

AUTO TECH: ELECTRICAL AND ELECTRONICS/2 (180 Hours)

Course No.: 79-90-63

COMPETENCY CHECKLIST

Student Name _____

Teacher Name _____ School Site _____

Start Date _____ Completion Date _____ Certificate Date _____

Teacher Signature _____ Student Signature _____

(Signature verifies 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 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 shop ventilation
- _____ 16. NATEF standard for chemical/material disposal
- _____ 17. Safety test

B. RESOURCE MANAGEMENT RESOURCE (3 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 REVIEW (10 hrs)

- _____ 1. Practical applications of math in industry
- _____ 2. Problem solving with whole number problems
- _____ 3. Review solving various fraction problems
- _____ 4. Review solving various decimal problems
- _____ 5. Changing fractions to decimals
- _____ 6. Changing decimals to fractions
- _____ 7. English system of measuring length
- _____ 8. English system of measuring weight

- _____ 9. English system of measuring volume/capacity
- _____ 10. English system of linear units
- _____ 11. English system of units of volume/capacity
- _____ 12. English system measuring problems
- _____ 13. Measuring techniques using tools of trade
- _____ 14. Metric system of measuring length
- _____ 15. Metric system of measuring weight
- _____ 16. Metric system of 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 using tools of trade
- _____ 21. Techniques for solving geometric problems
- _____ 22. Techniques for solving algebraic problems
- _____ 23. Problem-solving techniques using percentages
- _____ 24. Reading and interpreting graphs
- _____ 25. Demonstrate using a calculator

D. TOOLS AND EQUIPMENT REVIEW (5 hrs)

- _____ 1. Use/Maintenance/Storage of shop hand tools
- _____ 2. Use/Maintenance/Storage of shop equipment
- _____ 3. Specialty tools/equipment for auto industry

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

- _____ 1. Types of service manuals
- _____ 2. Types of information found in service manuals
- _____ 3. Demonstrate use of service manuals
- _____ 4. CD-ROM/web search to find auto tech info
- _____ 5. CD-ROM/web search vs. service manuals

F. ELECTRICAL THEORY (10 hrs)

- _____ 1. Electron flow theory
- _____ 2. Nature of electrical resistance
- _____ 3. Magnetic induction theory

- _____ 4. Voltage drop across resistors and inductors
- _____ 5. Operation of variable resistors
- _____ 6. Operation of voltage generators
- _____ 7. Operation of magnetic inductive sensors
- _____ 8. Transistor function
- _____ 9. Semi-conductor function
- _____ 10. Computer input/output logic
- _____ 11. Sensor ranges and system compensation
- _____ 12. Electronic fuel control loop
- _____ 13. Oxygen feedback carburetion
- _____ 14. Mixture control duty cycle
- _____ 15. Electronic fuel injection theory
- _____ 16. Function of electronic ignition module
- _____ 17. System self-diagnosis
- _____ 18. Function of mixture control solenoids

G. GENERAL MOTORS FUEL AND IGNITION

CONTROL REVIEW (5 hrs)

- _____ 1. GM electronic engine control systems
- _____ 2. Measure mixture control dwell
- _____ 3. Electronic spark timing sensor input
- _____ 4. Features of GM electronic fuel injection systems
- _____ 5. Activation for GM self-diagnostic system
- _____ 6. Measurements of GM sensor readings
- _____ 7. General Motors system trouble codes

H. FORD ELECTRICAL FUEL AND IGNITION CONTROL REVIEW (5 hrs)

- _____ 1. Ford electronic engine control systems
- _____ 2. Measure mixture control dwell
- _____ 3. Electronic spark timing sensor input
- _____ 4. Ford electronic fuel injection systems
- _____ 5. Activation for Ford self-diagnostic system
- _____ 6. Measurement of Ford sensor readings
- _____ 7. Ford system trouble codes

I. CHRYSLER FUEL AND IGNITION CONTROL REVIEW (5 hrs)

- _____ 1. Chrysler electronic engine control systems
- _____ 2. Measure mixture control dwell
- _____ 3. Electronic spark timing sensor input
- _____ 4. Chrysler electronic fuel injection systems
- _____ 5. Activation for Chrysler self-diagnostic system
- _____ 6. Measurement of Chrysler sensor readings
- _____ 7. Chrysler system trouble codes

J. IMPORT ELECTRONIC FUEL AND IGNITION CONTROL REVIEW (5 hrs)

- _____ 1. Import electronic engine control systems
- _____ 2. Electronic spark timing for import types
- _____ 3. Import electronic fuel injection systems
- _____ 4. Operation of CIS and CIS-E injection systems

- _____ 5. Activation for import self-diagnosis systems
- _____ 6. Samples of import sensor readings
- _____ 7. Various trouble codes found in imports

K. LIGHTING SYSTEMS DIAGNOSIS AND REPAIR (30 hrs)

- _____ 1. Complete work order with all information
- _____ 2. Diagnose lighting operation/problems
- _____ 3. Inspect, replace, and aim headlights and bulbs
- _____ 4. Incorrect turn signal or hazard light operation
- _____ 5. High intensity discharge headlights

L. GAUGES, WARNING DEVICES, AND DRIVER INFORMATION SYSTEMS DIAGNOSIS AND REPAIR (30 hrs)

- _____ 1. Inspect/test gauges & gauge sending units
- _____ 2. Inspect/test connectors, wires, circuit boards
- _____ 3. Problems with warning devices & info systems
- _____ 4. Sensors, connectors, and wires in circuits

M. HORN AND WIPER/WASHER DIAGNOSIS AND REPAIR (25 hrs)

- _____ 1. Diagnose incorrect horn operation
- _____ 2. Diagnose incorrect wiper operation
- _____ 3. Diagnose incorrect washer operation

N. ACCESSORIES DIAGNOSIS AND REPAIR (30 hrs)

- _____ 1. Motor-driven accessory circuits
- _____ 2. Heated glass, mirror, or seat operation
- _____ 3. Electric lock operation and keyless entry
- _____ 4. Cruise control systems
- _____ 5. Supplemental Restraint System concerns
- _____ 6. Disarm/enable airbag system for auto service
- _____ 7. Diagnose radio static & reception concerns
- _____ 8. Remove and reinstall door panel
- _____ 9. Diagnose body electronic system circuits
- _____ 10. Check for module communication errors
- _____ 11. Diagnose problems with anti-theft systems
- _____ 12. Keyless entry and remote-start systems
- _____ 13. Transfers/updates or flash reprogramming

O. EMPLOYABILITY SKILLS REVIEW (5 hrs)

- _____ 1. Employer requirements in an employee
- _____ 2. Identify potential employers thru job search
- _____ 3. Sample résumés
- _____ 4. Accurate, legible, complete application
- _____ 5. Common mistakes made on job applications
- _____ 6. Complete sample job applications
- _____ 7. Importance of enthusiasm on the job
- _____ 8. Appropriate appearance on a job
- _____ 9. Continuous upgrading of job skills
- _____ 10. Customer service to build relationships

P. ENTREPRENEURIAL SKILLS (5 hrs)

- _____ 1. Define entrepreneurship
- _____ 2. Characteristics of successful entrepreneurs
- _____ 3. Contributions to auto repair industry
- _____ 4. Purpose and components of a business plan
- _____ 5. Personal goals prior to starting a business
- _____ 6. Source of monetary investment to business
- _____ 7. Various licensing requirements for industry
- _____ 8. Student as auto repair business owner
- _____ 9. Sustainable/green vs. standard business practices