



JOB DEMANDS ANALYSIS

Company: City of Burnaby

Location: Shop Stores–Works Yard

Job Title: Partsman 1

Classification: Light Duty

Purpose of Activities

The Partsman 1 is responsible for receiving and distributing stock, parts and material; general Shop Stores and storage area clean up; and computer data entry for Tradesman (Mechanics, Painters, Carpenters, Plumbers) billing purposes.

Tools and Equipment

The Partsman 1 will use the following tools and equipment to perform his duties:

- Computer (PC with keyboard and mouse)
- Chair – adjustable for seat pan angle, height and seat pan depth; five point base of support, removable chair arms
- Standard metal desk
- Photo copier, fax, printer, adding machine, telephone
- Forklift
- Two - four wheeled carts (0.20 and 1.0 metre height)
- Receiving desks X 2 (1.27 metres high)
- Storage area X 3 (Shop Stores, Steel Storage, Miscellaneous Storage) with shelving units specific to product (lumber, steel, batteries, paint, automotive parts, etc.)

Usual Methods

Receive and Distribute Stock

1. Delivery Driver arrives at Shop Stores receiving doors.
2. Delivery Driver will bring stock to Counter in Shop Stores or Partsman 1 will help the Delivery Driver unload the stock (steel, lumber, automotive parts, paint, etc.) from the truck by hand or Forklift. Some stock is placed in storage racks and shelves as it is delivered.
3. Steel is unloaded at the Steel Storage area which is located in a building 75 metres from the Shop Stores. Lumber and other large automotive parts are stored in another building located 75 metres from the Shop Stores. All buildings are located in the Works Yard. The Partsman 1 will walk to and from these other buildings several times per day.
4. The Partsman 1 will count the pieces to ensure they are accounted for and then sign the waybill. The Partsman 1 will open the box(s) and deliver the piece to the Tradesman or place the part on the storage shelf if it was not a special order.
5. Repeat steps 1-4 as parts and material are delivered throughout the day.



Timecard Data Entry

1. Gather Tradesman timecards from Timecard drop off.**
2. Walk to computer (< 10 metres) and sit in chair.**
3. Enter data from Tradesman Timecard to computer.
4. Repeat step 3 until all timecards have been entered. This task takes approximately two to three hours per day and is usually performed in the morning.

General Cleaning

1. As required throughout the day, the Partsman 1 will sweep and mop the floors in the Shop Stores; clean and dust shelves and counters; and keep the area neat and free of clutter.

The presence of ** indicates non-value added tasks. These tasks do not contribute to the stated purpose of the work.

Administrative Issues

The Partsman 1 works an eight-hour day from 0700 to 1530, Monday to Friday with a ten-minute rest period in the morning, a 30-minute lunch break and a ten-minute rest period in the afternoon. There is no overtime or on-call requirement for this position. This position is classified as Light Duty. Lifting, carrying, pushing, pulling and loading or unloading weights up to 53-kg; steel bars up to 7.3 metres long; 4X8 sheets of aluminum and steel; pieces of lumber from a 2X4 to 2X12; and 4X8 sheets of plywood are required to perform the functions of this position. The Partsman 1 has access to a Forklift but it is not always possible to maneuver it into tight spaces (Shop Stores and Steel Storage) or get help from other Partsman. This position should not be classified as Light Duty for reasons described below in the Metabolic and Structural Stress section of this report.

Activity Demand Variables

These variables are tasks that must be carried out by the employee and are implicitly or explicitly required as objectives of the job.

- Data entry on computer
- Telephone use (varies from day to day)
- Interaction with Delivery Drivers (varies from day to day)
- Operation of general office equipment (computer, adding machine, photocopier, fax, telephone)
- Sit at computer terminal at standard metal desk
- Standing at customer service counter (on concrete, no mats)
- Walk from Shop Stores to Storage areas up to 75 metres one way several times per day
- Sit, drive and operate Forklift
- Unload parts, equipment, tools and other material from Delivery trucks by hand or Forklift
- Lift and place materials on shelving units from the floor to overhead heights
- Lift and carry to/from storage racks - steel (round, square, flat lengths up to 7.3 metres long, 4x8 sheets of steel and aluminum in various to 2.0 cm.
- Lift and carry to/from storage racks – lumber (2X4, 2X6, 2X8, 2X10, 2X12; 4x8 sheets of plywood to 2.0 cm thick



- Lift and carry to/from storage parts, tools and equipment with weights up to 53-kg

Worker Decision Variables

These variables are the sub-routines and cognitive/physical decisions made by the worker in carrying out the objectives of the job.

- Sitting posture at computer terminal and on Forklift
- Telephone use (trap telephone between ear and shoulder)
- Determine when to use forklift to lift and move materials from the Shop Stores to storage and back again as required
- Use carts to move materials from location to location

Accommodative Considerations

1. People with injuries to the spine in any region may have difficulty with the static seated postures and the dynamic movements required to lift, carry, push, pull, load and unload material from Delivery trucks to specific storage areas in the Shop Stores and secondary storage areas.
2. People with shoulder injuries such as rotator cuff tendonitis, bursitis and instability may have difficulty with static loading and reaching activities required to perform data entry on the computer, general shop clean up and receiving and distributing parts and materials.
3. People with any upper extremity injuries may have difficulty with this position for the reasons described above.
4. People with injuries to the lower extremities may have difficulty with standing on concrete floors and walking several hundred metres per day between the Shop Stores building and the two secondary storage areas.
5. Individuals who do not cope in open low-autonomy work environments would have difficulty with this position.
6. Some computer skills are required for data entry.
7. Some knowledge of automotive parts and accessories, lumber, steel and paint is required.

Prepared By: Jeffrey J. McGinn, Kinesiologist

May 19, 1999



Summary of Stresses

Metabolic Stresses

The main source of energy will be provided by the aerobic energy system to perform the sedentary (Computer data entry) and the moderately active tasks of lifting, carrying, walking, standing, pushing, pulling, bending, stooping and crouching (receiving, distributing and cleaning). The anaerobic energy system will be utilized for brief periods of heavy lifting or maneuvering parts and materials in the Shop Stores and after the aerobic energy system becomes fatigued. This fatigue will result from holding and maintaining static sitting postures during the two to three hours of data entry each morning.

Structural Stresses

Spine – the spine is at risk of injury for two reasons. The first has to do with sedentary seated posture required for computer data entry and the second with the dynamic lifting required in this position. A forward flexed sitting posture places significant passive loads on the spinal structures. This results in an increase in asymmetrical disc compression, passive stretch on the posterior ligaments and disc fibres. This can contribute to disc integrity problems over time as well as decondition the torso support musculature. The risk of injury to the Partsman 1 is increased when passive non-neutral postures precede the active lifting requirements. Spinal ligament stability will be compromised and increase the risk of injury when changing from passive to active postures without allowing the spinal ligaments to return to their original length.

Stocking shelves and racks with parts, equipment, lumber, steel, etc. will also place significant stress on the spine. Objects are often large and may be awkward to handle. Unstable lifting techniques may be the only option available to lift, carry and move the material to where it needs to be. A forklift is available but it can not always get into the storage areas so a good deal of hand bombing is required.

Compressive forces transmitted up through the ankles, knees and hips to the spine are likely to be high because the Partsman 1 will stand or walk on concrete and asphalt all day. The Shop Stores counter areas do not have anti-fatigue matting.

Shoulders and Neck – The two to three hour of computer data entry every morning will require the muscles of the rotator cuff, the upper trapezius and scalene muscles of the neck to maintain significant and often constant static load. This can lead to the development of pain and eventually to tendonitis and even possibly contribute to adverse neural tension. If individuals are too low in their sitting position with respect to the desk, static load is increased as the Partsman 1 is required to lift and hold his arms above the desk. The position or lack of a document holder at the computer monitor screen requires that the Partsman 1 maintain an undesirable head position that contributes to muscle shortness and soreness.

Stocking shelves and racks with parts, equipment, lumber, steel, etc. will also place significant stress on the shoulders. Objects are often large and may be awkward to handle. Unstable lifting techniques may be the only option available to lift, carry and move the material to where it needs to be. A forklift is available but it can not always get into the storage areas so a good deal of hand bombing is required.



Arms and Hands – Since the keyboard is on the desktop, the Partsman 1 is forced to hold his wrist in extension. Static wrist extension increases pressure in the Carpal Tunnel and transmits constant static load to the lateral epicondyle (outside) of the elbow. This can increase the risk for developing Carpal Tunnel Syndrome and lateral epicondylitis (tennis elbow) respectively. The arms and hands are also at risk for injury from pinch, crush and cut type injuries and metal and wood splinters would be expected when handling this material without gloves.

Lower Extremities – The Lower Extremities are at risk for injury mainly from the high compressive forces transmitted through the ankles, knees and hips because the Partsman 1 stands and walks on concrete and asphalt for almost the entire day. Slip and fall injuries could occur, as the receiving areas are not always level and unprotected from water.

INTERVENTIONS

Recommendations that could be implemented to increase productivity and lessen the risk of injury are listed below:

1. Encourage the Partsman 1 to maintain an increased level of fitness away from work that will focus on cardiovascular endurance, muscular strength, muscular endurance and flexibility.
2. Provide regular education in effective use of the body and neutral joint positions for this type of work.
3. Adjust monitor heights so that the individual is maintaining a neutral head position when looking at the computer screen (this varies according to individual visual bias).
4. Install a Vu-Ryte document holder to place under the monitor so that the Timecards can be positioned in front of the Partsman 1. This will also decrease the rotated neck posture in the current arrangement and eliminate the frequent reaching for documents.
5. Teach the Partsman 1 to maintain a neutral elbow and shoulder position while working at the keyboard (chair height may need to be increased).
6. Provide a footrest if necessary to maintain normal contact with the floor.
7. Encourage the Partsman 1 to approach keying with more arm movement and avoid fixed arm positions. Do not use wrist rests.
8. Install anti-fatigue matting on the floor at the service counters.
9. Significant hand bombing is required in this position. Investigate alternate storage areas for the steel so that it can be unloaded from the delivery trucks and placed into the storage racks by the Forklift rather than hand bombing. In addition, consideration should be given to reconfiguring or relocating the lumber storage so that a Forklift can be used when handling multiple sheets of plywood and bundles of lumber.
10. In its present form, this position should not be classified as light duty. By implementing the above recommendations, injured individuals can be exposed to less of a risk of injury than they presently are.

Referral: Lana Ho			Organization: City of Burnaby						Title: Partsman 1		
Dept.: Engineering			Division: Shop Stores						Contact: Larry Buday		
PHYSICAL DEMANDS			R E Q U I R E D	S I D E	FREQUENCY*				Max. Weight (kg)	Usual Weight (kg)	COMMENTS
					Sel 1	Low 2	Mod 3	High 4			
S T R E N G T H	Lifting - Floor to Knuckle	X	B		X			53	<1-53	parts, steel, equip., lumber, tools to/from shelf	
	Lifting - Knuckle to Waist	X	B			X		53	<1-53	parts, steel, equip. lumber, tools to/from shelf	
	Lifting - Waist to Shoulder	X	B			X		32	<1-32	parts, steel, equip. lumber, tools to/from shelf	
	Lifting - Over Head	X	B		X			32	<1-32	parts, steel, equip., lumber, tools to/from shelf	
	Carrying - With Handles	X	E		X			32	<1-32	some tools and equipment	
	Carrying - Without Handles	X	B			X		53	<1-53	parts, steel, lumber, equipment, tools	
	Pushing - Upper Extremity	X	E			X		20	<1-20	parts, steel, equipment, lumber from shelf	
	Pushing - Hip/Leg Assist	X	E			X		53	<1-53	parts, steel, equipment, lumber to shelf	
	Pulling - Upper Extremity	X	E			X		20	<1-20	parts, steel, equipment, lumber from shelf	
	Pulling - Hip/Leg Assist	X	E			X		53	<1-53	parts, steel, equipment, lumber from shelf	
	Reach - Shoulder or Above	X	B		X			20	<1-20	stock parts to shelves, stock steel to rack	
	Reach - Sho. or Above ext.	X	B		X			15	<1-15	restock parts to shelves	
	Reach - Below Shoulder	X	B				X	53	<1-53	lift, carry steel, parts, equipment, data entry	
	Reach - Bel. Shoulder ext.	X	B		X			53	<1-53	parts, paper, tools, equipment	
	Handling	X	B				X	53	<1-53	parts, paper, tools, equipment	
E N E R G Y P O S T U R E + M O B I L I T Y G E N E R A L	Gripping	X	B				X	50	<1-50	parts, steel, tools, equipment. Pens	
	Fine Finger Movements	X	D			X		max.	low	data entry, writing, handle parts, tools, equip.	
	Aerobic (percent)	X					90	clerical tasks, stock shelves, general clean up, receive stock			
	Anaerobic (percent)	X		10				heavy lift/carry of brake drums, steel, grader blades, cylinders			
	High Energy Expenditure	X		X				heavy lift/carry of brake drums, steel, grader blades, cylinders			
	Low Energy Expenditure	X					X	clerical tasks, stock shelves, general clean up, receive stock			
	Neck - Static Flexion	X					X	computer data entry, general clean up, receive/stock shelves			
	Neck - Static Neutral	X					X	stand, walk, stock shelves, drive fork lift			
	Neck - Static Extension	X				X		work above shoulders stock shelves, clean			
	Neck - Rotation	X	E		X			data entry from time cards, drive fork lift			
	Throwing										
	Sitting	X				X		fully adjustable chair capable of seat pan tilt			
	Standing	X					X	on concrete floor, asphalt in shop stores, secondary storage			
	Walking	X					X	in shop stores, betw shop stores and storage area, to 50m			
	Running/Jumping										
Climbing - Arms and Legs	X			X			in and out of fork lift				
Climbing - Legs Only	X			X			stairs in shop stores				
Bending/Stooping	X					X	access parts, tools, equipment on shelves, receive material				
Crouching	X			X			access parts, tools, equipment on shelves, receive material				
Kneeling	X		X				access parts, tools, equipment on shelves, receive material				
Crawling											
Twisting	X	E		X			computer on angle at desk for time card data try, drive fork lift				
Balancing											
Traveling											
Work Alone	X					X	perform tasks alone but in Shop Stores with others				
Interact with Public	X				X		delivery drivers				
Operate Equip/Machinery	X				X		computer, fork lift				
Irregular/Extended Hours							0700-1530, Monday - Friday, OT not required				

* Frequency Legend 1 = Seldom; Not Daily 2 = Low Daily Activity; < 1hr
 3 = Moderate Demand; Repetition 1 - 3 hrs daily 4 = High Frequency Demand; Repetition > 3 hrs daily
 The following shading denotes a HIGH RISK TASK: Modifications should be considered

REQD is marked with an X if the particular demand or category is relevant to the purpose of the job.

SIDE refers to the side or limb required to execute a task. If it is marked **E**, it indicates either side, the most common choice is listed first. **D** refers to dominant and **B** to both sides.

Referral:		Organization:						Title: see 1st page header	
Dept.:		Division:						Contact:	
PHYSICAL DEMANDS		R E Q D	S I D E	FREQUENCY*				COMMENTS	
				Sel. 1	Low 2	Mod. 3	High 4		
P E R C E P T I O N	Hearing - Conversations	X					X	other Partsman, delivery drivers, mechanics, carpenters, painters	
	Hearing - Other Sounds	X					X	telephone, door, fork lift, trucks	
	Vision - Far	X						clerical tasks, stock shelves, general clean up, receive stock	
	Vision - Near								
	Vision - Colour	X					X	parts, lumber, steel, aluminum	
	Vision - Depth	X					X	move in/around Shop Stores, parking lot and storage area	
	Perception - Spatial	X					X	move in/around Shop Stores, parking lot and storage area	
	Perception - Form	X				X		parts, steel, lumber, tools, equipment	
	Feeling (Tactile)	X				X		pull/push material to/from storage area and shelves	
	Reading	X				X		time sheets, computer screen, way bills, etc.	
W O R K E N V I R O N M E N T	Writing	X			X			sign for receivables	
	Speech	X					X	other Partsman, delivery drivers, mechanics, carpenters, painters	
	Inside Work	X					X	in Shop Stores, secondary storage, carpentry/mechanic shops	
	Outside Work	X				X		walk betw Shop Stores and Storage, receive material	
	Hot Conditions >25 deg. C	X		X				outside at secondary storage, walk to secondary storage	
	Cold Conditions <10 deg.C	X		X				outside at secondary storage, walk to secondary storage	
	Humid	X		X				wet weather	
	Dust								
	Vapor Fumes	X			X			diesel from delivery trucks, fork lift	
	Hazardous Machines	X				X		computer, fork lift	
T A S K S	Proximity to Moving Object	X				X		drive fork lift, delivery trucks, hand carts loaded with receivables	
	Noise	X					X	ambient office noise, fork lift, delivery trucks	
	Electrical Hazard								
	Sharp Tools	X			X			cutters, utility knife	
	Radiant/Thermal Energy								
	Slippery Conditions	X		X				during rain walking betw Shop Stores and secondary storage	
	Vibration and Related	X			X			drive fork lift, jarring/vibration on spine	
	Chemical Irritants	X		X				paints, solvents, little exposure	
	Organic Substances								
	Medical Waste								
T A S K S	Blood Products								
	Congested Worksite	X					X	in Shop Stores, between shelves	
	Lighting - Direct	X					X	overhead fluorescent, skylight, day light, sun light	
	Lighting - Indirect	X						day light, sun light in Shop Stores and secondary storage	
	Lighting - Adjustable	X				X		task lighting at desk	
	Lighting - Fluorescent	X					X	overhead fluorescent lights in Shop Stores	
	Lighting - Incandescent								
Lighting - Shadows etc.	X		X				depends on time of day, in secondary storage are no direct light		

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For detailed descriptions of each of the different categories, please refer to the reference guide or inquire with Human Effort at 1-888-4EFFORT