

Minnesota State College Southeast

AUTO 1118: Auto Engine Performance Lab

A. COURSE DESCRIPTION

Credits: 3

Lecture Hours/Week: 1

Lab Hours/Week: 4

OJT Hours/Week: *.*

Prerequisites: None

Corequisites: None

MnTC Goals: None

In this course the student will identify components related to fuel, ignition, and emission systems. The student will perform routine service and maintenance procedures related to fuel, ignition, and emission systems. Troubleshooting techniques will be developed using various tests and test equipment. This will be used to analyze engine performance problems. The following TASKS are required by NATEF (National Automotive Technician Education Foundation) NATEF requires that 95% of P-1's, 80% of P-2's, and 50% of P-3's be completed during the course. (Prerequisites: AUTO1105, AUTO1106, AUTO1208 or instructor approval) (3 Credits: 1 lecture/2 lab)

B. COURSE EFFECTIVE DATES: 10/05/1998 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

1. Safety Requirements
2. General Engine Diagnosis
3. Computerized Controls Diagnosis and Repair
4. Ignition System Diagnosis and Repair
5. Fuel, Air Induction, and Exhaust Systems Diagnosis and Repair
6. Emissions Control Systems Diagnosis and Repair
7. Engine Related Service

D. LEARNING OUTCOMES (General)

1. 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
2. Locate and interpret vehicle and major component identification numbers (VIN, vehicle certification labels, and calibration decals). P-1
3. Inspect engine assembly for fuel, oil, coolant, and other leaks; determine necessary action. P-2
4. Diagnose abnormal exhaust color, odor, and sound; determine necessary action. P-2
5. Perform engine absolute (vacuum/boost) manifold pressure tests; determine necessary action. P-1
6. Perform cylinder compression tests; determine necessary action. P-1
7. Perform cylinder leakage test; determine necessary action. P-1
8. Verify engine operating temperature; determine necessary action. P-1
9. Perform cooling system pressure tests; check coolant condition; inspect and test radiator, pressure cap, coolant recovery tank, and hoses; perform necessary action. P-1
10. Retrieve and record stored OBD I diagnostic trouble codes; clear codes. P-2
11. Retrieve and record stored OBD II diagnostic trouble codes; clear codes. P-1
12. Access and use service information to perform step-by-step diagnosis. P-1
13. Inspect and test ignition system secondary circuit wiring and components; perform necessary action. P-2
14. Inspect and test ignition coil(s); perform necessary action. P-1
15. Check and adjust ignition system timing and timing advance/retard (where applicable). P-3
16. Check fuel for contaminants and quality; determine necessary action. P-3
17. Inspect and test mechanical and electrical fuel pumps and pump control systems for pressure, regulation and volume; perform necessary action. P-1
18. Replace fuel filters. P-1
19. Inspect throttle body, air induction system, intake manifold and gaskets for vacuum leaks and/or unmetered air. P-2
20. Inspect and test fuel injectors. P-2
21. Check idle speed and fuel mixture. P-3
22. Adjust idle speed and fuel mixture. P-3
23. Inspect the integrity of the exhaust manifold, exhaust pipes, muffler(s), catalytic converter(s), resonator(s), tail pipe(s), and heat shield (s); perform necessary action. P-2
24. Perform exhaust system back-pressure test; determine necessary action. P-1
25. Inspect, test and service positive crankcase ventilation (PCV) filter/breather cap, valve, tubes, orifices, and hoses; perform necessary action. P-2
26. Inspect, test, service and replace components of the Exhaust Gas Recirculation (EGR) system, including EGR tubing, exhaust passages, vacuum/pressure controls, filters and hoses; perform necessary action. P-2
27. Inspect and test mechanical components of secondary air injection systems; perform necessary action. P-3
28. Inspect and test catalytic converter performance. P-1
29. Inspect and test components of intake air temperature control system; perform necessary action. P-3
30. Inspect and test components of early fuel evaporation (Intake Manifold Temperature) control system; perform necessary action. P-3
31. Inspect and test components and hoses of evaporative emissions control system; perform necessary action. P-2
32. Remove and replace thermostat. P-2
33. Exhibit Professionalism

E. Minnesota Transfer Curriculum Goal Area(s) and Competencies

None

F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

G. SPECIAL INFORMATION

None noted