

2017 NATEF Correlation Chart

MLR- Maintenance & Light Repair

AST- Auto Service Technology (Includes MLR)

MAST- Master Auto Service Technology (Includes MLR and AST)

	Task	Priority	MLR	AST	MAST	Text Page #	Task Page #
ENGINE REPAIR (A1)							
A. General: Engine Diagnosis; Removal and Reinstallation (R & R)							
1.	Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction.	P-1		✓	✓	78; 85– 89	15
2.	Research vehicle service information, including fluid type, vehicle service history, service precautions, and technical service bulletins.	P-1	✓	✓	✓	85– 89	17, 19, 20, 24, 25, 31, 42, 85, 86, 114, 124, 125, 132, 142, 149, 169
3.	Verify operation of the instrument panel engine warning indicators.	P-1	✓	✓	✓	193; 305– 306	45; 103

4.	Inspect engine assembly for fuel, oil, coolant, and other leaks; determine needed action.	P-1	✓	✓	✓	302–303	90, 91, 92, 93
5.	Install engine covers using gaskets, seals, and sealers as required.	P-1	✓	✓	✓	476–480	170, 206
6.	Verify engine mechanical timing.	P-2	✓	✓	✓	512–513	137, 172, 207, 208

	Task	Priority	MLR	AST	MAST	Text Page #	Task Page #
7.	Perform common fastener and thread repair, to include: remove broken bolt, restore internal and external threads, and repair internal threads with thread insert.	P-1	✓	✓	✓	27–30	4
8.	Inspect, remove and replace engine mounts.	P-2		✓	✓	331	106
9.	Identify service precautions related to service of internal combustion engine of a hybrid vehicle.	P-2	✓	✓	✓	179; 322–323	NA
10.	Remove and reinstall engine on a newer vehicle equipped with OBD; reconnect all attaching components and restore the vehicle to running condition.	P-3		✓	✓	330–332; 525–529	104, 105, 205

B. Cylinder Head and Valve Train Diagnosis and Repair

1.	Remove cylinder head; inspect gasket condition; install cylinder head and gasket; tighten according to manufacturer's specifications and procedures.	P-1		✓	✓	332–334; 497; 508–512	115, 171
2.	Clean and visually inspect a cylinder head for cracks; check gasket surface areas for warpage and surface finish; check passage condition.	P-1		✓	✓	358–362	116, 123, 182

(2)	Identify components of the cylinder head and valve train	P-1	✓ (MLR only)			399– 403	133, 134
3.	Inspect pushrods, rocker arms, rocker arm pivots and shafts for wear, bending, cracks, looseness, and blocked oil passages (orifices); determine needed action.	P-2		✓	✓	399– 403	133, 134
4.	Adjust valves (mechanical or hydraulic lifters).	P-3	✓	✓	✓	508– 509; 514– 515	136

	Task	Priority	MLR	AST	MAST	Text Page #	Task Page #
5.	Inspect and replace camshaft and drive belt/chain; includes checking drive gear wear and backlash, end play, sprocket and chain wear, overhead cam drive sprocket(s), drive belt(s), belt tension, tensioners, camshaft reluctor ring/tone-wheel, and valve timing components; verify correct camshaft timing.	P-1		✓	✓	396– 398; 411– 417; 512– 513	137, 172, 207, 208
6.	Establish camshaft position sensor indexing.	P-1		✓	✓	413	141
7.	Inspect valve springs for squareness and free height comparison; determine needed action.	P-3			✓	384	129
8.	Replace valve stem seals on an assembled engine; inspect valve spring retainers, locks/keepers, and valve lock/keeper grooves; determine needed action.	P-3			✓	384– 388	126
9.	Inspect valve guides for wear; check valve stem-to-guide clearance; determine needed action.	P-3			✓	362– 364	118
10.	Inspect valves and valve seats; determine needed action.	P-3			✓	378– 383	127, 128

11.	Check valve spring assembled height and valve stem height; determine needed action.	P-3			✓	384	129
12.	Inspect valve lifters; determine needed action.	P-2			✓	406– 409	135
13.	Inspect and/or measure camshaft for runout, journal wear and lobe wear.	P-3			✓	410	138, 139
14.	Inspect camshaft bearing surface for wear, damage, out-of-round, and alignment; determine needed action.	P-3			✓	410	140
C. Engine Block Assembly Diagnosis and Repair							
1.	Remove, inspect, and/or replace crankshaft vibration damper (harmonic balancer).	P-1		✓	✓	335	165, 188
2.	Disassemble engine block; clean and prepare components for inspection and reassembly.	P-1			✓	332– 336	108
3.	Inspect engine block for visible cracks, passage condition, core and gallery plug condition, and surface warpage; determine needed action.	P-2			✓	346– 347; 443– 444	150
4.	Inspect and measure cylinder walls/sleeves for damage, wear, and ridges; determine needed action.	P-2			✓	445	151
5.	Deglaze and clean cylinder walls.	P-2			✓	447– 448	152
6.	Inspect and measure camshaft bearings for wear, damage, out-of-round, and alignment; determine needed action.	P-3			✓	470– 471	153
7.	Inspect crankshaft for straightness, journal damage, keyway damage, thrust flange and sealing surface condition, and visual surface cracks; check oil passage condition;	P-1			✓	462– 463	161, 162, 183

	measure end play and journal wear; check crankshaft position sensor reluctor ring (where applicable); determine needed action.						
8.	Inspect main and connecting rod bearings for damage and wear; determine needed action	P-2			✓	468– 470	163, 173, 184
9.	Identify piston and bearing wear patterns that indicate connecting rod alignment and main bearing bore problems; determine needed action.	P-3			✓	432– 433	143, 164, 185
10.	Inspect and measure piston skirts and ring lands; determine needed action.	P-2			✓	421– 422	147
11.	Determine piston-to-bore clearance.	P-2			✓	434; 505– 507	154, 174, 186
12.	Inspect, measure, and install piston rings.	P-2			✓	433– 435	145, 146
13.	Inspect auxiliary shaft(s) (balance, intermediate, idler, counterbalance and/or silencer); inspect shaft(s) and support bearings for damage and wear; determine needed action; reinstall and time.	P-2			✓	461– 462	166, 187
14.	Assemble engine block.	P-1			✓	494– 508	189, 190
D. Lubrication and Cooling Systems Diagnosis and Repair							
1.	Perform cooling system pressure and dye tests to identify leaks; check coolant condition and level; inspect and test radiator, pressure cap, coolant recovery tank, heater core, gallery plugs; determine needed action.	P-1	✓	✓	✓	171– 172	32, 33
2.	Identify causes of engine overheating.	P-1		✓	✓	173	41
3.	Inspect, replace, and/or adjust drive belts, tensioners, and pulleys; check pulley and belt alignment.	P-1	✓	✓	✓	173– 174; 527	34

4.	Inspect and test coolant; drain and recover coolant; flush and refill cooling system; use proper fluid per manufacturer specifications; bleed air as required.	P-1	✓	✓	✓	174–175	37
5.	Inspect, remove, and replace water pumps.	P-2		✓	✓	168–169	38, 194
	Task	Priority	MLR	AST	MAST	Text Page #	Task Page #
6.	Remove and replace radiator.	P-2		✓	✓	164; 171	39, 195
7.	Remove, inspect, and replace thermostat and gasket/seal.	P-1	✓	✓	✓	162–163	36, 193
8.	Inspect and test fan(s), fan clutch (electrical or mechanical), fan shroud, and air dams; determine needed action	P-1		✓	✓	170	40, 196
9.	Perform oil pressure tests; determine needed action.	P-1		✓	✓	305–306	103
10.	Perform engine oil and filter change; use proper fluid type per manufacturer specifications; reset maintenance reminder as required	P-1	✓	✓	✓	186–190	209
(6)	Identify components of the lubrication and cooling systems.	P-1	✓ (MLR only)			159-201	103; 209
11.	Inspect auxiliary coolers; determine needed action.	P-3		✓	✓	200–201	44
12.	Inspect, test, and replace oil temperature and pressure switches and sensors.	P-2		✓	✓	193	45
13.	Inspect oil pump gears or rotors, housing, pressure relief devices, and pump drive; perform needed action.	P-2			✓	193–197	43, 191