



# 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: 10001 & up

Machine: HB215

Model: 1M0

Date: 14/03/2014

Location: Fairfield

Assessment Team: Bart Genson, Steve Williams

Conditions: Beacon, KGA attachments

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 02.01.02 Source of Risk **Obstructions / projections**

**Details** Engine air 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



Fuel fill point, hydraulic tank cover & fill point.



Air intake cleaner.

**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
Ergonomic	E	3	Moderate	E	3	Moderate
Slips, trips and falls	D	2	Low	E	2	Low



Right hand side access system.

**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

**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

**Details** Vertical distance between ground and track step is 550mm.  
 Vertical distance between track step and tracks is 360mm.  
 Vertical distance on right hand side (i.e. maintenance) access system between tracks and step 1 is 460mm.  
 Vertical distance on right hand side (i.e. maintenance) access system between step 1 and step 2 is 390mm.  
 Vertical distance on right hand side (i.e. maintenance) access system between step 2 and top platform is 400mm.  
 Vertical distance on cabin access system between tracks and cabin floor is 520mm.

**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
Slips, trips and falls	E	2	Low	E	2	Low



Ground to track step & track step to track distances.



Track step to maintenance access step 1 distance.



Maintenance access step 1 to step 2 distance.



Maintenance access step 2 to top platform distance.

KAPRA ID 02.02.01 Source of Risk Platforms and landings width

**Details** Step 1 width on right hand side (i.e. maintenance) access system varies from 330mm to 445mm.  
 Top platform walkway widths vary from 200mm to 580mm.  
 Internal cabin access width/clearance varies from 460mm to 550mm.

**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
Ergonomic	E	3	Moderate	E	3	Moderate
Slips, trips and falls	D	2	Low	E	2	Low



Maintenance access step 1.



Top platform widths.



Cabin access widths.

**02 - Access Systems**

**B - Platforms & Landings**

**KAPRA ID** 02.02.02 **Source of Risk** Maximum Slope

**Details** Tracks have a slope greater than 3 degrees.

**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**

**B - Platforms & Landings**

**KAPRA ID** 02.02.03 **Source of Risk** Vertical clearance above floors (Headroom)

**Details** Interior cabin height is 1570mm.

**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
Striking	D	2	Low	E	2	Low



Operator's cabin.



**02 - Access Systems**

**B - Platforms & Landings**

**KAPRA ID** 02.02.06      **Source of Risk** Holes or openings in floors

**Details** Slew motor area opening.

**Controls** Advise operator and maintenance staff of the potential for slips, trips and falls when performing maintenance activities (e.g.. 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



Slew motor area.

**02 - Access Systems**

**C - Walkways**

**KAPRA ID** 02.03.01      **Source of Risk** Angle of slope

**Details** Tracks have greater than 3° slope.

**Controls** Advise operator and maintenance staff of the potential slips, trips and falls and ergonomics hazards due to sloped tracks.

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	D	2	Low	E	2	Low

**02 - Access Systems**

**C - Walkways**

**KAPRA ID** 02.03.05 **Source of Risk** Walkways walking surfaces

**Details** Track shoes have grouser height of 9mm when new.

**Controls** Advise operator and maintenance personnel of the potential for slips, trips and falls when using the tracks as a work platform or access platform due to variation in height of the tracks due to shape of grouser plates.  
 Highlight that the Operation and Maintenance manual (refer to page 2-21) specifies to wipe off any oil, grease or mud on the handrails and steps prior to getting on or off the machine.  
 Demonstrate safe access and egress to the top platform of the machine using the maintenance access system.

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



Track shoes.

**02 - Access Systems**

**D - Handrails**

**KAPRA ID** 02.04.01 **Source of Risk** 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
Cut, stab and puncture	D	2	Low	E	2	Low
Ergonomic	E	3	Moderate	E	3	Moderate
Slips, trips and falls	D	2	Low	E	2	Low

**02 - Access Systems**

**D - Handrails**

**KAPRA ID** 02.04.02      **Source of Risk** Handrails height

**Details** Right hand side (i.e. maintenance) access stairway has handrail which varies from \*\*\*mm to \*\*\*mm in height above the nosing of the stair.

**Controls** Advise operator and maintenance staff of the potential slips, trips and falls and ergonomic hazards when using access system due to the height of the handrail.  
Demonstrate safe use of access system.

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



Handrail height of access system.

**02 - Access Systems**

**E - Guardrailings**

**KAPRA ID** 02.05.01      **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 (e.g.. 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

G - Toeboards

KAPRA ID 02.07.01 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



Height of top platform.

02 - Access Systems

H - Stairways

KAPRA ID 02.08.01 Source of Risk Stairway width

**Details** Right hand side (i.e. maintenance) access system varies in width from 330mm to 750mm.

**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
Ergonomic	E	3	Moderate	E	3	Moderate
Slips, trips and falls	D	2	Low	E	2	Low



Right hand side access system.

**02 - Access Systems**

**H - Stairways**

**KAPRA ID** 02.08.06 **Source of Risk** Landings on stairway

**Details** Top platform landing width on right hand side (i.e. Maintenance) access system is 400mm compared to the maximum stairways width of 720mm.  
Track landing width on right hand side (i.e. Maintenance) access system is 600mm compared to the maximum stairways width of 720mm.

**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**

**H - Stairways**

**KAPRA ID** 02.08.07 **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 720 mm.  
Step 1 tread width on right hand side (i.e. maintenance) access system is 330 mm compared to the maximum stairways width of 720 mm.  
Top platform tread width on right hand side (i.e. maintenance) access system is 4000 mm compared to the maximum stairways width of 720 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
Ergonomic	E	3	Moderate	E	3	Moderate
Slips, trips and falls	D	2	Low	E	2	Low

KAPRA ID 02.08.08 Source of Risk Height of risers

**Details** Vertical distance between track and step 1 on right hand side (i.e. maintenance) access system is 460mm.  
 Vertical distance between step 1 and step 2 on right hand side (i.e. Maintenance) access system is 390mm.  
 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
Ergonomic	E	3	Moderate	E	3	Moderate
Slips, trips and falls	D	2	Low	E	2	Low



Vertical distance from tracks to step 1.



Vertical distance from step 1 to step 2.



Vertical distance from step 2 to top platform.

**02 - Access Systems**

**H - Stairways**

**KAPRA ID** 02.08.09      **Source of Risk** **Depth of goings**

**Details**      Depth of step 2 on right hand side (i.e. Maintenance) access system is 520mm.

**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
Ergonomic	E	3	Moderate	E	3	Moderate
Slips, trips and falls	D	2	Low	E	2	Low



Depth of step 2.

**02 - Access Systems**

**H - Stairways**

**KAPRA ID** 02.08.10      **Source of Risk** **Variations in risers / going dimensions**

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

**Controls**      Advise operator and maintenance staff of the potential slips, trips and falls and ergonomics hazards due to 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
Ergonomic	E	3	Moderate	E	3	Moderate
Slips, trips and falls	D	2	Low	E	2	Low

**02 - Access Systems** **H - Stairways**

**KAPRA ID** 02.08.11 **Source of Risk** **Dimensions of rises / goings**

**Details** Step 1 dimensions on right hand side (i.e. maintenance) access system is 200mm by 400mm.  
Step 2 dimensions on right hand side (i.e. Maintenance) access system is 530mm by 400mm.

**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
Ergonomic	E	3	Moderate	E	3	Moderate
Slips, trips and falls	D	2	Low	E	2	Low

**02 - Access Systems** **H - Stairways**

**KAPRA ID** 02.08.12 **Source of Risk** **Tread depth 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

**02 - Access Systems** **H - Stairways**

**KAPRA ID** 02.08.13 **Source of Risk** **Continuity of handrails**

**Details** Handrail support provides obstruction on the handrail.

**Controls** Advise operator and maintenance staff of the potential slips, trips and falls due to the presence of the supporting bar on the handrail.  
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



02 - Access Systems

M - Individual Rung Ladders

KAPRA ID 02.13.03 Source of Risk Tread width/Rung Diameter (Tread depth)

**Details** Width of the track step tread is 18mm.

**Controls** Advise operator and maintenance staff of the potential slips, trips and falls due to tread width. 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	2	Low	E	2	Low



Track step.

02 - Access Systems

M - Individual Rung Ladders

KAPRA ID 02.13.06 Source of Risk Distance Variation

**Details** Vertical distance between ground and track step is 550mm. Vertical distance between track step and tracks is 360mm.

**Controls** Advise operator and maintenance staff of the potential slips, trips and falls and ergonomics hazards due to variation in rung distances. 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
Slips, trips and falls	E	2	Low	E	2	Low

**02 - Access Systems**

**M - Individual Rung Ladders**

**KAPRA ID** 02.13.08      **Source of Risk** Clearance to back edge of rung

**Details**      Depth of track step varies from 70mm to 160mm.

**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
Ergonomic	E	3	Moderate	E	3	Moderate
Slips, trips and falls	E	2	Low	E	2	Low



Track step.

**02 - Access Systems**

**M - Individual Rung Ladders**

**KAPRA ID** 02.13.09      **Source of Risk** Ladder step off point

**Details**      Tracks are not level.

**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**

**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
Cut, stab and puncture	C	3	High	D	3	Moderate
Crushing	C	3	High	D	3	Moderate
Ergonomic	D	3	Moderate	E	3	Moderate
Friction	B	2	High	C	2	Moderate
High temperature	B	3	High	C	3	High
Slips, trips and falls	C	3	High	D	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 is not labelled.

**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



Safety lock lever.

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
Electrical	D	5	Serious	E	5	High
Shearing	D	4	High	E	4	High
Striking	D	3	Moderate	E	3	Moderate

**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

**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.

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
Striking	C	2	Moderate	D	2	Low

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



Exhaust pipe & muffler.



Turbocharger.



Radiator header tank.



Oil cooler.

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



Exhaust pipe & muffler.



Radiator header tank.



Oil cooler.



**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
Cut, stab and puncture	D	3	Moderate	E	3	Moderate
Friction	C	2	Moderate	D	2	Low
High temperature	C	3	High	D	3	Moderate



Air conditioning compressor.

**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 methods 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



Battery isolator.

09 - Isolation Devices

A - General

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

**Details** Safety lock lever is not labelled.

**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



Safety lock lever.

**09 - Isolation Devices**

**A - General**

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

**Details** Hybrid system 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	E	5	High	E	5	High

**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

13 - Electrical

E - Equipment

KAPRA ID 13.05.10 Source of Risk Switches

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

Controls Advise operator & maintenance personnel 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