

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

Performance Evaluation/Assessment

Automotive Technology

NATEF Manual Drive Train and Axles

Standardized Integration Module (SIM)

Task 3: Transmission/Transaxle Diagnosis and Repair

Hours: 11

Date: 9/01/2008

Exit Outcome/Terminal Performance Objective:

- Demonstrate the ability to perform transmission/transaxle diagnosis and repair.

Enabling Objectives:

- Explains basic transmission/transaxle theory.
- Explains basic transmission/transaxle operation/functionality.
- Explains steps to diagnose transmission/transaxle problems.
- Identifies basic transmission/transaxle components.
- Performs basic transmission/transaxle diagnosis.
- Explains steps to repair transmission/transaxle problems.
- Performs basic transmission/transaxle 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.

PA Academic Standards/Assessment Anchors/Eligible Content

Science

PA Academic Standard:

3.1.10.E Describe patterns of change in nature, physical and man made systems.

3.6.10.C Apply physical technologies of structural design, analysis and engineering, personnel relations, financial affairs, structural production, marketing, research and design to real world problems.

Assessment Anchor:

S11.A.1.1 Analyze and explain the nature of science in the search for understanding the natural world and its connection to technological systems.

S11.C.3.1 Use the principles of motion and force to solve real-world challenges.

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

Performance Evaluation/Assessment

Eligible Content:

S11.A.1.1.4 Explain how specific scientific knowledge or technological design concepts solve practical problems.

S11.C.3.1.5 Calculate the mechanical advantage for moving an object by using a simple machine.

S11.C.3.1.6 Identify elements of simple machines in compound machines.

Math

PA Academic Standard:

2.3.8.E Describe how a change in linear dimension of an object affects its perimeter, area and volume.

2.8.11.P Analyze a relation to determine whether a direct or inverse variation exists and represent it algebraically and graphically.

Assessment Anchor:

M11.B.2.3 Describe how a change in one dimension of a figure (2 or 3 dimensional) affects other measurements of that figure.

M11.A.2.1 Apply ratio and/or proportion in problem-solving situations.

Eligible Content:

M11.B.2.3.1 Describe how a change in the linear dimension of a figure affects its perimeter, circumference, area or volume.

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.).

Language Arts:

PA Academic Standard:

1.1.11.G Demonstrate after reading understanding and interpretation of both fiction and nonfiction text, including public documents.

1.3.11.F Read and respond to fiction and nonfiction including poetry and drama

Assessment Anchor:

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

R11.A.1.3 Make inferences, draw conclusions, and make generalizations based on text.

R11.A.1.6 Identify, describe, and analyze genre of text.

Eligible Content:

R11.A.1.3.1 Make inferences and/or draw conclusions based on information from text.

R11.A.1.3.2 Cite evidence from text to support generalizations.

R11.A.1.6.1 Identify and/or analyze the author's intended purpose of text.

R11.A.1.6.2 Describe and/or analyze examples of text that support the author's intended purpose.

Social Studies:

PA Academic Standard:

5.4.12.A Analyze the impact of international economic, technological and cultural developments on the government of the United States

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

Performance Evaluation/Assessment

Career Education & Work

PA Academic Standard:

13.1.11.F Analyze the relationship between career choices and career preparation opportunities

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.		
Remove and reinstall transmission/transaxle. P-1		
Disassemble, clean, and reassemble transmission/transaxle components. P-1		
Inspect transmission/transaxle case, extension housing, case mating surfaces, bores, bushings, and vents; perform necessary action. P-2		
Diagnose noise concerns using transmission/transaxle powerflow principles. P-2		
Diagnose hard shifting and jumping out of gear concerns; determine necessary action. P-2		
Inspect, adjust, and reinstall shift linkages, brackets, bushings, cables, pivots, and levers. P-2		
Inspect, replace, and align powertrain mounts. P-2		
Inspect and replace gaskets, seals, and sealants; inspect sealing surfaces. P-2		
Remove and replace transaxle final drive. P-3		
Inspect, adjust, and reinstall shift cover, forks, levers, grommets, shafts, sleeves, detent mechanism, interlocks, and springs. P-2		
Measure end play or preload (shim or spacer selection procedure) on transmission/transaxle shafts; perform necessary action. P-1		

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

Performance Evaluation/Assessment

Inspect and reinstall synchronizer hub, sleeve, keys (inserts), springs, and blocking rings. P-1		
Diagnose transaxle final drive assembly noise and vibration concerns; determine necessary action. P-3		
Remove, inspect, measure, adjust, and reinstall transaxle final drive pinion gears (spiders), shaft, side gears, side bearings, thrust washers, and case assembly. P-3		
Inspect lubrication devices (oil pump or slingers); perform necessary action. P-3		
Inspect, test, and replace transmission/transaxle sensors and switches. P-2		
Describe the operational characteristics of an electronically controlled manual transmission/transaxle. P-3		
Complete an Outline, Reading Grid, Summary and "Last-Word" Worksheet Packet for Chapters 1-10, 80, 53, 54, 55, 56, 59, 60, 61 and 62 in <i>Modern Automotive Technology</i> .		
Score a 80% or better on <i>Modern Automotive Technology</i> chapter tests 1-10 & 80		
Score a 80% or better on <i>Modern Automotive Technology</i> chapter tests 53, 54, 55, 56, 59, 60, 61 and 62		
Score 80% or better on Math Intro Lessons 1-5 & Math Lessons 1 and 4 Homework Sheets.		
Score 80% or better on ASE Practice Test 3		

NOTES: