

EMPLOYEE:

CLAIM #



## Job Analysis

ALTERNATE FORMAT AVAILABLE

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**JOB TITLE** Electromechanic

**JOB CLASSIFICATION** Electromechanic

**DICTIONARY OF OCCUPATIONAL TITLES (DOT) NUMBER** 910.387-014

**DOT TITLE** Railroad-Car Inspector

**DEPARTMENT** Transportation

**DIVISION** Rail Transit

**# OF POSITIONS IN THE DEPARTMENT WITH THIS JOB TITLE** 16

**CONTACT'S NAME & TITLE** John Zastawniak, Vehicle Maintenance Chief & Rob Blackburn, Vehicle Maintenance Chief

**CONTACT'S PHONE** 206-255-7596, 206-255-2860

### ADDRESS OF WORKSITE

3407 Airport Way South  
Seattle, WA 98134

**VRC NAME** : Thomas S. Sproger, MS, CRC, CEAS II

**DATE COMPLETED** 5/10/11

### WORK HOURS

The Vehicle Maintenance section operates three shifts with 8 hour shifts for day, swing, and graveyard. Shifts are designed to provide service 24 hours per day, seven days a week. Employees may bid for all shifts which are awarded by seniority. "Picks" may be requested at 3 designated times per year. This position is overtime eligible at times and swing and graveyard shift employees receive a shift differential. Employees work a 40-hour per week schedule with two consecutive days off, but not necessarily Saturday and Sunday. Graveyard and/or swing shift vacancies will be the most likely openings. Employees must be able and willing to work any shift, including any combination of days off.

**OVERTIME** (Note: Overtime requirements may change at the employer's discretion)

Optional and varies depending on the business demand. Optional on most occasions, but can be required in emergency situations. Overtime can occur on nights and weekends as work is performed as part of a 24 hour per day operation.

### JOB DESCRIPTION

The responsibilities of this position include performing journey level, electrical, electronic and mechanical work on light rail vehicles and associated equipment. This position performs maintenance inspections, testing, troubleshooting and repairs to all railroad car equipment including but not limited to motor, fiber -optics, hydraulic, electric, propulsion, signaling, braking, & signage.

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## **ESSENTIAL ABILITIES FOR ALL KING COUNTY JOB CLASSIFICATIONS**

1. Ability to demonstrate predictable, reliable, and timely attendance.
2. Ability to follow written and verbal directions and to complete assigned tasks on schedule.
3. Ability to read, write & communicate in English and understand basic math.
4. Ability to learn from directions, observations, and mistakes, and apply procedures using good judgment.
5. Ability to work independently or part of a team; ability to interact appropriately with others.
6. Ability to work with supervision, receiving instructions/feedback, coaching/counseling and/or action/discipline.

## **JOB SPECIFIC REQUIREMENTS**

- Knowledge of current principles and practices of electrical, electronic and mechanical work on light rail vehicles and associated equipment; skill in AC/DC systems, operating principles of analog and digital electronics, electronic control circuitry and associated mechanical systems, heating, lighting, air conditioning, motors, brakes and related systems
- Knowledge and skill in the application of mechanical principles, repair methods, standards and practices typically found in a journey level skilled trades position
- Knowledge of current preventive maintenance requirements and skill in performing maintenance on light rail vehicles and associated equipment, machinery, tools, and equipment; skill in developing, and implementing preventive maintenance and safety inspection procedures
- Skill in the application of testing and inspection methods including solid state circuitry diagnostic and repair techniques and procedures
- Skill in the use of operating portable test equipment, bench type work stations, tools, parts and supply manuals needed in the repair, maintenance, and installation of electrical, electronic and mechanical systems and equipment
- Skill in reading and interpreting schematics, maintenance manuals, technical information in repair manuals, service change bulletins, parts and supply manuals, and specifications
- Skill in maintaining, repairing, troubleshooting, rebuilding and overhauling electrical and mechanical systems
- Skill in preparing written reports, documenting defects and repairs on inspection forms, work orders, and designated computer programs; prepare accurate time and material cost estimates and keeping accurate records
- Skill in applying industrial safety procedures and standards including cleaning and maintaining shop area
- Skill in problem solving, analyzing and diagnosing equipment problems
- Skill in the operation of current Windows based computer software; skill in learning new operating systems and staying current on all new technologies introduced into transit industries as it relates to light rail vehicle maintenance
- Skill in oral and written communications
- Skill in establishing and maintaining cooperative working relationships with a diverse group of individuals

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- Skill in working under established deadlines and timeframes
- Skill in leading and training others
- Washington State Class B driver's license or the ability to obtain and maintain a Class B license with airbrake endorsement and light rail vehicle "Yard Operator" certification
- Electronics Technician Certificate is **desirable**.

### **ESSENTIAL FUNCTIONS**

- Diagnose, test, maintain, repair, and overhaul rail vehicles' electrical, electronic and mechanical systems and equipment in accordance with schematics, drawings, wiring diagrams, operations manuals and manufacturer instructions.
- Conduct safety and preventive maintenance inspections on vehicles, systems and equipment; document defects, maintenance and repairs.
- Troubleshoot, repair, replace, or modify mechanical, electronic and electrical components, analog and solid state electronic systems, and defective parts for a variety of equipment and systems controls.
- Prepare time and material cost estimates and maintain records; prepare various activity and status reports, document defects and repairs on inspection forms, work orders, or designated computer programs.
- Install special electronic testing systems and communication devices on cars; service and maintain microprocessor control systems; calibrate and repair test equipment.
- Inspect, test, maintain, repair, service, rebuild and overhaul electrical, mechanical and electronic subsystems on rail vehicles.
- Machine, weld, or fabricate parts, jigs, stands or equipment as needed
- Operate computers for testing and diagnosing fault log management and related data input and retrieval.

### **NON-ESSENTIAL FUNCTIONS**

- \* Maintain parts inventory and computer inventory records
- \* Operate and maintain shop equipment and tools.

### **PERSONAL PROTECTIVE EQUIPMENT USED**

Head protection, safety vest, insulated gloves (high and low voltage), harness/fall protection, ear protection, eye protection, leather footwear with safety toe electrical boot, flash retardant clothing, long sleeve shirt, fire retardant clothing, arc resistant clothing, breathing protection and knee pads.

### **OTHER TOOLS & EQUIPMENT USED**

Impact tools, Brandt truck (rail tow rig), aerial platform, high rail equipment, cranes, forklift, hand tools, welder, metal working machines, press, lathe, wheel truing machine, band saw, manual yard switch, ladders, various testers, laptop, electronic testing devices, welding and cutting, hydraulic lifting (railing) equipment.

### **PHYSICAL DEMANDS AS JOB IS TYPICALLY PERFORMED**

Continuously = occurs 66-100% of the time

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Frequently = occurs 33-66% of the time  
Occasionally = occurs 1-33% of the time  
Rarely = may occur less than 1% of the time  
Never = does not ever occur (such demands are not listed)

Highly Repetitive = Repeating the same motion every few seconds with little or no variation for more than two hours total per day.

**This job is classified as**

Very Heavy—exerting in excess of 100 pounds of force occasionally, and/or in excess of 50 pounds of force frequently, and/or in excess of 20 pounds of force constantly to move objects. Please be aware that the job demands vary from day to day, depending on work to be done and staff available to do it.

**Standing**

Health Care Provider initials if restricted \_\_\_\_\_

*Occasionally* on concrete, asphalt, track ballast and uneven surfaces (such as rails) for up to 10-15 minutes hours at a time for up to 3 hours in a work shift. Most commonly occurs while operating band saw or drill press and while performing varied stationary repair tasks.

**Walking**

Health Care Provider initials if restricted \_\_\_\_\_

*Frequently* on concrete, track ballast, and uneven ground (such as rails) surfaces for distances of 1500 feet at a time for up to 5.5 miles per day total in a work shift. Most commonly occurs while repairing, installing, or troubleshooting components on light rail vehicles.

**Sitting**

Health Care Provider initials if restricted \_\_\_\_\_

*Occasionally* on an office chair, rolling mechanic stool, or a seat in the truck for up to 30 minutes at a time for up to 2.5 hours total in a work shift. Most commonly occurs while performing computer duties (work orders, order parts via M5 software), & coupler repairs.

**Climbing stairs**

Health Care Provider initials if restricted \_\_\_\_\_

*Occasionally* for up to 22 steps at a time for up to 1 -2 minutes at a time for up to 1.5 hours total in a work shift. Most commonly occurs while accessing the top of the light rail vehicles via upper maintenance platform (22 steps), accessing the maintenance pit and traversing the Brandt Truck (4 steps; 1<sup>st</sup> step up to 30" off of the ground).

**Climbing**

Health Care Provider initials if restricted \_\_\_\_\_

*Occasionally* on Brandt truck (4 steps; 1<sup>st</sup> step up to 30" off of the ground) and ladders, to heights of up to 8 feet for up to 1 minute at a time for up to 30 minutes total in a work shift. Most commonly occurs while climbing ladders, platforms and rolling staircases as well as getting in and out of the Brandt Truck.

**Balancing**

Health Care Provider initials if restricted \_\_\_\_\_

*Frequently* on a rail car at heights of up to 12 feet for up to 2.5-3 hours at a time for up to 6 hours total in a work shift. Most commonly occurs while working on the HVAC components and working on elevated sections of rail cars.

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**Bending neck up**

Health Care Provider initials if restricted \_\_\_\_\_

*Occasionally* for up to 15 minutes at a time for up to 2 hours total in a work shift. Most commonly occurs while performing overhead work as well as inspecting rail cars.

**Bending neck down**

Health Care Provider initials if restricted \_\_\_\_\_

*Occasionally* for up to 15 minutes at a time for up to 2 hours total in a work shift. Most commonly occurs while working on lower areas of the rail cars, bench work, computer work work as well as inspecting rail cars.

**Bending/Stooping**

Health Care Provider initials if restricted \_\_\_\_\_

*Occasionally* on concrete, ballast surfaces on inside cab for up to 30 minutes at a time for up to 3 hours total in a work shift. Most commonly occurs while inspecting train control components or while working on lower areas of the rail cars as well as inspecting rail cars. The employee can usually alternate between bending/stooping, kneeling or squatting as needed.

**Kneeling**

Health Care Provider initials if restricted \_\_\_\_\_

*Occasionally* on concrete, ballast surfaces for up to 15 minutes at a time for up to 2 hours total in a work shift. Most commonly occurs while working on lower areas of the rail cars, bench work, computer work as well as inspecting rail cars. The employee can alternate between bending/stooping, kneeling or squatting as needed.

**Squatting**

Health Care Provider initials if restricted \_\_\_\_\_

*Occasionally* on concrete, ballast surfaces for up to 15 minutes at a time for up to 2 hours total in a work shift. Most commonly occurs while working on lower areas of the rail cars, bench work, computer work as well as inspecting rail cars. The employee can alternate between bending/stooping, kneeling or squatting as needed.

**Lying Down**

Health Care Provider initials if restricted \_\_\_\_\_

*Rarely to Occasionally* on train cab floor while inspecting electrical and electronic components for 1-5 minutes at a time and 30 -60 minutes in a work shfit.

**Operating Controls with Feet**

Health Care Provider initials if restricted \_\_\_\_\_

*Occasionally* to operate tower truck for up to .5 hours at a time for up to 1.5 hours total in a work shift while driving the Brandt Truck to tow a disabled train.

**Reaching above shoulder height**

Health Care Provider initials if restricted \_\_\_\_\_

*Occasionally* for up to 5 minute at a time for up to 60 minutes total in a work shift while working in the pit on the underside of a rail car.

**Reaching at waist to shoulder height**

Health Care Provider initials if restricted \_\_\_\_\_

*Frequently to Continuously & Highly Repetitive* for up to 1.5 hours at a time for up to 9 hours total

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in a work shift while driving the Brandt truck, manipulating tools, operating a fork lift, performing computer duties, performing bench work and operating a crane.

**Reaching at knee to waist height**

Health Care Provider initials if restricted \_\_\_\_\_

*Occasionally* for up to 3 minutes at a time for up to 60 minutes total in a work shift while working on lower sections of the rail cars.

**Reaching at floor to knee height**

Health Care Provider initials if restricted \_\_\_\_\_

*Occasionally* on concrete, rubber blanket, asphalt, brick, track ballast, dirt, vegetation, undeveloped land and uneven surfaces for up to 10 minutes at a time for up to 1 hour total in a work shift. Most commonly occurs while changing wheels.

**Lifting 1-10 pounds**

Health Care Provider initials if restricted \_\_\_\_\_

*Occasionally* for up to 2 minutes at a time for up to 30 minutes total in a work shift. Most commonly occurs with weights of 2-5 pounds while using various hand tools, impact tools and manipulating small parts.

**Carrying 1-10 pounds**

Health Care Provider initials if restricted \_\_\_\_\_

*Occasionally* for up to 2 minutes at a time for up to 30 minutes total in a work shift. Most commonly occurs with weights of 2-5 pounds while using various hand tools, impact tools and manipulating small parts.

**Lifting 11-20 pounds**

Health Care Provider initials if restricted \_\_\_\_\_

*Occasionally* for up to 2 minutes at a time for up to 30 minutes total in a work shift. Most commonly occurs with weights of 12-15 pounds while using various hand tools, impact tools and manipulating various electronic modules and mechanical parts.

**Carrying 11-20 pounds**

Health Care Provider initials if restricted \_\_\_\_\_

*Occasionally* for up to 2 minutes at a time for up to 30 minutes total in a work shift. Most commonly occurs with weights of 12-15 pounds while using various hand tools, impact tools and manipulating various electronic modules and mechanical.

**Lifting 21-50 pounds**

Health Care Provider initials if restricted \_\_\_\_\_

*Occasionally* for up to 2 minutes at a time for up to 30 minutes total in a work shift. Most commonly occurs with weights of 25-35 pounds while manipulating various electronic and mechanical components as well as metal stock. Workers are instructed to use a cart or forklift for loads over 40#.

**Carrying 21-50 pounds**

Health Care Provider initials if restricted \_\_\_\_\_

*Occasionally* for distances up to 20 feet for up to 20 seconds at a time for up to 30 minutes total in a work shift. Most commonly occurs with weights of 25-35 pounds while transporting various electronic and mechanical components to and from GEM cart (battery operated material handling cart). Workers are instructed to use a cart or forklift for loads over 40#.

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**Lifting 51-100 pounds**

Health Care Provider initials if restricted \_\_\_\_\_

*Rarely to Occasionally* for up to 1 minute at a time for up to 10 minutes total in a work shift. Most commonly occurs with weights of 60-70 pounds while manipulating sand bags, electrical components and mechanical components on rail cars. Multiple cranes are available for most items. Workers are instructed to use a cart or forklift for loads over 40#.

**Carrying 51-100 pounds**

Health Care Provider initials if restricted \_\_\_\_\_

*Rarely to Occasionally* for up to 1 minute at a time for up to 10 minutes total in a work shift. Most commonly occurs with weights of 60-70 pounds while transporting sand bags, electrical components and mechanical components on rail cars. Multiple cranes are available for most items. Workers are instructed to use a cart or forklift for loads over 40#.

**Lifting >100 pounds**

Health Care Provider initials if restricted \_\_\_\_\_

*Rarely* for up to 1 minute at a time for up to 5 minutes total in a work shift. Most commonly occurs with "truck tires" > 100 pounds to remove them from stack and roll them to where "truck" is being repaired.

**Carrying >100 pounds**

Health Care Provider initials if restricted \_\_\_\_\_

*Rarely* for up to 1 minute at a time for up to 5 minutes total in a work shift. Most commonly occurs with "truck tires" > 100 pounds to remove them from stack and roll them to where "truck" is being repaired.

**Pushing and Pulling**

Health Care Provider initials if restricted \_\_\_\_\_

*Frequently* of chain hoists with a force of up to 1-100 pounds for up to 5 minutes at a time for up to 4 hours total in a work shift while using pallet jack, wheel changing machine and manual hand tools such as wrench and ratchet. The employee pushes with up to 100 pound of force when moving motored truck assembly (two person push) for a distance up to 20 feet. When using a torque wrench the employee needs to loosen/tighten a nut/bolt with up to 600 foot pounds of torque (two person job) with extension/breaker-bar to reduce force requirement.

**Handling**

Health Care Provider initials if restricted \_\_\_\_\_

*Continuously* for up to 40 minutes at a time for up to 7 hours total in a work shift while performing preventative maintenance and repairs using hand and impact tools.

**Operating Controls with Hands**

Health Care Provider initials if restricted \_\_\_\_\_

*Frequently* for up to 30 minutes at a time for up to 4 hours total in a work shift while operating Brandt truck, cranes, hoists, welders, band saw, press, lathe, etc.

**Fingering**

Health Care Provider initials if restricted \_\_\_\_\_

*Occasionally* while repairing switches of small parts for up to 2 minutes at a time for up to 2 hours total in a work shift while completing computer duties as well as manipulating electrical connections, small hand tools and small parts.

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**Feeling**

Health Care Provider initials if restricted \_\_\_\_\_

*Occasionally* for up to 1 minute at a time for up to 10 minutes in a work shift. Most commonly occurs when feeling for hidden bolts, nuts and equipment as well as when identifying equipment malfunction and utilizing/manipulating small parts.

**Talking**

Health Care Provider initials if restricted \_\_\_\_\_

*Frequently* for up to 5 minutes at a time for up to 5 hours total in a work shift while conversing with coworkers, supervisors and vendors.

**Hearing**

Health Care Provider initials if restricted \_\_\_\_\_

*Continuously* for up to 9 hours at a time during work shift while listening to traffic, co-workers, supervisor, and/or moving machinery while performing all job duties.

**Seeing**

Health Care Provider initials if restricted \_\_\_\_\_

*Continuously* for up to 3-4 hours at a time for up to 9 hours total in a work shift while watching for moving vehicles, completing inspections, performing repairs, watching for job hazards and watching coworkers for safety purposes.

**Working with Heightened Awareness**

Health Care Provider initials if restricted \_\_\_\_\_

*Continuously* for up to 3-4 hours at a time for up to 9 hours total in a work shift while working on live lines and identifying potential hazards such as moving machinery and electrocution potential.

**ENVIRONMENTAL FACTORS**

Work is performed primarily indoors but may also occur occasionally outdoors and in inclement weather. The work may also performed in close proximity high voltage wires. Work is rarely performed on energized lines.

**The noise level is**

Approximately 90 decibels. The noise is caused by power tools.

HCP Initials if Restricted

\_\_\_\_\_

**Work environment may include the following exposure(s):**

- Outside weather: Occasionally
- Non-weather related temperatures below 55 degrees: Rare
- Non-weather related temperatures above 75 degrees: Occasionally
- Wet: Occasionally
- Humidity/dampness: Rare
- Fumes: Rare
- Odors: Rare
- Dusts: Rare
- Mists: Occasionally
- Gases: Rare
- Moving mechanical parts: Continuously
- Vibration: Occasionally

HCP Initials if Restricted

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Working in high, exposed places: Rare  
Toxic or caustic chemicals: Rare


**POTENTIAL MODIFICATIONS TO JOB**

The one ergonomic risk factor identified was the need to manually lift railroad wheel/tires stacked on a pallet and weighing over 100# from floor to waist in order to move it to where truck repairs are taking place. NIOSH recommends restricting lifting to weights of which 75% of the industrial population are capable of lifting, in general a maximum lift of 40#. The Snook-Liberty Mutual Tables show only 10% of males are capable of safely lifting 76# from the ground and virtually none can safely lift 100# or more without being placed at risk of injury. For that reason it is recommended that the task be done using an Alum-A-Pack from Alumalift, a drum/roll handling device (see: <http://www.alum-a-pack.com/>)

Alternate between bending, stooping, kneeling and squatting in accordance with personal preference and physical tolerances.

**SIGNATURES**

Signatures on this page are obtained before the document becomes available for use and are not required each time the document is reused. Obtained signatures are kept on file at King County Safety & Claims. The Health Care Provider signature section is separate and appears on the following page.

Thomas S. Sproger, MS, CRC, Vocational Rehabilitation Counselor and Ergonomic Specialist  
Printed name & title of VRC evaluator

\_\_\_\_\_  
Signature of VRC evaluator

\_\_\_\_\_  
Date

\_\_\_\_\_  
Printed name & title of contact

\_\_\_\_\_  
Signature of contact

\_\_\_\_\_  
Date

KING COUNTY JOB ANALYSIS COMPLETED ON: 7/31/09  
JOB TITLE: Electromechanic

DOT #: 910.387-014

EMPLOYEE:

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Printed name & title of contact

---

Signature of contact

---

Date

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**HEALTH CARE PROVIDER SECTION**  
**Check all that apply**

- The employee is released to perform the described duties without restrictions on performance or work hours as of \_\_\_\_\_.
- The employee is released to perform the described duties on a reduced schedule as of \_\_\_\_\_. The recommended schedule is:  
\_\_\_\_\_  Temporary until \_\_\_\_\_  Permanent as of \_\_\_\_\_
- The employee is released to perform the described job with the following modifications:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  Temporary until \_\_\_\_\_  Permanent as of \_\_\_\_\_
- The employee is not released to perform the described duties due to the following job functions:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  Temporary until \_\_\_\_\_  Permanent effective \_\_\_\_\_
- The employee is unable to work in any capacity.  
A release to work is:  anticipated by \_\_\_\_\_  Not expected

The limitations are due to the following objective medical findings:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Printed or typed name and phone number of Health Care Provider

Signature of Health Care Provider

Date