

**North Montco Technical Career Center  
1265 Sunneytown Pike, Lansdale PA 19446**

**Performance Evaluation/Assessment**

**Automotive Technology**

**NATEF Electrical/Electronic Systems**

**Standardized Integration Module (SIM)**

**Task 2: Battery Diagnosis and Service**

**Hours: 30**

**Date: 9/01/2008**

**Exit Outcome/Terminal Performance Objective:**

- Demonstrates the ability to perform automotive battery diagnosis and service.

**Enabling Objectives:**

- Explains basic automotive battery theory.
- Explains basic automotive battery operation.
- Explains steps to diagnose automotive battery problems.
- Identifies basic automotive battery components.
- Performs basic automotive battery diagnostics.
- Explains steps to service an automotive battery.
- Performs basic automotive battery service.
- Locate correct diagnostic, repair, service & maintenance information using ShopKey.

**Mastery:** All hands-on tasks must be completed to 100% accuracy and to industry standards.

To achieve Mastery of this task, the student must:

1. Participate in a lecture, view either the PowerPoint presentation or video of the material.
2. Participate in a demonstration of the task.
3. Participate in a guided application of the task.
4. Practice the task without the instructor.
5. Complete task to 100% accuracy.
6. Demonstrate or practice the task with another student.

**PA Academic Standards/Assessment Anchors/Eligible Content**

**Science**

*PA Academic Standard:*

3.1.10.C Apply patterns as repeated processes or recurring elements in science and technology.

3.4.10.B Analyze energy sources and transfers of heat.

*Assessment Anchor:*

S11.C.2.1 Analyze energy sources and transfer of energy, or conversion of energy.

S11.A.1.3 Describe and interpret patterns of change in natural and human-made systems.

*Eligible Content:*

S11.C.2.1.4 Use Ohm's Law to explain relative resistances, currents, and voltage.

S11.A.1.3.1 Use appropriate quantitative data to describe or interpret change in systems (e.g., biological indices, electrical circuit data, automobile diagnostic systems data).

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**Math**

*PA Academic Standard:*

2.8.11.P Analyze and explain systems of equations, systems of inequalities and matrices.

2.8.11.G Solve problems using analytic geometry.

*Assessment Anchor:*

M11.C.3.1 Solve problems using analytic geometry.

M11.D.1.1 Analyze and/or use patterns or relations.

*Eligible Content:*

M11.C.3.1.2 Relate slope to perpendicularity and/or parallelism

M11.A.2.1.1 Solve problems using operations with rational numbers including rates and percents (single and multi-step and multiple procedure operations) (e.g., distance, work and mixture problems, etc.).

M11.A.2.1.2 Solve problems using direct and inverse proportions.

**Language Arts:**

*PA Academic Standard:*

1.1.11.E Establish a reading vocabulary by identifying and correctly using new words acquired through the study of their relationships to other words.

1.1.11.F Understand the meaning of and apply key vocabulary across the various subject areas.

*Assessment Anchor:*

R11.A.1.1 Identify and apply the meaning of vocabulary.

R11.A.1.2 Identify and apply word recognition skills.

*Eligible Content:*

R11.A.1.1.1 Identify and/or apply meaning of multiple-meaning words used in text.

R11.A.1.2.2 Define and/or apply how the meaning of words or phrases changes when using context clues given in explanatory sentences.

**Social Studies:**

*PA Academic Standard:*

8.1.12.A Evaluate chronological thinking

**Career Education & Work**

*PA Academic Standard:*

13.1.11.A Relate careers to individual interests, abilities and aptitudes.

**SAFETY NOTICE:** In addition to following all North Montco Technical Career Center Automotive Technology Program Safety and MSDS Policies, refer to the specific vehicle's manufacturer's shop manual for complete safety details when performing these tasks.

**NOTE:** *Safety is not an option!* Although this information is very thorough, it is general and does not fully cover all safety rules, procedures and hazards.

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**Performance Evaluation**

<b>PERFORMANCE CRITERIA</b>	<b>Needs Practice</b>	<b>Satisfactory</b>
Safety glasses must be worn at all times! Read all safety materials provided and observe all safety precautions demonstrated by your instructor.		
Perform battery state-of-charge test; determine necessary action. P-1		
Perform battery capacity test; confirm proper battery capacity for vehicle application; determine necessary action. P-1		
Maintain or restore electronic memory functions. P-1		
Inspect, clean, fill, and/or replace battery, battery cables, connectors, clamps, and hold-downs. P-1		
Perform battery charge. P-1		
Start a vehicle using jumper cables or an auxiliary power supply. P-1		
Identify high voltage circuits of electric or hybrid electric vehicle and related safety precautions. P-3		
Identify electronic modules, security systems, radios, and other accessories that require reinitialization or code entry following battery disconnect. P-1		
Identify hybrid vehicle auxiliary (12v) battery service, repair and test procedures. P-3		
Complete an Outline, Reading Grid, Summary and "Last-Word" Worksheet Packet for Chapters 1-10, 80, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 77, 78 and 79 from <i>Modern Automotive Technology</i>		
Score 80% or better on <i>Modern Automotive Technology</i> chapter tests 1-10 & 80		
Score 80% or better on <i>Modern Automotive Technology</i> chapter tests 29, 30, 31, 32, 33, 34, 37, 38, 77, 78 and 79		
Score 80% or better on Math Intro Lessons 1-5 & Math Lessons 1, 5 and 6 Homework Sheets		
Score 80% or better on ASE Practice Test 6		
Earn a passing grade on the AYES Electrical/Electronic Exit Exam A-6		

**NOTES:**