

POSITION DUTY STATEMENT

PM-0924 (REV 01/2022)

CLASSIFICATION TITLE Equipment Engineer	OFFICE/BRANCH/SECTION Division of Equipment/Engineering & Production/ Design	
WORKING TITLE Equipment Engineer	POSITION NUMBER 932-001-3639-925	REVISION DATE 10-17-2022

As a valued member of the Caltrans leadership team, you make it possible for the Department to provide a safe and reliable transportation network that serves all people and respects the environment.

GENERAL STATEMENT:

This position reports to a Senior Equipment Engineer and under their direction, performs difficult mechanical engineering design, vehicle specification preparation, modifications to existing designs to accommodate changing equipment performance requirements, estimating and inspection work involved in the design, development, fabrication, and assembly of all vehicles and mobile equipment purchased for the Department's statewide fleet. Performs research and development into advanced technology highway maintenance vehicles. Directs the performance and acceptance testing of vehicles and construction equipment. Provides the final engineering interpretive analysis of vehicle specifications, vehicle up-fitter engineering work, design drawings, compliance with air resource board requirements, final vehicle certification processes and other related work. Provides troubleshooting and design services to the end users and mechanics for the Department's statewide fleet. The incumbent is required to work primarily in an office setting but will also be in truck assembly/repair shops, district equipment repair shops, highway maintenance yards and various outdoor sites including work zones. The incumbent will work with vendors and assist in equipment inspections at the vendor's business location in or out of state. A valid driver's license is required when operating a State vehicle.

CORE COMPETENCIES:

As an Equipment Engineer, the incumbent is expected to become proficient in the following competencies as described below in order to successfully perform the essential functions of the job, while adhering to and promoting the Department's Mission, Vision, Values, Strategic Imperatives and Goals. Effective development of the identified Core Competencies fosters the advancement of the following Leadership Competencies: Change Commitment, Risk Appetite, Self-Development/Growth, Conflict Management, Relationship Building, Organizational Awareness, Communication, Strategic Perspective, and Results Driven.

- **Flexibility and Managing Uncertainty** : Adjusts thinking and behavior in order to adapt to changes in the job and work environment. (Strengthen Stewardship and Drive Efficiency - Innovation)
- **Decision Making**: Makes critical and timely decisions. Takes charge. Supports appropriate risk. Makes challenging and appropriate decisions. (Safety First - Engagement)
- **Reliability**: Ability to demonstrate dependability in meeting commitments, and providing a consistent work product. Takes responsibility for individual actions in order to meet deadline demands. (Cultivate Excellence - Integrity)
- **Problem-solving and Decision-making** : Identifies problems and uses logical analysis to find information, understand causes, and evaluate and select or recommend best possible courses of action. (Safety First - Engagement)
- **Teamwork and Collaboration**: Sets team structure. Organizes, leads, and facilitates team activities. Promotes team cooperation and encourages participation. Capable of cross functionality and working well with others on a team to achieve personal goals, team goals, and organizational goals. Takes responsibility for individual actions in order to achieve consistent results. (Strengthen Stewardship and Drive Efficiency - Pride)
- **Customer Focus**: Considers, prioritizes, and takes action on the needs of both internal and external customers. (Safety First - Engagement)
- **Interpersonal Effectiveness** : Effectively and appropriately interacts and communicates with others to build positive, constructive, professional relationships. Tailors communication style based on the audience. Provides and is receptive to feedback. (Cultivate Excellence - Engagement)
- **Planning and Results Oriented**: Organizes and executes work to meet organizational goals and objectives while meeting quality standards, following organizational processes, and demonstrating continuous commitment. (Strengthen Stewardship and Drive Efficiency - Engagement)
- **Technical Expertise**: Depth of knowledge and skill in a technical area. (Cultivate Excellence - Integrity)

ADA Notice

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TYPICAL DUTIES:

Percentage	Job Description
Essential (E)/Marginal (M) ¹	
40% E	Prepares the more difficult mechanical engineering designs, drawings, vehicle specifications and estimates for the procurement of all vehicles, mobile equipment, and mechanical subassemblies for the department's statewide fleet. Incorporates vehicle manufacturer body builder, FMVSS, Federal and state code requirements into vehicle designs. Directs performance and acceptance testing including drawing interpretation, determining and explaining performance and acceptance test methods, checking actual components for compliance with the drawings and/or specifications provided, and conducting performance testing as required in the specification. Will also provide an evaluation if an item is compliant when it is unclear and requires research to validate or reject the supplied item. Evaluates and provides recommendations for improvements in vehicle designs and specifications. Evaluations may include reviewing requests from the mechanics building the equipment and the users of the equipment, providing material cost savings, labor savings, safety improvements, functionality improvements, and product availability research to the senior engineer.
25% E	Performs CAD model creation and the preparation of detailed design drawings and bill of materials for the fabrication and assembly of truck chassis components, pneumatic and hydraulic operated mechanisms, specialized equipment, assembly tools, fixtures, and gauges. Ensures that the designs incorporate limitations placed on component locations by the vehicle manufacturer. Perform hands-on resolution which may include travel to out-of-state vendor or walking into our shop to physically look at the problem, design a solution and working with the vendor/mechanic while they are fixing the problem to make sure the corrective design is fully functional and to adjust the design and drawing as needed along the way. Performs engineering design drawing checks to ensure all drawings are technically correct. Designs and performs design checks on CAD system with Solidworks Software. Reviews Project Management files to determine what steps must be taken so that the monitored project stays on-task for completion by the deadline.
20% E	Prepares engineering reports, evaluations and performs consulting services. Reviews updates in the SAE (society of Automotive Engineers provides recommendations which are frequently used as a requirement by the Federal Standards), CA Vehicle Code, Federal Code of Regulations, FMVSS (Federal laws controlling the mechanical design and performance of highway vehicles and construction equipment), California Air Resources board and Federal EPA standards. Evaluates safety and regulatory concerns as they apply to mechanical and fleet equipment. Provides the Senior engineer with verbal and/or written explanations of how the updates affect our fleet and what changes need to be made to our drawings and specifications so that future vehicles are compliant. If changes are needed on the existing equipment, then a method is chosen to make the correction. The incumbent determines changes required for existing equipment to meet new regulations and communicates verbally and via e-mail with the people who operate and maintain the vehicle or by writing a statewide bulletin to correct multiple units. The engineer will also consult, when requested, with other state and local governments and municipalities by providing copies of our drawings for various bodies or components and answering questions they have about the drawings.
5% E	Develop training materials for HQ built equipment. This includes written material, video material, and training Division of Maintenance Motorized Equipment Training Academy trainers.
5% E	Attend mandated and job-related training, Safety Meetings, read trade/industry literature,
5% M	Typing training materials, editing video training materials and ensuring ADA compliance of materials posted to the web. Filing of Final Vehicle Certification packages.

¹ESSENTIAL FUNCTIONS are the core duties of the position that cannot be reassigned.

MARGINAL FUNCTIONS are the minor tasks of the position that can be assigned to others.

SUPERVISION OR GUIDANCE EXERCISED OVER OTHERS

May act as a lead in the absence of the supervisor. May also direct the work of students and provide guidance and drawing interpretation for suppliers, Heavy Equipment Mechanic staff and their management chain.

KNOWLEDGE, ABILITIES, AND ANALYTICAL REQUIREMENTS

Knowledge of: Mechanical engineering methods, materials and equipment used in the design, fabrication and maintenance of automotive and mobile equipment and their subsystems. Provisions of the Code of Federal Regulations, including the Federal

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Motor Vehicle Safety Standards, California Vehicle Code and their associated referenced and incorporated literature such as Society of Automotive Engineers recommendations. Techniques and instruments for measuring vehicle noise and for testing lighting devices, braking systems, electrical circuits, and other safety equipment. Commercial vehicle weight load distribution; requirements for commercial vehicle and cargo tank safety equipment; general automotive equipment engineering; engineering analysis; computer systems; codes, safety orders, and Federal and State regulations governing the design and building of mobile equipment and vehicles.

Knowledge of: Air mandates including the Federal Engine mandates, CARB ATCM (California Air resources Board Air Toxics Control Measure), CARB PERP (California Air Resources Board Portable Equipment Registration Program), and South Coast Air Quality Management District requirements. Incumbent shall understand how these mandates are met with the addition of various components that may be new to the industry. Incumbent must also be cognizant of how these components impact the installation of standard Caltrans equipment; for example, increased clearances around diesel particulate traps due to extreme regeneration temperatures of 1200-1500 °F.

Ability to: Prepare, analyze, and check drawings, specifications and estimates for vehicles and components. Organize and conduct research on automotive safety equipment; draw or work from plans, drawings, and specifications; effectively communicate with others; prepare formal reports; analyze situations accurately and take effective action and maintain cooperative relationships with members of the department and with manufacturers and dealers in the automotive and equipment field; operate in a lead capacity for special studies; analyze situations and adopt an effective course of action. Ability to drive rental & State vehicles.

RESPONSIBILITY FOR DECISIONS AND CONSEQUENCES OF ERROR

Decisions affecting the design, interpretation and development of detailed competitive engineering drawings and specifications for the fabrication and procurement of equipment will have a critical and direct impact on the operation, safety, initial purchase price and future repair costs. This extends from the cost to operate a piece of equipment to how it performs in doing the work it was designed to do.

PUBLIC AND INTERNAL CONTACTS

Internal contacts are statewide with staff who use and/or maintain Caltrans equipment including HQ and each district equipment shop, equipment managers and equipment operators. Contact with the public sector are with vendors who manufacturer Caltrans fleet vehicles and supporting mechanical equipment. Contact is also made with other governmental offices for a wide range of reasons including providing requested information and interpretation of regulations.

PHYSICAL, MENTAL, AND EMOTIONAL REQUIREMENTS

Physical Requirements: Ability to work with a keyboard & mouse; manual dexterity; sitting for long periods; develop and maintain cooperative relationships; ability to focus for long periods of time. Employee will be required to climb into and crawl under trucks and equipment. Employee may be required to work in snow and ice conditions for equipment testing and evaluation. Mental Requirements: Must grasp the essence of technical information; have the ability to multi-task, adapt to changing priorities and complete projects with short notice; ability to accept critique of others. Emotional Requirements: Ability to resolve emotionally charged issues reasonably, professionally and diplomatically; must be able to develop and maintain cooperative working relationships with the public and other agency members.

WORK ENVIRONMENT

While doing his/her duties the employee will be working under artificial light in a climate controlled office. The balance will be spent working in a shop that will have semi-controlled temperature and sound levels of varying elevations, outside in ambient temperatures, vendors facility in unknown conditions, district equipment repair shops, highway maintenance yards and various outdoor sites including work zones. Occasional overnight travel within the state and across state lines is required but not frequent. There is opportunity for telework, however, adequate support of shop personnel will require work in the office during some phases of assigned projects.

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I have read, understand and can perform the duties listed above. (If you believe you may require reasonable accommodation, please discuss this with your hiring supervisor. If you are unsure whether you require reasonable accommodation, inform the hiring supervisor who will discuss your concerns with the Reasonable Accommodation Coordinator.)

EMPLOYEE (Print)

EMPLOYEE (Signature)

DATE

I have discussed the duties with, and provided a copy of this duty statement to the employee named above.

SUPERVISOR (Print)

SUPERVISOR (Signature)

DATE