

# AUTOMOTIVE BRAKES

## Pierce County Careers Connection

### Dual Credit Articulation Agreement

Upon completion of high school courses equivalent to the following competencies:

**Must complete 100% of the following:**

- Diagnose poor stopping, pulling, or dragging caused by problems in the hydraulic system; determine needed repairs.
- Inspect flexible brake hoses for leaks, kinks, crack, bulging, or wear; tighten loose fittings and supports.
- Select, handle, store, and install brake fluids (including silicone fluids).
- Bleed (manual, pressure, vacuum, or surge) and/or flush hydraulic system.
- Diagnose poor stopping, noise, pulling, grabbing, or pedal pulsation caused by problems in the drum brake mechanical assembly; determine needed repairs.
- Remove, clean, inspect, and measure brake drums; service or replace as needed.
- Mount brake drum on lathe; machine braking surface.
- Remove, clean, and inspect brake shoes, springs, pins, clips, levers, adjusters/self-adjusters, and other related brake hardware; and backing support plates; lubricate and reassemble.
- Remove and reinstall wheel cylinder.
- Pre-adjust brake shoes and parking brake before installing brake drums or drum/hub assemblies and wheel bearings.
- Reinstall wheel, torque lug nuts, and make final checks and adjustments.
- Diagnose poor stopping, noise, pulling, grabbing, dragging or pedal pulsation caused problems; determine needed repairs.
- Remove caliper assembly from mountings; clean and inspect for leaks and damage to caliper housing.
- Clean and inspect caliper mountings and slides for wear and damage.
- Remove, clean, and inspect pads and retaining hardware; determine needed repairs.
- Reassemble, lubricate and reinstall caliper, pads, and related hardware.
- Clean, inspect, and measure rotor with a dial indicator and a micrometer; follow manufacturer's recommendations in determine need to machine or replace.
- Refinish rotor according to manufacturer's recommendations.
- Fill master cylinder with recommended fluid and seat pads; inspect caliper for leaks.
- Reinstall, wheel, torque lug nuts, and make final checks and adjustments.
- Remove and replace rotor.
- Diagnose wheel bearing noises, wheel shimmy, and vibration problems; determine needed repairs.
- Remove, clean, inspect, repack, and reinstall wheel bearings and replace seals; reinstall hub and adjust wheel bearings.
- Check parking brake operation; adjust as needed.
- Check operation of brake light system; adjust and service as needed.
- Replace wheel bearing and race.
- Observe anti-lock brake system (ABS) warning light(s) at startup; determine if further diagnosis is needed.
- Depressurize high-pressure components of the anti-lock brake system (ABS) following the manufacturer's recommended safety procedures.
- Fill the anti-lock brake system (ABS) master cylinder with the recommended fluid following manufacturer's procedures; inspect system for leaks.
- Remove, bench bleed, and replace master cylinder.
- Inspect brake lines and fitting for leaks, dents, kinks, rust, cracks, or wear; tighten loose fittings and supports.
- Fabricate and install brake lines (double flare and ISO types); replace hoses, fittings and supports as needed.
- Inspect, test, and replace metering (hold off), proportioning (balance), pressure differential, and combination valves.
- Inspect, test, and replace brake warning light system switch and wiring.
- Disassemble, and clean caliper assembly; inspect parts for wear, rust, scoring, and damage; replace seal, boot and damaged worn parts.
- Test pedal free travel with and without engine running to check power assist operation.
- Check vacuum supply (manifold or auxiliary pump) to vacuum-type power booster with a vacuum gauge.
- Inspect the vacuum-type power booster unit for vacuum leaks; inspect the check valve for proper operation; repair or replace parts as necessary.
- Check parking brake cables and components for wear, rusting, binding, and corrosion; clean lubricate, and replace as needed.
- Check operation of parking brake indicator light system.
- Diagnose anti-lock brake system (ABS) electronic control(s) and components using self-diagnosis and/or recommended test equipment; determine needed repairs.
- Bleed the anti-lock brake system's (ABS) front and rear hydraulic circuits following manufacturer's procedures.
- Service, test, and adjust anti-lock system (ABS) speed sensors following manufacturer's recommended procedures.
- Measure and adjust pedal pushrod length.
- Check master cylinder for internal and external leaks and proper operation; determine needed repairs.
- Inspect, test, replace, and adjust load or height sensing type proportioning valve(s).
- Adjust calipers with integrated parking brakes.
- Inspect, test, and service anti-lock brake system (ABS) hydraulic, electrical, and mechanical components.
- Diagnose poor stopping, wheel lock-up, abnormal pedal feel or pulsation, and noise problems caused by the anti-lock system (ABS); determine needed repairs.
- Perform a fluid pressure (hydraulic boost) diagnosis on the integral (high pressure) anti-lock system (ABS); determine

- needed repairs.
- Remove and install anti-lock brake system (ABS) electrical/electronic/hydraulic components following manufacturer's procedures and specification.
- Diagnose anti-lock brake system (ABS) braking problems caused by vehicle modifications (tire size, curb height, final drive ratio, etc.).

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**A student earning a "B" grade or better may earn college credit at the following college:**

<u>College</u>	<u>Course</u>	<u>Credits</u>
Bates Technical College	AUTOM 141	4
Clover Park Technical College	AUT 147 (CIP Code: 47.0604)	6