

NATEF TASK LIST

ENGINE REPAIR

For every task in Engine Repair, the following safety requirement must be strictly enforced:

Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

I. ENGINE REPAIR

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
2. Identify and interpret engine concern; determine necessary action. P-1
3. Research applicable vehicle and service information, such as internal engine operation, vehicle service history, service precautions, and technical service bulletins. P-1
4. Locate and interpret vehicle and major component identification numbers. P-1
5. Inspect engine assembly for fuel, oil, coolant, and other leaks; determine necessary action. P-1
6. Diagnose engine noises and vibrations; determine necessary action. P-2
7. Diagnose the cause of excessive oil consumption, coolant consumption, unusual engine exhaust color and odor; determine necessary action. P-2
8. Perform engine vacuum tests; determine necessary action. P-1
9. Perform cylinder power balance tests; determine necessary action. P-2
10. Perform cylinder cranking and running compression tests; determine necessary action. P-1
11. Perform cylinder leakage tests; determine necessary action. P-1

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| 12. | Remove and reinstall engine in an OBDII or newer vehicle; reconnect all attaching components and restore the vehicle to running condition. | P-2 |
| 13. | Install engine covers using gaskets, seals and sealers as required. | P-1 |
| 14. | 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 |
| 15. | Inspect, remove and replace engine mounts. | P-2 |

I. ENGINE REPAIR

B. Cylinder Head and Valve Train Diagnosis and Repair

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| 1. | Remove cylinder head; inspect gasket condition; install cylinder head and gasket; tighten according to manufacturer's specifications and procedures. | P-1 |
| 2. | Clean and visually inspect a cylinder head for cracks; check gasket surface areas for warpage and surface finish; check passage condition. | P-1 |
| 3. | Inspect valve springs for squareness and free height comparison; determine necessary action. | P-3 |
| 4. | Replace valve stem seals on an assembled engine; inspect valve spring retainers, locks/keepers, and valve lock/keeper grooves; determine necessary action. | P-3 |
| 5. | Inspect valve guides for wear; check valve stem-to-guide clearance; determine necessary action. | P-3 |
| 6. | Inspect valves and valve seats; determine necessary action. | P-3 |
| 7. | Check valve spring assembled height and valve stem height; determine necessary action. | P-3 |
| 8. | Inspect pushrods, rocker arms, rocker arm pivots and shafts for wear, bending, cracks, looseness, and blocked oil passages (orifices); determine necessary action. | P-2 |
| 9. | Inspect valve lifters; determine necessary action. | P-2 |
| 10. | Adjust valves (mechanical or hydraulic lifters). | P-1 |

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| 11. | 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 variable valve timing components). | P-1 |
| 12. | Inspect and/or measure camshaft for runout, journal wear and lobe wear. | P-2 |
| 13. | Inspect camshaft bearing surface for wear, damage, out-of-round, and alignment; determine necessary action. | P-2 |
| 14. | Establish camshaft position sensor indexing. | P-1 |

I. ENGINE REPAIR

C. Engine Block Assembly Diagnosis and Repair

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| 1. | Disassemble engine block; clean and prepare components for inspection and reassembly. | P-1 |
| 2. | Inspect engine block for visible cracks, passage condition, core and gallery plug condition, and surface warpage; determine necessary action. | P-2 |
| 3. | Inspect and measure cylinder walls/sleeves for damage, wear, and ridges; determine necessary action. | P-2 |
| 4. | Deglaze and clean cylinder walls. | P-2 |
| 5. | Inspect and measure camshaft bearings for wear, damage, out-of-round, and alignment; determine necessary action. | P-3 |
| 6. | Inspect crankshaft for straightness, journal damage, keyway damage, thrust flange and sealing surface condition, and visual surface cracks; check oil passage condition; measure end play and journal wear; check crankshaft position sensor reluctor ring (where applicable); determine necessary action. | P-1 |
| 7. | Inspect main and connecting rod bearings for damage and wear; determine necessary action. | P-2 |
| 8. | Identify piston and bearing wear patterns that indicate connecting rod alignment and main bearing bore problems; determine necessary action. | P-3 |
| 9. | Inspect and measure piston skirts and ring lands; determine necessary action. | P-2 |
| 10. | Remove and replace piston pin. | P-3 |

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| 11. | Determine piston-to-bore clearance. | P-2 |
| 12. | Inspect, measure, and install piston rings. | P-2 |
| 13. | Inspect auxiliary shaft(s) (balance, intermediate, idler, counterbalance or silencer); inspect shaft(s) and support bearings for damage and wear; determine necessary action; reinstall and time. | P-2 |
| 14. | Remove, inspect or replace crankshaft vibration damper (harmonic balancer). | P-2 |
| 15. | Assemble engine block. | P-1 |

I. ENGINE REPAIR

D. Lubrication and Cooling Systems Diagnosis and Repair

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| 1. | Perform oil pressure tests; determine necessary action. | P-1 |
| 2. | Inspect oil pump gears or rotors, housing, pressure relief devices, and pump drive; perform necessary action. | P-2 |
| 3. | Perform cooling system pressure tests; check coolant condition; inspect and test radiator, pressure cap, coolant recovery tank, and hoses; determine necessary action. | P-1 |
| 4. | Inspect, replace, and adjust drive belts, tensioners, and pulleys; check pulley and belt alignment. | P-1 |
| 5. | Inspect and replace engine cooling and heater system hoses. | P-1 |
| 6. | Inspect, test, and replace thermostat and gasket/seal. | P-1 |
| 7. | Test coolant; drain and recover coolant; flush and refill cooling system with recommended coolant; bleed air as required. | P-1 |
| 8. | Inspect, remove and replace water pump. | P-2 |
| 9. | Remove and replace radiator. | P-2 |
| 10. | Inspect, and test fans(s) (electrical or mechanical), fan clutch, fan shroud, and air dams. | P-1 |
| 11. | Inspect auxiliary coolers; determine necessary action. | P-3 |

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| 12. | Inspect, test, and replace oil temperature and pressure switches and sensors. | P-2 |
| 13. | Perform oil and filter change. | P-1 |
| 14. | Identify causes of engine overheating. | P-1 |

AUTOMATIC TRANSMISSION AND TRANSAXLE

For every task in Automatic Transmission and Transaxle, the following safety requirement must be strictly enforced:

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II. AUTOMATIC TRANSMISSION AND TRANSAXLE

A. General Transmission and Transaxle Diagnosis

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| 1. | Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction. | P-1 |
| 2. | Identify and interpret transmission/transaxle concern; differentiate between engine performance and transmission/transaxle concerns; determine necessary action. | P-1 |
| 3. | Research applicable vehicle and service information, such as transmission/transaxle system operation, fluid type, vehicle service history, service precautions, and technical service bulletins. | P-1 |
| 4. | Locate and interpret vehicle and major component identification numbers. | P-1 |
| 5. | Diagnose fluid loss and condition concerns; check fluid level in transmissions with and without dip-stick; determine necessary action. | P-1 |
| 6. | Perform pressure tests (including transmissions/transaxles equipped with electronic pressure control); determine necessary action. | P-1 |
| 7. | Perform stall test; determine necessary action. | P-3 |
| 8. | Perform lock-up converter system tests; determine necessary action. | P-3 |