

Chapter 02

Anti-Lock Brakes, Traction Control, and Stability Control



Name _____ Date _____

Instructor _____ Score _____

Objective: After studying this chapter, you will be able to describe the operation of anti-lock brakes, traction control, and stability control systems.

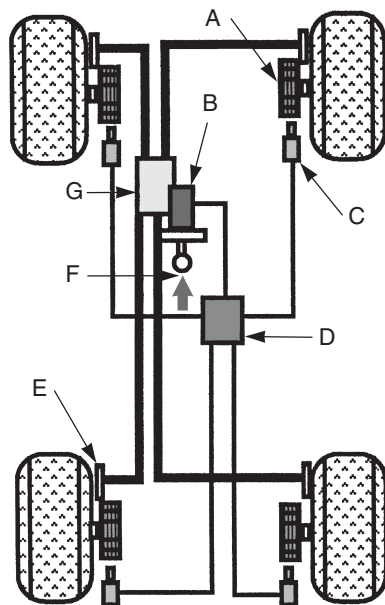
Anti-Lock Brake Systems (ABS)

- _____ 1. An anti-lock brake system uses all of the following to prevent loss of tire adhesion during hard braking *except*:
- (A) wheel speed sensors.
 - (B) leaf springs.
 - (C) a control module (computer).
 - (D) an electro-hydraulic brake actuator.

2. For maximum stopping power, what do you want the tires to do during a panic stop?

3. When a tire skids, its friction with the road surface _____ and stopping distance _____.

4. Identify the basic parts of the anti-lock brake system shown.



- (A) _____
- (B) _____
- (C) _____
- (D) _____
- (E) _____
- (F) _____
- (G) _____

5. How do wheel speed sensors produce a signal for the computer?

_____ 6. Technician A says the operation of a wheel speed sensor is similar to a coolant temperature sensor. Technician B says the operation of a wheel speed sensor is similar to a throttle position sensor. Who is right?
(A) A only.
(B) B only.
(C) Both A and B.
(D) Neither A nor B.

7. What is the purpose of the solenoid valve block in an anti-lock brake system?

_____ 8. None of the following store fluid under high pressure, *except*:
(A) fluid reservoir.
(B) accumulator.
(C) master cylinder-booster assembly.
(D) solenoid valve block.

9. How does the ABS (electro-hydraulic modulator) monitor system pressure?

10. What is the *ABS dump mode*?

_____ 11. Technician A says in the isolation mode, the modulator isolates the hydraulic circuit to any wheel that is locking up. Technician B says in the reapply mode, the modulator applies hydraulic pressure to one or more of the brake assemblies. Who is right?
(A) A only.
(B) B only.
(C) Both A and B.
(D) Neither A nor B.

12. Which channel ABS system has a separate hydraulic circuit for each wheel?

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- _____ 13. Technician A says that under normal braking conditions, ABS is not used. Technician B says ABS is used all the time for maximum braking control. Who is right?
- (A) A only.
 - (B) B only.
 - (C) Both A and B.
 - (D) Neither A nor B.
14. When ABS takes over, what will the brake pedal do and why?
- _____
- _____
- _____
- _____
- _____ 15. All of the following will occur if an ABS component malfunctions, *except*:
- (A) the brake system will not function.
 - (B) the ABS warning light will light.
 - (C) the ABS will be deactivated.
 - (D) the brake system will still function normally.

Traction and Stability Control Systems

16. Most traction control systems work with the ABS to _____ cycle _____ pressure to the wheel spinning the fastest.
- _____ 17. Technician A says the traction control system control module is capable of applying only one wheel brake at a time. Technician B says an indicator light will come on any time the traction control system is activated. Who is right?
- (A) A only.
 - (B) B only.
 - (C) Both A and B.
 - (D) Neither A nor B.
18. What is a *stability control system*?
- _____
- _____
- _____
- _____
- _____
19. Describe the additional sensors used in a stability control system.
- Steering angle sensor:*
- _____
- _____
- Lateral acceleration sensor:*
- _____
- _____

Yaw sensor:

Throttle position sensor (TPS):

Brake pressure sensor:

ABS Service

20. Besides inspecting for conventional troubles, what should you check on an ABS system during troubleshooting?

- _____ 21. Technician A says the ABS light should glow for several minutes after the vehicle is started. Technician B says if the ABS light stays on, the ECM has detected an abnormal condition. Who is right?
- (A) A only.
 - (B) B only.
 - (C) Both A and B.
 - (D) Neither A nor B.
- _____ 22. A scan tool will normally indicate problems with the following late-model ABS component(s).
- (A) Wheel speed sensor circuits.
 - (B) System relays.
 - (C) Modulator motors and brake switch circuit.
 - (D) All of the above.
- _____ 23. You can use the scan tool to manually control all of the following ABS parts, *except*:
- (A) ABS motors.
 - (B) relays.
 - (C) brake pedal.
 - (D) solenoids.

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24. If your scan tool indicates a problem with a wheel speed sensor, what should you do?

25. What tool(s) should be used to check the wheel speed sensor air gap?

_____ 26. Technician A says if the ABS modulator tests bad, most shops rebuild the unit. Technician B says if most shops rebuild ABS modulators, this would save customers money. Who is right?
 (A) A only.
 (B) B only.
 (C) Both A and B.
 (D) Neither A nor B.

27. When the _____ forms an integral part of the _____ modulator, you may need to use a very specific bleeding procedure.

28. How can a technician determine if the ABS is working normally during a test-drive?

Traction and Stability Control System Service

_____ 29. Technician A says when diagnosing a traction control problem, you can test-drive the vehicle while scanning. Technician B says you should test the vehicle away from pedestrians and traffic. Who is right?
 (A) A only.
 (B) B only.
 (C) Both A and B.
 (D) Neither A nor B.

30. When testing a traction or stability control system, what type of surface is best?

31. When the traction control or stability control system energizes, what should you hear?

- _____ 32. All of the following should be checked after an ABS, traction control, or stability control repair, *except*:
- (A) clear trouble codes and re-scan the system.
 - (B) test-drive the vehicle.
 - (C) simulate a panic stop in traffic.
 - (D) make sure the ABS indicator light stays off.