

# Electrical/Electronic Systems: Starting System Diagnosis and Repair

## Student/intern information:

Name \_\_\_\_\_ Date \_\_\_\_\_ Class \_\_\_\_\_

## Vehicle used for this activity:

Year \_\_\_\_\_ Make \_\_\_\_\_ Model \_\_\_\_\_

Odometer \_\_\_\_\_ VIN \_\_\_\_\_

Learning Objective/Task	CDX Tasksheet Number	2013 MLR NATEF Reference Number; Priority Level	2013 AST NATEF Reference Number; Priority Level	2013 MAST NATEF Reference Number; Priority Level
• Perform starter current draw tests; determine necessary action.	C309	6C1; P-1	6C1; P-1	6C1; P-1
• Perform starter circuit voltage drop tests; determine necessary action.	C310	6C2; P-1	6C2; P-1	6C2; P-1
• Inspect and test switches, connectors, and wires of starter control circuits; perform necessary action.	C313	6C5; P-2	6C5; P-2	6C5; P-2
• Inspect and test starter relays and solenoids; determine necessary action.	C311	6C3; P-2	6C3; P-2	6C3; P-2
• Remove and install starter in a vehicle.	C312	6C4; P-1	6C4; P-1	6C4; P-1
• Differentiate between electrical and engine mechanical problems that cause a slow-crank or a no-crank condition.	C314		6C6; P-2	6C6; P-2

Time off \_\_\_\_\_

Time on \_\_\_\_\_

Total time \_\_\_\_\_

## Materials Required

- Vehicle or simulator
- Starting and/or charging system tester
- Digital volt ohm meter (DVOM)
- Test light
- Fused jumper wire/s
- Floor jack and stands or vehicle hoist (preferred)

## Some Safety Issues to Consider

- Be cautious around electricity. High voltage (enough to injure or kill you) is present on many vehicles. Ignition systems, hybrid vehicles, and 42-volt electrical systems are just a few hazards to be careful of.
- Accidental deployment of the airbag system could happen if you inadvertently probe the wrong wire. Most manufacturers use yellow-colored wiring to denote wiring for the airbag system. Always be aware of the system/circuit you are working on.
- Use extreme caution when working around batteries. Immediately remove any electrolyte that may come into contact with you. Electrolyte is a mixture of sulfuric acid and water. Please consult with the shop safety and emergency procedures when working with or around batteries.

- Never exceed 16 volts when charging a 12-volt battery. Overheating and explosion hazards are greatly increased.
- Disconnect the battery before using wrenches or sockets to remove wires from the starter or solenoid to prevent short circuits and fires.
- Starter motors are heavy, always use another person to hold the starter while it is being removed and installed.
- Be careful when cranking engines while working under the hood. Keep away from moving belts, pulleys, and other parts.
- Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

### **Performance Standard**

**0—No exposure:** No information or practice provided during the program; complete training required

**1—Exposure only:** General information provided with no practice time; close supervision needed; additional training required

**2—Limited practice:** Has practiced job during training program; additional training required to develop skill

**3—Moderately skilled:** Has performed job independently during training program; limited additional training may be required

**4—Skilled:** Can perform job independently with no additional training