

PHYSICAL DEMANDS ASSESSMENT

HEAVY DUTY
EQUIPMENT
TECHNICIAN

PHYSICAL DEMANDS ASSESSMENT (PDA)

HEAVY DUTY EQUIPMENT TECHNICIAN

As a national organization mandated to identify and support HR needs for Canada's trucking and transportation sector, Trucking HR Canada (THRC) plays a pivotal role in designing and completing projects that directly address HR challenges to support a vibrant and thriving trucking workforce. A key concern is the attraction, recruitment and retention of skilled workers to keep the wheels of the industry turning.

What is the Issue?

Diversity and inclusion lead to strong, skilled workplaces; however, many industries - including the trucking sector - experience difficulties and barriers in engaging and retaining individuals that require accommodations to perform their jobs to their full potential.

How Can Physical Demands Assessments Help Employers?

Physical Demands Assessments are an invaluable HR tool for employers to ensure diverse workplaces in which all workers can effectively perform essential and valuable work.

PDAs help to identify the physical requirements of a position that can then serve as the basis for implementing accommodations to allow workers to perform their jobs effectively and efficiently.

What are Physical Demands Assessments?

Physical Demands Assessments (PDAs) identify the physical job requirements for specific occupations. Once employers are aware of the physical requirements of the job, current employees and new hires can be assessed to determine if they can perform the physical duties. If required, potential accommodations can be put in place to allow workers from various under-represented groups to not only perform, but thrive, in their roles - a mutually beneficial outcome for both workers and employers.

When are Physical Demands Assessments Useful for Employers?

Employers can use Physical Demands Assessments when working with the following diverse groups in the workplace:

- Workers with different physical body strength capabilities than their coworkers in the same role.
- Workers who may not have the same strength, balance, stamina or coordination as their co-workers.
- Employees who are returning to work after experiencing an injury that causes temporary impairment of physical ability or functioning.
- Employees or new hires who have permanent medical restrictions or disabilities that alter the way they perform certain physical tasks.

Physical Demands Assessments are useful for EVERY employee. PDAs promote the consideration of inclusive practices that help all workers to perform their jobs as effectively, safely and comfortably as possible.



PDA OVERVIEW

Job Description: Heavy Duty Equipment Technician

Heavy Duty Equipment Technicians repair and maintain commercial trucks and truck-tractors to ensure that the equipment is safe and in good working order. Trained and qualified technicians inspect, test, diagnose and repair truck and truck-tractor engines and other key operating systems such as power trains, transmissions, braking systems, and fuel and electrical systems. Today's trucks are more complex and sophisticated. Computers play an important role, allowing certified technicians to diagnose and troubleshoot equipment problems.

Heavy Duty Equipment Technicians often repair, overhaul, inspect and maintain the suspension, brake and electrical systems on trailers. Some Technicians specialize in working with trailers' temperature control units, which are used to transport goods at controlled temperatures.

Most physical aspects of the job:

The most commonly performed actions requiring physical **STRENGTH** include:

OCCASIONALLY Performed Actions:

- Lifting and Lowering
 - Floor to Bench
 - Bench to Shoulder
 - Floor to Shoulder
- Carrying
- Pushing/Pulling
 - Up/Down

RARELY Performed Actions:

- Pushing/Pulling:
 - Bilateral

Physical strength requirements (maximum and usual):

- Lifting and Lowering
 - Floor to Bench: Maximum 33.2 kg (73 lb.); usual 0-33.2 kg (0-73 lb.)
 - Bench to Shoulder: Maximum 27.3 kg (60 lb.); usual 0-27.3 kg (0-60 lb.)
 - Floor to Shoulder: Maximum 27.3 kg (60 lb.); usual 0-27.3 kg (0-60 lb.)
- Carrying
 - Weight – Maximum 26.9 kg (59 lb.); usual 0-26.9 kg (0-59 lb.)
 - Distance – Maximum 27 meters (89 ft.); usual 1-12 meters (3-39 ft.)
- Pushing/Pulling Force
 - Up/Down – maximum 74.8 kgf (164 lbf); usual 0-74.8 kgf (0-164 lbf)
 - Bilateral – maximum 17 kgf (37 lbf); usual 1-17 kgf (0-37 lbf)

The most commonly performed actions requiring **MOBILITY AND PHYSICAL POSITIONING** include:

FREQUENTLY Performed Actions:	OCCASIONALLY Performed Actions:	RARELY Performed Actions:
<ul style="list-style-type: none"> • Neck Movements • Gripping • Foot Action 	<ul style="list-style-type: none"> • Standing • Walking • Sitting • Climbing (ladders) • Balancing • Kneeling • Crouching/Squatting • Crawling • Low Back Movements • Reaching (Horizontal/ Vertical) • Elbow Movements • Wrist Movements • Fine Finger movements 	<ul style="list-style-type: none"> • Climbing (Stairs) • Reaching (Behind/Side) • Pinching

Legend:

	% of Shift	4hr Shift	8hr Shift	12hr Shift
SELDOM	Not daily	Not daily	Not daily	Not daily
RARE	0-5%	1-12 min	1-24 min	1 - 36 min
OCCASIONAL	6%-33%	13 min- 1hr 19 min	25 min - 2hr 38 min	37 min - 3hr 58 min
FREQUENT	34%-66%	1hr 20 min - 2hr 40 min	2hr 39 min - 5hr 15 min	3hr 59 min - 8hr
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ESSENTIAL JOB FUNCTIONS:

Essential job functions are the fundamental duties required of Heavy Duty Equipment Technicians. In other words, they are the duties that the incumbent **absolutely must be able to do** to perform the job.

The Essential Job Functions of the Heavy Duty Equipment Technician is:

- Servicing/Repairing commercial trucks and trailers

Heavy Duty Equipment Technicians spend upwards of 95% of their day servicing and repairing trucks and trailers.

ESSENTIAL PHYSICAL JOB REQUIREMENTS

Heavy Duty Equipment Technician is a physically demanding position. The following are the key physical requirements for job incumbents:

HEARING: Heavy Duty Equipment Technicians are required to hear various sounds and recognize the difference between them, particularly when diagnosing and troubleshooting equipment problems.

VISION: Heavy Duty Equipment Technicians are required to see details of objectives - both in close range (less than one foot away) and far range (more than one foot away) - when servicing equipment.

They are also required to detect colours, shades and brightness.

AGILITY: Heavy Duty Equipment Technicians are required to steady themselves and maintain posture when performing actions using intense pushing/pulling and straining action.

DEXTERITY: Heavy Duty Equipment Technicians require manual dexterity to manipulate hand and power tools.

POTENTIAL ACCOMMODATIONS

Please note that the accommodations referenced are high-level suggestions for employers. However, any individual requiring accommodations to perform their job tasks should be assessed by an authorized professional (e.g. Registered Kinesiologist, Ergonomist, Physio/Occupational Therapist) to develop an accommodation plan that is right for the individual.

Potential accommodations for actions requiring physical **STRENGTH**:

- **Lifting and Lowering** – use of jacks, moving equipment, etc.
- **Carrying** – use of two-person lifts, assistive carrying devices.
- **Pushing and pulling** – use of assistive pulleys, levers or tools (situation specific).

Potential accommodations for actions requiring **MOBILITY AND PHYSICAL POSITIONING**:

- **Neck movements** – use of braces.
- **Gripping** – use of adapters.

Universal Inclusive Practices and Accommodations:

- Ensuring a low-scent or scent-free environment (e.g. in vehicles, loading/unloading areas and offices)
- Providing frequent breaks to allow workers experiencing non-visible disabilities to conserve energy (e.g. workers experiencing chronic fatigue, chronic pain, needing to take medication, needing to eat at specific times, needing to take more frequent bathroom breaks)
- Using electronic devices (e.g. tablet computers or smartphones with touchscreens) to complete administrative tasks requiring fine finger movements or wrist movement
- Providing ergonomic chairs during periods of sitting or when at rest during breaks
- Providing ice packs or heating pads (in-cab or in-office) to assist in pain management
- Stretching during breaks
- Wearing orthotic footwear
- Outfitting computer monitors with screen protection to prevent glare and prevent headaches
- Ensuring all step ladders, step stools and ladders are equipped with grips to ensure stability and prevent slips and falls, as well as grab grips and vision reflection strips.
- Providing headsets for desk jobs that require wrist movement or neck and neck movement
- Utilizing grip holders for use of devices – such as phones or clipboards – that require an open grip
- Using ear plugs to block out excess noise but maintain hearing ability to assist workers with noise sensitivity, post-concussion or auditory processing issues
- Using sunglasses or darkened lenses to manage light sensitivity issues

PHYSICAL DEMANDS PROFILE

Job Title	Heavy Duty Equipment Technician	NOC	7312 – Heavy-Duty Equipment Mechanics
Report Completed By	CBI Workplace Solutions		

JOB OBJECTIVE:

Heavy Duty Equipment Technicians are responsible for keeping tractors and trailers in good safe working condition and on the road.

KEY PHYSICAL JOB TASKS

- 1. Perform safety inspections of trucks and trailers**
- 2. Perform trailer maintenance**
- 3. Service, diagnose, repair and inspect tractors**
- 4. Complete documentation**
- 5. Operate auxiliary equipment**
 - a. Operate forklifts
- 6. Perform maintenance services**
 - a. Perform welding tasks
 - b. Fabricate components and parts
 - c. Complete handyman functions

EQUIPMENT	PERSONAL PROTECTIVE EQUIPMENT
Tractors; trailers; various hand caps; toques; tools; various air tools; oil table; welding mask; beanie fire blanket; fire jacket/apron knee pads; oil reel; air cylinders; welder; trailer lift; safety stands; bumper jack; axle stands; trailer tester cart; battery charging station; booster carts; forklift; pallet jack; axle jack; headlight alignment stand.	Steel toe safety boots; coveralls; safety glasses; hearing protection; gloves; foam mat; weather suitable outer gear.

STRENGTH REQUIREMENTS		Frequency					Mass (KG)		Task #	Comments
		S	R	O	F	C	Max	Usual		
Lifting/Lowering	Floor to Bench (0-88 cm)			✓			33.2	0 - 33.2	2,3,5,6	<ul style="list-style-type: none"> For the purpose of this report, any item lifted to a maximum height of waist high will be expressed as 88 cm. There is a step stool to reduce lifting height on upper shelves by a factor of 50 cm. Tractor chair = 46.7 kg (2-person lift) - 88 cm. Dolly leg = 33.2 kg - 88 cm. Tractor battery = 26.9 kg - 88 cm. Bucket of floor cleaner = 23.1 kg (unilateral lift) - 88 cm. 16-foot ladder = 21.3 kg - 88 cm. Aluminum wheel hub = 21.2 kg - 88 cm. Bucket of sand (unilateral lift) = 20.3 kg - 88 cm. Brake shoe lining (16.5 x 8.5) = 20.0 kg - 160 cm. Starter = 15.9 kg - 127 cm. Fire extinguisher = 13.7 kg - 130 cm. 1" impact gun = 13.3 kg - 110 cm. Draw bar = 10.3 kg - 88 cm. Dual brake pot = 9.9 kg - 88 cm. Jack = 8.6 kg - 157 cm.
	Bench to Shoulder (89-149 cm)			✓			33.2	0 - 33.2	2,3,5,6	
	Floor to Shoulder (0-149 cm)			✓			33.2	0 - 33.2	2,3,5,6	
	Above Shoulder (>150 cm)			✓			33.2	0 - 33.2	2,3,5,6	

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STRENGTH REQUIREMENTS		Frequency					Mass (KG)		Task #	Comments
		S	R	O	F	C	Max	Usual		
Carrying	Weight			✓			26.9	0-26.9	2,3,6	<ul style="list-style-type: none"> • Maximum distance items are carried is from 2nd storage sea-can to farthest point on trailers in the shop. Usual distance from storage sea-can to shop floor is 12 m. From this area, there are dollies that can be utilized to transport items throughout the shop. • Tractor chair = 46.7 kg (2-person lift). • Tractor battery = 26.9 kg. • Bucket of floor cleaner = 23.1 kg (unilateral lift). • 16-foot ladder = 21.3 kg • Aluminum wheel hub = 21.2 kg • Bucket of sand (unilateral lift) = 20.3 kg. • Brake shoe lining (16.5 x 8.5) = 20.0 kg. • Starter = 15.9 kg. • Fire extinguisher = 13.7 kg • 1" impact gun = 13.3 kg. • Draw bar = 10.3 kg. • Dual brake pot = 9.9 kg, jack = 8.6 kg.
	Distance (feet)						27	1-12		
Pushing/Pulling	Up/Down			✓			74.8	0-74.8	2,3,6	<ul style="list-style-type: none"> • Push down on torque wrench = 74.8 kg, hand height = 90 cm. • Pull down on nitrogen cart handle = 32.9 kg, hand height = 130 cm. • Push down on cutting cart handle = 27.2 kg, hand height = 100 cm.
	Unilateral									Not Required.
	Bilateral	✓						17.0	0-17.0	2,6

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MOBILITY AND POSTURAL REQUIREMENTS		Frequency					Task #	Comments
		S	R	O	F	C		
Standing				✓			1,2,3,6	<ul style="list-style-type: none"> Standing is intermittent with walking. Worker will stand on concrete, gravel and dirt outside and will stand on concrete, drain grates and a ladder rung inside. Surfaces outside may become slippery from rain or snow. Worker will stand for approximately 3 hours out of every shift, dispersed throughout the day.
Walking				✓			1,2,3,6	<ul style="list-style-type: none"> Walking is intermittent with standing. Worker will walk on concrete, gravel and dirt outside and will stand on concrete and drain grates inside. Surfaces outside may become slippery from rain or snow. Worker will walk for approximately 3 hours out of every shift, dispersed throughout the day.
Sitting				✓			4,5	<ul style="list-style-type: none"> Sitting to drive tractors into shop, some electrical work and inspecting underneath trailers performed sitting on creepers.
Climbing	Stairs		✓				1,2,3,5,6	<ul style="list-style-type: none"> Steps into forklift, highest step = 44 cm. Steps into tractor, highest step = 44 cm. Steps on step stool, highest step = 25 cm. Steps into sea-can, highest step = 25 cm.
	Ladders			✓			1,2,3,6	<ul style="list-style-type: none"> Climb ladders to reach higher parts on trailers and tractors. Highest step = 30 cm.
	Other							Not Required.
Balancing				✓			1,2,3,6	<ul style="list-style-type: none"> Climbing into vehicles or onto step stool, climbing and standing on ladders. Repairs on roof of tractor or trailer.
Kneeling				✓			1,2,3,6	<ul style="list-style-type: none"> Kneeling is interchangeable with crouching (and vice versa). Worker will kneel to perform inspections and repairs. Worker will kneel/crouch for approximately hours out of every shift, dispersed throughout the day.
Crouching/Squatting			✓					

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MOBILITY AND POSTURAL REQUIREMENTS	Frequency					Task #	Comments
	S	R	O	F	C		
Crawling			✓			2,3,6	• Worker will work on back (using a creeper) for approximately 1 hour out of every shift to get underneath trailers and tractors.
Neck Movements				✓		1,6	• Worker will flex, extend, rotate and lateral flex with neck while inspecting and performing repairs.
Low Back Movements			✓			1,2,3,5,6	• Worker will flex forward while inspecting, performing repairs, pressure washing, sweeping and cleaning shop floor. Worker will extend while inspecting, performing repairs and pressure washing. Some rotation observed with pivoting in tighter spaces. Lateral flexion required for certain access points on equipment.
Reaching	Horizontal (Forward)			✓		1,2,3,5,6	• Worker will reach forward to access tools and to perform inspections and repairs. .
	Vertical (Up/Down)			✓		1,2,3,5,6	• Worker will access items from a variety of different heights in the shop. Top of shadow box - 205 cm, top supply shelf - 195 cm, trailer light tester controls - 173 cm, glad hand on back of trailer - 170 cm, supply cabinet key turn - 170 cm, lip of steel bin - 126 cm • There is a step stool to reduce reaching height by a factor of 50 cm.
	Extension (Behind)		✓			2,6	• Grabbing tools. Distance is worker's choice.
	Lateral (Side)		✓			2,6	• Grabbing tools. Distance is worker's choice.
Elbow movements			✓			2,3,5,6	• Flexion and extension observed with lifting. Pronation and supination observed with using hand tools.
Wrist movements			✓			2,3,5,6	• Flexion, extension, radial deviation and ulnar deviation observed with using hand tools.

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MOBILITY AND POSTURAL REQUIREMENTS	Frequency					Task #	Comments
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Gripping				✓		2,3,5,6	<ul style="list-style-type: none"> Lifting items, using tools and holding steering wheel.
Pinching		✓				1,2	<ul style="list-style-type: none"> Tip pinch (e.g. trailer light testers). Key pinch (e.g. starting tractor, opening parts cabinets).
Fine finger movements (e.g. keying)			✓			4	<ul style="list-style-type: none"> Typing on laptop/computer (for diagnostics and online safeties), touch screen on AC machine and auto-meter machine, controls on battery booster, filling out safety sheets, turning fasteners with fingers.
Striking with hand							Not Required.
Foot action				✓		5	<ul style="list-style-type: none"> Walking, climbing stairs, climbing ladder, using right foot to drive tractor. 3.7 kg foot pedals while operating vehicle pedals (e.g. gas, brake, clutch with standard transmission). Horizontal distance from pedal to the front of the seat 48 cm. 6.8 kg load lock pedal.

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ADDITIONAL CONCERNS AND DEMANDS

Environmental Conditions	✓	Hot		Adequate lighting
	✓	Cold	✓	Moving objects
	✓	Outdoor		Working at heights
	✓	Indoor	✓	Slippery surface
		Dry	✓	Congested area
		Humid	✓	Sharp edges
	✓	Noise	✓	Fumes/vapours/gases
	✓	Vibration		Electromagnetic fields
	✓	Glare		
Psychological/Mental Demands	✓	Work under pressure (deadlines)		Influence people
	✓	Fast pace work		Confrontation situations
		Deal with multiple tasks		Incentive/piece work
	✓	Perform complex and varied tasks	✓	Irregular hours
	✓	Attain precise standards/attention to detail	✓	Overtime
		Control of work pace	✓	Reading
		Direct control/plan of work	✓	Working alone
	✓	Close supervision		Working in a group
	✓	Follow instructions	✓	Travelling
Sensory Demands	✓	Hearing	✓	Spatial perception
	✓	Speech	✓	Tactile
	✓	Colour vision		Smell
		Near vision		Taste
	✓	Far vision		