RISK ASSESSMENT
REMOTE CONTROLLED KANGA LOADER SERIES 8-TR 825
THIS DOCUMENT IS UNCONTROLLED IF PRINTED

Remote controlled machines are widely used in many industries. They contain complex electrical and electronic equipment and interface with hydraulic and mechanical systems. They have the potential to kill workers if not used properly.

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HAZARD DESCRIPTION (Without Risk Control)	**LIST CURRENT CONTROL MEASURES IN THE CORRESPONDING CATEGORY**	**Matrix Reference (including Severity and likelihood)**	**Risk Rating**	**ACTION and RECOMMENDATIONS** **PRIORITY TO ELIMINATE / REDUCE AS FAR AS IS PRACTICABLE**	**Matrix Reference (including Severity and likelihood)**	**Risk Rating after Controls Actioned**
Unexpected movement (Movement of machine without operator input.)	**Engineering** All Hydraulic controls are sprung to return to neutral position. Autec remote controller (transmitter) toggles return to centre when not being manipulated. In remote/radio mode, the loader cannot start if any of the action toggles are out of centre alignment. In remote/radio mode, any disruption between the transmitter signal and receiver will result in the shutting down of the drive motor and in turn - hydraulics. Full initialisation/start sequence required to re-start loader. Machine speed is limited to 9.3 kph at maximum revs, however, loader will only commence movement in lowest speed setting. (7km/hr) Amber warning beacon and reversing beeper fitted to machine. **Guarding (Nil)** **Isolation (Nil)** **Administrative** Wheel Chocks to be applied when parked. Loader must be parked with load/bucket or attachments lowered. Loader is not to be parked on uneven surface (i.e., slopes) All bystanders are to maintain a 4-metre exclusion zone during operation. (Detailed in manual and decal)	**Sev**: Major **Lik**: Unlikely Matrix Ref = 8	Medium	**Elimination** Elimination of hazard is not possible at this time. **Substitution** Reduction of risk by substitution is not possible at this time. **Engineering** No other engineering controls are available at this time. Spool monitoring does not take place within this loader - therefore, in the unlikely event of an unplanned mechanical reaction or continuation of an operation contrary to operators' instructions - emergency stop button must be activated on the transmitter. **Isolation** Isolating controls are not available at this time. **Administrative** Operator to ensure that the loader has received its pre-operational inspection for the day and that all levers/buttons/keys are in required positions for pre-start. Operator to report any occurrence of unplanned movement to manufacturer immediately. Continued use of loader is prohibited until fault is identified and fixed. Owner/operator to ensure that the loader is cleaned after each day's use. Tilt loader back with bucket and wash all internal dirt debris out via the scupper holes in the floor of the loader. The air filter must be cleaned after every 8 hours of use. **PPE** Appropriate PPE to be worn during operation as shown throughout Risk Assessment.	**Sev**: Major **Lik**: Rare Matrix Ref = 4	Low

	Operator to conduct pre operation assessment of task (refer operator's manual). Operator to implement controls established prior to commencing. **PPE Nil.**					
Use/handling of Autec radio transmitter	**Engineering** The handset and toggles have been designed with the intention of reducing the risk of occupational over-use syndrome (OOS) and repetitive strain through the a) position of toggles, b) size and ergonomic design features in toggles and layout of buttons, switches and toggles. Continued operation of any equipment without appropriate breaks/rest periods will pose a risk of injury to operators. **Guarding (Nil)** **Isolation (Nil)** **Administrative** Operator required to check function of toggles prior to starting loader. If any of the toggles do not return to its neutral/central position, the manufacturer must be notified, and loader must not be used.	**Sev**: Moderate **Lik**: Possible Matrix Ref = 9	Low	**Elimination** Elimination of hazard is not possible at this time. **Substitution** Reduction of risk by substitution is not possible at this time **Engineering** No other engineering controls are available at this time. **Isolation** Isolating controls are not available at this time. **Administrative** Operator to ensure that rest periods of at least 10 minutes per hour are taken during operation period to prevent occupational over use syndrome. **PPE** Appropriate PPE to be worn during operation as shown throughout Risk Assessment.	**Sev**: Moderate Significant **Lik**: Rare Matrix Ref = 3	Low
Unplanned manipulation of manual levers loader in remote/radio mode It is possible for the operator to place the remote/radio transmitter down during a rest period and have somebody	**Engineering** There are no means available to prevent people from manually interfering with the manual levers on the rear of the loader when the operator is not observing the loader when shut down for rest periods etc **Guarding (Nil)** **Isolation (Nil)** **Administrative** Operator required to check position of manual operation levers on the loader prior to each initialisation/start-up after each period of shut down to counteract the potential for people to	**Sev:** Major **Lik:** Unlikely **8**	Low	**Elimination** Elimination of hazard is not possible at this time. **Substitution** Reduction of risk by substitution is not possible at this time **Engineering** No other engineering controls are available at this time. **Isolation** Isolating controls are not available at this time. **Administrative** Operator to ensure that each period resulting in non-observance of the loader is ended with a physical check of the manual operation levers and switches on the back of the loader. **PPE**	**Sev:** Major **Lik:** Rare **4**	Low

manipulate the manual hydraulic levers on the rear of the loader. This could result in unplanned movement of the loader	interfere with the loader's manual levers. **PPE** Standard PPE at all times when near loader as indicated throughout this risk assessment.			Appropriate PPE to be worn during operation as shown throughout Risk Assessment.		
Parking of Loader (Runaway of machine or collision with traffic or pedestrians.)	**Engineering** Machine speed is limited to 9.3 kph at maximum revs. If in local/manual mode, the loader can be stopped with the emergency stop button on top of the loader at the rear -this will disable the drive motor and hydraulics. If there is unplanned movement of the loader while operating in remote/radio mode, the operator must press the transmitter mounted emergency stop button - this will shut down all power to the loader - motor and hydraulics. Warning beacon and reversing beeper fitted to machine. **Guarding (Nil)** **Isolation (Nil)** **Administrative** Wheel Chocks to be applied when parked. Loader is not to be parked on uneven surface (i.e., slopes) All bystanders are to maintain a 4-metre exclusion zone during operation. (Detailed in manual and decal) Manuel direct operators to ensure that a Traffic Management Plans has been developed for the area of intended use. **PPE (Nil)**	**Sev:** Major **Lik:** Unlikely **8**	Low	**Elimination** Elimination of hazard is not possible at this time. **Substitution** Reduction of risk by substitution is not possible at this time **Engineering** No other engineering controls are available at this time. **Isolation** Isolating controls are not available at this time. **Administrative** Operator to conduct pre-operation assessment of task. Operator to implement controls established prior to commencing. Operator is the only person allowed within 4 metres of the loader when in operation. If there are any instances of unplanned movement of the loader, this must be reported to the manufacturer. Further use of the loader is prohibited until problem is identified and fixed. **PPE** Appropriate PPE to be worn during operation as shown throughout Risk Assessment.	**Sev:** Major **Lik:** Rare **4**	Low

Overloading (Human error or inappropriate use, Structural failure of load bearing parts, Slope causes machine to become unstable)	**Engineering** Design loads incorporates 2:1 safety margin. OEM structural quality control procedure during manufacture. **Guarding (Nil)** **Isolation (Nil)** **Administrative** Operation manual directs operators to perform periodic, daily and pre-start inspections and service regime. Safe Working Limits (SWL) decal placed on all machines. Operators manual details load limits. All bystanders are to maintain a 4-metre exclusion zone during operation. (Detailed in manual and decal) Operator to conduct pre-operation assessment of task. Operator to implement controls established prior to commencing. **PPE (Nil)**	**Sev**: Major **Lik**: Unlikely Matrix Ref = 8	Low	**Elimination** Elimination of hazard is not possible at this time. **Substitution** Reduction of risk by substitution is not possible at this time **Engineering** No other engineering controls are available at this time. **Isolation** Isolating controls are not available at this time. **Administrative** No other Administrative controls are available at this time. **PPE** Appropriate PPE to be worn during operation as shown throughout Risk Assessment.	**Sev**: Major **Lik**: Rare Matrix Ref = 4	Low
Overturning – Backwards (Operator error, Operating on slopes or inappropriate use)	**Engineering** **Guarding (Nil)** **Isolation (Nil)** **Administrative** Operators manual details maximum slope of 20 degrees for the operation of machine. Operators instruction manual directs operator to keep load close to the ground and to drive to the conditions. All bystanders are to maintain a 4-metre exclusion zone during operation. (Detailed in manual and decal) Purchasers of machines sign off on reading the operational manual. Operator to conduct pre-operation assessment of task. Operator to implement controls established prior to commencing.	**Sev**: Major **Lik**: Possible = 12	Medium	**Elimination** Elimination of hazard is not possible at this time. **Substitution** Reduction of risk by substitution is not possible at this time. **Engineering** No other engineering controls are available at this time. **Isolation** Isolating controls are not available at this time. **Administrative** Operator Manual directs operators to reverse down slopes and drive forwards going up slopes while under load. Safe Working Limits (SWL) decal placed on all machines. Due to the different perceptions that may be had of the angles of slopes over distances (when using the radio/remote from a stand-off point of view), the operator must position him/herself as close as possible to the loader's operation to ensure an accurate understanding of the gradients involved.	**Sev**: Major **Lik**: Unlikely Matrix Ref = 8	Low

	PPE (Nil)			**PPE** Appropriate PPE to be worn during operation as shown throughout Risk Assessment.		
Overturning – Sideways (Operator error, Operating on slopes or inappropriate use)	**Engineering** **Guarding (Nil)** **Isolation (Nil)** **Administrative** Manual informs operator to avoid crossing slopes where ever possible and if it is not possible to traverse with the load lowered as possible at reduced speed and exercising extreme caution. Operators manual details maximum slope of 20 degrees for the operation of machine. Operators instruction manual directs operator to keep load close to the ground and to drive to the conditions. All bystanders are to maintain a 4-metre exclusion zone during operation. (Detailed in manual and decal) Purchasers of machines sign off on reading the operational manual. Operator to conduct pre-operation assessment of task. Operator to implement controls established prior to commencing. **PPE (Nil)**	**Sev**: Major **Lik**: Possible = 12	Medium	**Elimination** Elimination of hazard is not possible at this time. **Substitution** Reduction of risk by substitution is not possible at this time. **Engineering** No other engineering controls are available at this time. **Isolation** Isolating controls are not available at this time. **Administrative** Operator Manual directs operators to reverse down slopes and drive forwards going up slopes while under load. Safe Working Limits (SWL) decal placed on all machines. Due to the different perceptions that may be had of the angles of slopes over distances (when using the radio/remote from a stand-off point of view), the operator must position him/herself as close as possible to the loader's operation to ensure an accurate understanding of the gradients involved. **PPE** Appropriate PPE to be worn during operation as shown throughout Risk Assessment.	**Sev**: Major **Lik**: Unlikely Matrix Ref = 8	Low
Tip forward of loader and attachment. (Operator error, Operating on slopes or inappropriate use)	**Engineering** **Guarding (Nil)** **Isolation (Nil)** **Administrative** Operators manual details maximum slope of 20 degrees for the operation of machine. Operator Manual directs operators to reverse down slopes and drive forwards going up slopes while under load.	**Sev**: Major **Lik**: Possible Matrix Ref = 12	Medium	**Elimination** Elimination of hazard is not possible at this time. **Substitution** Reduction of risk by substitution is not possible at this time **Engineering** No other engineering controls are available at this time. **Isolation** Isolating controls are not available at this time. **Administrative** Safe Working Limits (SWL) decal placed on all machines.	**Sev**: Major **Lik**: Unlikely 8	Low

	Operators instruction manual directs operator to keep load close to the ground and to drive to the conditions. All bystanders are to maintain a 4-metre exclusion zone during operation. (Detailed in manual and decal) Purchasers of machines sign off on reading the operational manual. Operator to conduct pre-operation assessment of task. Operator to implement controls established prior to commencing. **PPE (Nil)**			Due to the different perceptions that may be had of the angles of slopes over distances (when using the radio/remote from a stand-off point of view), the operator must position him/herself as close as possible to the loader's operation to ensure an accurate understanding of the gradients involved. **PPE** Appropriate PPE to be worn during operation as shown throughout Risk Assessment.		
Impact (with other plant & equipment, objects)	**Engineering** Design of machine allows for clear sight lines. **Guarding (Nil)** **Isolation (Nil)** **Administrative** Manual highlights the need for traffic control plans and to place barriers to separate activities from other persons. All bystanders are to maintain a 4-metre exclusion zone during operation. (Detailed in manual and decal) Operator to conduct pre-operation assessment of task. Operator to implement controls established prior to commencing.	**Sev**: Major **Lik**: Possible Matrix Ref = 12	Medium	**Elimination** Elimination of hazard is not possible at this time. **Substitution** Reduction of risk by substitution is not possible at this time. **Engineering** Warning beacon and reversing beeper fitted to machine. **Isolation** Isolating controls are not available at this time. **Administrative** Safe Working Limits (SWL) decal placed on all machines. When used in confined areas and in close proximity to other plant, equipment and objects (in radio/remote mode), the operator must stand as close as practicable to the loader to afford the best chance of identifying impact hazards and facilitating quick preventative action. **PPE** Operators and other people within work area should wear high visibility clothing.	**Sev**: Major **Lik**: Unlikely 8	Low
Impact with pedestrian (Lapse of concentration, operator error)	**Engineering** Design of machine allows for clear sight lines. **Guarding (Nil)** **Isolation (Nil)** **Administrative**	**Sev**: Major **Lik**: Possible Matrix Ref = 12	Medium	**Elimination** Elimination of hazard is not possible at this time. **Substitution** Reduction of risk by substitution is not possible at this time. **Engineering** Warning beacon and reversing beeper fitted to machine.	**Sev**: Major **Lik**: Rare 4	Low

	Manual highlights the need for traffic control plans and to place barriers to separate activities from other persons. All bystanders are to maintain a 4-metre exclusion zone during operation. (Detailed in manual and decal) Operator to conduct pre-operation assessment of task. Operator to implement controls established prior to commencing.			**Isolation** Isolating controls are not available at this time. **Administrative** Safe Working Limits (SWL) decal placed on all machines. When used in the radio/remote mode in areas where pedestrian traffic is expected or likely, the operator must stand as close as practicable to the loader to afford the best chance of identifying impact hazards and facilitating quick preventative action. **PPE** Operators and other people within work area should wear high visibility clothing.		
Physical Crush, Pinch and Entrapment (Attachment falls over when attempting to attach/detach from loader)	**Engineering** **Guarding (Nil)** **Isolation (Nil)** **Administrative** Operators manual states that attachments must be installed or removed from loader at very low speed. Gross weight of attachments is indicated on the attachment. All bystanders are to maintain a 4-metre exclusion zone during operation. (Detailed in manual and decal) Operator to conduct pre-operation assessment of task. Operator to implement controls established prior to commencing. **PPE (Nil)**	**Sev**: Major **Lik**: Possible Matrix Ref = 12	Medium	**Elimination** Elimination of hazard is not possible at this time. **Substitution** Reduction of risk by substitution is not possible at this time. **Engineering** No other engineering controls are available at this time. **Isolation** Isolating controls are not available at this time. To prevent inadvertent use of loader when attachments are being fitted, all attachment fitting exercises must be conducted with the loader in local/manual mode. **Administrative** No other administrative controls available at this time. **PPE** Appropriate Safety footwear to be worn in compliance with AS 2210 Safety Footwear	**Sev**: Major **Lik**: Unlikely Matrix Ref = 8	Low
Physical Crush, Pinch and Entrapment (Operator or other reach into potential crush, pinch and entrapment zones whilst operating Kanga arms up and down)	**Engineering** In remote controlled mode, the operator's stand-off location prevents access to pinch points. Speed at which arms lower in not fast action. Design minimises nip points (gaps greater than 4mm and less than 120mm). **Guarding (Nil)** **Isolation (Nil)**	**Sev**: Major **Lik**: Possible Matrix Ref = 12	Low	**Elimination** Elimination of hazard is not possible at this time. **Substitution** Reduction of risk by substitution is not possible at this time. **Engineering** Warning beacon and reversing beeper fitted to machine. **Isolation** Isolating controls are not available at this time. **Administrative**	**Sev**: Major **Lik**: Unlikely Matrix Ref = 8	Low

	Administrative Operators manual states that attachments must be installed or removed from loader at very low speed. Gross weight of attachments is indicated on the attachment. All bystanders are to maintain a 4-metre exclusion zone during operation. (Detailed in manual and decal) Operator to conduct pre-operation assessment of task. Operator to implement controls established prior to commencing.			Safe Working Limits (SWL) decal placed on all machines. **PPE** Operators and other people within work area should wear high visibility clothing. Appropriate Safety footwear to be worn in compliance with AS2210 Safety Footwear		
Contact with falling objects (Operator drops spoil on others)	**Engineering** Buckets are self-levelling. Generous bucket rollback permits ease of filling and safe transportation. **Guarding (Nil)** **Isolation (Nil)** **Administrative** All bystanders are to maintain a 4-metre exclusion zone during operation. (Detailed in manual and decal) Operators instruction manual directs operator to keep load close to the ground and to drive to the conditions. **PPE (Nil)**	**Sev**: Moderate **Lik**: Possible Matrix Ref = 9	Low	**Elimination** Elimination of hazard is not possible at this time. **Substitution** Reduction of risk by substitution is not possible at this time. **Engineering** Warning beacon and reversing beeper fitted to machine. **Isolation** Isolating controls are not available at this time. **Administrative** Operator to conduct pre-operation assessment of task. Operator to implement controls established prior to commencing. **PPE** Operators and other people within work area should wear high visibility clothing. Appropriate Safety footwear to be worn in compliance with AS2210 Safety Footwear	**Sev**: Moderate **Lik**: Rare Matrix Ref = 3	Low
Electric Shock (Contact with overhead uninsulated conductors)	**Engineering** Machine maximum reach less than the minimum clearance of 3 metres to overhead conductors. Remote controlled Kanga loaders have non-conductive rubber tyres and PVC track systems. **Guarding (Nil)** **Isolation (Nil)**	**Sev**: Catastrophic **Lik**: Unlikely Matrix Ref = 10	Medium	**Elimination** Elimination of hazard is not possible at this time. **Substitution** Reduction of risk by substitution is not possible at this time. **Engineering** No other engineering controls are available at this time. **Isolation** Isolating controls are not available at this time.	**Sev**: Catastrophic **Lik**: Rare Matrix Ref = **5**	Low

	Administrative Operators manual warns of hazard. All bystanders are to maintain a 4-metre exclusion zone during operation. (Detailed in manual and decal) Operators instruction manual directs operator to keep load close to the ground and to drive to the conditions. Operator to conduct pre-operation assessment of task. Operator to implement controls established prior to commencing.			**Administrative** No other administrative controls available at this time. **PPE** Appropriate Safety footwear to be worn in compliance with AS2210 Safety Footwear		
Electric Shock (Contact with buried electrical services when using	**Engineering** Remote controlled Kanga loaders have non-conductive rubber tyres and PVC track systems and non-conductive operation control knobs/grips. **Guarding (Nil)** **Isolation (Nil)** **Administrative** Operators manual warns of hazard. Warning notice and "1100 Dial before you dig" decal on loader. Operator to conduct pre-operation assessment of task. Operator to implement controls established prior to commencing. **PPE (Nil)**	**Sev**: Catastrophic **Lik**: Unlikely Matrix Ref = 10	Medium	**Elimination** Elimination of hazard is not possible at this time. **Substitution** Reduction of risk by substitution is not possible at this time. **Engineering** No other engineering controls are available at this time. **Isolation** Isolating controls are not available at this time. **Administrative** All bystanders are to maintain a 4-metre exclusion zone during operation. (Detailed in manual and decal) If loader operation is associated with trenching or auguring, hand dig to locate services prior to trenching and preferably after a service locator has scanned the ground for unanticipated services. Operators to stay within close proximity to trenching operations to listen for any change in soil texture e.g. sand, stone, pebbles denoting the possibility of service channels. Hearing early changes in soil type/structure can ensure prevention or minimisation of damage. **PPE** Appropriate Safety footwear to be worn in compliance with AS2210 Safety Footwear	**Sev**: Catastrophic **Lik**: Rare Matrix Ref = **5**	Low
Hot Parts (Contact with motor, exhaust or hydraulic parts)	**Engineering** Remote controlled Kanga loaders have non-conductive rubber tyres and PVC track systems. **Guarding (Nil)**	**Sev**: Moderate **Lik:** Unlikely Matrix Ref = 6	Low	**Elimination** Elimination of hazard is not possible at this time. **Substitution** Reduction of risk by substitution is not possible at this time. **Engineering**	**Sev**: Minor **Lik**: Rare Matrix Ref = 2	Low

	Muffler and exhaust guarded against inadvertent contact. **Isolation (Nil)** **Administrative** Warnings in Operators manual and on loader safety instruction decal. Hot warning sign on exhaust guard. Operator to conduct pre-operation assessment of task. Operator to implement controls established prior to commencing. **PPE (Nil)**			No other engineering controls are available at this time. **Isolation** Isolating controls are not available at this time. **Administrative** All bystanders are to maintain a 4-metre exclusion zone during operation. (Detailed in manual and decal) **PPE** Appropriate Safety footwear to be worn in compliance with AS2210 Safety Footwear Appropriate Safety gloves to be worn in compliance with AS2161 Occupational Protective Gloves. Suitable clothing (i.e. long pants and shirt) to be worn during operation.		
Entanglement (Operators or others have hair or clothes caught by rotating parts)	**Engineering** **Guarding (Nil)** Fixed guards on all rotating parts other than wheel/tracks. **Isolation (Nil)** **Administrative** Warnings in Operators manual and on loader safety instruction decal. All bystanders are to maintain a 4-metre exclusion zone during operation. (Detailed in manual and decal) Operator to conduct pre-operation assessment of task. Operator to implement controls established prior to commencing. **PPE (Nil)**	**Sev**: Catastrophic **Lik**: Unlikely Matrix Ref = 10	Medium	**Elimination** Elimination of hazard is not possible at this time. **Substitution** Reduction of risk by substitution is not possible at this time. **Engineering** No other engineering controls are available at this time. **Isolation** Isolating controls are not available at this time. **Administrative** No other administrative controls available at this time. **PPE** Suitable clothing (i.e. long pants and shirt) to be worn during operation. All operators must ensure that any long hair is appropriately tied back or restrained (i.e., hat)	**Sev**: Catastrophic **Lik**: Rare Matrix Ref = **5**	Low
High Pressure Fluid (Ruptured hydraulic hose)	**Engineering** Hose pressure rating has safety margin. Pressure relief valve fitted **Guarding (Nil)** Flexible hydraulic lines are protected by socks/guards where they are less than 0.5m from the operator during operation. **Isolation (Nil)** **Administrative**	**Sev**: Major **Lik**: Possible Matrix Ref = 12	Medium	**Elimination** Elimination of hazard is not possible at this time. **Substitution** Reduction of risk by substitution is not possible at this time. **Engineering** No other engineering controls are available at this time. **Isolation** Isolating controls are not available at this time. **Administrative** No other administrative controls available at this time.	**Sev**: Major **Lik**: Rare Matrix Ref = 4	Low

	Warnings in Operators manual and on loader safety instruction decal. Maintenance manual highlights hazard and recommends regular inspection and planned maintenance regime. All bystanders are to maintain a 4-metre exclusion zone during operation. (Detailed in manual and decal) Operator to conduct pre-operation assessment of task. Operator to implement controls established prior to commencing. **PPE (Nil)**			**PPE** Appropriate Safety footwear to be worn in compliance with AS2210 Safety Footwear Appropriate Safety gloves to be worn in compliance with AS2161 Occupational Protective Gloves. Suitable clothing (i.e. long pants and shirt) to be worn during operation.		
Hot radiator water splash	**Engineering** **Guarding (Nil)** **Isolation (Nil)** **Administrative** Caution decal on radiator. **PPE (Nil)**	**Sev**: Moderate **Lik**: Possible Matrix Ref = 9	Medium	**Elimination** Elimination of hazard is not possible at this time. **Substitution** Reduction of risk by substitution is not possible at this time. **Engineering** No other engineering controls are available at this time. **Isolation** Isolating controls are not available at this time. **Administrative** All bystanders are to maintain a 4-metre exclusion zone during operation. (Detailed in manual and decal) Operator to conduct pre-operation assessment of task. Operator to implement controls established prior to commencing. **PPE** Appropriate Safety footwear to be worn in compliance with AS2210 Safety Footwear Appropriate Safety gloves to be worn in compliance with AS2161 Occupational Protective Gloves. Suitable clothing (i.e. long pants and shirt) to be worn during operation.	**Sev**: Moderate **Lik**: Rare Matrix Ref = 3	Low

Crush – Inadvertent machine movement. (Operator or assistant stands to the front of and/or under the loader arms – hydraulics fail and arms lower – alternatively, machine moves forwards or backwards). Possibility of loader movement or operation while maintenance work is being performed.	**Engineering** Loader arms can be locked into position when fully upright. All Hydraulic controls are sprung to return to neutral position. Machine speed is limited to 9.3 kph at maximum revs. Hydraulic system disabled by shutting down drive motor. **Guarding (Nil)** **Isolation** Battery power to loader must be isolated via the Battery Main Lockout Switch before maintenance work. Maintenance work must only be performed on the loader or transmitter when the loader is in local/manual mode. **Administrative** All bystanders are to maintain a 4-metre exclusion zone during operation. (Detailed in manual and decal) Operator to conduct pre-operation assessment of task. Operator to implement controls established prior to commencing. **PPE (Nil)**	**Sev**: Catastrophic **Lik**: Possible Matrix Ref = 15	Medium	**Elimination** Elimination of hazard is not possible at this time. **Substitution** Reduction of risk by substitution is not possible at this time. **Engineering** No other engineering controls are available at this time. **Isolation** Isolating controls are not available at this time. When performing any maintenance work on the loader with the bucket fully raised, operator must ensure that the locking pins are inserted to ensure unplanned collapse of arms does not occur (i.e. when hydraulic oil is bled from system) **Administrative** Operator must isolate battery power to loader before any maintenance work is undertaken. Operator to lock the Battery Main Lockout Switch with a pad lock, zip tie, hasp etc while maintenance is underway. If maintenance work must involve testing of features requiring battery power, loader must be placed in local manual operation mode only. **PPE** Appropriate Safety footwear to be worn in compliance with AS2210 Safety Footwear Operators and other people within work area should wear high visibility clothing.	**Sev**: Catastrophic **Lik**: Rare Matrix Ref = 5	Low
Oxygen Depletion, Toxic fume inhalation (Exhaust gas (Carbon Monoxide) build up when operating in confined space)	**Engineering** **Guarding (Nil)** **Isolation (Nil)** **Administrative** Operating manual warns of hazard. Operator to conduct pre-operation assessment of task. Operator to implement controls established prior to commencing. Due to remote operation of this unit (most of the time), human exposure to oxygen depleted or contaminated atmospheres is not expected to occur.	**Sev**: Catastrophic **Lik**: Unlikely Matrix Ref = 10	Medium	**Elimination** Elimination of hazard is not possible at this time. **Substitution** Reduction of risk by substitution is not possible at this time. **Engineering** No other engineering controls are available at this time. **Isolation** Isolating controls are not available at this time. **Administrative** Adhere to requirements defined in AS 2865 Safe working in a confined space. **PPE** Appropriate PPE to be worn during operation as shown	**Sev**: Catastrophic **Lik**: Rare Matrix Ref = 5	Low

	PPE (Nil)			throughout Risk Assessment.		
Slips / Trips / Falls (Stepping off loader onto trailer after driving onto trailer)	**Engineering** Trailer deck has checker plate (non-slip) floor. Slip Resistance Assessment R11 (low) **Guarding (Nil)** **Isolation (Nil)** **Administrative** No stepping on or over the loader is required or permitted at any stage. The loader is not designed to be operated while riding or standing upon any part of the loader. **PPE (Nil)**	**Sev**: Insignificant **Lik**: Unlikely Matrix Ref = 2	Low	**Elimination** Elimination of hazard is not possible at this time. **Substitution** Reduction of risk by substitution is not possible at this time. **Engineering** No other engineering controls are available at this time. **Isolation** Isolating controls are not available at this time. **Administrative** Operator to conduct pre-operation assessment of task. Operator to implement controls established prior to commencing. No stepping on or over any part of the Loader is permitted or required. **PPE** Appropriate Safety footwear to be worn in compliance with AS2210 Safety Footwear.	**Sev**: Insignificant **Lik**: Unlikely Matrix Ref = 2	Low
Noise (Inherent effect of motor, hydraulics and attachments)	**Engineering** Machine designed to limit noise to safe level. **Guarding (Nil)** **Isolation (Nil)** **Administrative** Operator to conduct pre-operation assessment of task. Operator to implement controls established prior to commencing. Although the Loader does not emit noise levels beyond a safe level, the combination of Loader noise and background environmental/industrial noise may potentiate the effect of the noise emitted by the Loader individually. Therefore, hearing protection is recommended. **PPE (Nil)** Pictogram on machine details need for hearing protection.	**Sev**: Moderate **Lik**: Possible Matrix Ref = 9	Low	**Elimination** Elimination of hazard is not possible at this time. **Substitution** Reduction of risk by substitution is not possible at this time. **Engineering** No other engineering controls are available at this time. **Isolation** Isolating controls are not available at this time. **Administrative** Recommend that a Noise Management plan is developed and adherence to AS 1269 Occupational Noise Management. **PPE** Hearing protection to AS1269 is highly recommended in areas where the Loader is not the only source of noise.	**Sev**: Minor **Lik**: Unlikely Matrix Ref = 4	Low

Whole body vibration. (Prolonged use of Kanga loader)	**Engineering** Standing design of machine. Rubber type hand grips. Mounting design of motor/pumps. **Guarding (Nil)** **Isolation (Nil)** **Administrative** Operator to conduct pre-operation assessment of task. Operator to implement controls established prior to commencing. Most of the operation of the loader will be conducted by radio/remote - therefore eliminating the need for people to mount the Loader. There is no possibility of whole-of-body vibration being experienced by operators. **PPE (Nil)**	**Sev**: Insignificant **Lik**: Unlikely Matrix Ref = 2	Low	**Elimination** Elimination of hazard is not possible at this time. **Substitution** Reduction of risk by substitution is not possible at this time. **Engineering** No other engineering controls are available at this time. **Isolation** Isolating controls are not available at this time. **Administrative** Recommend that where possible that task rotation or regular breaks occur fin consideration of the transmitter handset usage. **PPE** Appropriate Safety footwear to be worn in compliance with AS2210 Safety Footwear.	**Sev**: Insignificant **Lik**: Unlikely Matrix Ref = 2	Low
Lightning (Lightning Strike)	**Engineering** Rubber tyres create “Faradays Cage” effect. **Guarding (Nil)** **Isolation (Nil)** **Administrative** **PPE (Nil)**	**Sev**: Catastrophic **Lik**: Rare Matrix Ref = 5	Low	**Elimination** Elimination of hazard is not possible at this time. **Substitution** Reduction of risk by substitution is not possible at this time. **Engineering** No other engineering controls are available at this time. **Isolation**	**Sev**: Catastrophic **Lik**: Rare Matrix Ref = 5	Low
Fuel (Fuel spillage during refuelling or ruptured tank during operation)	**Engineering** **Guarding (Nil)** **Isolation (Nil)** **Administrative** No smoking decal on machine next to refuelling point. Series 8 Kanga uses Diesel fuel to reduce volatility. Maintenance manual highlights above hazards and recommends regular inspections and maintenance regime.	**Sev**: Moderate **Lik**: Possible Matrix Ref = 9	Low	**Elimination** Elimination of hazard is not possible at this time. **Substitution** Reduction of risk by substitution is not possible at this time. **Engineering** No other engineering controls are available at this time. **Isolation** Isolating controls are not available at this time. **Administrative** Material Safety Data sheet to be available to operators. Diesel Hazardous Substance Risk Assessment to be	**Sev**: Moderate **Lik**: Rare Matrix Ref = 3	Low

	PPE (Nil)			completed and available to operators. **PPE** Appropriate Safety gloves to be worn in compliance with AS2161 Occupational Protective Gloves. Appropriate Safety glasses to be worn in compliance with AS1336 Recommended practices for eye protection.		
Exposure to chemicals (Castrol Antifreeze, Hyspin Hydraulic Oil, Engine Oil & Diesel fuel.	**Engineering** **Guarding (Nil)** **Isolation (Nil)** **Administrative (Nil)** **PPE (Nil)**	**Sev**: Moderate **Lik**: Possible Matrix Ref = 9	Low	**Elimination** Elimination of hazard is not possible at this time. **Substitution** Reduction of risk by substitution is not possible at this time. **Engineering** All chemicals used within machine are within closed systems with capped entry points. **Isolation** Isolating controls are not available at this time. **Administrative** Material Safety Data sheet to be available to operators. Hazardous Substance or Dangerous Goods Risk Assessments to be completed and available to operators. **PPE** Appropriate Safety gloves to be worn in compliance with AS2161 Occupational Protective Gloves. Appropriate Safety glasses to be worn in compliance with AS1336 Recommended practices for eye protection.	**Sev**: Moderate **Lik**: Rare Matrix Ref = 3	Low
Loading/unloading Kanga onto or off trailer. Operator mis-controls whilst loading onto and off trailer via ramps.	**Engineering** All Hydraulic controls are sprung to return to neutral position. OEM ramps of generous incline and within working slope when on relatively level ground. Tracks on loaders (where fitted) give way as loader transverses over change of incline keeping the loader stable during manoeuvre. **Guarding (Nil)** **Isolation (Nil)** **Administrative** Warning and safe instructions in manual.	**Sev**: Moderate **Lik**: Possible Matrix Ref = **9**	Medium	**Elimination** Elimination of hazard is not possible at this time. **Substitution** Reduction of risk by substitution is not possible at this time. **Engineering** No other engineering controls are available at this time. **Isolation** Isolating controls are not available at this time. **Administrative** No other Administrative Controls are available at this time. **PPE** Appropriate PPE to be worn during operation as shown throughout Risk Assessment.	**Sev**: Moderate **Lik**: Rare Matrix Ref = 3	Low

	All bystanders are to maintain a 4 metre exclusion zone during operation. (Detailed in manual and decal) Operator to conduct pre operation assessment of task. Operator to implement controls established prior to commencing. **PPE (Nil)**					
Poor Visibility (Night work – other plant in area, Working near trenches and alike	**Engineering** Loaders have headlight attached. Warning beacon and reversing beeper fitted to machine. **Guarding (Nil)** **Isolation (Nil)** **Administrative** All bystanders are to maintain a 4-metre exclusion zone during operation. (Detailed in manual and decal) Operator to conduct pre-operation assessment of task. Operator to implement controls established prior to commencing. **PPE (Nil)**	**Sev**: Major **Lik**: Likely Matrix Ref = 16	Severe	**Elimination** Elimination of hazard is not possible at this time. **Substitution** Reduction of risk by substitution is not possible at this time. **Engineering** No other engineering controls are available at this time. **Isolation** Isolating controls are not available at this time. **Administrative** If using loader in radio/remote mode at night time - ensure either a) the operator is standing as close as practicable to the loader while in use, or b) that the work area is totally flood lit to prevent possibility of reversing loader into people, plant, equipment or obstacles. **PPE** Operators and other people within work area should wear high visibility clothing.	**Sev**: Major **Lik**: Unlikely Matrix Ref = 8	Low
Physical (Trailer tilts whilst unloading due to trailer being detached from towing vehicle, Loader dropped while being lifted)	**Engineering** Lifting points designed and provided. Warning beacon and reversing beeper fitted to machine. **Guarding (Nil)** **Isolation (Nil)** **Administrative** Warning contained in manual. Decal on trailer arm. Loader weight posted on loader. Lifting point decal provided. All bystanders are to maintain a 4-metre exclusion zone during operation. (Detailed in manual and decal)	**Sev**: Moderate **Lik**: Possible Matrix Ref = **9**	Low	**Elimination** Elimination of hazard is not possible at this time. **Substitution** Reduction of risk by substitution is not possible at this time. **Engineering** No other engineering controls are available at this time. **Isolation** Isolating controls are not available at this time. **Administrative** Testing regime of the anchor points used for lifting the loader to adhere to AS 1891 Industrial falls arrest system and devices. Completion of certification of lifting points included at Point of Sale. **PPE**	**Sev**: Moderate **Lik**: Rare Matrix Ref = 3	Low

	Operator to conduct pre-operation assessment of task. Operator to implement controls established prior to commencing. **PPE (Nil)**			Operators and other people within work area should wear high visibility clothing.		
Dust Earthmoving, drilling, boring, trenching, etc, activities when using attachments.	**Engineering** **Guarding (Nil)** **Isolation (Nil)** **Administrative** Operator to conduct pre-operation assessment of task. Operator to implement controls established prior to commencing. **PPE (Nil)**	**Sev**: Moderate **Lik**: Likely Matrix Ref = 12	Medium	**Elimination** Elimination of hazard is not possible at this time. **Substitution** Reduction of risk by substitution is not possible at this time. **Engineering** No other engineering controls are available at this time. **Isolation** Isolating controls are not available at this time. **Administrative** All bystanders are to maintain a 4-metre exclusion zone during operation. (Detailed in manual and decal) **PPE** Appropriate Respiratory protection to be worn in compliance with AS 1617 Respiratory Protection Devices. Appropriate Safety glasses to be worn in compliance with AS1336 Recommended practices for eye protection.	**Sev**: Minor **Lik**: Possible Matrix Ref = 6	Low
Injury to pedestrian / road traffic incident. (Loader falls from trailer during transit)	**Engineering** Anchor points and restraints designed in and provided on Kanga loader and supplied trailer. **Guarding (Nil)** **Isolation (Nil)** **Administrative** Instructions in manual and on local signage. Loader anchor points decal provided. Operator to conduct pre operation assessment of task. Operator to implement controls established prior to commencing. **PPE (Nil)**	**Sev**: Catastrophic **Lik**: Unlikely Matrix Ref = 10	Medium	**Elimination** Elimination of hazard is not possible at this time. **Substitution** Reduction of risk by substitution is not possible at this time. **Engineering** No other engineering controls are available at this time. **Isolation** Isolating controls are not available at this time. **Administrative** Adherence to the NTC Load Restraint guide when securing loader, attachments and equipment to the trailer. **PPE** Appropriate PPE to be worn during operation as shown throughout Risk Assessment.	**Sev**: Catastrophic **Lik**: Rare Matrix Ref = 5	Low
Heat - Weather extremes (Heat Stress,	**Engineering (Nil)** **Guarding (Nil)** **Isolation (Nil)** **Administrative (Nil)**	**Sev**: Major **Lik**: Possible Matrix Ref =	Medium	**Elimination** Elimination of hazard is not possible at this time. **Substitution**	**Sev**: Minor **Lik:** Rare Matrix Ref = 2	Low

Dehydration, fatigue, cramping)	**PPE (Nil)**	12		Reduction of risk by substitution is not possible at this time. **Engineering** No other engineering controls are available at this time. **Isolation** Isolating controls are not available at this time. **Administrative** Ensure that operators have adequate rest breaks. Ensure regular and adequate hydration occurs (H20 @ 500-600ml/hr) Recommend that where possible that task rotation is utilised to reduce exposure to hazard. Where possible, use radio/remote transmitter from a shady location. **PPE** Ensure when working outdoors that appropriate clothing (including hat) and sunscreen (preferably SPF 30+) is worn - applied in the morning and again at midday. Operators to wear broad brimmed hats or hard hats with attachable brims.		

Risk Assessment Matrix:

Likelihood (L)	Consequences (C)				
	5 Catastrophic	4 Major	3 Moderate	2 Minor	1 Insignificant
5 – Almost Certain	25	20	15	10	5
4 – Likely	20	16	12	9	4
3 – Possible	15	12	9	6	3
2 – Unlikely	10	8	6	4	2

1 – Rare	5	4	3	2	1

C = Consequence	L = Likelihood	Risk Rating & Control Legend
5 = Catastrophic Death, disablement, significant incident, unacceptable risk, significant financial cost.	**5 = Almost Certain** Could occur in most circumstances	**Severe** **16-25** Cease activity immediately and implement risk controls before commencing work activities. Make the work area safe & consult with competent/qualified personnel.
4 = Major Extensive injuries leading to lost time, major risk-damage to plant and equipment, major financial cost for repairs/reinstatement.	**4 = Likely** May probably occur in most circumstances	
3 = Moderate Medical treatment, medium risk-damage to plant and equipment, medium financial cost for repairs/reinstatement.	**3 = Possible** May occur at some time	**Medium** **10-15** Plan and implement risk control measures after performing a Step Back 5 X 5 risk assessment. Seek advice from the manufacturer if any doubt exists.
2 = Minor First Aid treatment, minor risk-damage to plant and equipment, minor financial cost for repairs/reinstatement.	**2 = Unlikely** Could occur at some time	**Low** **6-9** No immediate risk. Assess overall risk in line with resources, instruction manual, and manufacturer's advice. **1-4** Accept level of risk
1 = Insignificant: No injuries, slight damage, low financial cost for repairs/reinstatement.	**1 = Rare** May occur only in exceptional circumstances	

Reference:

1. Model Code of Practice: Managing risks of plant in the workplace
2. Operators Manual Kanga 8B Series.
3. AS 4586 Slip resistance classification of new pedestrian surface materials
4. AS 2210 Safety Footwear
5. AS 2161 Occupational Protective Gloves
6. AS 2865 Safe working in a confined space.
7. AS 1269 Occupational noise management.
8. AS 1336 Recommended practices for eye protection.
9. AS 1891 Industrial falls arrest system and devices.
10. AS 1617 Respiratory Protection Devices.
11. AS/NZS 4240 Remote Controls for Mine Equipment
12. AS/NZS 4602 High Visibility Safety Vests
13. NTC Load Restraint Guide 2018

R

Note: The risk assessment methodology has been suited to the Model Work Health and Safety Act – including those states and territories that have enacted the Model Work Health and Safety Act and its Regulation. At the time of printing, the states and territories that have enacted the

Model Work Health and Safety Act and the Code of Practice for Managing risks of plant in the workplace are: Queensland, New South Wales, Australian Capital Territory, South Australia, Tasmania. Victoria has a code of practice for the management of plant in the form of the Compliance Code: Plant 2018 which is aligned to the Model Code of Practice – however Western Australia and the Northern Territory do not possess codes of practice related to the Model Code of Practice for Managing risks associated with plant.

Disclaimer:
The recommendations contained within this risk assessment are based to a large extent on the hazards identified by Kanga and associates. The owner of equipment must ensure that the risk management principles (as outlined in AS 4801: 2001 Occupational Health & Safety Management Systems - Specifications with guidance for use) are applied after purchase to ensure that risks are identified within the environment for intended use. Kanga believes that the advice and information herein is accurate and reliable, however, no warranty for accuracy or reliability is given and no responsibility arising in any way whatsoever for errors or omissions (including responsibility to any person by reason of negligence) is accepted by Kanga or associates.




