

**COMPETENCY MODEL FOR
HEAVY DUTY EQUIPMENT MECHANIC
CLASS CODE 3743**

The following competencies have been identified as those that best separate superior from satisfactory job performance in the class of **HEAVY DUTY EQUIPMENT MECHANIC**. (Numbers refers to the order of competencies in the Competency Bank.)

1. Reading Comprehension
4. Analytical Ability
8. Safety Focus
20. Job Knowledge
21. Technology Application
23. Equipment Operation
35. Teamwork
45. Oral Communication

On the following pages are descriptions of each competency, including a definition, the level of the competency required for the class (*italicized, bolded, and underlined*), examples of behavioral indicators, and satisfactory and superior performance levels.

1. READING COMPREHENSION – Comprehends and correctly applies information presented in written form. Makes correct inferences; draws accurate conclusions.

Level of Competency Required by Job:

- Level 1: Concrete, specific job-related information (work orders; instructions; material/equipment labels)
- Level 2: **General information related to field of work and assignments; (articles in trade publications; technical/instructional manuals; memos; letters; e-mails; reports)**
- Level 3: Abstract/complex information (highly technical articles/ reports in specialized area; legal or other regulatory material)

Examples of Behavioral Indicators:

- Follows written instructions correctly.
- Learns information presented in writing.
- Identifies relevant written information.
- Interprets written legal regulatory material accurately.

Performance Levels:

Satisfactory

Reads instructions correctly. Learns from manual and other printed material.

Superior

Learns from manual and may answer others' questions. Explains information presented in written form to others.

4. ANALYTICAL ABILITY – Identifies, obtains, and evaluates relevant information to establish relationships or patterns, cite causes, and reach logical conclusions.

Level of Competency Required by Job:

- Level 1: Recognize similarities/differences in current situation to those previously encountered and is guided accordingly. Apply existing policies correctly. Ask pertinent questions or otherwise seek additional information to formulate appropriate response.
- Level 2: Consider multiple, varied factors when evaluating a situation or issue. Seek additional information to provide further insight. Reach conclusions that logically follow from the information obtained.
- Level 3: **Consider a multitude of diverse factors, their interrelationships, the perspectives of others, alternative courses of action and their likely ramifications when evaluating information to reach a conclusion.**

Examples of Behavioral Indicators:

- Obtains the necessary amount of relevant information.
- Recognizes the impact of each type of information on conclusions.
- Evaluates the quality/source of information when considering it.
- States the shortcomings of the information and, therefore, the analysis.

Performance Levels:

Satisfactory

Recognizes available relevant information, seeks additional information to consider, and reaches a conclusion. Provides sound, convincing justification for conclusions, citing relevant data and facts.

Superior

Uses a great deal of existing and obtained information and data to develop and evaluate alternatives and arrive at a final conclusion. Provides compelling arguments in support of conclusions.

8. SAFETY FOCUS – Performs work in a way that minimizes risk of injury to self or others.

Level of Competency Required by Job:

- Level 1: Maintain awareness of unsafe conditions and actions to avoid injury.
- Level 2: Follow safety rules/procedures; avoid known hazards in the work environment.
- Level 3: **Carefully follow safety rules and procedures and consistently use all necessary safety equipment.**

Examples of Behavioral Indicators:

- Wears seat belt.
- Ensures safe physical work environment by taking actions such as eliminating unstable stacks of materials, closing drawers so filing cabinets will not tip over, and keeping pathways clear of tripping hazards.
- Reviews safety procedures before beginning each job with known hazards.
- Follows safety procedures while performing work even when it takes more time.
- Uses safety equipment such as goggles, gloves, and earplugs as required or warranted.
- Frequently checks safety equipment for proper condition and operation.

Performance Levels:

Satisfactory

Maintains awareness of personal safety to avoid injury or property damage during all work activities.

Superior

“Safety first.” Places avoidance of injury or property damage above all other job requirements. Mentions the need to follow safe work practices to co-workers. Actively seeks ways to avoid injury.

20. JOB KNOWLEDGE – Knows information required to perform a specific job. Includes both widely available courses of study (for example, chemistry, human resources management, graphic arts) and City-specific information (parking regulation and ticketing practices; purchasing procedures; provisions of the City Charter).

Level of Competency Required by Job:

Level 1: Knowledge is concrete, factual, and/or procedural and may be defined by the organization. Situations in which it is applied are quite consistent.

Level 2: Knowledge is substantive and may be defined by an external trade, field, or profession. Situations in which it is applied vary and, as such, require breadth and depth of understanding.

Level 3: Knowledge is abstract, conceptual, and/or complex and may be supported by a well-defined academic discipline or authoritative sources (e.g., laws, ordinances, government guidelines/regulations/codes). Situations in which it is applied may vary greatly or be novel.

Examples of Behavioral Indicators:

- Performs work correctly/avoids technical (job content related) errors.
- Answers technical questions about work accurately.
- Asks few technical questions about the performance of routine work activities.
- Offers advice (“coaching”) to new employees regarding their work.
- Develops training programs for other employees.
- Sought out as a source of information by others.

Performance Levels:

Satisfactory

Sufficient job knowledge to perform work correctly independently. Answers technical questions about work correctly.

Superior

Expertise in technical job information sufficient to serve as a resource to others. May develop training manuals/ programs and/or give internal and/or external presentations related to work.

Job Knowledge Areas

1. Knowledge of the basic mechanical principles of the internal combustion engine, such as spark and compression ignition types in order to diagnose and repair a core component of the equipment.
2. Knowledge of the principles and operational characteristics of hydraulic, air, and mechanical brake systems and their components, such as brake pads, master cylinders, quick release valves, and slack adjustors in order to diagnose and repair a core component of the equipment.
3. Knowledge of the principles and operational characteristics of gasoline, diesel, and alternative fuel systems and their components, such as electronic control modules (ECM), sensors, fueling nozzles, and injectors in order to diagnose and repair a core component of the equipment.
4. Knowledge of the principles and operational characteristics of drive shafts, final drive assemblies, clutch assemblies and their components, such as universal joints, differential components, mechanical adjustments, clutch brakes, pressure plates, and friction discs in order to diagnose and repair a core component of the equipment.
5. Knowledge of the principles and operational characteristics of various types of manual transmissions, auxiliary transmissions, automatic transmissions, and power-take off (PTO)-driven auxiliary equipment and their components, such as valve bodies, clutch packs, bands, and electronic controls in order to diagnose and repair a core component of the equipment.
6. Knowledge of the principles and operational characteristics of hydraulic systems such as direction control valves, cylinders, motors, and hydraulic schematics in order to diagnose and repair a core component/system of the equipment.
7. Knowledge of the principles and operational characteristics of exhaust and emission control systems and their components, such as O₂ sensors, catalytics, particulate filter devices, and control devices, in order to diagnose and repair a core component of the equipment.
8. Knowledge of the principles and operational characteristics of air conditioning systems and their components and controls, such as compressors, recovery systems, condensers, and evaporators in order to diagnose and repair a core component of the equipment.
9. Knowledge of the principles and operational characteristics of cooling and heating systems and their components and controls, such as thermostats, radiators, exchangers, and water pumps, in order to diagnose and repair a core component of the equipment.

10. Knowledge of the principles and operational characteristics of manual and power steering systems and components, such as gear boxes, pumps, and linkages in order to diagnose and repair a core component of the equipment.
11. Knowledge of the principles and operational characteristics of suspension systems on automotive and heavy-duty equipment and their components, such as leaf springs, airbags, control arms, and bushings in order to diagnose and repair a core component of the equipment.
12. Knowledge of tire wearing patterns inspection practices, such as feathering, cupping, or uneven wear, and front/rear end and tandem alignment procedures, using alignment tracking and gauges, sufficient to determine whether a tire needs to be replaced, reduce tire wear, and ensure that vehicle travel is straight.
13. Knowledge of wearing characteristics of tracks and their components, such as links, pins, grousers, idlers, pads, or gears in order to diagnose and repair a core component of the equipment they service.
14. Knowledge of the procedures and equipment used to diagnose engine noise, such as ambient noise, stethoscopes, electronic devices, and hand tools, in order to identify defects and repair a core component of the equipment.
15. Knowledge of the functions and operation of charging and starting systems and their components, such as alternators, starters, air starters, batteries, or battery isolators in order to diagnose and repair a core component of the equipment.
16. Knowledge of U.S. Department of Transportation (DOT) criteria on brake servicing and adjustment, such as brake travel, slack adjustor angles, or system pressure, and City personnel policies, rules, and regulations, such as proper use of City equipment, Mayor's Directives, and/or vehicle policies in order to diagnose and repair a core component of the equipment according to DOT specifications and ensure compliance.
17. Knowledge of types of tubing flares, sizes, fittings and hoses, such as brake lines, fuel lines, or hydraulic lines, in order to diagnose and repair a core component of the equipment they service.
18. Knowledge of the maintenance and safe operation of shop tools, such as hoists, cranes, drill press, grinders, jacks, lathes, or stands, using methods pertaining to standard industry practices, original equipment manufacturer (OEM), and/or Cal/OSHA requirements in order to aid in or allow for the diagnosis and repair of core components of equipment, such as escorting internal staff (e.g. other Heavy Duty Equipment Mechanics) or external clients (e.g. vendors) to different locations on the airfield to follow Federal Aviation Administration (FAA) guidelines.

19. Knowledge of the proper and safe use of tools and equipment, such as, but not limited to, battery load testers, volt ohmmeters, test lights, and diagnostic scan tools, used in inspecting, diagnosing, and repairing faulty vehicles and equipment.

21. TECHNOLOGY APPLICATION – Correctly applies technology as required on the job; conceptualizes improvements in work through introducing and/or enhancing use of technology.

Level of Competency Required by Job:

- Level 1: **Expert in the use of technology required for own job. May identify additional applications for currently used technology to enhance own work and/or work of others.**
- Level 2: Identify additional technology to be applied to improve own work and/or work of others and/or enhanced use of current technology to improve the operations of an entire function or department.
- Level 3: Identify new technology application to improve/enhance work of an entire function, department, or organization.

Examples of Behavioral Indicators:

- Demonstrates mastery of technical applications required for current work.
- Suggests additional applications of existing technology that improve productivity.
- Identifies new technology that can be applied to improve existing operations.
- Provides convincing justification for investment in new technology versus anticipated benefits.
- Presents compelling arguments to justify purchase of existing software (with or without modification) versus in-house development.

Performance Levels:

Satisfactory

Knows and correctly applies current technology as required on the job. Extends use of current technology to improve efficiency of accomplishing additional tasks.

Superior

Recognizes opportunities to apply technology to improve work processes in a function, department, or the entire organization. Identifies and justifies specific technology for specific uses.

Technology Application Areas

1. Uses electronic diagnostic scan tool(s), such as Cummins Insite or Caterpillar Electronic Technician (CAT ET) in order to inspect and diagnose equipment, such as gasoline fuel, alternative fuel, and exhaust systems in order to determine cause of malfunction(s).
2. Uses fleet management systems such as Faster or other vehicle management systems (VMS) to create electronic repair and/or work orders, which will determine type and extent of appropriate repairs necessary for the purpose of writing a permanent record of vehicle and equipment repairs.

23. EQUIPMENT OPERATION – Operates specialized equipment in performance of job duties.

Level of Competency Required by Job:

- Level 1: **Operate equipment based on on-the-job training.**
- Level 2: Operate equipment based on attendance at a training program and practice.
- Level 3: Operate equipment for which in-depth, complex training was required and which may require certification.

Examples of Behavioral Indicators:

- Operates equipment proficiently.
- Operates equipment with strict adherence to safety procedures.
- Understands the operation of equipment used on the job and correctly answers questions about it.
- Willingly participates in any training necessary to maintain up-to-date knowledge of equipment operation.

Performance Levels:

Satisfactory

Operates equipment safely and with a high degree of proficiency.

Superior

Operates equipment with extreme proficiency and correctly answers questions about its operation. Trains and/or coaches others in the operation of equipment.

Equipment Operation Areas

1. Operation of engines and components used for construction, road maintenance, firefighting and other specialized equipment such as sleeves, pistons, bearings, auxiliary components, or gears sufficient to overhaul, diagnose, and repair the aforementioned equipment using precision measuring tools and precision fit and finish practices.
2. Operation of basic hand and power tools such as wrenches and drills sufficient to perform vehicle and equipment repairs
3. Operation of basic welding and soldering tools, such as wire feed, stick welding, or oxyacetylene torch sufficient to diagnose and repair core equipment.

35. TEAMWORK – Interacts effectively with others to achieve mutual objectives; readily offers assistance to others to facilitate their goal accomplishment.

Level of Competency Required by Job:

- Level 1: Work effectively as a member of a work unit or project team. Readily offer assistance to others when they have too much work or have too little.
- Level 2: **Work effectively as a team member in which different people have different roles/responsibilities and perspectives. Identify points for collaboration with co-workers; readily offer and request assistance.**
- Level 3: Work effectively as a part of an interdependent team (your work gets done only if the work of the whole team is done; evaluation of team performance is more relevant than individual performance).

Examples of Behavioral Indicators:

- Discusses work-related matters with co-workers.
- Offers and requests assistance readily.
- Offers and is receptive to suggestions.
- Identifies problems with workflow that will prevent team from accomplishing its goals.
- Provides constructive criticism and feedback to team members to improve overall functioning of team.
- Assigns credit to team for accomplishments.

Performance Levels:

Satisfactory

Cooperates with co-workers and fulfills responsibilities as a member of a project team. Maintains a focus on common objectives and offers and requests assistance readily.

Superior

Sees the team as a whole; acknowledges that performance of the team is what in reality is evaluated by others. If anyone fails, everyone on the team fails.

45. ORAL COMMUNICATION – Communicates orally in a clear, concise, and effective manner.

Level of Competency Required by Job:

- Level 1: Exchange specific, job-related information orally with others in the immediate work environment or via telephone and/or radio.
- Level 2: **Obtain/provide/present general and/or job-specific information orally to a variety of others in various situations.**
- Level 3: Obtain/provide/present a diverse array of information orally at varying levels of complexity to a wide range of others across many different situations and circumstances.

Examples of Behavioral Indicators:

- Audience clearly understands the intended message.
- Rarely must repeat information in response to questions.
- Refrains from use of unnecessary words, phrases, or jargon.
- Provides a level of detail appropriate to the situation (avoids too much or too little detail).
- Speaks at a level appropriate to the audience in terms of terminology, sentence structure, and simplicity/complexity of ideas expressed.
- Uses words with precision (vocabulary) to convey exact information.

Performance Levels:

Satisfactory

Speaks clearly and audibly, providing the appropriate information and level of detail. Typically conveys the message on the first attempt. Answers questions accurately and directly.

Superior

Speech is direct and to the point. Speaks convincingly and with authority when appropriate. Maintains sensitivity to the audience while providing thorough information with the appropriate level of detail through the use of precise language.