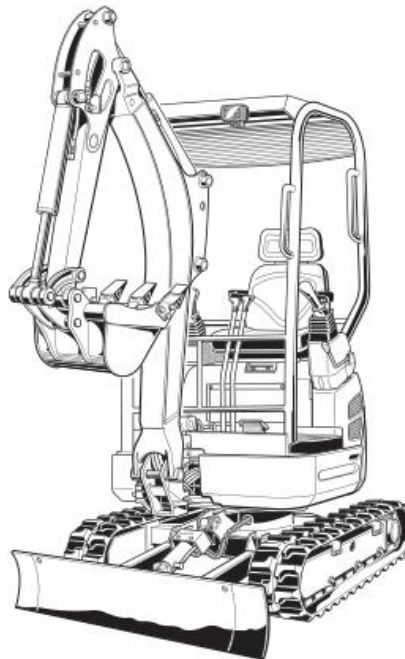


HAZARD IDENTIFICATION and RISK ASSESSMENT

U17-3





Assessment Date	10/05/2019
Revision	2
Assessment Location	KAU Truganina
Assessment Team	Travis Smith
Model Assessed	U17-3HG
Serial Number	

	Sample	Production
Type of Unit		✓

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

Kubota Australia have performed this risk assessment on a standard unit for flat ground application. A thorough risk assessment, specific to their application, must be carried out by the end user before the operation of this machine. All operating processes and environments must be carefully considered.

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 controlled.

PREPARED BY: Travis Smith Technical Engineer 	RELEASED BY: Benjamin Binns Engineering Manager 
Date: 10/05/2019	Date: 10/05/2019

1. Machine Specifications

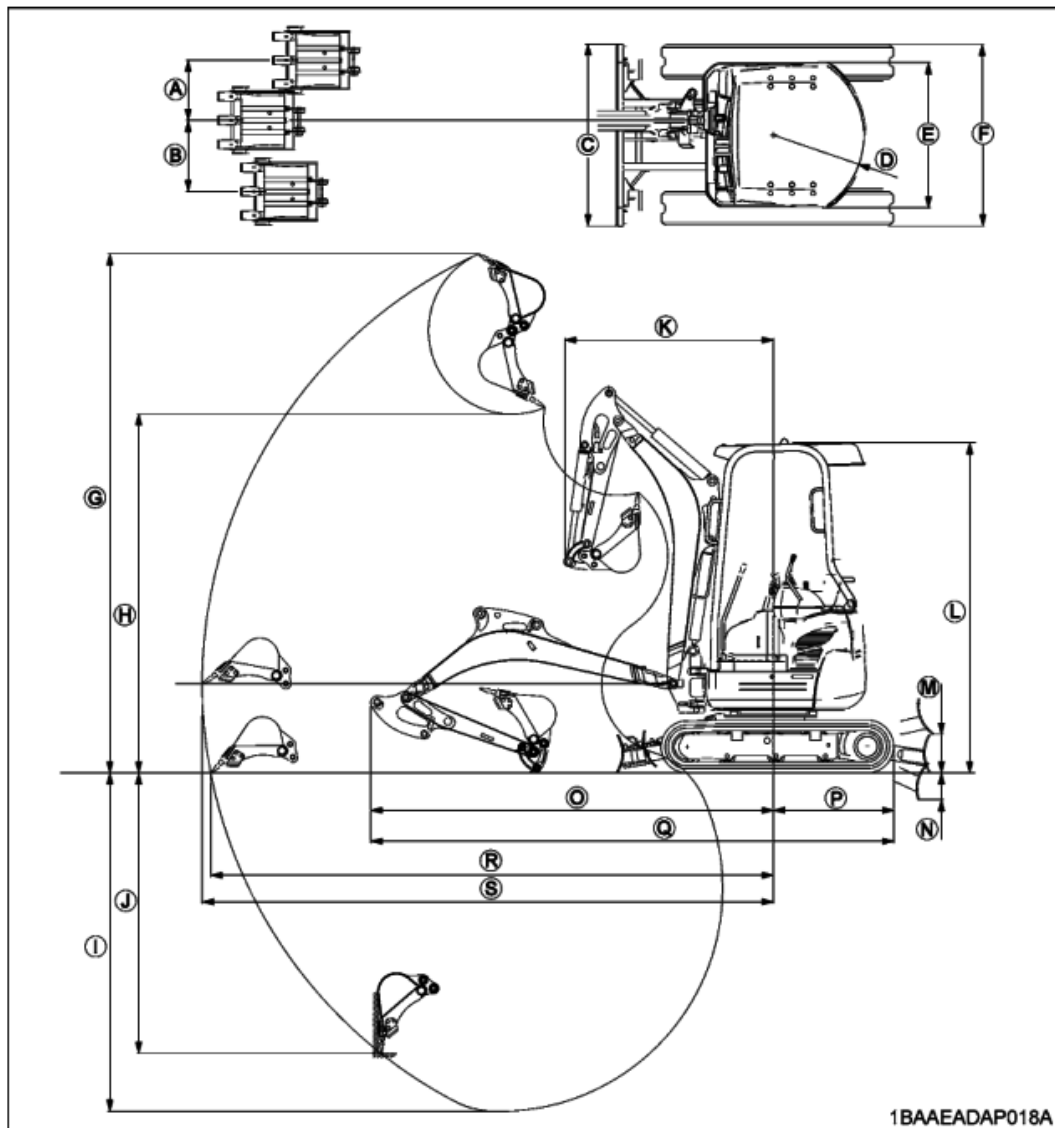
Noise level testing - Tested by KTA to AS2012

	Noise Level dBA	Reference Standard
Average at operators ear	79	<85 dBA eq 8 hr
Average at 7m	70	<85 dBA eq 8 hr

			KUBOTA EXCAVATOR
Model name			U17-3
Type			Canopy
Operating weight (including operator's)		lbs.(kg)	3704 (1680)
Engine	Type	Water cooled 4 cycle diesel engine with 3 cylinder	
	Model name	KUBOTA D902	
	Total displacement cc (cu.in)	898 (54.8)	
	Engine power SAE gross	kW(HP)	12.7 (17.0)
	Rated speed	rpm	2300
Performance	Unit swing speed		rpm 9.1
	Travel speed	Fast mph (km/h)	1.4 (2.1)
		Slow mph (km/h)	2.6 (4.1)
	Ground pressure (With operator)	psi (kPa) [kgf/cm ²]	3.7 26 [0.26]
	Climbing angle	%(deg)	58 (30)
Dozer	Width X Height	in.(mm)	39.0/48.8 X 10.2 (990/1240 X 260)
Boom swing angle	Left	deg (rad)	65 (1.13)
	Right	deg (rad)	58 (1.01)
Pressure connection for attachments	Max. displacement (Theoretical)	US gal (L)/min	7.13 (27)
	Max. pressure	psi (MPa) [kgf/cm ²]	2702 (18.6) [190]
Fuel tank capacity		US gal (L)	5.0 (19)

NOTE:

- Above dimensions are based on the machine with rubber trucks and JPN bucket.
JPN = made in Japan
- Specifications subject to change without notice.
 - * With unloaded digging bucket.
 - * Firm compacted soil.
 - * Operators must exercise extra caution and follow instructions in the operator's manual.
 - * Worse condition or heavier attachment to the above will decrease climbing angle.



1BAAEADAP018A

in. (mm)

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
20.08 (510)	15.2 (385)	39/ 48.8 (990/ 1240)	24.4 (620)	39.0 (990)	39/ 48.8 (990/ 1240)	139.0 (3540)	96.1 (2440)	90.9 (2310)	75.2 (1910)	56.7 (1440)	92.1 (2340)	11.0 (280)	7.5 (190)	108.3 (2750)	31.3 (795)	139.6 (3545)	151.2 (3840)	153.5 (3900)

2. Risk Assessment Tables

Likelihood Table

	Category	Description
		Cannot imagine that this could occur (over 5 years)
		Incident is possible, but unlikely to occur (2 years - 5 years)
		Incident is possible to occur (1 year - 2 years)
		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
		Effects unlikely to last until the next day.
		Likely to affect employee the next day.
		Injury needs formal medical treatment.
		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		Immediate action required
High		Implement short term safety controls immediately
Medium		Short term safety controls implemented to minimise risk of injury
Low	4	Monitor activity

A	B		C	D	E	F	G	H	J
Hazard Identification				Risk Control		Residual Risk			Action Required
Hazard Source	Need to access hazard	Potential Consequence	Current Controls	Hierarchy of Control	LH	Con	Risk		
1	Attachment component disintegrating under operation.	Operator required to be seated on the machine to operate. Machine may be required to operate in public areas around bystanders.	Stabbing or puncture.	Operator's manual provides SOP and defines the exclusion zone around the hazard area. Unit has provision for rock guard to be fitted to the front if required.	5. Administration	2. Unlikely	2. Minor	4. Low	
2	Bind spots at rear and side of the unit.	Machine may be required to operate in public areas around bystanders or around obstacles and structures.	Impact or crushing.	The operator's manual provides SOP. An audible travel alarm and horn warn bystanders of the machines movement. Unit has an open canopy with minimal vision obstructions, including behind the operator. Unit is fitted with reflective sticker for greater visibility at rear. Unit is fitted with warning decals against standing too close to the back of the machine whilst operating.	3. Engineering	2. Unlikely	3. Moderate	3. Medium	The manager of the machine is responsible to be fit a rotating beacon, if required by local regulation / work site requirements.
3	Burns or abrasion by moving parts.	Operator.	Burns.	Operator zone free of moving parts.	3. Engineering	2. Unlikely	2. Minor	4. Low	
4	Changing of attachments.	Operator and maintenance personnel required to connect and remove attachments.	Pinching fingers / crushing hands.	The operators manual provides SOP.	5. Administration	1. Rare	3. Moderate	4. Low	
5	Constrained body posture	Operator	Bone and muscle injuries	Operators manual provides SOP. Ergonomic suspension seat and arm rests fitted.	3. Engineering	2. Unlikely	2. Minor	4. Low	
6	Contact with hot surfaces.	Operator and maintenance personnel required to conduct daily inspection, maintenance and troubleshooting.	Burns.	The operator's manual provides SOP. Hot surfaces are isolated by lockable hood. Protective guards and safety decals warn the operator and maintenance person of the hot surfaces.	3. Engineering	2. Unlikely	2. Minor	4. Low	
7	Engine exhaust.	Operator, maintenance personnel.	Exposure to toxic gas/ asphyxiation/death.	Exhaust system points away from operator platform. Operator's manual instructs operator not to operate the machine in enclosed spaces and warns of asphyxiation.	3. Engineering	2. Unlikely	2. Minor	4. Low	
8	Excessive noise.	Operator required to be seated on the machine to operate.	Hearing damage.	Noise levels at an acceptable level.	3. Engineering	1. Rare	1. Negligible	4. Low	
9	Extremely hot radiator fluid.	Operator or maintenance personnel required to conduct daily inspection, maintenance and troubleshooting.	Burns or Scalding.	The operator's manual provides SOP, The radiator is isolated by a lockable hood. A safety decal above the radiator cap warns the operator and maintenance person of the hot surface.	3. Engineering	2. Unlikely	2. Minor	4. Low	
10	Falling objects.	Operator required to be seated on the machine to operate.	Objects striking operator.	Certified ROPS, TOPS and OPG structure protects operator when seated in the driving position.	3. Engineering	2. Unlikely	1. Negligible	4. Low	
	Hazard Identification			Risk Control		Residual Risk			

	Hazard Source	Need to access hazard	Potential Consequence	Current Controls	Hierarchy of Control	LH	Con	Risk	Action Required
11	Fire or explosion caused by ignition of fuel supply.	Operator, maintenance personnel or bystander.	Burns.	Fuel tank sealed with lock, fill point away from hot surfaces and safety decal warns of flammable substance. Safety decal instructs maintenance personnel not to disassemble fuel filter before letting the engine and exhaust cool.	3. Engineering	2. Unlikely	3. Moderate	3. Medium	The manager of the machine is responsible to fit a spark arrestor (complying to AS1019) if local regulation specifies. The manager of the machine is responsible to fit a fire extinguisher (complying to AS1841) if required by local regulation / worksite requirements.
12	High pressure hydraulic oil.	Operator and maintenance personnel required to complete daily inspections, maintenance and removal of components.	Oil injection.	Hoses are manufactured to ISO standard and wrapped in spiral wrap reducing the likelihood of premature wear. Operator's manual provides SOP for identifying oil leaks.	3. Engineering	1. Rare	3. Moderate	4. Low	
13	Hydraulic accumulator.	Operator and maintenance personnel required to conduct daily inspections and maintenance including removal of components.	Oil injection.	The operator's manual provides SOP for depressurizing the hydraulic system. The accumulator is isolated by a lockable service hood during normal operation.	3. Engineering	1. Rare	3. Moderate	4. Low	
14	Instability from overloading.	Operator required to be seated on the machine to operate. Machine may be required to operate in public area with bystanders.	Crushing/impact/death.	Operator is protected by a safe zone of clearance by a certified ROPS/OPG. An SAE J 386 certified seatbelt ensures the operator remains in the safe zone of clearance in the event of a roll over. The operator's manual provides SOP. A lifting chart decal near operator and operators manual notifies the operator of the lifting capacity of the machine. Safety decals warn bystanders not to enter the exclusion zone during operation.	3. Engineering	2. Unlikely	2. Minor	4. Low	
15	Instability on slopes.	Operator required to be seated on the machine to operate.	Crushing/impact/death.	Operator is protected by a safe zone of clearance by a certified ROPS/OPG. An SAE J 386 certified seatbelt ensures the operator remains in the safe zone of clearance in the event of a roll over. The operator manual provides SOP for working on slopes.	3. Engineering	2. Unlikely	2. Minor	4. Low	
16	Left/right swing operation of the main boom moves towards the operator platform	None.	Crush between boom and body.	Hydraulic lock lever unloads control pressure and applies parking brake reducing the likelihood of operation of the machine without the operator in the driving position. The operator's manual instructs the operator not to touch the hydraulic controls while standing outside the operating platform. Safety decal warns personnel of the hazard.	3. Engineering	1. Rare	3. Moderate	4. Low	
17	Loading/unloading machine from truck or trailer.	Operator required to be seated on the machine to operate.	Crushing/fall from trailer.	Operator is protected by a safe zone of clearance by a certified ROPS/OPG. An SAE J 386 certified seatbelt ensures the operator remains in the safe zone of clearance in the event of a roll over. Operator's manual provides SOP for loading and unloading the machine.	3. Engineering	2. Unlikely	2. Minor	4. Low	
	Hazard Identification			Risk Control		Residual Risk			
	Hazard Source	Need to access hazard	Potential Consequence	Current Controls	Hierarchy of Control	LH	Con	Risk	Action Required

18	Machine mobility.	Machine may be required to operate in public area with bystanders.	Collision.	The machine is fitted with a travel alarm and horn to warn bystanders of the machines movement.	3. Engineering	1. Rare	3. Moderate	4. Low	
24	Machine runaway starting machine by short circuiting starter motor.	None.	Crushing or impact, electric shock.	SOP, safety decal instructs the operator and maintenance person not to short circuit the starter motor. The starter motor is isolated by a lockable access hood.	4. Isolation	1. Rare	3. Moderate	4. Low	
25	Mounting/dismounting.	Operator required to access / egress driving position.	Slip, trip or fall.	Non-slip surface (rubber mat) reduces the likelihood of slipping. Hand rail provide the operator three points of contact reducing the likelihood of falling. Safety decal warns the operator of the risk of falling.	3. Engineering	3. Slight	1. Negligible	4. Low	
26	Overhead/underground power lines.	Operator required to be seated on the machine to operate.	Electrocution/death.	The operator's manual provides SOP. Safety decal warns the operator of the risk of electrocution from contacting overhead electrical conductors.	5. Administration	1. Rare	2. Minor	4. Low	Dial before you dig decal is to be added to the unit before delivery to customer.
27	Rear engine access hood closes against the body of the machine.	Operator and maintenance personnel need to access under hood to conduct daily checks and maintenance.	Pinch finger or hand.	Locking lever to prevent unintentional closing of hood. Vertical pivot axis requires operator and maintenance person.	3. Engineering	2. Unlikely	2. Minor	4. Low	
28	Restoring fluid levels.	Operator and maintenance personnel required to conduct daily inspections and replenish fluid as required.	Skin/eye irritation.	The operator's manual provides SOP. Machine has easy to access fill points.	3. Engineering	2. Unlikely	2. Minor	4. Low	
29	Rotating engine belt and fan.	Operator and maintenance personnel access for service and maintenance.	Crush/severe hand.	Rotating components are isolated by a lockable hood during normal operation. Caution decal warns the operator and maintenance person of risk of entanglement when hood is open.	3. Engineering	1. Rare	3. Moderate	4. Low	
30	Side hydraulic access hood closes against the body of the machine.	Operator and maintenance personnel need to access under hood to conduct daily inspection and maintenance.	Pinch finger or hand.	Gas Strut supports weight of the hood reducing the likelihood and consequence of pinching.	3. Engineering	2. Unlikely	2. Minor	4. Low	
Hazard Identification				Risk Control		Residual Risk			
	Hazard Source	Need to access hazard	Potential Consequence	Current Controls	Hierarchy of Control	LH	Con	Risk	Action Required

31	Unintentional or sudden machine movement.	Operator and maintenance personnel required to conduct daily inspections and maintenance.	Crushing/impact.	The operator's manual provides SOP before beginning any operation, daily checks or maintenance. Safety decal clearly describes functions of controls. Unit is fitted with an emergency stop button. Hydraulic locking mechanism isolates hydraulic and applies parking brake.	3. Engineering	2. Unlikely	2. Minor	4. Low	
----	---	---	------------------	---	----------------	-------------	----------	--------	--