SOS Mechanic Certification – Suspension & Steering Practice Exam (Sample)

Study Guide

BY EXAMZIFY

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Questions

1. **What is the primary method of bleeding a power steering unit?**
   - A. Turning the steering wheel left and right repeatedly
   - B. Draining the power steering fluid completely
   - C. Using a vacuum pump to remove air
   - D. Running the engine at high RPMs

2. **What symptom might indicate a problem with the vehicle's struts?**
   - A. Increased fuel consumption
   - B. Creaking or clunking noises
   - C. Worn tires
   - D. Difficulty turning the steering wheel

3. **How does uneven weight distribution affect a vehicle's suspension performance?**
   - A. It improves traction and handling characteristics
   - B. It leads to altered handling characteristics and reduced traction
   - C. It enhances stability during high-speed driving
   - D. It has no significant effect on performance

4. **Which statement is true regarding camber angles?**
   - A. Negative camber helps improve cornering
   - B. Positive camber is always preferred
   - C. Camber angles have no effect on tire contact
   - D. Zero camber is harmful for handling

5. **When should ball joints with wear indicators be checked?**
   - A. Only when the vehicle is on a lift
   - B. Before the tires are installed
   - C. When loaded and by visual observation
   - D. Only during routine maintenance intervals

6. What adjustment can be made to reduce pulling to one side?

A. Adjusting toe-in only

B. Adjusting caster angle on both sides

C. Equalizing tire air pressure

D. Adjusting camber settings

7. What type of suspension system uses both coil springs and shock absorbers?

A. Leaf spring suspension

B. MacPherson strut suspension

C. Air suspension

D. Independent suspension

8. The adjustment of which angle affects tire wear on a front tire?

A. Camber

B. Caster

C. Toe

D. All of the above

9. What effect does worn bushings have on a vehicle's handling?

A. It improves traction on wet roads

B. It can lead to increased play in the suspension

C. It enhances ride comfort significantly

D. It allows for more precise steering input

10. A tire wobbles from side to side; what could cause this problem?

A. Lateral runout

B. Tire pressure imbalance

C. Worn tread pattern

D. Improper wheel mounting

Answers

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

Explanations

1. What is the primary method of bleeding a power steering unit?

A. Turning the steering wheel left and right repeatedly

B. Draining the power steering fluid completely

C. Using a vacuum pump to remove air

D. Running the engine at high RPMs

The primary method of bleeding a power steering unit involves turning the steering wheel left and right repeatedly. This method allows any trapped air within the power steering system to be expelled as the fluid circulates. When the wheel is turned, the power steering pump creates movement in the fluid, which helps push the air out of the system and into the reservoir. As the steering wheel is turned from lock to lock, it encourages movement in the fluid and promotes the formation of aeration, allowing air bubbles to rise to the top and escape. This is a simple and effective technique that can be easily performed without needing specialized equipment. Other methods, such as draining the power steering fluid completely or using a vacuum pump, are not the primary techniques employed for bleeding the system. Draining fluid is more about maintenance or replacement rather than bleeding air, while vacuum pumps are often used in other systems but are less common in power steering applications. Running the engine at high RPMs does not effectively help in removing air from the power steering system and could potentially lead to other issues, such as overheating the fluid.

2. What symptom might indicate a problem with the vehicle's struts?

A. Increased fuel consumption

B. Creaking or clunking noises

C. Worn tires

D. Difficulty turning the steering wheel

Creaking or clunking noises can indicate a problem with a vehicle's struts because these sounds often arise from worn or damaged components in the suspension system, particularly the struts themselves. Struts are crucial elements that absorb impacts from the road and help maintain the vehicle's stability and handling. When they start to fail, they can produce abnormal noises due to the movement of internal parts or excessive clearance in joints. If the struts are not functioning properly, you may also notice changes in the ride quality, such as bouncing or swaying while driving, which can further validate issues with this component. While other symptoms like increased fuel consumption, worn tires, or difficulty turning the steering wheel can be related to different suspension or steering issues, the distinct creaking or clunking noises are specifically tied to problems within the strut assembly or related suspension components.

3. How does uneven weight distribution affect a vehicle's suspension performance?

A. It improves traction and handling characteristics

B. It leads to altered handling characteristics and reduced traction

C. It enhances stability during high-speed driving

D. It has no significant effect on performance

Uneven weight distribution significantly impacts a vehicle's suspension performance by leading to altered handling characteristics and reduced traction. When a vehicle's weight is not distributed evenly across its axles, it can place excessive load on one side or end of the vehicle. This imbalance affects how the suspension system operates, resulting in inconsistent responses to steering inputs and road conditions. With uneven weight distribution, the suspension on the heavier side can compress more than on the lighter side, leading to poor alignment and handling. Additionally, tires on the overloaded side may experience more wear and reduced grip, which compromises traction. This can cause instability, especially in cornering or during abrupt maneuvers, as the vehicle may tend to lean or roll more, affecting overall control. In contrast, a vehicle with a balanced weight distribution benefits from more predictable handling and improved traction. As a result, maintaining an even weight distribution is vital for optimal suspension performance, ensuring that each tire maintains contact with the road and provides the necessary grip for safe driving.

4. Which statement is true regarding camber angles?

A. Negative camber helps improve cornering

B. Positive camber is always preferred

C. Camber angles have no effect on tire contact

D. Zero camber is harmful for handling

Negative camber is advantageous for cornering because it allows the tire to maintain better contact with the road surface during turns. When a vehicle corners, the weight shifts to the outside of the tires. Having a negative camber means that the top of the tire leans inward toward the vehicle, which helps ensure that the larger portion of the tire's tread remains in contact with the ground. This improves grip and stability, allowing for more efficient cornering and better handling characteristics overall. In a racing context, this is especially important as it allows for quicker turn-in and more controlled cornering at higher speeds.

5. When should ball joints with wear indicators be checked?

A. Only when the vehicle is on a lift

B. Before the tires are installed

C. When loaded and by visual observation

D. Only during routine maintenance intervals

Ball joints with wear indicators should be checked when loaded and by visual observation because this provides the most accurate assessment of their condition. When the suspension system is under load, it simulates the actual working conditions that the ball joints experience while driving. The wear indicators are designed to help visualize any excessive wear that may affect the performance and safety of the vehicle. Observing them in this loaded state allows a technician to detect any play, cracks, or other signs of wear that might not be visible when the vehicle is lifted or unloaded. Additionally, checking them visually while the vehicle is loaded ensures that the technician can assess how they function in real-world conditions, giving a better understanding of whether replacement or adjustment is needed. This practical approach to inspection is crucial for maintaining proper suspension and steering performance, ultimately contributing to the safety and reliability of the vehicle while on the road.

6. What adjustment can be made to reduce pulling to one side?

A. Adjusting toe-in only

B. Adjusting caster angle on both sides

C. Equalizing tire air pressure

D. Adjusting camber settings

To understand how adjusting camber settings can help reduce pulling to one side, it is essential to consider how camber affects tire contact with the road. Camber refers to the tilt of the wheels in relation to vertical alignment. If one wheel has a positive or negative camber that is significantly different from the other wheel on the same axle, it can cause uneven tire wear and inconsistent handling characteristics. This misalignment may lead to the vehicle pulling to one side while driving. By adjusting the camber settings on the wheels, you can ensure that both wheels have an equal and appropriate angle relative to the vertical axis. This adjustment provides a more uniform contact patch with the road surface and helps balance the vehicle's handling dynamics. Consequently, aligning the camber can effectively reduce or eliminate the tendency for the vehicle to pull in one direction. In contrast, while other adjustments such as adjusting toe-in, caster angle, and tire air pressure play vital roles in overall steering feel and alignment, they do not directly address the imbalance caused by uneven camber angles as effectively. Therefore, optimizing camber settings is crucial for achieving a straight driving path and enhancing tire performance.

7. What type of suspension system uses both coil springs and shock absorbers?

A. Leaf spring suspension

B. MacPherson strut suspension

C. Air suspension

D. Independent suspension

The MacPherson strut suspension is a widely used design that incorporates both coil springs and shock absorbers to create a straightforward and effective suspension system. In this setup, the coil spring provides the necessary support and cushioning to absorb road shocks, while the shock absorber (or damper) controls the oscillation and movement of the springs, ensuring that the ride is smooth and stable. This system allows for a compact design, making it popular in many modern vehicles. It connects the wheel hub to the vehicle's chassis in a manner that supports lateral forces during cornering, enhancing handling and stability. The integration of the spring and damper into a single unit (the strut) is a hallmark of this design, optimizing space and weight. In contrast, other suspension types may prioritize different characteristics or configurations. For example, leaf spring suspension primarily uses leaf springs for load-bearing support, while air suspension relies on air-filled bags to adjust ride height and comfort. Independent suspension allows each wheel to react independently to road conditions, but does not inherently specify the use of coil springs and shock absorbers. Thus, the distinct combination of coil springs and shock absorbers within the MacPherson strut design makes it the correct answer.

8. The adjustment of which angle affects tire wear on a front tire?

A. Camber

B. Caster

C. Toe

D. All of the above

The adjustment of all three angles—camber, caster, and toe—can significantly affect tire wear on a front tire. Camber refers to the tilt of the wheels in relation to the vertical axis when viewed from the front of the vehicle. If the camber is incorrect, it can cause uneven wear on the tires. For example, excessive negative camber may result in increased wear on the inside edge of the tire, while excessive positive camber can lead to wear on the outer edge. Caster is the angle of the steering axis, which affects the stability and handling of the vehicle. While it's more about steering characteristics, its improper adjustment can still influence how the tire contacts the road surface over time, potentially impacting tire wear, although to a lesser extent than camber or toe. Toe refers to the direction the tires point in relation to the centerline of the vehicle. If the toe is misaligned, it can cause significant irregular tire wear. For instance, if the tires are toed in or out, they will drag against the road unevenly, resulting in faster deterioration in specific areas of the tread. Given that each of these adjustments can contribute to uneven tire wear, selecting all of the angles as affecting front tire wear is accurate. Understanding

9. What effect does worn bushings have on a vehicle's handling?

A. It improves traction on wet roads

B. It can lead to increased play in the suspension

C. It enhances ride comfort significantly

D. It allows for more precise steering input

Worn bushings have a notable impact on a vehicle's handling primarily by leading to increased play in the suspension. These bushings are crucial components that connect various parts of the suspension system, providing both support and flexibility. When bushings wear out, they lose their ability to maintain proper alignment and restrict movement. This results in a greater amount of play or looseness in the suspension, which can cause several handling issues. Increased play can lead to a lack of responsiveness when steering, making the vehicle feel unstable and less controlled. The vehicle may exhibit unpredictable movements, particularly when cornering or going over bumps, negatively affecting overall handling and safety. Therefore, the state of the bushings is vital for maintaining precise steering and stable handling characteristics. It’s essential for any vehicle's performance to ensure that the suspension bushings are in good condition to avoid these negative effects.

10. A tire wobbles from side to side; what could cause this problem?

A. Lateral runout

B. Tire pressure imbalance

C. Worn tread pattern

D. Improper wheel mounting

Lateral runout refers to the side-to-side deviation of the tire's surface as it rotates. When a tire has excessive lateral runout, it can cause the tire to wobble or shake as it spins. This phenomenon occurs as the tire's shape or alignment is not uniform, leading to inconsistencies with its contact with the road. Consequently, when a driver observes a wobbling effect while the vehicle is in motion, lateral runout could very well be the primary cause. Understanding lateral runout is essential for identifying related issues in wheel balance, alignment, and overall driving stability. It's important to address this condition promptly, as it can lead to increased wear on the tire, potential damage to suspension components, and compromised vehicle handling. Regular inspections and proper installation techniques are key in preventing lateral runout and ensuring a smooth ride.