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

Performance Evaluation/Assessment

Automotive Technology

NATEF Engine Performance

Standardized Integration Module (SIM)

Task 4: Fuel, Air Induction, and Exhaust Systems Diagnosis and Repair
Hours: 36
Date: 9/01/2008

Exit Outcome/Terminal Performance Objective:

- Demonstrate the ability to perform fuel, air induction, and exhaust systems diagnosis and repair.

Enabling Objectives:

- Explains basic fuel, air induction, and exhaust system theory.
- Explains basic fuel, air induction, and exhaust system operation/functionality.
- Explains steps to diagnose fuel, air induction, and exhaust system problems.
- Performs basic fuel, air induction, and exhaust system diagnosis.
- Identifies basic fuel, air induction, and exhaust system components.
- Explains steps to repair fuel, air induction, and exhaust system problems.
- Performs basic fuel, air induction, and exhaust system 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:
13.3.11.A Evaluate personal attitudes and work habits that support career retention and advancement.

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

Performance Evaluation/Assessment

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.

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 hot or cold no-starting, hard starting, poor driveability, incorrect idle speed, poor idle, flooding, hesitation, surging, engine misfire, power loss, stalling, poor mileage, dieseling, and emissions problems; determine necessary action. P-1		
Check fuel for contaminants and quality; determine necessary action. P-2		
Inspect and test fuel pumps and pump control systems for pressure, regulation, and volume; perform necessary action. P-1		
Replace fuel filters. P-2		
Inspect throttle body, air induction system, intake manifold and gaskets for vacuum leaks and/or unmetered air. P-2		
Inspect and test fuel injectors. P-1		
Verify idle control operation. P-1		
Inspect the integrity of the exhaust manifold, exhaust pipes, muffler(s), catalytic converter(s), resonator(s), tail pipe(s), and heat shield(s); perform necessary action. P-1		
Perform exhaust system back-pressure test; determine necessary action. P-1		
Test the operation of turbocharger/supercharger systems; determine necessary action P-3		

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: