

**Job:** Heavy Lift Truck Operator  
**Description:** Drives a variety of different heavy lift trucks on the dock  
**Equipment Assessed:** Racks, Top Picks and Reach Stackers

## ESSENTIAL DUTIES

1. **Operating the Lift Truck**
  - A) Sitting
  - B) Operating Controls
  - C) Operating Foot Pedals
2. **Ascending and Descending the Machine**
3. **Performing Pre-operation Inspection**



### Non Essential Duties:

- Keep inside of vehicle clean and orderly

### Shift Schedule:

There are two 8 hr shifts from 8am-4:30pm and 4:30pm-1am with a 30 minute scheduled lunch break and two 30 minute coffee breaks. There is also a graveyard shift of 6.5 hrs from 1am-8am with a 1/2hr lunch break.

### Staffing:

Lift truck operators work alone in their vehicle.

## DESCRIPTION OF ESSENTIAL DUTIES

### 1. OPERATING THE LIFT TRUCK

#### Frequency

- Typically operates the vehicle for the majority of an 8-hour shift.

#### Equipment

- Fantuzzi and Kalmar 40 ton top picks
- Fantuzzi 9 ton racks
- Fantuzzi and Kalmar 45 ton reach stacker

#### Task Description

- Operator drives the heavy lift truck around the dock to move containers from inbound area of receipt to outbound area or storage area. This may involve moving containers on and off rail cars and street trucks. Racks move empty containers only and top picks and reach stackers move loaded containers. Anywhere from 50-80 containers may be moved per 8hr shift by any of the heavy lift trucks.

<b>A</b>	SITTING			<b>Equipment</b>	Various Heavy Lift Trucks
<b>Duration</b>	up to 8 hours	<b>Frequency</b>	sustained	<b>Force</b>	None

#### Task Overview

- The operator is seated for the duration of the operating task.
- Natural seated posture is typically a rounded upper back and forward head posture.
- Whole-body vibration with driving.
- Frequent extension of the neck to see the elevated load.
- Occasionally twisting of the neck and back when shoulder checking before reversing.

<b>B</b>	HANDLING CONTROLS			<b>Equipment</b>	Steering Wheel, Lift Controls, etc
<b>Duration</b>	up to 8 hours	<b>Frequency</b>	Constant when operating	<b>Force</b>	Minimal to Moderate

#### Task Overview

- Operator has a steering wheel immediately in front which is typically equipped with a 'wheel knob'.
- Joystick and lift controls are to the right side of the steering wheel on a separate console.
- Ignition, lights and other vehicle controls are on the front console behind and to the sides of the steering wheel. The exact location varies depending on the lift truck.
- A power grip is used to grasp the steering wheel, suicide knob, and joystick control.
- Modified pinch grip is used to turn on the ignition.
- Finger or thumb flexion is used to push button controls.

#### Steering Wheel

- Forward reaching with both arms to access the steering wheel or left hand only if using suicide knob to steer.
- Forward, backward and across the body arm and shoulder movements to turn the steering wheel. Typically more left hand work than right as left hand is used primarily for steering, preserving right hand to operate controls.
- Power gripping with left or both hands to hold the steering wheel.

#### Right Hand Controls

- Shoulder forward or sideways reaching to access the joystick and other controls.
- Arm is then moved forwards, backwards, in towards the body or out away from the body to operate the control.
- Arm is typically unsupported during these control movements.
- Small wrist movements in all directions are also be required to manipulate the joystick.
- Wrist rotation into the palm down position is required when moving hand from the joystick to the other console controls.

<b>C</b>	OPERATING FOOT PEDALS			<b>Equipment</b>	Brake and gas
<b>Duration</b>	up to 8 hours	<b>Frequency</b>	Constant when driving	<b>Force</b>	Minimal

#### Task Overview

- Heavy lift trucks have 2 pedals, gas and brake. The brake is to the left of the steering column and operated with the left foot and the gas is to the right of the steering column and operated with the right foot.
- Operating foot pedals requires ankle flexion and extension and some knee extension.

## **x FUNCTIONAL DEMANDS with MSI POTENTIAL**

### **Operating the Lift Truck**

#### **Neck**

- Neck extension to view the raised load or when picking up cans that are stacked 3-5 tiers high.
- Driving lift truck may require neck flexion, extension, side flexion and/or rotation, all of which can place stress on the neck.
- Rounded upper back and forward head posture from sitting hunched can put stress on the neck and upper back.
- Reaching excessively far forward to the steering wheel with unsupported arms, (if seat is too far away) can also stress the upper back and neck.



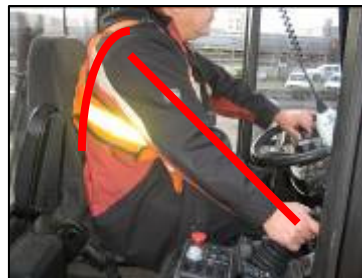
#### **Back**

- Lumbar spine rounds when sitting which places increased stress on the discs and other spinal tissues.
- Increased C-curve forward leaning postures place increased mechanical stress on the back.
- Static use of back muscles from sitting for extended periods can increase fatigue.
- Twisting or side bending postures stress spinal tissues such as when looking behind.



#### **Shoulder**

- Keeping the hands on the steering wheel for extended periods of time without rest promotes static shoulder muscle use, which reduces blood flow to the tissues.
- Sideways or forward reaching with an unsupported right arm to access a poorly adjusted joystick can stress structures in the shoulder and arm.
- Overhead or behind head reaching to sunshade or radio also places stress on the shoulders and upper back.



#### **Elbow/Wrist**

- Non-neutral wrist postures may be used to operate the joystick and other console controls, particularly if the shoulder is kept in a fixed position.
- Over-gripping the steering wheel can fatigue the wrist and forearm muscles.
- Static, awkward postures on the joystick when raising or lowering cans can also fatigue the hand and forearm.
- Repetitive thumb or finger movements when pushing joystick buttons can put mechanical stress on structures in the hand and forearm.



#### **Hips/Knees**

- Knee flexion greater than 90° if seat is too low can put stress on the knee joint.
- Excessive knee and hip extension can increase stress to the lower extremity as may occur if seat is too far away and worker is stretching to reach pedals.

## ✓ **STRATEGIES TO MINIMIZE MSI**

### **Driving the Truck**

#### **Neck**

- Stretch the neck muscles often to allow tissue recovery resulting from awkward postures. Try tucking the chin to place the neck in proper alignment with the spinal column and then rotate the head to one side or the other. Hold the stretch for 20 seconds.
- Keep neck in neutral spinal alignment by avoiding forward head postures.
- As much as possible turn body rather than twisting neck.
- Use cab tilt in top pick to reduce neck extension



File photos

#### **Back**

- As much as possible, avoid sitting for extended periods of time to minimize static use of back muscles.
- Take the opportunity to stretch or walk during scheduled breaks to restore blood flow to the spinal tissues.
- Minimize hunched sitting posture by taking the time to adjust seat for best fit.
- Reverse forward leaning postures by arching the back, squeezing the shoulder blades together and sticking the chest out.



#### **Shoulders**

- Position seat so that steering wheel can be reached without forwards reaching of the arms.
- Perform shoulder stretches as described above during breaks from driving (loading/unloading).
- Adjust joystick position so that it can be accessed with a relaxed shoulder and bent elbow to reduce strain.



#### **Elbow/Wrist**

- Maintain neutral wrist posture when operating joystick; move the whole arm from the shoulder joint to operate the joystick or to reach controls rather than just small wrist movements.
- Let go of the steering wheel when vehicle is stopped to reduce static grip stresses to the elbow, hand and forearm.
- Let go of the joystick when it is not in use and rest hand on thigh to reduce stress to the right forearm, wrist and hand.
- Perform wrist and forearm stretches during breaks or times when the vehicle is stopped and controls can be released.



#### **Hips/Knees**

- Adjust seat to allow access to pedals without excessive knee flexion or extension.



## 2. ASCENDING AND DESCENDING THE VEHICLE

### Frequency

- At the beginning and end of each shift and at the beginning and end of each of 2 coffee breaks and 1 lunch break. May also occur intermittently during the shift if the operator has to get down from the lift truck for other reasons.

### Equipment

- Fantuzzi and Kalmar 40 ton top picks
- Fantuzzi 9 ton racks
- Fantuzzi and Kalmar 45 ton reach stacker

### Task Description

- Operator uses foot and hand holds to climb onto and down from the cab of the lift truck with a 3-point stance. Depending on the vehicle, if there is a high bottom step significant motion of the hips is required to step up to and down from the bottom step.

<b>2</b>	ASCENDING & DESCENDING THE VEHICLE	<b>Equipment</b>	None
<b>Duration</b>	< 10 seconds	<b>Frequency</b>	8 or more times per shift
<b>Force</b>	Bodyweight		



### FUNCTIONAL DEMANDS WITH MSI POTENTIAL

#### Ascending & Descending the Equipment

#### Neck

- Significant neck flexion may occur as the operator looks down to ensure his footing.

#### Shoulder

- Reaching above shoulder height to access the hand holds can put stress on the structures around the shoulder.
- The shoulder and forearm muscles must work to pull the operator up, or lower him/her down from the vehicle.

#### Hip

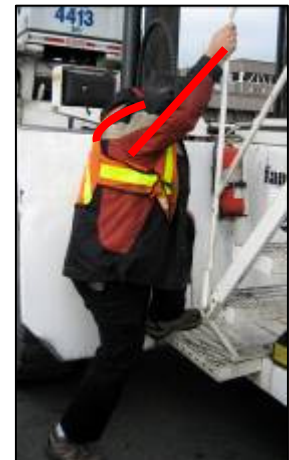
- Significant hip flexion is required when stepping up to or down from the bottom step of some vehicles.
- Possibility for high impact force when descending the vehicle, particularly from higher steps.
- Working at extreme postures requires the hip muscles to develop high forces from a mechanically disadvantageous position.

#### Knee

- Jumping down from the vehicle may place impact stress on the knee joint.
- Ascending the high first step of the vehicle requires quadriceps force which could be significant resulting in increased stress to the patella and knee joint.

#### Ankle

- Jumping down may place stress on the tissues in and surrounding the ankle joint.



## ✓ **STRATEGIES TO MINIMIZE MSI** **Ascending & Descending the Equipment**

### **Neck**

- Avoid sustained neck flexion when ascending or descending the lift truck. Check footing then return to looking in front when climbing in/out.

### **Shoulder**

- Grasp a handle with the palm facing sideways to keep the shoulder joint in a neutral position.
- Hold lower on the handles to reduce the degree of shoulder overhead reaching when ascending/descending.
- Push off with toes of lower foot to assist in ascending the first step.



### **Hip**

- Support the upper body when descending the vehicle to reduce force demands required.
- Control speed of descent from the vehicle to minimize possibility of high impact force.



### **Knee**

- Use both hand and foot supports where possible. Avoid jumping to minimize risk of strains and sprains to the knee joints.
- Control speed of descent to minimize possibility of high impact force.
- Use all steps when descending and do not jump over bottom step.



### **Ankle**

- Use both hand and foot supports where possible. Avoid jumping to minimize risk of strains and sprains to the ankle joints.
- Control speed of descent to minimize possibility of high impact force.

## **3. PERFORMING PRE-OPERATION INSPECTION**

### **Frequency**

- Each time the vehicle is entered (at beginning of the shift and after each coffee break and lunch break). Typically 4 times/shift.

### **Equipment**

- Fantuzzi and Kalmar 40 ton top picks
- Fantuzzi 9 ton racks
- Fantuzzi and Kalmar 45 ton reach stacker

### **Task Description**

- Operator walks around the vehicle and visually checks the tires, lug nuts, lights, condition of the vehicle body, hoses, and looking for leaks or other problems. If something looks amiss he may bend down or reach out to check something more closely.

**NOTE:** The joint ranges of motion required to perform the visual inspection is significantly less than the postural ranges required to operate the lift truck. As well, the operator is free to use a variety of different body postures to perform the visual inspection so MSI risks for this task are relatively low. The following points outline potential areas of stress and offer alternate postures, but overall the risk is low compared to other duties of the heavy lift truck operator.

<b>3</b>	PERFORMING THE PRE-OPERATIONAL INSPECTION			<b>Equipment</b>	None
<b>Duration</b>	1-2 minutes	<b>Frequency</b>	4 times per shift	<b>Force</b>	None

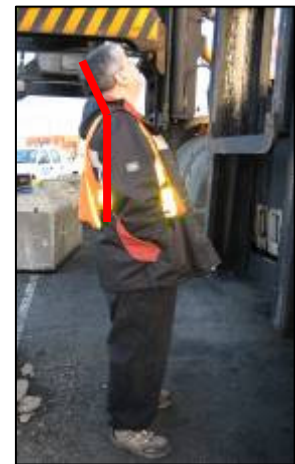
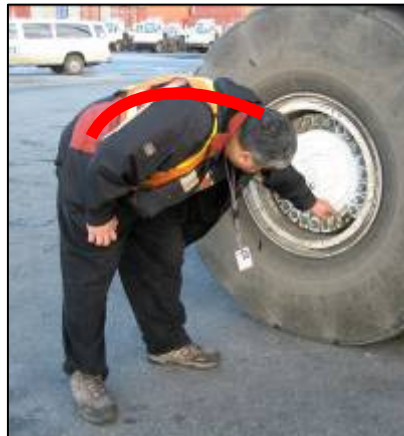
## **FUNCTIONAL DEMANDS WITH MSI POTENTIAL** **Performing the Pre-Operation Inspection**

### **Neck**

- Neck rotation, flexion and extension are required as the operator visually inspects the vehicle.

### **Back**

- Operator may be required to bend or stoop to perform a closer inspection of something that looks amiss or when checking tractor and trailer coupling. This posture can put stress on the back.



### **Knees**

- Operator may be required to kneel or squat to perform a closer inspection of something that looks amiss. This posture can put stress on the knees.

## **STRATEGIES TO MINIMIZE MSI** **Performing Pre-Operational Inspection**

### **Neck**

- Turn body by moving feet and pivoting to reduce the degree of neck rotation required.

### **Back**

- Maintain inward curve of the low back when bending, rather than bending forward at the waist and rounding the lower back. If necessary support upper body weight with one hand on thigh while bending.

### **Knees**

- Support body weight with hand on thigh when getting up from kneeling or squatting.
- Pull up on vehicle to assist in returning to standing from kneeling or squatting
- Minimize knee stress by kneeling on one knee and keeping other knee bent to 90° or less.



File Photo of Low Risk Posture

## 4. ENVIRONMENTAL CONSIDERATIONS

### Exposure to Elements

- The operator is inside the vehicle cab for the duration of the time he is operating the vehicle. Most lift trucks have climate controls systems including heating and air conditioning.
- The operator is exposed to the elements when ascending/descending the vehicle, performing the pre-operational inspection and when walking to/from the lunch room.

### Uneven Surfaces

- The operator may drive over uneven surfaces such as gantry rails and other pavement asymmetries during regular vehicle operation. This may result in sudden bumps or jolts in addition to that associated with regular vehicle vibration.
- The degree of lateral sway and vertical bounce is increased if driving over uneven pavement with a heavy container and at times can be significant.
- The jolting and bouncing is also typically greater for racks than for top picks or reach stackers.

### Vibration

- The operator is exposed to whole body vibration throughout operation of the vehicle.



## 5. PHYSICAL DEMANDS SUMMARY TABLE

Job Demands		Max. Weight/ Avg. Weight (Kg)	Duration per exposure h=hrs s=secs, m=mins	Frequency	Comments
<b>STRENGTH</b>	Lifting/Carry			N	
	Push/Pull	5/<5	<5s	F	Manipulating joystick, open close cab door
	Supporting Body Weight		<10s	R	Climb in/out of vehicle
	Gripping / Handling		8hrs	C	Steering wheel, joystick, controls, climb in/out
	Fine Motor Skills		6hrs	C	Manipulating Joystick
<b>POSTURE &amp; MOBILITY</b>	Sitting		8hrs	C	
	Driving		8hrs	C	
	Standing		<1m	R	Pre-op inspection
	Walking		< 5m	O	Pre-op inspection, walking to/from breaks
	Bending/ Stooping		<10s	R	Pre-op inspection, hunching to look out windows on a wet day, or when dealing with sun glare
	Sustained Crouching/ Kneeling			N	
	Climbing Stairs		<10s	R	Climb in/out of lift truck
	Climbing Ladders		<20s	R	If have to clean window on far side of cab
	Crawling			N	
	Balancing		<20s	R	On steps/ladder to climb in/out of vehicle
	Throwing			N	
	Overhead Reach		<5s	R	Handles when climbing in/out and overhead sunshade or radio in cab
<b>ENVIRONMENT</b>	Exposure to Elements		<2m	O	Pre-op inspection, walk to/from vehicle
	Uneven/Slippery Surfaces		<10s	O	Driving over gantry rails or uneven pavement areas, wet or icy steps to the cab
	Proximity to moving objects		8hrs	F	Other vehicles, gantries, etc
	Vibration (upper extremity)			N	
	Vibration (whole body)		8hrs	C	Driving in lift truck

### Frequency Ratings:

**N:** Never

**R:** Rare - Not daily or up to 1% of shift (<5mins/day)

**O:** Occasional - 1%-33% of shift (up to 2.5hrs)

**F:** Frequent - 34%-67% of shift (2.5-5hrs)

**C:** Constant ->67% of shift (>5hrs)