

# ATEC 215: MANUAL DRIVETRAINS AND AXLES

Theory and diagnosis of automotive power-train components on vehicles in the lab. Practical application of diagnosis, service, and repair on clutches, drive shafts, universal joints, frontwheel drive axles, manual transmissions, manual transaxles, rear axles, differentials, and four-wheel drive transfer cases.

## Course Student Learning Outcomes

1. List and describe the functions of a standard and semi-centrifugal clutch and how it operates.
2. Describe the basic fundamentals of centrifugal force, inertia, leverage, and torque multiplication.
3. List and diagnose clutch and clutch related problems.
4. List and explain the proper procedures for clutch removal and installation.
5. List essential clutch, transmission, driveline, differential and rear axle components.
6. Inspect components and identify wear areas.
7. Describe the function of manual transmissions.
8. Describe the operation of three, four, and five speed manual transmissions.
9. Identify and define components in three, four and five speed manual transmissions.
10. Diagnose manual transmission and shift linkage problems.
11. Properly disassemble, inspect, and carefully reassemble three different manual transmissions.
12. Describe the power flow on each transmission worked on.
13. Describe the function of an overdrive transmission.
14. Describe the function of universal joints.
15. List and define the types of universal joints and drive shafts in use.
16. Describe the function of a differential.
17. Properly remove and replace two types of universal joints.
18. List and define the conventional and limited slip differential.
19. Properly disassemble, carefully inspect, reassemble and adjust at least one removable and one integral type differential.
20. List the types of rear axle bearing in use today.
21. Read with understanding in order to perform competently as an Automotive Technician.
22. Convey ideas in writing in order to perform competently as an Automotive Technician.
23. Communicate effectively to perform competently as an Automotive Technician.
24. Use math to solve problems and communicate to fulfill responsibilities of an Automotive Technician.
25. Understand the expectations of the workplace, the responsibilities of an Automotive Technician and the methods of securing employment within the field.
26. Demonstrate the ability to use technology effectively in the workplace.
27. Demonstrate professionalism in workplace appropriate dress and conduct.
28. Demonstrate the ability to work as a productive member of a team.

Credits: 8

Program: [Automotive Technology](#)