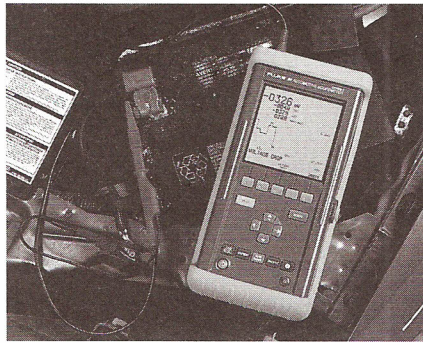


Starting System Fundamentals



Name: _____ Date: _____

Instructor: _____ Score: _____ Textbook pages 508–519

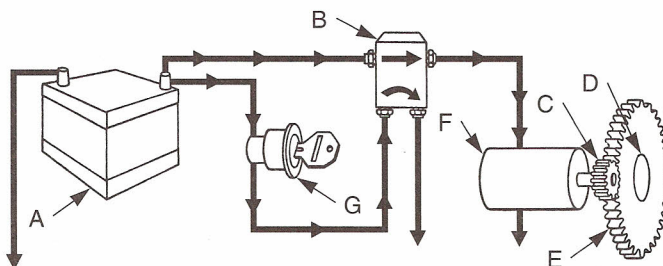
Objective: After studying this chapter, you will be able to explain the operation and construction of modern starting systems.

Starting System Principles

1. The _____ uses battery power and an electric motor to turn the engine crankshaft. 1. _____
2. Briefly describe what occurs in the starting system when the ignition is turned to the start position.

3. Describe a *commutator*: _____

4. Technician A says some late-model starting systems are programmed to open the circuit between the ignition key and the starter solenoid when the engine is running. Technician B says this prevents the driver from accidentally engaging the starting motor while the engine is running. Who is right?
(A) A only.
(B) B only.
(C) Both A and B.
(D) Neither A nor B. 4. _____
5. A(n) _____ is made up of invisible magnetic lines of force. 5. _____
6. What is another name for the *pole pieces*? 6. _____
7. Identify the parts in this basic starting system.



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

8. The _____ ride on top of the commutator. 8. _____
9. All of the following are used to increase starter motor power and smoothness, *except*: 9. _____
- (A) several loops of wire.
 - (B) a commutator with no segments.
 - (C) a commutator with many segments.
 - (D) connecting each winding to its own segment on the commutator.

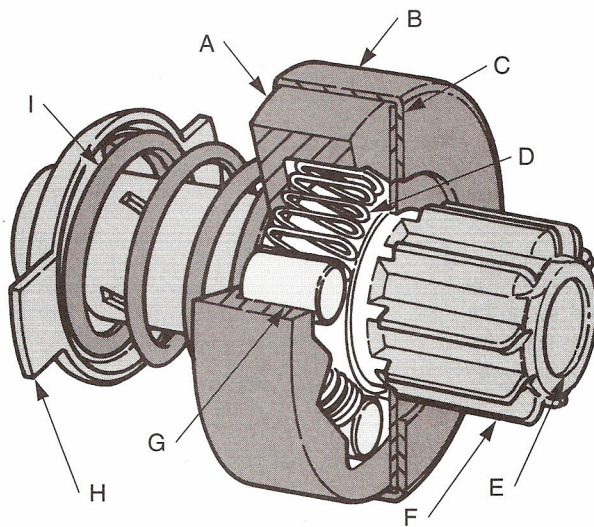
10. A starter armature consists of four components. Name them. _____

11. A(n) _____ is a stationary insulated wire wrapped in a circular shape. 11. _____
- (A) field winding
 - (B) armature
 - (C) commutator
 - (D) pinion

12. The magnetic field developed between the pole shoes can be _____ times larger than that of a permanent magnet. 12. _____

13. The starter pinion gear is the small gear on the _____ that engages the large gear on the _____. 13. _____

14. List the parts of this overrunning clutch.



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

15. Why is an overrunning clutch needed? _____

16. List the seven parts of a starter solenoid. _____

Name _____

17. Summarize starter solenoid operation. _____

18. The starter solenoid is located _____. 18. _____
 (A) on the starter motor
 (B) on a body panel away from the starter motor
 (C) in the starter motor itself
 (D) Both A and B.

Starting Motor Construction

19. What components are included in the *pinion drive assembly*? _____

20. What components are included in the *commutator end frame*? _____

21. All of the following are parts of the field frame, *except*: 21. _____
 (A) field coils.
 (B) center housing.
 (C) commutator.
 (D) shoes.

22. What is the *drive end frame*? _____

23. Technician A says a movable pole shoe starter uses a yoke lever to move the pinion gear. Technician B says a movable pole shoe starter has a plunger that moves a shift lever to engage the pinion gear. Who is right? 23. _____
 (A) A only.
 (B) B only.
 (C) Both A and B.
 (D) Neither A nor B.

24. Summarize the operation of the movable pole shoe starter. _____

25. A permanent magnet starter uses special _____ in place of conventional field windings. 25. _____

