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Motorcycle Repair

Study Guide

Assessments:
2402 Motorcycle Technician



OKLAHOMA
CareerTech

CTTC CareerTech Testing Center

Overview

This study guide is designed to help students prepare for the Motorcycle Technician 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 sections in this guide provides useful information for students preparing for the Motorcycle Technician assessment.

- CareerTech and Competency-Based Education: A Winning Combination
- Motorcycle Technician Assessment
 - ▶ Assessment Information
 - ▶ Standards and Test Content
 - ▶ Sample Questions
 - ▶ Abbreviations, Symbols, and Acronyms
- Strategies for Test Taking Success
- Notes

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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 measureable, 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.

Competency 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, written competency 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 competency 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.

Motorcycle Technician Assessment Information

What is the Motorcycle Technician assessment?

The Motorcycle Technician assessment is an end-of-program assessment for students in motorcycle repair programs. The assessment provides an indication of student mastery of knowledge and concepts 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 Motorcycle Technician assessment is endorsed by K&N Powersports.

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:

Motorcycle Technician (75 questions)

Perform Personal, Shop, and Administrative Functions	15%
Perform Preventative Maintenance for Motorcycles	20%
Maintain Engine Fuel Systems	11%
Maintain Electronic/Electrical Systems	20%
Overhaul Engines	16%
Maintain Chassis and Suspension Components	18%

What are the benefits of using this assessment?

Students receive a certificate for each assessment 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 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

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 Personal, Shop, and Administrative Functions (11 questions)

CODE	TASK	F	C
A.01	Apply customer service skills in a motorcycle repair shop <ul style="list-style-type: none"> • Demonstrate effective interpersonal skills • Demonstrate a positive attitude • Demonstrate customer service skills • Use proper telephone techniques • Use job-related terminology, symbols, and abbreviations • Interpret and follow oral and written directions • Understand organization structure and employee roles 	3	3
A.02	Job placement preparation <ul style="list-style-type: none"> • Understand salary, wages, and benefits packages • Complete an employment application • Prepare a resume • Complete an employment interview • Complete a W-4 form • Create an employment portfolio 	1	1
A.03	Safety <ul style="list-style-type: none"> • Explain the purpose for safety policies • Describe the types of fire hazards found in the workplace • Demonstrate safe use of personal protective equipment • Comply with company safety policies • Understand product liability • Understand shop liability 	3	3

CODE	TASK	F	C
A.04	Apply reading, writing, and math skills <ul style="list-style-type: none"> • Apply reading and writing skills <ul style="list-style-type: none"> — Properly complete a repair order form <ul style="list-style-type: none"> » Use appropriate parts identification media » Use appropriate service identification media » Communicate with customer and/or supervisor to determine service requested » Maintain work records to account for parts and labor • Apply math skills <ul style="list-style-type: none"> — Apply mathematical operations involving whole numbers, fractions, decimals, percentages, mathematical word problems, formulas, ratios, etc., when necessary <ul style="list-style-type: none"> » Addition » Subtraction » Multiplication » Division 	3	3
A.05	Identify tools and associated safety <ul style="list-style-type: none"> • Hand tools • Major equipment • General shop tools • Practice tool safety • Explain the hazards associated with specific types of equipment and tools 	3	3
A.06	Use metric and imperial measurements <ul style="list-style-type: none"> • Read a micrometer • Measure with a vernier caliper • Measure with a micrometer • Measure runout and verify timing with a dial indicator • Measure a cylinder bore with a telescoping gauge • Measure with a small bore gauge 	2	3

Duty B: Perform Preventative Maintenance for Motorcycles
(15 questions)

CODE	TASK	F	C
B.01	Demonstrate the tightening sequence and list torque values for a selected component from a service manual	3	3
B.02	Repair damaged threads using a thread repair kit	2	3
B.03	Remove a broken bolt using a screw extractor set	1	3
B.04	Troubleshoot a no-start complaint on a one-cylinder motorcycle engine	2	3
B.05	Perform a compression test on a motorcycle engine	2	2
B.06	Perform a leak-down test on a motorcycle engine	2	3
B.07	Adjust the valves on a motorcycle engine	2	3
B.08	Adjust cam chain tension	1	3
B.09	Service an air filter	3	3
B.10	Adjust a motorcycle carburetor	3	3

CODE	TASK	F	C
B.11	Synchronize fuel delivery system on a multi-cylinder motorcycle engine	2	2
B.12	Change engine oil and filter and service all fluids	3	3
B.13	Route and adjust control cables	2	2
B.14	Detail a motorcycle or an ATV	1	1
B.15	Complete pre-delivery inspection paperwork	3	3
B.16	Inspect and service drive-train <ul style="list-style-type: none"> Inspect and adjust primary chain Inspect and adjust gear drive Inspect and adjust belt drive 	2	3
B.17	Inspect tire condition and adjust tire pressure	3	3
B.18	Inspect brake wear and operation	3	3
B.19	Inspect electrical components	2	2

Duty C: Maintain Engine Fuel Systems (8 questions)

CODE	TASK	F	C
C.01	Remove a motorcycle carburetor	2	2
C.02	Disassemble a motorcycle carburetor	2	3
C.03	Clean and inspect a motorcycle carburetor	3	3
C.04	Reassemble a motorcycle carburetor	3	3
C.05	Install a motorcycle carburetor	2	2
C.06	Adjust float level	2	2
C.07	Verify passages are clear	2	3
C.08	Adjust fuel air ratio	2	3
C.09	Inspect and clean cold start systems	2	2
C.10	Remove, clean, and install a fuel tank and fuel valve	2	2
C.11	Identify fuel injection system components <ul style="list-style-type: none"> Understanding theory Troubleshooting Using service manual 	3	3

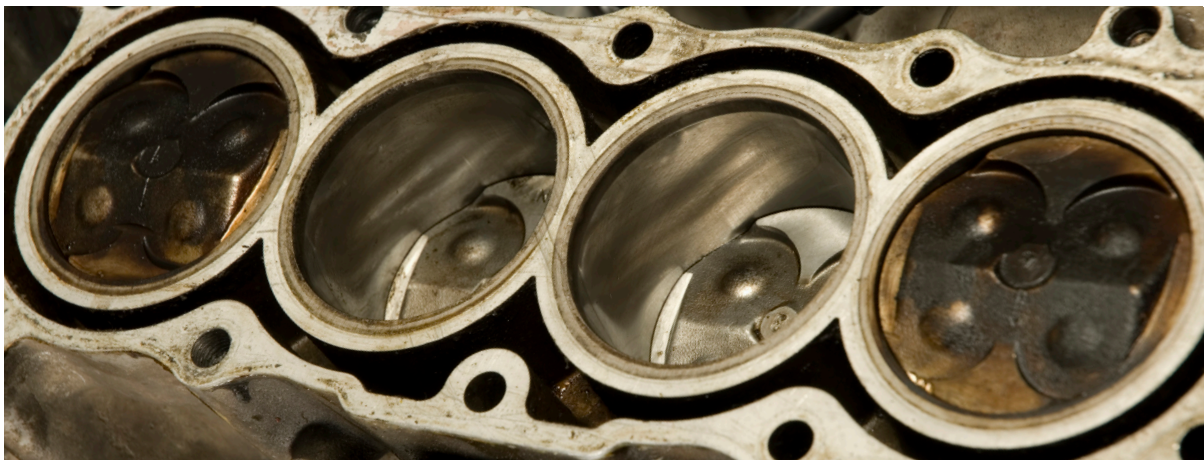


Duty D: Maintain Electronic/Electrical Systems (15 questions)

CODE	TASK	F	C
D.01	Remove, clean, service, and install a motorcycle battery	3	3
D.02	Inspect/troubleshoot/repair the electrical starter system	2	3
D.03	Inspect/troubleshoot/repair ignition system	2	3
D.04	Inspect/troubleshoot/repair the charging system	2	3
D.05	Inspect/troubleshoot/repair the lighting system	2	3
D.06	Inspect/troubleshoot/repair the fuel injection system	2	3
D.07	Trace a motorcycle electrical circuit on a wiring diagram	2	3
D.08	Splice and solder electrical wires and repair solderless connectors	2	3
D.09	Use service manual applicable to electrical systems	3	3

Duty E: Overhaul Engines (12 questions)

CODE	TASK	F	C
E.01	Disassemble and reassemble a two-stroke motorcycle engine	2	3
E.02	Disassemble and reassemble a four-stroke motorcycle engine	2	3
E.03	Read and interpret wear limit information from a service manual	2	3
E.04	Examine internal engine parts for damage or wear <ul style="list-style-type: none"> Evaluate cost effectiveness of repair 	2	3
E.05	Inspect/troubleshoot/repair valve train assembly on four-stroke cycle engine	2	3
E.06	Inspect reed valves on two-stroke cycle engine; replace as necessary	1	3
E.07	Inspect piston and ring assemblies; replace as necessary	2	3
E.08	Inspect/recondition or replace cylinders	1	3
E.09	Inspect/repair lubricating systems	1	3
E.10	Inspect/replace/repair crank shaft assemblies	1	3
E.11	Inspect and repair transmission and clutch (including CVT)	1	3
E.12	Run-test engine/set to manufacturer's specification	2	3
E.13	Inspect, repair, and/or replace cooling system components	1	3
E.14	Use service manual applicable to overhauling engines	3	3



Duty F: Maintain Chassis and Suspension Components (14 questions)

CODE	TASK	F	C
F.01	Remove, replace/repair, and install a front tire and wheel assembly on a motorcycle	3	3
F.02	Remove, replace/repair, and install a rear tire and wheel assembly on a motorcycle	3	3
F.03	Replace a damaged rim and respoke and true a motorcycle wheel	1	3
F.04	Remove, replace/repair, and install a tire on an ATV	3	3
F.05	Change oil in the front fork	1	2
F.06	Replace front fork seal	3	3
F.07	Inspect and replace drive components <ul style="list-style-type: none"> • Chain • Belt • Sprocket • CV shaft • Differential • Shaft drive 	2	3
F.08	Inspect, adjust, and replace steering components <ul style="list-style-type: none"> • Steering head bearings • Rack and pinion • Tie rods • Handle bars 	2	3
F.09	Inspect, adjust and replace suspension components <ul style="list-style-type: none"> • Shocks and forks • Control arms • Wheel bearings 	2	3
F.10	Replace brake shoes on a drum-type brake and adjust the brake	2	3
F.11	Replace brake pads on a disc system	2	3
F.12	Bleed a hydraulic brake system	2	3
F.13	Remove, replace, repair, and install swing arm and linkage	1	2
F.14	Use service manual applicable to chassis and suspension components	3	3

Sample Questions

- _____ 1. When using a thread repair kit to install a thread repair insert, the new internal thread is:
- slightly larger in diameter with a coarser pitch than the original female thread.
 - slightly smaller in diameter with a different pitch than the original female thread.
 - the next smaller female thread in diameter with the same thread pitch.
 - the same diameter and pitch as the original female thread.
- _____ 2. When should a valve adjustment be performed?
- as the last step in the tune up process
 - only when the top end is overhauled
 - when the engine is cold
 - when the engine is hot
- _____ 3. Which type of filter should be cleaned and re-oiled?
- centrifugal type
 - foam
 - oil bath
 - paper
- _____ 4. What type of carburetor is found in most two-stroke engines?
- constant velocity
 - slide valve
 - square bore
 - smooth bore
- _____ 5. What raises the slide in a constant velocity carburetor?
- a cable
 - a linkage
 - atmospheric pressure
 - vacuum
- _____ 6. After installing the carburetor on a motorcycle with a push-pull cable, what happens to the throttle operation when there is no slack?
- Cable action will be smoother.
 - Slack will not affect throttle operation.
 - The carburetor will not fully open.
 - Throttle operation will bind and not return properly.

- _____ 7. When adjusting the float height on a carburetor, hold the carburetor:
- as it sits in the bike.
 - at a 10° angle.
 - at a 45° angle.
 - upside down.
- _____ 8. What type of mixture does the carburetor need to feed the engine for cold starting?
- cold
 - hot
 - lean
 - rich
- _____ 9. Which of the following conditions occurs on a fuel injection equipped motorcycle if the battery terminal gets disconnected while the engine is running?
- Engine control module will become damaged.
 - Engine will run rich.
 - Throttle will hang open.
 - Fuel will shut off.
- _____ 10. Which switch must be closed on all bikes in order for the the starter motor to operate in first gear?
- brake
 - clutch
 - neutral
 - oil

Sample Questions — Key

1. When using a thread repair kit to install a thread repair insert, the new internal thread is:
 - a. slightly larger in diameter with a coarser pitch than the original female thread. **Incorrect**
 - b. slightly smaller in diameter with a different pitch than the original female thread. **Incorrect**
 - c. the next smaller female thread in diameter with the same thread pitch. **Incorrect**
 - d. the same diameter and pitch as the original female thread. **Correct**

2. When should a valve adjustment be performed?
 - a. as the last step in the tune up process **Incorrect**
 - b. only when the top end is overhauled **Incorrect**
 - c. when the engine is cold **Correct**
 - d. when the engine is hot **Incorrect**

3. Which type of filter should be cleaned and re-oiled?
 - a. centrifugal type **Incorrect**
 - b. foam **Correct**
 - c. oil bath **Incorrect**
 - d. paper **Incorrect**

4. What type of carburetor is found in most two-stroke engines?
 - a. constant velocity **Incorrect**
 - b. slide valve **Correct**
 - c. square bore **Incorrect**
 - d. smooth bore **Incorrect**

5. What raises the slide in a constant velocity carburetor?
 - a. a cable **Incorrect**
 - b. a linkage **Incorrect**
 - c. atmospheric pressure **Incorrect**
 - d. vacuum **Correct**

6. After installing the carburetor on a motorcycle with a push-pull cable, what happens to the throttle operation when there is no slack?
 - a. Cable action will be smoother. **Incorrect**
 - b. Slack will not affect throttle operation. **Incorrect**
 - c. The carburetor will not fully open. **Incorrect**
 - d. Throttle operation will bind and not return properly **Correct**

7. When adjusting the float height on a carburetor, hold the carburetor:
- a. as it sits in the bike. Incorrect
 - b. at a 10° angle. Incorrect
 - c. at a 45° angle. Correct
 - d. upside down. Incorrect
8. What type of mixture does the carburetor need to feed the engine for cold starting?
- a. cold Incorrect
 - b. hot Incorrect
 - c. lean Incorrect
 - d. rich Correct
9. Which of the following conditions occurs on a fuel injection equipped motorcycle if the battery terminal gets disconnected while the engine is running?
- a. Engine control module will become damaged. Correct
 - b. Engine will run rich. Incorrect
 - c. Throttle will hang open. Incorrect
 - d. Fuel will shut off. Incorrect
10. Which switch must be closed on all bikes in order for the the starter motor to operate in first gear?
- a. brake Incorrect
 - b. clutch Correct
 - c. neutral Incorrect
 - d. oil Incorrect

Abbreviations, Symbols, and Acronyms

The following is a list of abbreviations, symbols, and acronyms used in the motorcycle study guide and on the motorcycle assessment:

°	Degree
\$	Dollar
%	Percent
AC	Alternating current
ATV	All-terrain vehicle
BDC	Bottom dead center
CV	Constant velocity
CVT	Continuous Variable Transmission
DC	Direct current
IEP	Individualized Education Plan
mm	Millimeter
OEM	Original Equipment Manufacturer
w	Weight

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.



