

AUTO TECH: ENGINE PERFORMANCE/2 (180 Hours)

Course No.: 79-90-71

COMPETENCY CHECKLIST

Student Name _____

Teacher Name _____ School Site _____

Start Date _____ Completion Date _____ Certificate Date _____

Teacher Signature _____ Student Signature _____

(Signatures verify completion of course competencies)

A. INTRODUCTION AND SAFETY (5 hrs)

- _____ 1. Scope and purpose of course
- _____ 2. Classroom policies and procedures
- _____ 3. Class/workplace emergency procedures
- _____ 4. Occupations in industry for auto technicians
- _____ 5. OSHA workplace requirements: auto techs
- _____ 6. EPA legislation for transportation industry
- _____ 7. ARB legislation for transportation industry
- _____ 8. BAR standards for safety/environment
- _____ 9. MSDS in automotive industry
- _____ 10. Safety items required by feds/state/local
- _____ 11. NATEF in auto technician training
- _____ 12. NATEF standard: protective clothing/gloves
- _____ 13. NATEF standard: protective respiratory gear
- _____ 14. NATEF standard for protective eye gear
- _____ 15. NATEF standard for proper ventilation
- _____ 16. NATEF standard: chemical/material disposal
- _____ 17. Safety test

B. RESOURCE MANAGEMENT REVIEW (1 hr)

- _____ 1. Review terms related to topic
- _____ 2. Management of time, materials, personnel
- _____ 3. Effective use of time, material, personnel
- _____ 4. Benefits of effective resource management
- _____ 5. Environmentally responsible management

C. TRADE MATHEMATICS REVIEW (5 hrs)

- _____ 1. Practical applications of math to industry
- _____ 2. Review whole numbers problem solving
- _____ 3. Review various fraction problem solving
- _____ 4. Review various decimal problem solving
- _____ 5. Changing fractions to decimals
- _____ 6. Changing decimals to fractions
- _____ 7. Review English system for measuring length
- _____ 8. Review English system for measuring weight

- _____ 9. Review English measuring of volume/capacity
- _____ 10. Review English measuring of linear units
- _____ 11. Various English units of volume/capacity
- _____ 12. Solve English system measuring problems
- _____ 13. Measuring techniques using tools of trade
- _____ 14. Review metric system of measuring length
- _____ 15. Review metric system of measuring weight
- _____ 16. Review metric system for volume/capacity
- _____ 17. Review various metric system linear units
- _____ 18. Review various metric system units of weight
- _____ 19. Various metric system measuring problems
- _____ 20. Measuring metric system with tools of trade
- _____ 21. Solving techniques for geometric problems
- _____ 22. Solving techniques for algebraic problems
- _____ 23. Problem-solving techniques using percentages
- _____ 24. Techniques for reading and interpreting graphs
- _____ 25. Demonstrate using a calculator

D. TOOLS AND EQUIPMENT REVIEW (5 hrs)

- _____ 1. General hand tools use/maintenance/storage
- _____ 2. Shop equipment use/maintenance/storage
- _____ 3. Specialty items use/maintenance/storage

E. SERVICE MANUALS AND COMPUTER-BASED INFORMATION SYSTEMS REVIEW (1 hr)

- _____ 1. Different types of service manuals
- _____ 2. Types of info found in service manuals
- _____ 3. Demonstrate use of service manuals
- _____ 4. Demonstrate using CD-ROM & web search
- _____ 5. CD-ROM/web search vs. service manuals

F. ENGINE DESIGN REVIEW (5 hrs)

- _____ 1. Review major parts of automobile engine
- _____ 2. Review basic function/major engine parts
- _____ 3. Review 4-stroke cycle (internal combustion)

- _____ 4. Review different cylinder configuration types
- _____ 5. Advantage/Disadvantage: Cylinder configurations
- _____ 6. Different types of valve arrangements

G. AUTOMOTIVE ELECTRICITY REVIEW (3 hrs)

- _____ 1. Review/define terms related to industry
- _____ 2. Solve problems using Ohm's Law
- _____ 3. Review devices used in measuring electricity
- _____ 4. Compare similarities/differences: AC vs. DC
- _____ 5. Review electrical circuits and components
- _____ 6. Review description of magnetism
- _____ 7. Review how electricity can be generated
- _____ 8. Review list of electrical systems found in cars
- _____ 9. Review features/functions of storage battery
- _____ 10. Test an automotive storage battery
- _____ 11. Review the function of fuses
- _____ 12. Review list of various electrical accessories
- _____ 13. Review functions of electrical accessories

H. FUEL, AIR INDUCTION, & EXHAUST SYSTEMS DIAGNOSIS & REPAIR (50 hrs)

- _____ 1. Diagnose various system problems
- _____ 2. Check fuel for contaminants and quality
- _____ 3. Inspect and test fuel pumps and systems
- _____ 4. Replace fuel filters
- _____ 5. Inspect components for vacuum leaks/air
- _____ 6. Inspect and test fuel injectors
- _____ 7. Verify idle control operation
- _____ 8. Inspect integrity of exhaust system components
- _____ 9. Perform exhaust system back-pressure test
- _____ 10. Test operation of systems/determine action

I. EMISSION CONTROL SYSTEMS DIAGNOSIS & REPAIR (45 hrs)

- _____ 1. Diagnose concerns caused by PCV system
- _____ 2. Inspect, test, & service PCV
- _____ 3. Diagnose emissions or drivability concerns
- _____ 4. Inspect, test, service, & replace parts of EGR
- _____ 5. Inspect /test electrical/electronic system parts
- _____ 6. Diagnose air injection/catalytic converter concern
- _____ 7. Inspect/test mechanical air system components
- _____ 8. Inspect /test electrical components air systems
- _____ 9. Inspect /test catalytic converter efficiency
- _____ 10. Diagnose emissions and drivability concerns
- _____ 11. Inspect and test components and hoses
- _____ 12. Interpret DTCs and emissions scan tool data

J. ENGINE-RELATED SERVICE (45 hrs)

- _____ 1. Features/functions of starting systems
- _____ 2. Adjust valves on engine with various lifters
- _____ 3. Remove/replace timing belt; verify timing
- _____ 4. Remove/replace thermostat & gasket/seal

- _____ 5. Inspect/test mechanical/electrical components
- _____ 6. Perform common fastener & thread repairs
- _____ 7. Perform engine oil and filter change
- _____ 8. Identify hybrid engine service precautions

K. HYBRID VEHICLES REVIEW (5 hrs)

- _____ 1. Hybrid electric vehicles (HEVs)
- _____ 2. Gas engine & electric motor in hybrid
- _____ 3. Compare HEV vs. vehicle w/gasoline engine
- _____ 4. Technologies typically used by hybrids
- _____ 5. Optimum environment for driving an HEV

L. ALTERNATIVE FUEL VEHICLES REVIEW (2 hrs)

- _____ 1. Concept of alternative fuel vehicles
- _____ 2. Examples of alternative fuel vehicles
- _____ 3. Alternative fuel auto vs. gas powered auto

M. EMPLOYABILITY SKILLS REVIEW (3 hrs)

- _____ 1. Employer requirements in an employee
- _____ 2. Update potential employers thru job search
- _____ 3. Finalize résumé/cover letters
- _____ 4. Role of social network in job search
- _____ 5. Accurate, legible application
- _____ 6. Sample job applications
- _____ 7. Enthusiasm on the job
- _____ 8. Appropriate appearance on a job
- _____ 9. Upgrading of skills on a job
- _____ 10. Customer service to build relationships
- _____ 11. Review interviewing techniques
- _____ 12. Info resources for successful interview
- _____ 13. Review sample follow-up letters
- _____ 14. Review appropriate follow-up procedures

N. ENTREPRENEURIAL SKILLS (5 hrs)

- _____ 1. Entrepreneurship
- _____ 2. Necessary characteristics of successful entrepreneurs
- _____ 3. Entrepreneurs and the auto repair industry
- _____ 4. Purpose and components of a business plan
- _____ 5. Personal goals prior to starting a business
- _____ 6. Sources of monetary investment to business
- _____ 7. Various licensing requirements for industry
- _____ 8. Scenario: Student as auto repair business owner
- _____ 9. Sustainable/green practices vs. standard ones