



AUTOMOTIVE STARTING AND CHARGING SYSTEMS — AUTM 1013

A. Course Description

- **Credits:** 3.00
- **Lecture Hours/Week:** 1.00
- **Lab Hours/Week:** 2.00
- **OJT Hours/Week:** 0
- **Prerequisites:** None
- **Corequisites:** None
- **MnTC Goals:** None

This course covers automotive batteries, starting and charging system theories, diagnosis and repair procedures using various types of tools and test equipment and reference materials available in Alldata, Mitchell and student textbook. Prerequisites: AUTM1003

B. Course Effective Dates: 6/1/17 – Present

C. Outline of Major Content Areas

As noted on course syllabus

D. Learning Outcomes

1. Complete repair orders to include customer information vehicle identifying information, customer concern, related service history, cause, and correction
2. Diagnose charging system for the cause of undercharge, no-charge, and overcharge conditions
3. Differentiate between electrical and engine mechanical problems that cause a slow-crank or no-crank condition
4. Identify and demonstrate industry recognized professionalism and safety procedures
5. Identify and demonstrate proper use of various automotive tools and equipment
6. Inspect and clean battery cables, connectors, clamps, and hold-down; repair or replace as needed
7. Inspect and test starter relays and solenoids; determine necessary action
8. Inspect and test switches, connectors, and wires of starter control circuits; perform necessary action
9. Inspect, adjust, or replace generator (alternator) drive belts, pulleys, and tensioners; check pulley and belt alignment

10. Inspect, clean, fill, and replace battery
11. Locate and interpret vehicle and major component identification numbers (VIN, vehicle certification labels, calibration labels)
12. Maintain or restore electronic memory functions
13. Perform battery capacity test (or conductance test); confirm proper battery capacity for vehicle application; determine necessary action
14. Perform battery state-of-charge test; determine necessary action
15. Perform charging circuit voltage drop tests; determine necessary action
16. Perform charging system output test; determine necessary action
17. Perform slow/fast battery charge
18. Perform starter circuit voltage drop tests; determine necessary action
19. Perform starter current draw tests; determine necessary action
20. Remove and install starter in a vehicle
21. Remove, inspect, and install generator (alternator)
22. Research applicable vehicle and service information, vehicle service history, service precautions, and technical service bulletins
23. Start a vehicle using jumper cables and a battery or auxiliary power supply

E. Minnesota Transfer Curriculum Goal Area(s) and Competencies

F. Learner Outcomes Assessment

As noted on course syllabus

G. Special Information

None noted