Inspection and Diagnosis

In order to verify complaints and determine malfunctions a Heavy Duty Mechanic:

1. Reads operators written trouble reports, memos, and verbal reports of vehicle mechanical and electrical problems in order to verify complaint and determine cause of malfunction.

2. Inspects light and heavy construction, road maintenance, fire fighting, and other specialized equipment using visual and operational tests.

3. Identifies cause of engine noise using stethoscopes and scan tools.

4. Tests wiring, ignition circuits, and electrical AC/DC components such as battery, electrical control modules, coils, starters, alternators and distributors using volt ohmmeter, tachometers, battery and starter testers, and test light.

5. Diagnoses mechanical, hydraulic and air brake systems including shoes, springs, rotors, drums, valves, wheel and master cylinders, linkage, compressors, air dryers, governors, hydraulic and air lines using micrometers, dial indicators, pressure, vacuum, feeler gauges, and basic hand tools.

6. Diagnoses gasoline fuel system including pumps, filters, lines, fittings, fuel injection system, and computer controlled carburetors, using pressure and vacuum gauges, volume container, exhaust gas analyzer and road tests.

7. Diagnoses diesel fuels system including diesel injectors and pumps, filters, pick up and return lines by using opacity meter and pressure/flow gauges.

8. Diagnoses clutch assemblies; transmissions, drive shafts, drive chains, and final drive assemblies using pressure gauges, dial indicators and other specialty tools.
9. Inspects and diagnoses exhaust and emission control components for leaks, damage, restricted flow, contamination, excessive heat, and exhaust back pressure using manometer, pyrometer, opacity meter, vacuum gauge and exhaust gas analyzer.

10. Diagnoses air conditioning components and controls using thermometer, leak detector, and air conditioning service gauges.

11. Inspects cooling system and components using thermometer, system pressure tester, and chemical and block tester.

12. Inspects tires and suspension components for wear or damage using tread depth gauge and visual inspection.

13. Inspects pins, bushings, sprockets, idlers, rollers, links or undercarriage and frame on track-type equipment using wear gauges and basic hand tools.

14. Visually inspects undercarriages for damage to frame, hoses, lines, front/rear suspensions, shocks, springs and body parts.

15. Inspects and diagnoses hydraulic systems, pumps, controls, cylinders, valves, hoses, reservoirs and filters using flowmeters and pressure gauges.

16. Tests batteries and charging system components using hydrometer, volt ohmmeter and battery starter tester.

17. Visually inspects interiors and exteriors of vehicles including dash, instruments, seats and seat belts, glass, mirrors, decals, paint and body surfaces, windshield wipers and safety warning devices such as back-up alarm.

18. Tests for faulty emergency equipment such as red and amber lights, spotlights, sirens, power converters and other specialized equipment by using test light, and ohm and voltmeters.

19. Examines work history files to determine ongoing or repeat issues with vehicles or equipment in order to determine appropriate repairs.

20. Inspects and diagnoses water pumping equipment components such as pump relief valves, flow control valves, and plumbing valves.

21. Diagnoses and inspects AC generator components including power system, governor control, and voltage output using visual inspection, volt ohmmeter or load simulation device.
22. Diagnoses and inspects gas, electric, and diesel powered air compression equipment for overall output using pressure and flow gauges.

**Maintenance and Repair**

23. Tunes engine, replacing or repairing defective gasoline and diesel fuel system components, injection and transfer pumps, fuel filters, lines and tanks, and carburetors and ignition system components using timing light, tachometer, vacuum and injector gauges, infrared analyzer, diagnostic scan tool and basic hand tools.

24. Replaces and maintains lubricants, fluid levels, coolants, and fuel products using hydrometer, hand and pneumatic lube guns and pumps, and basic hand tools.

25. Repairs manual and power steering systems and components using pressure and flow gauges and basic hand and power tools.

26. Repairs faulty electrical circuits using volt ohmmeter, test light, soldering gun and basic hand tools.

27. Adjusts, repairs and overhauls components of piston, rotary, and screw-type stationary and portable air compressors using power tools, orifice gauges and basic hand tools.

28. Replaces water and fuel pumps using basic hand and power tools.

29. Fabricates and installs special equipment and parts on the vehicle and equipment using basic hand and power shop tools such as metric and standard tools, bench grinder, drill press, welding and soldering equipment and pneumatic tools.

30. Repairs, replaces or adjusts all mechanical, hydraulic and air brake system components including shoes/pads, springs, rotors, drums, valves, wheel and master cylinders, linkage, compressors, governors, hydraulic and air lines using micrometers, dial indicators, brake adjusting tools, pressure brake bleeder, vacuum and feeler gauges, drum lathe and basic hand tools.

31. Repairs or replaces standard and/or automatic transmissions, clutch assemblies, drive shafts, drive chains, final drive assemblies using transmission jacks, hoist or crane, and basic hand and power tools.

32. Repairs or replaces charging and starting system components using volt ohmmeter, load tester, battery starter tester and basic hand tools.
33. Replaces exhaust and emission control devices and components using basic hand tools, power saws and cutters, torches and welders.

34. Repairs discharge valve, transfer valve and relief valve components using hand and plumbing tools.

35. Services, repairs, replaces and recharges air conditioning and air filtration system components using vacuum pump and air conditioning station and basic hand tools.

36. Services, repairs, and replaces cooling and heating system controls and components using welding and soldering equipment, pressure leak detectors, and basic hand tools.

37. Repairs and/or replaces manual or power steering components using basic hand tools, pneumatic tools, pullers, and pressure gauges.

38. Repairs and/or replaces faulty emergency equipment such as red and amber lights, spotlights, sirens, power converters and other specialized equipment using soldering gun and basic hand tools.

39. Repairs and/or replaces interiors and exteriors of vehicles including roll cages, safety warning devices, dash, instruments, switches, seats, belts, glass and mirrors, door fixtures, headliner, panels, decals and mats using basic hand and power tools.

40. Repairs, replaces or fabricates piping systems, components and tanks on sweepers, flushers, and other equipment to eliminate leaks or blockage using taps and dies, welding and soldering equipment and basic hand tools.

41. Repairs and/or replaces frames, axles, body or cab components, cages, latches, or window regulators using hand tools, hydraulic presses, saws, grinders, air and electric drills and acetylene torches.

42. Rebuilds transmissions, clutch assemblies, differentials and other power train components using specialized tools such as clamps, spreaders, pinion jigs, hydraulic press, dial indicator and basic hand and power tools.

43. Replaces generators, starters, alternators, distributors, magnetos and carburetors using basic hand and power tools.
44. Overhauls and repairs hydraulic systems on cranes, aerial platforms, construction equipment and motor sweepers and components including pumps, valves, cylinders, and motors using high pressure gauges, heavy lifting equipment, specialty tools, cylinder hone, micrometers, and basic hand and power tools.

45. Cleans and washes parts and equipment using hot water, chemical and solvent cleaning apparatus.

**Safety**

46. Tests equipment after inspection, repair, and/or servicing to ensure safe and correct operating condition.

47. Practices shop and field safety precautions by maintaining tools and equipment in a safe condition, and observing good housekeeping practices, and wearing personal protective equipment to ensure conformance with safety regulations.

**Equipment Operation**

48. Drives service vehicles to job sites before making repairs and/or replacements on vehicles and equipment in the field.

**Administrative Duties**

49. Trains new personnel by demonstrating proper practices and procedures of using tools and equipment to complete automotive and construction equipment repair work.

50. Order verbally or in writing parts from outside vendors, manufacturers and contract sources to expedite repair on equipment.

51. Contacts user departments by phone to schedule preventative maintenance or needed repair work on equipment.

52. Operates radio equipment for the purpose of transmitting or receiving information regarding emergency repairs in the field.

53. Writes repair or work orders by examining vehicle and equipment work history, results of diagnostic and other equipment tests and actual condition of vehicle and/or equipment to determine type and extent of repairs necessary.
54. Creates a written vehicle document and equipment work history file, by reviewing for accuracy and completeness, entries on maintenance record forms for the purpose of maintaining a permanent record of vehicle and equipment repairs.

55. Coordinates repair and maintenance work using established maintenance programs and available shop facilities to ensure maximum availability of vehicle and equipment.