

**CORRELATION
FLORIDA DEPARTMENT OF EDUCATION
COURSE DESCRIPTION**

SUBJECT: Industrial Education
COURSE NAME: Automotive Service Technology 5
SUBMISSION TITLE: Automotive Excellence Volume 2 © 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
41.0		DEMONSTRATE PROFICIENCY IN GENERAL DRIVE TRAIN DIAGNOSIS, CLUTCH DIAGNOSIS AND REPAIR --The student will be able to:	
41.01		Identify and interpret drive train concern; determine necessary action. LA.A.142, LA.A.143, LA.A.244	P-1 SE2: MD564-577, MD614-615, MD634-635
41.02		Research applicable vehicle and service information, such as drive train system operation, vehicle service history, service precautions, and technical service bulletins. LA.A.142, LA.A.143, LA.A.244	P-1 SE2: HB48, MD557-568, MD592-593, MD614-615, MD625-632
41.03		Locate and interpret vehicle and major component identification numbers (VIN, vehicle certification labels, calibration decals). LA.A.142, LA.A.143, LA.A.244	P-1 SE2: HB48
41.04		Diagnose fluid usage, level, and condition concerns; determine necessary action. LA.A.142, LA.A.143, LA.A.244	P-1 SE2: MD592-593, MD615
41.05		Drain and fill manual transmission/transaxle and final drive unit. LA.A.142, LA.A.143, LA.A.244	P-2 SE2: MD592, MD615
41.06		Diagnose clutch noise, binding, slippage, pulsation, and chatter; determine necessary action. LA.A.142, LA.A.143, LA.A.244 LA.A.142, LA.A.143, LA.A.244	P-1 SE2: MD569-572
41.07		Inspect, clutch pedal linkage, cables, automatic adjuster mechanisms, brackets, bushings, pivots, and springs; perform necessary action. LA.A.142, LA.A.143, LA.A.244	P-1 SE2: MD564-567
41.08		Inspect, hydraulic clutch slave and master-cylinders, lines and hoses; perform necessary action. LA.A.142, LA.A.143, LAA244	P-1 SE2: MD566-567

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41.09		Inspect, release (throw-out) bearing, lever, and pivot; perform necessary action. LA.A.142, LA.A.143, LA.A.244	P-1 SE2: MD563
41.10		Inspect and replace clutch pressure plate assembly and clutch disc. LA.A.142, LA.A.143, LA.A.244	P-1 SE2: MD574
41.11		Bleed clutch hydraulic system. LA.A.142, LA.A.143, LA.A.244	P-1 SE2: MD567
41.12		Inspect, remove or replace crankshaft pilot bearing or bushing (as applicable).	P-1 SE2: MD564
41.13		Inspect, flywheel and ring gear for wear and cracks, measure run out; determine necessary action. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-1 SE2: MD574-575
41.14		Inspect engine block, clutch (bell) housing, and transmission/trans-axle case mating surface; determine necessary action. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-3 SE2: MD576
41.15		Measure flywheel-to-block run out and crankshaft end play; determine necessary action. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-3 SE2: MD574-575
42.0		DEMONSTRATE PROFICIENCY IN TRANSMISSION & TRANSAXLE DIAGNOSIS AND REPAIR --The student will be able to:	
42.01		Remove and reinstall transmission/transaxle. LA.A.142, LA.A.143, LA.A.244	P-1 SE2: MD594, MD597, MD639-640, MD644-645
42.02		Disassemble, clean, and reassemble transmission/transaxle components. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-2 SE2: MD595-597, MD640-644

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42.03		Inspect transmission/transaxle case, extension housing, case mating surfaces, bores, bushings, and vents; perform necessary action. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-3 SE2: MD595-597, MD642-643
42.04		Diagnose noise, hard shifting, jumping out of gear, and fluid leakage problems; determine necessary action. LA.A.142, LA.A.143, LA.A.244	P-2 SE2: MD592-593, MD634-635
42.05		Inspect, adjust, and reinstall shift linkages, brackets, bushings, cables, pivots, and levers. LA.A.142, LA.A.143, LA.A.244	P-2 SE2: MD588-590, MD638-639
42.06		Inspect and reinstall powertrain mounts. LA.A.142, LA.A.143, LA.A.244	P-3 SE2: MD597, MD636
42.07		Inspect and replace gaskets, seals, and sealants; inspect sealing surfaces. LA.A.142, LA.A.143, LA.A.244	P-2 SE2: MD595
42.08		Remove and replace transaxle final drive. LA.A.142, LA.A.143, LA.A.244	P-3 SE2: MD639-640, MD644-645
42.09		Inspect, adjust, and reinstall shift cover, forks, levers, grommets, shafts, sleeves, detent mechanisms, interlocks, and springs. LA.A.142, LA.A.143, LA.A.244	P-2 SE2: MD595-596, MD642-643
42.10		Measure end play or preload (shim or spacer selection procedure) on transmission/transaxle shafts; perform necessary action. SC.H.346, LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-1 SE2: MD643-644
42.12		Inspect and reinstall synchronizer hub, sleeve, keys (inserts), springs, and blocking rings. LA.A.142, LA.A.143, LA.A.244	P-2 SE2: MD596, MD642-643

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42.13		Inspect and reinstall speedometer drive gear, driven gear, vehicle speed sensor (VSS), and retainers. LA.A.142, LA.A.143, LA.A.244	P-2 SE2: MD595
42.14		Diagnose transaxle final drive assembly noise and vibration concerns; determine necessary action. LA.A.142, LA.A.143, LA.A.244	P-3 SE2: MD634-635
42.15		Remove, inspect, measure, adjust, and reinstall transaxle final drive pinion gears (spiders), shaft, side gears, side bearings, thrust washers, and case assembly. SC.H.346, LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-2 SE2: MD642-645
42.16		Inspect lubrication devices (oil pump or slingers); perform necessary action. LA.A.142, LA.A.143, LA.A.244	P-3 SE2: MD677
42.17		Inspect, test, and replace transmission/transaxle sensors and switches. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-1 SE2: MD631-632
43.0		DEMONSTRATE PROFICIENCY IN DRIVE AND HALF SHAFT UNIVERSAL AND CONSTANT-VELOCITY (CV) JOINT DIAGNOSIS AND REPAIR --The student will be able to:	
43.01		Diagnose constant-velocity (CV) joint noise and vibration concerns; determine necessary action. LA.A.142, LA.A.143, LA.A.244	P-1 SE2: MD653
43.02		Diagnose universal joint noise and vibration concerns; perform necessary action. LA.A.142, LA.A.143, LA.A.244	P-1 SE2: MD604-605, MD614-615

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43.03		Replace front wheel drive (FWD) front wheel bearing. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-2 SE2: MD664-665
43.04		Inspect, service, and replace shafts, yokes, boots, and CV joints. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-1 SE2: MD660-662
43.05		Inspect, service, and replace shaft center support bearings. LA.A.142, LA.A.143, LA.A.244	P-3 SE2: MD601-604
43.06		Check shaft balance; measure shaft run out; measure and adjust driveline angles. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141, MA.B.142, MA.B.241	P-2 SE2: MD602-604
44.0		DEMONSTRATE PROFICIENCY IN REAR AXLE DIAGNOSIS AND REPAIR; RING AND PINION GEARS, DIFFERENTIAL CASE ASSEMBLY AND LIMITED SLIP DIFFERENTIAL --The student will be able to:	
44.01		Diagnose noise and vibration concerns; determine necessary action. SC.H.346, LA.A.142, LA.A.143, LA.A.244	P-2 SE2: MD604-605, MD614-615
44.02		Diagnose fluid leakage concerns; determine necessary action. LA.A.142, LA.A.143, LA.A.244	P-2 SE2: MD615
44.03		Inspect and replace companion flange and pinion seal; measure companion flange run out. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-2 SE2: MD619
44.04		Inspect ring gear and measure run out; determine necessary action. SC.H.346, LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-2 SE2: MD617-619

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44.05		Remove, inspect, and reinstall drive pinion and ring, gear, spacers, sleeves, and bearings. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-2 SE2: MD617-619
44.06		Measure and adjust drive pinion depth. SC.H.346, LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-2 SE2: MD618-619
44.07		Measure and adjust drive pinion bearing preload. SC.H.346, LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-1 SE2: MD617
44.08		Measure and adjust side bearing preload and ring and pinion gear total backlash and backlash variation on a differential carrier ssembly (threaded cup and shim types). SC.H.346, LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-2 SE2: MD617-618
44.09		Check ring and pinion tooth contact patterns; perform necessary action. SC.H.346, LA.A.142, LA.A.143, LA.A.244, MA.B.241	P-1 SE2: MD617-618
44.10		Disassemble, inspect, measure, and adjust or replace differential pinion gears (spiders), shaft, side gears, side bearings, thrust washers, and case. SC.H.346, LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141, MA.B.241	P-2 SE2: MD615-621
44.11		Reassemble and reinstall differential case assembly; measure run out; determine necessary action. SC.H.346, LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-2 SE2: MD615-621
44.12		Diagnose noise, slippage, and chatter concerns; determine necessary action. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-3 SE2: MD610-612

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44.13		Inspect and flush differential housing; refill with correct lubricant. LA.A.142, LA.A.143, LA.A.244, MA.E.141	P-2 SE2: MD615-619
44.14		Inspect and reinstall clutch (cone or plate) components. LA.A.142, LA.A.143, LA.A.244	P-3 SE2: MD610-612
44.15		Measure rotating torque; determine necessary action. SC.H.346, LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-3 SE2: MD612
45.0		DEMONSTRATE PROFICIENCY IN DRIVE AXLE SHAFT AND FOUR-WHEEL DRIVE/ALL-WHEEL DRIVE COMPONENT DIAGNOSIS AND REPAIR --The student will be able to:	
45.01		Diagnose drive axle shafts, bearings, and seals for noise, vibration, and fluid leakage concerns; determine necessary action. LA.A.142, LA.A.143, LA.A.244	P-2 SE2: MD619-621
45.02		Inspect and replace rear axle shaft wheel studs. LA.A.142, LA.A.143, LA.A.244, MA.B.442	P-3 SE2: MD619-620
45.03		Remove and replace drive axle shafts. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-1 SE2: MD620-621
45.04		Inspect and replace drive axle shaft seals, bearings, and retainers. LA.A.142, LA.A.143, LA.A.244	P-2 SE2: MD620-621
45.05		Measure drive axle flange run out and shaft end play; determine necessary action. SC.H.346, LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-2 SE2: MD619-620
45.06		Diagnose noise, vibration, and unusual steering concerns; determine necessary action. LA.A.142, LA.A.143, LA.A.244	P-3 SE2: MD679

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45.07		Inspect, adjust, and repair shifting controls (mechanical, electrical, and vacuum), bushings, mounts, levers, and brackets. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-3 SE2: MD677-678
45.08		Remove and reinstall transfer case. LA.A.142, LA.A.143, LA.A.244	P-3 SE2: MD679-680, MD685
45.09		Disassemble, service, and reassemble transfer case and components. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-3 SE2: MD680-685
45.10		Inspect, front-wheel bearings and locking hubs; perform necessary action. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-3 SE2: MD686-688
45.11		Check drive assembly seals and vents; check lube level. LA.A.142, LA.A.143, LA.A.244	P-3 SE2: MD679
45.12		Diagnose, test, adjust and replace electrical/electronic components of four-wheel drive systems. SC.H.346, LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-3 SE2: MD677-678

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