

A1 - ENGINE Repair

A. General Engine Diagnosis

1. Inspect engine assembly for fuel, oil, coolant, and other leaks; determine necessary action.

B. Cylinder Head and Valve Train Diagnosis and Repair

1. Remove cylinder heads, disassemble, clean, and prepare for inspection.
5. Inspect valve spring retainers, rotators, locks/keepers, and lock grooves.
8. Inspect valves and valve seats; determine needed repairs.
10. Inspect pushrods, rocker arms, rocker arm pivots, and shafts
13. Inspect camshaft(s) (includes checking drive gear wear and backlash,
16. Inspect valve timing; time camshaft(s) to crankshaft.
17. Inspect cylinder head mating surface condition and finish

C. Engine Block Diagnosis and Repair

1. Remove and disassemble engine block
5. Inspect crankshaft
8. Inspect camshaft bearings
11. Inspect connecting rods and bearings
15. Inspect and replace pans and covers.

D. Lubrication and Cooling Systems Diagnosis and Repair (8 questions)

7. Inspect, replace, and adjust drive belt(s), tensioners), and pulleys.
9. Inspect, test, and replace thermostat,

E. Fuel, Electrical, Ignition, and Exhaust Systems Inspection and Service

6. Inspect and test ignition system components

A2 Automatic Transmission / Transaxle

C. Off-Vehicle Transmission/Transaxle Repair

2. Disassembly and Assembly (5 questions)
5. Inspect shaft
7. Inspect bushings
8. Inspect and measure components of the planetary gear assembly; replace as necessary.
9. Inspect case bores, passages, bushings, vents, mating surfaces
10. Inspect valve body mating surfaces, bores, valves, solenoids, springs, sleeves, retainers, brackets, check balls, screens, spacer plates, and gaskets
11. Inspect transaxle drive chains, sprockets, gears, bearings, and bushings

3. Friction and Reaction Units (4 questions)

1. Inspect components of the hydraulic clutch
4. Inspect components of one-way clutch assemblies

A4 - SUSPENSION AND STEERING

A. Steering Systems Diagnosis and Repair

2. Inspect and replace steering.
3. Inspect and replace steering gear (non-rack and pinion type) seals and gaskets.

B. Suspension Systems Diagnosis and Repair

Front Suspensions

2. Inspect and replace upper and lower control arms, bushings, and shafts.
3. Inspect and replace rebound and jounce bumpers.
4. Inspect, adjust, and replace track bar, strut rods/radius arms, and related mounts/bushings.
5. Inspect and replace upper and lower ball joints (with or without wear indicators).
6. Inspect non-independent front axle assembly for damage and misalignment.
11. Inspect and replace front stabilizer bar (sway bar) bushings, brackets, and links.
12. Inspect and replace front strut cartridge or assembly.
13. Inspect and replace front strut bearing(s) and mount(s).
14. Inspect and replace shock absorbers, mounts, and bushings.

C. Wheel Alignment Diagnosis, Adjustment, and Repair

1. Diagnose vehicle wander, drift, pull, hard steering, bump steer (toe curve), memory steer, torque steer, and steering return concerns;
determine needed repairs
17. Diagnose damaged component mounting locations which can cause vibration, steering, and wheel alignment problems

D. Wheel and Tire Diagnosis and Service

1. Diagnose tire wear patterns; determine needed repairs.
2. Inspect tire condition, size, and application (load and speed ratings).

A5 - Brakes

B. Drum Brake Diagnosis and Repair

3. Remove, clean, inspect, and measure brake drums
5. Using proper safety procedures, remove, clean, and inspect mechanical brake components

C. Disc Brake Diagnosis and Repair

3. Retract brake caliper piston(s)
4. Remove caliper assembly from mountings
9. Remove and replace rotor.
11. Install pads, calipers, and related attaching hardware

A7 Heating and Air Conditioning

1. Identify system type and conduct performance test
7. Inspect A/C System components for contamination.

- 8. Inspect and replace passenger compartment
- 11. Inspect and disarm airbag
- 19. Identify the procedures and equipment necessary to service, diagnose and repair A/C systems
- 23. Inspect and replace engine coolant hoses and pipes

B. Refrigeration System

Compressor and Clutch

- 3. Inspect, adjust, and replace A/C compressor drive belts, pulleys, and tensioners
- 4. Inspect, test, service and replace A/C compressor components or assembly
- 5. Identify required lubricant type

Evaporator, Condenser and Related Components

- 7. Inspect repair and replace A/C system mufflers, hoses, lines, filters, fittings, and seals
- 8. Inspect A/C condenser for proper air flow

Vacuum/Mechanical

- 9. Diagnose the cause of failures or HVAC
- 10. Inspect, test, service or replace the HVAC control panel
- 13. Inspect, test, adjust, repair or replace HVAC ducts, doors, and outlets (dual/ multi-zone systems)

Virtual Automotive Mechanic - Comprehensive Task List

	# of Disassembly steps	# of Assembly steps
Drum Brakes	17	14
Air Distribution	35	31
Suspension System	56	39
AC Compressor	17	22
Engine System	69	76
Sub Parts		
Front Cover Assembly	18	20
<i>Front Head, Water Pump, Oil Pressure Valve</i>		
Engine System	26	41
<i>Valves, Camshaft</i>		
Cylinder Block Assembly	37	61
<i>Pistons, Crankshaft, Connecting Rods, Flywheel</i>		
Intake Manifold Assembly	9	7
<i>Throttle Valve, Fuel Injector</i>		
Transmission System	19	18
Sub Parts		
Transmission Gear Assembly	13	11
Torque Converter & Oil Pump Housing Assembly	30	36
Transmission Control Unit	29	33
Low Reverse Clutch Assembly		
<i>2-6 Low 1, 2, 3, 4 clutch</i>	17	22
<i>3-5 reverse 4, 5, 6 Clutch</i>	20	24