

Ergonomic Hazard Assessment Tool BUS DRIVER

Route No.:

Bus No.:

Bus Type (diesel, trolley)

Floor Type (high, low):

Operator:

Start Time:

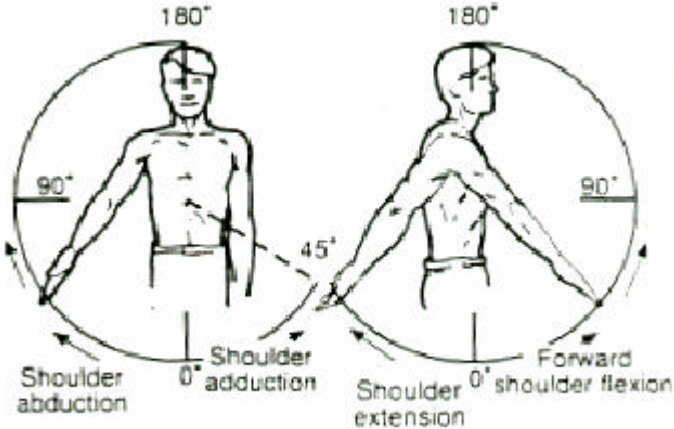
Finish Time:

Date of Assessment:

Assessed By:

Please note the following:

- For each of the questions, please make an appropriate selection, i.e. Yes, No or N/A.
- For questions where the response is “Yes”, further risk assessment is required. Alternatively, refer to list of modifications that may address the problem. In cases, where modifications do not address the problem, engineering modifications should be considered in the design of new buses. In the interim, rotation to different buses and/or routes may prove beneficial.
- This tool does not capture all aspects of an ergonomic assessment – only the ones that seem most prevalent. Annual revisions to the tool are recommended so that new ergonomic concerns can be incorporated in the assessment tool.

	Risk Factor	Response
REPETITION	<p>1. Shoulder repetition occurs more than once every 30 sec. and/or for more than 50% of the driving time.</p> <p>Awkward shoulder postures:</p> <ul style="list-style-type: none"> ▪ shoulder flexion $\geq 90^\circ$ ▪ shoulder abduction $\geq 90^\circ$ ▪ shoulder extension (hand behind the body) ▪ shoulder adduction (elbow crosses midline of body). 	<p><input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A</p>
	<p><i>If response is YES, the following modifications may lower the number of repetitions to an acceptable level:</i></p> <ol style="list-style-type: none"> a. Lower the height of steering column; and / or b. Tilt steering column towards employee; and / or c. Push seat forward; and / or d. Raise seat height; and / or e. Incorporate proper seated posture in New Employee Training Module. 	
STATIC WORK	<p>2. Employee assumes a static shoulder posture for more than 2 hours per day? Static shoulder posture is defined as “Hand(s) above the head” or “Elbow(s) above the shoulder”.</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A</p>
	<p><i>If response is YES, the following modifications may lower the duration to an acceptable level:</i></p> <ol style="list-style-type: none"> a. Lower the height of steering column; and / or b. Tilt steering column towards employee; and / or c. Push seat forward; and / or d. Raise seat height; and / or e. Incorporate proper seated posture in New Employee Training Module. 	

	Risk Factor	Response
FORCE	<p>3. Forces to operate the hand wheel are outside the following ranges:</p> <ul style="list-style-type: none"> ▪ One-hand operation: 2 – 13 kg ▪ Two-hand operation: 2 – 22 kg <p style="text-align: right;"><input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A</p> <p><i>If response is YES, the following modifications may lower the forces to an acceptable level:</i></p> <ul style="list-style-type: none"> a. <i>Encourage employee to use two hands while steering / turning; and / or</i> b. <i>Investigate if hand wheel requires maintenance or repairing.</i> 	
	<p>4. One-handed horizontal force exertions (e.g. emergency parking brake located on front dash) exceeds the following:</p> <ul style="list-style-type: none"> ▪ One-handed pushing: 7 kg ▪ One-handed pulling: 8 kg <p style="text-align: right;"><input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A</p> <p><i>If response is YES, the following modifications may lower the forces to an acceptable level:</i></p> <ul style="list-style-type: none"> a. <i>Investigate if part requires maintenance or repairing; and / or</i> b. <i>Investigate alternative ways of completing task, e.g. using 2 hands.</i> 	
	<p>5. One-handed vertical force exertions (e.g. emergency parking brake located beside window) exceeds the following:</p> <ul style="list-style-type: none"> ▪ One-handed pushing: 6 kg ▪ One-handed pulling: 7 kg <p style="text-align: right;"><input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A</p> <p><i>If response is YES, the following modifications may lower the forces to an acceptable level:</i></p> <ul style="list-style-type: none"> a. <i>Investigate if part requires maintenance or repairing; and / or</i> b. <i>Investigate alternative ways of completing task, e.g. using 2 hands.</i> 	
	<p>6. Forces to operate foot-operated push buttons (e.g. signalling buttons) are outside the range of 1.5 – 7.5 kg? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A</p> <p><i>If response is YES, consider the following:</i></p> <ul style="list-style-type: none"> a. <i>Investigate if part requires maintenance or repairing.</i> 	
	<p>7. Forces to operate foot pedals (e.g. brake, accelerator) are outside the range of 1.5 – 9 kg? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A</p> <p><i>If response is YES, consider the following:</i></p> <ul style="list-style-type: none"> a. <i>Investigate if part requires maintenance or repairing.</i> 	

	Risk Factor	Response		
SEATING	8. Foot support for the left foot while driving is inadequate.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
	<i>If response is YES, consider the following:</i>			
	a. Encourage employee to adopt different postures throughout shift.			
	9. Thigh support while driving is inadequate.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
	<i>If response is YES, consider the following:</i>			
	a. If collapsed cushion request maintenance to fix; and / or b. Advice employee on proper seat adjustments.			
10. Tears or rips are present in the seat covering.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	
<i>If response is YES, consider the following:</i>				
a. Request maintenance to repair seat.				
11. Driver's seat has <u>no</u> :				
▪ seat cushion height adjustment?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	
▪ seat cushion tilt adjustment:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	
▪ backrest angle adjustment?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	
▪ lumbar support adjustment – in and out?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	
▪ lumbar support adjustment – up and down?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	
▪ steering wheel adjustment – in and out?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	
▪ steering wheel adjustment – up and down?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	
▪ steering wheel adjustment – tilt?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	
▪ power steering?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	
▪ seat belt height adjustment?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	
<i>If response is YES, consider the following:</i>				
a. Encourage proper use of seat adjustment features; and / or b. Incorporate proper seated posture in New Employee Training module.				
12. The seat position or design does not eliminate all windscreen reflections from the vehicle interior.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	
<i>If response is YES, consider the following:</i>				
a. Adjust lighting inside the bus to minimize reflections; and / or b. Encourage employee to use sun visors; and or c. Encourage employee to wear baseball hat, sunglasses. d. Ensure windows are clean; and / or e. Clear windows of mist (using defrost control, paper towel).				
13. Seat material does not “breathe”, therefore, resulting in perspiration discomfort.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	

	Risk Factor	Response
SEATING (cont'd)	14. Seat is not equipped with a seat suspension or the seat suspension is not in working order.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
	<i>If response is YES, consider the following:</i>	
	a. Request maintenance to repair seat suspension; and / or	
	b. Encourage proper use of seat suspension.	
	15. The seat, steering wheel and pedals are not in a straight line.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
	16. Headroom in the driving cab is insufficient.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
	17. Employee does not stand up during breaks / layover times.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
	<i>If response is YES, consider the following:</i>	
	a. Encourage employee to stand / walk around during layover times.	
CONTROLS & DISPLAYS	18. Visual warning systems in the driver's field of vision are obstructed by the steering wheel.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
	19. Reach to primary controls requires stretching and / or twisting of the body.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
	<i>If response is YES, consider the following:</i>	
	a. Encourage employee to stand (if possible) when reaching for controls that require stretching, e.g. to change route signs, adjust rear view mirror.	
	20. Analogue dials are not properly illuminated.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
	<i>If response is YES, consider the following:</i>	
	a. Request maintenance to repair (if illumination is malfunctioning); and / or	
	b. Encourage employees to use illumination when necessary.	
	21. Controls are located in a position such that they can be damaged by water from the driver's signalling window.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
	<i>If response is YES, consider the following:</i>	
	a. Request maintenance to install cover.	
	22. Sunlight adversely affects the viewing of the displays.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
	<i>If response is YES, consider the following:</i>	
	a. Encourage employee to use sun visors; and or	
	b. Encourage employee to wear baseball hat, sunglasses.	

	Risk Factor	Response
CONTROLS & DISPLAYS (cont'd)	23. The cash collecting equipment obstructs or interferes with the operation of driving controls or gauges.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
	<i>If response is YES, consider the following:</i> a. Request maintenance to reposition cash collecting equipment.	
	24. On the cash collecting equipment, there are sharp edges or obstructions that might injure the driver during ticket transactions.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
<i>If response is YES, consider the following:</i> a. Encourage employee to retract cash collecting equipment (if possible) prior to exiting workstation; and / or b. Request maintenance to round off edges or modify.		
CONTROLS & DISPLAYS (cont'd)	25. Controls are not easy to operate, i.e. require forceful exertions.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
	<i>If response is YES, consider the following:</i> a. Investigate if part requires maintenance or repairing; and / or b. Investigate alternative ways of completing task, e.g. using 2 hands.	
	26. While standing, vertical reaches > 182 cm are required.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
REACHES	<i>If response is YES, consider the following:</i> a. Provide portable step stool or extension for employee that is unable to reach object; and / or b. Investigate alternative ways of completing task, e.g. encourage employees to drive up to curb and use curb to reach mirrors.	
	27. While standing, horizontal forward reaches > 75 cm are required.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
	<i>If response is YES, consider the following:</i> a. Provide employee with an extension tool for difficult to reach objects; and / or b. Investigate alternative ways of completing task.	
REACHES	28. While standing, horizontal lateral reaches > 72 cm are required.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
	<i>If response is YES, consider the following:</i> a. Provide employee with an extension tool for difficult to reach objects; and / or b. Investigate alternative ways of completing task.	

		Risk Factor					Response
REACHES (cont'd)	29. While sitting, horizontal forward reaches are outside acceptable limits (shaded regions in table below).						<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
		≤ 36 cm	36–50 cm	50–70 cm	> 70 cm		
	Frequent (> 3x per hour)						
	Infrequent (2-3x per hour)						
	Occasional (< 2x per hour)						
	<p><i>If response is YES, consider the following:</i></p> <p>a. Tilt steering column towards employee; and / or</p> <p>b. Push seat forward; and / or</p> <p>c. Bring object closer (if possible), e.g. ODI #, Radio; and / or</p> <p>d. Incorporate proper seated posture in New Employee Training module.</p>						
	30. While sitting, horizontal lateral reaches are outside acceptable limits (shaded regions in table below).						<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
		≤ 46 cm	46–60 cm	60–72 cm	> 72 cm		
	Frequent (> 3x per hour)						
	Infrequent (2-3x per hour)						
	Occasional (< 2x per hour)						
	<p><i>If response is YES, consider the following:</i></p> <p>a. Bring object closer (if possible).</p>						
	31. The step to get onto the driver's seat is outside the range of 12.4 – 20 cm.						<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Environmental / Personal	32. The sun visors provide inadequate protection to drivers of all stature.						<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
	<p><i>If response is YES, consider the following:</i></p> <p>a. Request maintenance to make necessary modifications.</p>						
	33. Sun visors are incapable of giving shade from the side.						<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
	<p><i>If response is YES, consider the following:</i></p> <p>a. Request maintenance to install sun visor on side.</p>						
	34. There is no air conditioning option.						<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
	35. There is inadequate storage space for personal belongings, i.e. lunch box, jacket.						<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A

