

AUTO TECH: EMISSION CONTROL/1 (90 Hours)

Course No.: 79-90-65

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** (3 hrs)

- _____ 1. Scope and purpose of course
- _____ 2. Classroom policies and procedures
- _____ 3. Class/work first-aid/emergency procedures
- _____ 4. Occupations available in auto tech industry
- _____ 5. OSHA requirements for auto technicians
- _____ 6. EPA impact on auto industry & environment
- _____ 7. ARB impact on auto industry & environment
- _____ 8. Use of MSDS as it applies to auto industry
- _____ 9. Safety items required by federal, state & local
- _____ 10. Safety test

B. **RESOURCE MANAGEMENT** (1 hr)

- _____ 1. Terms related to resource management
- _____ 2. Management of time, materials, & personnel
- _____ 3. Examples of effective resource management
- _____ 4. Benefits of effective resource management
- _____ 5. Economic/environmental benefits/liabilities

C. **TRADE MATHEMATICS** (5 hrs)

- _____ 1. Practical application of math in auto industry
- _____ 2. Problem solving using whole numbers
- _____ 3. Problem solving using fractions
- _____ 4. Problem solving using decimals
- _____ 5. Techniques for changing fractions to decimals
- _____ 6. Techniques for changing decimals to fractions
- _____ 7. English system of measuring length
- _____ 8. English system of measuring weight
- _____ 9. English system of measuring volume/capacity
- _____ 10. Relationship of linear units of measurement
- _____ 11. Relationship of volume/capacity measurements
- _____ 12. Math problems involving English system
- _____ 13. Use English system measuring tools of trade
- _____ 14. Metric system of measuring length
- _____ 15. Metric system of measuring weight
- _____ 16. Metric system of measuring volume/capacity
- _____ 17. Relationship of metric linear measurements

- _____ 18. Relationship of metric measures of weight
- _____ 19. Math problems involving metric system
- _____ 20. Using metric system measuring tools of trade
- _____ 21. Geometry problems related to auto industry
- _____ 22. Algebraic problems related to auto industry
- _____ 23. Problem solving techniques using percentages
- _____ 24. Techniques for reading/interpreting graphs
- _____ 25. Techniques for using a calculator

D. **SERVICE MANUALS AND COMPUTER-BASED INFO SYSTEMS** (3 hrs)

- _____ 1. Different types of service manuals
- _____ 2. Information that can be found in 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

E. **BAR RULES AND REGULATIONS** (5 hrs)

- _____ 1. Mission of BAR as government agency
- _____ 2. Major provision of 1971 Auto Repair Act
- _____ 3. Discuss Smog Check Program of BAR
- _____ 4. Licensing requirements for smog technicians
- _____ 5. Compliance and noncompliance certificates
- _____ 6. Test failures and repair cost limitations
- _____ 7. Test Only vs. Test/Repair stations
- _____ 8. Types and dimensions of smog check signs
- _____ 9. Discuss state smog inspection programs
- _____ 10. Discuss state biennial inspection program

F. **BAR-97 EMISSIONS INSPECTION SYSTEM (EIS)** (15 hrs)

- _____ 1. Enhanced Areas and Enhanced Area Vehicles
- _____ 2. Features and functions of BAR 97-EIS
- _____ 3. Operational techniques for BAR 97-EIS
- _____ 4. NOx test techniques for ASM
- _____ 5. Identify exceptions to BAR-97 ASM tests
- _____ 6. Certification competencies for BAR-97 EIS

_____ 7. Using BAR-97 EIS as diagnostic tool

G. SMOG CHECK PROGRAM: 2003/2007 UPDATES

(5 hrs)

- _____ 1. Updates for program/system/equipment
- _____ 2. Lab assignments and written exam

H. VEHICLE EMISSION TESTING PROCEDURES

(20 hrs)

- _____ 1. Effect of warranties on emission repairs
- _____ 2. Regulations for self-repair by vehicle owners
- _____ 3. Regulations regarding subletting smog repair
- _____ 4. Vehicle ID and classification for a certificate
- _____ 5. Inspecting emissions testing equipment
- _____ 6. Demonstrate vehicle/engine ID procedures
- _____ 7. Gross vehicle weight labels for trucks/RVs
- _____ 8. Emission system applications manuals/labels
- _____ 9. Certificate of compliance for I/M station
- _____ 10. Cert. of compliance for change of ownership
- _____ 11. Certificate of non-compliance
- _____ 12. Differences between types of failure
- _____ 13. Repair requirements for types of failures
- _____ 14. After- repairs test as per state standards
- _____ 15. Clearing an enforcement document
- _____ 16. Acceptable carburetor adjustments
- _____ 17. Authorized replacement parts & repair
- _____ 18. Laws pertaining to retrofit failures
- _____ 19. Computerized vs. non-computerized repairs
- _____ 20. Demonstrate self-diagnostic procedures
- _____ 21. Use of service manuals for emissions repair
- _____ 22. Procedures to clear emissions warning lights
- _____ 23. Procedures to verify closed loop operation
- _____ 24. Testing & measure various computer sensors
- _____ 25. Use of electrical wiring diagrams
- _____ 26. Malfunctions in computer-controlled engine
- _____ 27. Common test procedures for sensor testing
- _____ 28. Oxygen sensor voltage & fuel mixture duty cycle
- _____ 29. Sensor malfunctions and emission effects
- _____ 30. Use of manufacturers' diagnostic flow charts
- _____ 31. Written estimates, repair orders & authorizations
- _____ 32. Repair cost limits for different failure types
- _____ 33. Fill out repair order, including an estimate

I. OBD II SYSTEM HISTORY, TESTING, AND DIAGNOSTICS (5 hrs)

- _____ 1. History of OBD II and why it was adopted
- _____ 2. CARB standardization regulations
- _____ 3. Define common OBDII terminology
- _____ 4. Differences between OBD I & OBD II systems
- _____ 5. Discuss various 'relearn'
- _____ 6. Concept of main monitors
- _____ 7. Ways to identify root cause of problem

_____ 8. Using Scan Tool menu & lab scope

J. OBD II MALFUNCTION INDICATOR LIGHT STRATEGIES & DIAGNOSTIC TROUBLE CODES (5 hrs)

- _____ 1. On Board specialty program
- _____ 2. OBD I 'check engine light' vs. OBD II MIL
- _____ 3. Strategies to activate and deactivate an MIL
- _____ 4. Current pending & history codes on Scan Tool
- _____ 5. Freeze Frame Data and its use in diagnosis
- _____ 6. Lack of 'Intermittent' codes on OBD II
- _____ 7. Modes of MIL operation
- _____ 8. SAE J2012 Standards for code number/names
- _____ 9. Type "A" vs. Type "B" codes
- _____ 10. OBD II diagnostic flow chart
- _____ 11. Procedures used after all repairs

K. OBD II MAIN MONITORS AND READINESS TESTS (20 hrs)

- _____ 1. Comprehensive Component Monitor & code
- _____ 2. Catalyst Efficiency Monitor & DTC P0420
- _____ 3. Readiness Test & Trip for testing catalyst monitor
- _____ 4. EGR monitor and ways to test if working
- _____ 5. Examples of EGR Trips and Readiness Test
- _____ 6. EVAP Monitor and Readiness Test
- _____ 7. Using pressure tester to find EVAP problem
- _____ 8. Importance of some warm-up cycles
- _____ 9. Normally open vs. closed EVAP vent solenoids
- _____ 10. Fuel System Monitor: Short-/Long-Term Trim
- _____ 11. Feedback/effect of adaptive fuel on Fuel Trim
- _____ 12. Reset Fuel Trim after all repairs on systems
- _____ 13. Describe HO₂s switching codes
- _____ 14. Slow HO₂s effect on engine management
- _____ 15. Discuss misfire detection
- _____ 16. Identify rough road misfire strategies
- _____ 17. Monitoring CAP with a lab scope
- _____ 18. Driving within 10% of Freeze Frame values
- _____ 19. HO₂s Heater Monitor
- _____ 20. HO₂s Heater for closed loop and idle control
- _____ 21. Secondary AIR System Monitor
- _____ 22. Completing an OBD II Trip & OBD II Drive Cycle
- _____ 23. Load & horsepower needs for Readiness Test

L. EMPLOYABILITY SKILLS (3 hrs)

- _____ 1. Employer requirements in an employee
- _____ 2. Identify potential employers thru job search
- _____ 3. Design sample résumés
- _____ 4. Accurate, legible application
- _____ 5. Sample job applications
- _____ 6. Enthusiasm on the job
- _____ 7. Appropriate appearance on the job
- _____ 8. Continuous upgrading of job skills
- _____ 9. Customer service to build work relationships