

CUYAMACA COLLEGE
COURSE OUTLINE OF RECORD

Automotive Technology 153T – Advanced Brake System Assessment Test Out

1.5 hours laboratory, .5 unit

Catalog Description

This portfolio assessment course includes summative and criterion tests for students to prove knowledge, skills, and abilities to perform diagnosis and repair of active brake systems on vehicles in the department laboratory; or by using distance education technologies such as augmented reality or virtual reality. The tests will include recorded and live student demonstrations used for observation and assessment. This course allows a student residing at a distance from training centers to complete certification requirements prior to performing warranty service at a dealership. This course is complemented by AUTO 153 Advanced Brake System Diagnosis and Repair lecture, AUTO 153L Advanced Brake System Lab, and by Work Experience at a dealership.

Prerequisite

None

Recommended Preparation

“C” grade or higher or “Pass” in AUTO 162T Electronics Diagnosis and Repair Assessment Test Out and AUTO 151T Brake System Diagnosis and Repair Assessment Test Out or equivalent.

Entrance Skills

Without the following skills, competencies, and knowledge, students entering this course will be highly unlikely to succeed:

- 1) Demonstrate computer input and output tests and activation using a scan tool.
- 2) Obtain and describe normal and abnormal waveforms using a lab-scope.
- 3) Test thermistor, potentiometer, variable reluctance, pressure, Hall-effect and related sensors.
- 4) Graph and interpret system data using PIDS on a scan tool.
- 5) Diagnose and repair computer communication networking faults.
- 6) Describe types and functions of computer memory including RAM, ROM, and PROM.
- 7) Demonstrate proper diagnosis and repair of electronic system concerns.
- 8) Perform brake mechanical and hydraulic repair adhering to manufacturers guidelines.
- 9) Demonstrate and describe disc and drum brake system operation.
- 10) Repair brake lines using specialized repair tools.
- 11) Diagnose various brake system concerns including pull, pedal feel, vibrations, and noise related concerns.
- 12) Perform various hydraulic related tests and procedures.
- 13) Disassemble, inspect, and reassemble rear disc brakes.
- 14) Disassemble, inspect, and reassemble rear drum brakes.
- 15) Diagnose and repair parking brake systems.
- 16) Perform critical brake measurements.
- 17) Machine brake drums and rotors using on vehicle and off vehicle brake lathes.

Course Content

- 1) Written examination
- 2) Recorded or live hands on tests
- 3) Hands on tests using distance education technologies

Course Objectives

Students will be able to:

- 1) Demonstrate standardized safety and hazardous waste handling practices.
- 2) Successfully navigate manufacturer specific repair information for advanced brake system repairs.
- 3) Demonstrate knowledge of the Electronic Stability Control System (ESC).
- 4) Demonstrate knowledge of the Traction Control System.
- 5) Demonstrate knowledge of the Anti-Lock Braking System (ABS).
- 6) Create PID maps related to ESC, ABS and Traction Control Systems.
- 7) Identify ABS, ESC and Traction Control System components.
- 8) Diagnose ABS pump motor concerns.
- 9) Diagnose ABS warning light concerns.
- 10) Diagnose red brake warning lamp concerns.
- 11) Diagnose ABS/AdvanceTrac warning light.
- 12) Diagnose Electronic Parking Brake concerns.
- 13) Diagnose ABS/Electronic Stability Control concerns.

Method of Evaluation

A grading system will be established by the instructor and implemented uniformly. Grades will be based on demonstrated proficiency in subject matter determined by multiple measurements for evaluation, one of which must be essay exams, and skills demonstration.

- 1) Skills-based summative assessment that measures students' ability to successfully complete the necessary ASE tasks related to diagnosis, replacement, repair, testing of automotive brake control systems.
- 2) Practical exercises that measure students' progress toward mastering tasks related to diagnosis, replacement, repair, testing of electronic stability and active brakes.

Special Materials Required of Student

- 1) Approved safety glasses.
- 2) High speed internet connection and access to diagnostic repair information and equipment, and access to dealership or college vehicles.
- 3) Students will have access to testing tools and equipment while on campus.
- 4) Safe and appropriate dress code is required while in the lab on campus.
- 5) Students need a computer or smart device with a large screen and internet capability.

Minimum Instructional Facilities

- 1) Auto tech lab (20 service bays)
- 2) Various training vehicles
- 3) Smart classroom
- 4) Diagnostic tools and equipment

Method of Instruction

- 1) Demonstration
- 2) Individual assistance
- 3) Feedback of repair processes regardless of successful or unsuccessful

Out-of-Class Assignments

- 1) **Reading:** assigned course materials, manuals, content on websites, and more.
- 2) **Writing:** assignments where students describe the required tasks related to diagnosis, replacement, repair, and testing of electronic brake systems, components, and controls, and more.
- 3) **Other:** web-based training modules (pass online pretests prior to laboratory "Test Out"), portfolio performance projects related to electronic brake systems, components, and controls, and more.

Texts and References

- 1) Required (representative examples):
 - a. Student workbooks – will be provided electronically.
 - b. Required: VanGelder, Kirk. Fundamentals of Automotive Technology. Jones and Bartlett Learning, 2023.
 - c. Web Based Training Modules will be provided electronically.
 - d. Workshop Manuals will be provided electronically.
- 2) Supplemental: None

Student Learning Outcomes

Upon successful completion of this course, students will be able to:

- 1) Accurately describe and repair various electronic stability and brake system conditions.
- 2) Identify and repair advance brake problems by navigating the workshop manual based on symptoms or codes.
- 3) Communicate effectively and professionally in a diverse setting that includes prospective colleagues, clients, and supervisors.
- 4) Comply with environmental health and safety regulations at the state and federal levels.