

Department:

Automotive Technology

Course Description:

This course is a lecture course designed for students to increase their knowledge of various parts of chassis work, such as wheel alignment, wheel balancing, and suspension system operation and repair.

Course Competencies:

Upon completion of the course, the student should be able to:

General

1. Research applicable vehicle and service information, vehicle service history, service precautions, and technical service bulletins. P-1
2. Disable and enable supplemental restraint system (SRS). P-1

Related Suspension and Steering Service

1. Inspect rack and pinion steering gear inner tie rod ends (sockets) and bellows boots. P-1
2. Determine proper power steering fluid type; inspect fluid level and condition. P-1
3. Flush, fill, and bleed power steering system. P-2
4. Inspect for power steering fluid leakage; determine necessary action. P-1
5. Remove, inspect, replace, and adjust power steering pump drive belt. P-1
6. Inspect and replace power steering hoses and fittings. P-2
7. Inspect pitman arm, relay (centerlink/intermediate) rod, idler arm and mountings, and steering linkage damper. P-1
8. Inspect tie rod ends (sockets), tie rod sleeves, and clamps. P-1
9. Inspect upper and lower control arms, bushings, and shafts. P-1
10. Inspect and replace rebound and jounce bumpers. P-1
11. Inspect track bar, strut rods/radius arms, and related mounts and bushings. P-1
12. Inspect upper and lower ball joints (with or without wear indicators). P-1
13. Inspect suspension system cold springs and spring insulators (silencers). P-1
14. Inspect suspension system torsion bars and mounts. P-1
15. Inspect and replace front stabilizer bar (sway bar) bushings, brackets, and links. P-1
16. Inspect strut cartridge or assembly. P-1
17. Inspect front strut bearing and mount. P-1
18. Inspect rear suspension system lateral links/arms (track bars), control (trailing) arms. P-1
19. Inspect rear suspension system lead spring(s), spring insulators (silencers), shackles, brackets, bushings, center pins/bolts, and mounts. P-1
20. Inspect, remove, and replace shock absorbers; inspect mounts and bushings. P-1
21. Inspect electric power-assisted steering. P-3
22. Identify hybrid vehicle power steering system electrical circuits and safety precautions. P-2
23. Describe the function of the power steering pressure switch. P-3

Wheel Alignment

1. Perform pre-alignment inspection and measure vehicle ride height; determine necessary action. P-1

Wheels and Tires

1. Inspect tire condition; identify tire wear patterns; check for correct size and application (load and speed ratings) and adjust air pressure; determine necessary action. P-1
2. Rotate tires according to manufacturer's recommendations. P-1
3. Dismount, inspect, and remount tire on wheel; balance wheel and tire assembly (static and dynamic). P-1
4. Dismount, inspect, and remount tire on wheel equipped with tire pressure monitoring system sensor. P-2
5. Inspect tire and wheel assembly for air loss; perform necessary action. P-1
6. Repair tire using internal patch. P-1
7. Identify and test tire pressure monitoring systems (indirect and direct) for operation; verify operation of instrument panel lamps. P-2
8. Demonstrate knowledge of steps required to remove and replace sensors in a tire pressure monitoring system. P-2

Course Content:

Suspension and Steering

- A. Tires and Wheels
- B. Tire and Wheel Service
- C. Suspension System Components and Operation
- D. Front Suspension and Service
- E. Rear Suspension and Service
- F. Electronic Suspension Systems
- G. Steering Columns and Gears
- H. Steering Linkage and Service
- I. Power-Assisted Steering Operation and Service
- J. Wheel Alignment Principals
- K. Alignment Diagnosis and Service
- L. Automotive Wiring

Learning Assessments:

Assessments may include: Quizzes, tests, project work, demonstrated competence, instructor observation, weekly assignments and/or written papers.

Instructional Materials:

Textbook: Halderman, J. (2020). *Automotive Technology: Principles, Diagnosis, and Service* (6th ed.). Pearson. ISBN-13: 978-0135257272

Lab Manual: Halderman, J. (2020). *ASE Correlated Task Sheets for Automotive Technology* (6th ed.). Pearson. ISBN-13: 978-0135257418

Guidelines for Requesting Accommodations Based on Documented Disability or Medical Condition

It is the intention of Highland Community College to work toward full compliance with the Americans with Disabilities Act, to make instructional programs accessible to all people, and to provide reasonable accommodations according to the law.

Students should understand that it is their responsibility to self-identify their need(s) for accommodation and that they must provide current, comprehensive diagnosis of a specific disability or medical condition from a qualified professional in order to

receive services. Documentation must include specific recommendations for accommodation(s). Documentation should be provided in a timely manner prior to or early in the semester so that the requested accommodation can be considered and, if warranted, arranged.

In order to begin the process all students **must** complete the “Disabilities Self-Identification Form” on our [Disability Services website](#).

This form can also be accessed at the Highland Community College homepage under Students Services/Student Resources/Disability Service or by contacting the Disabilities Coordinator.

A Note on Harassment, Discrimination and Sexual Misconduct

Highland Community College seeks to assure all community members learn and work in a welcoming and inclusive environment. Title VII, Title IX, and College policy prohibit harassment, discrimination and sexual misconduct. Highland Community College encourages anyone experiencing harassment, discrimination or sexual misconduct to talk to report to the Vice President for Student Services, the Human Resources Director or complete an [online report](#) about what happened so that they can get the support they need and Highland Community College can respond appropriately.

There are both confidential and non-confidential resources and reporting options available to you. Highland Community College is legally obligated to respond to reports of sexual misconduct, and therefore we cannot guarantee the confidentiality of a report, unless made to a confidential resource. Responses may vary from support services to formal investigations. As a faculty member, I am required to report incidents of sexual misconduct and thus cannot guarantee confidentiality. I must provide our Title IX coordinator with relevant details such as the names of those involved in the incident. For more information about policies and resources or reporting options, please review our [Equity Grievance Policy](#).