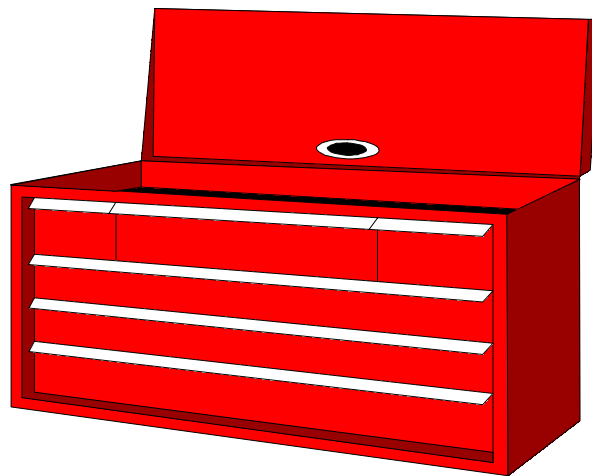


INDUSTRIAL MUSCULOSKELETAL INJURY REDUCTION PROGRAM

Common Industry Jobs (CIJs) Racker/Selector 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

RACKER/SELECTOR TOOL KIT

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Racker/Selector Tool Kit

Overview

Racker/Selector

Job Summary

A Racker/Selector is responsible for making bundles of siding according to grade and length. A Racker/Selector will inspect siding, lift siding into racks, lower bundles onto conveyors, and align bundles. Refer to the Physical Demands Analysis for more detail.

Physical Demands

The physical demands of the Racker/Selector may include:

- a) Forceful exertions of the elbow/wrist, and low back
- b) Repetitive movements of the neck, shoulder, elbow/wrist, low back, knee, and foot
- c) Awkward postures of the neck, shoulder, elbow/wrist, low back, and knee
- d) Continuous walking
- e) Lifting siding and lowering bundles

Mental Demands

A Racker/Selector will continuously inspect siding and sort according to grade and length.

Major Variations

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

- 1) Workstation design may vary in terms of:
 - a) Height of conveyors
 - b) Height of the racks
 - c) Type of floor covering

- 2) Size of siding handled may vary in terms of:
 - a) Length
 - b) Width
 - c) Depth

- 3) Production output may vary

Minor Variations

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

- 1) Workplace environmental characteristics in terms of:
 - a) Noise
 - b) Lighting levels
 - c) Air quality
 - d) Vibration levels through the floor

Physical Demands Analysis Racker/Selector

PDA General Instructions: Racker/Selector

The purpose of this PDA is to familiarise healthcare professionals with the physical demands of a Racker/Selector. 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 Racker/Selector(s) 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.

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 Racker/Selector

Task List

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

Inspect siding

The Racker/Selector inspects the incoming siding for grade marks and length.

Does this task occur at your mill?

Yes No



Lift siding

A Racker/Selector lifts the siding onto the appropriate rack.

Does this task occur at your mill?

Yes No



Lower bundles

A Racker/Selector then drops siding from the racks to complete bundles

Does this task occur at your mill?

- Yes No



Align bundles

A Racker/Selector must align the bundles.

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 Racker/Selector. 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>Inspect siding</i>					• <i>Cycle time = 1 to 2 seconds</i>
<i>Lift siding</i>					• <i>Cycle time = 1 to 5 seconds</i>
<i>Lower bundles</i>					• <i>Cycle time = 1 to 5 seconds</i>
<i>Align bundles</i>					• <i>Cycle time = 1 to 2 seconds</i>
<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 Racker/Selector. 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. Additional controls can be included under *Other*.

Type of Control	Function	Comments
	<i>Pull cord</i>	<ul style="list-style-type: none"> • <i>Start/stop chain</i> <ul style="list-style-type: none"> • <i>Rarely used</i> • <i>Used more frequently during heavy runs</i>
	<i>Finger push button</i>	<ul style="list-style-type: none"> • <i>Start/stop chain</i> • <i>Reverse chain</i> <ul style="list-style-type: none"> • <i>Rarely used.</i> • <i>Used more frequently during heavy runs</i>
	<i>Foot pedal</i>	<ul style="list-style-type: none"> • <i>Activate pin stops</i> <ul style="list-style-type: none"> • <i>Used frequently to sort when the runs only contain clear pieces of siding.</i>
	<i>Other:</i>	

Physical Demands

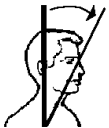
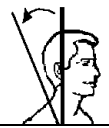
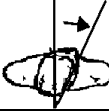

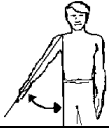

Whole Body Physical Demands



Identify each of the physical demands required by a Racker/Selector 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>	• <i>Lift siding</i>			✓		• <i>Cycle time = 1 to 5 seconds</i>
<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 Racker/Selector, 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: Shoulder Flexion</i>	• <i>Lift siding</i>		✓			• <i>Cycle time = 1 to 5 seconds</i>
Neck						
<i>Flexion</i> 						
<i>Extension</i> 						
<i>Twisting</i> 						
Shoulder						
<i>Flexion</i> 						
<i>Abduction/ adduction</i> 						
<i>Extension</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%	
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 Racker/Selector. 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 Racker/Selector 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%	

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 (<i>Indicate source</i>) <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 B of the PDA.

Region	Avg. Max July/Aug	Avg. Min Dec/Jan	Extreme Max.	Extreme Min.
<input type="checkbox"/> Vancouver Island	22.5 °C	-0.6 °C	36.1 °C	-18.8 °C
<input type="checkbox"/> Southwestern BC	22.9 °C	0.4 °C	35.6 °C	-18.3 °C
<input type="checkbox"/> Cariboo Chilcotin Coast	22.2 °C	-11.6 °C	36.4 °C	-42.5 °C
<input type="checkbox"/> High Country	26.3 °C	-9.9 °C	39.6 °C	-39.7 °C
<input type="checkbox"/> Okanagan Similkameen	26.5 °C	-8.4 °C	36.0 °C	-36.3 °C
<input type="checkbox"/> Kootenay Country	26.2 °C	-6.7 °C	38.5 °C	-32.0 °C
<input type="checkbox"/> British Columbia Rockies	24.7 °C	-12.3 °C	37.5 °C	-42.2 °C
<input type="checkbox"/> North by Northwest	19.5 °C	-11.7 °C	32.9 °C	-38.1 °C
<input type="checkbox"/> 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 Racker/Selector at your mill, indicate with a check mark (✓) which of the PPE items are required.

<input type="checkbox"/>	Gloves Type:	<input type="checkbox"/>	Hard Hat	<input type="checkbox"/>	Leather Apron
<input type="checkbox"/>	Glove Liners	<input type="checkbox"/>	Steel-toed Boots	<input type="checkbox"/>	Dust Mask
<input type="checkbox"/>	Eye Protection	<input type="checkbox"/>	Hearing Protection	<input type="checkbox"/>	Seat Belt
<input type="checkbox"/>	Face Shield/Helmet	<input type="checkbox"/>	Life Jacket	<input type="checkbox"/>	Harness
<input type="checkbox"/>	Knee Pads	<input type="checkbox"/>	Other:	<input type="checkbox"/>	Other:

Appendix A – Weight of Wood Equation

1. Type of Wood Handled

The table below contains a list of the types of wood processed in British Columbia. The weight per board foot wet and dry is given for each species. This information will be used in the table in *Section 4* to calculate the weight of the wood handled. Please indicate all of the types of wood processed.

Wood Handled	Wet lb./ Board Foot	Dry lb./ Board Foot	Wood Handled	Wet lb./ Board Foot	Dry lb./ Board Foot
Douglas Fir	3.60	2.83	Larch	3.48	N/A
Hemlock	3.42	2.49	Spruce/Pine/Fir*	2.95	2.18
Red Cedar	2.42	2.00	Alpine Fir	2.67	2.00
Yellow Cedar	3.01	2.49	Lodge Pole Pine	3.26	2.41
Sitka Spruce	2.76	2.23	White Spruce	2.93	2.15

*The Spruce/Pine/Fir values are an average of White Spruce, Lodge Pole Pine, and Alpine Fir.

2. Size of Wood*

The table below contains a list of different sizes or dimensions of wood. The percentage next to the size of the wood is the multiple used to compare the size of the board to a board foot (1" by 12" by 12"). This multiple will be used in the table in *Section 4* to calculate the weight of wood handled. Please indicate all of the applicable sizes of wood handled at the workstation. Add any other sizes to the bottom of the table if your particular size of wood is not listed.

1" Sizes	Multiple	2" Sizes	Multiple	4" Sizes	Multiple	6" Sizes	Multiple	8" Sizes	Multiple
1 by 4	0.33	2 by 4	0.67	4 by 4	1.33	6 by 6	3.00	8 by 8	5.33
1 by 6	0.50	2 by 6	1.00	4 by 6	2.00	6 by 8	4.00	8 by 10	6.67
1 by 8	0.67	2 by 8	1.33	4 by 8	2.67	6 by 10	5.00	8 by 12	8.00
1 by 10	0.83	2 by 10	1.67	4 by 10	3.33	6 by 12	6.00		
1 by 12	1.00	2 by 12	2.00	4 by 12	4.00				

* Conservative estimates of actual wood dimensions

If the size of the board is different from those in this table, use this equation to find out the multiple value.

$$[(\text{Dimensions of wood}) \times 12] / 144 = \text{Multiple}$$

For example: For a 5 by 5 piece of wood $[(5 \times 5) \times 12] / 144 = 2.08$

3. Length of Wood

The table below contains a list of the common lengths of wood. Please indicate which of these lengths are being handled at this particular workstation. Add additional lengths to the table if necessary. This information will be used in the table in *Section 4*.

Length of Wood			
6 foot		12 foot	
8 foot		14 foot	
10 foot		16 foot	
		18 foot	
		20 foot	
		22 foot	
		24 foot	
		Other:	
		Other:	

4. Weight of Wood Equation*

The table below is used to calculate the weight of the boards being handled. The weight is calculated by multiplying the species weight/board foot (*Section 1 value*) by the size of wood multiple (*Section 2 value*) and by the length of wood (*Section 3 value*).

Example: For a run of wet Spruce/Pine/Fir, 2" x 4", 16 feet long

$$2.95 \text{ (wet lb./ board foot)} \times 0.67 \text{ (size of wood multiple for 2" x 4")} \times 16 \text{ (length of board in feet)} = 32 \text{ lbs.}$$

For the heaviest species handled, enter the lb./board foot value, the multiple for the largest size of this wood, and the largest length of this wood. Multiply these values together to determine the weight of the board in pounds.

For the most common species handled, enter the lb./board foot value, the multiple for the most common size of wood, and the most common length of this wood. Multiply these values together to determine the weight of the board in pounds.

For the lightest species handled, enter the lb./board foot value, the multiple for the smallest size of wood, and the shortest length of this wood. Multiply these values together to determine the weight of the board in pounds.

If required, divide the pound value by 2.2 to obtain the weight of the board in kilograms.

Type of Wood Handled (lb./ board foot) <i>From Section 1</i>	x	Multiple (size of wood) <i>From Section 2</i>	x	Length of Wood <i>From Section 3</i>	=	Weight of the Board in pounds	Divide by 2.2 to calculate value in kilograms
Heaviest Species Handled	x		x		=		
Most Common Species Handled	x		x		=		
Lightest Species Handled	x		x		=		

* Weight may vary from the above calculation depending on the cell moisture content of the wood, actual wood dimensions, and wood density.

Appendix B – 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

Racker/Selector

Purpose

The Risk Factor Identification Checklist for a Racker/Selector 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 – Racker/Selector

Management Representative _____

Risk Identification completed:

Worker Representative _____

Before implementation of solutions

Date _____

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.

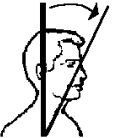

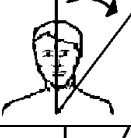
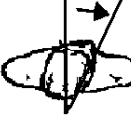
Static Postures: Static loading (sustained exertions) is physical effort (body postures) that is held, requiring muscle contraction for more than a short time.

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.

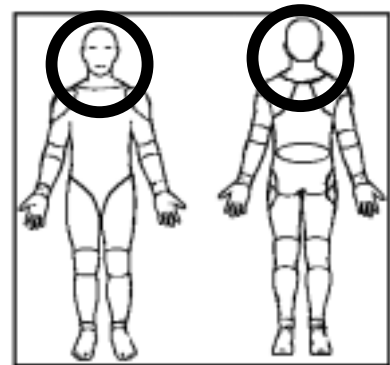
Awkward Postures: Awkward postures occur when there is a deviation from a power working posture. Some examples of awkward postures typically include reaching behind, twisting, working overhead, and forward or backward bending.

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., looking up or down frequently)			S O	
Ask the worker: Do you spend a large percentage of the day performing one action or task? (e.g., inspecting siding)			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 a conveyor for a long period)			S O	
Awkward Posture				
Flexion			S O	
Extension			S O	
Lateral Bending			S O	
Rotation			S O	



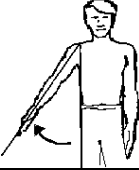
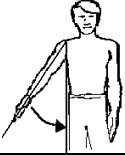
Please indicate whether the following direct risk factors were identified at the NECK .		
Direct Risk Factors	Repetition	<input type="checkbox"/> Yes <input type="checkbox"/> No
	Static Posture	<input type="checkbox"/> Yes <input type="checkbox"/> No
	Awkward Posture	<input type="checkbox"/> Yes <input 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



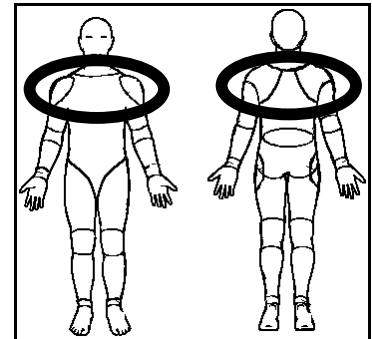
Body parts within the circled area will be classified as NECK issues.

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 for siding)		S O	
Ask the worker: Do you spend a large percentage of the day performing one action or task? (e.g., handling siding)		S O	
Static Posture			
Ask the worker: Do tasks require your shoulders to be maintained in a fixed or static posture?		S O	
Ask the worker: Do you hold parts, tools, or objects for long periods?		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



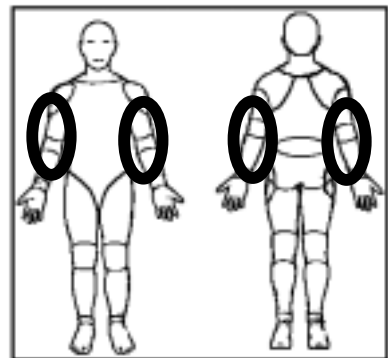
Body parts within the circled area will be classified as SHOULDER issues.

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., tools)			S	
			O	
Are objects handled in a pinch grip? (e.g., siding)			S	
			O	
Are objects handled in a hook grip? (e.g., pull cord)			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., handling siding)				S
				O
Ask the worker: Do you spend a large percentage of the day performing one action or task? (e.g., handling siding)				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?			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?			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., handling siding)			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



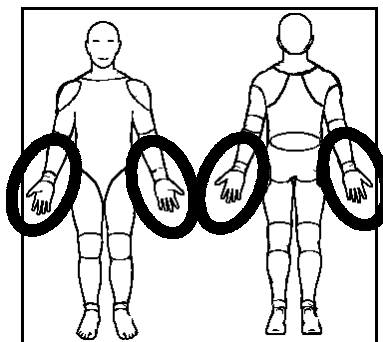
Body parts within the circled area will be classified as ELBOW issues.

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., tools)			S	
			O	
Are objects handled in a pinch grip? (e.g., siding)			S	
			O	
Are objects handled in a hook grip? (e.g., pull cord)			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., handling siding)				S
				O
Ask the worker: Do you spend a large percentage of the day performing one action or task? (e.g., handling siding)				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?				S	
				O	
Ask the worker: Do you hold parts, tools, or objects for long periods?				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., handling siding)				S	
				O	
Ask the worker: Do you use your hand like a hammer for striking?				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



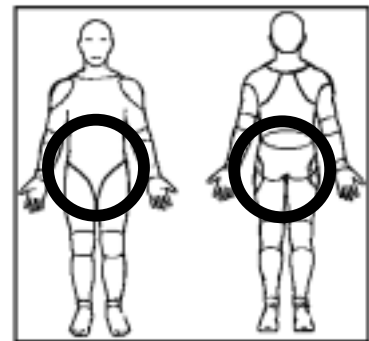
Body parts within the circled area will be classified as WRIST issues.

LOW BACK OR HIP/THIGH

Force	N	Y	Comments:
Is forceful physical handling performed? Such as:			S
Lifting			O
Lowering			S
			O
Pushing			S
			O
Pulling			S
			O
Carrying			S
			O
Repetition			
Are identical or similar motions performed over and over again?			S
			O
Ask the worker: Do you spend a large percentage of the day performing one action or task? (e.g., racking siding)			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?			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?			S
			O


Awkward Posture		N	Y	Comments:
Flexion			<input type="radio"/> S <input type="radio"/> O	
Extension			<input type="radio"/> S <input type="radio"/> O	
Lateral Bending			<input type="radio"/> S <input type="radio"/> O	
Twisting			<input type="radio"/> S <input type="radio"/> O	
Vibration				
Ask the worker: Is your whole body exposed to vibration for significant portions of the work shift?			<input type="radio"/> S <input type="radio"/> 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

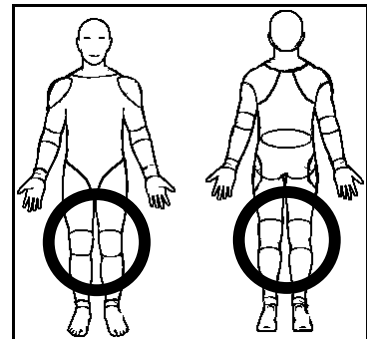


Body parts within the circled area will be classified as LOW BACK issues.

KNEE



Repetition		N	Y	Comments:
Are identical or similar motions performed over and over again? (e.g., pivoting)			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 any 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

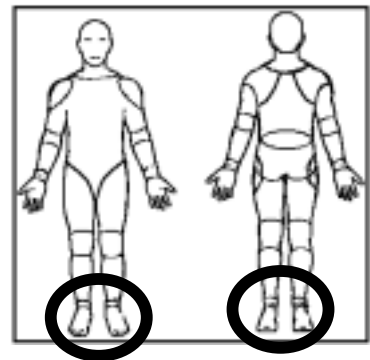


Body parts within the circled area will be classified as KNEE issues.

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 vibrating floors)			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., long pieces of siding)			S O
Are there problems handling a load due to its fragile, unbalanced, or non-rigid conditions? (e.g., long pieces of siding)			S O
Ask the worker: Do you experience situations where mechanical aids or equipment are not readily available to assist with manipulating an object?			S O
Are handles for tools and equipment inappropriate in terms of size or shape? (e.g., wrenches)			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?			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? (e.g., poorly maintained conveyors)		S O	

WORK ORGANISATION

	N	Y	Comments:
Is the work externally-paced or controlled by a machine or the process?		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**



Racker/Selector

This Work Manual contains information about the body parts found to be at risk of musculoskeletal injury (MSI) for the Racker/Selector (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

Racker/Selector

Disclaimer

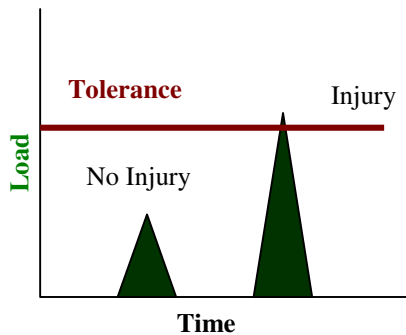
The BC sawmill IMIRP documents were developed by Advanced Ergonomics Inc. (AEI) based on analyses conducted in a number of voluntary, participating sawmills in British Columbia and should be considered applicable only to the BC sawmill industry. Modification to these documents may reduce their usefulness 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.

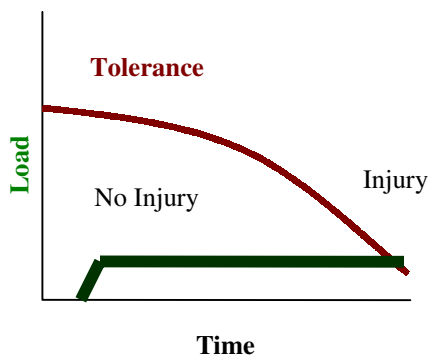
Example – a worker going over on their ankle and spraining it.



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 Racker/Selector 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 Racker/Selector. 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 Racker/Selector position and found that the shoulder, elbow/wrist, and low back are the body parts of major concern while performing the duties. Focussing on solutions that target the areas of major concern will likely reduce the greatest risks associated with this job.

Shoulder: Major risks include repetitive movements with awkward shoulder postures while racking siding. The height of the racks and size of siding will affect loading on the shoulder.

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

1. Reduce height of the racks (page 73)
2. Stretches (page 76)
3. Job rotation (page 80)

Elbow/wrist: Major risks include forceful and repetitive gripping with awkward wrist postures while handling siding. The size of the siding will affect loading on the elbow/wrist area.

The following solutions are targeted at reducing the risk of injury to the elbow/wrist:

1. Stretches (page 76)
2. Proper fitting gloves (page 78)
3. Job rotation (page 80)

Low back: Major risks include forceful and repetitive lifting of siding onto racks. The following solutions are targeted at reducing the risk of injury to the low back:

1. Chain height (page 74)
2. Stretches (page 76)
3. Job rotation (page 80)

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

NECK

Direct Risk Factors:
Repetition
Awkward Postures



A Racker/Selector may look down in order to inspect siding.

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

Repetition

- When the head is repeatedly bent forward, 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.

AWKWARD POSTURES

- Neck muscles must support the weight of the head while in a forward bent position. The more the neck bends, the greater the load on the muscles and tendons.

INDIRECT RISK FACTORS

Workstation Design

Working Heights

- The height of the chain affects the posture of the neck. Chains that are too low increase bending of the neck, leading to increased stress on neck tissues.

CONSEQUENCES

- Repeatedly bending the neck forward can fatigue the muscles at the back of the neck.
- 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 81 to 82.
- For exercises that can help to prevent *neck* injuries, see the *Neck section of the Body Manual*.

SHOULDER

Direct Risk Factors:
Repetition
Awkward Postures



A Racker/Selector must repeatedly lift siding on to racks. This lifting can be above shoulder level.

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

Repetition

- The rotator cuff tendon can fray from repeated rubbing against bone. If the repetitive stress is excessive, and recovery is not adequate, the tendon may fatigue to the point of injury.

AWKWARD POSTURES

- A rotator cuff tendon may rub up against bone (impingement) when the arms are lifted overhead. The friction between the tendon and the bone increases as the arm is lifted higher. In addition, the rotator cuff must stabilise the weight of the arms when working overhead, increasing the tension in the tendon. The combination of impingement and tension increases the stress on this tendon.

INDIRECT RISK FACTORS

Workstation Design

Working Heights

- The height of the top racks affects the working postures of the shoulder. Racks that are too high lead to extreme shoulder postures, which increases the risk of injury.

Characteristics of Objects Being Handled

Size and Shape

- Wider and/or longer pieces of siding increase loading on the shoulder.

CONSEQUENCES

- Repeatedly lifting the arms overhead may lead to fraying in the tendon, as a result of the friction between the tendon and the bone.
- Rotator cuff muscles may become weakened.
- Signs and symptoms include pain when lifting the arm to the side, above shoulder height.

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 81 to 82.
- For exercises that can help to prevent *shoulder* injuries, see the *Shoulder section of the Body Manual*.

ELBOW/WRIST

Direct Risk Factors:

Force
Repetition
Awkward Postures



A Racker/Selector must repeatedly grip siding when lifting pieces on to racks.

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.

Repetition

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

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. Objects that are too small or too large 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.

INDIRECT RISK FACTORS

Characteristics of Objects Being Handled

Size and Shape

- The size of the siding affects the loading on the elbow and wrist. Gripping and handling heavier pieces increases the stress to the elbow and wrist areas.

CONSEQUENCES

- Repeated forceful gripping may lead to fatigue at the tendon/bone connection near the elbow, or in the tissues of the wrist.
- Signs and symptoms include pain in the elbow and wrist 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 81 to 82.
- For exercises that can help to prevent *elbow* injuries, see the *Elbow section of the Body Manual*.

LOW BACK

Direct Risk Factors:

Force
Repetition



A Racker/Selector must repeatedly lift siding on to racks.

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. Muscles are used to stabilise the spine when moving the body or handling objects.

DIRECT RISK FACTORS

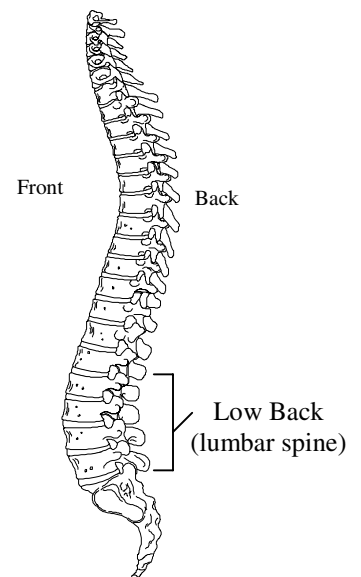
Force

- 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.

Repetition

- Repeated lifting can gradually fatigue the structures of the low back. If the repetitive stress is excessive, and recovery is not adequate, soft tissue in the back may fatigue to the point of injury.

Neutral Spine



INDIRECT RISK FACTORS

Workplace Design

Working Reaches

- The position of the racks affects loading on the low back. Racks that are set farther back increase the amount of reaching required, increasing loading on the back.

Characteristics of Objects Being Handled

Size and Shape

- Handling heavier and/or longer pieces of siding increases loading on the low back.

CONSEQUENCES

- Repeatedly lifting may lead to soft tissue damage in the low back.
- Signs and symptoms may include muscle spasm and sharp pain in the back.

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 81 to 82.
- For exercises that can help to prevent *back* injuries, see the *Back section of the Body Manual*.

LOW BACK

Direct Risk Factors:
Repetition
Awkward Postures

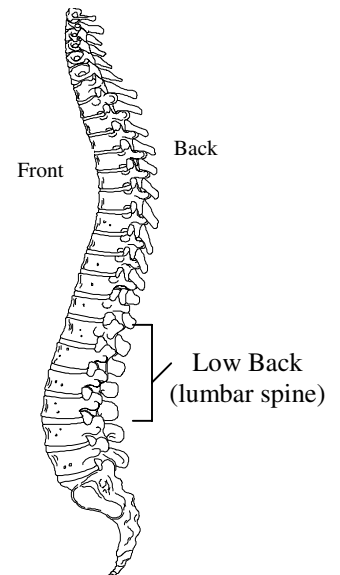


A Racker/Selector may repeatedly bend down to reach siding on chain.

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

Repetition

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

Awkward Postures

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

INDIRECT RISK FACTORS

Workstation Design

Working Heights

- The height of the chain can affect the posture of the low back. Chains that are too low cause workers to bend down slightly to grab siding. This bending puts stress on the soft tissue in the low back.

CONSEQUENCES

- Repeatedly bending may lead to damage in the soft tissue in the low back.
- 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 81 to 82.
- For exercises that could help to prevent *back* injuries, see the *Back section of the Body Manual*.

KNEE

Direct Risk Factors:
Repetition
Awkward Postures



A Racker/Selector may have to repeatedly turn to place siding on shelves behind them.

DIRECT RISK FACTORS

Repetition

- Repeated pivoting may gradually irritate the knee to the point that soft tissue becomes damaged.

Awkward Posture

- Twisting the knee when pivoting can increase stress on soft tissues (e.g., ligaments and cartilage) in the knee.

INDIRECT RISK FACTORS

Workstation Design

Additional Workstation Design Options

- The design of the racker/selector area can affect the amount of pivot required. Stacking siding on shelves behind the worker increases the amount of pivoting and the stress on the knee.

CONSEQUENCES

- Repeated pivoting can lead to soft tissue damage in the knee.
- Signs and symptoms include pain in the knee, and possibly swelling.

SUGGESTED SOLUTIONS

- For specific solutions that may prevent injuries to the Knee, please see the column labelled “Knee” in the Summary of Solutions on pages 81 to 82.
- For exercises that could help to prevent *knee* injuries, see the *Knee section of the Body Manual*.

FOOT

Direct Risk Factors:

Repetition
Vibration



A Racker/Selector may walk on a hard, vibrating surface for prolonged periods.

BACKGROUND INFORMATION

- There are a number of small muscles in the base of the foot, as well as a tough band that attaches to the heel bone and runs down towards the toes. This band is called the plantar fascia, and it contributes to the arch in the foot.

DIRECT RISK FACTORS

Repetition

- During walking, impact between the ground and the feet loads the plantar fascia. If the duration of walking is excessive, and recovery is not adequate, the fascia may fatigue to the point of injury.

Vibration

- Vibrating floors can increase the loading on the foot. Factors like vibration level and frequency increase the amount of loading on the foot, and can lead to irritation. The longer the Racker/Selector is exposed to vibration, the greater the risk of injury.

INDIRECT RISK FACTORS

Workstation Design

Floor Surfaces

- Type of floor surface can affect loading on the feet. Harder surfaces like concrete, significantly increase the stress transmitted to feet.

CONSEQUENCES

- Continual walking may cause damage to the plantar fascia.
- Signs and symptoms include pain and stiffness at the base of the heel, initially in the morning. As the problem progresses the pain may become chronic.

SUGGESTED SOLUTIONS

- For specific solutions that may prevent injuries to the Foot, please see the column labelled “Foot” in the Summary of Solutions on pages 81 to 82.
- For exercises that can help to prevent *foot* injuries, see the *Foot section of the Body Manual*.

Summary of Body Parts at Risk

NECK

- A Racker/Selector may look down in order to inspect siding.



SHOULDER

- A Racker/Selector must repeatedly lift siding on to racks. This lifting can be above shoulder level.



ELBOW/WRIST

- A Racker/Selector must repeatedly grip siding when lifting pieces on to racks.



LOW BACK

- A Racker/Selector must repeatedly lift siding on to racks.



- A Racker/Selector may repeatedly bend down to reach siding on chain.



KNEE

- A Racker/Selector may have to repeatedly turn to place siding on shelves behind them.



FOOT

- A Racker/Selector may walk on a hard, vibrating surface for prolonged periods.



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*	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	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆

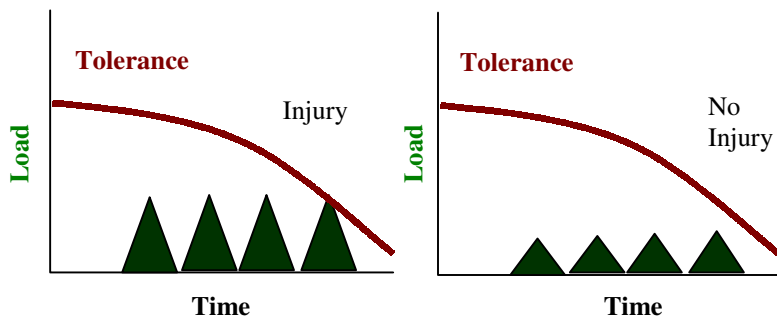
* Extended exposure to any risk factor can increase the likelihood of injury. For solutions designed to decrease the duration of exposure to any risk factor please refer to the Work Organisation section of the General Risk Factor Solutions Manual

** 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 81 to 82 for specific problem/solution information. Additional information on some risk factors can be found in the General Risk Factor Solutions Manual.

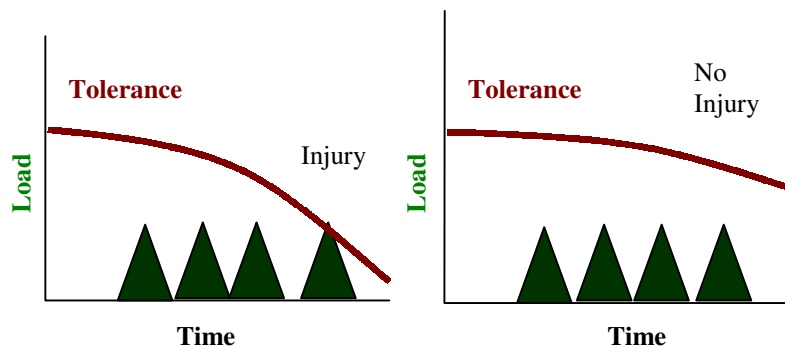
Injury Prevention

*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 Racker/Selector 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

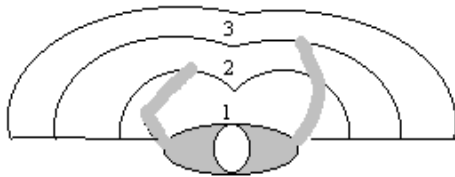
These are devices worn by a worker to reduce the risk of injury, including gloves, kneepads, hearing protection, and leather aprons.

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.

Extend racks

E To reduce handling siding away from the body, which increases loading on the shoulder and back, have racks extended out. To avoid hitting fingers on the racks, siding should not be flush with the end of the rack.



Adjustable backing plates

E To reduce the time required to position siding in racks, install adjustable backing plates in racks. This will ensure that the appropriate lengths will be racked and make it easier to keep the far ends of siding flush.

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 trunk. 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 Racker/Selector, 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.

Reduce height of the racks

E

To reduce awkward shoulder posture, reduce the height of the racks. At some mills that have runs of 10-inch wide siding, the height of the racks has to be higher. Height adjustable racks that could lower for smaller width siding would help reduce risk for shoulder injuries.



Stack short siding on top rack

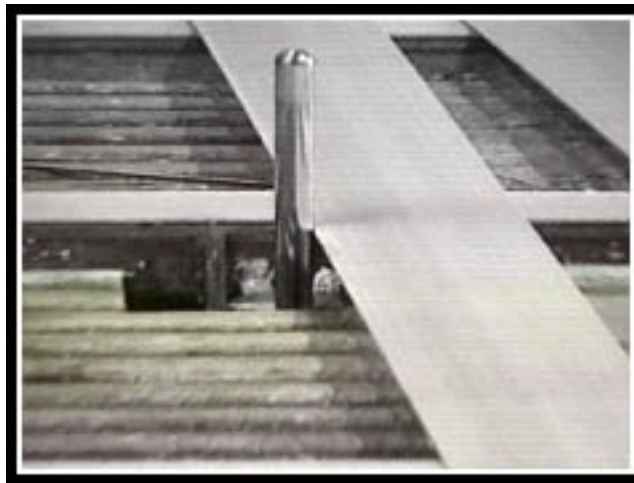
E

To reduce loading on shoulders, use top racks for short lengths and/or uncommon grades. This will minimise the weight to be lifted and/or the number of pieces lifted.

Pin stops

E

To reduce loading on the shoulder and the back from lifting siding, install pin stops, which allows the siding to be sorted on the chain. This system works best when the variety in siding size is minimised. Mills with two chains can direct all clears to one chain with pin stops.



Two person stacking

A

To reduce loading on the back and shoulder, send one Racker to the opposite side of transfer deck to help lift longer, heavier siding.

Chain height

E

To reduce loading on the neck and back, chains should be at a height that does not force workers to bend to inspect and reach siding.

FLOOR SURFACES

Anti-fatigue matting

E

In order 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. In addition, anti-fatigue matting may also aid in damping vibration levels.

Anti-fatigue matting is a practical solution when a worker spends a majority of their time in one area, and the matting does not hinder the safety of the worker or the performance of the task.

Anti-fatigue insoles

PPE

If a worker must stand in several different areas for long periods of time, anti-fatigue boot insoles may be more practical to minimise fatigue in the lower extremities. The cushioned surface of the insole can absorb repeated impact from walking on metal catwalks, and may aid in damping vibration while standing in one spot.

ADDITIONAL WORKSTATION DESIGN OPTIONS

Stacking behind worker

E

To reduce stress to the knee, avoid using shelves behind the worker to store siding. This change will minimise the amount of pivoting required.

Pivot in both directions

WP

To avoid overstraining one knee, alternate sides when pivoting to placing siding on shelf behind the worker.

Additional Work Practices

Stretches

WP

In order to minimise awkward and static posture of the neck, shoulder, wrist and low back, stretch these body parts throughout the day to enhance tissue tolerance for those muscle groups. See additional stretches in the Body Manual.

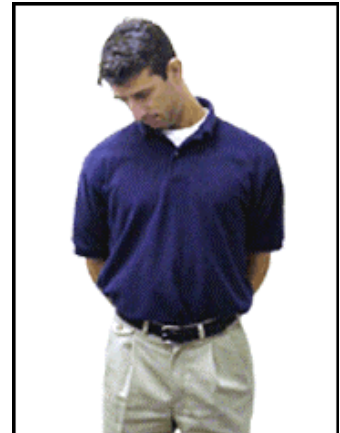
Chin Tuck (neck)

With your head upright, tuck chin in. You should feel a gentle stretch, in the back of the neck. Hold for 20 seconds and then relax. Repeat 3 times.



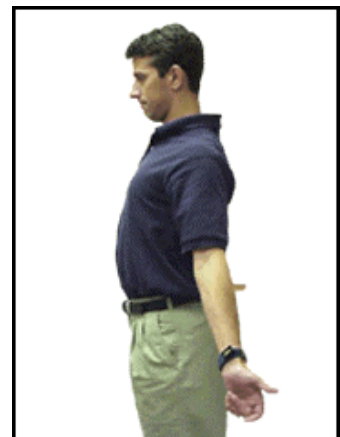
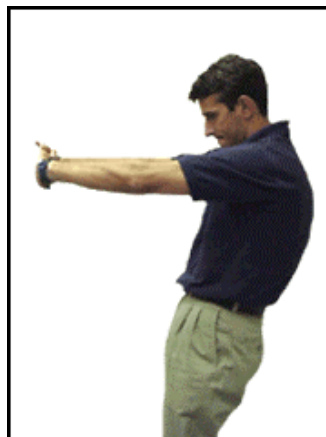
Neck Stretch

Turn the head slightly to one side and reach for the ground with the ground behind you with the opposite arm. Hold for 10 seconds. Repeat 3 times on each side.



Upper Back & Chest Stretch

Place the hands together in front of the body and push them outwards. Bring the arms behind the body and squeeze the shoulder blades together while pressing the shoulders down and keeping the chin tucked in. Repeat 5 times.



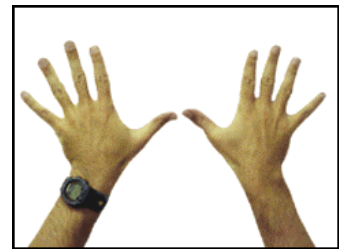
Wrist Flexor and Extensor Stretch

With your arm extended and fingers pointing up, gently pull hand towards your body until you feel a mild stretch in the forearm. (**Note:** do not stretch to the point where you feel pain or tingling). Hold for 15 – 30 seconds. Repeat with fingers pointing down. Repeat with the other arm.



Hands and Fingers Stretch

Clench both fists and hold for 3 seconds. Then open your hands and spread fingers apart. Hold for 3 seconds. Repeat.



View with eyes

WP In order to reduce awkward postures of the neck, rotate the eyes and neck, not just the neck, to view the work area.

Characteristics of Objects Being Handled

SIZE AND SHAPE

Proper fitting gloves

A	To reduce loading on the elbow and wrist, use gloves that fit properly.
WP	Some workers tie a knot in the string on the back of the gloves to improve fit.



Pull siding into body

WP	To reduce loading on the back and shoulder, pull the siding into the body before lifting.
----	-------------------------------------------------------------------------------------------



Turn body sideways

WP To reduce loading on the shoulder and back, lift siding with the body turned sideways, and grip the siding with the hands far apart.

Alternate sides

WP To avoid developing muscle imbalance in the shoulder and back, alternate sides when lifting.

Grip posture

WP To improve grip strength, keep thumbs in on the hand that grips the end of the board.



Environmental Conditions

Please refer to the General Risk Factor Solutions Manual for solutions regarding environmental conditions.

Work Organisation

Job rotation

A To reduce loading on the body parts of concern listed in this Work Manual, the Racker/Selector can be rotated to other job positions that require different physical and mental demands. By rotating to jobs that require different physical demands, 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, 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	Foot
Extend racks	72			A				A				
Adjustable backing plates	72	A		A	A			A				
Reduce height of the racks	73			A R								
Stack short siding on top rack	74			A R								
Pin stops	74			A				F				
Two person stacking	74			R				F A				
Chain height	74	A R						A R				
Anti-fatigue matting	75											R
Anti-fatigue insoles	75											R
Stacking behind worker	75									A R		
Pivot in both directions	75									R		
Stretches	76	directly reduces risk of injury to the body										
View with eyes	77	A										
Proper fitting gloves	78				F							

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.

SOLUTIONS	Page	Injury Prevention Potential										
		Neck	Neck/ Shoulder	Shoulder	Elbow/Wrist	Wrist	Wrist/ Hand	Low Back	Hip	Knee	Ankle/Foot	Foot
Pull siding into body	78			F A				F				
Turn body sideways	79			A				F				
Alternate sides	79			R				R				
Grip posture	79				F							
Job rotation	80 ♦	indirectly reduces risk of injury to the body										
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										
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

R = Repetition

A = Awkward Postures

S = Static Postures

C = Contact Stress

V = Vibration

♦ = See General Risk Factor Solutions Manual

CHECK IF THIS APPLIES	ACTIVITY OF RISK	DIRECT RISK FACTOR(S)	POTENTIAL HAZARDS	SUGGESTED SOLUTIONS
	<p>Shoulder</p> <p>A Racker/Selector must repeatedly lift siding on to racks. This lifting can be above shoulder level.</p>	<p>Repetition</p> <p>Awkward Postures</p>	<ul style="list-style-type: none"> • The rotator cuff tendon can fray from repeated rubbing against bone. If the repetitive stress is excessive, and recovery is not adequate, the tendon may fatigue to the point of injury. • A rotator cuff tendon may rub up against bone (impingement) when the arms are lifted overhead. The friction between the tendon and the bone increases as the arm is lifted higher. In addition, the rotator cuff must stabilise the weight of the arms when working overhead, increasing the tension in the tendon. The combination of impingement and tension increases the stress on this tendon. 	<ul style="list-style-type: none"> • To reduce loading on the shoulder, pull the siding into the body before lifting. • To reduce loading on the shoulder and back, lift siding with the body turned sideways, and grip the siding with the hands far apart. • For exercises that can help prevent Shoulder 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 Racker/Selector must repeatedly grip siding when lifting pieces on to racks.</p>	<p>Force</p> <p>Repetition</p> <p>Awkward Postures</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. • Repeated stress to the elbow without adequate rest could slowly fatigue tissues to the point of injury. • 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. Objects that are too small or too large 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. 	<ul style="list-style-type: none"> • To reduce loading on the elbow and wrist, use gloves that fit properly. Some workers tie a knot in the string on the back of the gloves to improve fit. • To improve grip strength, keep thumbs in on the hand that grips the end of the board. See picture in work manual. • For exercises that can help prevent <i>Elbow</i> and <i>Wrist</i> injuries, <i>see the Elbow and Wrist section of the Body Manual.</i>

CHECK IF THIS APPLIES	ACTIVITY OF RISK	DIRECT RISK FACTOR(S)	POTENTIAL HAZARDS	SUGGESTED SOLUTIONS
	<p>Knee</p> <p>A Racker/Selector may have to repeatedly turn to place siding on shelves behind them.</p>	<p>Repetition</p> <p>Awkward Postures</p>	<ul style="list-style-type: none"> • Repeated pivoting may gradually irritate the knee to the point that soft tissue becomes damaged. • Twisting the knee when pivoting can increase stress on soft tissues (e.g., ligaments and cartilage) in the knee. 	<ul style="list-style-type: none"> • To avoid overstraining one knee, alternate sides when pivoting to placing siding on shelf behind worker. • For exercises that can help prevent <i>Knee</i> injuries, <i>see the <i>Knee</i> section of the <i>Body Manual</i>.</i>

CHECK IF THIS APPLIES	ACTIVITY OF RISK	DIRECT RISK FACTOR(S)	POTENTIAL HAZARDS	SUGGESTED SOLUTIONS
	<p>Foot</p> <p>A Racker/Selector may walk on a hard, vibrating surface for prolonged periods.</p>	<p>Repetition</p> <p>Vibration</p>	<ul style="list-style-type: none"> • During walking, impact between the ground and the feet loads the plantar fascia. If the duration of walking is excessive, and recovery is not adequate, the fascia may fatigue to the point of injury. • Vibrating floors can increase the loading on the foot. Factors like vibration level and frequency increase the amount of loading on the foot, and can lead to irritation. The longer the Racker/Selector is exposed to vibration, the greater the risk of injury. 	<ul style="list-style-type: none"> • To improve foot tolerance for long periods of walking, use anti-fatigue insoles in work boots. • In order to ensure healthy foot alignment, purchase appropriate footwear. See the guidelines for footwear in the <i>Foot section of the Body Manual</i>. • For exercises that can help prevent <i>Foot</i> injuries, see the <i>Foot section of the Body Manual</i>.