Ref No: SINO-B001

Plant Risk Assessment
Electric and Diesel-powered Boom lift

Address:	39 Alta road Caboolture Qld 4510
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Make	SINOBOOM	Model	**ALL ELECTRIC AND ENGINE POWERED BOOM LIFTS**
Plant Description:	Electric Scissor Lift & Diesel Boom lift	Maintenance / Prestart Checks Required:	▪ Last Service: ▪ Plant pre-start checklist ▪ Maintenance logbook

Person Completing Assessment:	Conrad Christian	Title	National Technical Manager
Signature:			

Licences or Competency Required:	Verification of competency required: ▪ Where the boom lit has the capacity to elevate under 11m yellow card is required. ▪ Where the boom lift has the capacity to elevate past 11 meters a High-Risk Work Licence is required (TLILIC2005A – High Risk Work Licence (HRW) – Boom Lift Over 11 Metres).		
Training / Competencies Required for maintenance	Training and competence required for inspection of this plant include: ▪ Has acquired, through training qualifications or experience, the necessary skills to inspect, maintain and repair the plant and ▪ Has a sound knowledge of, and competence in the operation, maintenance, repair, alteration and dismantle of the plant and ▪ Has sound knowledge of relevant Australian Standards, relevant Codes of Practice and other relevant legislation.		
Occupational Health, Safety or Environmental Legislation:	▪ *Work Health and Safety Act 2011* ▪ *Work Health and Safety Regulations 2011*	Codes or Standards Applicable to the Works:	▪ *AS1418.10* ▪ *AS2550.10*

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RISK MATRIX

LIKELIHOOD	
Rare - 1	The event may occur only in exceptional circumstances
Unlikely - 2	Could occur at some time / the event is not expected to occur
Moderate - 3	The event may occur
Likely -4	Likely to occur at some time / the event will probably occur
Almost Certain - 5	Has or likely to occur weekly

CONSEQUENCE	SAFETY / PEOPLE	ENVIRONMENT / PLANT / EQUIPMENT
Insignificant – 1	No medical treatment other than first aid required and no lost time injury.	No lasting detrimental effect on the environment. Insignificant damage less than $1000
Minor – 2	Medically treated injury.	Short term, local detrimental effect on the environment or social impact. Plant, property or equipment damage less than $10,000 and no disruption to business
Moderate - 3	Lost time injury without being admitted to a hospital.	Serious environmental event (discharge of pollution) requires remedial action. Breach of environmental law. No long-term impact on environment. Plant, property or equipment damage less than $100,000 and minimal disruption to business
Major - 4	Lost time injury resulting in being admitted to hospital with the ability to return to work after treatments.	Any of the above, with the potential for long-term environmental or social impact. Plant, property or equipment damage less than $1,000,000, major disruption to business
Extreme - 5	Fatality, permanent disability or multiple serious injuries to staff, contractors or public.	Extensive and long-term impacts on the environment and community. Plant, property or equipment damage more than $1,000,000, major disruption to business i.e. sites shut down

Consequence

Likelihood	1 Insign.	2 Minor	3 Mod.	4 Major	5 Extreme
1 Rare	1	2	3	4	5
2 Unlikely	2	4	6	8	10
3 Moderate	3	6	9	12	15
4 Likely	4	8	12	16	20
5 Almost certain	5	10	15	20	25

RISK LEVELS

Low (1-3)
Works shall be monitored by supervisor. Any risk assessed as presenting a low risk level will be permitted to be controlled using a combination of controls as appropriate, more than one lower-level control must be applied if elimination and or engineering controls are not practicable

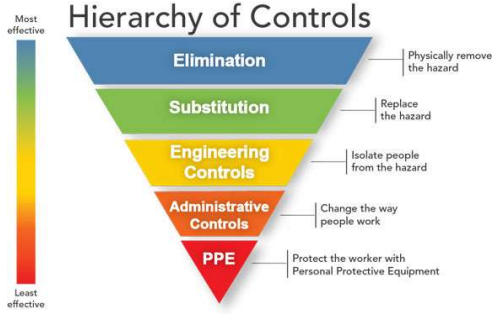
Medium (4 – 8)
Works shall be monitored by senior management. Any risk assessed as presenting high or medium risk level will only be allowed to be controlled using a combination of at least one engineering control and one lower level controls as appropriate

High (9 – 14)
No works to commence unless otherwise approved by Senior Management. Any risk assessed as presenting high or medium risk level will only be allowed to be controlled using a combination of at least one engineering control and one lower level controls as appropriate

Extreme (15 – 25)
No works to commence unless otherwise authorised by the Director. Any risk assessed presenting extreme risk level will only be allowed to be controlled using elimination and or engineering controls as the primary source of controls. The activity **MUST** be signed off by director or project manager before proceeding

HIERARCHY OF CONTROLS

ELIMINATE	Can we eliminate or remove the hazard completely?
SUBSTITUTE	Can we substitute the hazard with something else less dangerous?
ENGINEER / ISOLATION	Can we re-design or isolate the hazard completely?
ADMINISTRATION	What controls can we put in place, e.g. training, job rotation, supervision?
PPE	What personal protective equipment is required to undertake this activity?



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Plant Risk Assessment – **Electric and Diesel Boom Lift**

SN	HAZARD TYPE	HAZARD DISCRIPTION	RISK RATING			CONTROL MEASURE BY MANUFACTURER	RESPONSIBLE PERSONNEL	RESIDUAL RISK		
			L	C	R			L	C	R
A	**GENERAL**									
1	**Crushing**	Operating in a high movement area or in an enclosed environment. Potential crush and collision during lifting or travelling.	3	4	12	• The machine has motion alarm and a flashing, emitting audible and visual warning. • Select to low drive speed if available. • Drive enable function is enabled when the turret is swung past 90 degrees. • Have a spotter/guide when traffic is high with people & machinery movements.	OPERATOR	1	4	4
2	**Entanglement**	Loosed wiring and hoses. Rotating parts (motor, engine flywheel and fan). Loose clothing and accessories.	1	4	4	• All wires and hoses are safe and fixed at specific locations, and the charger cable is shortest. • No rotating parts are exposed outside the machine. Flywheels and fans on the engine are enclosed in their own compartments and thus are accessible only with special tools and repaired only by qualified personnel. • In addition, warning signs are posted on the machine. Always wear proper & just fit clothing, no accessories like bangle, chain, bracelet, vendetta, scarf etc. • Operator to ensure all loose items are secure before operation, perform walk around inspection	OPERATOR	1	2	2
3	**Cutting**	Sharp edges, rusty area,	3	5	15	• All contact surfaces are free of any sharp edges. • All handrail edges are smooth and painted well against rusting.	OPERATOR	1	4	4
4	**Puncturing.**	Protruding bolt/screw/pins.	3	4	12	• Any protrusion in platform should face outside (away from people standing inside). • Any protrusion below platform should face inside to avoid injury to people nearby.	OPERATOR	1	4	4
5	**Shearing**	Boom lowering between turret & boom mechanism.	3	5	15	• Guards are provided in accordance with plant code requirements for guarding. • Guarding provided is a fixed permanent nature and can only be removed with tools. • Follow maintenance procedures in the service manual. • Ensure no one near machine when operating, always horn before start lowering	OPERATOR	1	4	4

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			L	C	R			L	C	R
6	**Friction**	Mechanical faults, Platform rising/lowering not smooth	3	1	3	• Friction-caused mechanical faults are reduced greatly with lubrication. Greasing points at cylinders' ends. All other pins come with self-lubricating bushings. • The maintenance manual specifies the lubrication schedule and grease type for reference. • Always ensure sliding wear pad areas are always free of debris & clean to reduce friction.	OPERATOR	1	1	1
7	**Striking**	Sudden or unintended movements. lowering/driving.	2	2	4	• Deadman switch provided to prevent inadvertent movement, no movement will work without first activating the Deadman switch. • Drive enable switch is provide to restrict driving when turret is swung past 90 degrees. • Use a spotter in high traffic environments.	OPERATOR	1	1	1
B	**ERGONOMIC**									
8	**Tripping**	Tripping while in platform	3	3	9	• Operational Manual stipulated "keep the platform floor free of obstacles". Hold the handrail when moving in the platform.	OPERATOR	2	2	4
9	**Falling**	General operations. Falling when entering/exiting platform.	2	2	4	• Platform comes with safety rail to prevent operator fall off. • Safety lanyard anchor points provided for all operators. • Platform door is swing inward type & self-locking type, as specified by AS1418.10. For more, refer to Operational Manual "Falling Hazard". • Always practice 3 points contact. Always Enter head on & exit back down to avoid falling.	OPERATOR	2	2	4
10	**Slipping**	Slipping on the platform, slip on lubricant, water or wet material like cloth.	4	3	12	• Platform floor is of expanded metal mesh pattern type to reduce slippage. • Always clear all spilt liquid in platform & surrounding area. • Always wear non-slip safety shoe.	OPERATOR	1	3	3

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			L	C	R			L	C	R
C	**EQUIPMENT SYSTEM**									
11	**High Pressure Fluid**	High pressure fluid can cut or penetrate	4	4	16	• System is designed with relief valve & pressure-reducing valve with suitable safety margins. • All hydraulic component & hoses compliance with the system working pressure, with its bursting pressure within safety margins. • Refer to Maintenance Manual for proper adjustment & repair.	OPERATOR	2	2	4
12	**High Temperature**	Heat can burn or scald skin.	2	4	8	• Do not open radiator cap when it is hot. • Do not check engine when it is hot. • Always wear PPE like gloves & goggles/face shield.	OPERATOR	2	1	2
13	**Fire/Explosion**	During operating or charging the equipment. Combustible material not subjected to heat. During refuelling & spill of fuel.	3	4	12	• Maintenance Manual specifies the related warning: in open-flame or potential explosion environment, it is forbidden to use or charge the machine. • Do not touch any battery terminal with tools that may generate sparks. • Store & remove all combustible material from machine immediately. E.g. cloth/paper with stain lubricant, fuel, & dry debris which can catch fire easily. Especially area near engine/motor. • No open flame or smoking during refuelling, always clean up spill fuel asap.	OPERATOR	2	4	8
14	**Exhaust Gas**	Working In a closed environment, Engine exhaust gas during operation.	4	4	16	• In a concealed environment, don't start or operate any machine with diesel engine. • Adequate ventilation is required when using engine powered units indoors.	OPERATOR	1	1	1
15	**Gas Emitted During Charging**	Inhalation of exhaust gas	3	4	12	• Only charge battery in a well-ventilated area, do not work in the same area where machine is charging.	OPERATOR	1	2	2

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			L	C	R			L	C	R
D	ELECTRICAL									
16	**Overload Electrical Circuit**	System overload & caused fire.	3	3	9	• Power supply circuit has a minimum of 250Afuse, and control circuit has a minimum of 10ACircuit breaker. • Besides, on the main positive circuit has main power-off/isolator switch.	OPERATOR	1	3	3
17	**AC Electric Shock**	Electrocution hazard.	3	5	15	• For standard equipment, the system voltage is below 24V DC. • For off-road equipment with diesel engine, the system voltage is below 14V DC. For off-road electric equipment, the system voltage is below 48V DC. • 220V charger has power protection function by limiting the charging and emitting warning signal. Outside the platform handrail, the mains port has such functions as short circuit + overload + leakage protection (RCBO), at 230V of voltage, 16A of current and 5-10 In of electromagnetic tripping (C curve) (Selection of protective element is dependent on the corresponding areas.)	OPERATOR	1	3	3
18	**ELECTRUCTION HAZARD**	ELECTRICUTION HAZARD, Electromagnetic interference	4	5	20	• The vehicle is of non-insulated design and marked with non-insulated signs. CAN BUS is of shielded twisted pair for data interaction. • Always practice minimum approach distance, always find out power line voltage before operating. Refer to operational manual. • Use a spotter	OPERATOR	2	5	10

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			L	C	R			L	C	R
E	**STABILITY**									
19	**Uneven/Slope Ground**	It is possible that the machine tip over	4	5	20	• Nameplate and Operation Manual clearly specify the allowable inclination. • Above the inclination, the vehicle cannot be used. • With a level sensor, the machine can give out warning signal if tilted beyond the inclination, limiting some functions. • Tests have been done on pits/slopes that meet or exceed AS 1418.10 standards.	OPERATOR	2	3	6
20	**Outriggers/Axle Not Deploy**	With outriggers/axles not deployed, exceeding allowable height may tip over the vehicle.	2	5	10	• Platform height is limited with outriggers unfolded, which is set in the program. • Manuals stipulate the precautions for outriggers/axles not deployed.	OPERATOR	2	3	6
21	**Drive: Pothole, Hitting Object**	The vehicle may tip over in pothole or obstacles.	2	1	2	• Our products are designed and tested according to standards, approving that they don't tip over in pothole or obstacles specified in standards AS1418.10. • Always practice worksite inspection before operation, mark out all pothole/object that cannot be removed.	OPERATOR	1	1	1
22	**Safe Workload, Side Load**	Higher than the safe working load: side load may cause the vehicle to tip over.	4	5	20	• Our products are designed and tested according to standard AS1418.10, approving that they don't tip over at the 400NM specified workload and side load. • There are safe workload and side load requirements on the safety signs. • Manuals also list the safety workload and side load requirements.	OPERATOR	2	4	8
23	**Wind Rating Indoor/Outdoor**	Above the specified wind speed, the vehicle may tip over.	5	5	25	• Safety signs stated max allowable wind speeds for indoor and outdoor products. • Manuals also specify the maximum allowable wind speed, as well as the applicable indoor/outdoor models. • Always ensure unit is for indoor or outdoor application. • Machines are tested to 12.5 m/s as per AS14181.10.	OPERATOR	2	1	2
24	**Over-speeding**	Above allowable traveling speed, the vehicle may roll over.	5	5	25	• Traveling speed has been limited in the control system. • Do not adjust travel speed higher than spec. Always be aware of travel ground & surrounding condition. • Machine slows down while elevated.	OPERATOR	1	1	1

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F	**HYDRAULIC FAILURE**									
25	**Hose Failure**	High pressure fluid can cut or penetrate skin	3	4	12	• Hoses must be in compliance with the system working pressure, with its bursting pressure way higher than latter. • Besides, at the friction parts of hoses are mounted sheathes for protection. • There is an relief valve to limit the system pressure. • Always de-pressurize the system before maintenance, refer to Maintenance Manual.	OPERATOR	2	2	4
26	**Cylinder Failure**	Cylinder piston rod is bent. Unit self-lowered uncontrol, tip over.	2	3	6	• Main seals are of reputable manufacturer to ensure the sealing quality. • The bending and buckling of the cylinders is tested to standard AS1418.10. • Check & test unit prior operation, do not use unit if abnormality detected in any cylinders	OPERATOR	1	1	1
27	**Hydraulic Component Failure**	The work platform lowers by itself. Unit become inoperable at critical position.	2	4	8	• Component used are of reputable manufacturer to ensure safety & quality. • Filters are design into system to keep off foreign materials.	OPERATOR	1	2	2
G	**STRUCTURAL FAILURE**									
28	**Boom Fatigue/Corrosion**	Fatigue break and corrosion fracture. Boom failure will cause platform to collapse from height.	1	5	5	• CAE is adopted for calculation and analysis to ensure fatigue safety coefficient – in accordance with AS 1418.10. • Surfaces in touch with corrosive materials are painted well, with maintenance intervals shown in manuals. • Visual inspection prior operation, rectify fault before used.	OPERATOR	1	1	1
29	**Pin, Bushing, Linkages**	Platform collapse or breakdown in critical position.	2	5	10	• CAE is adopted for calculation and analysis to ensure fatigue safety coefficient – in accordance with AS1418.10. • Manuals specify the periodic maintenance and inspection.	OPERATOR	2	1	2
30	**Overloading**	Collapse or tilt over due to overloading.	3	5	15	• Safety sign shows the max. rated load, and so do manuals. No overloading. • Load sensors fitted to cut functions.	OPERATOR	2	1	2

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			L	C	R			L	C	R
H	MAINTENANCE									
31	**Boom**	Erratic movement, breakdown in critical position	2	3	6	• Check & ensure periodically maintenance are perform & machine works normally prior start work Maintenance Manual stipulates component & inspection/maintenance interval.	OPERATOR	1	1	1
32	**Battery Short Pos & Neg Terminal**	Potentially fire & explosion, system totally not functioning at critical position	2	3	6	• Check unit prior operation for proper cleanliness, battery terminals are tight, rubber covered properly, no foreign object that can cause short circuit, no spilled battery water or other fluid.	OPERATOR	2	1	2
33	**Pressurized Hydraulic System**	High pressure fluid can cut or penetrate skin. Erratic movement, breakdown in critical position.	3	4	12	• Periodically check all relief pressure setting, regularly change filters &hydraulic oil as specified in Maintenance manual. • Replace hoses when the outer layer is worn out even it does not leak to prevent sudden burst of hose due to its strength is compromised. • Depressurise the system before carrying out repairs.	OPERATOR	2	1	2
34	**Battery Fluid Acid**	Corrosion on component & burn the skin.	3	4	12	• Standard maintenance-free battery, less chance of handling of acid or leaks or spilt its electrolyte. • Always wear rubber glove & goggles when handling battery acid/electrolyte.	OPERATOR	1	1	1
I	**TRANSPORT**									
35	**On Trailer-Tie down Points**	Machine roll off trailer during transport.	4	4	16	• Tie-down points are provided in the machine. • Ensure proper tie down method is done & with sufficient capacity of tie down material.	OPERATOR	1	1	1
36	**Hoisting- Lifting Point**	Machine tilt off balance & fall while hoisting.	2	3	6	• Ensure hoisting material are proper length, capacity suffice & latch to specific hoisting points. • Manuals have lifting procedure.	OPERATOR	1	1	1
37	**Loading/ Unloading**	Machine slip & fall at ramp	4	3	12	• Ensure ramp is not wet, drive at low-speed high torque. • Have spotter if from platform cannot see the ramp clearly. • Driver must have a license to operate.	OPERATOR	2	1	2

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			L	C	R			L	C	R
J	**OCCUPATIONAL HAZZARD**									
38	**Unauthorized Use**	General operations. Accident resulting in injury/fatality & damaged to property & machine.	4	5	20	• Only one controller can be used at one time. • Ground controllers are recessed to prevent against accidental operation. • Detachable key switch to prevent unauthorized operation. • Only allow trained operator to use the machine. • Machine have a lockable isolator to isolate batteries.	OPERATOR	1	1	1
39	**Emergency Lowering**	Platform not able to lower at critical height.	2	2	4	• Emergency lowering procedure is on the chassis. • Always check emergency lowering prior start of work, ensure people nearby know how to perform emergency lowering. • Refer Operation Manual.	OPERATOR	1	1	1
40	**Safety Sign & Label**	Decal Removed / Wrong decal(s) Wrong operation resulting in accident.	3	3	9	• Warning signs are permanent, waterproof and conspicuous. • The nameplate specifications are stamped, and permanently valid. • All safety warning signs are illustrated in Operation Manual. • Ensure all sign & label are readable & in proper location, replace immediately prior work start.	OPERATOR	2	1	2

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Workers Acknowledgement

I acknowledge that I have been trained in the Plant Risk Assessment listed above, the controls are clearly understood, and my qualifications are current to undertake this activity. I will comply with the Plant Risk Assessment, and I have been consulted and had the opportunity to contribute to the Plant Risk Assessment. If at any stage I feel I cannot conduct my task/s safely, I will stop work immediately and report the issue to the relevant supervisor.

Print Name	Position / Trade	Signature:	Date