



BAKER COLLEGE STUDENT LEARNING OUTCOMES

AST 2510A Engine Performance II 4 Semester Hours

Student Learning Outcomes & Enabling Objectives

1. Demonstrate fuel, air induction, and exhaust system diagnosis and repair techniques.
 - a. Diagnose (troubleshoot) hot or cold no-starting, hard starting, poor driveability, incorrect idle speed, poor idle, flooding, hesitation, surging, engine misfire, power loss, stalling, poor mileage, dieseling, and emissions problems; determine needed action. P-2
 - b. Check fuel for contaminants; determine needed action. P-2
 - c. Inspect and test fuel pump(s) and pump control system for pressure, regulation, and volume; perform needed action. P-1
 - d. Replace fuel filter(s) where applicable. P-2
 - e. Inspect, service, or replace air filters, filter housings, and intake duct work. P-1
 - f. Inspect throttle body, air induction system, intake manifold and gaskets for vacuum leaks and/or unmetered air. P-2
 - g. Inspect, test, and/or replace fuel injectors. P-2
 - h. Verify idle control operation. P-1
 - i. Inspect integrity of the exhaust manifold, exhaust pipe, muffler(s), catalytic converter(s), resonator(s), tail pipe(s), and heat shields; perform needed action. P-1
 - j. Inspect condition of exhaust system hangers, brackets, clamps, and heat shields; determine needed action. P-1
 - k. Perform exhaust system back-pressure test; determine needed action. P-2
 - l. Check and refill diesel exhaust fluid (DEF). P-2
 - m. Test the operation of turbocharger/supercharger systems; determine needed action. P-2
2. Demonstrate emission control systems diagnosis and repair techniques.
 - a. Diagnose oil leaks, emissions, and driveability concerns caused by the positive crankcase ventilation (PVC) system; determine needed action. P-3

- b. Inspect, test, service, and/or replace positive crankcase ventilation (PCV) filter/breather, valve, tubes, orifices, and hoses; perform needed action. P-2
- c. Diagnose emissions and driveability concerns caused by the exhaust gas recirculation (EGR) system; inspect, test, service and/or replace electrical/electronic sensors, controls, wiring, tubing, exhaust passages, vacuum/pressure controls, filters, and hoses of exhaust gas recirculation (EGR) systems; determine needed action. P-2
- d. Diagnose emissions and driveability concerns caused by the secondary air injection system; inspect, test, repair, and/or replace electrical/electronically-operated components and circuits of secondary air injection systems; determine needed action. P-2
- e. Diagnose emissions and driveability concerns caused by the evaporative emissions control (EVAP) system; determine needed action. P-1
- f. Diagnose emission and driveability concerns caused by catalytic converter system; determine needed action. P-2 g
- g. Interpret diagnostic trouble codes (DTCs) and scan tool data related to the emissions control systems; determine needed action. P-2

Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

Big Ideas

Fuel, air induction, and exhaust system diagnosis and repair techniques
Emission control systems diagnosis and repair techniques

Essential Questions

1. How do you perform fuel, air induction, and exhaust system diagnosis and repair?
2. How do you perform emission control systems diagnosis and repair?

These SLOs are not approved for experiential credit.

Effective: Fall 2023