

# CR104B Vehicle Electrical and Mechanical Systems Practice Test (Sample)

## Study Guide



**Everything you need from our exam experts!**

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# Introduction

Preparing for a certification exam can feel overwhelming, but with the right tools, it becomes an opportunity to build confidence, sharpen your skills, and move one step closer to your goals. At Examzify, we believe that effective exam preparation isn't just about memorization, it's about understanding the material, identifying knowledge gaps, and building the test-taking strategies that lead to success.

This guide was designed to help you do exactly that.

Whether you're preparing for a licensing exam, professional certification, or entry-level qualification, this book offers structured practice to reinforce key concepts. You'll find a wide range of multiple-choice questions, each followed by clear explanations to help you understand not just the right answer, but why it's correct.

The content in this guide is based on real-world exam objectives and aligned with the types of questions and topics commonly found on official tests. It's ideal for learners who want to:

- Practice answering questions under realistic conditions,
- Improve accuracy and speed,
- Review explanations to strengthen weak areas, and
- Approach the exam with greater confidence.

We recommend using this book not as a stand-alone study tool, but alongside other resources like flashcards, textbooks, or hands-on training. For best results, we recommend working through each question, reflecting on the explanation provided, and revisiting the topics that challenge you most.

**Remember:** successful test preparation isn't about getting every question right the first time, it's about learning from your mistakes and improving over time. Stay focused, trust the process, and know that every page you turn brings you closer to success.

Let's begin.

# How to Use This Guide

**This guide is designed to help you study more effectively and approach your exam with confidence. Whether you're reviewing for the first time or doing a final refresh, here's how to get the most out of your Examzify study guide:**

## **1. Start with a Diagnostic Review**

**Skim through the questions to get a sense of what you know and what you need to focus on. Your goal is to identify knowledge gaps early.**

## **2. Study in Short, Focused Sessions**

**Break your study time into manageable blocks (e.g. 30 - 45 minutes). Review a handful of questions, reflect on the explanations.**

## **3. Learn from the Explanations**

**After answering a question, always read the explanation, even if you got it right. It reinforces key points, corrects misunderstandings, and teaches subtle distinctions between similar answers.**

## **4. Track Your Progress**

**Use bookmarks or notes (if reading digitally) to mark difficult questions. Revisit these regularly and track improvements over time.**

## **5. Simulate the Real Exam**

**Once you're comfortable, try taking a full set of questions without pausing. Set a timer and simulate test-day conditions to build confidence and time management skills.**

## **6. Repeat and Review**

**Don't just study once, repetition builds retention. Re-attempt questions after a few days and revisit explanations to reinforce learning. Pair this guide with other Examzify tools like flashcards, and digital practice tests to strengthen your preparation across formats.**

**There's no single right way to study, but consistent, thoughtful effort always wins. Use this guide flexibly, adapt the tips above to fit your pace and learning style. You've got this!**

## Questions

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- 1. All of these are mechanical failures for a power window EXCEPT:**
  - A. Broken window regulator**
  - B. Power window motor electrical fault**
  - C. Worn sash guide**
  - D. Poor grounds**
  
- 2. The Diagnostic SOP Checklist recommends performing a visual inspection as the first step.**
  - A. True**
  - B. False**
  - C. Depends on the issue**
  - D. Never**
  
- 3. Why are motor circuits commonly protected by a circuit breaker?**
  - A. motors draw a surge of current when first started.**
  - B. they require constant current control.**
  - C. they operate at a fixed resistance.**
  - D. they never experience inrush.**
  
- 4. Which statement is correct regarding wiper motor voltage when running vs off and protection?**
  - A. The voltage at low speed is higher than high speed**
  - B. Some wiper systems use an internal automatic resetting circuit breaker to protect the motor from overloads**
  - C. Both statements are true**
  - D. Neither statement is true**
  
- 5. When the engine is off and the alternator is not operating, the typical battery terminal voltage is about which range?**
  - A. 14.0-14.1**
  - B. 12.0-12.2**
  - C. 11.0-11.5**
  - D. 13.0-13.5**

- 6. In a circuit, the ground side commonly serves as what?**
- A. The return path to ground**
  - B. The supply rail**
  - C. The hot conductor**
  - D. The load terminal**
- 7. Which statement about battery voltage testing is correct?**
- A. Connecting the red DVOM lead to the negative battery post and the black DVOM lead to the positive battery post**
  - B. The voltage readings will be higher when the engine is running and lower when the engine is off**
  - C. Both statements are true**
  - D. Neither statement is true**
- 8. A corroded ground can be thought of as what element in the circuit?**
- A. An open circuit**
  - B. A short to ground**
  - C. A resistance in series with the load**
  - D. A separate power source**
- 9. When measuring a circuit, the voltage drop measures the**
- A. Current**
  - B. Resistance**
  - C. Power**
  - D. Voltage Consumed**
- 10. Using the test results, reason for the higher amperage reading in bulb D compared to A and B?**
- A. Bulb D is newer**
  - B. Lower resistance in bulb D**
  - C. Higher voltage across D**
  - D. Longer wire in bulb D**



## Answers

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1. D
2. A
3. A
4. B
5. B
6. A
7. B
8. C
9. D
10. B

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## **Explanations**

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**1. All of these are mechanical failures for a power window EXCEPT:**

- A. Broken window regulator**
- B. Power window motor electrical fault**
- C. Worn sash guide**
- D. Poor grounds**

Power window failures can be mechanical or electrical. Mechanical problems involve parts that physically move the glass: a broken window regulator stops the lift mechanism, and a worn sash guide can cause friction and misalignment that blocks smooth movement. An electrical fault in the motor is not a mechanical failure; it's an electrical issue that prevents the motor from turning. Likewise, poor grounds are an electrical problem affecting current return rather than a physical moving part. Therefore, the issue that isn't a mechanical failure is poor grounds.

**2. The Diagnostic SOP Checklist recommends performing a visual inspection as the first step.**

- A. True**
- B. False**
- C. Depends on the issue**
- D. Never**

Starting with a visual inspection is essential because it lets you quickly observe the system's condition and spot obvious hazards, damage, or misalignments before you touch anything. This initial scan provides important context—like loose connections, leaks, corrosion, worn parts, or missing components—that guides the rest of the diagnostic process and helps prevent misdiagnosis or injury. In the Diagnostic SOP Checklist, you begin with this visual check to establish a safe, informed baseline before proceeding with any tools, measurements, or tests. Skipping it could mean you miss a readily visible fault or mistake, and pursuing deeper testing without seeing what's plainly wrong can waste time or create new problems. Saying it's only needed for certain issues or never would contradict the standard procedure, which is to perform the visual inspection first as the default starting point.

**3. Why are motor circuits commonly protected by a circuit breaker?**

- A. motors draw a surge of current when first started.**
- B. they require constant current control.**
- C. they operate at a fixed resistance.**
- D. they never experience inrush.**

The main idea is that motors draw a surge of current when they start. When a motor is not yet spinning, its windings look almost like a simple low-resistance path, and there's no back-EMF to limit current. That means the starting current can be several times higher than the running current. A circuit breaker protects the circuit by interrupting power if the current becomes too high for too long, or if a short circuit occurs. Many breakers are designed to tolerate brief inrush surges (magnetic action for short spikes and thermal action for overload), so normal motor startup doesn't trip the breaker, while sustained overloads or a fault do. Other options don't fit because motors aren't protected by constant current control in normal operation, their windings don't have a fixed resistance during operation, and it's not true that motors never experience inrush.

**4. Which statement is correct regarding wiper motor voltage when running vs off and protection?**

- A. The voltage at low speed is higher than high speed**
- B. Some wiper systems use an internal automatic resetting circuit breaker to protect the motor from overloads**
- C. Both statements are true**
- D. Neither statement is true**

Wiper motor speed is controlled by how much voltage reaches the winding, or by using different windings. For a slower speed, a resistor or higher-resistance path reduces the voltage seen by the motor, so the winding actually receives less voltage. For a higher speed, that drop is reduced and the motor winding gets more voltage. So the statement that the voltage at low speed is higher than at high speed isn't accurate. Protection-wise, many wiper systems include an internal automatic resetting circuit breaker to guard the motor against overloads or stalling. If the motor overheats or is overloaded, the breaker trips and then automatically resets when cooled, preventing damage without user intervention. This protection feature is the part that makes that option true.

**5. When the engine is off and the alternator is not operating, the typical battery terminal voltage is about which range?**

- A. 14.0-14.1**
- B. 12.0-12.2**
- C. 11.0-11.5**
- D. 13.0-13.5**

When the engine is off and the alternator isn't charging, you're measuring the battery's resting, open-circuit voltage. A 12-volt lead-acid battery that isn't being charged typically reads around 12 volts. In practice, a common resting range is about 12.0 to 12.2 volts, which is why that option is the best fit. The other ranges reflect charging conditions (13-14 volts) or a heavily discharged battery (around 11 volts).

**6. In a circuit, the ground side commonly serves as what?**

- A. The return path to ground**
- B. The supply rail**
- C. The hot conductor**
- D. The load terminal**

A circuit needs a complete path for current to flow, and the ground side provides that return path back to the source, forming the loop. This return path, often tied to the source's negative terminal, chassis, or earth, gives a common reference voltage and lets the current from the supply flow through the load and back safely. The supply rail is the energized line delivering power, the hot conductor is the live wire carrying current to the load, and the load terminal is simply where the device connects. So the ground side's main role is to complete the circuit by returning current to the source.

**7. Which statement about battery voltage testing is correct?**

- A. Connecting the red DVOM lead to the negative battery post and the black DVOM lead to the positive battery post**
- B. The voltage readings will be higher when the engine is running and lower when the engine is off**
- C. Both statements are true**
- D. Neither statement is true**

When you test a 12-volt automotive battery, you're looking at two states: engine off and engine running. With the engine off, the battery's resting voltage is about 12.6 volts for a healthy full-charge battery. When the engine is running, the alternator charges the system and raises the voltage to roughly 13.8-14.4 volts. So the reading tends to be higher during operation than when the engine is off, which is the behavior described and why that statement is correct. Regarding how to measure, the proper procedure is to place the red voltmeter lead on the positive battery terminal and the black lead on the negative terminal. Reversing the leads would give an incorrect reading. That explains why the statement about the leads in the other option isn't correct, reinforcing why the higher-with-engine-running description is the best answer.

**8. A corroded ground can be thought of as what element in the circuit?**

- A. An open circuit**
- B. A short to ground**
- C. A resistance in series with the load**
- D. A separate power source**

The main idea is that any extra resistance in the return path changes how a circuit behaves, just like adding a resistor in series with the load. When ground connections corrode, the ground path to the chassis develops noticeable resistance. Current still has to travel through that path to complete the circuit, so there's a voltage drop across the corrosion-resistance according to Ohm's law ( $V = I \times R$ ). That means the load doesn't receive the full supply voltage, colors of symptoms like lights dimming or sensors acting oddly, and devices can fail to operate correctly. This is why a corroded ground is modeled as a resistance in series with the load. It isn't an open circuit (that would stop current entirely), nor a short to ground (that would bypass the load), nor a separate power source.

**9. When measuring a circuit, the voltage drop measures the**

- A. Current**
- B. Resistance**
- C. Power**
- D. Voltage Consumed**

Voltage drop is the potential difference across a component as current flows through it. This potential difference represents the energy per unit charge that the component uses or “consumes” as current passes, turning electrical energy into other forms like heat or light. So measuring the voltage drop tells you how much voltage is being consumed by that part of the circuit. It's not a measure of current, since current is the amount of charge flowing, not the energy per charge. It's not directly a measure of resistance, because resistance is found from  $V = I \cdot R$  and requires knowing either the current or the voltage and the other quantity. It's also not measuring power by itself; power is the product of voltage drop and current ( $P = V \cdot I$ ), so you'd need the current as well to determine power.

**10. Using the test results, reason for the higher amperage reading in bulb D compared to A and B?**

- A. Bulb D is newer**
- B. Lower resistance in bulb D**
- C. Higher voltage across D**
- D. Longer wire in bulb D**

When voltage is the same across each bulb, the current through a bulb depends on its resistance according to  $I = V / R$ . If bulb D shows a higher current than A and B, its resistance must be lower at the moment of the test. That reduced resistance lets more current flow through D under the same supply voltage. In bulbs, resistance changes with temperature as the filament heats up; a bulb with a lower operating resistance will draw more current. If these bulbs are in parallel, each sees the same voltage, so differences in current reflect differences in resistance. Other factors like being newer or longer wire would not naturally explain a higher current in D at the same voltage, since longer wires raise resistance and newer bulbs aren't guaranteed to have lower resistance.

## Next Steps

**Congratulations on reaching the final section of this guide. You've taken a meaningful step toward passing your certification exam and advancing your career.**

**As you continue preparing, remember that consistent practice, review, and self-reflection are key to success. Make time to revisit difficult topics, simulate exam conditions, and track your progress along the way.**

**If you need help, have suggestions, or want to share feedback, we'd love to hear from you. Reach out to our team at [hello@examzify.com](mailto:hello@examzify.com).**

**Or visit your dedicated course page for more study tools and resources:**

**<https://cr104bvehicleelectricalmechsys.examzify.com>**

**We wish you the very best on your exam journey. You've got this!**

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