NORTH MONTCO TECHNICAL CAREER CENTER
1265 SUMNEYTOWN PIKE, LANSDALE, PA 19446

Performance Evaluation/Assessment

Automotive Technology

NATEF Engine Performance

Standardized Integration Module (SIM)

Task 5: Emissions Control Systems Diagnosis and Repair
Hours: 36
Date: 9/01/2008

Exit Outcome/Terminal Performance Objective:

- Demonstrate the ability to perform emissions control systems diagnosis and repair

Enabling Objectives:

- Explains basic emissions control systems theory.
- Explains basic emissions control systems operation/functionality.
- Explains steps to diagnose emissions control systems system problems.
- Performs basic emissions control systems system diagnosis.
- Identifies basic emissions control systems components.
- Explains steps to repair emissions control systems problems.
- Performs basic emissions control systems repairs.
- 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.
7. Obtain PA Emissions Inspector Certification.

PA Academic Standards/Assessment Anchors/Eligible Content
Science
PA Academic Standard:
3.4.10.B Analyze energy sources and transfers of heat.
4.2.10.A Explain that renewable and nonrenewable resources supply energy and materials
Assessment Anchor:
S11.A.1.3 Describe and interpret patterns of change in natural and human-made systems.
S11.C.2.2 Demonstrate that different ways of obtaining, transforming, and distributing energy have different environmental consequences.

Performance Evaluation/Assessment

Eligible Content:
S11.C.2.1.2 Describe energy changes in chemical reactions.
S11.C.2.1.3 Apply the knowledge of conservation of energy to explain common systems (e.g., refrigeration, rocket propulsion, heat pump).
S11.C.2.1.4 Use Ohm's Law to explain relative resistances, currents, and voltage.
S11.C.2.2.1 Explain the environmental impacts of energy use by various economic sectors (e.g., mining, logging, transportation) on environmental systems.

Math
PA Academic Standard:
2.8.11.O Determine the domain and range of a relation, given a graph or set of ordered pairs.
2.8.11.K Select, justify and apply an appropriate technique to graph a linear function
Assessment Anchor:
M11.D.1.1 Analyze and/or use patterns or relations.
M11.D.2.1 Write, solve and/or graph linear equations and inequalities using various methods.
Eligible Content:
M11.D.1.1.2 Determine if a relation is a function given a set of points or a graph.
M11.D.2.1.1 Solve compound inequalities and/or graph their solution sets on a number line (may include absolute value inequalities).
M11.D.2.1.2 Identify or graph functions, linear equations or linear inequalities on a coordinate plane.

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:
7.4.12.A Analyze the impacts of physical systems on people.

Career Education & Work
PA Academic Standard:
Evaluate the impact of lifelong learning on career retention and advancement.

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.

NORTH MONTCO TECHNICAL CAREER CENTER
1265 SUMNEYTOWN PIKE, LANSDALE, PA 19446

Performance Evaluation/Assessment

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.

Performance Evaluation

PERFORMANCE CRITERIA	Needs Practice	Satisfactory
Safety glasses must be worn at all times! Read all safety materials provided and observe all safety precautions demonstrated by your instructor.		
Diagnose oil leaks, emissions, and driveability concerns caused by the positive crankcase ventilation (PCV) system; determine necessary action. P-2		
Inspect, test and service positive crankcase ventilation (PCV) filter/breather cap, valve, tubes, orifices, and hoses; perform necessary action. P-2		
Diagnose emissions and driveability concerns caused by the exhaust gas recirculation (EGR) system; determine necessary action. P-1		
Inspect, test, service and replace components of the EGR system, including EGR tubing, exhaust passages, vacuum/pressure controls, filters and hoses; perform necessary action. P-1		
Inspect and test electrical/electronic sensors, controls, and wiring of exhaust gas recirculation (EGR) systems; perform necessary action. P-2		
Diagnose emissions and driveability concerns caused by the secondary air injection and catalytic converter systems; determine necessary action. P-2		
Inspect and test mechanical components of secondary air injection systems; perform necessary action. P-3		
Inspect & test electrical/electronically-operated components and circuits of air injection systems; perform necessary action. P-3		
Inspect and test catalytic converter efficiency. P-1		
Diagnose emissions and driveability concerns caused by the evaporative emissions control system; determine necessary action. P-1		
Inspect and test components and hoses of the evaporative emissions control system; perform necessary action. P-1		
Interpret diagnostic trouble codes (DTCs) and scan tool data related to the emissions control systems; determine necessary action. P-1		

NORTH MONTCO TECHNICAL CAREER CENTER
1265 SUMNEYTOWN PIKE, LANSDALE, PA 19446

Performance Evaluation/Assessment

Complete an Outline, Reading Grid, Summary and "Last-Word" Worksheet Packet for Chapters 1-10, 80, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 43, 44, 45, 46 and 47 from *Modern Automotive Technology*		
Score 80% or better on *Modern Automotive Technology* chapter tests 1-10 & 80		
Score 80% or better on *Modern Automotive Technology* chapter tests 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 43, 44, 45, 46 and 47		
Score 80% or better on Math Intro Lessons 1-5 & Math Lessons 1, 2, 4, 5, 6, 9, 10 and 11 Homework Sheets.		
Score 80% or better on ASE Practice Test 8		
Earn a passing grade on the AYES Engine Performance Exit Exam A-8		
Obtain PA Emissions Inspector Certification		

NOTES: