

BILLINGS PUBLIC SCHOOLS
AUTOMOTIVE II
Adoption Date April 12, 2004

MISSION STATEMENT

The Career Center is dedicated to providing Billings area students with an education that explores and enhances vocational and academic skills to promote critical thinking, self-discipline and responsible citizenship.

BELIEF STATEMENTS

1. We believe in an environment that fosters mutual respect and dignity.
2. We believe that students and faculty should maintain pride in their work to improve their performance.
3. We believe that academic skills lay the foundation for critical thinking, problem solving, mathematical and communication skills.
4. We believe in the integration of academic and career areas.
5. We believe in the importance of current technology, and its impact on the future.
6. We believe that students who are encouraged to set goals will gain confidence in their potential and ability to contribute to society.
7. We believe mutual support between school and community is an integral part of a students learning experience.

PHILOSOPHY

The automotive technician is a person who works in an exciting, rapidly changing and growing industry. The automotive technology curriculum is designed to educate individuals to become competent auto technicians. The primary focus of the educating program is the diagnosis, service and repair of automobile systems and components. Students will perform service on modern automotive equipment using special test equipment and tools. Students in the program will learn how to plan and perform repairs according to the various manufacturers recommended procedures. Career and Vocational/Technical Education programs focus on career preparation, resource management, communication, technical skill development, applied academics, technological literacy; and personal skills and leadership.

LEARNING DOMAINS

- I. The student will demonstrate an understanding of automotive literacy.**
- II. The student will demonstrate an understanding of automotive work place skills**
- III. The student will apply basic skills in automotive engine overhauls.**
- IV. The student will apply basic skills in automotive power trains.**
- V. The student will apply basic skills in automotive performance.**

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Learner Objectives

I. The student will demonstrate an understanding of automotive literacy.

1. Student will demonstrate use of technical manual in class and lab. (E)

- a. **Disassembly and assembly.**
- b. **Guide for inspection.**
- c. **Identify all necessary defective components.**
- d. **Comply with all OSHA, State, and Federal standards.**
- e. **Identify recent advances in automotive technology.**
- f. **Use of computer training.**

2. Student will demonstrate an understanding of automotive safety. (E)

- a. **Complete required safety tests.**
- b. **View of video and test book.**
- c. **Comply with OSHA, State, and Federal law.**
- d. **Work in a clean and well maintained environment.**

II. The student will demonstrate an understanding of appropriate automotive workplace skills.

3. Student will demonstrate procedures of workplace skills while working with tools, apparatuses, equipment, and materials. (E)

- a. **Follow all safety rules and procedures.**
- b. **Maintain a safe and clean work environment.**
- c. **Conduct shop activities and equipment operation in safe manner.**

4. Student will explore various aspects of workplace readiness. (R)

- a. **Understand that skills developed in academic and occupational programs relate to career goals.**
- b. **Understand the importance of reading, writing, speaking, and the knowledge of mathematical skills in the workplace.**
- c. **Listen to written and verbal instructions.**

5. Student will develop an understanding of the options available after high school. (R)

III. The student will demonstrate an understanding in automotive engine overhaul.

6. Student will understand basic procedures to disassembly of an engine. (E)

- a. **Understand the importance of disassembly procedures.**
- b. **Identify the necessary components.**
- c. **Recognize defective components.**
- d. **Understand how the engine works.**
- e. **Demonstrate proper working procedure habits and tests.**
- f. **Demonstrate the proper removal and installation procedures.**

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III. The student will demonstrate an understanding in automotive engine overhaul.
(cont.)

7. Student will apply science and math skills to help with the learning activities.

(E)

- a. Complete engine lab sheet student develops an understanding of how engines work and are repaired.
- b. Diagnose engine for fuel, oil, coolant leaks, oil consumption and noise.
- c. Remove engine using safety procedures.
- d. Use lab sheet to record measurements of engine, diagnosis of damage or wear.
- e. Disassemble engine, clean and inspect.
- f. Identify engine components.
- g. Identify how engine components work in relationship with each other.
- h. Inspect, measure, and record all findings.
- i. Determine what repair or replacement needs to be done.
- j. Inspect, replace, or repair damaged components.
- k. Check manufacturer specifications using technician manuals and computer programs.
- l. Install engine components usual in a reverse order of disassembly.
- m. Assemble engine using correct job sheets.
- n. Adjust all components to manufacturers specifications.
- o. Test compression using proper procedures.
- p. Correct any reading that is not according to manufacturers specification.
- q. Install an engine.
- r. Install all accessories.

8. Student will start and run rebuilt engine. (E)

- a. Install electronic controls.
- b. Install all mechanical controls.
- c. Install vacuum systems.
- d. Install fuel systems.
- e. Check and repair all leaks, noise and vibration problems.
- f. Ensure proper break in procedures by operator.
- g. Road test to verify any needed repairs.

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IV. The student will demonstrate an understanding in automotive power trains.

9. Student will demonstrate an understanding in power trains overhaul. (I)
- a. Understand the importance of disassembly of automatic transmissions and transfer components.
 - b. Identify the necessary components.
 - c. Recognize defective components.
 - d. Understand how automatic transmissions work.
 - e. Demonstrate proper working procedures, habits, and tests.
 - f. Demonstrate the proper removal and installation procedures.

10. Student will apply science and math skills (R) to help with learning activities.

(E)

- a. **Complete lab sheets, and develop an understanding of how power train components work and are repaired.**
- b. **Diagnose power train components for leaks, defective parts and noise.**
- c. **Use lab sheets to record measurements and test procedures.**
- d. **Identify how power train components work, wear, and why failure occurs.**
- e. **Inspect, clean, measure, and record all findings.**
- f. **Determine what failure needs to be repaired or replaced.**
- g. **Use manufacturers specifications, technician manuals and computer programs to repair.**
- h. **Install power train components usually in reverse order of disassembly.**
- i. **Adjust all components to manufacturer's specifications during reassembly.**
- j. **Test components for proper working procedures.**
- k. **Correct any malfunction that has occurred.**
- l. **Install component into vehicle.**
- m. **Install accessories and fluids.**

11. Student will road test vehicle. (I)

- a. Test for leaks, noise, vibrations and proper working procedures.
- b. Ensure break-in procedures are followed.
- c. Verify any components failure related to power train systems.

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- V. The student will apply basic skills in automotive performance.**
- 12. Student will apply the following basic skills in testing procedures in tune up: (E)**
- a. Bench work, mock-up, and live work will be offered for practice and demonstrations.**
 - b. Identify, diagnose, and repair of point type ignitions systems.**
 - c. Identifying, diagnose, and repair of electronic ignitions systems.**
 - d. Identify, diagnose, and repair of computer type ignitions systems.**
 - e. Perform scope test of engines.**
 - f. Perform scanner test on engines.**
- 13. Student will apply basic skills in testing procedures of fuel systems. (E)**
- a. Diagnose and repair fuel systems.**
 - b. Diagnose and repair carburetors.**
 - c. Diagnose and repair fuel delivery systems including all fuels.**
 - d. Diagnose and repair fuel injection systems.**
- 14. Student will apply basic skills in testing procedures and repair emissions controls. (E)**
- a. Diagnosis of positive crankcase systems.**
 - b. Diagnosis of spark timing control systems.**
 - c. Diagnosis and repair of idle speed systems.**
 - d. Diagnosis and repair of exhaust gas recirculation systems.**
 - e. Diagnosis and repair of gas treatment.**
 - f. Diagnosis and repair of manifold heat control.**
 - g. Diagnosis and repair of fuel vapor control.**
- 15. Student will apply basic understanding of the following emission control laws: (R)**
- a. OSHA requirements**
 - b. Federal requirements**
 - c. State requirements**
 - d. Local requirements**
- 16. Student will apply basic skills of computer control systems. (E)**
- a. Construction of electrical systems.**
 - b. Construction of fuel systems.**
 - c. Construction of emission systems.**

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V. The student will apply basic skills in automotive performance. (cont.)

17. Student will apply basic skills to demonstrate repair through use of the following training aids: (E)

- a. Bench work**
- b. Mock-ups**
- c. Factory donations**
- d. Line work**

18. Student will apply basic skill of performance by use of the following lab sheets: (E)

- a. Technical bulletins**
- b. Textbooks**
- c. Service manuals**
- d. Computer disks**

19. Student will apply basic skill of performance learning. (E)

- a. Training aid repair.**
- b. Bench work repair.**
- c. Live work.**

20. Student will apply basic reading and communication skill. (E)

- a. Ask questions.**
- b. Read text.**
- c. Explain how to make repairs.**
- d. Explain how repair was completed.**

21. Student will apply the following basic work skills on industry standards: (R)

- a. Skilled – Can work independently**
- b. Moderately skilled. – Has performed independently during training program**
- c. Limited Practice – Has practiced during training program**
- d. Exposure only – General information provided with no practice time**