Forwarder Assessment

Assessment	This document can be used: • For gathering evidence in a training environment • As a competency check of knowledge on an existing worker; or • As a summative assessment.
Candidate Name	
Assessor Name	
Date of Assessment	
Summary of Assessment	☐ The candidate met all outcomes of the **worker assessment** ☐ The candidate has **NOT** met all outcomes of the **worker assessment** ☐ Gap training plan developed
Date of Reassessment	
Summary of Reassessment	☐ The candidate met all outcomes of the **worker assessment** ☐ The candidate has **NOT** met all outcomes of the **worker assessment**
Instructions	• Complete the assessment with the candidate adding notes to justify your decisions. • Ensure the first page of this document is completed (all fields). • Develop a gap training plan for practical deficiencies if required. • Use the same form for reassessment (if applicable) only reassessing the areas where gaps exist. • Conduct the competency conversation before conducting the practical assessment.

Note: This worker assessment covers the technical components of a specific role. For general knowledge and a complete picture of a worker's competency, BC Forest Safety recommends the optional Basic Forest Worker competency profile and assessment tools that can be found at www.bcforestsafe.org.

Part 1 - Competency Conversation

General Instructions
To conduct a competency conversation, ask the worker the questions in this first part of the assessment to determine if they understand the knowledge components of their role. It is acceptable to rephrase the question in a way that the worker understands but the worker cannot be given hints to the correct answer. The assessment should not be used as a training opportunity; instead any deficiencies identified in this assessment should be collected into a gap training plan and addressed with the worker later. **Important Note:** Do not conduct competency conversation while operating equipment.

Training and Assessment Rubric	
Assessment Instruction	S - This means that the candidate must supply all responses listed, as the knowledge is **safety** critical or important. B - This means the candidate must at a minimum verbalize the **bolded** responses, and additional responses are further proof of competence. P - The candidate must give a **percentage** of responses correctly to reasonably show competence in the area.

1068 – Describe Signals Used in Forestry

Locator	Questions		
	General Yarding / General Mechanized Harvesting		
1.2	**What is the signal process before blasting?** ☐ 12 short whistle signals sounded at 1 second intervals ☐ Two minutes elapse after the last warning signal before initiating the blast ☐ After blast and inspection one prolonged whistle of at least 5 second duration must be sounded before permission granted to return announced by radio Assessment Instruction: S		
	Assessment:	☐ Outcome met	☐ Outcome not met

1090 – Describe Harvesting Methods

Locator	Questions		
	General Forestry		
1.1	**In what conditions are cable-logging systems generally used?** ☐ Cable logging is generally conducted on steep slope, wet, or inaccessible terrain for ground based mechanized harvesting Assessment Instruction: S		
	Assessment:	☐ Outcome met	☐ Outcome not met
1.2	**What are safety considerations related to ground based mechanized harvesting?** ☐ Machine limitations (slope and stability, handling loads) ☐ Ground conditions ☐ Steep slopes ☐ Lock out ☐ Three-point contact ☐ Crush points ☐ Minimum safe separation or hazard zones and safe zones ☐ Overhead or buried power or gas ☐ Danger trees Assessment Instruction: P -7 from list		
	Assessment:	☐ Outcome met	☐ Outcome not met
1.3	**What are safety considerations related to cable logging systems?** ☐ Runaway trees ☐ Bight ☐ Clearing ☐ Workers in area ☐ Minimum safe distances ☐ Danger trees ☐ Crushing Assessment Instruction: P – 6 from list		
	Assessment:	☐ Outcome met	☐ Outcome not met

2.3	**What is critical to do when changing a logging plan?** ☐ Communicate to all workers what the changes are Assessment Instruction: S		
	Assessment:	☐ Outcome met	☐ Outcome not met

1081 – Describe Tools and Equipment for Heavy Machinery

Locator	Questions		
	Mechanized Harvesting / Road Building		
1.1	**What are 9 common and specialty tools used on heavy equipment?** ☐ Multi-testers ☐ Inspection mirrors ☐ Pick up magnets ☐ Easy outs ☐ Wrenches ☐ Taps and dies ☐ Hammers ☐ Shovels ☐ Drift and pry bars ☐ Chisel ☐ Files ☐ Jack ☐ Air tools ☐ Impact wrenches ☐ Ratchets ☐ Die grinder ☐ Greaser ☐ Hose press Assessment Instruction: P – 9 from list		
	Assessment:	☐ Outcome met	☐ Outcome not met

2.1	**Name eight pieces of welding equipment and supplies used on heavy equipment** ☐ Oxy acetylene cutting systems ☐ Air arc ☐ Chip hammers ☐ Propane gas torch ‘tiger torch’ ☐ Wire brush ☐ Chalk ☐ Tip cleaner ☐ Grinder ☐ Drill ☐ Cut off saw ☐ Air tools ☐ Flux chippers ☐ Grinders ☐ Vice ☐ Cutting table ☐ Plasma cutter Assessment Instruction: P – 8 from list		
	Assessment:	☐ Outcome met	☐ Outcome not met
2.2	**What are three types of welding commonly used on heavy equipment?** ☐ Stick ☐ Wire feed ☐ Brazing Assessment Instruction: S		
	Assessment:	☐ Outcome met	☐ Outcome not met
2.3	**What PPE is mandatory when using welding equipment?** ☐ Gloves ☐ Welding helmet ☐ Cutting goggles ☐ Fireproof clothing ☐ Safety glasses Assessment Instruction: S		
	Assessment:	☐ Outcome met	☐ Outcome not met

3.1	**What are common gas-powered tools used on heavy equipment?** ☐ Cut off saw ☐ Pressure washers ☐ Gas or electric compressors ☐ Gas or diesel generators ☐ Pumps ☐ Plate compactor Assessment Instruction: P – 4 from list		
	Assessment:	☐ Outcome met	☐ Outcome not met

1082 – Describe General Heavy Equipment Inspection and Maintenance Procedures

Locator	Questions		
	Mechanized Harvesting / Road Building		
1.1	**What are the major mechanical components or systems that require maintenance and inspection?** ☐ Engine systems ☐ Hydraulic systems ☐ Electrical systems ☐ Attachments ☐ Undercarriage Assessment Instruction: S		
	Assessment:	☐ Outcome met	☐ Outcome not met
1.2	**What are common symptoms or indicators of failure?** ☐ Noise ☐ Vibration ☐ Smells ☐ Leaks ☐ Cracks ☐ Lack of power ☐ Improper function ☐ Exhaust colour ☐ Gauges		

	☐ Warning lights Assessment Instruction: P – 7 from list		
	Assessment:	☐ Outcome met	☐ Outcome not met
2.1	**What are the three main pre-start procedures?** ☐ External visual equipment checks ☐ Fluid checks ☐ Operational (in cab) checks Assessment Instruction: S		
	Assessment:	☐ Outcome met	☐ Outcome not met
2.2	**What are the main considerations for shut down procedures?** ☐ Parking position ☐ Attachments grounded ☐ Cool down time ☐ Maintenance log Assessment Instruction: S		
	Assessment:	☐ Outcome met	☐ Outcome not met
2.3	**What are common maintenance procedures on heavy equipment?** ☐ Lock out or zero energy state ☐ Greasing ☐ Adding fluids and fuel ☐ Draining fuel sumps and water separators ☐ Tightening loose hardware ☐ Repair leaks ☐ Replacing O-rings ☐ Replacing hoses ☐ Replacing filters ☐ Bleeding air from fuel systems ☐ Adjust track tension ☐ Adjust belt tension ☐ Maintain tire pressure ☐ Clean and maintain batteries Assessment Instruction: P – 10 from list		
	Assessment:	☐ Outcome met	☐ Outcome not met

1083 – Describe Heavy Equipment Mechanical Systems

Locator	Questions		
	Mechanized Harvesting / Road Building		
1.1	**What are two basic components of an engine and their function?** ☐ Turbo charger – increases power on an engine ☐ Cylinder head – Allows air/fuel into/out of combustion chamber ☐ Piston – creates compression Assessment Instruction: P – 2 from list		
	Assessment:	☐ Outcome met	☐ Outcome not met
1.2	**Name two things a driver should check in an engine lubrication system** ☐ Oil level ☐ Oil pressure ☐ Grade of oil required Assessment Instruction: P – 2 from list		
	Assessment:	☐ Outcome met	☐ Outcome not met
1.3	**What are two components of a cooling system and their function?** ☐ Radiator – allows air and water flow to cool engine ☐ Hoses – water to circulate ☐ Fan – draw air into radiator ☐ Fan belts – drive the fan Assessment Instruction: P – 2 from list		
	Assessment:	☐ Outcome met	☐ Outcome not met
1.4	**What are three components of a fuel system and their function?** ☐ Tanks – holds fuel ☐ Lines – deliver fuel from tank to engine ☐ Filters – removes foreign debris from fuel ☐ Pump – Deliver fuel to engine Assessment Instruction: P – 3 from list		
	Assessment:	☐ Outcome met	☐ Outcome not met

1.5	**What are three components of air induction and exhaust systems and their function?** ☐ Pre-cleaner – Takes coarse particulates from air supply ☐ Air filter – Removes fine particulates from air supply ☐ Air to air – Delivery system of air to the turbo charged engine ☐ After treatment (DEF) – System that minimizes air pollution in exhaust Assessment Instruction: P – 3 from list		
	Assessment:	☐ Outcome met	☐ Outcome not met
2.1	**What are three components of hydraulic systems including function?** ☐ Pumps – pump fluid ☐ Motor – propulsion on components ☐ Cylinders – move attachments or implements ☐ Hoses – delivers fluid to motors or cylinders ☐ Valves – Controls flows ☐ Tank and fluid level indicator – identify levels of fluids Assessment Instruction: P – 3 from list		
	Assessment:	☐ Outcome met	☐ Outcome not met
3.1	**What are three components of a powertrain system including function?** ☐ Travel motor – allows machine/component to move ☐ Transmissions – transfer power form engine to drive systems ☐ Differentials – transfers power from transmission to axles ☐ Swing gear – allows machine to rotate ☐ Final drives – drives tracks ☐ Engine – primary source of power ☐ Pumps – secondary source of power Assessment Instruction: P – 3 from list		
	Assessment:	☐ Outcome met	☐ Outcome not met

4.1	**What are three components of track systems including function?** ☐ Tracks – enables machine to move ☐ Idler – allows track to rotate around ☐ Sprocket – drives track to rotate around ☐ Bottom and top (carrier) rollers – reduce friction within the undercarriage system ☐ Track adjuster – keeps track tight Assessment Instruction: P – 3 from list		
	Assessment:	☐ Outcome met	☐ Outcome not met
5.1	**What are four types of braking systems?** ☐ Air system ☐ Hydraulic system ☐ Air/hydraulic system ☐ Engine braking system (compression, exhaust) ☐ Hydrostatic system Assessment Instruction: P – 4 from list		
	Assessment:	☐ Outcome met	☐ Outcome not met
6.1	**Name three common parts of electrical systems and their function** ☐ Alternators – creates electrical current ☐ Starters – starts the engine ☐ Batteries – powers the starter ☐ Fuses – fail safe for system ☐ Solenoids – a electromagnetic switch ☐ Switches - turns power on and off Assessment Instruction: P – 3 from list		
	Assessment:	☐ Outcome met	☐ Outcome not met
6.1	**What are the two common types of electrical systems?** ☐ 12 V and 24 V Assessment Instruction: S		
	Assessment:	☐ Outcome met	☐ Outcome not met

7.1	**Name three types of ground engaging systems and their function** ☐ Blades – pushes material ☐ Buckets – carries material ☐ Scarifiers – digs up ground ☐ Grapples – grabs logs ☐ Rock hammer – breaks rocks ☐ Compactors – compresses material ☐ Drill hammer – drills holes in rocks Assessment Instruction: P – 3 from list		
	Assessment:	☐ Outcome met	☐ Outcome not met

1094 – Describe and Operate Forwarder

Locator	Questions		
1.1	**Name two places an operator can find information on operational capabilities, limitations, and restrictions of forwarders** ☐ Operator manuals ☐ Standard operating procedures Assessment Instruction: S		
	Assessment:	☐ Outcome met	☐ Outcome not met
1.3	**What should be considered when developing a harvest plan?** ☐ Other phases ☐ Terrain and soil conditions including drainage patterns ☐ Site sensitive areas and no-go zones ☐ Skid direction ☐ Decking locations Assessment Instruction: P -4 from list		
	Assessment:	☐ Outcome met	☐ Outcome not met
1.4	**What are hazards related to operating a forwarder?** ☐ Slips and falls ☐ Crush points ☐ Fire from debris build up with machine ☐ Roll over ☐ Other worker in work area		

	☐ Energized machines ☐ Communication failure ☐ Unstable soil ☐ Slippery machine surfaces ☐ Jill pokes ☐ Logs entering cab Assessment Instruction: P – 8 from list		
	Assessment:	☐ Outcome met	☐ Outcome not met
2.7	**What long-term effect does constantly sitting in a poor body position cause?** ☐ Sore back ☐ Sore neck ☐ Sore shoulders ☐ Carpal tunnel syndrome Assessment Instruction: P – 3 from list		
	Assessment:	☐ Outcome met	☐ Outcome not met
3.3	**What basic repairs may an operator perform on a forwarder?** ☐ Replace hydraulic hoses ☐ Replace / clean fuel filters ☐ Change engine oil and filter ☐ Adjust belt tension ☐ Clean battery terminals ☐ Adjust track tension or air tire pressure ☐ Adjust tire chain tightness Assessment Instruction: P – 5 from list		
	Assessment:	☐ Outcome met	☐ Outcome not met

Part 2 – Practical Assessment

General Instructions
To conduct the practical assessment, monitor the worker in a variety of situations to determine if they can consistently perform the skill components of their role in a safe and effective manner. Once confident that the worker can conduct the skills consistently, mark the outcome met. If the worker cannot consistently perform the skills required, add this component to the gap training plan. Remember not to distract the operator when conducting the practical assessment.

Training and Assessment Rubric	
Outcome Not Met (ONM)	**Skills:** Can complete the task but only with direct instruction and supervision, may lack consistency in application. **Knowledge:** Does not understand what they are doing, or are not aware of a knowledge deficiency, or need guidance and support. **Attributes:** Displays limited or no professional attributes including being fit for work, prepared for the day, working in an organized manner, achieving work outcomes, or lacks in consistency.
Outcome Met (OM)	**Skills:** Consistently completes the task using safe work practices multiple times in a variety of contexts. **Knowledge:** Has a solid grasp of underpinning knowledge, consistently applies it, and can explain it. **Attributes:** Consistently displays professional attributes including being fit for work, prepared for the day, working in and organized manner and achieving work outcomes.

A) PREPARE FOR THE DAY	OM	ONM	N/A
Arrived on time	☐	☐	☐
Clothing for conditions • Layered clothing appropriate to the elements for working and transport conditions	☐	☐	☐
Nutrition and water • Adequate food for the day • Sufficient hydration for work and weather conditions	☐	☐	☐
Fit for work • Candidate is physically able to do the task • 3-point contact on and off machine • Able to get up and down machine • Able to perform simple maintenance • Able to change attachments • Can fit through escape hatch	☐	☐	☐
Not noticeably impaired • Candidate is not obviously physically or mentally impaired (by drugs, alcohol, personal situations, fatigue)	☐	☐	☐
Knows where ERP is located	☐	☐	☐
B) PERSONAL PROTECTIVE EQUIPMENT (where applicable)	**OM**	**ONM**	**N/A**
Hard hat • CSA – less than 3 years old / ANSI – less than 5 years old • No dents/cracks, modifications • Suspension maintained (4-point min)	☐	☐	☐
Hi-Vis • Minimum 120 square inches front and back • Not faded, discoloured, torn or permanently dirty • Contrasts with the work environment	☐	☐	☐
Leg protection • Minimum 3600/4100 FPM rating • Kevlar not compromised or exposed • Pants maintained and repaired (no loose tears to outer layer)	☐	☐	☐

Face/Eye protection • Face screen free of holes • Moves freely between down and raised position • Safety glasses used when appropriate	☐	☐	☐
Hand protection • Not damaged and free of holes • Appropriate to weather conditions • Sized correctly for hands	☐	☐	☐
Hearing protection • Minimum 24 NRR • Maintained and in working condition	☐	☐	☐
Footwear • Good condition including sole tread pattern • Must be laced	☐	☐	☐
Has fire extinguisher in cab	☐	☐	☐
Dust mask • NIOSH N95 compliant	☐	☐	☐
PPE inspected and maintained	☐	☐	☐
PPE used consistently as required	☐	☐	☐

C) PRE-WORK ACTIVITIES	OM	ONM	N/A
Equipment manuals available	☐	☐	☐
Pre-start equipment checks • Walk around and check for leaks • Check for loose components • Check for cracks, loose, missing bolts • Check for damage to machine • Obstructions • Fluid levels • Water/Coolant • Hydraulic • Engine • Night switch • Check track pads (where applicable) • Tire pressure (where applicable) • Check for tire damage (where applicable) • Wheels and wheel nuts (where applicable) • Close air reservoir (where applicable) • Safety equipment check	☐	☐	☐
Start-up procedures • Maintain three-point contact on and off machine • Find key • Check gauges • Warning systems • Start and warm up hydraulics • Check transmission • Warning lights • Wipers • Seatbelt • Lock out • Parking brake • All controls and major systems	☐	☐	☐

• Escape hatch • Housekeeping • Radio operational			
D) COMMUNICATION	**OM**	**ONM**	**N/A**
Attend pre-work meetings	☐	☐	☐
Ensures hazards are understood	☐	☐	☐
Communicates hazards throughout workday	☐	☐	☐
Uses signals as required	☐	☐	☐
Consistently communicates work plans	☐	☐	☐
Professional communication throughout workday	☐	☐	☐

E) ERGONOMICS	**OM**	**ONM**	**N/A**
Lifts correctly (where applicable)	☐	☐	☐
Best practice for body position while operating	☐	☐	☐
Walks safely in the bush (where applicable)	☐	☐	☐

F) COMPLETE TASKS	**OM**	**ONM**	**N/A**
Shut down procedures • Safe parking location • Brake on (where applicable) • Lower boom/blade/attachments • Position for ease of access and egress • Level position for fluid checks • Cool down before shut-down • Walk around and general check • Secure/lock machine • 3-point contact on and off • Turn off night switch • Close air reservoir access (where applicable)	☐	☐	☐

Daily maintenance tasks • Lubrication systems • Air intake systems • Air system reservoir • Fuel tank sump • Drain air system/water separator • Drain Fuel filters/water separator • Inspect and clean components • Housekeeping • Track tension (where applicable) • Tire pressure (where applicable) • Greasing • Fueling • Check for leaks	☐	☐	☐
Basic repairs • Hydraulic hoses/fittings/O-rings • Fuel/air filter • Engine oil change • Belt tension • Battery terminals • Attachment teeth/buckets (where applicable) • Change lights • Repair wiring	☐	☐	☐

G) OPERATE FORWARDER	OM	ONM	N/A
Maintains 3-point contact on and off machine	☐	☐	☐
Ability to use multiple functions while operating equipment	☐	☐	☐
Monitors equipment performance while operating	☐	☐	☐

Operator functions on forwarder • Lift boom • Move forward • Stop • Back up • Raise or lower boom and grapple • Move boom ahead and back • Rotate grapple left, right and open and closed • Load logs on units • Transport to landing locations • Unload in suitable decks • Trails located in correct locations • Cleanup of logs in work area • Smooth operations • Multiple functions at once	☐	☐	☐
Use and maintain forwarder attachments • Boom • Grapple	☐	☐	☐

Hazard awareness • Debris build up in machine • Roll over • Crush injuries • Slips trips falls • Pinch points • Roll over • Jill pokes • Unstable • Unsecured runaway	☐	☐	☐
Harvest map • Identify decking locations • Skid trail locations • Understand terrain and soil conditions including drainage patterns	☐	☐	☐

This is the last page of the assessment.

In consultation with industry subject matter experts, the BC Forest Safety Council (BCFSC) facilitated the production of this material. Funding was provided by the Government of Canada, the Province of British Columbia, and industry in-kind contributions.

Printed copies are considered uncontrolled and may be outdated. Current versions are available from the BCFSC. Refer to https://www.bcforestsafe.org/node/2823 for more information.

Feedback is welcome and may be sent to training@bcforestsafe.org.

Canada BRITISH COLUMBIA

Funding provided through the Canada-British Columbia Labour Market Development Agreement.

BC **Forest Safety**