

# Certificate of Qualification (C of Q) 310T Truck and Coach Technician - Engine 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. Which component's primary job is to regulate the air entering the engine?**
  - A. Intake manifold**
  - B. Exhaust manifold**
  - C. Throttle body**
  - D. Fuel pump**
  
- 2. When comparing brake power measured at the flywheel with that at the drive wheels, what is generally true?**
  - A. No difference if the transmission is functioning properly.**
  - B. Power at the wheels exceeds that at the flywheel by 10% to 25%.**
  - C. Power can only be measured at the drive wheels.**
  - D. Power at the flywheel exceeds that at the drive wheels by 20% to 25%.**
  
- 3. Which SAE multigrade oil is likely recommended for year-round use in North America?**
  - A. 5W-30**
  - B. 15W-40**
  - C. 20W-20**
  - D. 20W-50**
  
- 4. When grinding a valve face to remove pitting, the critical specification to monitor during machining would be the?**
  - A. Shank diameter**
  - B. Stem**
  - C. Poppet diameter**
  - D. Margin**
  
- 5. Rod and main journal bearing clearances are best measured with which tool?**
  - A. Tram gauges**
  - B. Dial indicators**
  - C. Plastigage**
  - D. Snap gauges**

- 6. What is the operating principle of a typical coolant pump on a highway diesel engine?**
- A. Positive displacement.**
  - B. Centrifugal.**
  - C. Constant volume.**
  - D. Gear type.**
- 7. What type of piston is favored by diesel engine OEMs in post-2007 products?**
- A. Forged steel trunk**
  - B. Aluminum trunk**
  - C. Two-piece articulating**
  - D. Two-piece crosshead**
- 8. In the event of an engine overheating, where is the coolant likely to boil first?**
- A. At the engine water jacket**
  - B. At the top of the radiator tank**
  - C. At the inlet to the coolant pump**
  - D. At the thermostat housing**
- 9. How can you verify if an engine is properly tuned?**
- A. A properly tuned engine runs smoothly and shows efficient fuel consumption.**
  - B. A properly tuned engine always uses premium fuel.**
  - C. A properly tuned engine has a loud exhaust.**
  - D. A properly tuned engine leaks oil.**
- 10. What should be used to install piston rings onto a piston?**
- A. The thumb and index finger**
  - B. A ring contractor**
  - C. A ring expander**
  - D. Snapping pliers**

## Answers

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

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## **Explanations**

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**1. Which component's primary job is to regulate the air entering the engine?**

- A. Intake manifold**
- B. Exhaust manifold**
- C. Throttle body**
- D. Fuel pump**

The component responsible for regulating the air entering the engine is the throttle body. It plays a crucial role in controlling the amount of air that flows into the intake manifold and subsequently into the engine's cylinders. The throttle body works in conjunction with the accelerator pedal; when the driver presses the pedal, the throttle opens wider to allow more air in, which is necessary for increased engine power. By adjusting the air intake, the throttle body helps manage the engine's performance and efficiency, ensuring it operates smoothly under various load conditions. In contrast, while the intake manifold is essential for distributing the air-fuel mixture to the engine cylinders, it does not actively regulate the air flow; rather, it serves more as a delivery system. The exhaust manifold is tasked with directing exhaust gases away from the engine after combustion and does not have a role in air intake regulation. The fuel pump's primary function is to supply fuel to the engine, playing no direct part in the regulation of air entering the engine. Thus, the throttle body is clearly the correct answer when considering the component that controls air intake regulation in an engine.

**2. When comparing brake power measured at the flywheel with that at the drive wheels, what is generally true?**

- A. No difference if the transmission is functioning properly.**
- B. Power at the wheels exceeds that at the flywheel by 10% to 25%.**
- C. Power can only be measured at the drive wheels.**
- D. Power at the flywheel exceeds that at the drive wheels by 20% to 25%.**

When comparing brake power measured at the flywheel with that at the drive wheels, it is accurate that the power at the flywheel typically exceeds that at the drive wheels by a margin of about 20% to 25%. This difference arises primarily due to the losses that occur in the drivetrain, which includes components like the transmission, differential, and other related parts. These components consume some of the power generated by the engine as they convert rotational energy into motion, resulting in a reduction in the amount of power that ultimately reaches the ground at the drive wheels. Factors such as friction within engine parts, inefficiencies in the transmission, and energy loss in the differential contribute to this reduction. Therefore, the measurement of power directly at the flywheel is higher compared to what is measured at the wheels, reflecting the real-world performance of the vehicle. Understanding this principle is key in evaluating vehicle performance and making necessary adjustments or repairs to improve efficiency.

**3. Which SAE multigrade oil is likely recommended for year-round use in North America?**

- A. 5W-30**
- B. 15W-40**
- C. 20W-20**
- D. 20W-50**

The correct choice, which suggests 5W-30 multi-grade oil, is favored for year-round use in North America primarily due to its versatility across a wide range of temperatures. The "5W" indicates that the oil flows like a 5-weight oil in colder temperatures, which allows for easier starting and better engine protection during cold weather. The "30" denotes its viscosity at higher temperatures, providing adequate protection and lubrication when the engine is running hot. This oil provides a balance that makes it suitable for both cold starts in winter and the higher temperatures experienced in summer. It maintains performance and efficiency throughout the year by adapting its viscosity appropriately based on temperature, which is a critical factor in areas with significant seasonal temperature variations. In comparison, the other options either have a higher cold viscosity rating, which may hinder cold weather performance, or are less adaptable to both extremes of temperature, making them less suitable for year-round use. For example, 15W-40 would be better suited for warmer climates but may not flow as well in very cold conditions, while both 20W-20 and 20W-50 are too thick at low temperatures, leading to poor cold start conditions. Thus, 5W-30 stands out as the

**4. When grinding a valve face to remove pitting, the critical specification to monitor during machining would be the?**

- A. Shank diameter**
- B. Stem**
- C. Poppet diameter**
- D. Margin**

Monitoring the margin during the grinding of a valve face is crucial because it directly affects the valve's sealing ability against the seat in the cylinder head. The margin is the area on the valve face that comes into contact with the seat when the valve is closed. If the margin is ground too thin as pitting is removed, it can compromise the valve's ability to create a proper seal, leading to issues such as leakage, reduced compression, and poor engine performance. Maintaining the correct margin ensures that the valve maintains its structural integrity and functionality while also preventing excessive material removal that may lead to a failure in sealing. Proper attention to the margin is essential for achieving a balance between effective material removal and the durability of the valve, which is critical for the engine's overall reliability.

**5. Rod and main journal bearing clearances are best measured with which tool?**

- A. Tram gauges**
- B. Dial indicators**
- C. Plastigage**
- D. Snap gauges**

Measuring rod and main journal bearing clearances effectively is crucial for ensuring proper engine performance and longevity. Plastigage is specifically designed for this purpose, as it provides a simple and accurate way to measure clearance. When used, Plastigage is placed between the bearing and the journal. Once the bearing cap is tightened to the specified torque, the Plastigage is compressed, and its width at the point of compression corresponds directly to the clearance. This is particularly beneficial because it offers a direct visual representation of the clearance, making it easy to interpret the measurements. Other tools have their own specific applications but may not provide the same level of ease or accuracy for this particular measurement. For example, dial indicators are ideal for measuring movement or displacement but can be cumbersome in confined spaces like engine bearing clearances. Similarly, tram gauges are typically used for aligning surfaces rather than measuring small gaps or clearances. Snap gauges can measure widths but do not clearly indicate clearance in a bearing context, as they require more setup and may not be as straightforward to read. Thus, Plastigage stands out as the most appropriate tool for measuring rod and main journal bearing clearances due to its accuracy, ease of use, and direct visual results.

**6. What is the operating principle of a typical coolant pump on a highway diesel engine?**

- A. Positive displacement.**
- B. Centrifugal.**
- C. Constant volume.**
- D. Gear type.**

The operating principle of a typical coolant pump on a highway diesel engine is centrifugal. This type of pump is designed to move coolant through the engine cooling system by converting rotational energy into hydrodynamic energy, effectively pushing the fluid away from the impeller. In a centrifugal coolant pump, the impeller rotates at high speeds, creating a low-pressure area at the inlet, which draws coolant from the engine. As the coolant enters the pump, it is accelerated outward by the impeller blades. This action generates a flow of coolant that travels through the engine and into the radiator for cooling. The efficiency and the ability to move large volumes of coolant quickly make centrifugal pumps the preferred choice for diesel engines in Highway applications. Understanding why centrifugal pumps are prevalent in this application is useful. They are less complex, tend to be more efficient at continuous flow rates, and can handle the variations in flow caused by engine operating conditions. Knowing the core operating principle can aid in troubleshooting and maintenance for technicians working with these systems.

**7. What type of piston is favored by diesel engine OEMs in post-2007 products?**

- A. Forged steel trunk**
- B. Aluminum trunk**
- C. Two-piece articulating**
- D. Two-piece crosshead**

Diesel engine manufacturers have increasingly favored forged steel trunk pistons in their post-2007 products due to several key benefits they offer. Forged steel pistons are known for their exceptional strength and durability, which are critical in the high-pressure environment of modern diesel engines. These pistons can withstand the increased thermal and mechanical stresses associated with more efficient, power-dense diesel engine designs that meet stringent emissions regulations. Additionally, forged steel provides better resistance to deformation and wear compared to other piston materials, allowing for longer service intervals and reduced maintenance costs. The manufacturing process also allows for precision engineering, which leads to tighter tolerances and improved performance metrics, including fuel efficiency and reduced emissions. The choice of piston design directly impacts the overall efficiency and reliability of the engine. By opting for forged steel trunk designs, OEMs can enhance the longevity and performance of their engines, aligning with industry trends focused on power, efficiency, and environmental compliance.

**8. In the event of an engine overheating, where is the coolant likely to boil first?**

- A. At the engine water jacket**
- B. At the top of the radiator tank**
- C. At the inlet to the coolant pump**
- D. At the thermostat housing**

The coolant is likely to boil first at the inlet to the coolant pump because this area is typically under lower pressure compared to other parts of the engine cooling system. When an engine overheats, the coolant's temperature can exceed its boiling point, leading to the formation of steam. Inlet areas, especially where the coolant enters the pump, are most susceptible to reaching this boiling point first due to the dynamic nature of the cooling system. As coolant circulates, it absorbs heat from the engine components, and if the system is compromised (such as with low coolant levels or insufficient circulation), it can create hot spots. The inlet to the coolant pump may not be as effectively cooled as other areas, allowing the coolant there to boil before it reaches more temperature-stable areas like the engine water jacket or the top of the radiator tank, where coolant pressure and flow are typically more controlled. Understanding this concept is essential for diagnosing cooling system issues and preventing engine damage due to overheating.

## 9. How can you verify if an engine is properly tuned?

- A. A properly tuned engine runs smoothly and shows efficient fuel consumption.**
- B. A properly tuned engine always uses premium fuel.**
- C. A properly tuned engine has a loud exhaust.**
- D. A properly tuned engine leaks oil.**

A properly tuned engine operates efficiently, which is indicated by smooth running and optimal fuel consumption. When an engine is tuned correctly, it is able to mix air and fuel in the right proportions and ignite that mixture effectively, resulting in a seamless operation with minimal vibrations and noise. This efficiency reflects positively on fuel consumption, as less fuel is wasted and more power is generated from the same amount of fuel input. In contrast, statements regarding using premium fuel, having a loud exhaust, or leaking oil do not accurately indicate whether an engine is properly tuned. The use of premium fuel is determined by engine design and manufacturer recommendations rather than tuning status. A loud exhaust can indicate issues such as exhaust leaks or modifications that may not relate to the engine's tuning condition. Oil leaks suggest engine problems that need attention but do not contribute to an assessment of the tuning state. Hence, smooth operation and efficient fuel consumption are key metrics for verifying proper engine tuning.

## 10. What should be used to install piston rings onto a piston?

- A. The thumb and index finger**
- B. A ring contractor**
- C. A ring expander**
- D. Snapping pliers**

Installing piston rings onto a piston requires a tool designed specifically for that purpose, which is a ring expander. A ring expander is a specialized tool that allows for the controlled expansion of the piston ring to fit over the piston without damaging the ring itself. This is crucial because piston rings are typically made of materials that can be fragile, and using the proper tool helps to avoid bending or breaking them during installation. When using a ring expander, it creates uniform tension across the ring, ensuring it fits snugly into the piston grooves while maintaining its form. This precision is vital for the engine's overall performance, as improperly installed rings can lead to issues such as poor sealing, increased oil consumption, or even engine failure. Other methods, such as employing just the thumb and index finger, lack the control and distribution of pressure needed and can result in improper installation or damage. Similarly, while snapping pliers are useful in many applications, they are not suited for installing piston rings. A ring contractor is a tool intended for managing the compression of multiple rings but doesn't directly aid in the installation onto the piston itself.

## 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:**

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

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