KAPRA Risk Assessment Report

Printed: Friday, 7 August 2009

IMPORTANT NOTE:
Komatsu Australia Pty Ltd ("Komatsu") has been requested by the customer to supply this risk assessment report in relation to the specified equipment ("the report"). The report supplements the information provided by Komatsu in the Operation and Maintenance manual ("the manual") and the report should be read in conjunction with the manual. The report does not purport to set out all possible risks which might be relevant to the customer's use or operation of the equipment in the report. The report is provided on a confidential basis for the internal use of the customer only and it is not to be used for any other purpose. The report does not form part of any contract between Komatsu and the customer and it is not to be relied upon by any other party for any purpose. The customer accepts sole responsibility for the use of the report. The customer acknowledges that it must carry out its own risk assessment in relation to the equipment in the report.

Serial No:	20001 and up	Machine:	PC138US	Model:	8
Date:	12/05/2009	Location:	Fairfield	Assessment Team:	Erwin Surjadi, Steve Bowling
Conditions:	KGA Attachments, Beacon				

NOTE: Please refer to KAPRA Classification Guide for item definitions and classifications.

Risk Scoring Method

The likelihood and consequences for each potential hazards are assessed to calculate the risk level using the table shown below.

Likelihood "L" Codes

Code	Descriptor	Description
A	Almost certain	Common or repeating occurrence.
B	Likely	Known to occur or has happened.
C	Possible	Could occur and is likely.
D	Unlikely	Could occur but not likely.
E	Rare	May occur only in exceptional circumstances.

Consequences "C" Codes

Code	Descriptor	Description
1	Insignificant	No medical treatment required.
2	Minor	First aid treatment.
3	Moderate	Medical treatment required.
4	Major	Extensive injuries.
5	Catastrophic	Death or permanent disability.

Risk Level Matrix

Likelihood	Consequence				
	1	2	3	4	5
A	High	High	Serious	Serious	Serious
B	Moderate	High	High	Serious	Serious
C	Low	Moderate	High	Serious	Serious
D	Low	Low	Moderate	High	Serious
E	Low	Low	Moderate	High	High

02 - Access Systems

A - General

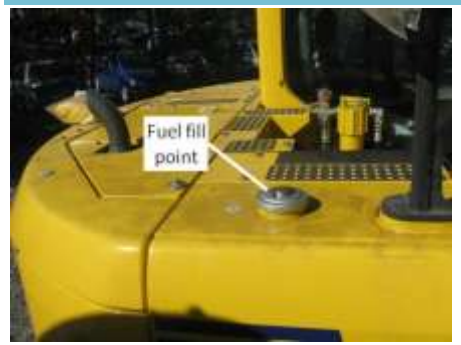
KAPRA ID 02.01.01 **Source of Risk** **Access to work areas above ground level**

Details Top platform of machine has no guardrailing and is a work area for refuelling, topping up hydraulic oil, fuel/coolant filter replacement, checking levels of engine and swing gear box oils,maintaining beacon lighting and cleaning rear cabin window. Tracks are a work area for cleaning front and side cabin windows.

Controls Advise operator and maintenance staff of the potential for slips, trips and falls when performing maintenance activities (eg. Refuelling, topping up hydraulic oil, fuel/coolant filter replacement, checking levels of engine and swing gear box oils, maintaining beacon lighting and cleaning cabin windows) on the top platform of the machine and on the tracks. Demonstrate safe access to all maintenance areas on the top platform of the machine and on the tracks.

	Initial Risk Assessment			Residual Risk Assessment		
Hazard	**L**	**C**	**Risk Rating**	**L**	**C**	**Risk Rating**
Slips, trips and falls	D	3	Moderate	E	3	Moderate

KAPRA ID 02.01.02 **Source of Risk** **Obstructions / projections**



Details Fuel fill point partially obstruct walkways on the top platform of the machine.

Controls Advise operator and maintenance staff of the potential for slips, trips and falls due to partial obstruction of walkways on the top platform of the machine by fuel fill point. Demonstrate safe access to all maintenance areas on the top platform of the machine.

	Initial Risk Assessment			Residual Risk Assessment		
Hazard	**L**	**C**	**Risk Rating**	**L**	**C**	**Risk Rating**
Slips, trips and falls	D	2	Low	E	2	Low

KAPRA ID 02.01.03 **Source of Risk** **Points of contact**

Details Potential difficulties in maintaining three points of contact when using right hand side (i.e. maintenance) access systems.

Controls Advise operator and maintenance staff of the potential slips, trips and falls and ergonomics hazards due to potential difficulties in maintaining three points of contact when using the maintenance access system. Demonstrate safe use of the maintenance access system.

	Initial Risk Assessment			Residual Risk Assessment		
Hazard	**L**	**C**	**Risk Rating**	**L**	**C**	**Risk Rating**
Slips, trips and falls	D	2	Low	E	2	Low
Ergonomic	E	3	Moderate	E	3	Moderate

KAPRA ID 02.01.04 **Source of Risk** **Lighting**

Details Night operations.

Controls Advise operator and maintenance staff of the potential slips, trips and falls and ergonomics hazard when accessing the machine at night. Advise operator and maintenance staff that additional sources of lighting are required during night operations.

	Initial Risk Assessment			Residual Risk Assessment		
Hazard	**L**	**C**	**Risk Rating**	**L**	**C**	**Risk Rating**
Slips, trips and falls	C	3	High	D	3	Moderate
Ergonomic	D	3	Moderate	E	3	Moderate

KAPRA ID 02.01.05 **Source of Risk** **Carriage of small objects while using access systems**

Details None.

Controls Advise operator and maintenance staff of the potential for slips, trips and falls when carrying small objects (tools, lunchboxes, etc) whilst accessing the machine. Highlight that the Operation and Maintenance manual (refer to page 2-15) specifies not to get on or off the machine whilst holding tools. Advise operator and maintenance staff to always maintain three points of contact wherever possible and to place lunchboxes, tools, etc in a backpack or toolbag when accessing the machine.

	Initial Risk Assessment			Residual Risk Assessment		
Hazard	**L**	**C**	**Risk Rating**	**L**	**C**	**Risk Rating**
Slips, trips and falls	D	2	Low	E	2	Low

KAPRA ID 02.01.06 **Source of Risk** **Sloping platform**

Details Tracks have a maximum 7.8 degree slope.

Controls Advise operator and maintenance staff of the potential ergonomics hazard when accessing the machine due to the slope of the tracks. Demonstrate safe use of access systems.

	Initial Risk Assessment			Residual Risk Assessment		
Hazard	**L**	**C**	**Risk Rating**	**L**	**C**	**Risk Rating**
Ergonomic	E	3	Moderate	E	3	Moderate

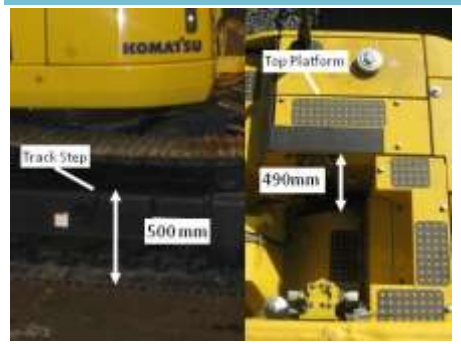
KAPRA ID 02.01.07 **Source of Risk** **Distance between adjacent platforms of 300-450mm (without intermediate step)**

Details Vertical distance between track steps and tracks is 340 mm.
Vertical distance between track and step 1 on right hand side (i.e. maintenance) access system is 350 mm.
Vertical distance between step 1 and step 2 on right hand side (i.e. maintenance) access system is 325 mm.
Vertical distance between track and cabin floor is 430mm.

Controls Advise operator and maintenance staff of the potential slips, trips and falls and ergonomics hazards due to access system step spacings (refer to details). Demonstrate safe use of access systems.

	Initial Risk Assessment			Residual Risk Assessment		
Hazard	**L**	**C**	**Risk Rating**	**L**	**C**	**Risk Rating**
Slips, trips and falls	D	2	Low	E	2	Low
Ergonomic	E	3	Moderate	E	3	Moderate

KAPRA ID 02.01.08 **Source of Risk** **Distance between adjacent platforms of more than 450mm (without ladder or stairway)**



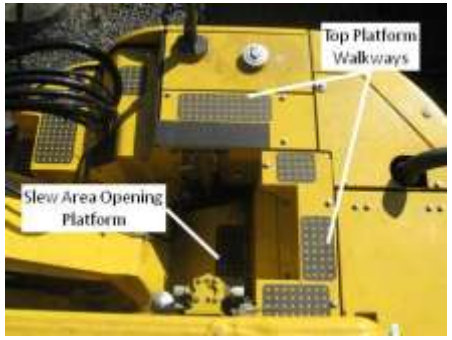
Details Vertical distance between ground and track step is 500 mm.
Vertical distance between slew area opening platform and top platform is 490 mm.

Controls Advise operator and maintenance staff of the potential slips, trips and falls and ergonomic hazards due to access system step spacings (refer to details). Demonstrate safe use of access systems.

	Initial Risk Assessment			Residual Risk Assessment		
Hazard	**L**	**C**	**Risk Rating**	**L**	**C**	**Risk Rating**
Slips, trips and falls	D	2	Low	E	2	Low
Ergonomic	E	3	Moderate	E	3	Moderate

B - Platform

KAPRA ID 02.02.01 **Source of Risk** **Walkway / platform / landing width**



Details Walkway widths on top platform of machine are 150 - 415mm.
Track step widths are 320mm.
Step 1 width on right hand side (i.e. maintenance) access system is 240mm.
Step 2 width on right hand side (i.e. maintenance) access system is 285mm.
Step 3 width on right hand side (i.e. maintenance) access system is 420mm.
Step 4 width on right hand side (i.e. maintenance) access system is 365mm.
Slew area opening platform on the top platform access system is 400mm.
Internal cabin access width / clearance is 510mm.

Controls Advise operator and maintenance staff of the potential slips, trips and falls and ergonomics hazards due to walkways / platform / landing widths (refer to details).
Demonstrate safe use of access systems.

	Initial Risk Assessment			Residual Risk Assessment		
Hazard	**L**	**C**	**Risk Rating**	**L**	**C**	**Risk Rating**
Slips, trips and falls	D	2	Low	E	2	Low
Ergonomic	E	3	Moderate	E	3	Moderate

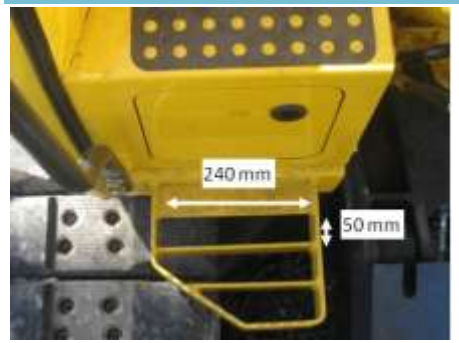
KAPRA ID 02.02.02 **Source of Risk** **Vertical clearance above floors**

Details Interior cabin height is 1550mm.

Controls Advise operator and maintenance staff of the potential ergonomics hazard due to interior cabin height. Demonstrate safe use of cabin access sysetm.

	Initial Risk Assessment			Residual Risk Assessment		
Hazard	**L**	**C**	**Risk Rating**	**L**	**C**	**Risk Rating**
Ergonomic	E	3	Moderate	E	3	Moderate

KAPRA ID 02.02.08 **Source of Risk** **Dimensions of grated floors.**



Details Dimensions of openings in Step 1 floor on right hand side (i.e. maintenance) access system are 240 mm x 50 mm.

Controls Advise operator and maintenance staff of the potential for slips, trips and falls due to small openings in step 1 floor on maintenance access system. Demonstrate safe use of maintenance access system.

	Initial Risk Assessment			Residual Risk Assessment		
Hazard	**L**	**C**	**Risk Rating**	**L**	**C**	**Risk Rating**
Slips, trips and falls	D	2	Low	E	2	Low

C - Handrails

KAPRA ID 02.03.01 **Source of Risk** **Continuity and composition of handrails**

Details Mirror mounts and mirrors protrude from handrails on cabin access system and mirror mounts from handrails on right hand side (i.e. maintenance) access system.

Controls Advise operator and maintenance staff of the potential slips, trips and falls, ergonomics and cut, stab and puncture hazards when using access systems due to placement of mirrors on handrails. Demonstrate safe use of access systems.

	Initial Risk Assessment			Residual Risk Assessment		
Hazard	**L**	**C**	**Risk Rating**	**L**	**C**	**Risk Rating**
Slips, trips and falls	D	2	Low	E	2	Low
Ergonomic	E	3	Moderate	E	3	Moderate
Cut, stab and puncture	D	2	Low	E	2	Low

KAPRA ID 02.03.02 **Source of Risk** **Handrail clearance**

Details 50mm clearance on cabin access handrail due to mirror mount and mirror.

Controls Advise operator and maintenance staff of the potential ergonomics hazard due to handrail clearance on the cabin access system. Demonstrate safe use of cabin access systems.

	Initial Risk Assessment			Residual Risk Assessment		
Hazard	**L**	**C**	**Risk Rating**	**L**	**C**	**Risk Rating**
Ergonomic	D	2	Low	E	2	Low

KAPRA ID 02.03.08 **Source of Risk** **Sizing of mounting bolts**

Details 10 mm mounting bolts on handrails for cabin entry.

Controls 10mm bolts are standard factory build and suitable for the intended design purpose. Highlight that the Operation and Maintenance manual (refer to page 2-15) specifies to always check the handrails before getting on or off the machine, repair any damage and tighten any loose bolts.

	Initial Risk Assessment			Residual Risk Assessment		
Hazard	**L**	**C**	**Risk Rating**	**L**	**C**	**Risk Rating**
Slips, trips and falls	E	2	Low	E	2	Low
Ergonomic	E	3	Moderate	E	3	Moderate

D - Guardrailings

KAPRA ID 02.04.01 **Source of Risk** **Provision and location of guardrailing**

Details Top platform of machine has no guard railing.

Controls Advise operator and maintenance staff of the potential for slips, trips and falls when performing maintenance activities (eg. Refuelling, topping up hydraulic oil, fuel/coolant filter replacement, checking levels of engine and swing gear box oils) on the top platform of the machine. Demonstrate safe access to all maintenance areas on the top platform of the machine.

	Initial Risk Assessment			Residual Risk Assessment		
Hazard	**L**	**C**	**Risk Rating**	**L**	**C**	**Risk Rating**
Slips, trips and falls	D	3	Moderate	E	3	Moderate

F - Toeboards

KAPRA ID 02.06.01 **Source of Risk** **Objects falling from edges of floors higher than 2m**

Details Top platform of machine is 2050mm above ground.

Controls Advise operator and maintenance staff of the potential striking hazard due to tools, rocks, etc falling from the top platform of the machine. Highlight the need for safe housekeeping procedures.

	Initial Risk Assessment			Residual Risk Assessment		
Hazard	**L**	**C**	**Risk Rating**	**L**	**C**	**Risk Rating**
Striking	C	2	Moderate	D	2	Low

G - Stairways

KAPRA ID 02.07.01 **Source of Risk** **Stairway width**

Details Track width is 500 mm.
Step 1 width on right hand side (i.e. maintenance) access system is 240 mm.
Step 2 width on right hand side (i.e. maintenance) access system is 285 mm.
Step 3 width on right hand side (i.e. maintenance) access system is 420 mm.
Step 4 width on right hand side (i.e. maintenance) access system is 365 mm.
Top platform width on right hand side (i.e. maintenance) access system is 415 mm.

Controls Advise operator and maintenance staff of the potential slips, trips and falls and ergonomics hazards due to stairway widths (refer to details).
Demonstrate safe use of maintenance access systems.

	Initial Risk Assessment			Residual Risk Assessment		
Hazard	**L**	**C**	**Risk Rating**	**L**	**C**	**Risk Rating**
Slips, trips and falls	D	2	Low	E	2	Low
Ergonomic	E	3	Moderate	E	3	Moderate

KAPRA ID 02.07.05 **Source of Risk** **Width of landings on stairways**

Details Top platform landing width on right hand side (i.e. maintenance) access system is 415 mm compared to the maximum stairways width of 500 mm.

Controls Advise operator and maintenance staff of the potential slips, trips and falls and ergonomics hazards due to landing widths (refer to details). Demonstrate safe use of maintenance access systems.

	Initial Risk Assessment			Residual Risk Assessment		
Hazard	**L**	**C**	**Risk Rating**	**L**	**C**	**Risk Rating**
Slips, trips and falls	D	2	Low	E	2	Low
Ergonomic	E	3	Moderate	E	3	Moderate

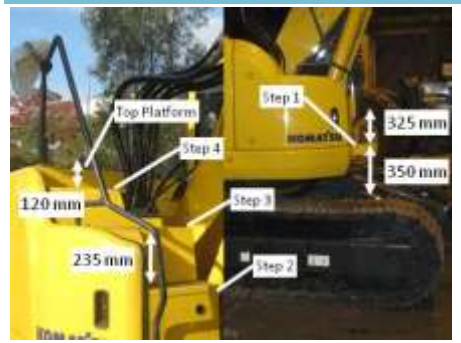
KAPRA ID 02.07.06 **Source of Risk** **Tread extension across stairway**

Details Step 1 tread width on right hand side (i.e. maintenance) access system is 240 mm compared to the maximum stairways width of 500 mm.
Step 2 tread width on right hand side (i.e. maintenance) access system is 285 mm compared to the maximum stairways width of 500 mm.
Step 3 tread width on right hand side (i.e. maintenance) access system is 420 mm compared to the maximum stairways width of 500 mm.
Step 4 tread width on right hand side (i.e. maintenance) access system is 365 mm compared to the maximum stairways width of 500 mm.
Top platform tread width on right hand side (i.e. maintenance) access system is 415 mm compared to the maximum stairways width of 500 mm.

Controls Advise operator and maintenance staff of the potential slips, trips and falls and ergonomics hazards due to tread width (refer to details). Demonstrate safe use of maintenance access systems.

	Initial Risk Assessment			Residual Risk Assessment		
Hazard	**L**	**C**	**Risk Rating**	**L**	**C**	**Risk Rating**
Slips, trips and falls	D	2	Low	E	2	Low
Ergonomic	E	3	Moderate	E	3	Moderate

KAPRA ID 02.07.07 **Source of Risk** **Height of rises**

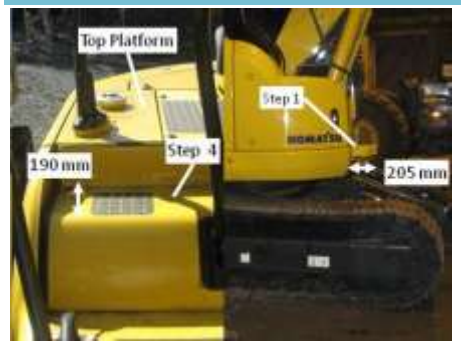


Details Vertical distance between track and step 1 on right hand side (i.e. maintenance) access system is 350 mm.
Vertical distance between step 1 and step 2 on right hand side (i.e. maintenance) access system is 325 mm.
Vertical distance between step 2 and step 3 on right hand side (i.e. maintenance) access system is 235 mm.
Vertical distance between step 4 on right hand side (i.e. maintenance) access system and top platform is 120 mm.

Controls Advise operator and maintenance staff of the potential slips, trips and falls and ergonomics hazards due to step height (refer to details). Demonstrate safe use of maintenance access systems.

	Initial Risk Assessment			Residual Risk Assessment		
Hazard	**L**	**C**	**Risk Rating**	**L**	**C**	**Risk Rating**
Slips, trips and falls	D	2	Low	E	2	Low
Ergonomic	E	3	Moderate	E	3	Moderate

KAPRA ID 02.07.08 **Source of Risk** **Depth of goings**



Details Depth of step 1 on right hand side (i.e. maintenance) access system is 205 mm.
Depth of step 4 on right hand side (i.e. maintenance) access system is 190 mm.

Controls Advise operator and maintenance staff of the potential slips, trips and falls and ergonomics hazards due to step depth (refer to details). Demonstrate safe use of maintenance access systems.

	Initial Risk Assessment			Residual Risk Assessment		
Hazard	**L**	**C**	**Risk Rating**	**L**	**C**	**Risk Rating**
Slips, trips and falls	D	2	Low	E	2	Low
Ergonomic	E	3	Moderate	E	3	Moderate

KAPRA ID 02.07.09 **Source of Risk** **Variations in rise / going dimensions**

Details Rises on right hand side (i.e. maintenance) access system vary between 120 mm to 350 mm.
Goings on right hand side (i.e. maintenance) access system vary between 175 mm to 300 mm.

Controls Advise operator and maintenance staff of the potential slips, trips and falls and ergonomics hazards due variations in step heights and depth (refer to details). Demonstrate safe use of maintenance access systems.

	Initial Risk Assessment			Residual Risk Assessment		
Hazard	**L**	**C**	**Risk Rating**	**L**	**C**	**Risk Rating**
Slips, trips and falls	D	2	Low	E	2	Low
Ergonomic	E	3	Moderate	E	3	Moderate

KAPRA ID 02.07.10 **Source of Risk** **Dimensions of rises / goings**

Details Step 1 dimensions on right hand side (i.e. maintenance) access system is 200 mm by 325 mm.
Step 2 dimensions on right hand side (i.e. maintenance) access system is 175 mm by 235 mm.
Step 3 dimensions on right hand side (i.e. maintenance) access system is 300 mm by 200 mm.
Step 4 dimensions on right hand side (i.e. maintenance) access system is 190 mm by 120 mm.

Controls Advise operator and maintenance staff of the potential slips, trips and falls and ergonomics hazards due to step heights and depths (refer to details). Demonstrate safe use of maintenance access systems.

	Initial Risk Assessment			Residual Risk Assessment		
Hazard	**L**	**C**	**Risk Rating**	**L**	**C**	**Risk Rating**
Slips, trips and falls	D	2	Low	E	2	Low
Ergonomic	E	3	Moderate	E	3	Moderate

KAPRA ID 02.07.11 **Source of Risk** **Tread width in relation to going**

Details No overlap on right hand (i.e. maintenance) access system except between tracks and step 1.

Controls Advise operator and maintenance staff of the potential slips, trips and falls when accessing the right hand (i.e. maintenance) access system (refer to details). Demonstrate safe use of maintenance access systems.

	Initial Risk Assessment			Residual Risk Assessment		
Hazard	**L**	**C**	**Risk Rating**	**L**	**C**	**Risk Rating**
Slips, trips and falls	E	1	Low	E	1	Low

KAPRA ID 02.07.14 **Source of Risk** **Diameter of handrails**

Details The diameter of the handrail on right hand (i.e. maintenance) access system is 32 mm.

Controls Advise operator and maintenance staff of the potential slips, trips and falls and ergonomics hazards due to size of handrails (refer to details). Demonstrate safe use of maintenance access systems.

	Initial Risk Assessment			Residual Risk Assessment		
Hazard	**L**	**C**	**Risk Rating**	**L**	**C**	**Risk Rating**
Slips, trips and falls	D	2	Low	E	2	Low
Ergonomic	E	3	Moderate	E	3	Moderate

KAPRA ID 02.07.15 **Source of Risk** **Slope and height of handrails**

Details Vertical distance between step 1 nosing and the handrail on the right hand side (i.e. maintenance) access system is 600 mm.
Vertical distance between step 2 nosing and the handrail on the right hand side (i.e. maintenance) access system is 260 mm.
Vertical distance between step 3 nosing and the handrail on the right hand side (i.e. maintenance) access system is 250 mm.
Vertical distance between step 4 nosing and the handrail on the right hand side (i.e. maintenance) access system is 680 mm.

Controls Advise operator and maintenance staff of the potential slips, trips and falls and ergonomics hazards due to handrail height (refer to details). Demonstrate safe use of maintenance access systems.

	Initial Risk Assessment			Residual Risk Assessment		
Hazard	**L**	**C**	**Risk Rating**	**L**	**C**	**Risk Rating**
Slips, trips and falls	D	2	Low	E	2	Low
Ergonomic	E	3	Moderate	E	3	Moderate

N - Emergency Use

KAPRA ID 02.14.02 **Source of Risk** **Means of egress from operator's cab**

Details Emergency egress located near engine compartment.

Controls Advise operator and maintenance staff to use normal cabin egress system in the event of a fire around the engine area.

	Initial Risk Assessment			Residual Risk Assessment		
Hazard	**L**	**C**	**Risk Rating**	**L**	**C**	**Risk Rating**
Fire	D	3	Moderate	E	3	Moderate

04 - Work Environment

C - Lightings

KAPRA ID 04.03.01 **Source of Risk** **Lighting about the workplace**

Details Night operations

Controls Advise operator and maintenance staff of the potential for slips, trips and falls, high temperature, cut, stab and puncture, friction and crushing hazards when performing maintenance activities at night. Advise operator and maintenance staff that additional sources of lighting are required during night operations.

	Initial Risk Assessment			Residual Risk Assessment		
Hazard	**L**	**C**	**Risk Rating**	**L**	**C**	**Risk Rating**
Slips, trips and falls	C	3	High	D	3	Moderate
High temperature	B	3	High	C	3	High
Cut, stab and puncture	C	3	High	D	3	Moderate
Friction	B	2	High	C	2	Moderate
Crushing	C	3	High	D	3	Moderate
Ergonomic	D	3	Moderate	E	3	Moderate

05 - Instrumentation and Operator Controls

A - General

KAPRA ID 05.01.14 **Source of Risk** **Labelling of instrumentation and controls**

Details Safety lock lever.

Controls Advise operator and maintenance staff that there are potential crushing and striking hazards associated with misuse of the safety lock lever. Advise operator and maintenance staff that the safety lock lever functions as a hydraulic isolation device and demonstrate this functionality. Refer to page 3-77 of the Operation and Maintenance manual for further information on the safety lock lever.

	Initial Risk Assessment			Residual Risk Assessment		
Hazard	**L**	**C**	**Risk Rating**	**L**	**C**	**Risk Rating**
Crushing	C	4	Serious	D	4	High
Striking	C	4	Serious	D	4	High

C - Communication Systems

KAPRA ID 05.03.01 **Source of Risk** **Communications between persons involved in operation and maintenance**

Details None.

Controls Advise operator and maintenance staff of the variety of potential hazards (crushing, cut, stab and puncture, shearing, striking and electrical) that may result from miscommunications between persons involved in operation or maintenance. Advise operator and maintenance staff to always sound the horn and ensure the area is clear before operating any part of the machine. Recommend the use of tag-out procedures, completion of risk assessment prior to any potentially hazardous activity and the fitment of a two-way radio or carriage of some other reliable communication device e.g. mobile phone.

	Initial Risk Assessment			Residual Risk Assessment		
Hazard	**L**	**C**	**Risk Rating**	**L**	**C**	**Risk Rating**
Crushing	D	4	High	E	4	High
Cut, stab and puncture	D	2	Low	E	2	Low
Shearing	D	4	High	E	4	High
Striking	D	3	Moderate	E	3	Moderate
Electrical	D	5	Serious	E	5	High

KAPRA ID 05.03.02 **Source of Risk** **Emergency communications for emergency situations**

Details None.

Controls Advise operator and maintenance staff of the variety of potential hazards (crushing, fire and explosion) in emergency situations. Advise operator and maintenance staff to always sound the horn and ensure the area is clear before operating any part of the machine. Recommend the use of tag-out procedures, completion of risk assessment prior to any potentially hazardous activity and the fitment of a two-way radio or carriage of some other reliable communication device e.g. mobile phone.

	Initial Risk Assessment			Residual Risk Assessment		
Hazard	**L**	**C**	**Risk Rating**	**L**	**C**	**Risk Rating**
Crushing	D	4	High	E	4	High
Fire	D	4	High	E	4	High
Explosion	D	4	High	E	4	High

06 - Protective Structures

A - General

KAPRA ID 06.01.02 **Source of Risk** **Falling objects and equipment overturning**

Details OPG2 guards is available as an option.

Controls Advise operator and maintenance staff of the potential for crushing and striking due to equipment overturning or falling objects. Advise operator and maintenance staff that the machine is fitted with a safety cab (ROPS certification pending) and that an OPG2 guard to protect against falling objects is available as an option. Advise operator and maintenance staff to only operate machine in accordance with the Operation and Maintenance manual and recommend fitment of optional OPG2 guard where application has a falling object hazard.

	Initial Risk Assessment			Residual Risk Assessment		
Hazard	**L**	**C**	**Risk Rating**	**L**	**C**	**Risk Rating**
Crushing	E	3	Moderate	E	3	Moderate
Striking	E	3	Moderate	E	3	Moderate

07 - Safety Signage

A - General

KAPRA ID 07.01.02 **Source of Risk** **Marking of areas requiring PPE**

Details None.

Controls Advise operator and maintenance staff of the potential slips, trips and falls and striking hazards when operating and maintaining the machine. Advise operator and maintenance staff to refer to the Operation and Maintenance manual and site specific requirements for further information on when PPE is required.

	Initial Risk Assessment			Residual Risk Assessment		
Hazard	**L**	**C**	**Risk Rating**	**L**	**C**	**Risk Rating**
Striking	C	2	Moderate	D	2	Low
Slips, trips and falls	D	3	Moderate	E	3	Moderate

08 - Guardings

A - General

KAPRA ID 08.01.01 **Source of Risk** **Hot parts**

Details Exhaust pipe, radiator header tank and oil cooler may become hot during and following operation.

Controls Advise operator and maintenance staff that the exhaust pipe, radiator header tank and oil cooler may present a high temperature hazard during and following operation. Advise operator and maintenance staff to avoid contact with these areas until the machine has cooled down or utilise gloves whenever contact in this period is necessary. Advise operator and maintenance staff to only operate and maintain machine in accordance with the Operation and Maintenance manual.

	Initial Risk Assessment			Residual Risk Assessment		
Hazard	**L**	**C**	**Risk Rating**	**L**	**C**	**Risk Rating**
High temperature	C	3	High	D	3	Moderate

KAPRA ID 08.01.02 **Source of Risk** **Exposed parts**

Details Exhaust pipe, radiator header tank and oil cooler.

Controls Advise operator and maintenance staff that the exhaust pipe, radiator header tank and oil cooler may present a high temperature hazard during and following operation. Advise operator and maintenance staff to avoid contact with these areas until the machine has cooled down or utilise gloves whenever contact in this period is necessary. Advise operator and maintenance staff to only operate and maintain machine in accordance with the Operation and Maintenance manual.

	Initial Risk Assessment			Residual Risk Assessment		
Hazard	**L**	**C**	**Risk Rating**	**L**	**C**	**Risk Rating**
High temperature	C	3	High	D	3	Moderate

KAPRA ID 08.01.04 **Source of Risk** **Capability to prevent access to the danger zone**

Details Cooling fan & air conditioning belt guarding.

Controls Advise operator and maintenance staff of the potential cut, stab and puncture, friction and crushing hazards when working in the vicinity of the cooling fan, air conditioning compressor belts and air conditioning compressor belt pulley. Advise operator and maintenance staff that the machine should be switched off prior to opening engine top cover, to only perform maintenance on fans, belts, pulleys and other items in the immediate area when the machine controls have been tagged out with a "DO NOT OPERATE" sign and to ensure all maintenance is carried out in accordance with the Operation and Maintenance manual.

	Initial Risk Assessment			Residual Risk Assessment		
Hazard	**L**	**C**	**Risk Rating**	**L**	**C**	**Risk Rating**
Crushing	D	3	Moderate	E	3	Moderate
Friction	C	2	Moderate	D	2	Low
Cut, stab and puncture	D	3	Moderate	E	3	Moderate

KAPRA ID 08.01.06 **Source of Risk** **Chain or belt drives**

Details Air conditioner compressor belt pulley and air conditioner compressor belt.

Controls Advise operator and maintenance staff of the potential crushing hazards when working in the vicinity of the air conditioning compressor belt pulley and air conditioning compressor belt. Advise operator and maintenance staff that the machine should be switched off prior to opening engine top cover, to only perform maintenance on fans, belts, pulleys and other items in the immediate area when the machine controls have been tagged out with a "DO NOT OPERATE" sign and to ensure all maintenance is carried out in accordance with the Operation and Maintenance manual.

	Initial Risk Assessment			Residual Risk Assessment		
Hazard	**L**	**C**	**Risk Rating**	**L**	**C**	**Risk Rating**
Crushing	D	3	Moderate	E	3	Moderate

09 - Isolation Devices

A - General

KAPRA ID 09.01.01 **Source of Risk** **Availability of isolation device for all power supplies**

Details No electrical isolation.

Controls Advise operator and maintenance staff that there is a potential electrical hazard when conducting electrical repairs and when connecting / disconnecting the batteries.

	Initial Risk Assessment			Residual Risk Assessment		
Hazard	**L**	**C**	**Risk Rating**	**L**	**C**	**Risk Rating**
Electrical	E	1	Low	E	1	Low

KAPRA ID 09.01.04 **Source of Risk** **Identification of purpose of isolation device**

Details Safety Lock Lever

Controls Advise operator and maintenance staff that there are potential crushing and striking hazards associated with misuse of the safety lock lever. Advise operator and maintenance staff that the safety lock lever functions as a hydraulic isolation device and demonstrate this functionality. Refer to page 3-77 of the Operation and Maintenance manual for further information on the safety lock lever.

	Initial Risk Assessment			Residual Risk Assessment		
Hazard	**L**	**C**	**Risk Rating**	**L**	**C**	**Risk Rating**
Crushing	C	4	Serious	D	4	High
Striking	C	4	Serious	D	4	High

10 - Energy Dissipation/Restraint

A - General

KAPRA ID 10.01.02 **Source of Risk** **Energy dissipation processes**

Details Release of hydraulic pressure with work equipment raised, checking and topping up coolant levels and adding oil to hydraulic tank.

Controls Advise operator and maintenance staff that there is a potential crushing hazard when releasing remaining pressure in the hydraulic cylinder circuit whilst work equipment is raised above ground. Advise operator and maintenance staff to ensure work area is clear prior to conducting this activity and to exercise fine lever control to ensure that work equipment is lowered to the ground at a controlled state. Advise operator and maintenance staff that there is a potential high temperature hazard when checking and topping coolant levels and adding oil to the hydraulic tank. Advise operator and maintenance staff to never top up coolant levels via the radiator or add oil to the hydraulic tank until the machine has cooled down and to turn filler caps slowly to release internal pressure prior to removal. Advise operator and maintenance staff to check and top up coolant levels via the radiator subtank wherever possible.

	Initial Risk Assessment			Residual Risk Assessment		
Hazard	**L**	**C**	**Risk Rating**	**L**	**C**	**Risk Rating**
Crushing	D	4	High	E	4	High
High temperature	C	3	High	D	3	Moderate