

# 37 Lights, Instrumentation, Wipers, and Horns— Operation and Service

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Instructor: \_\_\_\_\_ Score: \_\_\_\_\_ Textbook pages 647–682

**Objective:** After studying this chapter, you will be able to explain the operation and service of light, wiper, and horn systems.

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## Lighting Systems

1. Name four components in the lighting system that operate the interior and exterior lights on a vehicle.

\_\_\_\_\_

\_\_\_\_\_

2. Which components are included in the headlamp system?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

3. What does the headlamp switch control?

\_\_\_\_\_

4. A headlamp switch may contain a(n) \_\_\_\_\_ for adjusting the brightness of the instrument panel lights.

4. \_\_\_\_\_

5. Define *multifunction switch*.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

6. What is the purpose of a *flash-to-pass* feature?

\_\_\_\_\_

\_\_\_\_\_

7. When are low beams used?

\_\_\_\_\_

8. When are high beams used?

\_\_\_\_\_

9. What are the two different types of sealed-beam headlamp bulbs? \_\_\_\_\_

10. A halogen headlamp increases light output by about \_\_\_\_\_% without increasing current draw. 10. \_\_\_\_\_

11. The maximum brightness for low beams, according to federal regulations, is \_\_\_\_\_ candle power. 11. \_\_\_\_\_

12. A glass or plastic \_\_\_\_\_ disperses the light beam in front of the vehicle and protects the bulb. 12. \_\_\_\_\_

13. A lamp number is generally stamped on the \_\_\_\_\_. 13. \_\_\_\_\_

14. Explain what happens when the driver activates the dimmer switch. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

15. How does an *automatic headlight dimmer system* function? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

16. Where can a turn signal switch be mounted? \_\_\_\_\_

\_\_\_\_\_

17. Explain how a turn signal flasher works. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

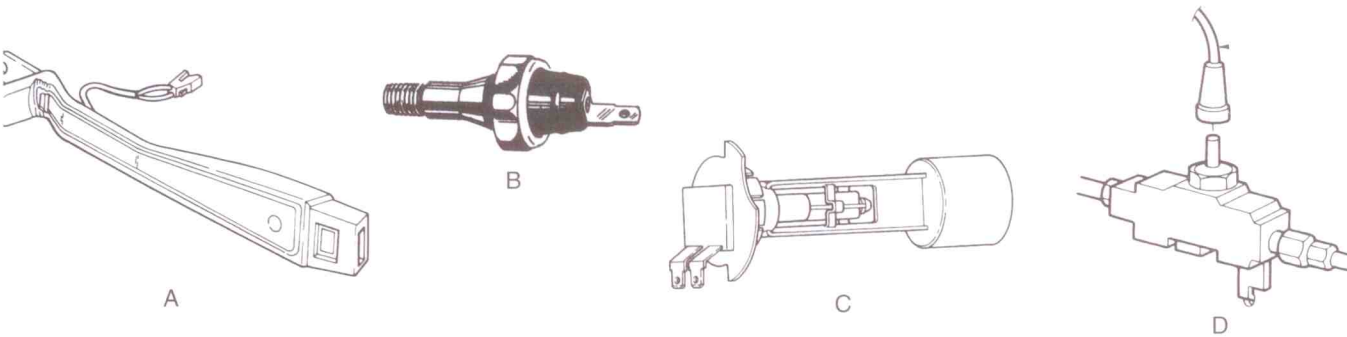
18. What components are included in the emergency light system? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

19. The \_\_\_\_\_ closes the light circuit when the transmission is shifted into reverse. 19. \_\_\_\_\_

20. Identify the types of switches.



(A) \_\_\_\_\_

(C) \_\_\_\_\_

(B) \_\_\_\_\_

(D) \_\_\_\_\_

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**Light System Service**

21. Why must you *not* touch the surface of a headlight bulb insert? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

22. What is indicated if all or several of the lights flicker? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

23. All of the following are ways to test a light switch, *except*:  
(A) check the fuse unit. 23. \_\_\_\_\_  
(B) use a test light.  
(C) check with a voltmeter.  
(D) test with an ohmmeter.

24. What is a *headlight aiming screen*? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

■ *Items 25 through 27. Match the following terms to their definitions.*

25. Built into late-model headlight assemblies to  
simplify headlight aiming. (A) Headlight aimers 25. \_\_\_\_\_  
(B) Headlight leveling bubbles

26. Alter the direction of the headlamp beams. (C) Headlight adjusting screws 26. \_\_\_\_\_

27. Point the car's headlamps in a specified position. 27. \_\_\_\_\_

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**Instrumentation**

28. What is the purpose of *instrumentation*? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

■ *Items 29 through 32. Match the following terms to their definitions.*

29. Small glass tubes filled with neon or argon gas. (A) Digital instruments 29. \_\_\_\_\_

30. Use various types of lights and electronic displays to show operating conditions. (B) Vacuum fluorescent displays 30. \_\_\_\_\_

31. Use rotating needles or dials to indicate operating conditions. (C) Liquid crystal displays 31. \_\_\_\_\_

32. Semiconductor panels that will pass light when electrically energized and block light when not energized. (D) Analog instruments 32. \_\_\_\_\_

33. Define *sending units*. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

34. If a gauge is not working, what should you do first? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

35. Information displayed onto the windshield or a plastic dash panel for easier viewing is reflected by a(n) \_\_\_\_\_. 35. \_\_\_\_\_

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## Windshield Wipers

36. What protects a windshield wiper system? \_\_\_\_\_  
\_\_\_\_\_

37. Name the two common types of pumps used with windshield washer systems.  
\_\_\_\_\_

38. How does a *rain-sensing wiper system* detect water? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

39. What should be checked if the windshield washer does *not* work? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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## Horns

40. What should be done to adjust horn current? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

41. How can meter damage be prevented? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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## Finding Common Electrical Problems

42. What could cause an *open circuit*? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

43. What should you do to find a *high resistance*? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

44. A voltage drop across an electrical conductor should not exceed \_\_\_\_\_ 44. \_\_\_\_\_  
volts.

45. How do you test a relay? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_