

Gmc duramax diesel speed sensor replacement Online PDF

GMC Duramax Diesel Speed Sensor Replacement: A Comprehensive Guide to Restoring Your Vehicle's Performance

The GMC Duramax diesel engine is renowned for its power, durability, and efficiency. However, like all complex mechanical systems, it relies on various sensors to operate optimally. One critical component is the speed sensor, which plays a vital role in ensuring accurate data transmission to the vehicle's engine control unit (ECU). When this sensor malfunctions or fails, it can lead to a range of issues, from poor acceleration to transmission shifting problems. In this article, we'll explore everything you need to know about GMC Duramax diesel speed sensor replacement, including symptoms of failure, step-by-step replacement procedures, and tips to ensure a successful repair.

Understanding the Role of the Speed Sensor in GMC Duramax Diesel Engines

What Is a Speed Sensor?

The speed sensor, often referred to as the vehicle speed sensor (VSS), is an electronic component that measures the rotational speed of the vehicle's wheels or transmission shaft. This data is crucial for various systems, including cruise control, anti-lock braking system (ABS), traction control, and engine management.

How the Speed Sensor Affects Your GMC Duramax

The speed sensor provides real-time data to the ECU to optimize engine performance, fuel efficiency, and transmission operation. A faulty speed sensor can cause:

- Erratic or surging engine behavior
- Transmission shifting issues
- Check engine light illumination
- Speedometer malfunction
- Reduced fuel economy
- ABS warning lights

Signs That Indicate Need for GMC Duramax Diesel Speed Sensor Replacement

Recognizing the symptoms of a failing speed sensor is essential for timely repairs. Common signs include:

- Inconsistent or Non-Working Speedometer: The speedometer may fluctuate or be stuck.
- Transmission Shifting Problems: Hard shifts, delayed engagement, or failure to shift properly.
- Check Engine Light: The ECU detects sensor malfunctions and triggers warning lights.
- ABS and Traction Control Malfunctions: These systems rely on accurate speed data.
- Poor Acceleration or Engine Performance: Erroneous data can lead to decreased power delivery.
- Sudden Stalling or Engine Limp Mode: In some cases, the vehicle may enter a reduced power mode.

If you notice any of these symptoms, it's advisable to perform a diagnostic scan to confirm whether the speed sensor is at fault.

Diagnosing a Faulty Speed Sensor in GMC Duramax Diesel

Before proceeding with replacement, proper diagnosis is critical. Here's how you can confirm if the speed sensor needs replacing:

Tools Needed

- OBD-II scanner with live data capabilities
- Basic hand tools (socket set, screwdrivers)
- Jack and jack stands (for access)
- Replacement speed sensor

Diagnostic Steps

- Connect an OBD-II Scanner: Check for diagnostic trouble codes (DTCs). Common codes related to speed sensor issues include P0500 (Vehicle Speed Sensor Malfunction) and P0501 (Vehicle Speed Sensor Range/Performance).
- Observe Live Data: Monitor the vehicle speed readings. If the data fluctuates wildly or shows zero while driving, it indicates a sensor issue.
- Inspect Sensor and Wiring: Visually examine the sensor and wiring harness for damage,

corrosion, or disconnection.

- Test the Sensor: Use a multimeter to check for proper resistance according to manufacturer specifications.

If diagnostics confirm sensor failure, proceed with replacement.

GMC Duramax Diesel Speed Sensor Replacement: Step-by-Step Guide

Replacing the speed sensor can be a straightforward task if you have basic mechanical skills. Below is a detailed step-by-step process tailored for GMC Duramax diesel models.

Preparation and Safety

- Park your vehicle on a flat surface
- Engage the parking brake
- Disconnect the negative battery terminal
- Gather all necessary tools and replacement parts

Tools and Materials Required

- Replacement speed sensor compatible with GMC Duramax
- Socket set (commonly 10mm or 8mm sockets)
- Ratchet wrench
- Screwdrivers
- Jack and jack stands
- Protective gloves and safety glasses

Replacement Procedure

- Lift the Vehicle: Use a jack to raise the front or rear, depending on sensor location, and secure with jack stands.
- Locate the Speed Sensor: The sensor is typically mounted on the transmission or differential housing, often near the output shaft.
- Disconnect Wiring Harness: Carefully unplug the electrical connector from the sensor.
- Remove the Faulty Sensor: Use the appropriate socket to unscrew and remove the sensor from its mounting location.
- Inspect the Area: Clean the mounting area of any debris or corrosion to ensure proper

installation of the new sensor.

- Install the New Sensor: Thread the new sensor into place manually, then tighten securely with the socket.
- Reconnect Wiring: Plug the electrical connector firmly into the new sensor.
- Lower the Vehicle: Remove the jack stands and carefully lower the vehicle.
- Reconnect the Battery: Attach the negative terminal.
- Test the Repair: Start the engine and check for proper operation. Use the OBD-II scanner to clear any codes and verify no new codes appear.

Post-Replacement Tips and Maintenance

- Clear Diagnostic Trouble Codes: Always reset the ECU after replacing the sensor to ensure the system recognizes the new component.
- Test Drive: Take your vehicle for a test drive to observe performance and confirm the issue is resolved.
- Regular Inspection: Periodically check wiring and sensor connections, especially after off-road driving or harsh conditions.
- Use Quality Replacement Parts: Opt for OEM or high-quality aftermarket sensors to ensure longevity and compatibility.

Common Challenges and Troubleshooting

While replacing the speed sensor is generally straightforward, some issues may arise:

- Sensor Not Detecting Properly: Ensure the sensor is installed correctly and the wiring is intact.
- Persistent Warning Lights: Re-scan the vehicle to verify the code has been cleared.
- Difficulty Accessing the Sensor: Use proper tools and techniques; if the sensor is stuck, applying penetrating oil and gentle leverage can help.

Conclusion

Maintaining your GMC Duramax diesel engine's sensors is essential for optimal vehicle performance, safety, and longevity. The speed sensor, in particular, ensures accurate data flow to the engine and transmission systems. If you notice symptoms like erratic speedometer readings, transmission issues, or warning lights, diagnosing and replacing the speed sensor promptly can save you from costly repairs down the line.

By following the detailed steps outlined above, even DIY enthusiasts can confidently replace a faulty speed sensor. Remember, always prioritize safety, use quality parts, and consult your vehicle's

service manual for specific specifications and procedures. Proper maintenance and timely repairs will keep your GMC Duramax diesel running smoothly for miles to come.

GMC Duramax Diesel Speed Sensor Replacement: A Comprehensive Guide to Restoring Performance and Accuracy

The GMC Duramax diesel speed sensor replacement is a crucial maintenance task that can significantly impact your truck's performance, safety, and diagnostic capabilities. Whether you're experiencing erratic speed readings, ABS warning lights, or transmission issues, a faulty speed sensor could be the culprit. This guide aims to provide a detailed, step-by-step overview of the process, ensuring you understand each phase and can confidently tackle the replacement, whether you're a seasoned DIY mechanic or a curious truck owner.

Understanding the Importance of the Speed Sensor in GMC Duramax Diesel Engines

Before diving into the replacement process, it's essential to grasp the role of the speed sensor in your GMC Duramax diesel engine. The vehicle relies on this sensor to provide accurate wheel or transmission speed data to various control modules, including the engine control unit (ECU), anti-lock braking system (ABS), and transmission control module (TCM).

Why Is the Speed Sensor Critical?

- **Safety Systems Functionality:** The ABS and traction control systems depend heavily on accurate speed readings to prevent wheel lock-up and maintain stability.
- **Transmission Performance:** Proper shifting and torque management require precise speed data.
- **Diagnostic Accuracy:** Faulty sensors can trigger warning lights and error codes, complicating troubleshooting.

When the speed sensor malfunctions, it can lead to:

- Erratic or inaccurate speedometer readings
- ABS or traction control warning lights illuminated
- Harsh or delayed shifting
- Reduced fuel efficiency
- Transmission shifting issues

Recognizing these symptoms early can save you from costly repairs and ensure your GMC Duramax runs smoothly.

Identifying Symptoms and Diagnosing a Faulty Speed Sensor

Common Signs of a Faulty Speed Sensor

- Speedometer fluctuations or failures
- ABS or traction control warning lights on the dashboard
- Transmission shifting irregularities
- Check engine light illuminated
- Vehicle enters limp mode or exhibits reduced power

Diagnostic Procedures

- Use an OBD-II scanner to retrieve error codes such as C0045, C0035, or related transmission/speed sensor codes.
- Visual inspection for damaged wiring, connectors, or corrosion.
- Testing the sensor's resistance and voltage output with a multimeter (if accessible and trained).

Note: If diagnostics confirm a faulty speed sensor, proceed with replacement.

Tools and Parts Needed for GMC Duramax Diesel Speed Sensor Replacement

Essential Tools

- Jack and jack stands or wheel ramps
- Socket set (typically 10mm, 8mm, or 11mm depending on sensor location)
- Ratchet wrench
- Flat-head screwdriver or pry tool
- Torque wrench
- Wire brush or electrical contact cleaner
- Multimeter (for testing)
- Safety gloves and eye protection

Replacement Parts

- New speed sensor compatible with your GMC Duramax model
- Replacement connector or wiring harness (if necessary)
- Thread locker (optional, for securing sensor bolts)

- Dielectric grease (to prevent corrosion)

Step-by-Step Guide to Replacing the GMC Duramax Diesel Speed Sensor

- Prepare Your Workspace and Vehicle
 - Park your truck on a level surface.
 - Engage the parking brake.
 - Disconnect the negative terminal of the battery to prevent electrical shorts.
 - Gather all tools and parts beforehand.
- Locate the Speed Sensor

The location of the speed sensor varies depending on the model year and specific setup:

- Transmission Speed Sensor: Usually mounted on the transmission housing, often near the tailshaft or output shaft.
- Wheel Speed Sensor: Located at each wheel hub, connected to the ABS system.

Consult your vehicle's service manual for exact location details. For GMC Duramax diesel trucks:

- Transmission speed sensors are typically accessible from under the vehicle, near the bellhousing or transfer case.
- Wheel speed sensors are at each wheel hub, behind the brake rotor.

- Raise the Vehicle Safely
 - Use a jack to lift the truck if needed.
 - Secure the vehicle on jack stands or wheel ramps.
 - Remove the wheel if working on wheel speed sensors.
- Disconnect the Sensor Wiring

- Locate the sensor's wiring harness.
- Carefully disconnect the electrical connector, noting its orientation.
- Inspect the wiring for damage or corrosion.

- Remove the Faulty Sensor

- Use the appropriate socket to remove the mounting bolt(s).
- Gently pry out the sensor if it's stuck, avoiding damage to surrounding components.
- Clean the mounting area with a wire brush or contact cleaner to ensure a good seal for the new sensor.

- Install the New Speed Sensor

- Compare the new sensor with the old one to ensure compatibility.
- Insert the new sensor into the mounting hole.
- Secure it with the mounting bolt(s), tightening to the manufacturer's specified torque.
- Apply a small amount of thread locker if recommended.

- Reconnect Wiring and Verify

- Attach the wiring connector securely.
- Apply dielectric grease to prevent moisture intrusion.
- Double-check all connections.

- Lower the Vehicle and Test Drive

- Carefully lower the vehicle from the jack stands.
- Reconnect the negative battery terminal.
- Start the engine and observe the dashboard for warning lights.
- Use an OBD-II scanner to clear any fault codes.
- Test drive the vehicle to ensure proper operation and that symptoms are resolved.

Additional Tips and Precautions

- Always wear safety gear and take proper precautions when working under a vehicle.
- If unsure about sensor location or wiring, consult your vehicle's service manual or a professional.
- For wheel speed sensors, ensure the hub or rotor area is clean before installing the new sensor.
- Replace sensors in pairs if both sides show symptoms, to maintain system balance.

When to Seek Professional Assistance

While many DIY enthusiasts can handle speed sensor replacement, certain situations might require professional help:

- Difficult access to the sensor location
- Persistent fault codes after replacement
- Suspected wiring or electronic module issues
- Lack of proper tools or experience

A professional mechanic can perform a thorough diagnosis and ensure the system's integrity.

Conclusion: Restoring Your GMC Duramax's Performance

The GMC Duramax diesel speed sensor replacement is a manageable task that can save you time and money while restoring your vehicle's safety and performance. By understanding the sensor's role, recognizing symptoms, and following a methodical replacement process, you can effectively troubleshoot and resolve speed-related issues. Regular maintenance and prompt attention to warning signs will keep your Duramax running smoothly, ensuring reliable performance for years to come.

Remember: Always prioritize safety and consult your vehicle's service manual for specific procedures and torque specifications. When in doubt, seeking professional assistance can prevent further damage and ensure the job is done correctly.

Question What are the common symptoms indicating a faulty GMC Duramax diesel speed sensor? **Answer** Common symptoms include erratic speedometer readings, loss of cruise control, check engine light activation, and transmission shifting issues. These signs suggest the speed sensor may need replacement. How do I locate the speed sensor on my GMC Duramax diesel engine? The speed sensor is typically mounted on the transmission or transfer case. Consult your vehicle's repair manual for exact location, but it's often found near the output shaft or on the transfer case housing. What tools are required to replace the GMC Duramax diesel speed sensor? You'll generally need a socket set, screwdrivers, possibly a torque wrench, and safety gloves. Specific tools may vary depending on your model, so check your repair manual for detailed

requirements. Can I replace the GMC Duramax diesel speed sensor myself, or should I seek professional help? If you have basic mechanical skills and the right tools, replacing the speed sensor can be a DIY task. However, if you're unsure or uncomfortable, it's best to have a professional mechanic handle the replacement to ensure proper installation. How much does it cost to replace the speed sensor on a GMC Duramax diesel? The cost typically ranges from \$150 to \$300, including parts and labor. The sensor itself is usually inexpensive, but labor charges depend on the shop's rates and accessibility of the sensor. How long does it take to replace the speed sensor on a GMC Duramax diesel? The replacement process generally takes about 1 to 2 hours, depending on your vehicle's specific model and the technician's experience. Proper diagnosis before replacement is also recommended.

Related keywords: GMC Duramax, diesel engine, speed sensor, replacement, sensor failure, diagnostic tools, vehicle performance, engine troubleshooting, Duramax parts, speed sensor location

speed and distance practice a answer key

Speed and Distance Practice A Answer Key

Understanding how to accurately solve problems related to speed and distance is essential for students preparing for exams, especially in mathematics and physics. Practice questions help reinforce concepts, improve problem-solving skills, and build confidence. In this article, we will provide a comprehensive speed and distance practice A answer key, along with detailed explanations to help you grasp the core principles behind each problem. Whether you're a student studying for a test or a teacher preparing practice materials, this guide will serve as a valuable resource.

Understanding the Basics of Speed and Distance

Before diving into practice problems, it's important to review the fundamental concepts that underpin speed and distance calculations.

Key Formulas

- **Speed = Distance / Time**
- **Distance = Speed × Time**
- **Time = Distance / Speed**

These formulas are the foundation for solving most speed and distance problems. Remember to keep units consistent, e.g., if speed is in km/h, distance in km, and time in hours.

Practice Problem Set and Answer Key

Below are typical practice questions related to speed and distance, followed by their detailed solutions.

Question 1:

A car travels 240 km in 4 hours. What is its average speed?

Answer 1:

To find the average speed, use the formula:

$$\text{Speed} = \text{Distance} / \text{Time}$$

Substitute the given values:

$$\text{Speed} = 240 \text{ km} / 4 \text{ hours} = 60 \text{ km/h}$$

Answer: The car's average speed is 60 km/h.

Question 2:

A cyclist covers a distance of 90 km at a speed of 15 km/h. How long does the journey take?

Answer 2:

Using the formula:

$$\text{Time} = \text{Distance} / \text{Speed}$$

$$\text{Time} = 90 \text{ km} / 15 \text{ km/h} = 6 \text{ hours}$$

Answer: The journey takes 6 hours.

Question 3:

An airplane flies at a speed of 900 km/h for 3 hours. How far does it travel?

Answer 3:

Apply the distance formula:

$$\text{Distance} = \text{Speed} \times \text{Time}$$

$$\text{Distance} = 900 \text{ km/h} \times 3 \text{ hours} = 2700 \text{ km}$$

Answer: The airplane travels 2700 km.

Question 4:

A runner completes a 10 km race in 50 minutes. What is their average speed in km/h?

Answer 4:

First, convert minutes to hours:

$$50 \text{ minutes} = 50 / 60 = 5 / 6 \text{ hours} \approx 0.833 \text{ hours}$$

Now, use the speed formula:

$$\text{Speed} = \text{Distance} / \text{Time}$$

$$\text{Speed} = 10 \text{ km} / (5/6 \text{ hours}) = 10 \text{ km} \times (6/5) = 12 \text{ km/h}$$

Answer: The runner's average speed is 12 km/h.

Question 5:

Two cars start from the same point and travel in the same direction. Car A travels at 80 km/h, and Car B at 100 km/h. How long will it take for Car B to catch up with Car A if Car A has a 20 km head start?

Answer 5:

This is a problem of relative speed.

- Relative speed of Car B with respect to Car A = $100 \text{ km/h} - 80 \text{ km/h} = 20 \text{ km/h}$
- Distance to cover = 20 km (head start)

Time taken to catch up:

$$\text{Time} = \text{Distance} / \text{Relative speed} = 20 \text{ km} / 20 \text{ km/h} = 1 \text{ hour}$$

Answer: It will take 1 hour for Car B to catch Car A.

Tips for Solving Speed and Distance Problems

Understanding common pitfalls and strategies can help improve accuracy.

1. Keep Units Consistent

Always ensure that the units for distance, speed, and time are compatible. Convert units where necessary before calculations.

2. Use Formulas Appropriately

Identify which formula applies to the problem. For example, if you have distance and time, find speed; if you have speed and time, find distance.

3. Break Down Complex Problems

For multi-step problems, write down what is known and what you need to find before setting up equations.

4. Practice Word Problems

Work through various scenarios to develop a flexible understanding of how different variables relate.

Additional Practice Questions for Mastery

To further reinforce your understanding, here are additional questions:

- Calculate the speed of a train that covers 500 km in 5 hours.
- If a boat travels at 30 km/h downstream and takes 2 hours to reach a point 60 km away, what is its upstream speed if it takes 3 hours to return?
- A motorbike accelerates uniformly from 20 km/h to 60 km/h in 5 seconds. What is its acceleration?

Answers:

- Speed = 500 km / 5 hours = 100 km/h

- Downstream speed = 60 km / 2 hours = 30 km/h

Upstream speed = Distance / Time = 60 km / 3 hours = 20 km/h

- Acceleration = (Final velocity - Initial velocity) / Time

Convert velocities to m/s: 20 km/h = $20 \times (1000/3600)$? 5.56 m/s

60 km/h ? 16.67 m/s

Acceleration = $(16.67 - 5.56) \text{ m/s} / 5 \text{ s}$? 2.22 m/s²

Conclusion

Mastering speed and distance problems requires a clear understanding of formulas, consistent unit conversion, and strategic problem-solving. The speed and distance practice A answer key provided here aims to clarify common question types and their solutions, serving as a solid resource for learners. Regular practice using these types of problems will enhance your ability to quickly and accurately solve speed and distance questions, whether for exams or real-world applications. Remember, consistent practice and a thorough grasp of the fundamentals are key to success.

Speed and Distance Practice Answer Key: A Comprehensive Guide to Mastering Speed and Distance Problems

Understanding speed and distance practice answer key is essential for students preparing for exams that involve kinematic concepts, such as physics tests, standardized assessments, or competitive exams. These practice questions help reinforce fundamental principles, improve problem-solving skills, and build confidence in tackling real-world scenarios involving motion. In this guide, we will explore the core concepts, common question formats, strategies for solving, and how to interpret answer keys effectively.

Introduction to Speed and Distance Problems

Speed and distance problems are a staple in many mathematics and physics curricula because they provide practical insights into the relationship between how fast something is moving, the distance it covers, and the time taken. These problems often involve the basic formula:

Speed = Distance / Time

or equivalently,

Distance = Speed × Time

and sometimes require solving for any of these variables when given the other two.

Why Practice with Answer Keys?

Utilizing speed and distance practice answer key resources offers several benefits:

- Immediate Feedback: Quickly verify your solutions to understand where mistakes may have occurred.
- Understanding Problem Variations: Exposure to different question types helps develop flexible problem-solving skills.
- Building Confidence: Repeated practice with answer keys enhances accuracy and speed.
- Preparation for Exams: Familiarity with common question formats reduces exam anxiety.

Types of Speed and Distance Practice Questions

Speed and distance problems can vary in complexity and format. Here are common types:

- Basic Speed, Distance, and Time Problems
 - Example: A car travels 150 miles in 3 hours. What is its average speed?
- Relative Speed Problems
 - Example: Two trains leave opposite ends of a track and move towards each other. Find the time until they meet given their speeds and the starting distance.
- Multiple-Stage Problems

- Example: A person walks for 2 hours at 3 mph, then bikes for 1 hour at 9 mph. Find the total distance traveled.

- Speed and Time with Variable Speeds

- Example: A runner accelerates during a race. How does this affect average speed calculations?

Core Strategies for Solving Speed and Distance Questions

Step 1: Identify Known Variables

Read the problem carefully and note down:

- Distance (d)
- Speed (s)
- Time (t)

Step 2: Determine What You Need to Find

Clarify whether the question asks for speed, distance, or time.

Step 3: Choose the Appropriate Formula

Recall the basic relationships:

- $\text{Speed} = \text{Distance} / \text{Time}$
- $\text{Distance} = \text{Speed} \times \text{Time}$
- $\text{Time} = \text{Distance} / \text{Speed}$

Step 4: Set Up the Equation

Translate the problem into an algebraic equation based on knowns and unknowns.

Step 5: Solve and Check Units

Ensure units are consistent (miles/hour, km/hour, meters/second) before solving.

Step 6: Verify Your Answer

Check if the answer makes sense in the context of the problem.

Interpreting the Answer Key

An answer key provides the correct solutions to practice questions. When reviewing:

- Compare your solution steps with the answer key's methodology.
- Check calculations for arithmetic errors.
- Understand alternative solutions if provided.
- Review explanations to grasp the reasoning behind correct answers.

Sample Problem with Answer Key Breakdown

Question: A cyclist travels 60 miles at a constant speed. If the trip takes 4 hours, what is the cyclist's average speed?

Solution:

- Identify variables:
 - Distance (d) = 60 miles
 - Time (t) = 4 hours
 - Speed (s) = ?
- Use the formula:

$$s = d / t$$

- Substitute knowns:

$$s = 60 \text{ miles} / 4 \text{ hours}$$

- Calculate:

$s = 15$ miles/hour

Answer: The cyclist's average speed is 15 miles per hour.

Tips for Effective Practice Using Answer Keys

- Attempt problems independently before consulting the answer key.
- Use the answer key to understand mistakes, not just to verify answers.
- Practice regularly to improve speed and accuracy.
- Create a error log to track recurring mistakes and focus on those areas.
- Work through explanations provided in the answer key to deepen understanding.

Common Pitfalls and How to Avoid Them

- Misreading the question: Always double-check what is being asked.
- Ignoring units: Ensure units are consistent throughout calculations.
- Rushing calculations: Take your time to avoid simple arithmetic errors.
- Assuming constant speed: Clarify whether the problem specifies uniform or variable speed.

Conclusion

Mastering speed and distance practice answer key exercises is crucial for excelling in exams that test understanding of motion concepts. By systematically applying problem-solving strategies, interpreting answer keys carefully, and learning from mistakes, students can significantly improve their competency in these topics. Remember, consistent practice coupled with thoughtful review of answers and explanations is the key to becoming proficient in solving speed, distance, and time problems efficiently and accurately.

Final Thoughts

Whether you're a student preparing for a physics test, a math exam, or simply looking to strengthen your understanding of basic kinematic principles, using practice questions with detailed answer keys is an effective way to learn. Keep practicing, stay curious, and use each problem as a stepping stone toward mastering the concepts of speed, distance, and time.

Question What is the basic formula to calculate speed in a speed-distance-time problem? **Answer** The basic formula is $\text{Speed} = \text{Distance} / \text{Time}$. How do you find the distance traveled when speed and time are given? Use the formula $\text{Distance} = \text{Speed} \times \text{Time}$. If a car travels at 60 km/h for 2 hours, what is the total distance covered? $\text{Distance} = 60 \text{ km/h} \times 2 \text{ hours} = 120 \text{ km}$. In a practice

problem, if a train covers 240 km in 4 hours, what is its speed? $\text{Speed} = 240 \text{ km} / 4 \text{ hours} = 60 \text{ km/h}$. Why is understanding the relationship between speed, distance, and time important for solving practice problems? Because it allows you to set up and solve equations accurately, helping to find missing values in various real-world scenarios efficiently.

Related keywords: speed practice, distance calculations, physics practice, speed and distance worksheet, motion problems, velocity and time exercises, kinematics practice, speed distance problems answers, physics answer key, motion worksheet solutions

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