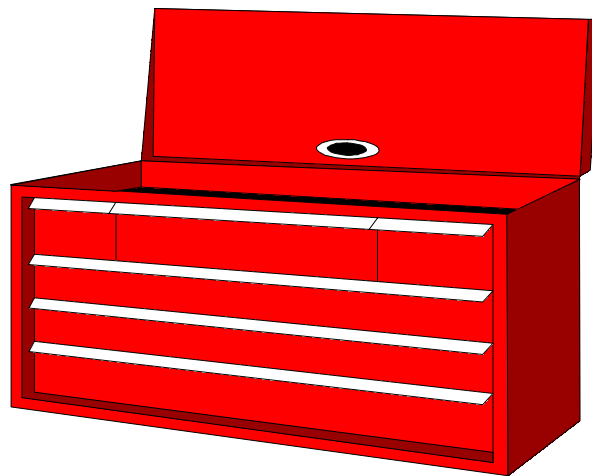


INDUSTRIAL MUSCULOSKELETAL INJURY REDUCTION PROGRAM

Common Industry Jobs (CIJs) Headrig Tailsawyer Tool Kit



IMIRP program coordinated by:



Council of
Forest
Industries



Industrial
Wood & Allied
Workers of
Canada



Advanced
Ergonomics
Inc.

In cooperation with the Workers' Compensation Board of British Columbia

HEADRIG TAILSAWYER TOOL KIT

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Headrig Tailsawyer
Tool Kit

Overview

Headrig Tailsawyer

Job Summary

A Headrig Tailsawyer is responsible for guiding pieces of wood cut by the headrig carriage onto rollers. A Headrig Tailsawyer uses controls to direct the wood to the appropriate locations and to manipulate the wood to straighten. This straightening may also be performed manually, using tools to assist. A Headrig Tailsawyer also monitors the flow of wood and performs clean-up duties. Refer to the Physical Demands Analysis for more detail.

Physical Demands

The physical demands of the Headrig Tailsawyer may include:

- a) Forceful movements of the shoulder, elbow/wrist, and low back
- b) Awkward postures of the neck, shoulder, elbow/wrist, and low back
- c) Repetitive forward reaching to pull or push slabs of wood with hand tools, affecting the tissues of the shoulders and low back
- d) Repetitive twisting of the neck
- e) Pulling, pushing, and lifting wood manually and with hand tools
- f) Pulling or pushing with the trunk rotated, in a seated posture
- g) Standing for long periods of time

Mental Demands

A Headrig Tailsawyer must remain alert when guiding wood onto chains. The speed of the headrig carriage and the close proximity increases the risk of injury. A Headrig Tailsawyer makes frequent decisions to discard the wood or send it to the appropriate location.

Major Variations

With different mills, the following major variations may be found:

- 1) A Headrig Tailsawyer job may be automated and controlled from a booth (see the Booth Toolkit for more details)
- 2) A Headrig Tailsawyer may manually handle slabs of wood:
 - a) While seated
 - b) While standing
- 3) Rollers can be positioned:
 - a) At waist height
 - b) On the floor

Minor Variations

With different mills, the following minor variations may be found:

- 1) A Headrig Tailsawyer may use different tools to guide wood onto rollers, such as:
 - a) A picaroon
 - b) A peevee
 - c) A slab hook

Physical Demands Analysis Headrig Tailsawyer

PDA General Instructions: Headrig Tailsawyer

The purpose of this PDA is to familiarise healthcare professionals with the physical demands of a Headrig Tailsawyer. This PDA can be used to gather information about an individual's job and to assist in developing a rehabilitation and return-to-work plan. It is not intended for use in claims adjudication.

Where applicable, common industry job data (e.g., hand tools, tasks) have been included in the tables of this document. The information reported was collected from a sample of Headrig Tailsawyers in the BC Sawmill Industry. However, the PDA requires completion by the healthcare professional, with input from the injured worker to highlight tasks that aggravate the injury or prevent the worker from returning to their job. The worker's supervisor may be contacted for further information or verification of tasks.

A PDA should be filled out for each individual worker following an injury. Subsequent changes in the work process may reduce the accuracy of any pre-existing physical demands assessments. The IMIRP Society accepts no responsibility for the use or misuse of this Physical Demands Analysis, or for the accuracy of the PDA as it applies to any specific workplace.

Disclaimer

*The IMIRP Society accepts no responsibility for the use or misuse of the PDA,
or the accuracy of the PDA as it applies to any specific workplace.*

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Physical Demands Analysis Headrig Tailsawyer

Task List

For each of the tasks listed below, please indicate whether it occurs at your mill.

Guide slab onto rollers

A Headrig Tailsawyer guides cut pieces (slabs, boards) onto rollers with a picaroon or other hand tool. The Headrig Tailsawyer may also perform this task with their hands directly.

Does this task occur at your mill?

- Yes No



Operate controls

A Headrig Tailsawyer operates roller controls to advance or reverse slabs and lumber, to ensure transfer to the appropriate locations.

Does this task occur at your mill?

- Yes No



Monitor flow of wood

A Headrig Tailsawyer monitors the flow of wood being cut from the logs, to look for scrap wood and to prevent jam-ups.

Does this task occur at your mill?

- Yes No



Clean-up

A Headrig Tailsawyer cleans debris that accumulates on the rollers or deck.

Does this task occur at your mill?

- Yes No



Job Profile

Date: _____

Company Name: _____

Division: _____

Employee Name: _____

Supervisor: _____

Phone: _____

Fax: _____

Is a Return-to-Work (RTW) strategy in place? Yes No

If yes, check all that apply: Modified Job Modified Worksite Graduated RTW

Describe:

Length of shift _____ hours

Formal breaks

- Two 10 minute breaks
- One 30 minute lunch break
- Other: _____

Informal breaks

- Yes, length of break varies
- Yes, _____ minutes/shift

Work pace control

- Self-paced
- Time pressure (e.g., completing a task during the 30 minute lunch break)
- Other: _____

Job rotation

Describe:

Yes No

Work Organisation

Task Description

The table below contains a list of tasks performed by a Headrig Tailsawyer. Use the left column to check off tasks that are present. Estimate the *Percent of Shift* each task is performed and place a check mark in the appropriate column. The *Comments* section may be used to include information related to duration, frequency, and cycle times. Additional tasks can also be included under *Other*.

| Task | Percent of Shift | | | | Comments |
|--------------------------------|-------------------|--------------------------|-------------------------|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Rarely 0 to 5% | Occasionally 6 to 33% | Frequently 34 to 66% | Constantly 67 to 100% | |
| <i>Guide slab onto rollers</i> | | | | | <ul style="list-style-type: none"> • Frequency will vary depending on the number of pieces cut per shift (e.g., 20 logs per hour at an average of 4 cuts per log) • May not handle each piece of wood cut from each log |
| <i>Operate controls</i> | | | | | <ul style="list-style-type: none"> • Location and type of controls may vary between mills • Types of controls most commonly observed are button controls; others include pull cords and levers |
| <i>Monitor flow of wood</i> | | | | | <ul style="list-style-type: none"> • Repetitive neck twisting is required • Frequency depends on the number of pieces cut |
| <i>Clean-up</i> | | | | | <ul style="list-style-type: none"> • As required |
| <i>Other:</i> | | | | | |
| | | | | | |
| | | | | | |

Workstation Characteristics

Dimensions & Layout

Sketch workstation(s) and indicate relevant measurements, such as working heights and reaches.

Flooring, Displays and Seating

The table below lists several components of a workstation. For *Flooring* and *Displays* there are several options provided. Please indicate all of the options that apply to the workstation. For the *Seating* section, describe and identify the features of the seat, if applicable. The *Comments* section may be used to include additional information, especially any workstation characteristics of concern.

| Workstation Characteristics | Comments |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| <p>Flooring (<i>Check all that apply</i>)</p> <p><input type="checkbox"/> Cement</p> <p><input type="checkbox"/> Wood</p> <p><input type="checkbox"/> Rubber matting</p> <p><input type="checkbox"/> Metal</p> <p><input type="checkbox"/> Other _____</p> | |
| <p>Displays (<i>Check all that apply</i>)</p> <p><input type="checkbox"/> Lights on console</p> <p><input type="checkbox"/> Mirrors</p> <p><input type="checkbox"/> Video monitors</p> <p><input type="checkbox"/> Computer monitors</p> <p><input type="checkbox"/> Scrolling display</p> <p><input type="checkbox"/> Signal lights</p> <p><input type="checkbox"/> Other _____</p> | |
| <p>Seating (<i>Check all that apply</i>)</p> <p><input type="checkbox"/> Armrests</p> <p><input type="checkbox"/> Backrest</p> <p><input type="checkbox"/> Swivel seat</p> <p><input type="checkbox"/> Slide track</p> <p><input type="checkbox"/> Lumbar support</p> <p><input type="checkbox"/> Foot rest</p> <p><input type="checkbox"/> Casters # _____</p> <p><i>Indicate if adjustable:</i></p> <p><input type="checkbox"/> Height</p> <p><input type="checkbox"/> Armrests</p> <p><input type="checkbox"/> Backrest</p> <p><input type="checkbox"/> Forward tilt</p> | <p>Height of seat: _____ cm</p> <p>Depth of seat: _____ cm</p> <p>Width of seat: _____ cm</p> <p>Covering type: _____</p> |

Equipment & Machinery Controls

The table below contains a list of the types of controls used by a Headrig Tailsawyer. Use the left column to check off controls that are present at the work site. Highlight controls that may aggravate the injury, or which the worker finds difficult to use. The *Comments* section may be used to include any additional information. Further controls can be included under *Other*.

| Type of Control | Function | Comments | |
|-----------------|---------------------|--------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <i>Push Buttons</i> | <ul style="list-style-type: none"> • <i>Lifts chains</i> | <ul style="list-style-type: none"> • <i>Performed frequently throughout the shift</i> • <i>May be required for every piece</i> |
| | <i>Levers</i> | <ul style="list-style-type: none"> • <i>Reverse rollers</i> | <ul style="list-style-type: none"> • <i>Used as needed</i> |
| | <i>Pull cords</i> | <ul style="list-style-type: none"> • <i>Lifts chains or catchers</i> | <ul style="list-style-type: none"> • <i>Performed frequently throughout the shift</i> |
| | <i>Foot pedals</i> | <ul style="list-style-type: none"> • <i>Activates bumpers</i> • <i>Raises chains</i> | <ul style="list-style-type: none"> • <i>Performed frequently throughout the shift</i> |
| | <i>Other:</i> | | |
| | | | |
| | | | |

Physical Demands


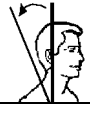




Whole Body Physical Demands

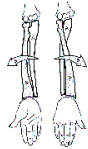

Identify each of the physical demands required by a Headrig Tailsawyer and list the corresponding tasks in the second column. Check off (✓) the estimated *Percent of Shift*, and use the *Comments* section to include information related to duration, frequency, and cycle times.

| Physical Demands | Tasks or Activity | Percent of Shift | | | | Comments |
|--------------------------------|---------------------------------------------------------------------------|-------------------|--------------------------|-------------------------|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | Rarely 0 to 5% | Occasionally 6 to 33% | Frequently 34 to 66% | Constantly 67 to 100% | |
| <i>Example: Standing</i> | <ul style="list-style-type: none"> Guide slab onto rollers | | | | ✓ | <ul style="list-style-type: none"> No seating available to rest when there is a break in the flow of wood Forceful pulling may be required - standing provides better leverage to perform this task |
| <i>Walking</i> | | | | | | |
| <i>Sitting</i> | | | | | | |
| <i>Standing</i> | | | | | | |
| <i>Climbing</i> | | | | | | |
| <i>Balancing</i> | | | | | | |
| <i>Kneeling/ Crouching</i> | | | | | | |
| <i>Other:</i> | | | | | | |





Body Postures





The table below outlines the body postures that may be adopted throughout the shift by a Headrig Tail Sawyer, related to tasks. Check off (✓) the estimated *Percent of Shift*, and use the *Comments* section to include information describing posture duration, frequency, cycle times, and hand used.

| Body Posture | Task(s) | Percent of Shift | | | | Comments |
|------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|-------------------|--------------------------|-------------------------|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | Rarely 0 to 5% | Occasionally 6 to 33% | Frequently 34 to 66% | Constantly 67 to 100% | |
| <i>Example: Neck Twisting</i> | <ul style="list-style-type: none"> Monitor flow of wood | | | | ✓ | <ul style="list-style-type: none"> Degree of neck rotation varies depending on the position of the rollers The closer the rollers, the greater the amount of neck rotation required |
| Neck | | | | | | |
| Flexion  | | | | | | |
| Extension  | | | | | | |
| Twisting  | | | | | | |
| Shoulder | | | | | | |
| Flexion  | | | | | | |
| Abduction/adduction  | | | | | | |
| Extension  | | | | | | |

| Body Posture | Task(s) | Percent of Shift | | | | Comments |
|-------------------------------------------------------------------------------------------------------------|---------|-------------------|--------------------------|-------------------------|--------------------------|----------|
| | | Rarely 0 to 5% | Occasionally 6 to 33% | Frequently 34 to 66% | Constantly 67 to 100% | |
| Forearm | | | | | | |
| <i>Rotation</i>  | | | | | | |
| Wrist | | | | | | |
| <i>Wrist Movements</i>  | | | | | | |
| Hand/Fingers | | | | | | |
| <i>*Handling</i> | | | | | | |
| <i>*Fingering</i> | | | | | | |
| <i>*Gripping</i> | | | | | | |

Legend for Hand/Fingers

| | | | | |
|------------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| <i>Handling</i> | <i>grasping, turning, holding, etc.</i> | | | |
| <i>Fingering</i> | <i>picking, pinching, etc.</i> | | | |
| <i>Gripping</i> | <i>Power</i>  | <i>Pinch</i>  | <i>Hook</i>  | <i>Precision</i>  |

| Body Posture | Task(s) | Percent of Shift | | | | Comments |
|-------------------------------------------------------------------------------------------------------------|---------|-------------------|--------------------------|-------------------------|--------------------------|----------|
| | | Rarely 0 to 5% | Occasionally 6 to 33% | Frequently 34 to 66% | Constantly 67 to 100% | |
| Back | | | | | | |
| <i>Flexion</i>  | | | | | | |
| <i>Lateral Flexion</i>  | | | | | | |
| <i>Twisting</i>  | | | | | | |
| <i>Extension</i>  | | | | | | |

Manual Material Handling

The table below contains a list of general manual material handling activities performed by a Headrig Tailsawyer. Indicate tasks that require one or more of these activities, and fill in the weight of the objects, or the force required, for each action. Check off (✓) the estimated *Percent of Shift*, and use the *Comments* section to include information related to duration, frequency, cycle times, and characteristics of objects handled. If necessary, please refer to Appendix A to calculate the weight of the wood being handled.

| Activity | Task Description | Weight (kg) | Percent of Shift | | | | Comments |
|-----------------|------------------|-------------|-------------------|--------------------------|-------------------------|--------------------------|----------|
| | | | Rarely 0 to 5% | Occasionally 6 to 33% | Frequently 34 to 66% | Constantly 67 to 100% | |
| <i>Pushing</i> | | | | | | | |
| <i>Pulling</i> | | | | | | | |
| <i>Lifting</i> | | | | | | | |
| <i>Lowering</i> | | | | | | | |
| <i>Carrying</i> | | | | | | | |

Hand Tools

Indicate the hand tools used by a Headrig Tail Sawyer by placing a check mark (✓) in the far left column. Determine the weight of the hand tool and enter it in the appropriate column. Check off (✓) the estimated *Percent of Shift*, and use the *Comments* section to include information related to duration, frequency, cycle times, and characteristics of objects handled.

| Type of Tool | Task(s) | Weight (kg) | Percent of Shift | | | | Comments |
|------------------------|---------|-------------------|-------------------|--------------------------|-------------------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------|
| | | | Rarely 0 to 5% | Occasionally 6 to 33% | Frequently 34 to 66% | Constantly 67 to 100% | |
| <i>Picaroon</i> | | <i>1.5 to 1.7</i> | | | | | <ul style="list-style-type: none"> Used with slabs that are farther away from the body |
| <i>Peevee</i> | | <i>4.4 to 5.3</i> | | | | | <ul style="list-style-type: none"> Used when required |
| <i>Slab hook</i> | | <i>0.5</i> | | | | | <ul style="list-style-type: none"> Used when lumber is closer to the operator Often made in-house |
| <i>Air hose</i> | | <i>1.9</i> | | | | | <ul style="list-style-type: none"> Used as needed |
| <i>Modified shovel</i> | | <i>2.4</i> | | | | | <ul style="list-style-type: none"> Used to push sawdust and debris between chains |
| <i>Other:</i> | | | | | | | |
| | | | | | | | |
| | | | | | | | |

Environmental Conditions

Work Environment

The table below contains a list of environmental conditions that may be of concern. If any of these factors aggravate the injury, describe in the *Comments* section.

| Factor | Comments |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| Vibration (Indicate source) <input type="checkbox"/> Seat <input type="checkbox"/> Floor <input type="checkbox"/> Tool <input type="checkbox"/> Other: _____ | |
| Noise level | |
| Lighting level | |
| Other: | |

Location of Workstation

The table below contains a list of potential work environments. Indicate with a check mark (✓) in the left column which of the work environments apply to the specific workstation. For example, the workstation may be inside a building with both a local fan and heater, exposed to the outside by a doorway that is always open. In this situation, 'Inside exposed', 'Heater present', and 'Fan present' would all be checked.

| Work Environment | |
|------------------|-------------------|
| | Outside uncovered |
| | Outside covered |
| | Inside enclosed |
| | Inside exposed |
| | Heater present |
| | Fan present |

Temperature

The table below contains a list of the geographical regions of British Columbia. Indicate the appropriate region with a check mark (✓) in the left column. Refer to the regional map in Appendix A of the PDA.

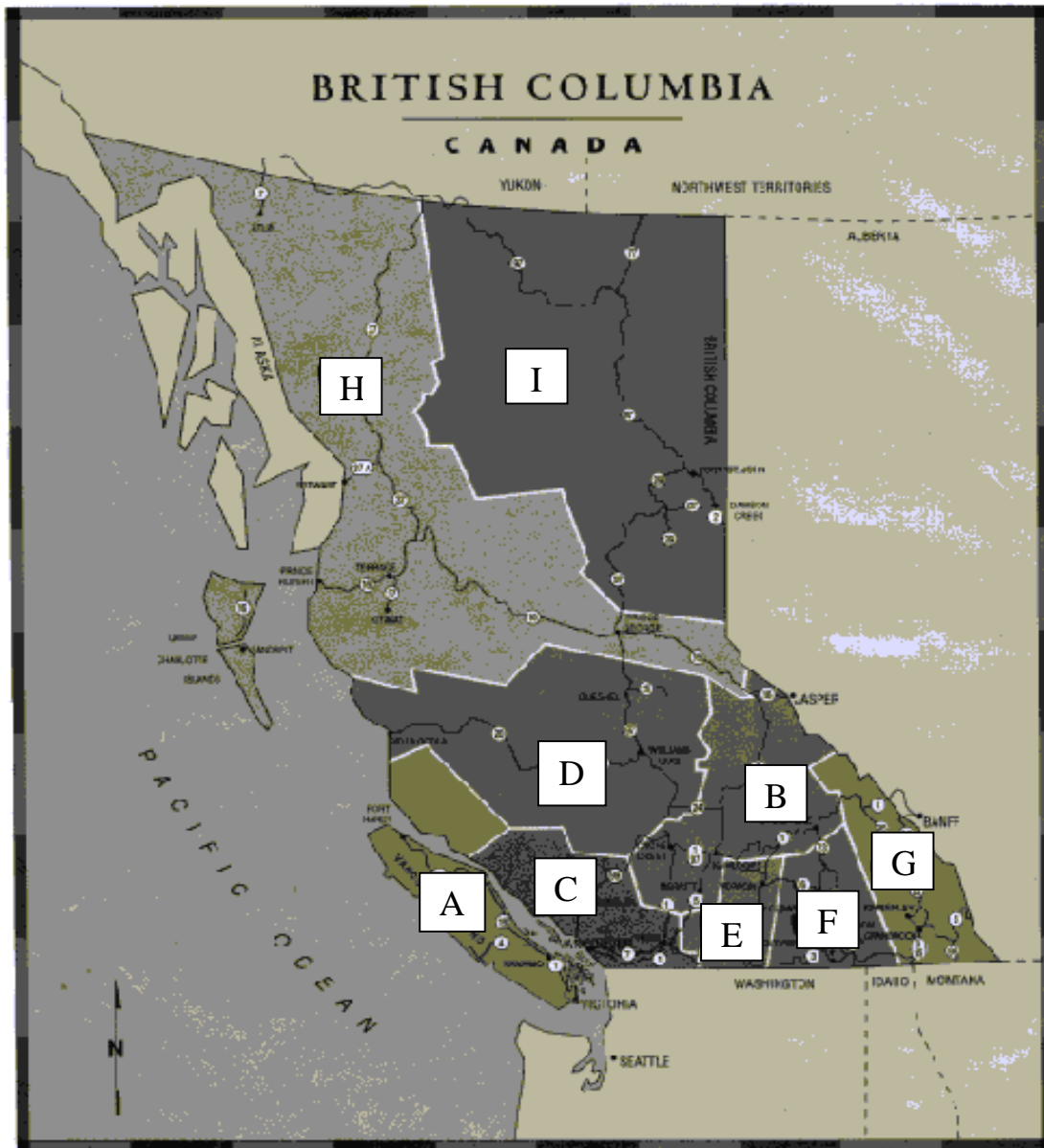
| Region | Avg. Max July/Aug | Avg. Min Dec/Jan | Extreme Max. | Extreme Min. |
|----------------------------|----------------------|---------------------|--------------|--------------|
| Vancouver Island | 22.5 °C | -0.6 °C | 36.1 °C | -18.8 °C |
| Southwestern BC | 22.9 °C | 0.4 °C | 35.6 °C | -18.3 °C |
| Cariboo Chilcotin Coast | 22.2 °C | -11.6 °C | 36.4 °C | -42.5 °C |
| High Country | 26.3 °C | -9.9 °C | 39.6 °C | -39.7 °C |
| Okanagan Similkameen | 26.5 °C | -8.4 °C | 36.0 °C | -36.3 °C |
| Kootenay Country | 26.2 °C | -6.7 °C | 38.5 °C | -32.0 °C |
| British Columbia Rockies | 24.7 °C | -12.3 °C | 37.5 °C | -42.2 °C |
| North by Northwest | 19.5 °C | -11.7 °C | 32.9 °C | -38.1 °C |
| Peace River Alaska Highway | 20.0 °C | -20.2 °C | 34.6 °C | -47.7 °C |

Personal Protective Equipment

The table below contains a list of the personal protective equipment (PPE). For the Headrig Tailsawyer job at your mill, indicate with a check mark (✓) which of the PPE items are required.

| | | |
|--------------------|--------------------|---------------|
| Gloves Type: | Hard Hat | Leather Apron |
| Glove Liners | Steel-toed Boots | Dust Mask |
| Eye Protection | Hearing Protection | Seat Belt |
| Face Shield/Helmet | Life Jacket | Harness |
| Knee Pads | Other: | Other: |

Appendix A – Regional Map



- | | |
|------------------------------------|---------------------------------------|
| A - Vancouver Island | F - Kootenay Country |
| B - High Country | G - British Columbia Rockies |
| C - Southwestern BC | H - North by Northwest |
| D - Cariboo Chilcotin Coast | I - Peace River Alaska Highway |
| E - Okanagan Similkameen | |

Risk Factor Identification Checklist

Headrig Tailsawyer

Purpose

The Risk Factor Identification Checklist for a Headrig Tailsawyer is used to **identify** potential ergonomic risk factors. Keep in mind that the purpose of this checklist is only to **identify** potential ergonomic risk factors, **not** to assess them.

The checklist can be used as part of your ergonomic intervention process, when workers express concerns about their work environment, during regular workplace inspections and observations, or when conducting an accident or injury investigation. Ideally, management and worker representatives who have completed the IMIRP Occupational Health & Safety Committee and Supervisor Ergonomic Training Session should complete this checklist. Try to view different workers in the same occupation when completing the checklist. Some specific examples are given to help answer the questions.

Instructions

General

Except for the first two questions, all remaining questions will require an answer with an implied frequency. For appropriate questions indicate with a check mark whether the answer to the question is 'No' or 'Yes'. This way you will have a record indicating that all risk factors have been considered in the identification process.

If you indicate 'No', please continue to the next question. If the question refers to a situation which does not exist (e.g., there is no seating available), please indicate 'No' in the appropriate box and continue to the next question.

If your answer is 'Yes', please check the appropriate box and then circle the frequency ('S' for 'Sometimes' or 'O' for 'Often'). If you answer 'Yes – Sometimes', then this risk factor **may be** a potential area of concern. If you answer 'Yes – Often' then there is an increased likelihood that this risk factor **is** an issue. Each mill will be responsible for defining what 'Sometimes' and 'Often' will mean to them. It is important that all people who complete the checklist are consistent in how they determine if a risk factor occurs 'Sometimes' or 'Often'. Use the 'Comments' section to indicate specific tasks, or to make other notes about the direct risk factors.

Since ergonomic risk factors frequently occur in combinations, you may find similar questions in different sections. Answering all questions will ensure that the situations that involve combinations of ergonomic risk factors are identified. It is very important to recognise all risk factors that occur in the work area.

Please note that for some of the questions it will be beneficial to ask the worker for their input. Please take the opportunity to include the operator in the risk factor identification process as much as possible. Videotaping the job of interest and reviewing the checklist in a quiet area with the worker may allow for more discussion.

Summary Tables

At the end of each body part section, summarise your findings in the table provided. If any of the direct risk factor sections contain a 'Yes', indicate 'Yes' in the appropriate section of the summary table. Answer the questions referring to injury statistics and discomfort survey findings. If there are only 'No' answers in a direct risk factor section, indicate 'No' in the summary table for that section. Use the summary information to determine how you will use the Work Manual.

Risk Factor Identification Checklist – Headrig Tailsawyer

Management Representative _____

Worker Representative _____

Date _____

Risk Identification completed:

Before implementation of solutions

After implementation of solutions

| Job History | | No | Yes | Comments |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|----------|
| 1 | Are there records of musculoskeletal injuries or accidents to indicate a risk of musculoskeletal injury? (refer to Worksheet 1 in Implementation Guide) | | | |
| 2 | Are there worker comments to indicate a risk of musculoskeletal injuries? (refer to Worksheet 2 in Implementation Guide) | | | |

Definitions

Force: Force is the amount of physical effort required by the person to do a task and/or maintain control of tools and equipment. The effort depends on the type of grip, object weight and dimensions, body posture, type of activity, surface of the object, temperature, vibration, duration of the task, and number of repetitions.

Repetition: Repetition is defined as similar or the same motions performed repeatedly. The severity of risk depends on the frequency of repetition, speed of the movement or action, the number of muscle groups involved, and the required force. Repetition is influenced by machine or line pacing, incentive programs, piecework, and deadlines.

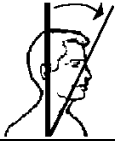
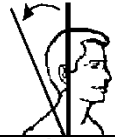
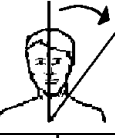

Static Postures: Static loading (sustained exertions) is physical effort (body postures) that is held, requiring muscle contraction for more than a short time.

Contact Stress: Contact stress is the contact of the body with a hard surface or edge. Contact stress can also result when using a part of the body as a hammer or striking instrument.

Awkward Postures: Awkward postures occur when there is a deviation from a power working posture. Some examples of awkward postures typically include reaching behind, twisting, working overhead, and forward or backward bending.

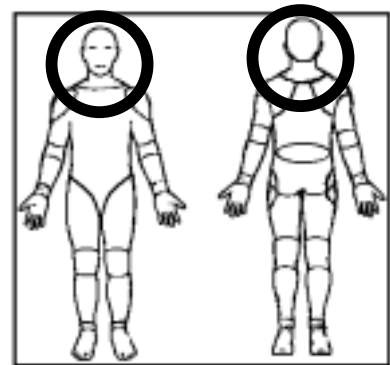
Vibration: Vibration is oscillation of a tool or surface. Vibration can be transmitted through the arm or through the whole body.

NECK

| Repetition | | N | Y | Comments: |
|----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---|--------|-----------|
| Are identical or similar motions performed over and over again? (e.g., frequently looking side to side) | | | S O | |
| Ask the worker: Do you spend a large percentage of the day performing one action or task? (e.g., monitoring the flow of lumber) | | | S O | |
| Static Posture | | | | |
| Ask the worker: Do tasks require your neck or shoulders to be maintained in a fixed or static posture? (e.g., looking down at rollers) | | | S O | |
| Awkward Posture | | | | |
| Flexion |  | | S O | |
| Extension |  | | S O | |
| Lateral Bending |  | | S O | |
| Rotation |  | | S O | |

Please indicate whether the following direct risk factors were identified at the **NECK**.



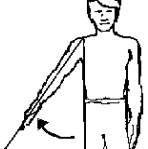
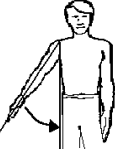
| | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|----------------------------------------------------------|
| Direct Risk Factors | Repetition | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| | Static Posture | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| | Awkward Posture | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| In the Injury Statistics investigation, were there injury reports for the Neck or Head/Eye or Upper Back? (see Worksheet 1 in the Implementation Guide) | | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| In the Discomfort Survey investigation, were there reports of discomfort for the Neck or Head/Eye or Upper Back? (see Worksheet 2 in the Implementation Guide) | | <input type="checkbox"/> Yes <input type="checkbox"/> No |



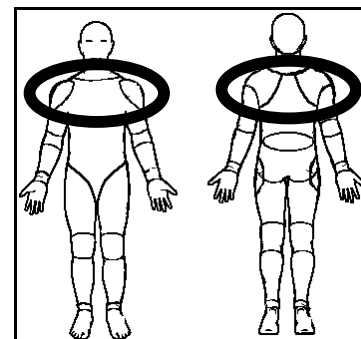
Body parts within the circled area will be classified as NECK issues.

SHOULDER

| Force | N | Y | Comments: |
|-----------------------------------------------------------------------------------------------------------------------------------------|----------|----------|------------------|
| Is forceful physical handling performed? Such as: Lifting | | S O | |
| Lowering | | S O | |
| Pushing | | S O | |
| Pulling | | S O | |
| Carrying | | S O | |
| Repetition | | | |
| Are identical or similar motions performed over and over again? (e.g., reaching and pulling operating controls overhead or to the side) | | S O | |
| Ask the worker: Do you spend a large percentage of the day performing one action or task? (e.g., pulling slabs) | | S O | |
| Static Posture | | | |
| Ask the worker: Do tasks require your shoulders to be maintained in a fixed or static posture? (e.g., holding controls) | | S O | |
| Ask the worker: Do you hold parts, tools, or objects for long periods? (e.g., picaroons or slab hooks) | | S O | |




| Awkward Posture | | N | Y | Comments: |
|-----------------|-----------------------------------------------------------------------------------|---|--------|-----------|
| Flexion |  | | S O | |
| Extension |  | | S O | |
| Abduction |  | | S O | |
| Adduction |  | | S O | |

| | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|----------------------------------------------------------|
| Please indicate whether the following direct risk factors were identified at the SHOULDER . | | |
| Direct Risk Factors | Force | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| | Repetition | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| | Static Posture | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| | Awkward Posture | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| In the Injury Statistics investigation, were there injury reports for the Shoulder or Neck or Upper Back? (see Worksheet 1 in the Implementation Guide) | | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| In the Discomfort Survey investigation, were there reports of discomfort for the Shoulder or Neck or Upper Back? (see Worksheet 2 in the Implementation Guide) | | <input type="checkbox"/> Yes <input type="checkbox"/> No |



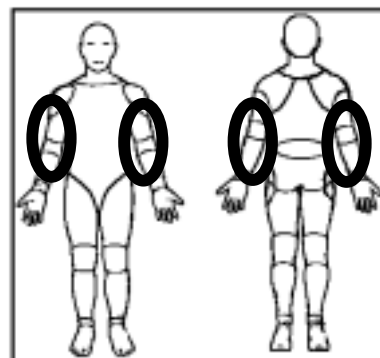
Body parts within the circled area will be classified as SHOULDER issues.

ELBOW

| Force | | N | Y | Comments: |
|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---|---|-----------|
| Is forceful physical handling performed? Such as: | | | S | |
| Lifting | | | O | |
| Lowering | | | S | |
| | | | O | |
| Pushing | | | S | |
| | | | O | |
| Pulling | | | S | |
| | | | O | |
| Carrying | | | S | |
| | | | O | |
| Turning materials | | | S | |
| | | | O | |
| Are objects handled in a power grip? (e.g., picaroons, slab hooks) |  | | S | |
| | | | O | |
| Are objects handled in a pinch grip? (e.g., lumber, slabs) |  | | S | |
| | | | O | |
| Are objects handled in a hook grip? (e.g., lumber, slabs) |  | | S | |
| | | | O | |
| Ask the worker: Do you wear gloves while performing your job? If the answer is No , check the No box and go to next section. | | | * | S |
| | | | | O |
| *If the answer to the above question is Yes , ask the worker: Are the gloves too large/small? | | | | S |
| | | | | O |
| Does the thickness of the gloves cause problems with gripping? | | | | S |
| | | | | O |
| Repetition | | | | |
| Are identical or similar motions performed over and over again? (e.g., gripping a picaroon) | | | | S |
| | | | | O |
| Ask the worker: Do you spend a large percentage of the day performing one action or task? (e.g., pulling slabs) | | | | S |
| | | | | O |




| Static Posture | | N | Y | Comments: |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---|--------|-----------|
| Ask the worker: Do tasks require your hand and arm to be maintained in a fixed or static posture? (e.g., operating controls on a console) | | | S O | |
| Ask the worker: Do you apply constant pressure on controls/objects with your hand? | | | S O | |
| Ask the worker: Do you hold parts, tools, or objects for long periods? (e.g., picaroons, slab hooks) | | | S O | |
| Contact Stress | | | | |
| Ask the worker: Do any objects, tools or parts of the workstation put pressure on any parts of your hand or arm, such as the backs or sides of fingers, palm or base of the hand, forearm, elbow? (e.g., metal edges of consoles digging into elbow) | | | S O | |
| Vibration | | | | |
| Ask the worker: Is vibration transmitted to your hand through a tool or piece of equipment? | | | S O | |





| Please indicate whether the following direct risk factors were identified at the ELBOW . | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------------------------------------------------|
| Direct Risk Factors | Force | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| | Repetition | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| | Static Posture | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| | Contact Stress | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| | Vibration | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| In the Injury Statistics investigation, were there injury reports for the Elbow or Forearm? (see Worksheet 1 in the Implementation Guide) | | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| In the Discomfort Survey investigation, were there reports of discomfort for the Elbow or Forearm? (see Worksheet 2 in the Implementation Guide) | | <input type="checkbox"/> Yes <input type="checkbox"/> No |



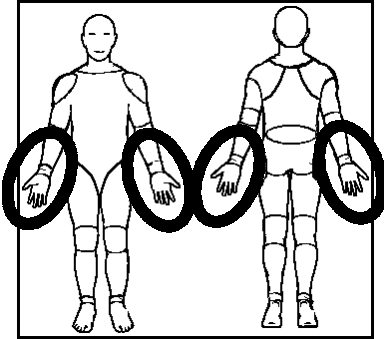
Body parts within the circled area will be classified as ELBOW issues.

WRIST/HAND

| Force | | N | Y | Comments: |
|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---|---|-----------|
| Is forceful physical handling performed? Such as: | | | S | |
| Lifting | | | O | |
| Lowering | | | S | |
| | | | O | |
| Pushing | | | S | |
| | | | O | |
| Pulling | | | S | |
| | | | O | |
| Carrying | | | S | |
| | | | O | |
| Turning materials | | | S | |
| | | | O | |
| Are objects handled in a power grip? (e.g., picaroons, slab hooks) |  | | S | |
| | | | O | |
| Are objects handled in a pinch grip? (e.g., lumber, slabs) |  | | S | |
| | | | O | |
| Are objects handled in a hook grip? (e.g., lumber, slabs) |  | | S | |
| | | | O | |
| Ask the worker: Do you wear gloves while performing your job? If the answer is No , check the No box and go to next section. | | | * | S |
| | | | | O |
| *If the answer to the above question is Yes , ask the worker: Are the gloves too large/small? | | | | S |
| | | | | O |
| Does the thickness of the gloves cause problems with gripping? | | | | S |
| | | | | O |
| Repetition | | | | |
| Are identical or similar motions performed over and over again? (e.g., pressing buttons on console) | | | | S |
| | | | | O |
| Ask the worker: Do you spend a large percentage of the day performing one action or task? (e.g., setting controls for machines) | | | | S |
| | | | | O |

| Static Posture | | N | Y | Comments: |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---|--------|-----------|
| Ask the worker: Do tasks require any part of your arm or hand to be maintained in a fixed or static posture? | | | S O | |
| Ask the worker: Do you apply constant pressure on controls/objects with your hand? (e.g., holding down buttons on consoles) | | | S O | |
| Ask the worker: Do you hold parts, tools, or objects for long periods? (e.g., holding a picaroon) | | | S O | |
| Contact Stress | | | | |
| Ask the worker: Do any objects, tools or parts of the workstation put pressure on any parts of your hand or arm, such as the backs or sides of fingers, palm or base of the hand, forearm? (e.g., hand tools that dig into the palm of the hand) | | | S O | |
| Ask the worker: Do you use your hand like a hammer for striking? (e.g., buttons on a console) | | | S O | |
| Awkward Posture | | | | |
| Flexion |  | | S O | |
| Extension |  | | S O | |
| Ulnar Deviation |  | | S O | |
| Radial Deviation |  | | S O | |
| Vibration | | | | |
| Ask the worker: Is vibration transmitted to your hand through a tool or piece of equipment? | | | S O | |





| | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|----------------------------------------------------------|
| Please indicate whether the following direct risk factors were identified at the WRIST/HAND . | | |
| Direct Risk Factors | Force | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| | Repetition | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| | Static Posture | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| | Contact Stress | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| | Awkward Posture | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| | Vibration | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| In the Injury Statistics investigation, were there injury reports for the Wrist or Hand/Finger or Forearm? (see Worksheet 1 in the Implementation Guide) | | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| In the Discomfort Survey investigation, were there reports of discomfort for the Wrist or Hand/Finger or Forearm? (see Worksheet 2 in the Implementation Guide) | | <input type="checkbox"/> Yes <input type="checkbox"/> No |



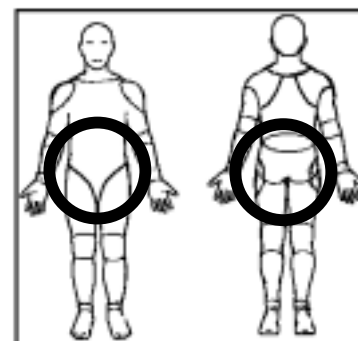
Body parts within the circled area will be classified as WRIST issues.

LOW BACK OR HIP/THIGH

| Force | N | Y | Comments: |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|-----------|
| Is forceful physical handling performed? Such as: Lifting | | S | |
| | | O | |
| Lowering | | S | |
| | | O | |
| Pushing | | S | |
| | | O | |
| Pulling | | S | |
| | | O | |
| Carrying | | S | |
| | | O | |
| Repetition | | | |
| Are identical or similar motions performed over and over again? (e.g., reaching forward, twisting back) | | S | |
| | | O | |
| Ask the worker: Do you spend a large percentage of the day performing one action or task? (e.g., reaching for slabs or cants) | | S | |
| | | O | |
| Static Posture | | | |
| Ask the worker: Do tasks require your trunk and upper body to be maintained in a fixed or static posture? | | S | |
| | | O | |
| Are workers required to sit or stand in a stationary position for long periods of time during the shift? (e.g., sitting at console) | | S | |
| | | O | |
| Contact Stress | | | |
| Ask the worker: Do any objects, tools or parts of the workstation put pressure on any parts of your hip/thigh? (e.g., conveyors that dig into the hip or thigh) | | S | |
| | | O | |


| Awkward Posture | | N | Y | Comments: |
|-----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---|--------|-----------|
| Flexion |  | | S O | |
| Extension |  | | S O | |
| Lateral Bending |  | | S O | |
| Twisting |  | | S O | |
| Vibration | | | | |
| Ask the worker: Is your whole body exposed to vibration for significant portions of the work shift? (e.g., standing on concrete floors) | | | S O | |

| Please indicate whether the following direct risk factors were identified at the LOW BACK or HIP/THIGH . | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|----------------------------------------------------------|
| Direct Risk Factors | Force | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| | Repetition | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| | Static Posture | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| | Contact Stress | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| | Awkward Posture | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| | Vibration | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| In the Injury Statistics investigation, were there injury reports for the Low Back or Hip/Thigh? (see Worksheet 1 in the Implementation Guide) | | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| In the Discomfort Survey investigation, were there reports of discomfort for the Low Back or Hip/Thigh? (see Worksheet 2 in the Implementation Guide) | | <input type="checkbox"/> Yes <input type="checkbox"/> No |

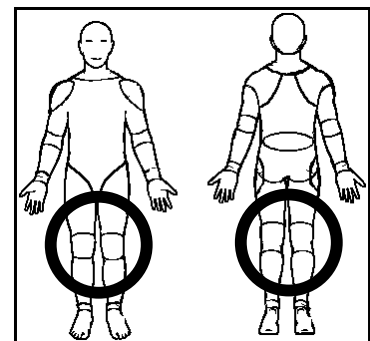


Body parts within the circled area will be classified as LOW BACK issues.

KNEE



| Repetition | | N | Y | Comments: |
|----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---|--------|-----------|
| Are identical or similar motions performed over and over again? | | | S O | |
| Static Posture | | | | |
| Ask the worker: Do tasks require you to maintain your knee(s) in a fixed or static posture? | | | S O | |
| Are workers required to sit or stand in a stationary position for long periods of time during the shift? | | | S O | |
| Do workers kneel (with one or both knees)? | | | S O | |
| Contact Stress | | | | |
| Ask the worker: Do <u>any</u> objects or parts of the workstation put pressure on your knee(s)? | | | S O | |
| Awkward Posture | | | | |
| Extreme Flexion |  | | S O | |

| | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|----------------------------------------------------------|
| Please indicate whether the following direct risk factors were identified at the KNEE . | | |
| Direct Risk Factors | Repetition | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| | Static Posture | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| | Contact Stress | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| | Awkward Posture | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| In the Injury Statistics investigation, were there injury reports for the Knee or Hip/Thigh? (see Worksheet 1 in the Implementation Guide) | | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| In the Discomfort Survey investigation, were there reports of discomfort for the Knee or Hip/Thigh? (see Worksheet 2 in the Implementation Guide) | | <input type="checkbox"/> Yes <input type="checkbox"/> No |

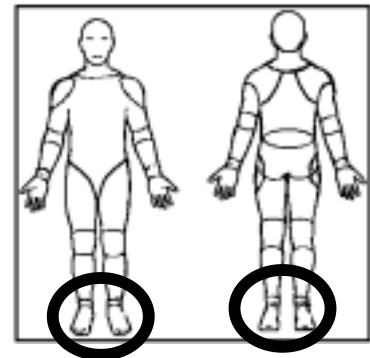


Body parts within the circled area will be classified as KNEE issues.

ANKLE/FOOT

| Repetition | | N | Y | Comments: |
|----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---|--------|-----------|
| Are identical or similar motions performed over and over again? (e.g., walking on uneven surfaces) | | | S O | |
| Static Posture | | | | |
| Are workers required to stand in a stationary position for long periods of time during the shift? | | | S O | |
| Awkward Posture | | | | |
| Flexion |  | | S O | |
| Extension |  | | S O | |
| Vibration | | | | |
| Ask the worker: Is your whole body exposed to vibration for significant portions of the work shift? (e.g., standing on catwalks) | | | S O | |

| Please indicate whether the following direct risk factors were identified at the ANKLE/FOOT. | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|----------------------------------------------------------|
| Direct Risk Factors | Repetition | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| | Static Posture | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| | Awkward Posture | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| | Vibration | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| In the Injury Statistics investigation, were there injury reports for the Ankle or Foot? (see Worksheet 1 in the Implementation Guide) | | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| In the Discomfort Survey investigation, were there reports of discomfort for the Ankle or Foot? (see Worksheet 2 in the Implementation Guide) | | <input type="checkbox"/> Yes <input type="checkbox"/> No |



Body parts within the circled area will be classified as ANKLE/FOOT issues.

CHARACTERISTICS OF OBJECTS BEING HANDLED

| | N | Y | Comments: |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|-----------|
| Are there problems handling a load due to its size or shape? (e.g., slabs, cants) | | | S O |
| Are there problems handling a load due to its fragile, unbalanced, or non-rigid conditions? (e.g., chains) | | | S O |
| Ask the worker: Do you experience situations where mechanical aids or equipment are not readily available to assist with manipulating an object? (e.g., hoists) | | | S O |
| Are handles for tools and equipment inappropriate in terms of size or shape? (e.g., hand tools) | | | S O |
| Ask the worker: Do any objects that you work with (other than tools or equipment) have handles? If the answer is No , check the No box and go to the next section. | | | S O |
| If the answer to the above question is Yes , ask the worker: Are the handles an inappropriate size or shape for the characteristics of the object? | | | S O |

ENVIRONMENTAL CONDITIONS

| Temperature | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--------|
| Ask the worker: Are your hands or arms exposed to cold from exhaust air, cold liquids or solids? | | | S O |
| Ask the worker: Are you exposed directly to temperature extremes that may cause you to use more force or cause you to fatigue quicker than normal? (e.g., hot or cold, either by equipment or natural environment) | | | S O |
| Lighting | | | |
| Ask the worker: Do you assume awkward postures to overcome problems associated with glare, inadequate lighting, or poor visibility? (e.g., working under equipment) | | | S O |

ENVIRONMENTAL CONDITIONS [CONTINUED]

| Noise | N | Y | Comments: |
|----------------------------------------------------------------------------------|---|--------|-----------|
| Have there been complaints on the level of noise in the work area? | | S O | |
| Ask the worker: Are there any distracting or annoying noises at the workstation? | | S O | |

WORK ORGANISATION

| | N | Y | Comments: |
|--------------------------------------------------------------------------------------------------------------------------------------------------|---|--------|-----------|
| Is the work externally-paced or controlled by a machine or the process? (e.g., Headrig) | | S O | |
| Do peak workloads or sudden increases in pace occur with the tasks? | | S O | |
| Ask the worker: Are there indications of excessive fatigue or pain, or symptoms of adverse health effects due to extended work days or overtime? | | S O | |
| Ask the worker: Are there indications of excessive fatigue or adverse health effects due to shiftwork? | | S O | |
| Ask the worker: Are rest periods or task variety insufficient to prevent the build-up of fatigue or the risk of adverse health effects? | | S O | |
| Ask the worker: Are tasks in a job rotation program similar to one another, and therefore not providing a variation in movements? | | S O | |

Work Manual

**Industrial
Musculoskeletal
Injury
Reduction
Program**



Headrig Tailsawyer

This Work Manual contains information about the body parts found to be at risk of musculoskeletal injury (MSI) for the Headrig Tailsawyer (Injury Education), and how to reduce the risk of MSIs using various control measures (Injury Prevention). Each Work Manual is intended to help Occupational Health and Safety Committee members establish effective solutions to reduce MSIs, and as a resource for workers to understand the MSI risks that they may encounter on the job.

The Body Manual, referenced throughout the Work Manual, is a separate document that contains information on how to prevent common MSIs through exercise. Please note exercises described in the Body Manual should only be used after consulting a healthcare practitioner.

The General Risk Factor Solutions Manual, referenced throughout the Work Manual, is a separate document that contains general, preventative information on Environmental Conditions and Work Organisation issues.

Work Manual

Headrig Tailsawyer

Disclaimer

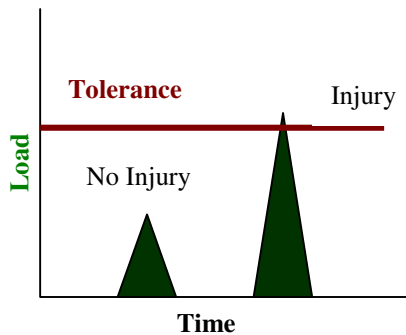
The BC sawmill IMIRP documents were developed by Advanced Ergonomics Inc. (AEI) based on analyses conducted in a number of voluntary, participating sawmills in British Columbia and should be considered applicable only to the BC sawmill industry. Modification to these documents may reduce their usefulness and/or lead to hazardous situations. Individuals or committees wishing to make Physical Demands Analyses (PDAs) site-specific, or wishing to implement options from the Work Manuals, are advised to first complete the two-day OHSC and Supervisors Ergonomics Training Session. Modifications to a PDA must be within the scope of competence of those individuals making the changes and must be reported to any rehabilitation professional using the PDA. Neither AEI nor the IMIRP Society accepts any responsibility for the use or misuse of these documents.

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Injury Education

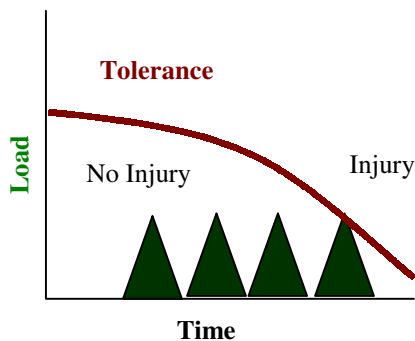
*Injuries occur when ...
Loads exceed tissue tolerances*



Excessive Force

This type of injury occurs from a single event, where the loads or forces are so great they exceed tissue tolerances and cause an immediate injury. This type of injury is more common with trips and falls.

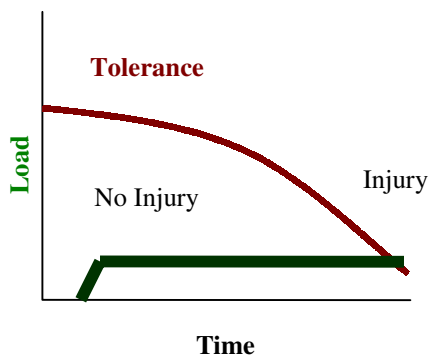
Example – a worker going over on their ankle and spraining it.



Excessive Repetition

This type of injury occurs from repeated loading weakening tissue to the point of failure. It progresses slowly to the point where a subfailure load can cause an injury. This type of injury is more common with repetitive tasks.

Example – a worker pulling lumber off a chain developing a herniated disc.



Excessive Duration

This type of injury occurs from constant loading weakening tissue to the point of failure. This type of injury is more common with tasks that require workers to adopt static or awkward postures for extended periods.

Example – a Grader developing neck tension.

Body Parts at Risk

The previous page on injury education explains how injuries can occur. The Injury Education section of this Work Manual expands on these principles, relating them to the specific body parts at risk of being injured.

After all of the appropriate information is collected during the investigation of the Headrig Tailsawyer job (i.e., injury statistics, discomfort surveys, results from the Identification Checklist), the next steps are to:

1. Match the body parts of concern from your investigation to those described in this section of the Work Manual.
2. Note the direct risk factors associated with each body part of concern.
3. Read the information on the page and try to understand why a body part, in combination with each of the direct risk factors, is of concern.
4. Discover which indirect risk factors are associated with a particular body part problem and the headings under which they are found in the Injury Prevention section of the Work Manual.
5. Note the consequences of the direct risk factor relative to a body part.
6. Note where the potential solutions can be found within the Injury Prevention section of the Work Manual. In addition, for many of the body parts, a reference may be provided to refer to specific sections of the Body Manual.

At the end of the Body Parts at Risk Section, there is a summary page of all the body parts of concern for the Headrig Tailsawyer. In addition, a reference table, with a summary of the direct and indirect risk factors by body part, is provided.

In the last section on Injury Prevention, the Work Manual discusses specific solution options for each of the body parts at risk.

Major Risk Identification

IMIRP ergonomists have assessed the Headrig Tailsawyer operator position and found that the Low Back, Shoulder, and Elbow/Wrist are the body parts of primary concern. Focussing on solutions that target these body areas will likely reduce the greatest risks associated.

Low Back: Major risks include repetitive and forceful pushing, pulling, and lifting of wood. This task may occur with the operator sitting or standing. Other tasks that may effect the Low Back are standing for long periods on a vibrating floor and repetitive reaching for controls.

The following solutions are targeted at reducing the risk of injury to the Low Back:

1. Control placement (page 66)
2. Standing work (page 67)
3. Sit/stand stool (page 68)
4. Recessed foot pedals (page 69)
5. Modify tool handles (page 71)
6. Job rotation (page 72)

Shoulder: Major risks include repetitive reaching, pushing, and pulling. Another task that may effect the shoulder is repetitive reaching overhead.

The following solutions are targeted at reducing the risk of injury to the Shoulder:

1. Control placement (page 66)
2. Shoulder check (page 67)
3. Stretch neck muscles (page 68)
4. Job rotation (page 72)

Elbow/Wrist: Major risks include forceful and repetitive gripping of tools to handle wood. Awkward postures of the wrist may also contribute to the risk of injury.

The following solutions are targeted at reducing the risk of injury to the Elbow/Hand:

1. Modify tool handles (page 71)
2. Sticky palm gloves (page 71)
3. Job rotation (page 72)

For additional stretching and strengthening exercises that would benefit a Headrig Tailsawyer operator refer to the Low Back, Shoulder, and Elbow/Wrist sections of the Body Manual.

NECK

Direct Risk Factors:
Awkward Postures
Repetition



A Headrig Tailsawyer may repeatedly turn their head from side to side to monitor slabs being cut from the headrig carriage to the rollers.

BACKGROUND INFORMATION

- A number of smaller muscles around the neck produce the forces necessary to support and move the head. These muscles remain relatively relaxed when the head is balanced over the spine (neutral posture). The neutral posture occurs when the head is upright and the ears and shoulders are aligned.

DIRECT RISK FACTORS

Awkward Postures

- Neck muscles are required to turn the head to the side. The farther the head is turned to the side, the greater the load on the muscles and tendons.
- Neck muscles must support the weight of the head while in a forward or rotated position. The more the neck bends, the greater the load on the muscles and tendons.

Repetition

- When the head is repeatedly turned to the side, the muscles of the neck are subjected to repeated stress with little time for recovery. If the repetitive stress is excessive, and recovery is not adequate, the tissues can fatigue to the point of injury.

INDIRECT RISK FACTORS

Workstation Design

Additional Workstation Design Options

- Loading on the neck muscles is increased due to the orientation of the worker, with respect to the infeed and outfeed. The closer the operator is to the rollers the greater the amount of neck rotation required.

CONSEQUENCES

- When the head is held in a twisted posture, muscles and soft tissues of the neck may fatigue. Fatigue leads to an accumulation of waste products and/or a decrease in the ability to tolerate additional stress.
- Signs and symptoms include pain, tenderness, muscle spasm in the neck area, and headaches.

SUGGESTED SOLUTIONS

- For specific solutions that may prevent injuries to the Neck, please see the column labelled “Neck” in the Summary of Solutions on pages 73 & 74.
- For exercises that can help to prevent *neck* injuries, see the *Neck section of the Body Manual*.

SHOULDER

Direct Risk Factors:

Force
Awkward Postures
Repetition



A Headrig Tailsawyer may have to pull slabs of wood from logs using a picaroon or other hand tools.

Pulling or pushing slabs or cants is a major risk of concern.

Repetitive reaching overhead or out to the side operating controls is a minor risk of concern.



The cumulative effect of this type of loading may lead to an increased risk of injury.



BACKGROUND INFORMATION

- The shoulder joint is designed for mobility. The joint is held together by muscles and soft tissues. The larger muscle groups around the shoulder are responsible for producing movement (e.g., deltoids). The deeper muscles stabilise the shoulder joint as well as produce movement. These deeper muscles and their tendons are referred to as the rotator cuff.

DIRECT RISK FACTORS

Force

- The rotator cuff stabilises the shoulder joint when objects are pushed or pulled. The heavier the object, or the larger the force required, the greater the load on the rotator cuff.
- If the force placed on the rotator cuff exceeds the tissue tolerances, injury may occur.

Awkward Postures

- The rotator cuff stabilises the shoulder joint when the arms are away from the body. The farther away the arms are from the body, the greater the load on the rotator cuff.

Repetition

- When the arms are repeatedly raised, the rotator cuff is subjected to repeated stress with little time for recovery. If the repetitive stress is excessive, and recovery is not adequate, the tissues may fatigue to the point of injury.

INDIRECT RISK FACTORS

Workstation Design

Working Reaches

- Loading on the shoulder increases when the arm has to reach farther away from the body. The farther the reach, the greater the load on the shoulder joint.

CONSEQUENCES

- When using the arms to push or pull slabs or lumber, the rotator cuff may fatigue. Fatigue leads to an accumulation of waste products and/or a decrease in the ability to tolerate additional stress.
- Stressing a fatigued shoulder may lead to degeneration or injury in the rotator cuff muscles of the shoulder joint.
- Signs and symptoms include pain, tenderness, and decreased range of motion and strength in the shoulder joint.

SUGGESTED SOLUTIONS

- For specific solutions that may prevent injuries to the Shoulder, please see the column labelled “Shoulder” in the Summary of Solutions on pages 73 & 74.
- For exercises that can help to prevent *shoulder* injuries, see the *Shoulder section of the Body Manual*.

ELBOW/WRIST

Direct Risk Factors:

Force
Awkward Postures
Repetition



A Headrig Tailsawyer may grip picaroons or other tools to guide slabs onto rollers.

Repetitive forceful gripping with the wrist in a bent position is a major risk of concern.

The cumulative effect of this type of loading may increase the risk of injury to the elbow and wrist.

BACKGROUND INFORMATION

- Muscles used for gripping are found in the forearm. The tendons of these muscles cross over the elbow and the wrist joints before connecting to bones. The elbow area may be affected by tension generated in the forearm muscles.

DIRECT RISK FACTORS

Force

- Gripping an object requires activation of the forearm muscles, which generates tension at the tendon/bone connection of the elbow. The harder that an object must be gripped the greater the load on the tendon/bone connection.

Awkward Postures

- The width of an object affects how much muscle tension needs to be generated. There is an optimal grip width where the forearm muscles work efficiently. Outside this width, muscles have to work harder to generate equivalent tension. Consequently, objects that are too large (e.g., large cuts of wood) or too small (e.g., narrow tool handles) could increase the tension generated by muscles, and lead to tissue fatigue at the tendon/bone connection.

- The position of the wrist also affects how much muscle tension needs to be generated. There is an optimal wrist position where the forearm muscles work efficiently. This occurs when the wrist is in its natural relaxed (neutral) position. Bending the wrist forward or backward deviates from this position, and the forearm muscles have to work harder to maintain the grip. Consequently, gripping objects with the wrist bent increases the tension generated by muscles, and could lead to tissue fatigue at the tendon/bone connection.

Repetition

- Repeated stress to the elbow without adequate rest could slowly fatigue tissues to the point of injury.

INDIRECT RISK FACTORS

Characteristics of Objects Being Handled **Container, Tool, and Equipment Handles**

- Loading on the elbow/wrist can increase if the size of the handgrip used is too large and does not allow the hand to close. The larger the grip size, the greater the amount of muscle activity required. Repetitive loading can increase the rate of muscle fatigue, which may lead to an increased risk of injury.

CONSEQUENCES

- Repeated forceful gripping may lead to fatigue at the tendon/bone connection near the elbow.
- Signs and symptoms include pain in the elbow area and decreased grip strength.

SUGGESTED SOLUTIONS

- For specific solutions that may prevent injuries to the Elbow/Wrist, please see the column labelled “Elbow/Wrist” in the Summary of Solutions on pages 73 & 74.
- For exercises that can help to prevent *elbow* injuries, see the *Elbow section of the Body Manual*.

LOW BACK

Direct Risk Factors:
Force
Awkward Postures
Repetition



A Headrig Tail Sawyer may bend forward or to the side to guide slabs onto rollers.

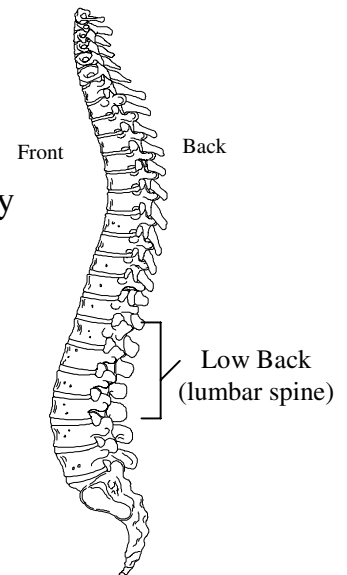
Reaching pulling slabs of wood in twisted postures, especially when seated, is a major risk of concern.

The cumulative effect of this type of loading may increase the risk of injury to the low back.

BACKGROUND INFORMATION

- The spine is made up of 33 bones called vertebrae. Each of these vertebrae is specially designed to protect the spinal cord and provide support for the back. Between each of the vertebrae are discs. Discs have tough elastic walls that are filled with a watery gel-like substance. These discs are like jelly donuts; when they are pressed down on one side, the other side bulges and puts increased pressure on the wall of the disc. To maintain an even distribution of pressure across the discs, the spine has to be kept in the neutral posture.

Neutral Spine



DIRECT RISK FACTORS

Force

- Lifting increases the loading on the spine. Weight held in the hands is transmitted to the low back. The greater the weight, the greater the loading on the structures of the low back.

Awkward Postures

- Back muscles must support the weight of the upper body when leaning forward or to the side. Increased bending of the back increases the loading on the spine and increases the pressure on the walls of the discs.

Repetition

- Repeated forward and/or side bending can gradually fatigue the structures of the low back. If the repetitive stress is excessive, and recovery is not adequate, the disc walls may fatigue to the point of injury.

INDIRECT RISK FACTORS

Workstation Design

Working Reaches

- Loading increases on the low back when reaching forward or to the side. The farther the reach, the higher the loading. Loading can be further increased when reaching in a seated posture. This cumulative load can increase the risk of injury to the back.

Working Heights

- Loading increases on the low back when low working heights lead to increased forward trunk lean while reaching forward or to the side. The farther the forward lean, the greater the loading on the soft tissues of the back. Loading can be further increased when reaching in a seated posture. This cumulative load can increase the risk of injury to the back.

Seating

- Loading on the tissues of the trunk is increased when pulling slabs from a seated position. Without the help of the additional force available from the larger muscles of the legs, the smaller back muscles can become overloaded and fatigued, possibly leading to injury.

CONSEQUENCES

- Repeatedly bending forward or to the side may lead to damage in the disc walls.
- Signs and symptoms may include muscle spasm and sharp or radiating pain in the back and/or lower extremities.

SUGGESTED SOLUTIONS

- For specific solutions that may prevent injuries to the Back, please see the column labelled “Back” in the Summary of Solutions on pages 73 & 74.
- For exercises that can help to prevent *back* injuries, see the ***Back section of the Body Manual***.

LOW BACK

Direct Risk Factors:
Awkward & Static
Postures
Vibration



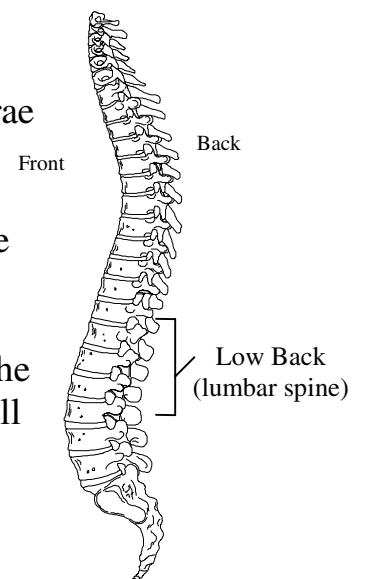
A Headrig Tail Sawyer continually sits or stands on a vibrating surface.

Standing for long periods on a vibrating surface, is a minor risk of concern.

BACKGROUND INFORMATION

- The spine is made up of 33 bones called vertebrae. Each of these vertebrae is specially designed to protect the spinal cord and provide support for the back. Between each of the vertebrae are discs. Discs have tough elastic walls that are filled with a watery gel-like substance. These discs are like jelly donuts; when they are pressed down on one side, the other side bulges and puts increased pressure on the wall of the disc. To maintain an even distribution of pressure across the discs, the spine has to be kept in the neutral posture. Sitting will cause the pelvis to rotate out of a neutral posture, as the lumbar spine will flatten.

Neutral Spine



DIRECT RISK FACTORS

Awkward and Static Postures

- Sitting increases the loading on the walls of the discs. If the duration of sitting is excessive, and the recovery is not adequate (e.g., spine not returned to neutral posture), the tissues may deform to the point of injury.

Vibration

- Whole body vibration is usually transmitted through the seat into the low back. Exposure to whole body vibration introduces a unique mechanical stress to the structures of the spine that can significantly increase the loading on the low back. Prolonged sitting on a vibrating surface may contribute to the gradual weakening of the lumbar discs.

INDIRECT RISK FACTORS

Environmental Conditions

Vibration

- Tasks requiring prolonged sitting or standing on a vibrating surface may increase the risk of injury.

CONSEQUENCES

- Continually sitting on a vibrating surface may lead to deformation in the disc walls and accelerated degeneration of the tissues.
- Signs and symptoms include muscle spasm and sharp or radiating pain in the back and/or lower extremities.

SUGGESTED SOLUTIONS

- For specific solutions that may prevent injuries to the Back, please see the column labelled “Back” in the Summary of Solutions on pages 73 & 74.
- For exercises that can help to prevent ***back*** injuries, see the ***Back section of the Body Manual***.

Summary of Body Parts at Risk

NECK

- A Headrig Tailsawyer may repeatedly turn their head from side to side to monitor slabs being cut from the headrig carriage to the rollers.



SHOULDER

- A Headrig Tailsawyer may have to pull slabs of wood from logs using a picaroon or other hand tools.
- Pulling or pushing slabs or cants is a major risk of concern.
- Repetitive reaching overhead or out to the side when operating controls is a minor risk of concern.
- The cumulative effect of this type of loading may lead to an increased risk of injury.



ELBOW/WRIST

- A Headrig Tailsawyer may grip picaroons or other tools to guide slabs onto others.
- Repetitive forceful gripping with the wrist in a bent posture is a major risk of concern.
- The cumulative effect of this type of loading may increase the risk of injury to the elbow and wrist.



LOW BACK

- A Headrig Tailsawyer may bend forward or to the side to guide slabs onto rollers.
 - Reaching and pulling slabs of wood in twisted postures, especially when seated, is a major risk of concern.
 - The cumulative effect of this type of loading may increase the risk of injury to the low back.
-
- A Headrig Tailsawyer continually sits or stands on a vibrating surface.
 - Standing for long periods on a vibrating surface, is a minor risk of concern.



Risk Factors by Body Part

| Direct Risk Factors | Neck | Neck/ Shoulder | Shoulder | Elbow/ Wrist | Wrist | Wrist/ Hand | Low Back | Hip | Knee | Ankle/ Foot | Foot |
|-------------------------------|------|-------------------|----------|-----------------|-------|----------------|----------|-----|------|----------------|------|
| Force | | | ✓ | ✓ | | | ✓ | | | | |
| Repetition | ✓ | | ✓ | ✓ | | | ✓ | | | | |
| Awkward Postures | ✓ | | ✓ | ✓ | | | ✓ | | | | |
| Static Postures | | | | | | | | | | | |
| Contact Stress | | | | | | | | | | | |
| Vibration – Whole body* | | | | | | | | | | | |
| Vibration - Hand Transmitted* | | | | | | | | | | | |

| Indirect Risk Factors | Neck | Neck/ Shoulder | Shoulder | Elbow/ Wrist | Wrist | Wrist/ Hand | Low Back | Hip | Knee | Ankle/ Foot | Foot |
|-------------------------------------------------|----------------------------------------|-------------------|----------|-----------------|-------|----------------|----------|-----|------|----------------|------|
| Duration* | ✓ | | ✓ | | | | ✓ | | | | |
| Workstation Design | Working Reaches | | ✓ | | | | ✓ | | | | |
| | Working Heights | | | | | | ✓ | | | | |
| | Seating | | | | | | ✓ | | | | |
| | Floor Surfaces | | | | | | | | | | |
| Characteristics of Objects Being Handled | Size and Shape | | | ✓ | | | | | | | |
| | Load Condition and Weight Distribution | | | | | | | | | | |
| | Container, Tool and Equipment Handles | | | | ✓ | | | | | | |
| Environmental Conditions | Heat Exposure | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ |
| | Cold Exposure | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ |
| | Lighting | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ |
| | Noise | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ |
| | Vibration** | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ | ✓ | ♦ | ♦ | ♦ |
| Work Organisation | Work-Recovery Cycles | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ |
| | Task Variability | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ |
| | Work Rate | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ | ♦ |

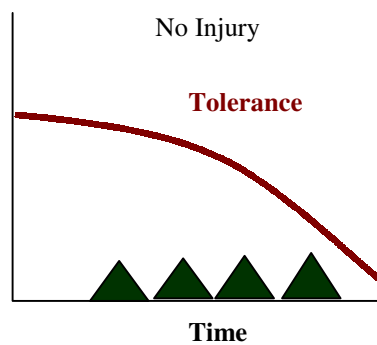
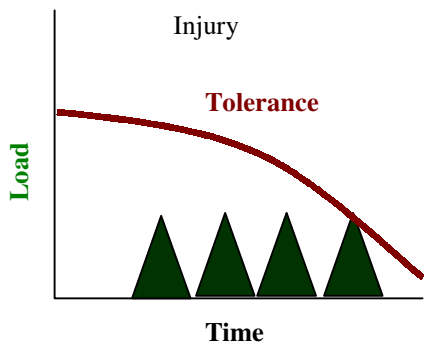
* Extended exposure to any risk factor can increase the likelihood of injury. For solutions designed to decrease the duration of exposure to any risk factor please refer to the Work Organisation section of the General Risk Factor Solutions Manual

** Vibration is categorised under both direct and indirect risk factors. Vibration can directly increase the likelihood of injury to the back and wrist as well as indirectly (environmental conditions) promote injuries in other parts of the body.

- = Indicates that the risk factor was assessed and was not found to be a contributor to the body part problem.
- ♦ = Indicates that the risk factor assessed is commonly found in sawmills, and may need to be addressed at your mill. See the appropriate section of the General Risk Factor Solutions Manual for more information.
- ✓ = Indicates that the risk factor was assessed as a contributor to the body part problem. Please see the Summary of Solutions Table on pages 73 & 74 for specific problem/solution information. Additional information on some risk factors can be found in the General Risk Factor Solutions Manual.

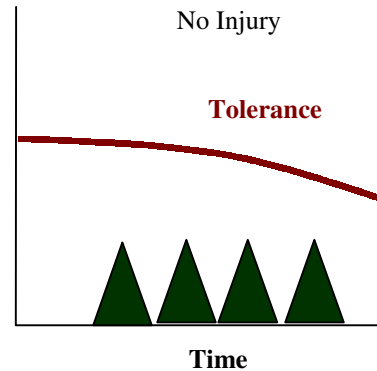
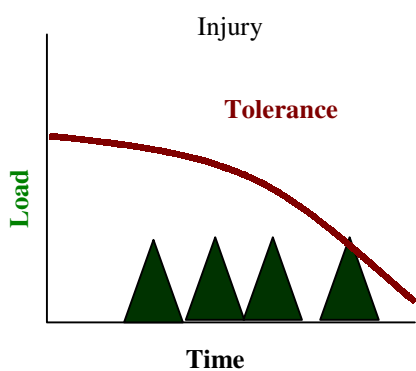
Injury Prevention

*Injuries are prevented by ...
Decreasing loads and increasing tissue tolerances*



Injuries may be avoided by decreasing the size of the loads on the tissue.

Example – using a torque multiplier wrench to loosen bolts.



Injuries may be avoided by increasing tissue tolerances, and allowing the body to endure more loading.

Example – using maintenance exercises to strengthen tissues.

Suggested Solutions

The previous page explains how injuries may be prevented by decreasing the load on a tissue or by increasing the tissue tolerances. The Injury Prevention section of the Work Manual provides possible solutions that can be implemented to decrease the size of the loads on the tissues.

Each of the solutions described in the Work Manual has a risk control icon. The Risk Control Key provides guidelines on how to distinguish between different types of risk controls. Generally, engineering, administrative, and work practice controls are considered more effective than the use of personal protective equipment to decrease the risk of musculoskeletal injuries.

The focus of the Injury Prevention section is on solutions developed following the ergonomic investigation of the Headrig Tailsawyer job. The solutions are presented under the headings of Workstation Design, Characteristics of Objects Being Handled, Environmental Conditions, and Work Organisation.

The Summary of Solutions table provides a quick reference guide to solutions for specific body part problems.

Please note that the information provided in the Body Manual addresses the issue of injury prevention in terms of increasing tissue tolerances through exercise. This information is not provided in the Work Manual.

Risk Control Key

Risk control measures (solutions) are commonly grouped into four categories:

E

ENGINEERING CONTROLS

These include physical changes to workstations, equipment, materials, production facilities, or any other relevant aspect of the work environment, that reduce or prevent exposure to risk factors.

A

ADMINISTRATIVE CONTROLS

These include any change in procedure that significantly limits daily exposure to risk factors, by control or manipulation of the work schedule or manner in which work is performed. Administrative controls include, but are not limited to, job rotation, rest breaks, alternative tasks, job enlargement, redesign of work methods, and adjustment of work pace or output. Some models of risk control include work practice controls within this category.

WP

WORK PRACTICE CONTROLS

These include techniques used to perform the tasks of a job, such as reaching, gripping, using tools and equipment, or discarding objects, etc. Education and training are an integral part of work practice controls.

PPE

PERSONAL PROTECTIVE EQUIPMENT

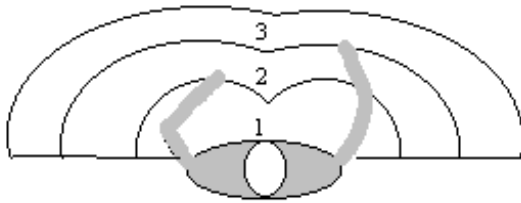
These are devices worn by a worker to reduce the risk of injury, including gloves, kneepads, hearing protection, and leather aprons.

On the following pages, the icons next to the solution options indicate the type of risk control.

Workstation Design

WORKING REACHES

A working reach that is too far for the worker will require stressful shoulder, elbow, wrist, and back postures. Reaching to the side, behind, or too far in front of the body can put stress on the smaller muscles. Ideally, working reaches should be within a normal reach envelope, as laid out below, with the controls and materials that are handled most often closest to the body. It is also ideal to have controls that perform similar or combined functions grouped together to decrease awkward postures that may otherwise occur.



| |
|------------------------------------------|
| 1 = Controls/items most frequently used |
| 2 = Controls/items less frequently used |
| 3 = Controls/items least frequently used |

Generally, the most frequently used items should be placed within a forearm's reach, with less frequently used items placed within a comfortable arm's reach, and infrequently used items placed within a fully extended arm's reach. For more specific recommendations on working reaches, please consult anthropometric tables or an ergonomist.

Control placement

E

To minimise repetitive and awkward postures of the neck, shoulder and low back, controls for the rollers and gates most frequently used should be located as close to the operator as possible, without interfering with reaching slabs or waste wood. The controls should be located between waist and shoulder height to minimise loading on the shoulders.

If using rope-operated controls, the rope should be long enough to allow the Headrig Tailsawyer to reach it without raising their arm above shoulder height. The amount of force required to pull the rope should be minimal in order to prevent muscle fatigue.

Shoulder check

WP

To reduce muscle fatigue in the shoulder and neck area, a Headrig Tailsawyer should periodically check their shoulders to see if they are raising them in anticipation to pull on a rope. This anticipation effect may activate muscles before they are needed, which may accelerate muscle fatigue. Moving the cords lower may reduce this effect, however, if rope can not be lowered the Headrig Tailsawyers should be aware of this effect.

Standing work

WP

To minimise loading on the low back, pulling, pushing, and lifting of wood should be performed while standing. With both feet planted on the floor, the Headrig Tailsawyer has more stability and can recruit the larger muscle groups from the legs to assist with the physical demands. Sitting will increase the amount of reaching necessary, place increased stress on the muscle groups of the upper body, and increase the risk of injury.

WORKING HEIGHTS

A working height that is too high for the worker will require stressful shoulder and arm postures, while a height that is too low will require stressful bending of the neck and upper body. The height of a work surface should allow room to change position and move the legs and feet (WCB Draft Ergonomic Regulations, 1994).

The ideal workstation is height adjustable, allowing a large percentage of the population to adjust the work surface height to suit their dimensions

To determine the appropriate work height specific for the Headrig Tailsawyer, identify the body part of most concern. If the main concern is the:

Neck - minimise forward bending of the neck by increasing working height.

Shoulders - minimise elevation of the arms by lowering working height.

Low Back - minimise forward bending of the back by increasing working height.

For more specific guidelines on matching the working heights with the tasks performed please consult anthropometric tables or an ergonomist.

Tool lengths

WP To reduce awkward postures of the low back due to repetitive bending, use tools of longer length.

Mirrors for feedback

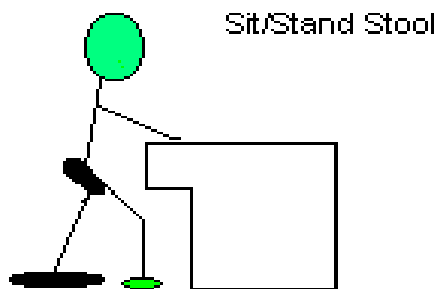
**E
WP** To reduce repetitive and awkward posture of the neck, mirrors should be provided for the Headrig Tailsawyer. These mirrors should be positioned to provide feedback regarding the flow of wood along the rollers. The Headrig Tailsawyer should use these mirrors to reduce the amount of repetitive neck rotation and degree of awkward postures required. The Headrig Tailsawyer should be consulted when installing the mirrors.

Stretch neck muscles

WP To minimise overuse of the neck muscles due to repetitive and awkward postures, the Headrig Tailsawyer should stretch all neck muscle groups to maintain flexibility and increase blood flow. If the Headrig Tailsawyer tends to look over to the same side, they should stretch the neck muscles on the other side frequently to prevent muscle imbalance. See the Neck section of the Body Manual for further instructions.

Sit/stand stool

**E
WP** To minimise fatigue in the lower extremities, sit/stand stools can be provided and used when there is a break in the flow of wood. Sitting and performing forceful pulling, pushing, and lifting is not recommended. However, sit/stand stools can alleviate some muscle fatigue in the lower extremities during breaks. Sit/stand stools are preferred over regular stools, as the design makes it easier to alternate between sitting and standing. If sit/stand stools are not possible, foot rests or foot rails can be provided to encourage frequent changes in posture.



FLOOR SURFACES

Anti-fatigue matting

E

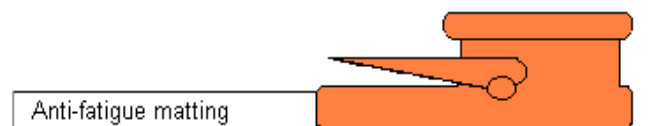
To minimise fatigue in the lower extremities, anti-fatigue matting can be installed. The use of anti-fatigue matting in the work area will help to increase comfort and reduce muscle fatigue. The cushioned surface encourages continuous micro-movements of the feet, which minimises blood pooling in the feet and legs and the associated discomfort. Addition of anti-fatigue matting may also aid in damping vibration levels.



Recessed foot pedals

E

To minimise awkward postures of the ankle, recess foot pedals into anti-fatigue matting to decrease the height of the foot pedal base. To recess foot pedals, and provide a more comfortable standing surface in the process, position anti-fatigue matting as close as possible to the foot pedal base. If the pedals are stationary, cut the matting to surround the front of the foot pedal. For moveable foot pedals, place the matting as close to the base of the foot pedal as possible. The height of the matting should not exceed the base of the foot pedal (see diagram below). It is important to ensure pedals are kept clean of debris and are well maintained.

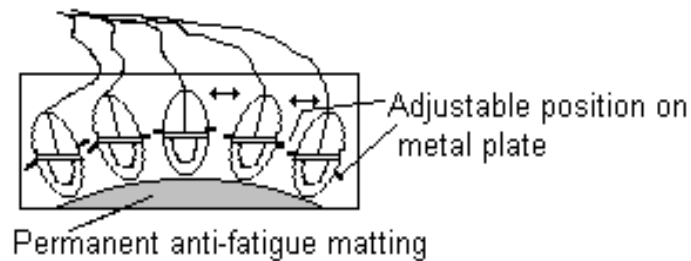


Moveable foot pedals

E
WP To reduce awkward postures of the lower extremities, allow operators to choose the most appropriate position for the pedals, based on their body dimensions and the workstation design.

E Securing the foot pedals may be required or desirable. Three solutions include:

- 1) Providing moveable foot pedals on a metal plate. The foot pedals are positioned in slide tracks cut into the metal, which allow pedals to move into the desired positions. The pedals are then fastened into place. The operator is able to move the set of foot pedals to any desired position in the workstation.



- 2) Providing several positions on the floor where clips or nails may be used to secure foot pedals. If this option is considered, make sure each possible position is highly visible to all operators, to prevent tripping or injuries.
- 3) Providing a physical link (e.g., a metal bar) between two foot pedals with the same function. This solution is most appropriate where a worker may move to manipulate lumber but still needs to operate the foot pedals.

Characteristics of Objects Being Handled

CONTAINER, TOOL AND EQUIPMENT HANDLES

Keep tools sharpened

WP To reduce the amount of force required to spear a log, keep tools sharpened and well maintained. Dull tools require more force to perform the task.

Modify tool handles

E In order to reduce the force required to grip hand tools, increase the friction between the tool handles and the operator's glove. Due to the smooth, slippery surface of metal or wooden tool handles (e.g., pike pole, picaroon) a Headrig Tailsawyer must use a higher grip force in order to maintain control of the tool. This can put the elbow, and possibly the wrist and hand, at risk of injury. Wrapping the tool handles with foam, rubber, medical/athletic tape, or modifying the surface using other friction increasing material (e.g., gritty paint if plastic substances are not allowed) would increase the friction between the handle and the Headrig Tailsawyer's glove, and thus decrease the grip forces required.

Sticky palm gloves

PPE In order to reduce grip forces required by the Headrig Tailsawyer, the operator should wear thin, close fitting gloves with a "sticky" palm surface to increase the friction between the gloves and the tool handles.

Environmental Conditions

Please refer to the General Risk Factor Solutions Manual for solutions regarding environmental condition risk factors.

Work Organisation

Job rotation

A

To reduce loading on the body parts of concern listed in this Work Manual, the Headrig Tailsawyer can be rotated to other job positions that require different physical and mental demands. By rotating to jobs that require different physical demands the working muscles get a chance to recover and repair, decreasing the risk of injury. Job rotation is more effective if it occurs throughout the shift, for example, every hour or every two hours. The duration of exposure to risk has a large effect on the amount of time required for the tissue to recover.

Please refer to the General Risk Factor Solutions Manual for solutions regarding work organisation risk factors.

Summary of Solutions

Refer to the table below to help determine which solution alternatives will aid in addressing risk factors in the particular body parts of concern.

| | | Injury Prevention Potential | | | | | | | | | | |
|----------------------|------|-----------------------------|-------------------|-------------|-------------|-------|----------------|-------------|-----|------|-------|------|
| SOLUTIONS | Page | Neck | Neck/ Shoulder | Shoulder | Elbow/Wrist | Wrist | Wrist/ Hand | Low Back | Hip | Knee | Ankle | Foot |
| Control placement | 66 | | | A R | | | | A R | | | | |
| Shoulder check | 67 | | | A R | | | | | | | | |
| Standing work | 67 | | | F A R | | | | F A R | | | | |
| Tool lengths | 68 | | | | | | | A R | | | | |
| Mirrors for feedback | 68 | A R | | | | | | | | | | |
| Stretch neck muscles | 68 | A R | | | | | | | | | | |
| Sit/stand stool | 68 | | | | | | | S | | S | S | S |
| Anti-fatigue matting | 69 | | | | | | | S | | | | S |
| Recessed foot pedals | 69 | | | | | | | | | | A | |
| Moveable foot pedals | 70 | | | | | | | | | | A | |
| Keep tools sharpened | 71 | | | | F A | | | F A R | | | | |

Direct Risk Factors

F = Force

S = Static Postures

R = Repetition

C = Contact Stress

A = Awkward Postures

V = Vibration

Summary of Solutions

Refer to the table below to help determine which solution alternatives will aid in addressing risk factors in the particular body parts of concern.

| | | Injury Prevention Potential | | | | | | | | | | |
|---------------------|------|-------------------------------------------------------|-------------------|-------------|-------------|-------|----------------|-------------|-----|------|-------|------|
| SOLUTIONS | Page | Neck | Neck/ Shoulder | Shoulder | Elbow/Wrist | Wrist | Wrist/ Hand | Low Back | Hip | Knee | Ankle | Foot |
| Modify tool handles | 71 | | | | F | | | | | | | |
| Sticky palm gloves | 71 | | | | F | | | | | | | |
| Job rotation | 72 | A R | | F A R | F A R | | | F A R | | | | |
| Heat Exposure | ♦ | indirectly reduces risk of injury to the body | | | | | | | | | | |
| Cold Exposure | ♦ | indirectly reduces risk of injury to the body | | | | | | | | | | |
| Lighting | ♦ | indirectly reduces risk of injury to the body | | | | | | | | | | |
| Noise | ♦ | indirectly reduces risk of injury to the body | | | | | | | | | | |
| Vibration | ♦ | directly reduces risk of injury to the back and wrist | | | | | | | | | | |
| Rest breaks | ♦ | indirectly reduces risk of injury to the body | | | | | | | | | | |
| Job Rotation | ♦ | indirectly reduces risk of injury to the body | | | | | | | | | | |
| Task Rotation | ♦ | indirectly reduces risk of injury to the body | | | | | | | | | | |
| Work Pace | ♦ | indirectly reduces risk of injury to the body | | | | | | | | | | |
| Scheduling | ♦ | indirectly reduces risk of injury to the body | | | | | | | | | | |

Direct Risk Factors

F = Force

S = Static Postures

♦ = See General Risk Factor Solutions Manual

R = Repetition

C = Contact Stress

A = Awkward Postures

V = Vibration

| CHECK IF THIS APPLIES | ACTIVITY OF RISK | DIRECT RISK FACTOR(S) | POTENTIAL HAZARDS | SUGGESTED SOLUTIONS |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <p>Shoulder</p> <p>A Headrig Tailsawyer may have to pull slabs of wood from logs using a picaroon or other hand tools.</p> <p>Pulling or pushing slabs or cants is a major risk of concern.</p> <p>Repetitive reaching overhead or out to the side when operating controls is a minor risk of concern. The cumulative effect of this type of loading may lead to an increased risk of injury.</p> | <p>Force</p> <p>Awkward Postures</p> <p>Repetition</p> | <ul style="list-style-type: none"> • The rotator cuff stabilises the shoulder joint when objects are pushed or pulled. The heavier the object, or the larger the force required, the greater the load on the rotator cuff. • If the force placed on the rotator cuff exceeds the tissue tolerances, injury may occur. • The rotator cuff stabilises the shoulder joint when the arms are away from the body. The farther away the arms are from the body, the greater the load on the rotator cuff. • When the arms are repeatedly raised, the rotator cuff is subjected to repeated stress with little time for recovery. If the repetitive stress is excessive, and recovery is not adequate, the tissues may fatigue to the point of injury. | <ul style="list-style-type: none"> • When using rope controls, check your shoulders periodically to see if you are raising them in anticipation to pull on a rope. Move the rope controls lower so that activation can occur at a lower height. • For exercises that can help prevent <i>Shoulder</i> injuries, <i>see the Shoulder section of the Body Manual</i>. |

| CHECK IF THIS APPLIES | ACTIVITY OF RISK | DIRECT RISK FACTOR(S) | POTENTIAL HAZARDS | SUGGESTED SOLUTIONS |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <p>Elbow/Wrist</p> <p>A Headrig Tailsawyer may grip picaroons or other tools to guide slabs onto rollers.</p> <p>Repetitive forceful gripping with the wrist in a bent posture is a major risk of concern.</p> <p>The cumulative effect of this type of loading may increase the risk of injury to the elbow and wrist.</p> | <p>Force</p> <p>Awkward Postures</p> <p>Repetition</p> | <ul style="list-style-type: none"> • Gripping an object requires activation of the forearm muscles, which generates tension at the tendon/bone connection of the elbow. The harder that an object must be gripped the greater the load on the tendon/bone connection. • The width of an object affects how much muscle tension needs to be generated. Objects that are too large (e.g., large cuts of wood) or too small (e.g., narrow tool handles) could increase the tension generated by muscles, and lead to tissue fatigue at the tendon/bone connection. • Wrist posture affects how much muscle tension needs to be generated. An optimal wrist posture is in its natural relaxed (neutral) position. Bending the wrist forward or backward deviates from this position, makes the forearm muscles work harder. Consequently, gripping objects with the wrist bent increases the tension generated by muscles, and could lead to tissue fatigue at the tendon/bone connection. • Repeated stress to the elbow without adequate rest could slowly fatigue tissues to the point of injury. | <ul style="list-style-type: none"> • Keep tools sharpened and well maintained. • Wrists should be kept neutral when operating controls and using tools. • For exercises that can help prevent <i>Elbow</i> injuries, <i>see the Elbow section of the Body Manual.</i> |

| CHECK IF THIS APPLIES | ACTIVITY OF RISK | DIRECT RISK FACTOR(S) | POTENTIAL HAZARDS | SUGGESTED SOLUTIONS |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <p>Low Back</p> <p>A Headrig Tailsawyer may bend forward/to the side to guide slabs onto rollers.</p> <p>Reaching and pulling slabs of wood in twisted posture, especially when seated is a major risk of concern.</p> <p>The cumulative effect of this type of loading may increase the risk of injury to the low back.</p> | <p>Force</p> <p>Awkward Postures</p> <p>Repetition</p> | <ul style="list-style-type: none"> • Lifting increases the loading on the spine. Weight held in the hands is transmitted to the low back. The greater the weight, the greater the loading on the structures of the low back. • Back muscles must support the weight of the upper body when leaning forward or to the side. Increased bending of the back increases the loading on the spine and increases the pressure on the walls of the discs. • Repeated forward and/or side bending can gradually fatigue the structures of the low back. If the repetitive stress is excessive, and recovery is not adequate, the disc walls may fatigue to the point of injury. | <ul style="list-style-type: none"> • Pull, push, and lift wood with both feet planted on the floor. • Avoid reaching while sitting. • Use longer tools to reach down for slabs. • For exercises that can help prevent Low Back injuries, <i>see the Low Back section of the Body Manual.</i> |

| CHECK IF THIS APPLIES | ACTIVITY OF RISK | DIRECT RISK FACTOR(S) | POTENTIAL HAZARDS | SUGGESTED SOLUTIONS |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <p>Low Back</p> <p>A Headrig Tailsawyer continually sits or stands on a vibrating surface.</p> <p>Standing for long duration on a vibrating surface, is a minor risk of concern.</p> | <p>Awkward & Static Postures</p> <p>Vibration</p> | <ul style="list-style-type: none"> • Sitting increases the loading on the walls of the discs. If the duration of sitting is excessive, and the recovery is not adequate (e.g., spine not returned to neutral posture), the tissues may deform to the point of injury. • Whole body vibration is usually transmitted through the seat into the low back. Exposure to whole body vibration introduces a unique mechanical stress to the structures of the spine that can significantly increase the loading on the low back. Prolonged sitting on a vibrating surface may contribute to the gradual weakening of the lumbar discs. | <ul style="list-style-type: none"> • Use sit/stand stools when there is a break in the flow of wood. • Avoid sitting and performing forceful pulling, pushing, and lifting. • Use sit/stand stools to alleviate some muscle fatigue in the lower extremities. • For exercises that can help prevent Low Back injuries, <i>see the Low Back section of the Body Manual.</i> |