Chapter 31



## Starting System Fundamentals

Name:	Date	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 tur	n the engine	1	
	crankshaft.	0		
2. Briefly describe what occurs in the starting system when the ignition is turned			d to the start position.	
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3.	Describe a <i>commutator</i> .			Г.
	2			
4.	<ul> <li>Technician A says some late-model starting systems are proopen the circuit between the ignition key and the starter solent engine is running. Technician B says this prevents the driver f tally engaging the starting motor while the engine is running.</li> <li>(A) A only.</li> <li>(B) B only.</li> <li>(C) Both A and B.</li> <li>(D) Neither A nor B.</li> </ul>	oid when the rom acciden-	4	
5.	A(n) is made up of invisible magnetic lines of force.		5	+
6.	What is another name for the <i>pole pieces</i> ?		6	
7.	Identify the parts in this basic starting system.			
[ A		(B) (C) (D)	, ,	

F

(G) \_

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<ul> <li>8. The ride on top of the commutator.</li> <li>9. All of the following are used to increase starter motor power and smoothness, <i>except:</i> <ul> <li>(A) several loops of wire.</li> <li>(B) a commutator with no segments.</li> <li>(C) a commutator with many segments.</li> <li>(D) connecting each winding to its own segment on the commutator.</li> </ul> </li> <li>10. A starter armature consists of four components. Name them</li></ul>	8 9	$\bigcirc$
<ul> <li>(A) field winding</li> <li>(B) armature</li> <li>(C) commutator</li> <li>(D) pinion</li> </ul>	11	
<ol> <li>The starter pinion gear is the small gear on the that engages the large gear on the</li> </ol>	13	
Image: state of the state		
15. Why is an overrunning clutch needed?		

16. List the seven parts of a starter solenoid.

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7. Summarize starter solenoid operation.			
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8. The starter solenoid is located		18	
(A) on the starter motor		10	
<ul><li>(B) on a body panel away from the starter motor</li><li>(C) in the starter motor itself</li></ul>			
(D) Both A and B.			
tarting Motor Construction			
9. What components are included in the <i>pinion drive assembly</i> ?			
0. What components are included in the <i>commutator end frame?</i>			
	2		
1. All of the following are parts of the field frame, <i>except</i> :		21	
<ul><li>(A) field coils.</li><li>(B) center housing.</li></ul>			
(C) commutator.			
<ul><li>(D) shoes.</li><li>2. What is the <i>drive end frame</i>?</li></ul>			
2. Tachaising A source a manufula and a share starting upon a suche lawar to		22	
3. Technician A says a movable pole shoe starter uses a yoke lever to the pinion gear. Technician B says a movable pole shoe starter	has a	23	
plunger that moves a shift lever to engage the pinion gear. Who is ri (A) A only.	ght?		
(B) B only.			
<ul><li>(C) Both A and B.</li><li>(D) Neither A nor B.</li></ul>			
4. Summarize the operation of the movable pole shoe starter.			
5. A permanent magnet starter uses special in place of conver	itional	25	

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26.	A(n) is sometimes used to increase the rotating force applied to the engine flywheel.	26
27.	List three types of dc motor circuits.	
28.	What prevents the engine from starting unless the shift selector is in neutral or park?	28
29.	Where is the neutral safety switch mounted on cars with automatic transmissions?	29
	<ul> <li>(A) On the shift lever.</li> <li>(B) On the transmission.</li> <li>(C) On a body panel.</li> <li>(D) Both A and B.</li> </ul>	
30.	<ul> <li>The neutral safety switch is wired into the circuit going into the</li> <li>(A) starter motor</li> <li>(B) starter solenoid</li> <li>(C) starter relay</li> <li>(D) None of the above.</li> </ul>	30
31.	In most late-model cars, the is wired into the same control circuit as the neutral safety switch.	31
32.	<ul> <li>A uses a small current from the ignition switch to control a slightly higher current to the starter solenoid.</li> <li>(A) transistor</li> <li>(B) diode</li> <li>(C) starter relay</li> <li>(D) neutral safety switch</li> </ul>	32
33.	Summarize starter relay operation.	
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