffler of two-stroke engine	2	2
B.08	Service engine controls	2	2
B.09	Service fuel system	3	2

Duty C: Maintain Engine Fuel Systems (9 questions)

CODE	TASK	F	C
C.01	Inspect/repair/replace fuel delivery system	3	2
C.02	Troubleshoot/service the carburetor	3	3
C.03	Check fuel pump output	1	2
C.04	Check/adjust governor	2	3
C.05	Prepare fuel system for storage	1	2
C.06	Prepare fuel system for operation after storage	2	2

Duty D: Maintain Charging and Starting Systems (6 questions)

CODE	TASK	F	C
D.01	Service the battery	2	2
D.02	Inspect/troubleshoot/repair the electrical starter system	2	2
D.03	Inspect/troubleshoot/repair starter controls	2	2
D.04	Inspect/troubleshoot/repair the charging system	2	2
D.05	Service a rewind starter system	2	2
D.06	Prepare system for storage	1	1
D.07	Prepare system for operation after storage	1	2

Duty E: Maintain the Ignition System (5 questions)

CODE	TASK	F	C
E.01	Inspect spark plugs; replace as necessary	3	2
E.02	Inspect/troubleshoot the ignition system; repair as necessary	2	2

Duty F: Overhaul Power Products' Gasoline Engines (15 questions)

CODE	TASK	F	C
F.01	Disassemble engine	2	2
F.02	Examine internal engine parts for damage or wear – evaluate cost effectiveness of repair	1	3
F.03	Inspect/troubleshoot/repair valve train assembly on four-stroke cycle engine	2	2
F.04	Inspect reed valves on two-stroke cycle engine; replace as necessary	2	2
F.05	Inspect piston, ring, and rod assemblies; replace as necessary	2	3
F.06	Inspect/recondition or replace cylinders	1	2
F.07	Inspect/repair lubricating systems	1	3
F.08	Inspect/replace/repair crankshaft assemblies	1	3
F.09	Inspect and repair damaged threads	2	3
F.10	Assemble engine	2	3
F.11	Run-test engine/set to manufacturer's specification	3	3

Sample Questions

1. What is the correct way to manage a business telephone call?
 - a. Place the call on hold until someone can answer the call.
 - b. State the business name and your name and place the caller on hold.
 - c. State the business name and your name and find out the purpose of the call.
 - d. Try to help the caller regardless of whom he/she called.

2. Cleaning the exterior and cooling fins of small engines helps the engine:
 - a. look better.
 - b. run smoother.
 - c. cool more efficiently.
 - d. protect itself while idling.

3. With a small engine, what is the effect of a partially plugged fuel tank vent system?
 - a. The engine starts, but stops again.
 - b. The engine starts, but stalls at higher rpms.
 - c. The engine will not start or run.
 - d. The engine will start and runs well, but will not idle.

4. What is the purpose of the governor system on a small engine?
 - a. increases horsepower
 - b. limits oil pressure
 - c. maintains selected speed
 - d. prevents idling

5. The water and acid mixture in the battery cells is known as:
 - a. antifreeze.
 - b. electrolyte.
 - c. ion.
 - d. sulfate.

6. Starter ropes should be replaced when:
 - a. exposed to oil or gas.
 - b. discolored.
 - c. frayed or broken.
 - d. stretched.

7. How is internal lubrication of 4-cycle engines accomplished?
 - a. a mixture of oil and fuel
 - b. oil delivered to friction points by pumps or other mechanisms
 - c. a permanently-sealed oiling reservoir
 - d. Teflon-coated bearings that require no lubrication

8. What is the correct method to tighten cylinder head bolts?
 - a. with a speed wrench on its highest setting
 - b. in a counter-clockwise sequence
 - c. in the order and torque specified by the manufacturer
 - d. with an air impact wrench on its lowest setting

9. A suitable spark plug replacement is a plug that:
 - a. is manufactured by the same company as the original plug.
 - b. will fit another engine made by the same manufacturer.
 - c. will screw into the threads with minimal force.
 - d. is recommended by the manufacturer.

10. Eliminating excessive engine rpm of a four-cycle small engine is accomplished by:
 - a. adjusting the high speed carburetor adjustment.
 - b. replacing the governor spring.
 - c. shortening and reinstalling the governor spring.
 - d. stretching the reinstalling the governor spring.



Sample Questions — Key

1. What is the correct way to manage a business telephone call?
 - a. Place the call on hold until someone can answer the call. Incorrect
 - b. State the business name and your name and place the caller on hold. Incorrect
 - c. State the business name and your name and find out the purpose of the call. Correct
 - d. Try to help the caller regardless of whom he/she called. Incorrect

2. Cleaning the exterior and cooling fins of small engines helps the engine:
 - a. look better. Incorrect
 - b. run smoother. Incorrect
 - c. cool more efficiently. Correct
 - d. protect itself while idling. Incorrect

3. With a small engine, what is the effect of a partially plugged fuel tank vent system?
 - a. The engine starts, but stops again. Incorrect
 - b. The engine starts, but stalls at higher rpms. Correct
 - c. The engine will not start or run. Incorrect
 - d. The engine will start and runs well, but will not idle. Incorrect

4. What is the purpose of the governor system on a small engine?
 - a. increases horsepower Incorrect
 - b. limits oil pressure Incorrect
 - c. maintains selected speed Correct
 - d. prevents idling Incorrect

5. The water and acid mixture in the battery cells is known as:
 - a. antifreeze. Incorrect
 - b. electrolyte. Correct
 - c. ion. Incorrect
 - d. sulfate. Incorrect

6. Starter ropes should be replaced when:
 - a. exposed to oil or gas. Incorrect
 - b. discolored. Incorrect
 - c. frayed or broken. Correct
 - d. stretched. Incorrect

7. How is internal lubrication of 4-cycle engines accomplished?
- a. a mixture of oil and fuel Incorrect
 - b. oil delivered to friction points by pumps or other mechanisms Correct
 - c. a permanently-sealed oiling reservoir Incorrect
 - d. Teflon-coated bearings that require no lubrication Incorrect
8. What is the correct method to tighten cylinder head bolts?
- a. with a speed wrench on its highest setting Incorrect
 - b. in a counter-clockwise sequence Incorrect
 - c. in the order and torque specified by the manufacturer Correct
 - d. with an air impact wrench on its lowest setting Incorrect
9. A suitable spark plug replacement is a plug that:
- a. is manufactured by the same company as the original plug. Incorrect
 - b. will fit another engine made by the same manufacturer. Incorrect
 - c. will screw into the threads with minimal force. Incorrect
 - d. is recommended by the manufacturer. Correct
10. Eliminating excessive engine rpm of a four-cycle small engine is accomplished by:
- a. adjusting the high speed carburetor adjustment. Incorrect
 - b. replacing the governor spring. Correct
 - c. shortening and reinstalling the governor spring. Incorrect
 - d. stretching the reinstalling the governor spring. Incorrect



Abbreviations, Symbols, and Acronyms

The following is a list of abbreviations, symbols, and acronyms used in the Small Gasoline Engine Mechanic study guide and on the Small Gasoline Engine Mechanic assessments:

%	Percent
EPA	Environmental Protection Agency
IEP	Individualized Education Plans
rpm	Revolutions per minute
V	Volt

Test Taking Strategies

This section of the study guide contains valuable information for testing success and provides a common-sense approach for preparing for and performing well on any test.

General Testing Advice

1. Get a good night's rest the night before the test — eight hours of sleep is recommended.
2. Avoid junk food and “eat right” several days before the test.
3. Do not drink a lot or eat a large meal prior to testing.
4. Be confident in your knowledge and skills!
5. Relax and try to ignore distractions during the test.
6. Focus on the task at hand — taking the test and doing your best!
7. Listen carefully to the instructions provided by the exam proctor. If the instructions are not clear, ask for clarification.

Testing Tips

1. Read the entire question before attempting to answer it.
2. Try to answer the question before reading the choices. Then read the choices to determine if one matches or is similar to your answer.
3. Do not change your answer unless you misread the question or are certain that your first answer is incorrect.
4. Answer questions you know first, so you can spend additional time on the more difficult questions.
5. Check to make sure you have answered every question before you submit the assessment for scoring — unanswered questions are marked incorrect.



