

Starting System Tests

The function of a vehicle's starting system is to rotate the engine's crankshaft fast enough so that combustion can take place, and the engine can begin to run under its own power. This system, is commonly referred to as the "cranking system".

Providing the cranking power needed for reliable engine starts requires all starting system components to be in good working order. Testing the starting system can confirm that it is functioning properly, or provide valuable diagnostic information to isolate a problem in the system.

The STARTING SYSTEM TEST measures starter current draw and cranking voltage. If the engine cranking speed is good, and the starter current draw amperage and cranking voltage readings are within specifications, you can generally conclude that the starting system is functioning properly. But, if the starter does not crank, cranks too slowly, or the amps and/or volts reading are not within specifications, further testing will be required.

Before performing the STARTING SYSTEM TEST, the starting system should be visually inspected for physical defects, and some preliminary checks should be performed that will aid you in diagnosing a starting system problem. These are taken care of during the pretest.

PRETEST

1. To prevent possible personal injury and protect the vehicle from damage, inspect the starting system for defects. Check for the following; then repair and/or replace any defective components.
 - .Battery defects
 - .Frayed or broken electrical wiring
 - .Corroded or loose connections
 - .Loosely mounted starter motor, series-parallel switch, magnetic switch, solenoid, starter relay, etc.
2. Check state-of-charge of battery. For accurate starter current draw test results, the battery must be fully charged.
3. BE SURE TO USE FENDER COVERS to avoid damaging the vehicle paint due to battery acid on the tester cables.

STARTING SYSTEM TEST

1. Perform PRETEST (previous page).

*NOTE: Battery should be fully charged and engine at normal operating temperature.
A cold or overheated engine draws more amps during starter current draw test.*

2. Turn off all of the vehicle's electrical accessories.

3. Disable the ignition or fuel system as follows to prevent engine from starting during test:

4. With the LOAD KNOB in the OFF position (fully counterclockwise), connect LOAD LEADS to battery (red to positive and black to negative)

5. Press AMPS – 0 – KEY to zero display, if it does not read zero (0).

6. Make sure BATTERY volts function indicator is ON

7. Connect the AMPS PROBE around either the positive or negative starter cable.

8. Crank engine and observe AMPS and VOL TS readings
(after readings have leveled off - not peak readings).

CAUTION: TO PREVENT STARTER DAMAGE, DO NOT CRANK ENGINE FOR MORE THAN 15 SECONDS AND ALLOW 2 MINUTES FOR COOLING BETWEEN CRANKING TESTS.

9. Compare test readings to specifications. If starter current draw is too high, voltage is below 10 volts, or the engine cranks slowly a problem is indicated.

Starter current draw specifications vary considerably, depending on engine size, type (gas or diesel), compression ratio, etc. The following auto and light truck current draw information (for 12 volt systems) is a general guideline. It is normal for some starting systems to draw more amperage.

- 4 cylinder gas engine -typically draws up to 160 amps
- 4 cylinder diesel -typically draws up to 350 amps.
- 6 cylinder gas engine -typically draws up to 210 amps.
- 6 cylinder diesel -typically draws up to 450 amps.
- 8 cylinder gas -typically draws up to 250 amps.
- 8 cylinder diesel -typically draws up to 650 amps.