

AUTO TECH: ENGINE PERFORMANCE/1 (180 Hours)

Course No.: 79-90-69

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. ORIENTATION 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 for 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 for protective clothing/gloves
- _____ 13. NATEF standard for protective respiratory gear
- _____ 14. NATEF standard for protective eye gear
- _____ 15. NATEF standard for proper ventilation
- _____ 16. NATEF standard for chemical/material disposal
- _____ 17. Safety test

B. RESOURCE MANAGEMENT (2 hrs)

- _____ 1. Resource management principles/techniques
- _____ 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 (8 hrs)

- _____ 1. Practical applications of math
- _____ 2. Whole number problems
- _____ 3. Various fraction problems
- _____ 4. Various decimal problems
- _____ 5. Fractions to decimals
- _____ 6. Decimals to fractions
- _____ 7. English system: Measuring length
- _____ 8. English system: Measuring weight
- _____ 9. English system: Measuring volume/capacity
- _____ 10. English system linear units
- _____ 11. English system: Units of volume/capacity
- _____ 12. English system measuring problems
- _____ 13. Measuring techniques of objects
- _____ 14. Metric system: Measuring length
- _____ 15. Metric system: Measuring weight
- _____ 16. Metric system: Measuring volume/capacity
- _____ 17. Various metric system linear units
- _____ 18. Various metric system units of weight
- _____ 19. Various metric system measuring problems
- _____ 20. Metric system measuring tools
- _____ 21. Geometric problems
- _____ 22. Algebraic problems
- _____ 23. Problem-solving techniques using percentages
- _____ 24. Reading and interpreting graphs
- _____ 25. Using a calculator

D. TOOLS AND EQUIPMENT (5 hrs)

- _____ 1. Use/Storage techniques: General hand tools
- _____ 2. Use/Storage techniques: Shop equipment
- _____ 3. Use/Storage: Specialty tools & equipment

E. SERVICE MANUALS AND COMPUTER-BASED INFORMATION SYSTEMS (2 hrs)

- _____ 1. Service manuals
- _____ 2. Information that can be found in service manuals
- _____ 3. Use of service manuals
- _____ 4. CD & web search to find auto tech info
- _____ 5. Advantages: CD & web over service manuals

F. ENGINE DESIGNS (5 hrs)

- _____ 1. Major parts: Automobile engine
- _____ 2. Function: Major parts – Automobile engine
- _____ 3. Four-stroke cycle: Internal combustion engine
- _____ 4. Features/Functions: Cylinder configurations
- _____ 5. Advantage/Disadvantage: Cylinder configurations
- _____ 6. Features/Functions: Valve arrangements

G. BASIC AUTOMOTIVE ELECTRICITY (5 hrs)

- _____ 1. Definitions
- _____ 2. Ohm's Law problems
- _____ 3. Devices used in measuring electricity
- _____ 4. Compare similarities & differences: AC to DC
- _____ 5. Electrical circuits and their components
- _____ 6. Magnetism
- _____ 7. How electricity can be generated
- _____ 8. List electrical systems found in cars
- _____ 9. Automotive storage battery
- _____ 10. Test: Automotive storage battery
- _____ 11. Function: Fuses
- _____ 12. List various electrical accessories
- _____ 13. Function: Various electrical accessories

H. GENERAL ENGINE DIAGNOSIS (45 hrs)

- _____ 1. Complete work order
- _____ 2. Engine performance concern
- _____ 3. Research applicable vehicle & service format
- _____ 4. Vehicle & major component identification #s
- _____ 5. Inspect engine assembly for fuel, etc
- _____ 6. Diagnose abnormal engine noise
- _____ 7. Abnormal exhaust color, odor, and sound
- _____ 8. Engine absolute manifold pressure tests
- _____ 9. Cylinder power balance test
- _____ 10. Cranking & running compression tests
- _____ 11. Cylinder leakage test
- _____ 12. Diagnose engine mechanical, etc concerns
- _____ 13. Inspect/prepare for test & exhaust readings
- _____ 14. Engine operating temperature
- _____ 15. Cooling system pressure tests; etc
- _____ 16. Verify correct camshaft timing

I. COMPUTERIZED ENGINE CONTROLS DIAGNOSIS AND REPAIR (45 hrs)

- _____ 1. Diagnostic trouble codes; clearing codes
- _____ 2. Emission/driveability concerns; scan tool data
- _____ 3. Diagnose emissions or driveability concerns
- _____ 4. Check for module communication errors
- _____ 5. Inspect/test engine control systems sensors
- _____ 6. Access/use service info to perform diagnosis
- _____ 7. Diagnose problems from malfunctions
- _____ 8. Perform active tests of actuators w/scan tool
- _____ 9. Importance: Running all OBDII monitors

J. IGNITION SYSTEM DIAGNOSIS & REPAIR (45 hrs)

- _____ 1. Diagnose ignition system related problems
- _____ 2. Inspect /test ignition circuits and components
- _____ 3. Inspect and test crankshaft and camshaft
- _____ 4. Inspect, test, and/or replace

K. HYBRID VEHICLES (7 hrs)

- _____ 1. Hybrid electric vehicles (HEVs)
- _____ 2. Relationship of gas engine & electric motor
- _____ 3. Difference: HEV/vehicle with gas engine
- _____ 4. Technologies typically used by hybrids
- _____ 5. Optimum driving environment for HEV

L. ALTERNATIVE FUEL VEHICLES (2 hrs)

- _____ 1. Concept: Alternative fuel vehicles
- _____ 2. Examples: Alternative fuel vehicles
- _____ 3. Differentiate: Gas engine or alternate fuel car

M. EMPLOYABILITY SKILLS (4 hrs)

- _____ 1. Employer requirements in an employee
- _____ 2. Identify potential employers thru job search
- _____ 3. Sample résumé/cover letters
- _____ 4. Accurate, legible application
- _____ 5. Sample job applications
- _____ 6. Complete sample job applications
- _____ 7. Enthusiasm on the job
- _____ 8. Appropriate appearance on a job
- _____ 9. Continuous upgrading of skills on a job
- _____ 10. Customer service to build relationships
- _____ 11. Appropriate interviewing techniques
- _____ 12. Info materials to be successful in interview
- _____ 13. Sample follow-up letters
- _____ 14. Demo appropriate follow-up procedures