ENGINE REPAIR ACS 11 Instructor's Name

Lab Tech.

Fall 2009

Competency Ratings 3 SATISFACTORY PERFORMANCE 2 PASSING (WITH DEFICIENCIES) 1 UNSATISFACTORY

BLANK – MATERIAL NOT COVERED in Class / Performed during internship

Column 1 represents the student competencies being assesed by th corresponding tasks	o Corresponding student Assesment	NAMES							
General Engine Diagnosis; Removal and Reinstallation (R&R)									
1. Identify and interpret engine concern; determine necessary action. P-1	B D								
 Research applicable vehicle and service information, such as internal engine operation, vehicle service history, service precautions, and technical service bulletins. P-1 	B F								
 Locate and interpret vehicle and major component identification numbers (VIN, vehicle certification labels, and calibration decals). P-1 	B F								

4. Inspect engine assembly for fuel, oil,	BCD								
coolant, and other leaks; determine									
necessary action. P-1									
5. Diagnose engine noises and vibrations;	C D								
determine necessary action. P-2									
6. Diagnose the cause of excessive oil	B D								
consumption, unusual engine exhaust color,									
odor, and sound; determine necessary									
action. P-2									
7. Perform engine vacuum tests; determine	BDE								
necessary action. P-1									
8. Perform cylinder power balance tests;	B D E								
determine necessary action. P-1									
9. Perform cylinder compression tests;	BDE								
determine necessary action. P-1									
10. Perform cylinder leakage tests; determine	BDE								
necessary action. P-1									
11. Remove and reinstall engine in a late model	B D F								
front-wheel drive vehicle (OBDI or newer);									
reconnect all attaching components and									
restore the vehicle to running									
condition. P-1									
12. Remove and reinstall engine in a late model	B C D F								
rear-wheel drive vehicle (OBDI or newer);									
reconnect all attaching components and									
restore the vehicle to running									
condition. P-3									
Cylinder Head and Valve Train								U U	
Diagnosis and Repair									
1. Remove cylinder head(s); visually inspect	B D E								

cylinder head(s) for cracks; check gasket								
surface areas for warpage and leakage;								
check passage condition. P-2								
2. Install cylinder heads and gaskets; tighten	BDEF							
according to manufacturer's specifications								
and procedures. P-1								
3. Inspect valve springs for squareness and free	BDEF							
height comparison; determine necessary								
action. P-2								
4. Replace valve stem seals on an assembled	BDE							
engine; inspect valve spring retainers, locks,								
and valve grooves; determine necessary								
action. P-2								
5. Inspect valve guides for wear; check valve	B F							
stem-to-guide clearance; determine								
necessary action. P-3								
6. Inspect valves and valve seats; determine	B F							
necessary action. P-3								
7. Check valve face-to-seat contact and valve	A C D E							
seat concentricity (runout); determine								
necessary action. P-3								
8. Check valve spring assembled height and	A C D E							
valve stem height; determine necessary								
action. P-3								
9. Inspect pushrods, rocker arms, rocker arm	B D F							
pivots and shafts for wear, bending, cracks,								
looseness, and blocked oil passages								

(orifices); determine necessary action. P-2									
10. Inspect hydraulic or mechanical lifters; determine necessary action. P-2	BDF								
 Adjust valves (mechanical or hydraulic lifters). P-1 	DE								
 Inspect camshaft drives (including gear wear and backlash, sprocket and chain wear); determine necessary action. P-2 	DEF								
 Inspect and replace timing belts (chains), overhead camdrive sprockets, and tensioners; check belt/chain tension; adjust as necessary. P-1 	DEF								
 Inspect camshaft for runout, journal wear and lobe wear. P-2 	DEF								
 Inspect camshaft bearing surface for wear, damage, out-of-round, and alignment; determine necessary action. P-3 	DEF								
16. Establish camshaft(s) timing and cam sensor indexing according to manufacturer's specifications and procedures. P-1	ADEF								
Engine Block Assembly Diagnosis and Repair									
1. Disassemble engine block; clean and prepare components for inspection and reassembly. P-2	A B D C								
2. Inspect engine block for visible cracks, passage condition, core and gallery plug condition, and surface warpage; determine necessary action. P-2	D								

3. Inspect internal and external threads; restore	D C								
as needed (includes installing thread									
inserts). P-2									
4. Inspect and measure cylinder walls for	DC								
damage, wear, and ridges; determine									
necessary action. P-2 5. Deglaze and clean cylinder walls. P-2	DC								
6. Inspect and measure camshaft bearings for	DCE								
	DCE								
wear, damage, out-of-round, and alignment;									
determine necessary action. P-3									
7. Inspect crankshaft for end play, straightness,	DCE								
journal damage, keyway damage, thrust									
flange and sealing surface condition, and									
visual surface cracks; check oil passage									
condition; measure journal wear; check									
crankshaft sensor reluctor ring (where									
applicable); determine necessary									
action. P-2	D.G.F.								
8. Inspect and measure main and connecting	DCE								
rod bearings for damage, clearance, and end									
play; determine necessary action (includes									
the proper selection of bearings). P-2									
9. Identify piston and bearing wear patterns	D E F								
that indicate connecting rod alignment and									
main bearing bore problems; inspect rod									
alignment and bearing bore condition. P-3									
10. Inspect and measure pistons; determine	DEF								
necessary action. P-2									
11. Remove and replace piston pin. P-3	С								

12. Inspect, measure, and install piston	C D							
rings. P-1								
13. Inspect auxiliary (balance, intermediate,	DEF							
idler, counterbalance or silencer) shaft(s);								
inspect shaft(s) and support bearings for								
damage and wear; determine necessary								
action; reinstall and time. P-2								
14. Inspect or replace crankshaft vibration	C D							
damper (harmonic balancer). P-3								
15. Assemble the engine using gaskets, seals,								
and formed-in-place (tube-applied) sealants,	C B D							
thread sealers, etc., according to								
manufacturer's specifications. P-2								
Lubrication and Cooling Systems								
Diagnosis and Repair								
1. Perform oil pressure tests; determine	DE							
necessary action. P-1								
2. Inspect oil pump gears or rotors, housing,	CD							
pressure relief devices, and pump drive;								
perform necessary action. P-2								
3. Perform cooling system, cap, and recovery	CDE							
system tests (pressure, combustion leakage,								
and temperature); determine necessary								
action. P-1								
4. Inspect, replace, and adjust drive belts,	C D							
tensioners, and pulleys; check pulley and								
belt alignment. P-1								
5. Inspect and replace engine cooling and	C D							
heater system hoses. P-1								
6. Inspect, test, and replace thermostat and	CDE							

housing. P-2								
7. Test coolant; drain and recover coolant; flush and refill cooling system with recommended coolant; bleed air as required. P-1	D F							
8. Inspect, test, remove, and replace water pump. P-1	CD							
9. Remove and replace radiator. P-2	C D							
 Inspect and test fan(s) (electrical or mechanical), fan clutch, fan shroud, and air dams. P-2 	CD							
 Inspect auxiliary oil coolers; determine necessary action. P-3 	C D							
 Inspect, test, and replace oil temperature and pressure switches and sensors. P-2 	CDE							
13. Perform oil and filter change. P-2	С							