ASE Suspension and Steering (A4) Practice Test (Sample)

Study Guide

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Questions

1. Which steering gear box adjustment should be performed first?

A. Sector shaft preload

B. Worm bearing preload

C. Sector shaft over center

D. Worm bearing end-play

2. What is the primary symptom of a leaking shock absorber?

A. Decreased braking performance

B. Excessive tire wear

C. Reduced ride comfort

D. Inability to steer

3. When does a positive camber angle exist?

A. When the top of the tire leans outward

B. When the top of the tire leans inward

C. When the upper ball joint is rearward of the lower ball joint as viewed from the side

D. When the rear axle is crooked

4. In a steering system with excessive play, which component is most likely worn?

A. Worn strut mounts

B. Worn sway bar bushings

C. Worn shock mounts

D. Worn rack mounts

5. Which component's wear could lead to changes in camber and caster, causing steering pull?

A. Control arm bushings

B. Track rod

C. Ball joints

D. Shock absorbers

6. Which vehicle component is responsible for connecting the steering wheel to the steering gear?

A. Steering column

B. Pitman arm

C. Idler arm

D. Track rod

7. What component is primarily responsible for setting the thrust line in a vehicle?

A. Rear toe

B. Front toe

C. Caster adjustment

D. Camber adjustment

8. In the process of removing a steering wheel on a vehicle equipped with SRS, which technician is correct in their procedure?

A. Technician A, who follows OEM power-down procedures

B. Technician B, who starts removal after removing the SRS fuse

C. Both technicians are correct

D. Neither technician is correct

9. A customer says that the steering wheel turns more turns to the left than the right. Which of the following is the LEAST LIKELY cause?

A. Incorrectly timed steering gear

B. Bent pitman arm

C. Faulty power steering pump

D. Bent tie rod

10. The EPS light is continuously illuminated on the dash. What should the technician do?

A. Replace the EPS system

B. Connect a scan tool and access the trouble code

C. Check the battery voltage

D. Inspect the EPS fluid level

Answers

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

Explanations

1. Which steering gear box adjustment should be performed first?

A. Sector shaft preload

B. Worm bearing preload

C. Sector shaft over center

D. Worm bearing end-play

The first adjustment to be performed on a steering gear box typically involves the worm bearing preload. This adjustment is crucial because it sets the initial resistance to rotation of the worm gear, which directly affects the overall steering feel and precision. By establishing the proper preload, the components can operate smoothly without excessive play, enabling more accurate control of the steering system. Adjusting the worm bearing preload first ensures that it is appropriately positioned to support the operation of the steering gear. Following this initial adjustment, other adjustments, such as sector shaft preload and over center settings, can be made with the assurance that the foundational components are set correctly. This sequence is important because it prevents excessive wear and ensures that all adjustments made afterward are effective and do not compromise the adjustment of the worm bearing itself.

2. What is the primary symptom of a leaking shock absorber?

A. Decreased braking performance

B. Excessive tire wear

C. Reduced ride comfort

D. Inability to steer

A leaking shock absorber primarily impacts the vehicle's ability to absorb bumps and irregularities in the road, resulting in reduced ride comfort. Shock absorbers are crucial components of a vehicle's suspension system that help maintain contact between the tires and the road surface. When they are leaking fluid, their effectiveness is compromised, leading to excessive bounce or rocking and an overall harsh ride. This diminished ability to dampen movements can make driving uncomfortable, as passengers will feel more of the road disturbances. While it could indirectly affect braking performance, tire wear, and steering dynamics over time, the immediate and most noticeable symptom drivers experience is the lack of ride comfort, making it the primary symptom of a leaking shock absorber.

3. When does a positive camber angle exist?

A. When the top of the tire leans outward

B. When the top of the tire leans inward

C. When the upper ball joint is rearward of the lower ball joint as viewed from the side

D. When the rear axle is crooked

A positive camber angle exists when the top of the tire leans outward from the vehicle. This configuration generally indicates that the tire is angled away from the vehicle's centerline, which can influence handling characteristics and tire wear. Positive camber can be beneficial in certain performance aspects, particularly during cornering, as it allows for better stability and contact patch management with the road surface. The outward lean can help in distributing forces more evenly across the tire surface when under lateral load, optimizing grip. In contrast, the other options describe different conditions that are not related to positive camber. An inward lean of the tire would represent a negative camber angle, while the positioning of the ball joints and the condition of the rear axle are unrelated to the camber measurement of the tire itself.

4. In a steering system with excessive play, which component is most likely worn?

A. Worn strut mounts

B. Worn sway bar bushings

C. Worn shock mounts

D. Worn rack mounts

In a steering system exhibiting excessive play, the component that is most likely to be worn is the rack mounts. The rack and pinion steering mechanism relies on precise alignment and stability to provide effective steering response. Over time, rack mounts can degrade due to wear, exposure to road conditions, and the stresses of steering maneuvers. When the rack mounts are worn, they can result in a loose connection between the steering rack and the vehicle frame, leading to increased play in the steering wheel. This excessive play can manifest as a loose feeling when turning the steering wheel, which can compromise the driver's control over the vehicle. Consequently, addressing worn rack mounts is crucial for restoring proper steering response and ensuring safe vehicle operation. While other components like strut mounts, sway bar bushings, and shock mounts can also contribute to ride quality and handling, they do not specifically impact the steering mechanism in the same direct way that worn rack mounts do. Thus, it is the condition of the rack mounts that predominantly leads to the excessive play described in the steering system.

5. Which component's wear could lead to changes in camber and caster, causing steering pull?

A. Control arm bushings

B. Track rod

C. Ball joints

D. Shock absorbers

The wear of control arm bushings can significantly impact the alignment of the suspension components, particularly camber and caster angles. Control arm bushings are designed to provide a pivot point and maintain proper alignment of the control arms, which are critical for keeping the vehicle's wheels positioned correctly relative to the body of the vehicle and the road. When control arm bushings wear out, they can lose their ability to hold the control arm in its proper position. This loss of precise positioning can alter the angles of camber and caster, resulting in uneven tire wear and potentially causing the vehicle to pull to one side when driving. A change in these suspension angles can also compromise handling and stability. In contrast, while ball joints, track rods, and shock absorbers are also important components of the suspension system, their primary functions differ. Ball joints allow for movement of the control arms and affect steering response, while track rods help maintain wheel alignment and direction but are less directly involved with camber and caster adjustments. Shock absorbers primarily dampen the motion of the vehicle's suspension system and maintain ride comfort. Therefore, while they all play vital roles in steering and suspension, the specific link between wear in control arm bushings and changes in camber and caster directly correlates

6. Which vehicle component is responsible for connecting the steering wheel to the steering gear?

A. Steering column

B. Pitman arm

C. Idler arm

D. Track rod

The steering column is the component that connects the steering wheel to the steering gear, enabling the driver to control the direction of the vehicle. It transfers the rotational motion of the steering wheel directly to the steering gear, which then translates that movement into steering input at the wheels. The steering column also houses various components, such as the ignition switch, and may contain wiring for features like steering wheel controls and horn activation. Its design ensures that the driver's input is smoothly and accurately conveyed, providing the necessary control for steering the vehicle. In contrast, other components listed, such as the pitman arm, idler arm, and track rod, serve different functions within the steering and suspension system, primarily related to the linkage and stability of the steering mechanism rather than linking the steering wheel and steering gear directly.

7. What component is primarily responsible for setting the thrust line in a vehicle?

A. Rear toe

B. Front toe

C. Caster adjustment

D. Camber adjustment

The component that is primarily responsible for setting the thrust line in a vehicle is the rear toe. The thrust line is an imaginary line that runs through the center of the rear axle and extends toward the front of the vehicle. It is crucial for ensuring that the vehicle tracks straight while in motion. Rear toe adjustment affects the position of the rear wheels in relation to the front wheels. If the rear wheels are toed in or out too much, it can cause the vehicle to veer off its intended path, leading to uneven tire wear and handling issues. By properly setting the rear toe, the thrust line can be aligned with the vehicle's centerline, enhancing stability and handling. Proper adjustment allows for optimized steering response and can help eliminate issues such as crab walking, where the vehicle moves diagonally instead of straight. While options related to front toe, caster adjustment, and camber adjustment play important roles in overall vehicle alignment and handling characteristics, they do not specifically define the thrust line as effectively as rear toe does.

8. In the process of removing a steering wheel on a vehicle equipped with SRS, which technician is correct in their procedure?

A. Technician A, who follows OEM power-down procedures

B. Technician B, who starts removal after removing the SRS fuse

C. Both technicians are correct

D. Neither technician is correct

The procedure for removing a steering wheel on a vehicle equipped with a Supplemental Restraint System (SRS) emphasizes the importance of following the Original Equipment Manufacturer (OEM) power-down procedures. When SRS components such as airbags are present, it is crucial to ensure that the system is completely powered down to avoid accidental deployment during service. Technician A's method of adhering to the OEM power-down procedures is a significant safety step. This procedure usually includes disconnecting the battery and waiting a specific duration to ensure that any residual electrical charge is dissipated. Following this protocol minimizes the risk of injury and damage to the vehicle's safety systems. In contrast, Technician B's approach of simply removing the SRS fuse may not be sufficient for ensuring safety. While removing the fuse disconnects power to the SRS system, it does not adequately address the potential for stored energy in components like capacitors. This method may leave the system vulnerable to accidental deployment. Thus, adhering to the OEM power-down processes as suggested by Technician A represents the safest and most reliable practice when dealing with SRS systems.

9. A customer says that the steering wheel turns more turns to the left than the right. Which of the following is the LEAST LIKELY cause?

A. Incorrectly timed steering gear

B. Bent pitman arm

C. Faulty power steering pump

D. Bent tie rod

When evaluating the scenario where a customer reports that the steering wheel turns more to the left than the right, it's essential to consider the mechanics of the steering system. A faulty power steering pump is the least likely cause of this issue because a malfunctioning pump would generally lead to problems such as difficulty in steering or a lack of assist, but it would not typically result in an asymmetrical turning ratio. The power steering pump's role is to provide hydraulic pressure to assist in steering. If the pump were defective, it would not cause an imbalance in the number of turns required to steer left versus right; rather, it would affect the overall ease of steering operation. On the other hand, issues like an incorrectly timed steering gear, a bent pitman arm, or a bent tie rod could all directly cause an uneven steering response by altering the geometry or relationship of components in the steering system, leading to the described condition. Thus, while other mechanical failures can create the problem of unequal steering effort between left and right turns, a faulty power steering pump is unlikely to directly cause this specific symptom, making it the least likely cause in this situation.

10. The EPS light is continuously illuminated on the dash. What should the technician do?

A. Replace the EPS system

B. Connect a scan tool and access the trouble code

C. Check the battery voltage

D. Inspect the EPS fluid level

When the EPS (Electronic Power Steering) light is continuously illuminated on the dashboard, the most appropriate course of action is to connect a scan tool and access the trouble code. This step is critical because the EPS system is equipped with onboard diagnostics that can provide specific trouble codes related to the steering system's performance. These codes can help identify the underlying issue, whether it's related to the power steering control module, sensors, or other components. Using a scan tool allows the technician to retrieve not only the trouble codes but also any additional data that may assist in diagnosing the problem effectively. This systematic approach is essential in automotive repair, ensuring that the technician can address the issue accurately rather than making assumptions. While checking battery voltage, inspecting EPS fluid levels, or even replacing the EPS system might seem reasonable, these steps do not provide the immediate and specific insights that the diagnostic trouble codes can offer. Battery voltage checks and fluid inspections are part of broader maintenance but are not direct diagnostic steps for the illuminated EPS warning light. Replacing the EPS system can be costly and unnecessary without first confirming that the EPS system itself has failed through proper diagnostics.