

**CORRELATION
FLORIDA DEPARTMENT OF EDUCATION
COURSE DESCRIPTION**

SUBJECT: Industrial Education
COURSE NAME: Automotive Service Technology 7
SUBMISSION TITLE: Automotive Excellence Volume 1 © 2007
PUBLISHER: Glencoe/McGraw-Hill
GRADE(S): 9-12

COURSE CODE NUMBER:

OUTCOME NUMBER	BENCHMARK NUMBER	INTENDED OUTCOME/BENCHMARK DESCRIPTION	PAGE(S) OR LOCATION(S) WHERE TAUGHT IN MAJOR TOOL
3.0		DEMONSTRATE PROFICIENCY IN GENERAL BRAKE SYSTEM DIAGNOSIS AND HYDRAULIC SYSTEM DIAGNOSIS AND REPAIR--The student will be able to:	
3.01		Identify and interpret brake system concern; determine necessary action. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-1 SE1: BR145-150, BR164-168
3.02		Research applicable vehicle and service information, such as brake system operation, vehicle service history, service precautions, and technical service bulletins. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-1 SE1: HB44, SS592, EP372
3.03		Locate and interpret vehicle and major component identification numbers (VIN, vehicle certification labels, calibration decals). LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-1 SE1: HB44, SS528, EP410-411
3.04		Diagnose pressure concerns in the brake system using hydraulic principles (Paschal's Law).	P-1 SE1: BR127-129, BR145-150, BR164-168
3.05		Measure brake pedal height; determine necessary action. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-2 SE1: BR128
3.06		Check master cylinder for internal and external leaks and proper operation; determine necessary action. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-2 SE1: BR124-130
3.07		Remove, bench bleed, and reinstall master cylinder. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-1 SE1: BR128-129, BR133-135

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3.08		Diagnose poor stopping, pulling or dragging concerns caused by problems in the hydraulic system; determine necessary action. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-1 SE1: BR145-150, BR164-168
3.09		Inspect brake lines, flexible hoses, and fittings for leaks, dents, kinks, rust, cracks, bulging or wear; tighten loose fittings and supports; determine necessary action. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-2 SE1: BR109, BR112, BR129
3.10		Fabricate and install brake lines (double flare and ISO types); replace hoses, fittings, and supports as needed. LA.A.142, LA.A.143, LA.A.244, MA.B.241, MA.B.442, MA.E.141	P-2 SE1: BR109, BR112, BR129
3.11		Select, handle, store, and install brake fluids to proper level. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-1 SE1: BR114-117, BR125-126, BR148, BR186
3.12		Inspect, test, and replace metering (hold-off), proportioning (balance), pressure differential, and combination valves. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-3 SE1: BR131-133
3.13		Inspect, test, replace, and adjust height (load) sensing proportioning valve. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-3 SE1: BR132, BR208
3.14		Inspect, test, and replace components of brake warning light system. SC.H.346, LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-3 SE1: BR193, EL325-326
3.15		Bleed (manual, pressure, vacuum or surge) brake system. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-1 SE1: BR133-135, BR219-220

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3.16		Flush hydraulic system. LA.A.142, LA.A.143, LA.A.244	SE1: BR133-135, BR219-220 P-3
4.0		DEMONSTRATE PROFICIENCY IN DRUM BRAKE DIAGNOSIS AND REPAIR --The student will be able to:	
4.01		Diagnose poor stopping, noise, pulling, grabbing, dragging or pedal pulsation concerns; determine necessary action. SC.H.346, LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141, MA.B.241, MA.B.242	SE1: BR145-150 P-1
4.02		Remove, clean (using proper safety procedures), inspect, and measure brake drums; service or perform necessary action. SC.H.346, LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141, MA.B.241, MA.B.242	SE1: BR151-155 P-1
4.03		Refinish Brake Drum. SC.H.346, LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141, MA.B.241, MA.B.242	SE1: BR151-155 P-2
4.04		Remove, clean, and inspect brake shoes, springs, pins, clips, levers, adjusters/self-adjusters, other related brake hardware, and backing support plates; lubricate and reassemble. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141, MA.B.242	SE1: BR153 P-2
4.05		Remove and inspect wheel cylinders. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141, MA.B.242	SE1: BR153-154 P-2

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4.06		Pre-adjust brake shoes and parking brake before installing brake drums or drum/hub assemblies and wheel bearings. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141, MA.B.242	P-1 SE1: BR154-155
4.07		Install wheel, torque lug nuts, and make final checks and adjustments. LA.A.142, LA.A.143, LA.A.244, MA.E.141, MA.E.241, MA.B.442, MA.B.242	P-1 SE1: BR517-518
5.0		DEMONSTRATE PROFICIENCY IN THE OPERATION OF DISC BRAKE DIAGNOSIS AND REPAIR--The student will be able to:	
5.01		Diagnose poor stopping, noise, pulling, grabbing, dragging or pedal pulsation concerns; determine necessary action. LA.A.142, LA.A.143, LA.A.244, MA.E.141, MA.B.242	P-1 SE1: BR164-168
5.02		Remove caliper assembly from mountings; clean and inspect for leaks and damage to caliper housing; determine necessary action. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141, MA.B.242	P-1 SE1: BR159-163, BR167, BR170-173
5.03		Clean and inspect caliper mounting and slides for wear and damage; determine necessary action. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141, MA.B.242	P-1 SE1: BR159-163, BR167, BR170-173
5.04		Remove, clean, and inspect pads and retaining hardware; determine necessary action. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141, MA.B.242	P-1 SE1: BR169-170

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5.05		Disassemble and clean caliper assembly; inspect parts for wear, rust, scoring, and damage; replace seal, boot, and damaged or worn parts. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141, MA.B.242	SE1: BR169-171 P-1
5.06		Reassemble, lubricate, and reinstall caliper, pads, and related hardware, seat pads, and inspect for leaks. LA.A.142, LAA143, LA.A.244, MA.B.442, MA.E.141, MA.B.241, MA.B.242	SE1: BR169-172 P-1
5.07		Clean, inspect, and measure rotor with a dial indicator and a micrometer; follow manufacturer's recommendations in determining need to machine or replace. SC.H.346, LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141, MA.B241, MA.B.242	SE1: BR173-177 P-1
5.08		Remove and replace rotor. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141, MA.B.241, MAB242	SE1: BR173-177 P-1
5.09		Refinish rotor according to manufacturer's recommendations. SC.H.346, LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141, MA.B.241, MA.B.242	SE1: BR173-177 P-1
5.10		Adjust calipers with integrated parking brake system. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141, MA.B.242	SE1: BR168, BR200-202 P-3
5.11		Install wheel, torque lug nuts, and make final checks and adjustments. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141, MA.B.241, MA.B.242	SE1: SS517-520 P-1
6.0		DEMONSTRATE PROFICIENCY IN THE OPERATION OF POWER ASSIST UNITS DIAGNOSIS AND REPAIR- The student will be able to:	

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6.01		Test pedal free travel with and without engine running; check power assist operation. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141, MA.B.241, MA.B.242	SE1: BR147 P-2
6.02		Check vacuum supply (manifold or auxiliary pump) to vacuum-type power booster. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.B.442, MA.E.141, MA.B.241, MA.B.242	SE1: BR181, BR187 P-2
6.03		Inspect the vacuum-type power booster unit for vacuum leaks; inspect the check valve for proper operation; determine necessary action. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141, MA.B.241, MA.B.242	SE1: BR181-184, BR187-189 P-3
6.04		Inspect and test hydro-boost system and accumulator for leaks and proper operation; determine necessary action. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141, MA.B.241, MA.B.242	SE1: BR184-186, BR187-189 P-3
7.0		DEMONSTRATE PROFICIENCY IN MISCELLANEOUS (WHEEL BEARINGS, PARKING BRAKES, ELECTRICAL, ETC.) DIAGNOSIS AND REPAIR--The student will be able to:	
7.01		Diagnose wheel bearing noises, wheel shimmy, and vibration concerns; determine necessary action. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141, MA.B.241, MA.B.242	SE1: BR148-149, SS560-561 P-1
7.02		Remove, clean, inspect, repack, and install wheel bearings and replace seals; install hub and adjust wheel bearings. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141, MA.B.241, MA.B.242	SE1: SS560-561, BR148-149 P-1

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7.03		Check parking brake cables and components for wear, rusting, binding, and corrosion; clean, lubricate, and replace as needed. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141, MA.B.241, MA.B.242	P-2 SE1: BR168, BR200-202
7.04		Check parking brake operation; adjust as needed. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141, MA.B.242	P-1 SE1: BR168, BR200-202
7.05		Check operation of parking brake indicator light system. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141, MA.B.242	P-3 SE1: BR193
7.06		Check operation of brake stop light system; determine necessary action. LA.A.142, LA.A.143, LA.A.244 MA.B.442, MA.E.141, MA.B.242	P-1 SE1: EL316-318
7.07		Replace wheel bearing and race. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141, MA.B.241, MA.B.242	P-1 SE1: SS560-561, BR148
7.08		Inspect and replace wheel studs. LA.A.142, LA.A.143, LA.A.244	P-1 SE1: SS560-561, BR148
7.09		Remove and reinstall sealed wheel bearing assembly. LA.A.142, LA.A.143, LA.A.244, MA.B.442	P-2 SE1: SS560-561, BR148
8.0		DEMONSTRATE PROFICIENCY IN ANTILOCK BRAKE SYSTEM --The student will be able to:	
8.01		Inspect, and test antilock brake system (ABS) components; determine necessary action. SC.H.346, LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141, MA.B.241, MA.B.242	P-2 SE1: BR217-220

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8.02		Diagnose poor stopping, wheel lock-up, abnormal pedal feel or pulsation, and noise concerns caused by the antilock brake system (ABS); determine necessary action. SC.H.346, LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141, MA.B.242	P-2 SE1: BR217-219
8.03		Diagnose antilock brake system (ABS) electronic control(s) and components using self-diagnosis and/or recommended test equipment; determine necessary action. SC.H.346, LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141, MA.B.242	P-1 SE1: BR217-220
8.04		Depressurize high pressure components of the antilock brake system (ABS) following manufacturer's recommended safety procedures. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141, MAB.241, MA.B.242	P-2 SE1: BR219
8.05		Bleed the antilock brake system's (ABS) front and rear hydraulic circuits following manufacturer's procedures. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141, MA.B.241, MA.B.242	P-2 SE1: BR219
8.06		Remove and install antilock brake system (ABS) electrical/electronic/ hydraulic components. LA.A.142, LA.A.143, LA.A.244, MAB442, MA.E.141, MA.B.241, MA.B.242	P-3 SE1: BR217-220

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