(A4) Suspension and Steering Sample Questions and Answers

Answers to these questions are found beginning on page 4 of this document

1. Two technicians are discussing the replacement of an inner tie rod end (ball-socket assembly) of a rack-and-pinion steering gear. Technician A says that the inner and outer tie rod ends are part of the rack and cannot be replaced separately. Technician B says that the steering gear unit should be removed from the vehicle before the inner tie rod end can be removed. Which technician is correct?

   a. Technician A only
   b. Technician B only
   c. Both Technicians A and B
   d. Neither Technician A nor B

2. A customer complains that the steering lacks power assist only when cold. Technician A says that the power steering fluid may be low. Technician B says that a worn housing around the rotary (spool) valve is the most likely cause. Which technician is correct?

   a. Technician A only
   b. Technician B only
   c. Both Technicians A and B
   d. Neither Technician A nor B

3. A defective upper strut mount can cause all of the following except _____.

   a. Binding
   b. Noise when driving over bumps
   c. Poor steering wheel return after turning a corner
   d. A crooked steering wheel

4. A light film of oil is observed on the upper area of a shock absorber. Technician A says that this condition should be considered normal. Technician B says that a rod seal may bleed fluid during cold weather causing the oil film. Which technician is correct?

   a. Technician A only
   b. Technician B only
   c. Both Technicians A and B
   d. Neither Technician A nor B

5. A rear-wheel-drive vehicle equipped with front coil springs and rear leaf springs is sagging down at the right rear and the left front is higher than the right front. Which is the most likely cause?

a. A broken stabilizer bar link in the left front
b. A broken rear track rod
c. A broken leaf spring on the right rear
d. A broken left front shock absorber

6. The rear of a sport utility vehicle is sagging. Which is the least likely cause?

a. Excessive load in the rear of the vehicle
b. Incorrect springs
c. Broken spring seats
d. Leaking shock absorbers

7. A vehicle has ride (trim) height lower on the left side than on the right side. Which is the most likely cause?

a. Worn ball joints on the left side
b. A worn or leaking shock absorber on the right side
c. A weak or leaking shock absorber on the left side
d. Sagging springs on the left side

8. Technician A says that a vehicle will pull (or lead) to the side with the most camber (or least negative camber) if the difference exceeds factory specifications. Technician B says that a vehicle will pull (or lead) to the side with the most front toe. Which technician is correct?

a. Technician A only
b. Technician B only
c. Both Technicians A and B
d. Neither Technician A nor B

9. A pickup truck was aligned and then the owner installed a heavy camper. Technician A says that the extra weight will change the camber and caster on the front wheels. Technician B says that the weight will cause the toe to change. Which technician is correct?

a. Technician A only
b. Technician B only
c. Both Technicians A and B
d. Neither Technician A nor B

10. A vehicle is pulling to the right. Technician A says that more camber on the right than the left could be the cause. Technician B says that more toe-in on the left than on the right could be the cause. Which technician is correct?

a. Technician A only
b. Technician B only
c. Both Technicians A and B
d. Neither Technician A nor B

11. Technician A says that the present alignment will cause excessive tire wear to the inside of both front tires. Technician B says the rear of the vehicle will dog track because of the difference in the rear toe. Which technician is correct?

    a. Technician A only
    b. Technician B only
    c. Both Technicians A and B
    d. Neither Technician A nor B

12. A front-wheel-drive vehicle with an independent rear suspension steers to the right. Technician A says that unequal front toe can be the cause. Technician B says that unequal rear toe could be the cause. Which technician is correct?

    a. Technician A only
    b. Technician B only
    c. Both Technicians A and B
    d. Neither Technician A nor B

13. Technician A says that lug nuts should be tightened in a star pattern. Technician B says that a torque wrench should be used to be assured that all of the lug nuts are uniformly tightened and to the specified torque. Which technician is correct?

    a. Technician A only
    b. Technician B only
    c. Both Technicians A and B
    d. Neither Technician A nor B

14. Wheels were installed on a vehicle using an air impact wrench without using a torque absorbing adapter. What could occur?

    a. Hard to remove
    b. Vibration and possible warped rotors/drums
    c. Wheel/tire assembly out of balance
    d. Both a and b could occur

15. A TPMS dash warning is flashing. Technician A says that this means that a low tire has been detected. Technician B says that this means that the system has detected a fault such as a wheel sensor that is not broadcasting data. Which technician is correct?

    a. Technician A only
    b. Technician B only
    c. Both Technicians A and B
    d. Neither Technician A nor B

Answers to Sample Questions

1. **The correct answer is d.** Neither technician is correct. Technician A is not correct because the inner tie-rod ends are separate components and can be replaced separately in most vehicles. Technician B is not correct because the inner tie-rod end can usually be replaced without requiring that the rack and pinion steering gear unit be removed. Answer c is not correct because neither technician is correct.

2. **The correct answer is b.** Technician B is correct because a worn control valve housing in the steering gear would allow power steering fluid to leak past the seals and result in hard steering until the fluid warms allowing the Teflon seals to become pliable and begin to seal the fluid. Technician A is not correct because low power steering fluid is unlikely to cause a lack of power assist when cold only although it could cause excessive noise due to aeration of the fluid. Answers c and d are not correct because Technician B only is correct.

3. **The correct answer is d.** A crooked (not straight) steering wheel cannot be caused by a defective upper strut mount, even though it could cause steering problems. Incorrect toe is the major reason for a crooked steering wheel. Answer a is not correct because a defective upper strut mount can cause binding. Answer b is not correct because a defective upper strut mount could cause noise while the vehicle is being driven over bumps in the road. Answer c is not correct because a defective upper strut bearing could have so much friction that the front wheels do not return to the straight ahead position after turning a corner.

4. **The correct answer is c.** Both technicians are correct. Technician A is correct because it is normal for a thin film of oil to be seen at the top of a shock absorber near the seal. If liquid is observed dripping from the shock absorber, then this is a fault and the shock absorber should be replaced. Technician B is correct because cold temperatures can cause the rod seal to bleed a thin layer of fluid and this condition is considered normal. Answers a, b, and d are not correct because both technicians are correct.

5. **The correct answer is c.** Defective rear leaf springs can cause the rear of the vehicle to sag thereby causing the left front to rise. Answer a is not correct because a broken stabilizer bar link will cause noise from the front and can cause the vehicle to lean excessively when cornering but it is not a load-carrying component so it could not cause the vehicle to sag down in the rear or rise up in the front. Answer b is not correct because the track rod keeps the rear wheels tracking properly behind the front wheels and could not cause the described problem. Answer d is not correct because a standard shock absorber does not support the vehicle weight and could not cause the problem even though a broken shock absorber could have contributed to the breaking of the rear leaf spring.

6. **The correct answer is d.** The least likely cause of a vehicle to sag in the rear would be leaking shock absorbers because even though this condition can cause the vehicle to ride roughly or cause the body to bounce over bumps in the road, the shock absorbers are not a load-carrying component. Answers a, b, and c are not correct because all of these could cause the rear of the vehicle to sag.

7. **The correct answer is d.** Sagging springs will cause the vehicle to be lower than normal. If a heavy load has been carried in the vehicle on the left side, the left side springs could have sagged and remained lower than normal even though the load had been removed. Sagging springs require replacement. Answers a, b, and c are not correct because they do not support the weight of the vehicle and cannot be the cause of the problem.

8. **The correct answer is a.** Technician A is correct because camber is a pulling angle if both front wheels are not within 0.5~. Technician B is not correct because while incorrect front toe can cause vehicle handling problems, it is not a pulling angle and therefore, would not cause a pull. Answers c and d are not correct because only Technician A is correct.

9. **The correct answer is c.** Both technicians are correct. Technician A is correct because the extra weight of the camper will cause the springs to compress, which usually changes the camber and caster. Technician B is correct because the extra weight of the camper will cause the front toe angle to change as the camber changes when the springs compress. The truck should be aligned with the camper installed to avoid handling or tire wear problems. Answers a, b, and d are not correct because both technicians are correct.

10. **The correct answer is a.** Technician A is correct because a vehicle will pull to the side with the most camber (highest positive camber or the lowest negative camber angles). Technician B is not correct because even if there is unequal toe between the left and right side, the toe angle splits when the vehicle is being driven and the steering wheel is forced crooked as the front wheels align themselves. Answers c and d are not correct because only Technician A is correct.

11. **The correct answer is d.** Neither technician is correct. Technician A is not correct because front camber and toe are within specifications. It would require negative camber or a toe out condition to cause tire wear on the inside edges of the front tires. Technician B is not correct because the rear toe is within specifications. Answers a, b, and c are not correct because neither technician is correct.

12. **The correct answer is b.** Technician B is correct because the difference in the rear toe will cause the vehicle to steer toward the side that has the greatest amount of toe just as a rudder is used to steer a boat. Technician A is not correct because unlike the rear wheels, the front wheels are tied together with tie rods and this causes the toe to split equally as the vehicle is driven. Answers c and d are not correct because only Technician B is correct.

13. **The correct answer is c.** Both technicians are correct. Technician A is correct because the lug nuts should be tightened in a star pattern to insure that the wheels are installed with even clamping force. Technician B is correct because a torque wrench should be used to not only be assured that the proper torque is applied to the lug nut, but to ensure that all of the nuts are tightened to the same torque to help avoid wheel or brake rotor distortion. Answers a, b, and d are not correct because both technicians are correct.

14. **The correct answer is d.** Both and b are correct. Answer a is correct because an air impact wrench exerts more than the specified lug nut torque which will make them hard to remove. Answer b is correct because reason for using a torque wrench or torque absorbing adapters is to prevent doing harm to the vehicle by exerting unequal torque to the lug nuts causing some warpage of the wheel and/or disc brake rotor may occur by unequal torque on the lug nuts. Answer c is not correct because even though warpage can occur that causes a vibration, the use of an air impact wrench cannot cause a tramp-type vibration or out of balance condition.

15. **The correct answer is b.** Technician B only is correct. A flashing TPMS dash warning light indicates the system has detected a fault in the system. The most likely reason is that the system has detected that one or more of the wheel sensors is not broadcasting tire pressure information to the TPMS controller. Technician A (answer a) is not correct because the warning lamp would be on, but not flashing if a low tire was detected. Answer c and d are not correct because Technician B only is correct.