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# KAPRA Risk Assessment Report

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| | | | |
|---|---|---|---|
| Serial No: | 8349 and up | | |
| Machine: | PC88MR | Model: | 10 |
| Audit Date: | 20/03/2018 | Audit Location: | Fairfield |
| Assessment Team: | Bart Genson, Ralph Goad, Tony Corry | | |
| Conditions: | Komatsu Genuine Attachments, Beacon, Rubber tracks | | |

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 |

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**02 - Access Systems** **A - General**

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

**Requirement(s) or Condition(s)** Access to all work areas above ground level has been provided in the form of ladders, handrails and guard railed platforms / walkways / landings etc.
Reference(s): WA COP-Prevention of Falls at Workplaces; COP- Managing the Risk of Falls at Workplaces.

**Findings** Maintenance activities carried out on beacon. Tracks are a work area for cleaning cabin windows.Cabin

**Suggested Controls** Advise operation and maintenance personnel of the potential for slips, trips and falls when accessing the beacon for maintenance purposes.
Advise operator and maintenance staff that the radiator and hydraulic tank compartments should not be used as tread surfaces and recommend the use of an elevating work platform when performing maintenance activities on the beacon.

| | 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 |

Cabin windows and beacon lighting

**02 - Access Systems** **A - General**

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

**Requirement(s) or Condition(s)** Lighting allowing safe use of the access system is provided.
Reference(s): WA COP-Prevention of Falls at Workplaces; WHS COP- Managing the Risk of Falls at Workplaces 2011

**Findings** Night operations.

**Suggested Controls** Advise operator and maintenance staff of the potential for slips, trips and falls and ergonomics hazards 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 | D | 2 | Low | E | 2 | Low |

**02 - Access Systems** **A - General**

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

**Requirement(s) or Condition(s)** Design of access / egress systems considers functionality when operator or serviceman use it while carrying small objects such as tools and equipment, from and around the work areas.
Reference(s): WA COP-Prevention of Falls at Workplaces

**Findings** None

**Suggested 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 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 | C | 2 | Moderate | E | 2 | Low |

**02 - Access Systems** **A - General**

**KAPRA ID** 02.01.06 **Source of Risk** **Slip resistant surface**

**Requirement(s) or Condition(s)** All walking surfaces, including steps, treads and rungs are slip resistant.
Reference(s): AS1657

**Findings** Use of rubber tracks when muddy.
Note: Blade is not to be used as access step to the rubber track to cabin.

**Suggested Controls** Advise operator and maintenance staff of the potential for slips, trips and falls when using blade or muddy rubber tracks as tread surfaces.
Advise operator and maintenance staff that the blade should not be used as a tread surface and to always ensure that rubber tracks are clean prior to accessing 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 |

Rubber Tracks

**02 - Access Systems** **A - General**

**KAPRA ID** 02.01.07 **Source of Risk** **Provision for change in level of platforms, landings & walkways**

**Requirement(s) or Condition(s)**

The following requirements apply:
A) Level change of less than 300mm, intermediate step is not necessary.
B) Level change between 300-450mm, an intermediate step is provided.
C) Level change of more than 450mm, a ladder, stairway or walkway is provided
Reference(s): AS1657

**Findings**

Vertical distance from ground to track step on cabin access system is 430mm.
Vertical distance from track step to rubber track on cabin access system is 260mm.
Vertical distance from rubber track to the slip resistant step on cabin access system is 400mm.
Vertical distance from ground to track step on maintenance access system (RHS) is 430mm.
Vertical distance from track step to rubber track on maintenance access system (RHS) is 260mm.
Vertical distance from rubber track to step 1 on maintenance access system (RHS) is 380mm.
Vertical distance from step 1 to step 2 on maintenance access system (RHS) is 260mm.

**Suggested Controls**

Advise operator and maintenance staff of the potential for slips, trips and falls and ergonomic hazards due to level changes in cabin access system (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 | D | 2 | Low | E | 2 | Low |

Vertical distance from ground to track step - Cabin LHS

Vertical distance from track step to rubber track- Cabin LHS

Rubber track to cabin floor

Step 1 on RHS maintenance access

Step 2 on RHS maintenance access

**02 - Access Systems** **A - General**

**KAPRA ID** 02.01.09 **Source of Risk** **Flooring material made of metal plate and grating/expanded metal**

**Requirement(s) or Condition(s)**

The following requirements apply to flooring material:
A) Metal plate: has to be chequered, indented or equivalent surface characteristics, and the gap between plates does not exceed 10 mm in any length.
B) Grating and expanded metal: the smallest dimension of any opening does not exceed 45 mm and the area of any opening does not exceed 5000 mm2, and any gap between adjacent made-up sections of grated floor shall not exceed 10 mm in any length.
Reference(s): AS1657

**Findings**

Dimensions of openings in Step 1 floor on right hand side (i.e. maintenance) access system are 160 mm x 45 mm.

**Suggested 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 |

Step 1 - RHS maintenance access

**02 - Access Systems** **B - Platforms & Landings**

**KAPRA ID** 02.02.01 **Source of Risk** **Platforms and landings width**

**Requirement(s) or Condition(s)** The clear width of the walking/working surface of every platform and landing is not less than 600 mm.
Reference(s): AS1657

**Findings** Track widths are 450 mm.
Internal cabin access width/clearance is 400 - 460 mm.
Step 1 width on right hand side (i.e. Maintenance) access system is 170 mm.
Step 2 width on right hand side (i.e. Maintenance) access system is 350 mm.

**Suggested Controls** Advise operator and maintenance staff of the potential slips, trips and falls and ergonomic hazards due to landing width (refer to  details).
Demonstrate safe use of cabin access system.

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

Track width.

Internal cabin access width.

Step 1 on right hand side access system.

Step 2 on right hand side access system.

**02 - Access Systems** **B - Platforms & Landings**

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

**Requirement(s) or Condition(s)** Headroom - Vertical clearance above all floors (except for cabin entrance opening) is 2000mm minimum.
Reference(s): AS1657

**Findings** Interior operator's compartment height is 1550mm.

**Suggested Controls** Advise operation and maintenance personnel of the potential ergonomic hazard due to interior operator's compartment height.
Demonstrate safe use of operator's compartment access system.

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

Cabin

**02 - Access Systems** **B - Platforms & Landings**

**KAPRA ID** 02.02.04 **Source of Risk** **Platform walking surfaces**

**Requirement(s) or Condition(s)**

Surfaces are to be installed as follows:
A) All elements and panels are securely fixed to the supporting structure
B) All elements and panels are evenly laid with a maximum variation in height of 5 mm between adjacent sections
C) Where surface is likely to be wet, provision is made to prevent the retention of the liquid by drainage or other means
D) Walking surface is slip resistant
E) Capable of sustaining the imposed actions
F) Floors are evenly laid, any variation in height between adjacent boards or plates do not exceed 5 mm.
Reference(s): AS1657

**Findings**

65mm variation in floor height between the slip resistant step and the operator's compartment flooring.

**Suggested Controls**

Advise operator and maintenance staff of the potential slips, trips and falls and ergonomics hazards due to variations in floor heights (refer to details).
Advise operator and maintenance staff to always maintain three points of contact when using the operator's compartment access system (refer to the OMM manual).
Demonstrate safe use of the operator's compartment access system.

| | 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 |
| Ergonomic | D | 3 | Moderate | E | 3 | Moderate |

Slip resistant step to cabin floor.

**02 - Access Systems** **N - Emergency Use**

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

**Requirement(s) or Condition(s)** Two means of egress are provided from the operators cab to the ground, including;
A) at least one means of normal egress and
B) at least one means of emergency egress which is suitably marked e.g. second door, push out window, ladder, escape chute etc., and which is away from fire sources.
Reference(s): AS1657

**Findings** Emergency egress located near engine compartment.

**Suggested 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 |

Emergency exit.

**04 - Work Environment** **C - Lightings**

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

**Requirement(s) or Condition(s)** Lighting allows people to work and move safely about the workplace.
Reference(s): WA Occupational Safety and Health Regulations 1996 3.13(a)(b); QLD COP Plant 2005 Item 1.27

**Findings** Night operations.

**Suggested 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 | 2 | Moderate | D | 2 | Low |
| High temperature | C | 3 | High | D | 3 | Moderate |
| 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 |
| Striking | C | 2 | Moderate | D | 2 | Low |

**05 - Instrumentation and Operator Controls** **A - General**

**KAPRA ID** 05.01.13 **Source of Risk** **Labelling of instrumentation and controls**

**Requirement(s) or Condition(s)** All instrumentation and controls are labelled so that their nature and function is clear.
Reference(s): QLD COP - Plant 2005 Item 1.25

**Findings** Safety lock lever and control levers.

**Suggested Controls** Advise operator and maintenance staff that there are potential crushing and striking hazards associated with misuse of the safety lock lever and other control levers.
Advise operator and maintenance staff that the safety lock lever functions as a hydraulic isolation device and demonstrate this functionality.
Refer to the OMM manual for further information on the safety lock lever and other control levers.

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

**05 - Instrumentation and Operator Controls** **C - Communication Systems**

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

**Requirement(s) or Condition(s)** Equipment control systems provide for effective communication between persons involved in operation or maintenance.
Reference(s): QLD Mining and Quarrying Safety and Health Regulations 2001 102(1)(b)(i)

**Findings** None.

**Suggested 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 | C | 3 | High | D | 3 | Moderate |
| Cut, stab and puncture | D | 2 | Low | E | 2 | Low |
| Shearing | C | 3 | High | D | 3 | Moderate |
| Striking | D | 3 | Moderate | E | 3 | Moderate |
| Electrical | C | 3 | High | D | 3 | Moderate |

**05 - Instrumentation and Operator Controls** **C - Communication Systems**

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

**Requirement(s) or Condition(s)** Emergency communications have been provided for in emergency situations.

**Findings** None.

**Suggested 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 |

**07 - Safety Signage** **A - General**

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

**Requirement(s) or Condition(s)** Safety signs are placed in areas where PPE is required.
Reference(s): NZ Management of Noise in the Workplace 2002 Item 6.4

**Findings** None.

**Suggested 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**

**Requirement(s) or Condition(s)** Pipes and other parts that may become hot are adequately guarded and insulated.

**Findings** Exhaust pipe, hydraulic tank, hydraulic valve, radiator header tank, oil cooler and all other components inside the engine compartment may become hot during and following operations.

**Suggested Controls** Advise operator and maintenance staff that the exhaust pipe, hydraulic tank, hydraulic valve, radiator header tank, oil cooler and all other components inside engine compartment 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 |

Exhaust pipe and surrounding components.

Hydraulic tank.

Crankcase ventilation filter and surrounding components

Battery, radiator header tank and oil cooler.

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

**KAPRA ID** 08.01.06 **Source of Risk** **Moving parts**

**Requirement(s) or Condition(s)** Guards to protect against hazards generated by moving parts, for example pulleys, belts, gears, racks and pinions, shafts, are either fixed guards or movable interlocking guards.
Reference(s): AS4024

**Findings** Air conditioning compressor belt pulley (with guarding and warning decal).
(Note: AC belt/pulley and cooling fan are enclosed inside the engine compartment).

**Suggested Controls** Air-conditioning compressor belt pulley is guarded.
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 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 |

Warning decal for moving parts (ie belt).

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

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

**Requirement(s) or Condition(s)** Machinery is fitted with device(s) that enable it to be isolated from all power supplies.NOTE: Consider all power supplies including electrical, hydraulic, mechanical, pneumatic, etc.
Reference(s): AS4024.1603

**Findings** No electrical isolation.

**Suggested 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 | D | 3 | Moderate | E | 3 | Moderate |

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

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

**Requirement(s) or Condition(s)** The relationship between each isolating device and the machine (or part of it) which is to be isolated, is clear and easily understood.
Reference(s): AS4024.1603

**Findings** Safety lock lever.

**Suggested 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 3-14 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 | 3 | High | D | 3 | Moderate |
| Striking | C | 3 | High | D | 3 | Moderate |

**10 - Energy Dissipation/Restraints** **A - General**

**KAPRA ID** 10.01.02 **Source of Risk** **Reduction in ability to use machine following energy dissipation**

**Requirement(s) or Condition(s)** When dissipation of stored energy would excessively reduce the ability of the machine to be used, additional means are incorporated to reliably restrain or contain the remaining stored energy.
Reference(s): AS4024

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

**Suggested 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 sub tank wherever possible.

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