For Earth, For Life

Kubota

Kubota Tractor Australia Pty Ltd
25-29 Permas Way
TRUGANINA, 3029
Victoria Australia

HAZARD IDENTIFICATION and RISK ASSESSMENT

Assessment Date	Assessment Location	Revision
Tuesday, 20 December 2016	Kubota Tractor Australia, Truganina, Victoria	1

Assessment Team
M.Morona (Technical Engineer)

Unit Assessed			
	Evaluation Sample	Australian Specification Production	
Type of unit	✓		
	Model	Item Code	Serial Number
Base Model	ZG222	K3261-31001	-
Attachment 1	RCK48P-222Z	K5576-00000	-

Section 1: Machine Specifications
Section 2: Risk Assessment Tables
Section 3: Hazard Identification and Risk Assessment
Section 4: Required Risk Controls

Kubota Tractor Australia Pty Ltd. has conducted this risk assessment as part of its duties to manager the risks associated with its products as required by the Work Health and Safety Act. The hazard identification and risk assessment has been performed on a standard unit as described above for flat ground application.
It is the responsibility of the dealer supplying the machine to conduct their own hazard identification and risk assessment to include any options, accessories or third party attachments installed to the machine.
The manager of the machine must conduct a thorough risk assessment specific to their application, carefully considering the environment, obstacles, operator competency and local regulations before operating the machine.

This risk assessment is void unless all the risk controls in section 4 have been completed and all the actions in section 3 J have been completed.

PREPARED BY:	RELEASED BY:
Matt Morona	Benjamin Binns
Technical Engineer - Ag Products Date: 20/12/2016	Engineering Manager Date: 30/12/2016

1. Machine Specifications

Specifications				
General	Model		**ZG222**	**ZG227**
	Item Code		K3267-31001	K327741001
	Manufacturer		Kubota Manufacturing of America	
	Country of Origin		United States of America	
Engine	Model		KGZ770-MA3	KGZ770-MA2
	No. of cylinders		2 (V-Twin)	
	Gross power	(kW)	16.4	20.1
	Rated RPM		3200	
Mower Deck	Model		RCK48P-222Z	RCK54P-227Z
	Item Code		K5576-00000	K5619-00000
	Cutting width	(mm)	1225	1375
	Cutting height	(mm)	25 - 127	
	No. of blades		3	
Dimensions	Overall length	(mm)	2096	
	Overall width	(mm)	1210	
	Overall height	(mm)	1775	
	Wheel base	(mm)	1295	
	Track front	(mm)	870	
	Track rear	(mm)	930	
	Weight	(kg)	530	540

Noise Level Exposure				
Reference Standard	AS 2012.1:1996 **	AS 2012.2:1996 **	Maximum Noise exposure ***	
Location	Bystander (7m)	Operator's Ear	Bystander (7m)	Operator's Ear
ZG222	75.1	86.6	85.1	96.0

* A-Weighted equivalent noise level exposure for 8 hours operation

**Test conducted in accordance with AS2012 series, with unit stationary operating at rated Engine RPM with all attachments disengaged

*** Test conducted with unit stationary in configuration which creates maximum noise level exposure (maximum engine RPM with attachment (mower deck etc) engaged, air conditioner on etc.)

Manufacturers Declaration of compliance - Operator protective structure		
The machine is supplied with a factory fitted operator protection structure which complies with the listed standards	Structure type	Reference Standard
	ROPS	OSHA 1928.52

2. Risk Assessment Tables

Likelihood Table

	Category	Description
1	Rare	Cannot imagine that this could occur (over 5 years)
2	Unlikely	Incident is possible, but unlikely to occur (2 years - 5 years)
3	Slight	Incident is possible to occur (1 year - 2 years)
4	Likely	Incident could occur at some time (1 month - 1 year)
5	Almost Certain	Incident will occur at some time (0 - 1 month)

Consequences Table

	Category	Description
1	Negligible	Effects unlikely to last until the next day.
2	Minor	Likely to affect employee the next day.
3	Moderate	Injury needs formal medical treatment.
4	Major	Injury requiring extensive medical treatment and/or hospitalisation.
5	Severe	Injury resulting in death or permanent incapacity.

Risk Score Calculator

		Consequences				
		Negligible	Minor	Moderate	Major	Severe
Likelihood	Almost Certain	Medium	High	Very High	Very High	Very High
	Likely	Medium	Medium	High	Very High	Very High
	Slight	Low	Medium	High	High	Very High
	Unlikely	Low	Low	Medium	Medium	High
	Rare	Low	Low	Low	Medium	Medium

Risk Priority Table

	Priority	Action
Very High	1	Immediate action required
High	2	Implement short term safety controls immediately
Medium	3	Short term safety controls implemented to minimise risk of injury
Low	4	Monitor activity

3. Hazard Identification and Risk Assessment (Hazards and risks associated with operating and maintaining the machine in accordance with the manufacturers instructions)

	A	B	C	D	E	F	G	H	J
	Hazard Identification				**Risk Control**	**Residual Risk**			
Hazard Type	**Identified**	**Hazard Source**	**Need to access hazard**	**Potential Consequence**	**Current Controls**	**Hierarchy of Control**	**LH**	**Con**	**Risk**	**Action Required**
Acceleration, deceleration										
Approach of a moving element to a fixed part / Crushing / Impact	✓	Closing engine hood against the body	The operator and maintenance person are required to access under the engine hood to conduct daily inspection, troubleshooting and regular maintenance.	Pinching fingers	The hood is designed in such a way that the centre of mass is past the roll over point therefore eliminating risk of falling hood.	**4. Engineering**	**3. Slight**	**1. Negligible**	**4. Low**	
	✓	Lowering seat against body	The operator may place seat in the raised position to protect it from weather damage when not in use. The operator and maintenance personnel may be required to perform maintenance and daily checks of components located under the seat	Pinching fingers	The operation of lowering the seat requires at least one hand to be placed on the top of the seat back removing it from the hazard zone	**4. Engineering**	**3. Slight**	**1. Negligible**	**4. Low**	
	✓	Moving operator controls	The operator is required to manually actuate controls to operate the machine.	Pinching fingers	The design and layout of the operator controls eliminates the risk of pinching by providing large gaps between moving controls.	**1. Elimination**	**1. Rare**	**1. Negligible**	**4. Low**	
	✓	Lowering mower deck towards the ground	The operator is required to adjust cutting height and anti-scalp rollers.	Crushing feet	The operator's manual provides safe working instructions for operating the machine.	**5. Administration**	**2. Unlikely**	**2. Minor**	**4. Low**	
	✓	The discharge chute moves towards the mower deck	The operator or maintenance person is required to install or replace damaged components	Pinching fingers	The spring tension is not sufficeint to sever or crush fingers/limbs	**4. Engineering**	**2. Unlikely**	**2. Minor**	**4. Low**	
Elastic elements	✓	Spring loaded Idler pulley	The maintenance person is required to remove and replace the drive belt as required	Pinching fingers	The spring load on the idler pulley can be safely released by disengaging the belt drive lever. The spring load on the idler pulley can be safely released by using tools to adjust the load on the spring.	**5. Administration**	**2. Unlikely**	**2. Minor**	**4. Low**	
	✓	Spring loaded discharge chute	The operator or maintenance person is required to assemble the spring loaded discharge chute.	Pinching fingers	The spring tension is not sufficeint to sever or crush fingers/limbs	**5. Administration**	**2. Unlikely**	**2. Minor**	**4. Low**	

	A	B	C	D	E	F	G	H	J
Hazard Identification				**Risk Control**		**Residual Risk**			
Hazard Type	**Identified**	**Hazard Source**	**Need to access hazard**	**Potential Consequence**	**Current Controls**	**Hierarchy of Control**	**LH**	**Con**	**Risk**	**Action Required**
Falling objects / Potential energy	✓	Falling operator seat	The operator may place the seat in the raised position to protect it from weather damage when not in use. The operator and maintenance person are required to conduct daily inspections and regular maintenance on items under the seat.	Pinching fingers Crushing	The seat is supported in the raised position by a locking mechanisim The machine is fitted with a seat support which holds the seat in the open position.	**4. Engineering**	**2. Unlikely**	**3. Moderate**	**3. Medium**	The manager of the machine must ensure that: - the operator and maintenance person are trained and follow safe working procedures. The operator and maintenance person must ensure that: - the seat support is correctly installed before conducting maintenance.
	✓	Falling Engine Hood	The operator or maintenance person is required to access under the engine hood for daily inspection, maintenance and troubleshooting as required	Pinching fingers Crushing limbs Striking head	The engine hood is supported in the open position by placing the center of mass past the pivot point. Operator's manual warns not to open the hood while engine is running.	**4. Engineering**	**2. Unlikely**	**2. Minor**	**4. Low**	
	✓	Falling ROPS	The operator is required to raise and lower the ROPS as required depending of the operating environment.	Pinching Fingers Striking Head	The operator's manual provides safe working procedure when raising and lowering the ROPS.	**5. Administration**	**2. Unlikely**	**2. Minor**	**4. Low**	
High pressure	✓	High pressure hydraulic oil	The operator and maintenance person may be required to locate oil leaks. The operator is required to connect and disconnect implement hoses to the hydraulic quick connectors.	Oil injection, Skin / eye irritation	The hydraulic hoses are ISO rated ensuring quality material and operating performance. The operators manual provides safe working procedures for inspecting and locating oil leaks, depressurising the hydraulic system and connecting/disconnecting hydraulic hoses. The operator's manual provides instructions for the maintenance person to regularly inspect and replace damaged hydraulic hoses.	**5. Administration**	**2. Unlikely**	**4. Major**	**3. Medium**	The manager of the machine must ensure that: - the operator and maintenance person are trained and follow safe working procedures. - the machine is maintained in accordance with the manufacturer's maintenance schedule - the hydraulic hoses and associated components are replaced when damaged. The operator and maintenance person must ensure that: - they follow the manufacturer's safe working procedure for identifying oil leaks as listed in the operator's manual.

	A	B	C	D	E	F	G	H	J
	Hazard Identification			Risk Control		Residual Risk			
Hazard Type	Identified	Hazard Source	Need to access hazard	Potential Consequence	Current Controls	Hierarchy of Control	LH	Con	Risk	Action Required
Instability	✓	Instability of machine when operating on steep and undulating terrain	The operator may be required to operate the machine on sloping and undulating terrain.	Roll-over Crushing Serious injury Death	The machine is fitted with a folding roll-over protection structure (ROPS) compliant with OSHA 1928.52 providing the operator with a safe zone of clearance in the event of a roll-over. The machine is fitted with a seatbelt to restrain the operator and keep them in the safe zone of clearance. The operator's manual provides safe operating procedures and warnings not to operate the machine in areas where it may tip or slip, including rough and wet terrain.	5. Administration	1. Rare	5. Severe	3. Medium	The manager of the machine must ensure that: - the operator is trained and follows safe working procedures. - the training includes conducting a risk assessment of the area and identifying hazards, ditches, steep and wet surfaces. The operator must ensure that: - they conduct a site specific risk assessment before operating the machine on steep or undulating terrain. - they wear the seatbelt whenever the ROPS is fixed in the up position. - the ROPS is only folded into the down positing when operating under low clearance objects
Kinetic energy	✓	Material discharge from mower chute	The machine may be required to operate around buildings/objects (rebounding discharge), or around bystanders or members of the public.	Impact Eye injury Cuts Serious injuries Concussion	The mower discharge chute is designed, manufactured and tested to comply with ANSI B71.1 (Consumer) or B71.4 (Commercial) ensuring that it safely deflects discharged material.	4. Engineering	2. Unlikely	4. Major	3. Medium	The manager of the machine must ensure that: - the operator is trained and follows safe working procedures. - the training includes conducting a site specific risk assessment which identifies structures that can rebound discharge as well as bystanders and members of the public. The operator must ensure that: - the discharge chute is not remove or restrain in the open position during operation.
Machinery mobility	✓	Machine mobility	The machine may be required to operate around building, stationary objects and bystanders.	Collision	The machine is fitted with a service brake allowing the operator to control the machine and stop it in an emergency. The operator has a 360 degree unobstructed view from the driving position reducing the likelihood of unexpected collisions.	4. Engineering	2. Unlikely	3. Moderate	3. Medium	The manager of the machine must ensure that: - the operator is trained and follows safe working procedures. - the training includes conducting a risk assessment of the area and identifying hazards, objects and people that may cause a collision.
Mechanical Strength										
	✓	Rotating drive shaft	None	Entanglement	The engine drive shaft is isolated by location. Safety decals and the operator's manual instructs the operator to shut down the engine before leaving the seat.	3. Isolation	1. Rare	4. Major	3. Medium	The manager of the machine must ensure that: - the operator and maintenance person are trained and follows safe working procedures. - the training includes ensuring no one conducts maintenance while the engine is running.