

COCONINO COMMUNITY COLLEGE

COURSE OUTLINE

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Status: Permanent

Date: Sept. 2, 2004

A. Identification:

1. Subject Area: Automotive Technology
2. Course Number: AUT 121
3. Course Title: Automotive Brake Systems Service Lab
4. Credit Hrs: 3
5. Catalog Description:
Emphasizes service of automotive and light truck brakes systems. Topics will include: Power Assist Units Diagnosis and Repair, Brakes Related (Wheel Bearings, Parking Brakes, Electrical, Etc.), and Antilock Brake and Traction Control Systems. Pre or Co-requisites: AUT 120. One lecture. Four Lab. May be taken for S/U credit.

B. Course Goals:

To provide students with extensive and intensive hands-on training for the student in Power Assist Units Diagnosis and Repair, Brakes Related (Wheel Bearings, Parking Brakes, Electrical, Etc.) and Antilock Brake and Traction Control Systems.

C. Course Outcomes:

Students will:

1. Test pedal free travel with and without engine running; check power assist operation.
2. Check vacuum supply (manifold or auxiliary pump) to vacuum-type power booster.
3. Inspect the vacuum-type power booster unit for vacuum leaks; inspect the check valve for proper operation; determine necessary action.
4. Inspect and test hydro-boost system and accumulator for leaks and proper operation; determine necessary action.
5. Diagnose wheel bearing noises, wheel shimmy, and vibration concerns; determine necessary action.
6. Remove, clean, inspect, repack, and install wheel bearings and replace seals; install hub and adjust wheel bearings.
7. Check parking brake cables and components for wear, rusting, binding, and corrosion; clean, lubricate, or replace as needed.
8. Check parking brake operation; determine necessary action.
9. Check operation of parking brake indicator light system.
10. Check operation of brake stop light system; determine necessary action.
11. Replace wheel bearing and race.
12. Inspect and replace wheel studs.
13. Remove and reinstall sealed wheel bearing assembly.
14. Identify and inspect antilock brake system (ABS) components; determine necessary action.
15. Diagnose poor stopping, wheel lock-up, abnormal pedal feel or pulsation, and noise concerns caused by the antilock brake system (ABS); determine necessary action.
16. Diagnose antilock brake system (ABS) electronic control(s) and components using self-diagnosis and/or recommended test equipment; determine necessary action.
17. Depressurize high-pressure components of the antilock brake system

- (ABS).
18. Bleed the antilock brake system's (ABS) front and rear hydraulic circuits.
 19. Remove and install antilock brake system (ABS) electrical/electronic and hydraulic components.
 20. Test, diagnose and service ABS speed sensors, toothed ring (tone wheel), and circuits using a graphing multimeter (GMM)/digital storage oscilloscope (DSO) (includes output signal, resistance, shorts to voltage/ground, and frequency data).
 21. Diagnose antilock brake system (ABS) braking concerns caused by vehicle modifications (tire size, curb height, final drive ratio, etc.).
 22. Identify traction control system components.

D. Course Content:

Will include:

1. Power Assist Units Diagnosis and Repair
2. Brakes Related (Wheel Bearings, Parking Brakes, Electrical, Etc.)
3. Antilock Brake and Traction Control Systems