

**Course Objectives/Course Outline**  
**Spokane Community College**

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**Course Title:** Engine Performance, Service, and Repair

**Prefix and Course Number:** AUTO 122

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**Course Learning Outcomes:**

**By the end of this course, a student should be able to:**

- have an in-depth knowledge of basic fuel systems, emissions, air conditioning, and ignition systems.
- have an in-depth knowledge of diagnosing engines, ignition, fuel, or emissions control problems with an infrared exhaust analyzer.
- have an in-depth knowledge of performing analytic/diagnostic procedures on vehicles with onboard or self-diagnostic type computer systems.

**Course Outline:**

- I. Special Problems in Carburetion Inspection Procedures
  - A. Inspection and Service
    1. carburetor acceleration enrichment systems
    2. carburetor idle compensator valves and vents
    3. carburetor idle speed/fuel mixture
      - a. propane enrichment adjustment method
      - b. closed-loop fuel control systems
      - c. float, needles, and seats
- II. Special Problems in Fuel Pump Systems Inspection Procedures
  - A. Inspection and Service
    1. gas tank
      - a. filter
      - b. cap
      - c. fuel lines
      - d. hoses
    2. fuel pumps
      - a. pump controls
      - b. filters
- III. Special Problems in Exhaust Emissions Inspection Procedures
  - A. Positive Crankcase Ventilation
  - B. Spark Timing Controls
  - C. Idle Speed Controls
  - D. Exhaust Gas Recirculation
  - E. Exhaust Gas Treatment
- IV. Special Problems in Fuel Injection Inspection Procedures
  - A. Fuel Injection Components
    1. nozzles
    2. pumps

- V. Special Problems in Ignition Systems/Tune Up Inspection Procedures
  - A. Electronic Ignition Systems
    - 1. ignition primary circuit and wiring
    - 2. ignition secondary circuit and wiring
    - 3. ignition points/condenser
    - 4. timing and timing advance
    - 5. wiring harness and connectors
    - 6. ignition coil
- VI. Special Problems in Air Conditioning/Heating Systems Inspection Procedures
  - A. Intake Manifold Heat Controls
  - B. Temperature Control Problems
    - 1. hoses and belts
    - 2. radiator
    - 3. pressure cap
    - 4. expansion tank
    - 5. water pump
    - 6. thermostat
      - a. by-pass
      - b. housing
    - 7. cooling system
      - a. drain, flush, refill
    - 8. fan
      - a. clutch
        - 1) electrical
        - 2) mechanical
      - b. shroud
    - 9. heater coolant control valve
      - a. manual
      - b. vacuum
      - c. electrical
    - 10. heater core
      - a. flush
  - C. Electrical Controls
    - 1. A/C and heater blower motors
      - a. resistors
      - b. switches
      - c. relays
      - d. wiring
      - e. protection devices
    - 2. A/C compressor
      - a. clutches
      - b. relays
      - c. wiring
      - d. sensors
      - e. switches
      - f. protection devices