

**CORRELATION
FLORIDA DEPARTMENT OF EDUCATION
COURSE DESCRIPTION**

SUBJECT: Industrial Education
COURSE NAME: Automotive Service Technology 6
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
9.0		DEMONSTRATE PROFICIENCY IN GENERAL SUSPENSION AND STEERING SYSTEM DIAGNOSIS - -The student will be able to:	
9.01		Identify and interpret suspension and steering concern; determine necessary action. LA.A.142, LA.A.143, LA.A.244, MA.E.141	P-1 SE1: SS585
9.02		Research applicable vehicle and service information, such as suspension and steering system operation, vehicle service history, service precautions, and technical service bulletins. LA.A.142, LA.A.143, LA.A.244, MA.E.141	P-1 SE1: HB44, SS528, EP410-411
9.03		Locate and interpret vehicle and major component identification numbers (VIN, vehicle certification labels, calibration decals).	P-1 SE1: HB44, SS528, EP410-411
9.04		Disable and enable supplemental restraint system (SRS) LA.A.142, LA.A.143, LA.A.244, MA.E.141	P-1 SE1: SS532
9.05		Remove and replace steering wheel; center/time supplemental restraint system (SRS) coil (clock spring). LA.A.142, LA.A.143, LA.A.244, MA.E.141	P-1 SE1: SS532, SS546-547, EL343
9.06		Diagnose steering column noises, looseness, and binding concerns (including tilt mechanisms); determine necessary action LA.A.142, LA.A.143, LA.A.244, MA.E.141, MA.B.341	P-3 SE1: SS532-533
9.07		Diagnose power steering (non-rack and pinion) binding, uneven turning effort, looseness, hard steering, and fluid leakage concerns; determine necessary action. LA.A.142, LA.A.143, LA.A.244, MA.E.141, MA.B.341	P-3 SE1: SS542-544

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OUTCOME NUMBER	BENCHMARK NUMBER	INTENDED OUTCOME/BENCHMARK DESCRIPTION	PAGE(S) OR LOCATION(S) WHERE TAUGHT IN MAJOR TOOL
9.08		Diagnose power steering gear (rack and pinion) binding, uneven turning effort, looseness, hard steering and fluid leakage concerns; determine necessary action. LA.A.142, LA.A.143, LA.A.244, MA.E.141, MA.B.341	SE1: SS542-544 P-3
9.09		Inspect steering shaft universal-joint(s), flexible coupling (s), collapsible column, lock cylinder mechanism, and steering wheel; perform necessary action. LA.A.142, LA.A.143, LA.A.244	SE1: SS531-535 P-2
9.10		Adjust manual or power non-rack and pinion worm bearing preload and sector lash. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	SE1: SS542-544 P-3
9.11		Remove and replace manual or power rack and pinion steering gear; inspect mounting bushings and brackets. LA.A.142, LA.A.143, LA.A.244	SE1: SS533-535 P-2
9.12		Adjust manual or power rack and pinion steering gear. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	SE1: SS533-535 P-3
9.13		Inspect and replace manual or power rack and pinion steering gear inner tie rod ends (sockets) and bellows boots. LA.A.142, LA.A.143, LA.A.244	SE1: SS533-535 P-1
9.14		Inspect power steering fluid levels and condition. LA.A.142, LA.A.143, LA.A.244	SE1: SS540-541 P-1
9.15		Flush, fill, and bleed power steering system. LA.A.142, LA.A.143, LA.A.244, MA.E.141	SE1: SS540-541 P-2
9.16		Diagnose power steering fluid leakage; determine necessary action. LA.A.142, LA.A.143, LA.A.244	SE1: SS540-541 P-2
9.17		Remove and reinstall replace, and adjust power steering pump belt. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	SE1: SS539, BR189 P-1

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9.18		Remove and reinstall power steering pump. LA.A.142, LA.A.143, LA.A.244	P-3 SE1: SS539-540
9.19		Remove and reinstall power steering pump pulley; check pulley and belt alignment. LA.A.142, LA.A.143, LA.A.244	P-3 SE1: SS539-540
9.20		Inspect and replace power steering hoses and fittings. LA.A.142, LA.A.143, LA.A.244, MA.E.141	P-2 SE1: SS539-540
9.21		Inspect and replace pitman arm, relay (centerlink/intermediate) rod, idler arm and mountings, and steering linkage damper. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-3 SE1: SS551-552, SS556, SS558
9.22		Inspect, replace, and adjust tie rod ends (sockets), tie rod sleeves, and clamps. LA.A.142, LA.A.143, LA.A.244	SE1: SS551-552, SS556, SS558
9.23		Test and diagnose components of electronically controlled steering systems using a scan tool; determine necessary action. SC.H.346, LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-3 SE1: SS535, SS543
10.0		DEMONSTRATE PROFICIENCY IN SUSPENSION SYSTEMS DIAGNOSIS AND REPAIR; FRONT SUSPENSIONS --The student will be able to:	
10.01		Diagnose short and long arm suspension system noises, body sway, and uneven riding height concerns; determine necessary action. LA.A.142, LA.A.143, LA.A.244, MA.B.241, MA.B.442, MA.E.141	P-1 SE1: SS513-514, SS558, SS589-590

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10.02		Diagnose strut suspension system noises body sway, and uneven riding height concerns; determine necessary action. LA.A.142, LA.A.143, LA.A.244, MA.E.141, MA.B.241	P-1 SE1: SS564-568
10.03		Remove, inspect, and install upper and lower control arms, bushings, shafts, and rebound bumpers. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-2 SE1: SS556, SS558, SS564
10.04		Remove, inspect, install, and adjust strut rods (compression/tension) and bushings. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-2 SE1: SS565-568
10.05		Remove, inspect, and install upper and lower ball joints. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-2 SE1: SS558-560
10.06		Remove, inspect, and install steering knuckle assemblies. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-2 SE1: SS564
10.07		Remove, inspect, and install short and long arm suspension system coil springs and spring insulators. LA.A.142, LA.A.143, LA.A.244, MA.B.242, MA.B.442, MA.E.141	P-2 SE1: SS552-554
10.08		Remove, inspect, install, and adjust suspension system torsion bars; inspect mounts. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-3 SE1: SS556
10.09		Remove, inspect and install stabilizer bar bushings, bracket and links. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-3 SE1: SS556

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10.10		Remove, inspect, and replace strut cartridge or assembly, strut coil spring, (silencers) insulators, and upper strut bearing mount. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-1 SE1: SS564-568
10.11		Lubricate suspension and steering systems. LA.A.142, LA.A.143, LA.A.244	P-2 SE1: SS558
11.0		DEMONSTRATE PROFICIENCY IN SUSPENSION SYSTEMS DIAGNOSIS AND REPAIR; REAR SUSPENSIONS, WHEEL ALIGNMENT DIAGNOSIS, ADJUSTMENT, REPAIR AND MISCELLANEOUS SERVICE --The student will be able to:	
11.01		Remove, inspect, and install coil springs and spring insulators. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-2 SE1: SS572-573
11.02		Remove, inspect, and install transverse links, control arms, bushings, and mounts. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-2 SE1: SS556, SS558
11.03		Remove, inspect, and install leaf springs, leaf spring insulators (silencers), shackles, brackets, bushings, and mounts. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-3 SE1: SS570-571
11.04		Remove, inspect, and install strut cartridge or assembly, strut coil spring, and insulators (silencers). LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-2 SE1: SS572-573
11.05		Inspect, remove, and replace shock absorbers. LA.A.142, LA.A.143, LA.A.244	P-1 SE1: SS554-556
11.06		Remove, inspect, and service or replace front and rear wheel bearings. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-1 SE1: SS560-561

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11.07		Test and diagnose components of electronically controlled suspension systems using a scan tool; determine necessary action. SC.H.346, LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-3 SE1: SS562
11.08		Differentiate between steering and suspension concerns using principles of steering geometry (caster, camber, toe, etc). LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-1 SE1: SS585
11.09		Diagnose vehicle wander, drift, pull, hard steering, bump steer, memory steer, torque steer, and steering return concerns; determine necessary action. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-1 SE1: SS533, SS584-591
11.10		Perform pre-alignment inspection; perform necessary action. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-1 SE1: SS584-591
11.11		Measure vehicle riding height; determine necessary action. LA.A.142, LA.A.143, LA.A.244, MA.B.242, MA.B.442, MA.E.141	P-1 SE1: SS563, SS569, SS570, SS584
11.12		Check and adjust front and rear wheel camber; perform necessary action. SC.H.346, LA.A.142, LA.A.143, LA.A.244, MA.B.241, MA.B.242, MA.B.442, MA.E.141	P-1 SE1: SS577-583, SS584-591
11.13		Check and adjust caster; perform necessary action. SC.H.346, LA.A.142, LA.A.143, LA.A.244, MA.B.241, MA.B.242, MA.B.442, MA.E.141	P-1 SE1: SS584-591
11.14		Check and adjust front wheel toe; adjust as needed. 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: SS584-591

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11.15		Center steering wheel. SC.H.346, LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-1 SE1: SS584-591
11.16		Check toe-out-on-turns (turning radius); determine necessary action. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141, MA.B.241, MA.B.242	P-2 SE1: SS584-591
11.17		Check SAI (steering axis inclination) and included angle; determine necessary action. SC.H.346, LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-2 SE1: SS580
11.18		Check and adjust rear wheel toe. SC.H.346, LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA..141	P-2 SE1: SS584-591
11.19		Check rear wheel thrust angle; 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: SS583-587
11.20		Check for front wheel setback; determine necessary action. SC.H.346, LA.A.142, LA.A.143, LA.A.244, MA.B.442, MAE141, MA.B.241, MA.B.242	P-2 SE1: SS581
11.21		Check front cradle (sub-frame) alignment; 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-3 SE1: SS581, SS584-591
12.0		DEMONSTRATE PROFICIENCY IN WHEEL AND TIRE DIAGNOSIS AND REPAIR --The student will be able to:	
12.01		Diagnose tire wear patterns; determine necessary action. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-1 SE1: SS513-515
12.02		Inspect tires; check and adjust air pressure. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-1 SE1: SS513-515

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12.03		Diagnose wheel/tire vibration, shimmy, and noise; determine necessary action. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-2 SE1: SS513-515, SS584-585
12.04		Rotate tires according to manufacturer's recommendations. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-1 SE1: SS515
12.05		Measure wheel, tire, axle, and hub run out; determine necessary action. SC.H.346, LA.A.142, LA.A.143, LA.A.244, MA.B.442, MAE141, MAB241, MAB242	P-2 SE1: SS525-527
12.06		Diagnose tire pull (lead) problem; determine necessary action. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-2 SE1: SS513-515, SS584-585
12.07		Balance wheel and tire assembly (static and dynamic) SC.C.246, SC.H.346, LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-1 SE1: SS525, SS527
12.08		Dismount, inspect, repair, and remount tire on wheel. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-2 SE1: SS521-525
12.09		Reinstall wheel; torque lug nuts. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-1 SE1: SS522-525
12.10		Inspect and repair tire. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-2 SE1: SS513-515, SS523

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