

CASE STUDY - Fork Truck Operation (standing)

TASK TITLE: Fork Truck Operation (standing)

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|---|--|
| Task Description: | <p>The Fork Truck Operation (standing) task primarily requires the driver to stand while operating the lift truck. This type of truck is most commonly associated with obtaining stock from pick tunnels in a warehouse setting. This driving task may also include the use of standing trucks known as “mules” which may be used to push or pull carts and/or transport palletized loads. This case study does not include lifting tasks associated with obtaining stock from pick tunnels. For lifting tasks associated with picking stock from pick tunnels, please see Case Study 17 – Picking/Stocking. Also refer to Case Study 11 – Loading and Unloading, or Case Study 22 – Lifting.</p> <p>Typical environments in which the standing driving task occurs include (not necessarily limited to):</p> <ul style="list-style-type: none">• Stock picker/pick tunnel• General warehouse material handler. |
| Job Performance Measures Most Often Impacted by Fork Truck Operation (standing): | <p>Measure of work performance can include (but are not necessarily limited to):</p> <ul style="list-style-type: none">• Pick rate• Number of loads per day. |
| Typical Employee Comments about Fork Truck Operation (standing): | <p>Employees typically experience discomfort in the low back, and shoulders.</p> <p>The back/torso and legs/knees/feet are the body areas that most commonly receive a “High” priority rating. The remaining body areas, with the exception of the head/eyes, are more likely to receive a “Medium” priority rating, or lower.</p> |
| Suggested Level II Analysis: | <p>Postural Analysis, Vibration Analysis, Biomechanical Lifting Analysis, NIOSH Lifting Equation</p> |

Shoulder/Neck

| Job Factor | Potential Causes | Corrective Action | Level of Changes | | Cost | Impact On | |
|--|--|--|----------------------------|----------------------|------|-----------|--------------|
| | | | ✓ Minor Modification | ✓ Major Change | | Quality | Productivity |
| 1. Reaching | <ul style="list-style-type: none"> Controls levers are too high or too far away | 41. Move work piece closer to body <ul style="list-style-type: none"> relocate or lower keypads or other stock tracking equipment | ✓ | | low | low | med |
| 2. Arm forces: Repeated arm forces or holding/ carrying materials | <ul style="list-style-type: none"> Pulling control levers is difficult due to poor lever maintenance or poor lever design Turning steering wheel is difficult due to poor maintenance or poor design (e.g., non-powered) | 101. Provide appropriate controls which do not require excessive force <ul style="list-style-type: none"> contact supplier to investigate adjustable and/or smoother traveling levers | | ✓ | high | low | med |
| | | 148. Provide appropriate equipment <ul style="list-style-type: none"> contact supplier to investigate power steering | | ✓ | high | low | med |
| | | 35. Maintain tracks, rollers, and movement mechanisms <ul style="list-style-type: none"> maintain equipment to reduce forces associated with lever action and steering | ✓ | low to med | low | low | |
| 3. High speed, sudden shoulder movements | <ul style="list-style-type: none"> Rarely occurs | N/A | | | | | |

Shoulder/Neck (cont'd)

| Job Factor | Potential Causes | Corrective Action | Level of Changes | | Cost | Impact On | |
|------------------------------|---|--|----------------------------|----------------------|------|-----------|--------------|
| | | | ✓ Minor Modification | ✓ Major Change | | Quality | Productivity |
| 4. Head/neck bent or twisted | <ul style="list-style-type: none"> • Work location/path of travel located behind operator | 147. Provide an alternate container <ul style="list-style-type: none"> • reduce the height of pallet loads when practical | ✓ | | low | med | med |
| | | 13. Encourage ergonomic work techniques <ul style="list-style-type: none"> • encourage the operator to shift his/her whole body rather than just the head/neck | ✓ | | low | low | low |
| | | 20. Incorporate rest pauses | ✓ | | low | low | low |
| | | 25. Increase task variety | ✓ | | low | low | low |
| | <ul style="list-style-type: none"> • Looking up at stacks for prolonged periods • Difficult to see around overhead guarding | 84. Provide an adjustable mirror <ul style="list-style-type: none"> • provide mirrors for seeing high up | | ✓ | med | low | low |
| | | 148. Provide appropriate equipment <ul style="list-style-type: none"> • select models with improved cage visibility • replace cage with reinforced clear plastic sheet | | ✓ | high | med | med |
| | <ul style="list-style-type: none"> • Controls are too high or too far away | 41. Move work piece closer to body <ul style="list-style-type: none"> • relocate or lower keypads or other stock tracking equipment | ✓ | | low | low | med |

Hands/Wrists/Arms

| Job Factor | Potential Causes | Corrective Action | Level of Changes | | Cost | Impact On | |
|---|--|--|----------------------------|----------------------|------|-----------|--------------|
| | | | ✓ Minor Modification | ✓ Major Change | | Quality | Productivity |
| 5. Bent wrists/repeated wrist movements or repeated forearm rotation | <ul style="list-style-type: none"> Fork truck control design requires operator to repeatedly bend the wrist back and forth. | 35. Maintain tracks, rollers, and movement mechanisms <ul style="list-style-type: none"> maintain fork truck controls to require a minimum of wrist movement 101. Provide appropriate controls which do not require excessive force <ul style="list-style-type: none"> contact supplier to investigate adjustable levers or speed knob option to improve wrist posture | ✓ | | low | low | med |
| 6. Repeated manipulations with fingers | <ul style="list-style-type: none"> Rarely occurs | N/A | | | | | |
| 7. Hyper-extension of finger/thumb or repeated single finger activation | <ul style="list-style-type: none"> Wide handle span or single finger activation on fork truck controls | 101. Provide appropriate controls which do not require excessive force <ul style="list-style-type: none"> provide controls with multi-finger triggers and which allows the thumb and finger to be together | | ✓ | high | low | low |
| 8. Hand/grip forces | <ul style="list-style-type: none"> Pulling control levers is difficult due to poor lever maintenance or poor lever design | 101. Provide appropriate controls which do not require excessive force <ul style="list-style-type: none"> contact supplier to investigate adjustable and/or smoother traveling levers | | ✓ | high | low | med |

Hands/Wrists/Arms (cont'd)

| Job Factor | Potential Causes | Corrective Action | Level of Changes | | Cost | Impact On | |
|---|--|--|----------------------------|----------------------|----------------|----------------|----------------|
| | | | ✓ Minor Modification | ✓ Major Change | | Quality | Productivity |
| | <ul style="list-style-type: none"> Turning steering wheel is difficult due to poor maintenance or poor design (e.g., non-powered) | 148. Provide appropriate equipment <ul style="list-style-type: none"> contact vendor to investigate purchase of powered steering option 35. Maintain tracks, rollers, and movement mechanisms <ul style="list-style-type: none"> maintain equipment to reduce forces associated with lever action and steering | | ✓ | high | low | med |
| | | | ✓ | | low | low | low |
| 9. High speed hand/wrist/arm movements or vibration, impact or torque to the hand | <ul style="list-style-type: none"> Fork truck control design requires operator to repeatedly bend the wrist back and forth. | 35. Maintain tracks, rollers, and movement mechanisms <ul style="list-style-type: none"> maintain fork truck controls to require a minimum of wrist movement | ✓ | | low | low | low |
| 10. Exposure to hard edges | <ul style="list-style-type: none"> Rarely occurs | N/A | | | | | |
| 11. Hand/fingers exposed to cold temperatures | <ul style="list-style-type: none"> Work area is too cold | 93. Provide appropriate gloves 12. Encourage appropriate seasonal clothing | ✓ ✓ | | low low | low low | low low |

Back/Torso

| Job Factor | Potential Causes | Corrective Action | Level of Changes | | Cost | Impact On | |
|---|--|--|----------------------------|----------------------|------------|-----------|--------------|
| | | | ✓ Minor Modification | ✓ Major Change | | Quality | Productivity |
| 12. Repeated forward or sideways bending movements | <ul style="list-style-type: none"> Looking at stack for bar code | 18. Improve visual access to work <ul style="list-style-type: none"> increase size of pallet rack's bar code label | | ✓ | low to med | med | med |
| 13. Twisting of the lower back | <ul style="list-style-type: none"> Looking at stack for bar code | 18. Improve visual access to work <ul style="list-style-type: none"> increase size of pallet rack's bar code label | | ✓ | low to med | med | med |
| 14. High speed, sudden movements or Lifting awkward, uneven, shifting or bulky items. | <ul style="list-style-type: none"> Rarely occurs | N/A | | | | | |
| 15. Static, awkward back postures | <ul style="list-style-type: none"> Viewing around load Looking up at stacks for prolonged periods Difficult to see around overhead guarding | 147. Provide an alternate container <ul style="list-style-type: none"> reduce the height of pallet loads when practical | ✓ | | low | med | med |
| | | 84. Provide an adjustable mirrors | ✓ | | low | low | low |
| | | 84. Provide adjustable mirrors <ul style="list-style-type: none"> provide mirrors for seeing high up | ✓ | | low | low | low |
| | | 148. Provide appropriate equipment <ul style="list-style-type: none"> select models with improved cage visibility | | ✓ | high | med | med |
| | | <ul style="list-style-type: none"> replace cage with reinforced clear plastic sheet | | ✓ | med | med | med |

Back/Torso (cont'd)

| Job Factor | Potential Causes | Corrective Action | Level of Changes | | Cost | Impact On | |
|--------------------------|--|--|----------------------------|----------------------|-------------|-----------|--------------|
| | | | ✓ Minor Modification | ✓ Major Change | | Quality | Productivity |
| | <ul style="list-style-type: none"> Difficult to see around overhead guarding | 11. Eliminate unnecessary tasks <ul style="list-style-type: none"> move entire pallet rather than moving heavy objects off the pallet. This may require relocating the stock location | ✓ | | low to high | low | med |
| 16. Lifting forces | <ul style="list-style-type: none"> Rarely occurs | N/A | | | | | |
| 17. Pushing or pulling | <ul style="list-style-type: none"> Rarely occurs | N/A | | | | | |
| 18. Whole body vibration | <ul style="list-style-type: none"> Truck or standing surface may increase exposure to vibration Floor/surface condition causes shock or high forces during transport | 35. Maintain tracks, rollers, and movement mechanisms <ul style="list-style-type: none"> keep fork trucks in top condition and conduct vibration measurement when appropriate | ✓ | | low | low | low |
| | | 17. Improve floor condition <ul style="list-style-type: none"> repair cracks or gaps in floor | | ✓ | high | low | med |

Legs/Feet

| Job Factor | Potential Causes | Corrective Action | Level of Changes | | Cost | Impact On | |
|---|--|--|----------------------------|----------------------|---------------------------|------------|--------------|
| | | | ✓ Minor Modification | ✓ Major Change | | Quality | Productivity |
| 19. Fixed position, standing | <ul style="list-style-type: none"> Rarely occurs | N/A | | | | | |
| 20. Exposure to hard edges on legs, knees, and feet <u>or</u> Standing on hard surfaces | <ul style="list-style-type: none"> Leaning against racks or cages may expose legs to hard edges | 9. Eliminate exposure to hard edges <ul style="list-style-type: none"> wrap hard edges of cages with padding provide knee pads when appropriate | ✓ | | low | low | low |
| | | | ✓ | | low | low | low |
| 21. Awkward leg postures | <ul style="list-style-type: none"> Operating foot pedals Lack of foot space | 101. Provide appropriate controls which do not require excessive force <ul style="list-style-type: none"> substitute hand controls for foot controls 50. Provide a foot pedal which requires the correct amount of force to use <ul style="list-style-type: none"> provide heel support for foot pedal provide a place to rest back while operating the pedal 80. Provide adequate leg clearance <ul style="list-style-type: none"> contact vendor to investigate alternative vehicles with increased leg clearances | | ✓ | med to high | low | low |
| | | | ✓ | | low to med low to high | low med | low med |
| | | | | ✓ | med to high | med | med |

Legs/Feet

| Job Factor | Potential Causes | Corrective Action | Level of Changes | | Cost | Impact On | |
|---------------------------|---|--|----------------------------|----------------------|-------------|-----------|--------------|
| | | | ✓ Minor Modification | ✓ Major Change | | Quality | Productivity |
| 22. Awkward foot postures | <ul style="list-style-type: none"> Operating foot pedals Lack of foot space | 134. Replace standing foot pedals with alternative controls <ul style="list-style-type: none"> substitute hand controls for foot controls | | ✓ | med to high | low | low |
| | | 145. Modify foot pedal <ul style="list-style-type: none"> provide a heel support for foot pedal | ✓ | | low to med | low | low |

Head/Eyes

| Job Factor | Potential Causes | Corrective Action | Level of Changes | | Cost | Impact On | |
|--|---|--|----------------------------|----------------------|------------|-----------|--------------|
| | | | ✓ Minor Modification | ✓ Major Change | | Quality | Productivity |
| 23. Difficult to see/light levels too low/too high | <ul style="list-style-type: none"> • Hard to read stock list | 18. Improve visual access to work <ul style="list-style-type: none"> • provide task light inside truck to illuminate stock list | | ✓ | low to med | med | med |
| 24. Intensive visual tasks, staring at work objects for long periods | <ul style="list-style-type: none"> • Rarely occurs | N/A | | | | | |

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