

**CORRELATION  
FLORIDA DEPARTMENT OF EDUCATION  
COURSE DESCRIPTION**

**SUBJECT:** Industrial Education  
**COURSE NAME:** Automotive Service Technology 10  
**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
36.0		DEMONSTRATE PROFICIENCY IN A/C SYSTEM DIAGNOSIS AND REPAIR --The student will be able to:	
36.01		Identify and interpret heating and air conditioning concern; 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 SE2: HA317-333, HA386-397
36.02		Research applicable vehicle and service information, such as heating and air conditioning system operation, vehicle service history, service precautions, and technical service bulletins. SC.H.346, LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141, MA.B.242	P-1 SE2: HB48, HA272-291
36.03		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 SE2: HB48
36.04		Performance test A/C system; diagnose A/C system malfunctions using principles of refrigeration. SC.H.346, LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141, MA.B.242	P-1 SE2: HA327-333
36.05		Diagnose unusual operating noises in the A/C system; determine necessary action. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141, MA.B.242	P-2 SE2: HA322-324
36.06		Identify refrigerant type; conduct a performance test of the A/C System; 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 SE2: HA325, HA327-333, HA339

SE2 = Student Edition Vol 2

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OUTCOME NUMBER	BENCHMARK NUMBER	INTENDED OUTCOME/BENCHMARK DESCRIPTION	PAGE(S) OR LOCATION(S) WHERE TAUGHT IN MAJOR TOOL
36.07		Leak test A/C system; 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-1 <b>SE2:</b> HA326-327
36.08		Inspect the condition of discharged oil; determine necessary action. LA.A.142, LA.A.143, LA.A.244, MA.B.442	P-2 <b>SE2:</b> HA317-322
36.09		Determine recommended oil for system application. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141, MA.B.241, MA.B.242	P-1 <b>SE2:</b> HA347
37.0		DEMONSTRATE PROFICIENCY IN REFRIGERATION SYSTEM COMPONENT DIAGNOSIS AND REPAIR OF COMPRESSOR, COMPRESSOR CLUTCH, EVAPORATOR, RECEIVER/DRIER, CONDENSER, ETC. --The student will be able to:	
37.01		Diagnose A/C system problems that cause the protection devices (pressure, thermal, and PCM) to interrupt system operation; 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 <b>SE2:</b> HA317-333
37.02		Inspect A/C compressor drive belts; replace and adjust as needed. LA.A.142, LA.A.143, LA.A.244	P-2 <b>SE2:</b> HA319-321
37.03		Inspect, test, and replace A/C compressor clutch components or assembly. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141, MA.B.241	P-2 <b>SE2:</b> HA321, HA368-370
37.04		Remove and replace A/C compressor and mountings; determine necessary action. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-1 <b>SE2:</b> HA368-370, HA372

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37.05		Determine need for A/C system filter; perform necessary action. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141, MA.B.242	P-3 SE2: HA327-330
37.06		Remove and inspect A/C system mufflers, hoses, lines, fittings, o-rings, seals, and service valves; perform necessary action. LA.A.142, LA.A.143, LA.A.244	P-2 SE2: HA322, HA355, HA359
37.07		Inspect A/C condenser for air flow restrictions; perform necessary action. LA.A.142, LA.A.143, LA.A.244	P-1 SE2: HA318-322, HA360-361
37.08		Remove and install receiver/drier or accumulator/drier. LA.A.142, LA.A.143, LA.A.244	P-1 SE2: HA365-366
37.09		Remove and install expansion valve or orifice (expansion) tube. LA.A.142, LA.A.143, LA.A.244	P-2 SE2: HA362-363
37.10		Inspect evaporator housing water drain; perform necessary action. LA.A.142, LA.A.143, LA.A.244	P-3 SE2: HA361-362
37.11		Remove and reinstall evaporator; measure oil quantity; determine necessary action. LA.A.142, LA.A.143, LA.A.244	P-3 SE2: HA361-362
37.12		Remove and reinstall condenser; measure oil quantity; determine necessary action. LA.A.142, LA.A.143, LA.A.244	P-3 SE2: HA360
38.0		DEMONSTRATE PROFICIENCY IN HEATING AND ENGINE COOLING SYSTEMS DIAGNOSIS AND REPAIR --The student will be able to:	
38.01		Diagnose temperature control problems in the heater/ventilation system; determine necessary action. LA.A.142, LA.A.143, LA.A.244	P-2 SE2: HA384-396

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38.02		Perform cooling system, cap, and recovery system tests (pressure, combustion leakage, and temperature); determine necessary action. SC.H.346, LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-1 SE2: HA301-302
38.03		Inspect engine cooling and heater system hoses and belts; perform necessary action. LA.A.142, LA.A.143, LA.A.244	P-1 SE2: HA305-307
38.04		Inspect, test, and replace thermostat and housing. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-1 SE2: HA308-309
38.05		Determine coolant condition; drain and recover coolant. SC.H.346, LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-1 SE2: HA295-297
38.06		Flush system; refill with recommended coolant; bleed system. LA.A.142, LA.A.143, LA.A.244, MA.B.241	P-1 SE2: HA303-304
38.07		Inspect, and test fan, fan clutch (electrical and mechanical), fan shroud, and air dams; perform necessary action. LA.A.142, LA.A.143, LA.A.244	P-1 SE2: HA311-313
38.08		Inspect and test electrical fan control system and circuits, determine necessary action. SC.H.346, LA.A.142, LA.A.143, LA.A.244	P-1 SE2: HA311-313
38.09		Inspect and test heater control valve(s); perform necessary action. LA.A.142, LA.A.143, LA.A.244	P-2 SE2: HA310
38.10		Remove and reinstall heater core. LA.A.142, LA.A.143, LA.A.244	P-3 SE2: HA310, HA361-362
39.0		DEMONSTRATE PROFICIENCY IN A/C OPERATING SYSTEMS AND RELATED CONTROLS DIAGNOSIS AND REPAIRS --The student will be able to:	

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39.01		Diagnose malfunctions in the electrical controls of heating, ventilation, and A/C (HVAC) systems; 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 SE2: HA384-391
39.02		Inspect and test A/C-heater blower, motors, resistors, switches, relays, wiring, and protection devices; perform 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 SE2: HA392-393
39.03		Test and diagnose A/C compressor clutch control systems; 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 SE2: HA321, HA367-373
39.04		Diagnose failures in the vacuum and mechanical components and controls of the heating, ventilation, and A/C (HVAC) system; determine necessary action. SC.H.346, LA.A.142, LA.A.143, LA.A.244	P-2 SE2: HA318-324, HA386-397
39.05		Inspect and test A/C-heater control panel assembly; determine necessary action. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141	P-3 SE2: HA318-324, HA386-397
39.06		Inspect and test A/C-heater control cables and linkages perform necessary action. LA.A.142, LA.A.143, LA.A.244	P-3 SE2: HA318-324, HA386-397
39.07		Inspect and test A/C-heater ducts, doors, hoses, and outlets; perform necessary action. LA.A.142, LA.A.143, LA.A.244	P-3 SE2: HA318-322, HA386-397

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39.08		Check operation of automatic and semi-automatic heating, ventilation, and air-conditioning (HVAC) control systems; determine necessary action. LA.A.142, LA.A.143, LA.A.244	SE2: HA384-391 P-3
40.0		DEMONSTRATE PROFICIENCY REFRIGERANT RECOVERY, RECYCLING, AND HANDLING --The student will be able to:	
40.01		Perform correct use and maintenance of refrigerant handling equipment. LA.A.142, LA.A.143, LA.A.244	SE2: HA337-351 P-1
40.02		Identify (by label application or use of a refrigerant identifier) and recover A/C system refrigerant. LA.A.142, LA.A.143, LA.A.244	SE2: HA337-342 P-1
40.03		Recycle refrigerant. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141, MA.B.242	SE2: HA342-343 P-1
40.04		Label and store refrigerant. LA.A.142, LA.A.143, LA.A.244	SE2: HA343 P-1
40.05		Test recycled refrigerant for non-condensable gases. LA.A.142, LA.A.143, LA.A.244	SE2: HA342 P-1
40.06		Evacuate and charge A/C system. LA.A.142, LA.A.143, LA.A.244, MA.B.442, MA.E.141, MA.B.242	SE2: HA345-348 P-1

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