

Standards and Competencies for Automotive: Brake Systems (Course # 5712)

	Begin-End Yr
Standard 1 - Students will demonstrate leadership, citizenship, and teamwork skills required for success in the school, community, and workplace.	2009 -
1.1 - Exhibit positive leadership skills.	2009 -
1.2 - Participate in SkillsUSA as an integral part of classroom instruction	2009 -
1.3 - Assess situations and apply problem-solving and decision-making skills to client relations in the community and workplace.	2009 -
1.4 - Demonstrate the ability to work cooperatively with others in a professional setting	2009 -
Standard 2 - Students will demonstrate automotive technology safety practices, including Occupational Safety and Health Administration (OSHA) and Environmental Protection Agency (EPA) requirements, for an automotive repair facility.	2009 -
2.1 - Determine the safe and correct application for chemicals used in brake systems	2009 -
2.2 - Use protective clothing and safety equipment.	2009 -
2.3 - Use fire protection equipment.	2009 -
2.4 - Follow OSHA and EPA regulations and manufacturer specifications affecting brake systems technology	2009 -
2.5 - Respond to safety communications referring to brake systems.	2009 -
2.6 - Pass with 100 percent accuracy a written examination relating to safety issues	2009 -
2.7 - Pass with 100 percent accuracy a performance examination relating to safety	2009 -
2.8 - Maintain a portfolio record of written safety examinations and equipment examinations for which the student has passed an operational checkout by the instructor.	2009 -
Standard 3 - Students will properly test, diagnose, service, and repair General Brake Systems NATEF Task Standards 2005 V-A-1	2009 -
3.1 - Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction. P-1	2009 -
3.2 - Identify and interpret brake system concern; determine necessary action. P-1	2009 -
3.3 - Research applicable vehicle and service information, such as brake system operation, vehicle service history, service precautions, and technical service bulletins. P-1	2009 -
3.4 - Locate and interpret vehicle and major component identification numbers (VIN, vehicle certification labels, calibration decals) P-1	2009 -
Standard 4 - Students will properly test, diagnose, service, and repair Hydraulic System NATEF Task Standards 2005 V-E	2009 -
4.1 - Diagnose pressure concerns in the brake system using hydraulic principles (Pascal's Law). P-1	2009 -
4.2 - Measure brake pedal height; determine necessary action. P-2	2009 -
4.3 - Check master cylinder for internal and external leaks and proper operation; determine necessary action. P-1	2009 -
4.4 - Remove, bench bleed, and reinstall master cylinder. P-1	2009 -
4.5 - Diagnose poor stopping, pulling or dragging concerns caused by malfunctions in the hydraulic system; determine necessary action. P-1	2009 -
4.6 - Inspect brake lines, flexible hoses, and fittings for leaks, dents, kinks, rust, cracks, bulging or wear; tighten loose fittings and supports; determine necessary action. P-2	2009 -
4.7 - Fabricate and/or install brake lines (double flare and ISO types); replace hoses, fittings, and supports as needed. P-2	2009 -
4.8 - Select, handle, store, and fill brake fluids to proper level. P-1	2009 -
4.9 - Inspect, test, and/or replace metering (hold-off), proportioning (balance), pressure differential, and combination valves. P-2	2009 -
4.10 - Inspect, test, and adjust height (load) sensing proportioning valve. P-3	2009 -
4.11 - Inspect, test, and/or replace components of brake warning light system. P-3	2009 -
4.12 - Bleed (manual, pressure, vacuum or surge) brake system. P-1	2009 -
4.13 - Flush hydraulic system. P-3	2009 -
Standard 5 - Students will properly test, diagnose, service, and repair Drum Brake NATEF Task Standards 2005 V-F	2009 -
5.1 - Diagnose poor stopping, noise, pulling, grabbing, dragging or pedal pulsation concerns; determine necessary action. P-1	2009 -
5.2 - Remove, clean (using proper safety procedures), inspect, and measure brake drums; determine necessary action. P-1	2009 -
5.3 - Refinish brake drum. P-1	2009 -
5.4 - Remove, clean, and inspect brake shoes, springs, pins, clips, levers, adjusters/self-adjusters, other related brake hardware, and backing support plates; lubricate and reassemble. P-1	2009 -
5.5 - Remove, inspect, and install wheel cylinders. P-2	2009 -
5.6 - Pre-adjust brake shoes and parking brake before installing brake drums or drum/hub assemblies and wheel bearings. P-1	2009 -
5.7 - Install wheel, torque lug nuts, and make final checks and adjustments. P-1	2009 -
Standard 6 - Students will properly test, diagnose, service, and repair Disc Brake NATEF Task Standards 2005 V-G	2009 -
6.1 - Diagnose poor stopping, noise, pulling, grabbing, dragging or pedal pulsation concerns; determine necessary action. P-1	2009 -
6.2 - Remove caliper assembly from mountings; clean and inspect for leaks and damage to caliper housing; determine necessary action. P-1	2009 -

	6.3 - Clean and inspect caliper mounting and slides for wear and damage; determine necessary action. P-1	2009 -
	6.4 - Remove, clean, and inspect pads and retaining hardware; determine necessary action. P-1	2009 -
	6.5 - Disassemble and clean caliper assembly; inspect parts for wear, rust, scoring, and damage; replace seal, boot, and damaged or worn parts. P-2	2009 -
	6.6 - Reassemble, lubricate, and reinstall caliper, pads, and related hardware; seat pads, and inspect for leaks. P-1	2009 -
	6.7 - Clean, inspect, and measure rotor with a dial indicator and a micrometer; follow manufacturer's recommendation in determining need to machine or replace. P-1	2009 -
	6.8 - Remove and reinstall rotor. P-1	2009 -
	6.9 - Refinish rotor on vehicle. P-1	2009 -
	6.10 - Refinish rotor off vehicle. P-1	2009 -
	6.11 - Adjust calipers equipped with an integrated parking brake system. P-3	2009 -
	6.12 - Install wheel, torque lug nuts, and make final checks and adjustments. P-1	2009 -
Standard 7 - Students will properly test, diagnose, service, and repair Power Assist Units. NATEF Task Standards 2005 V-f		2009 -
	7.1 - Test pedal free travel with and without engine running; check power assist operation. P-2	2009 -
	7.2 - Check vacuum supply (manifold or auxiliary pump) to vacuum-type power booster. P-2	2009 -
	7.3 - Inspect the vacuum-type power booster unit for vacuum leaks; inspect the check valve for proper operation; determine necessary action. P-2	2009 -
	7.4 - Inspect and test hydraulically assisted power brake system for leaks and proper operation; determine necessary action. P-3	2009 -
	7.5 - Measure and adjust master cylinder pushrod length. P-3	2009 -
Standard 8 - Students will properly test, diagnose, service, and repair Miscellaneous (Wheel Bearings, Parking Brakes, Electrical, Etc.) NATEF Task Standards 2005 V-F		2009 -
	8.1 - Diagnose wheel bearing noises, wheel shimmy, and vibration concerns; determine necessary action. P-1	2009 -
	8.2 - Remove, clean, inspect, repack, and install wheel bearings and replace seals; install hub and adjust wheel bearings. P-1	2009 -
	8.3 - Check parking brake cables and components for wear, rusting, binding, and corrosion; clean, lubricate, or replace as needed. P-2	2009 -
	8.4 - Check parking brake operation; determine necessary action. P-1	2009 -
	8.5 - Check operation of parking brake indicator light system. P-3	2009 -
	8.6 - Check operation of brake stop light system; determine necessary action. P-1	2009 -
	8.7 - Replace wheel bearing and race. P-1	2009 -
	8.8 - Inspect and replace wheel studs. P-1	2009 -
	8.9 - Remove and reinstall sealed wheel bearing assembly. P-2	2009 -
Standard 9 - Students will properly test, diagnose, service, and repair Antilock Brake and Traction Control Systems NATEF Task Standards 2005 V-G		2009 -
	9.1 - Identify and inspect antilock brake system (ABS) components; determine necessary action. P-1	2009 -
	9.2 - Diagnose poor stopping, wheel lock-up, abnormal pedal feel or pulsation, and noise concerns caused by the antilock brake system (ABS); determine necessary action. P-2	2009 -
	9.3 - Diagnose antilock brake system (ABS) electronic control(s) and components using self-diagnosis and/or recommended test equipment; determine necessary action. P-1	2009 -
	9.4 - Depressurize high-pressure components of the antilock brake system (ABS). P-3	2009 -
	9.5 - Bleed the antilock brake system's (ABS) front and rear hydraulic circuits. P-2	2009 -
	9.6 - Remove and install antilock brake system (ABS) electrical/electronic and hydraulic components. P-1	2009 -
	9.7 - 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 fre	2009 -
	9.8 - Diagnose antilock brake system (ABS) braking concerns caused by vehicle modifications (tire size, curb height, final drive ratio, etc.). P-3	2009 -
	9.9 - Identify traction control system/vehicle stability control system components. P-3	2009 -
Standard 10 - Students will demonstrate communication skills required in the automotive service industry		2009 -
	10.1 - Communicate and comprehend oral and written information typically occurring in the automotive service workplace referring to brake systems.	2009 -
	10.2 - Solve brake problems and make decisions using a logical process, based on information communicated to them.	2009 -
	10.3 - Use teamwork skills to accomplish goals, solve problems, and manage conflict within groups	2009 -
Standard 11 - Students will demonstrate interpersonal and employability skills required in the automotive service industry		2009 -
	11.1 - Analyze relationships between work ethics, organizational skills, and personal job success	2009 -
	11.2 - Demonstrate attitudes conducive to working in a team.	2009 -
	11.3 - Compare the correlation between a clean orderly work environment and successful and efficient job performance.	2009 -
	11.4 - Assess implications of diversity for communities and workplaces	2009 -
	11.5 - Develop individual time management and work sequencing skills	2009 -