



# KAPRA Risk Assessment Report

**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: 1001 &amp; up

Machine: HB 205

Model: 1

Date: 7/07/2011

Location: Fairfield

Assessment Team: Amber Mahoney, Steve Bowling, Steve Williams

Conditions:

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

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

**Details** Top platform of machine has no guard railing 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.

Hazard	Initial Risk Assessment			Residual Risk Assessment		
	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** Pre-cleaner, fuel fill point and top of hydraulic tank 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 pre-cleaner, fuel fill point and top of the hydraulic tank. Demonstrate safe access to all maintenance areas on the top platform of the machine.

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



**02 - Access Systems**

**A - General**

**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.

Hazard	Initial Risk Assessment			Residual Risk Assessment		
	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



**02 - Access Systems**

**A - General**

**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.

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

**02 - Access Systems**

**A - General**

**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 2-21) 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 tool bag when accessing the machine.

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

**02 - Access Systems**

**A - General**

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

**Details**      Tracks have a maximum 7.6 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.

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

**02 - Access Systems**

**A - General**

**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 400 mm.  
 Vertical distance between track and step 1 on right hand side (i.e. maintenance) access system is 450 mm.  
 Vertical distance between step 1 and step 2 on right hand side (i.e. maintenance) access system is 400mm.  
 Vertical distance between step 2 on right hand side (i.e. maintenance) access system and top platform is 400mm.

**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.

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



**02 - Access Systems**

**A - General**

**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 510 mm.  
Vertical distance between track and cabin floor is 520mm.

**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.

Hazard	Initial Risk Assessment			Residual Risk Assessment		
	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



**02 - Access Systems**

**B - Platform**

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

**Details** Walkway widths on top platform of machine are 390 - 470mm.  
Track step widths are 320mm.  
Step 1 width on right hand side (i.e. maintenance) access system is 600mm.  
Internal cabin access width / clearance is 350 - 480mm.

**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.

Hazard	Initial Risk Assessment			Residual Risk Assessment		
	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



**02 - Access Systems**

**B - Platform**

**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 system.

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



**02 - Access Systems**

**B - Platform**

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

**Details** Dimension of opening in Step 1 floor on right hand side (i.e. maintenance) access system is 25mm x 220mm.

**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.

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



KAPRA ID 02.02.10 Source of Risk Holes or openings in floors

**Details** Slew area opening.

**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 and maintaining beacon lighting) on the top platform of the machine due to opening in floor at slew area. Demonstrate safe access to all maintenance areas on the top platform of the machine.

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





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 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.

Hazard	Initial Risk Assessment			Residual Risk Assessment		
	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



**02 - Access Systems**

**C - Handrails**

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

**Details** 45mm 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.

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



**02 - Access Systems**

**C - Handrails**

**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 2-21) specifies to always check the handrails before getting on or off the machine, repair any damage and tighten any loose bolts.

Hazard	Initial Risk Assessment			Residual Risk Assessment		
	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



02 - Access Systems

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 and maintaining beacon lighting) on the top platform of the machine. Demonstrate safe access to all maintenance areas on the top platform of the machine.

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



02 - Access Systems

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 2100mm 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.

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

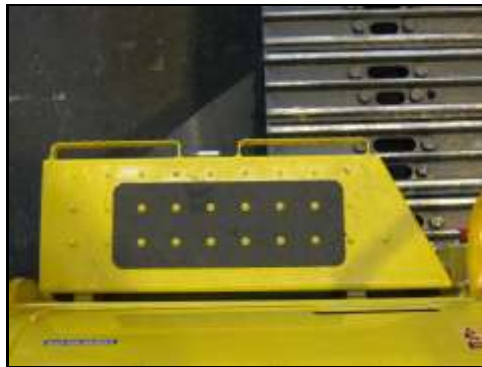


KAPRA ID 02.07.01 Source of Risk Stairway width

**Details** Top platform width on right hand side (i.e. Maintenance) access system is 450 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.

Hazard	Initial Risk Assessment			Residual Risk Assessment		
	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





**02 - Access Systems** **G - Stairways**  
**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 450 mm compared to the maximum stairways width of 800mm  
 Track landing width on right hand side (i.e. Maintenance) access system is 600 mm compared to the maximum stairways width of 800 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.

Hazard	Initial Risk Assessment			Residual Risk Assessment		
	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

**02 - Access Systems** **G - Stairways**  
**KAPRA ID** 02.07.06 **Source of Risk** Tread extension across stairway

**Details** Track width on right hand side (i.e. maintenance) access system is 600 mm compared to the maximum stairways width of 800 mm.  
 Step 1 tread width on right hand side (i.e. maintenance) access system is 600 mm compared to the maximum stairways width of 800 mm.  
 Top platform tread width on right hand side (i.e. maintenance) access system is 450 mm compared to the maximum stairways width of 800 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.

Hazard	Initial Risk Assessment			Residual Risk Assessment		
	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 450 mm. Vertical distance between step 1 and step 2 on right hand side (i.e. Maintenance) access system is 400 mm. Vertical distance between step 2 on right hand side (i.e. Maintenance) access system and top platform is 400 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.

Hazard	Initial Risk Assessment			Residual Risk Assessment		
	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



**02 - Access Systems**

**G - Stairways**

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

**Details** Depth of step 2 on right hand side (i.e. Maintenance) access system is 530 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.

Hazard	Initial Risk Assessment			Residual Risk Assessment		
	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

**02 - Access Systems**

**G - Stairways**

**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 400 mm to 450 mm.  
Goings on right hand side (i.e. maintenance) access system vary between 270 mm to 530 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.

Hazard	Initial Risk Assessment			Residual Risk Assessment		
	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

**02 - Access Systems**

**G - Stairways**

**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 400 mm.  
Step 2 dimensions on right hand side (i.e. Maintenance) access system is 530 mm by 400 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.

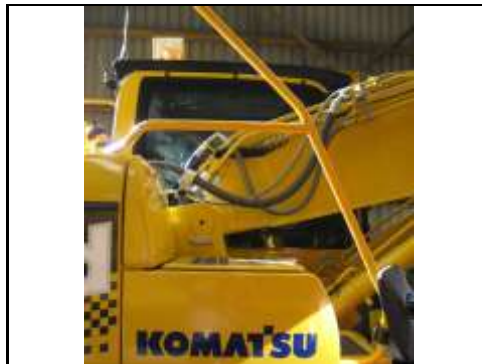
Hazard	Initial Risk Assessment			Residual Risk Assessment		
	L	C	Risk Rating	L	C	Risk Rating
Slips, trips and falls	D	2	Low	E	2	Low
Ergonomic	E	3	Moderate	E	3	Moderate

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.

Hazard	Initial Risk Assessment			Residual Risk Assessment		
	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.

Hazard	Initial Risk Assessment			Residual Risk Assessment		
	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

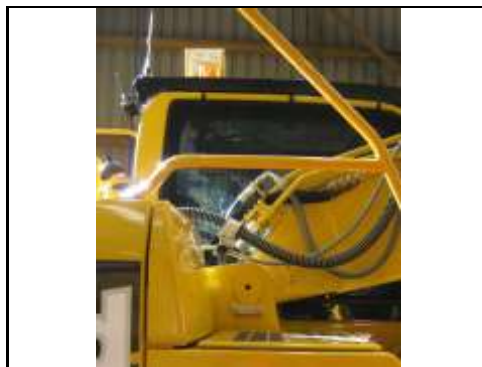


KAPRA ID 02.07.15 Source of Risk Slope and height of handrails

**Details** Vertical distance between step 1 nosing and the handrail on the right hand side (i.e. maintenance) access system is 260 mm.  
 Vertical distance between step 2 nosing and the handrail on the right hand side (i.e. maintenance) access system is 500 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.

Hazard	Initial Risk Assessment			Residual Risk Assessment		
	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



**02 - Access Systems**

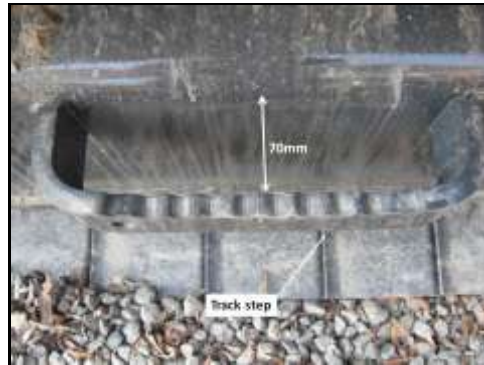
**M - Individual Rung Ladders**

**KAPRA ID** 02.13.09      **Source of Risk** Clearance to back edge of rung

**Details**      Depth of track steps is 70mm.

**Controls**      Advise operator and maintenance staff of the potential slips, trips and falls and ergonomics hazards due to clearance to back edge of track steps. Demonstrate safe use of access systems.

Hazard	Initial Risk Assessment			Residual Risk Assessment		
	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



**02 - Access Systems**

**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.

Hazard	Initial Risk Assessment			Residual Risk Assessment		
	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.

Hazard	Initial Risk Assessment			Residual Risk Assessment		
	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 3-84 of the Operation and Maintenance manual for further information on the safety lock lever.

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



**05 - Instrumentation and Operator Controls**

**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.

Hazard	Initial Risk Assessment			Residual Risk Assessment		
	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

**05 - Instrumentation and Operator Controls**

**C - Communication Systems**

**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.

Hazard	Initial Risk Assessment			Residual Risk Assessment		
	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 falling objects 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.

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

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.

Hazard	Initial Risk Assessment			Residual Risk Assessment		
	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

KAPRA ID 08.01.01 Source of Risk Hot parts

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

**Controls** Advise operator and maintenance staff that the exhaust pipe, muffler, turbocharger, 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.

Hazard	Initial Risk Assessment			Residual Risk Assessment		
	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, muffler, radiator header tank and oil cooler.

**Controls** Advise operator and maintenance staff that the exhaust pipe, muffler, 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.

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





**08 - Guardings**

**A - General**

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

**Details** Turbocharger guarding and fan/belt guarding.

**Controls** Advise operator and maintenance staff of the potential high temperature, cut, stab and puncture, friction and crushing hazards when working in the vicinity of the turbocharger, cooling fan and air conditioning compressor belts and pulley. Advise operator and maintenance staff to avoid contact with the turbocharger until the machine has cooled down or utilise gloves whenever contact during and following operation is necessary. 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.

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



**08 - Guardings** **A - General**

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

**Details** Air conditioner compressor belt pulley.

**Controls** Advise operator and maintenance staff of the potential crushing hazards when working in the vicinity of the 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.

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

**09 - Isolation Devices** **A - General**

**KAPRA ID** 09.01.03 **Source of Risk** Identification of state of isolation device

**Details** Isolation of hybrid electrical system is completed by the switching of the battery isolator device.

**Controls** Advise the operators and maintenance personnel of the method of safe isolation of the hybrid electrical system, and ways to check that isolation has occurred successfully.

Hazard	Initial Risk Assessment			Residual Risk Assessment		
	L	C	Risk Rating	L	C	Risk Rating
Electrical	E	5	High	E	5	High



**09 - Isolation Devices** **A - General**

**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 3-84 of the Operation and Maintenance manual for further information on the safety lock lever.

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

**09 - Isolation Devices**

**A - General**

**KAPRA ID** 09.01.10 **Source of Risk** Ineffective isolation

**Details** Isolation is provided through the control circuit

**Controls** Advise operator and maintenance staff of methods to isolate machine, and how to ensure that hybrid capacitor is effectively isolated.

Hazard	Initial Risk Assessment			Residual Risk Assessment		
	L	C	Risk Rating	L	C	Risk Rating
Electrical	C	5	Serious	D	5	Serious

**10 - Energy Dissipation/Restraints**

**A - General**

**KAPRA ID** 10.01.01 **Source of Risk** Availability of device for energy dissipation

**Details** Operator unable to discharge hybrid capacitor.

**Controls** Advise operator to contact Komatsu maintenance personnel if discharging of the capacitor is required.

Hazard	Initial Risk Assessment			Residual Risk Assessment		
	L	C	Risk Rating	L	C	Risk Rating
Electrical	E	5	High	E	5	High

**10 - Energy Dissipation/Restraints**

**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.

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

**13 - Electrical**

**E - Equipment**

**KAPRA ID** 13.05.05 **Source of Risk** Electrical information markings

**Details** Properties of electrical equipment is not durably marked due to variations in their values.

**Controls** Advise operator and maintenance personnel to refer to the shop manual for electrical equipment ratings & values under different operating conditions

Hazard	Initial Risk Assessment			Residual Risk Assessment		
	L	C	Risk Rating	L	C	Risk Rating
Electrical	D	5	Serious	E	5	High

KAPRA ID 13.05.10 Source of Risk Switches

**Details** The machine uses parts that are compliant to international standards.

**Controls** Advise operator & maintenance personel that switches are manufactured to international standards.

Hazard	Initial Risk Assessment			Residual Risk Assessment		
	L	C	Risk Rating	L	C	Risk Rating
Electrical	E	5	High	E	5	High