

*Automotive Engines 10th*

**Chapter 16 Engine Starting and Charging Systems**

**SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.**

1. How does a technician measure the amperage output of a alternator?
2. How does a technician test the voltage drop of the charging circuit?
3. What are the steps for performing a battery load test?
4. What are the steps taken to perform a voltage drop test of the cranking circuit?
5. What are the results of a voltmeter test of a battery and its state of charge?
6. How is a battery drain test performed?

## Answer Key

### Testname: ENGINES 10 SHORT 16

1. To measure the amperage output from an alternator, use a carbon-pile tester. When applying a load to the battery with a carbon pile tester during an alternator output test, do not permit the battery voltage to drop below 13 volts. Most alternators will produce their maximum output (in amperes) above 13 volts.  
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2. To test the voltage drop of the insulated charging circuit, attach one voltmeter test lead to the output terminal of the alternator and the other test lead to the positive terminal of the battery. Start the engine and turn on the headlights and observe the voltmeter. Repeat the test for the ground side.  
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3. A battery load test involves removing the surface charge, loading the battery to  $\frac{1}{2}$  of the CCA rating for 15 seconds, and observing the voltage at the end of the time with the load still applied. A good battery should be able to maintain at least 9.6 volts at the end of the test.  
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4. Crank the engine with a voltmeter connected to the battery and record the reading. Crank the engine with the voltmeter connected across the starter and record the reading. If the difference in the two readings exceeds 0.5-volt, further testing is required to find the fault.  
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5. After removing the surface charge, a battery voltage of 12.6 volts or higher indicates a fully charged battery. If 12.4 volts, it is 75% charged; 12.2 volts is 50% charged, and if 12.0 volts, the battery is only 25% charged.  
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6. A battery drain test is performed using either a clamp-on ammeter or by connecting an ammeter in series between the negative terminal of the battery and the disconnected negative battery cable end. A disconnect tool can also be used.  
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