

2008 NATEF AUTOMOBILE STANDARDS CORRELATIONS

BRAKES

For every task in Brakes, the following safety requirement must be strictly enforced:

Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

A. General Brake Systems Diagnosis	Student Edition	Technical Applications
1. Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction. (P-1)	HB-44	Job Sheet BR-1
2. Identify and interpret brake system concern; determine necessary action. (P-1)	BR-145 through BR-150, BR-164 through BR-168	Job Sheets BR-10, BR-12
3. Research applicable vehicle and service information, such as brake system operation, vehicle service history, service precautions, and technical service bulletins. (P-1)	HB-44, EP-372, SS-548, SS-592	Job Sheet HB-4
4. Locate and interpret vehicle and major component identification numbers. (P-1)	HB-44, EP-410 through EP-411, SS-528	Job Sheets HB-1, HB-2
B. Hydraulic System Diagnosis and Repair	Student Edition	Technical Applications
1. Diagnose pressure concerns in the brake system using hydraulic principles (Pascal's Law). (P-1)	BR-145 through BR-150, BR-164 through BR-168, BR-127 through BR-129	Job Sheet BR-4
2. Measure brake pedal height, travel, and free play (as applicable); determine necessary action. (P-1)	BR-128, BR-147, BR-164	Job Sheets BR-5, BR-13
3. Check master cylinder for internal and external leaks and proper operation; determine necessary action. (P-2)	BR-124 through BR-130	Diagnostic Sheet BR-1 Job Sheet BR-2
4. Remove, bench bleed, and reinstall master cylinder. (P-1)	BR-128 through BR-129, BR-133 through BR-135	Job Sheet BR-3

B. Hydraulic System Diagnosis and Repair (continued)	Student Edition	Technical Applications
5. Diagnose poor stopping, pulling or dragging concerns caused by malfunctions in the hydraulic system; determine necessary action. (P-2)	BR-145 through BR-150, BR-164 through BR-168	Job Sheet BR-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-1)	BR-109, BR-112, BR-129	Diagnostic Sheets BR-2, BR-3 Job Sheets BR-6, BR-7
7. Replace brake lines, hoses, fittings, and supports. (P-2)	BR-109, BR-112, BR-129	Job Sheets BR-4, BR-6
8. Fabricate brake lines using proper material and flaring procedures (double flare and ISO types). (P-2)	BR-109, BR-112, BR-129	Job Sheets BR-4, BR-6
9. Select, handle, store, and fill brake fluids to proper level. (P-1)	BR-114 through BR-117, BR-125 through BR-126, BR-148, BR-186	Job Sheet BR-9
10. Inspect, test, and/or replace metering (hold-off), proportioning (balance), pressure differential, and combination valves. (P-3)	BR-131 through BR-133	Job Sheet BR-8
11. Inspect, test, and/or replace components of brake warning light system. (P-3)	BR-193, EL-325 through EL-326	Diagnostic Sheet BR-5 Job Sheet BR-30
12. Bleed and/or flush brake system. (P-1)	BR-133 through BR-135, BR-219 through BR-220	Job Sheet BR-9
13. Test brake fluid for contamination. (P-1)	BR-115, BR-127 through BR-128	Job Sheets BR-1, BR-2

C. Drum Brake Diagnosis and Repair	Student Edition	Technical Applications
1. Diagnose poor stopping, noise, vibration, pulling, grabbing, dragging or pedal pulsation concerns; determine necessary action. (P-1)	BR-145 through BR-150	Job Sheet BR-12
2. Remove, clean, inspect, and measure brake drums; determine necessary action. (P-1)	BR-151 through BR-155	Job Sheets BR-19, BR-20
3. Refinish brake drum; measure final drum diameter. (P-1)	BR-149, BR-151 through BR-155	Job Sheet BR-20
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)	BR-153	Job Sheet BR-21
5. Inspect and install wheel cylinders. (P-2)	BR-153 through BR-154	Job Sheet BR-22
6. Pre-adjust brake shoes and parking brake; install brake drums or drum/hub assemblies and wheel bearings. (P-2)	BR-154 through BR-155	Job Sheet BR-23
7. Install wheel, torque lug nuts, and make final checks and adjustments. (P-1)	SS-517 through SS-518	Job Sheet SS-5
D. Disc Brake Diagnosis and Repair	Student Edition	Technical Applications
1. Diagnose poor stopping, noise, vibration, pulling, grabbing, dragging or pulsation concerns; determine necessary action. (P-1)	BR-164 through BR-168	Job Sheet BR-10
2. Remove caliper assembly; inspect for leaks and damage to caliper housing; determine necessary action. (P-1)	BR-159 through BR-163, BR-167, BR-170 through BR-173	Job Sheet BR-24

D. Disc Brake Diagnosis and Repair (continued)	Student Edition	Technical Applications
3. Clean and inspect caliper mounting and slides/pins for operation, wear, and damage; determine necessary action. (P-1)	BR-159 through BR-163, BR-167, BR-170 through BR-173	Job Sheet BR-24
4. Remove, inspect, and replace pads and retaining hardware; determine necessary action. (P-1)	BR-169 through BR-170	Job Sheet BR-24
5. Disassemble and clean caliper assembly; inspect parts for wear, rust, scoring, and damage; replace seal, boot, and damaged or worn parts. (P-3)	BR-169 through BR-171	Job Sheet BR-24
6. Reassemble, lubricate, and reinstall caliper, pads, and related hardware; seat pads, and inspect for leaks. (P-1)	BR-169 through BR-172	Job Sheets BR-24, BR-25
7. Clean, inspect, and measure rotor thickness, lateral runout, and thickness variation; determine necessary action. (P-1)	BR-173 through BR-177	Job Sheet BR-26
8. Remove and reinstall rotor. (P-1)	BR-173 through BR-177	Job Sheet BR-27
9. Refinish rotor on vehicle; measure final rotor thickness. (P-1)	BR-173 through BR-177	Job Sheet BR-27
10. Refinish rotor off vehicle; measure final rotor thickness. (P-1)	BR-173 through BR-177	Job Sheet BR-27
11. Retract caliper piston on an integrated parking brake system. (P-3)	BR-168, BR-200 through BR-202	Job Sheets BR-31, BR-33, BR-34
12. Install wheel, torque lug nuts, and make final checks and adjustments. (P-1)	SS-517 through SS-520	Job Sheet SS-5
13. Check brake pad wear indicator system operation; determine necessary action. (P-2)	BR-163, EL-327	Job Sheet BR-24

E. Power Assist Units Diagnosis and Repair	Student Edition	Technical Applications
1. Test pedal free travel; check power assist operation. (P-2)	BR-147	Job Sheet BR-13
2. Check vacuum supply to vacuum-type power booster. (P-1)	BR-181, BR-187	Job Sheet BR-28
3. Inspect the vacuum-type power booster unit for vacuum leaks; inspect the check valve for proper operation; determine necessary action. (P-1)	BR-181 through BR-184, BR-187 through BR-189	Job Sheet BR-28
4. Inspect and test hydraulically assisted power brake system for leaks and proper operation; determine necessary action. (P-3)	BR-184 through BR-186, BR-187 through BR-189	
5. Measure and adjust master cylinder pushrod length. (P-3)	BR-128	
F. Miscellaneous (Wheel Bearings, Parking Brakes, Electrical, etc.) Diagnosis and Repair	Student Edition	Technical Applications
1. Diagnose wheel bearing noises, wheel shimmy, and vibration concerns; determine necessary action. (P-1)	BR-148 through BR-149, SS-560 through SS-561	Job Sheet BR-18
2. Remove, clean, inspect, repack, and install wheel bearings and replace seals; install hub and adjust bearings. (P-1)	BR-148 through BR-149, SS-560 through SS-561	Job Sheets BR-11, BR-14, BR-18
3. Check parking brake cables and components for wear, binding, and corrosion; clean, lubricate, adjust, or replace as needed. (P-2)	BR-168, BR-200 through BR-202	Job Sheets BR-31, BR-33, BR-34
4. Check parking brake and indicator light system operation; determine necessary action. (P-1)	BR-168, BR-193, BR-200 through BR-202	Job Sheets BR-31, BR-32, BR-33, BR-34
5. Check operation of brake stop light system; determine necessary action. (P-1)	EL-316 through EL-318	Job Sheet BR-29

F. Miscellaneous (Wheel Bearings, Parking Brakes, Electrical, etc.) Diagnosis and Repair (continued)	Student Edition	Technical Applications
6. Replace wheel bearing and race. (P-2)	BR-148, SS-560 through SS-561	Diagnostic Sheet BR-4 Job Sheet BR-15
7. Inspect and replace wheel studs. (P-1)	BR-148, SS-560 through SS-561	Job Sheet BR-16
8. Remove and reinstall sealed wheel bearing assembly. (P-1)	BR-148, SS-560 through SS-561	Job Sheet BR-17
G. Electronic Brake, Traction and Stability Control Systems Diagnosis and Repair	Student Edition	Technical Applications
1. Identify and inspect electronic brake control components; determine necessary action. (P-1)	BR-217 through BR-220	Job Sheets BR-37, BR-38
2. Diagnose poor stopping, wheel lock-up, abnormal pedal feel, unwanted application, and noise concerns associated with the electronic brake control system ; determine necessary action. (P-2)	BR-217 through BR-219	Job Sheet BR-35
3. Diagnose electronic brake control system electronic control(s) and components by retrieving diagnostic trouble codes, and/or using recommended test equipment; determine necessary action. (P-1)	BR-217 through BR-220	Job Sheet BR-40
4. Depressurize high-pressure components of the electronic brake control system. (P-3)	BR-219	Job Sheet BR-39
5. Bleed the electronic brake control system hydraulic circuits. (P-2)	BR-219	Job Sheet BR-41
6. Remove and install electronic brake control system electrical/electronic and hydraulic components. (P-3)	BR-217 through BR-220	

G. Anti-lock Brake and Traction Control Systems <i>(continued)</i>	Student Edition	Technical Applications
7. Test, diagnose, and service electronic brake control system speed sensors (digital and analog), 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). (P-1)	BR-217 through BR-219	Job Sheet BR-36
8. Diagnose electronic brake control system braking concerns caused by vehicle modifications (tire size, curb height, final drive ratio, etc.). (P-3)	BR-217 through BR-220	
9. Identify traction control/vehicle stability control system components. (P-3)	BR-213 through BR-221	
10. Describe the operation of a regenerative braking system. (P-3)	BR-220	