



Shoulder Ballast Cleaner – Specific to SBC34

Warning

You cannot undertake this activity in the rail corridor unless you have completed a pre work brief and work site protection plan. Reference should also be made to the [Protocol for Entering the ARTC Rail Corridor](#) and the [Business Rules for Working in the ARTC Rail Corridor](#). Minimum Personal Protective Equipment (PPE) must also be met in line with the [Personal Protective Equipment \(PPE\) Work Instruction](#).

Work Activity:	Shoulder Ballast Cleaner – Specific to SBC34			WMS No: TSP 4.0
Coverage:	ARTC employees, and contractors directly managed by ARTC			Version No: 1.1
Developed by:	Shoulder Ballast Cleaning Team	Approved by:	Executive General Manager Enterprise Services	Date Approved: 13 May 2016

<i>What are the tasks involved?</i>	<i>What are the hazards and risks?</i>	<i>What are the control measures?</i>	<i>Related Documents</i>
Preparation for Work in rail siding prior to setting out to dig location	Miscommunications and/or misunderstanding between operators	<p>Prior to any SBC operations, one single person must be appointed to coordinate activities and direct all operators.</p> <p>The employee is referred to as “The Ground Person”</p> <p>All site communications must be in accordance to “Site Radio Communication Matrix”</p>	<p>Loram User Manual P167</p> <p>SBC34 Site Operational Radio Communication Matrix</p>
	Unauthorised entry to rail corridor – struck by train entering machine consist to unlock / start up	No entry to the corridor until safe worker has confirmed safe access to the corridor with relevant authority granted, compiled a pre start brief and complied / communicated a worksite protection plan	
	Slips on steps / handrails accessing machine when dark	<p>Do not attempt to enter the machine without adequate lighting provided by torches, work lights, headlamps.</p> <p>Maintain three points of contact</p>	
	Manual handling injury placing / attaching buckets to wheels	Mechanical lifting devices to be used for lifting buckets to digging wheels.	
	Damage to infrastructure lifting buckets on/off B Cab storage racks	Use remote controlled hiab crane located on the B cab deck (or other mechanical lifting machinery) to lift the buckets on and off the deck. Only personnel with familiarisation training to operate the crane on B cab.	



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<p>Refuelling the machine with contractor tankers</p>	<p>Fire during refuelling with diesel</p>	<p>Ensure the area around the fuel tank is clear of combustibles.</p> <p>No ignition sources (for example, stop grinding, oxy cutting activities)</p> <p>No smoking when refuelling.</p> <p>Fire extinguishers behind the fuel tank to be checked and available.</p> <p>Handle substance according to safety data sheet.</p>	<p>Safety Data Sheet</p>
	<p>Tanker struck by trains on running adjacent lines</p>	<p>The safe worker in charge is to ensure all adjacent lines are protected prior to setting up tanker.</p>	
	<p>Fuel spills</p>	<p>A SBC Team member to monitor the external fuel guage on the tank during pumping to avoid over filling and spillage.</p> <p>No refuelling is to be undertaken within 100m of open culverts or waterways.</p> <p>Spill kits to be accessible.</p>	
	<p>Uncontrolled movement of machine during refuelling</p>	<p>Handbrakes and/or park brakes must be applied to the loader car and confirmed to the Work Group Leader before commencement of refuelling activities.</p>	



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Train line brake testing	Machine runaway when conducting brake tests	<p>Confirm head count prior to starting test.</p> <p>Follow handbrake "SBC Team Brake Test Work Instruction" and a cab operator to ensure that all details are read back correctly.</p>	SBC34 Pre Start and Operational Work Instructions – Brake Test Work Instructions section 2.2
	Hand injury removing brake chocks	Wear gloves	
	Manual handling injury lifting brake blocks	Tandem lift when manually lifting on to support car.	
Performing Function Testing in rail siding	Entanglement in rotating parts	<p>Radio communications are to be used at all times when carrying out the function tests.</p> <p>The appointed ground person coordinating the function test to ensure all persons are 3 metres (min) from components prior to engaging operators to start up.</p>	
	Persons on the ground struck by spoil debris from swing conveyor	<p>The appointed person on the ground coordinating the function test to ensure all personnel are clear prior when engaging operators to position the swing belt and start up.</p> <p>Limit / control the number of people working around machine – only have the number of workers required to safely undertake the task.</p> <p>Wear hard hats and safety glasses if working within the swing zone.</p>	
	Exposure to noise from machinery	Hearing protection to be worn outside cabs when function testing operations.	



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Track travelling to / from work location in Intermediate Travel Mode	Derailing in yard exiting siding or crossing loop	<p>The safe worker in charge and machine operator are to ensure points are set correctly and de-railer/point clips removed and relevant authority is granted prior to proceeding.</p> <p>Travel to track and weather conditions.</p>	
	Machine components not retracted prior to leaving sidings resulting in striking infrastructure during travelling	The ground person is to ensure all components are packed up for intermediate travel as per SBC Team Work Instruction "Pack up for intermediate travel"	SBC34 Pre Start and Operational Work Instructions – Brake Test Work Instructions section 3.3
	Collision between hirail support plant and the SBC consist	<p>The Safe Worker in charge is to ensure that the location any hirail plant travelling in convoy with the SBC is identified and communicated to SBC driver, and agreed fixed points to maintain safe distances between rail bound plant items are communicated before travelling in intermediate travel mode.</p> <p>Travel to conditions and speed restrictions.</p>	
Set up in worksite for work mode	Crushing to persons unpacking wheels, raise, extend and lower wheels	<p>Limit/control the number of people working around the machine 3m exclusion zone to be maintained when unpacking wheels.</p> <p>If there is a requirement to encroach the 3m zone to inspect components, the A cab operator is to disable the machine from A Cab and a minimum of one lockout switch manually turned from the exterior of the machine prior to entering within 3m</p>	



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	Damage to structures raising/slewing swing conveyor	Positive precise communications between the ground person, A and B cab operators to coordinate movement around obstructions. Ref to Loram User Manual "Swing Conveyor Operating Guidelines"	Loram User Manual P173-174 SBC34 Pre Start and Operational Work Instructions - Unpacking Procedure – <i>Moving to Work Mode</i> section 3.2
	Electrocution raising/slewing swing conveyor on overhead power	The ground person to ensure correct safe working distance is maintained to safe distance where overhead power line are within the rail corridor	SBC34 Pre Start and Operational Work Instructions - Unpacking Procedure – <i>Moving to Work Mode</i> section 3.2
	Crushing injury to personnel lowering wing ploughs	Limit/control the number of people working around the ploughs and wing boxes 3m exclusion zone to be maintained during working mode, lock out procedure to be used when fouling work zone.	Loram User Manual <i>Machine Specific Lockout and Tagout Procedures</i>
	Injury to personnel starting up conveyor belts	The ground person to ensure all site personnel are clear, communicate to and advise the A cab operator to start up belts.	SBC34 Pre Start and Operational Work Instructions - Unpacking Procedure – <i>Moving to Work Mode</i> section 3.2
Operation of SBC	Struck by outgoing reject spoils from swing conveyor	Maintain 3m exclusion zone from soil swing conveyor Wear Hard Hat Limit/control the number of people working around the machine	



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	Personnel struck by rail track on live adjacent lines	No personnel to egress the machine or commence unpinning/unpacking until the Safe Worker in charge confirms protection arrangements are in place on adjacent lines in accordance with ARTC Network Rules and Procedures	
	Personnel struck by ballast from ballast hoppers and brooms	Safety glasses to be used all times on site Maintain minimum of 3m distance from hoppers and brooms unless positive radio communications are made to the B cab operator	
	Entanglement in rotating parts	Maintain minimum of 3m from rotating parts during operations. If there is a requirement to inspect rotating parts, the machine must be stopped, the A cab operator to disable the machine from A Cab, and a minimum of one lockout switch manually turned from the exterior of the machine prior to entering within 3m	
	Exposure to noise from machinery operations	Ear muffs/ear plugs to be used when machine is in operation at all times	
	Airborne dust inhalation - Silicosis	On board water spray system to be used in dry/dusting conditions to reduce dust emission so far as reasonably possible. P2 Dust masks to be worn during dusty conditions	
	Striking infrastructure assets ie: signals, turnouts, pot heads bridge pylons etc	3m exclusion zone around the machine when in working mode. The Ground Man to sequence machine around obstacles via radio between A and B cab operators. Ref to Loram User Manual "Manual Sequencing around Obstructions"	Loram User Manual P174



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	Uncontrolled release of oils/coolants/fuels	<p>In the event of an uncontrolled release of oils or coolants, the area to be contained by use of spill kits so far as reasonably practical.</p> <p>All contaminated spill matting to be contained and stored on the machine and disposed of by authorised contractors.</p> <p>Spill kits available on site</p> <p>If spillage occurs manage the spill in accordance with ENV-PR-002</p>	<p>Environmental Incident Management EVV-PR-002</p>
	Miscommunications between operators and ground person	<p>The operational team to only use digital radios with private discrete channel at all times during operations.</p> <p>SBC Team “Site Radio Communication Matrix” to be adhered to at all times during operations to eliminate cross radio broadcasting with non SBC operations.</p> <p>A radio check is required before commencing shoulder cleaning operations.</p> <p>If loss of or suspected loss of communications is experienced within the operational team, an SBC Operations must stop is to be applied immediately until positive communications are maintained or restored.</p>	<p>SBC34 Site Operational Radio Communication Matrix</p>
The ground person working within danger zone during working operations to inspect rotating components and assess digging wheel jams	Struck by bucket wheels	The ground person is to be in constant contact and maintain positive and precise communications with the operators at all times during inspection.	
	Struck by SBC consist crossing from one side of the track to another during operations in work mode	Ground person to move approx. 15m ahead of A cab, establish positive radio communications with A cab operator and advise of the intention to cross in front of the machine. The A cab operator to confirm that image of the ground person is observed on the front camera screen and can proceed. A cab operator is to observe the crossing and prepare to stop if required. The ground person to confirm to the A cab operation once clear of the front of the machine	



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Pack up from site and travel to siding	Machine components not retracted prior to leaving sidings resulting in striking infrastructure during travelling	The ground person(s) to ensure all components are packed up for intermediate travel as per SBC Team Procedure Packing up Procedure – Moving to Intermediate Travel Mod, and Loram Procedure Prepare the Machine for Travel. Confirmation by the A Cab operator to the Work Group Leader that the machine is ready for travel prior to the machine track travelling.	Loram User Manual P180 SBC34 Pre Start and Operational Work Instructions - Unpacking Procedure – Moving to Intermediate Work Mode section 3.3
	SPAD travelling to siding	SBC driver to ensure the safe worker in charge is in the leading vehicle prior to travelling to sidings to ensure the limits are not exceeded.	ARTC Network Rules and Procedures
Maintenance Actives eg: <ul style="list-style-type: none"> • Inspections • Cleaning • Welding • Grinding • Mechanical repairs • Oil/filter changes 	Eye injury using air guns to clean off debris	Safety glasses to be worn at all times when blowing off debris from the machine.	
	Fall from heights	Work at heights equipment (harnesses, lanyards, karabiners) and anchor points to be inspected for damage. Work at heights equipment to use used when there is a potential to fall.	
	Hydraulic spills changing out hoses	Spill matting is to be placed below joints to capture spills when loosening joints and fitting. Spoilt matting to be collected and stored and placed in workshop until disposal can be arranged from a licenced hazardous waste disposal contractor. Ensure isolation of components hydraulic in accordance to Loarm User Manual Wear safety glasses	Loram User Manual Machine Specific Lockout and Tagout Procedures
	Fires due to welding/grinding/oxy cutting	Prior to carrying out welding or grinding activities assess the area for flammable and combustible materials and remove as required. Ensure a minimum 2,000l of water stored in the SBC water tank, and the water pump on the machine is running and hoses are within reach of the affected area.	



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	Requirement to carryout emergency repairs by welding/grinding/oxy cutting during Total Fire Band Period	No works are to commence unless a Hot Works Permit has been approved with a copy on site and fully reviewed for required controls. Prior to carrying out hot works activities, assess the area for vegetation and relocated the machine if practical. Ensure minimum 2,000l of water stored in the tank on board the SBC, the water pump on the machine is running, appoint a dedication person to wet down the affected zone prior to and during hot works.	ETM-13-01 – Total Fire Bands ETM1301F-01 Hot Works check List
Inspection of operational components	Entanglement in rotating parts	Maintain minimum of 3m from rotating parts when the machine is in operation/testing. If there is a requirement to inspect rotating parts, the rotating components must be stopped, the A cab operator to disable the machine from A Cab, and a minimum of one lockout switch manually turned from the exterior of the machine prior to entering the area to be inspected Positive and Precise communication with operator Clear area of trip hazards No loose clothing Once all conditions are confirmed, inspection can commence.	Loram User Manual Machine Specific Lockout and Tagout Procedures
Removing/Replacing buckets from digging Wheels	Entanglement in rotating wheels	Positive and Precise communication with operator Ensure lockout procedure is in place and confirmed	
	Hand injury – Pinching	Wear gloves	
	Noise from rattle gun	Wear ear muffs/earplugs	
	Manual Handling injury raising/lowering buckets	Use crane hoist and hiab crane (of other mechanical means) to raise and lower buckets on and off B cab deck, use electric crane hoist (or other mechanical means) to raise/lower buckets from digging wheel	
	Uncontrolled movement of load using lifting devices	Ensure digging wheels are lowered and resting on the ground prior to entering in the work zone. Inspect lifting equipment prior to lift and unsure tagged in date Clear area of unnecessary personnel	
	Crushing injury lifting buckets on/off B cab deck area	Competent operator to use hiab crane Positive and Precise communication with operator Operator and licensed dogman or rigger to be aware of pinch points	



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Spoiling into dump trucks on positioned adjacent lines			
<p>Site Preparation – Setting up work area for shoulder cleaning operations Open Spoiling into Dump Trucks during SBC34 ballast Cleaning Operations</p>	<p>Communication between SBC34 Personnel and Dump Truck Operator</p>	<p>One additional person must be nominated to communicate and coordinate dump truck movements.</p> <p>This (additional) person is referred to as the “Dump Truck Coordinator and will be located in B Cab during spoiling activities</p> <p>The dump “Truck Coordinator” will interact via secure radio channel with the Ground Person to advise when:</p> <ol style="list-style-type: none"> 1. The dump truck is in position 2. The dump Truck is full 3. Stop SBC machine movement as/if required <p>The Dump Truck Coordinator will communicate with the dump truck drivers via agreed UHF radio channel and instruct all required dump truck movements as required during the spoiling activity.</p>	
	<p>Dump Truck roll over when gaining access to adjacent line for spoiling operations</p>	<p>Operators competencies to be checked and confirmed prior to commencing project. This to be completed by appointed project representative.</p> <p>Track access points to be inspected by operator prior to driving onto the track.</p>	
	<p>Collision Between SBC34 Rotating Parts and Dump Trucks</p>	<p>The ground person to cease digging operations prior to deploying dump truck into position within the operational area.</p> <p>If communication is lost between SBC34 coordinator and dump truck operator, machinery is to come to a stand and work cease until communications are restored.</p>	



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	<p>People/Plant Interaction</p>	<p>The ground person is the only person on site authorised to be on track whilst digging operations are being undertaken when spoiling into a dump trucks.</p> <p>The ground person to remain at least 3m in front of SBC machine at all times whilst spoiling into dump trucks</p> <p>Dump truck operators are required to complete SBC34 online induction before commencing work</p>	
	<p>Collision between Dump Trucks</p>	<p>Only one dump truck to be placed inside SBC operational area at a time.</p>	
	<p>Spoiling into Dump Trucks on Adjacent Lines</p>	<p>The appointed Dump Truck Coordinator to coordinate the positioning of the dump truck under the swing conveyor when instructed by the SBC34 ground person.</p> <p>Dump Trucks must be positioned in the reverse direction at all times to facilitate visibility by the coordinator.</p> <p>The ground person to be notified by the dump Truck coordinator confirming that the dump truck is in correct position. The SBC operators to complete operational call back to SBC ground person. Once the SBC ground person is satisfied everything is ready for ballast cleaning, operations shall commence</p> <p>Once the dump truck has reached $\frac{3}{4}$ capacity, the nominated Dump Truck coordinator will notify the B Cab Operator to call a stop command to the A Cab operator and run off conveyor belts. If communication has failed, the B Cab Operator shall use the travel stop button on his work console to stop the machine travel. If a dump truck is required to pass the digging wheels, the digging wheel on that side must be stopped to allow the vehicle to pass by.</p> <p>The Dump Truck Coordinator will communicate dump truck movements to the dump truck drivers in and out of operational work</p>	



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		area.	
	Dump truck slipping off track	<p>The dump trucks must “straddle” the rails on the adjacent line. If during the reversing movement the dump truck strays outside the rails, the Dump Truck Coordinator must broadcast a stop command. The SBC travel movement must remain stopped until the dump truck is repositioned.</p> <p>Push the machine Travel Stop or E Stop buttons if communications are lost.</p>	
	Poor vision from B can during wet weather	<p>The dump trucks must “straddle” the rails on the adjacent line. If during the reversing movement the dump truck strays outside the rails, the coordinator must broadcast all operators stop all cutting operations. All SBC movements must remain stopped until the dump truck is repositioned.</p> <p>Push the machine Travel Stop or E Stop buttons if communications are lost.</p>	
	Dusty conditions	<p>Use on board dust suppression during dry conditions</p> <p>Cease spoiling into dump trucks if vision is impaired by dust.</p>	
	Communications failure	<p>Stop work if in the event of a communications failure.</p> <p>Ensure communications are working prior to restarting spoiling into the dump trucks</p> <p>Push the machine Travel Stop or E Stop buttons if communications are lost.</p>	
	Overcrowding in B Cab during spoiling	Only essential personnel for SBC operations to be located in B Cab	



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	into dump trucks	ie: 2 x B Cab operators and Dump Truck Coordinator	
Repositioning dump trucks after filling	Collision with dump trucks, dump truck roll over	<p>On completion of filling the dump truck and ceasing SBC cutting operation, the Dump Truck Coordinator to direct the loaded dump truck to exit the SBC operational zone and tip the unload in the nominated tip site using the nominated access points</p> <p>The Dump Truck Coordinator is to direct the next dump truck into the SBC operational zone.</p> <p>The Dump Truck Coordinator will position the next empty dump truck</p> <p>No spilling into (off track) dump trucks on embankments that is higher than 3. meters unless the plant is on hirail</p>	



References	
<p>Standards, Codes of Practice, Guidance:</p> <p>Comcare</p> <p>The Code of Practice for Construction Work</p> <p>Risk Management Policy and Procedure</p>	<p>Plant / Equipment / Tools:</p> <p>Loram Shoulder Ballast Cleaner, hand tools, pneumatic equipment, hiab crane, arc welder, grinder, impact wrenches, electric crane hoists, hydraulic rams, work at heights equipment, 6x6 articulated dump truck, 4x4 articulated dump truck, hirail excavators.</p>
<p>Training Requirements:</p> <p>Track Machine Operator (heavy), Track Vehicle Operator, Work at Heights, Operator Dump Truck, Relevant RTA License</p>	<p>Inspection / Testing requirements:</p> <p>SBC34 Specific Technical Maintenance Plan, Loram User Manual, Loram Maintenance Manual, SBC34 Brake Test</p> <p>Daily Plant Inspection Checklist</p>