# HAZARD IDENTIFICATION & RISK ASSESSMENT


**MANITOU MT(-X) 625**

*2016-07-14 / version A*

*Handling your world : La manutention de votre monde*

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# HAZARD IDENTIFICATION AND RISK ASSESSMENT OF PLANT

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|---|---|
| **Organisation:** | MANITOU GROUP / MANITOU AUSTRALIA Pty. Ltd. - 94-96 Euston Road, Alexandria, NSW, 2035 - ABN 42 114 388 591 |
| **Plant Make & Model:** | MANITOU MT(-X) 625 |
| **Risk Assessment Method Used:** | SAFETY REVIEW |
| **Ref Documents used:** | AS4024.1301 – 2006, NSW WHS Regulation 2011<br>AS/NZS4360 – 2004 (risk management guidelines) & HB436:2004 (Handbook for AS/NZS4360)<br>AS1418.19 – 2007, AS2550.19 – 2007 |
| **Date / Version:** | 2016-07-14 / version A |

This Hazard Identification and Risk Assessment has been prepared to identify reasonably foreseeable hazards to health and safety arising from an end-user / owner operational point of view, including transport, operation and maintenance of the plant.

It is based on information available at the date of publication. It includes suggestions for supplementary risk control measures that can be implemented to avoid injuries and/or fatalities due to these hazards. These suggestions are not exhaustive and can be completed, adapted by the plant's owner and or any other stakeholder.

Although every attempt has been made to identify reasonably foreseeable circumstances, no guarantee as to the completeness of this assessment is implied or provided. It is the responsibility of the plant owner / end-user to carry-out their own risk assessment adapted to their specific work site, application, environment conditions and regulations. To assist, this document can be used as a base and guideline.

Manitou will not be responsible for the actions or inactions of the Plant Owner, Site Management, the Operator and or Other Personnel. It is also the plant owner's responsibility to maintain and use the plant adequately according to the manual's instructions and current laws and guidelines. The plant owner must ensure the operator is competent and holds all relevant qualifications and or licenses to operate the plant as required by Law and or WorkCover.

The assessment must be reviewed by all stakeholders and revised:

(a) Having regard to the options and general arrangement of miscellaneous equipment/facilities that may be provided on the plant according to the end users requirements or specification;

(b) According to the particular circumstances under which the plant is used and maintained;

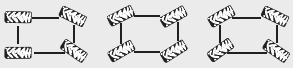
(c) As new hazards are identified or as risks are reassessed;

(d) As new or revised control measures are implemented;

(e) As and when work procedures are altered.

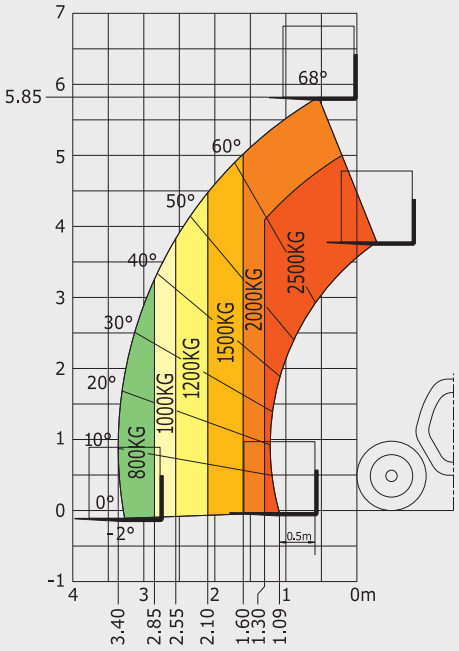
Any comment on this Risk Assessment, please contact Manitou Australia: info.mau@manitou-group.com

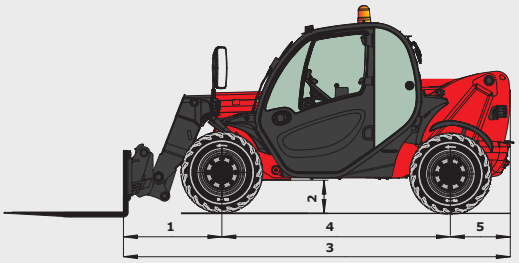
# MT-X625

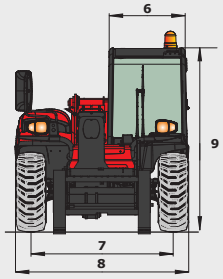
| | MT-X 625 |
|---|---|
| **Lifting** | |
| Max. capacity | 2500 kg |
| Max. lifting height | 5.85 m |
| Max. outreach | 3.40 m |
| Break-out force with bucket | 3427 daN |
| **Unladen time** | |
| Lifting | 8.0 secs |
| Lowering | 5.4 secs |
| Extension | 5.6 secs |
| Retraction | 4.3 secs |
| Crowd | 3.5 secs |
| Dump | 3.6 secs |
| **Tyres** | 12-16.5 12PR SKS CL TUBELESS |
| **Braking** | |
| Service brake | oil immersed multi-disc braking |
| Parking brake | negative oil immersed multi-disc |
| **Engine** | KUBOTA - STAGE 3A |
| Type | V3307-DI-T-E3B |
| Cubic capacity | 4 cyl. - 3331 $cm^3$ |
| Power | 75 HP/55.4 kW |
| Max. torque | 265 Nm at 1400 rpm |
| Injection | direct |
| Cooling | water |
| Laden drawbar pull | 4035 daN |
| **Transmission** | torque converter 4 wheel drive |
| Reversing shift | electrohydraulic control |
| Number of gears (forward/reverse) | 2/2 |
| Max. travel speed (may vary according to applicable regulations) | 25 kph |
| Steering mode | 4 wheel steer - 3 Steering Modes  |
| **Controls** | JSM® Joystick multi - function<br>Load Limiter Cut off system - EN15000 Norm |
| **Hydraulics** | |
| Pump | gear type with priority valve<br>88 l/min - 235 bar |
| **Capacities** | |
| Hydraulic oil | 115 l |
| Fuel | 63 l |
| **Unladen weight** (with forks) | 4710 kg |
| **Dimensions** | |
| **1.** Front wheel centre to carriage | 0.99 m |
| **2.** Ground clearance | 0.33 m |
| **3.** Overall length to carriage | 3.89 m |
| **4.** Wheelbase | 2.30 m |
| **5.** Rear wheel centre to rear face | 0.60 m |
| **6.** Overall width of cab | 0.80 m |
| **7.** Inside tyre width | 1.49 m |
| **8.** Overall width | 1.81 m |
| **9.** Overall height | 1.92 m |
| Standard forks (length x width x thickness) | 1200 x 125 x 45 mm |
| Turning radius (over tyres) | 3.31 m |
| Carriage rotation (crowd/dump) | 12°/117° |
| **Noise and vibration** | |
| Noise at driving position (LpA) | 75 dB |
| Environmental noise (LwA) | 104 dB |
| Vibration to whole hand/arm | <2.50 $m/s^2$ |

## Rough terrain load chart

standard EN1459 B



# NOTES

## DEFINITIONS

MGMT: Refers to the person legally responsible for the use of the unit; it generally means the employer, the company or the legal entity that has responsibility under the Health and Safety legislation in the State or Territory in which the unit is being used.
OP: Is the operator, authorized by management and responsible for the operation and preoperational inspection and use of the unit.
OWNER: Is the person or organisation that owns the unit and is responsible for its condition and state of repair.
MEWP: Mobile Elevating Work Platform

## GENERAL NOTES

1. This Risk Assessment has been prepared by MANITOU for the subject plant and is not transferable to other plant or parties.
2. Item Numbers refer to hazards, which can exist if the unit is not adequately maintained – e.g. Guards not fitted, gauges fail to correctly display readings etc. The measures listed to control risks arising from this type of hazard can include reference to operating procedures. Operating Procedures cannot make the operator responsible for inadequate maintenance/repairs etc. but is only intended to ensure that the procedures include the need for the operator to report any faults detected.
3. This Hazard Identification and Risk Assessment document has been prepared based on information available at the date of publication. In order to ensure this Hazard Identification, Risk Assessment, Risk Control document is both accurate and complete; "Management of the Unit" must review it:
   (a) According to the particular circumstances under which the plant and/or process is used and maintained,
   (b) As new hazards are identified or as risks are re-assessed,
   (c) As new or revised control measures are implemented,
   (d) As and when work procedures are altered.

Although every attempt has been made to identify reasonably foreseeable circumstances, no guarantee as to the completeness of this assessment is implied or provided.
4. "Preliminary" is placed in this document to indicate that the Controls listed in Columns C and E are a practicable way of controlling the risks arising out of the Hazards listed in Column B. "Preliminary" status remains in place until the "Management of the Unit" agrees that the assessment is complete and that the controls proposed are practicable.
5. Column Y has been provided on the document to allow the "Management of the Unit" to record that their Hazard Identification, Risk Assessment, and Risk Control process has been completed and that all controls are in place and operating. When Column Y is completed, the document becomes a record of the completeness of the process and the documentation (subject to any changes which need to be further reviewed in accordance with Item 3 above).
6. The determination of risk, column D, is a subjective assessment based on the following factors: exposure – the number of times humans are exposed to the risk, the probability of the hazard arising, and the consequence of the hazard – death or serious injury.

## RISK MANAGEMENT

Risk management is a five-step process for controlling exposure to health and safety risks associated with hazards in the workplace.
To properly manage exposure to risks, a person must:

(a) Identify hazards;
(b) Assess risks that may result because of the hazards;
(c) Decide on appropriate control measures to prevent or minimise the level of the risks;
(d) Implement control measures; and
(e) Monitor and review the effectiveness of the measures.

Hazards and risks are NOT the same thing.
A **hazard** is something with the potential to cause harm. This can include substances, plant, work processes or other aspects of the work environment.
**Risk** is the likelihood that death, injury or illness might result because of the hazard.

As examples:
• The hazard is electricity—the risk is the likelihood that a worker might be electrocuted because of exposure to electrical wires that are inadequately insulated.
• The hazard is a 40 kg bag—the risk is the likelihood that a worker might suffer back strain from manually lifting 40 kg bags.
• The hazard is carbon monoxide—the risk is the likelihood that a worker might suffer carbon monoxide poisoning because they are using a petrol-operated pump in a well.

When undertaking risk management:
(a) Involve workers in the process; (it is legal requirement that all stakeholders are consulted)
(b) Don't use it to justify a decision that has already been made;
(c) Consider good industry practice; and be aware of the current State of Knowledge in relation to the hazard
(d) Record any risk management activities undertaken.

Under the relevant Workplace Health and Safety Acts, to properly manage exposure to risks, a person should consider the appropriateness of control measures in the following order (sometimes referred to as the 'Hierarchy of Control'):
(a) Eliminating the hazard or preventing the risk; or
(b) If eliminating the hazard or preventing the risk is not possible, minimising the risk by measures that must be considered n the following order:

(i) Substituting the hazard giving rise to the risk with a hazard giving rise to a lesser risk;
(ii) Isolating the hazard giving rise to the risk from anyone who may be at risk;
(iii) Minimising the risk by engineering means;
(iv) Applying administrative measures; and
(v) Using personal protective equipment.

Examples of subparagraph (iii)—redesigning work, plant, equipment, components or premises.
Examples of subparagraph (iv)—training, reasonable hours of work.

The higher in the hierarchy of control, the better and more reliable the control is. In practice, several control options are often used in combination. Personal protective equipment is usually used in conjunction with other control measures.
Control measures must be implemented before work commences.

## RISK RANKING MATRIX

***CONSEQUENCE TABLE***

| Level | Descriptor | Examples |
|---|---|---|
| 1 | **Insignificant** | No injuries, low financial loss |
| 2 | **Minor** | First aid treatment, on-site release immediately contained, medium financial loss |
| 3 | **Moderate** | Medical treatment required, on-site release contained without assistance, high financial loss |
| 4 | **Major** | Extensive injuries, loss of production capability, off-site release with no detrimental effects, major financial loss |
| 5 | **Catastrophic** | Death, toxic release off-site with detrimental effect, huge financial loss |

NOTE: Measures used should reflect the needs and nature of the organisation & activity under study, e.g.in high risk industries multiple fatalities and fatalities may be separated into several levels.

***LIKELIHOOD TABLE***

| Level | Descriptor | Examples |
|---|---|---|
| A | **Very likely** | Is expected to occur in most circumstances |
| B | **Likely** | Will probably occur in most circumstances |
| C | **Moderate** | Might occur at some time |
| D | **Unlikely** | Could occur at some time |
| E | **Rare** | May occur only in exceptional circumstances |

NOTE: Measures used should reflect the needs and nature of the organisation and activity under study.

***MATRIX TABLE***

| | CONSEQUENCE | | | | |
|---|---|---|---|---|---|
| **LIKELIHOOD** | **Catastrophic (5)** | **Major (4)** | **Moderate (3)** | **Minor (2)** | **Insignificant (1)** |
| **Almost certain (A)** | Extreme | Extreme | Extreme | High | High |
| **Likely (B)** | Extreme | Extreme | High | High | Moderate |
| **Moderate (C)** | Extreme | Extreme | High | Moderate | Low |
| **Unlikely (D)** | Extreme | High | Moderate | Low | Low |
| **Rare (E)** | High | High | Moderate | Low | Low |

The risk level read from the matrix defines the priority for action or the importance for review. Again the actions required for a particular risk level should be customized to the particular circumstances.
Possible actions are:
E= Extreme risk—consider stopping work (who decides which boxes contain E?)
H= High risk—should be reduced as soon as possible.
M= Moderate risk—management responsibility and action dates must be specified
L= Low risk—manage by routine procedures
The matrix suggests four different action levels but could equally be divided into a larger number of priority levels. There is merit in assigning all events that have the potential for a fatality priority 1 unless they are so unlikely that they are not expected ever to occur. This ensures that controls for preventing fatalities receive priority attention even where they are believed to be good.

*Notes on using the matrix method*
The strengths of this method are:
• The analysis provides a ranking of risk.
• The method encourages the risk analyst or team to understand the hazard in order to rank the significance of the risk.
The major problems involved in applying such a method are:
• People guess levels of likelihood and consequence without sufficient analysis of the hazard or existing controls.
• The analysis methodology is applied to a risk where the circumstances of occurrence are rare. For example, suppose a person was exposed to a hazard for a short period of time, once every 10 years. Suppose also that that hazard was almost certain to cause fatality upon each exposure. It would be incorrect to use a simple methodology whereby the likelihood of the consequences was ranked relatively low at once in 10 years. In that particular example the likelihood of fatality is certain once exposure occurs. An amended methodology will be required to deal with those circumstances such as the fine risk score calculator.
• Since judgements of consequences and likelihood are highly subjective the matrix does not work well as a decision tool, particularly concerning the need for action on high consequence low probability risks.

**WARNING**
The risk ratings used in this document are intended to stimulate discussion from the parties affected by the use of the subject machine; they shall not be adopted as the most appropriate risk rating without sufficient consideration by the designer, manufacturer, management or user of the plant.

# VERSION HISTORY

| Date | Version Number | Note |
|---|---|---|
| 2016-07-14 | A | |
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| A | B | C | D | E | F | X | Y |
|---|---|---|---|---|---|---|---|
| **Hazard No.** | **Hazard Description -** | **Is there any risk?** | | | | | |
| | **(the situation or parts of plant which could cause injury or illness)** | **Describe the risk control measures ALREADY implemented** | **Risk Level** | **Proposed SUPPLEMENTARY risk control measure** | **Are the control measures practicable?** Yes/No | **For Action by Whom** | **Confirmation that the necessary action has been completed** |
| **0** | **General – Device selection and use** | | | | | | |
| 0.1 | Persons could be injured when following a poor system of work in relation to the operation of this device. | Operating and Maintenance manual provided detailing specifications, limitations and residual hazards associated with the operation of the machine when used with the approved attachments. | M | Prepare a documented system of work having regard to the operating specification and limitations as detailed in the owners operating manual;<br><br>Verify that the procedure (including maintenance) covers all modes of operation of the telehandler and is a practicable solution;<br><br>Ensure operator's manual is with the telehandler at all times. | | | |
| 0.2 | Persons could be injured if the device is not suitable for the required task. | Machine specifications are included in operators manual. | M | Ensure that the unit is adequately rated in terms of capacity, height and reach, rated inclination and mass; having regard to the required task, the site conditions and the environment; | | | |
| 0.3 | Persons could be injured or injure others when operating the unit without sufficient information, instruction, training and supervision. | Operating and maintenance manual provided detailing specifications, limitations and residual hazards associated with the operation of the machine.<br><br>Warning in operators manual that the machine is to only be used by authorized personnel. | M | Ensure that all standard work procedures (SWP's) are effectively implemented;<br><br>Ensure that the operator(s) have read and understand the training and instructions (which must include Manufacturer's and local information). | | | |
| 0.4 | Injury as a result of site specific hazards. | General requirements and general list of site-specific hazards located in manual. | H | Ensure operators are able to identify particular hazards that may be encountered at the site and implement actions to ensure that they are addressed by appropriate means;<br><br>Ensure operators conduct a site hazard assessment before use;<br><br>Ensure operators implement appropriate systems to eliminate the hazards or adequately control the risks associated with the hazards identified;<br><br>Ensure operators feedback information relating to new hazards identified so they may be reviewed and measures implemented in a training package;<br><br>Ensure that if operators are uncertain how to address a particular site hazard that they seek advice from a competent person. | | | |
| 0.5 | Injury due to unauthorised use. | The operator's cabin is lockable. | M | Ensure that the unit is locked before leaving unattended;<br><br>Ensure that the machine is not lent or sub-hired to any unauthorized person;<br><br>Ensure that only authorized personnel use the telehandler. | | | |
| 0.6 | Injuries exacerbated as a result of insufficient communication, procedures or equipment following or during an emergency. | Instructions are included in the manual which describes the options for exit from the cabin in case of an emergency. | L | Ensure that operators are aware of the emergency procedures specified in the manual;<br><br>Establish and audit routine emergency procedures;<br><br>Ensure that all operators are equipped with portable communications equipment where necessary;<br><br>Establish protocols and procedures to ensure a timely and appropriate response in emergencies;<br><br>Ensure all operators report in when attending site and on a routine basis thereafter;<br><br>Periodically verify emergency equipment and supplies. | | | |

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| A | B | C | D | E | F | X | Y |
|---|---|---|---|---|---|---|---|
| **Hazard No.** | **Hazard Description -** | **Is there any risk?** | **Risk Level** | **Proposed SUPPLEMENTARY risk control measure** | **Are the control measures practicable?** Yes/No | **For Action by Whom** | **Confirmation that the necessary action has been completed** |
| | **(the situation or parts of plant which could cause injury or illness)** | **Describe the risk control measures ALREADY implemented** | | | | | |
| 0.7 | Failure due to unauthorized alteration or interference. | Note provided in operator's manual prohibiting unauthorized modification of the machine. | H | Seek advice for all modifications/repairs considered during life of machine;<br><br>Ensure that no additions or alterations are performed on the machine without written approval from engineering department. | | | |
| 0.8 | Injuries exacerbated as a result of working solo. | Instructions provided in AS2550.19 – 2007 clause 5.3 (h) regarding the assistance that shall be available to the operator as required. | H | Ensure that workers do not work solo;<br><br>Establish protocols and procedures to ensure a timely and appropriate response in emergencies in accordance with AS2550.19 requirements;<br><br>Ensure all operators report in when attending site and on a routine basis thereafter. | | | |
| 0.9 | Persons injured due to unrecognized hazard. | Preliminary hazard ID prepared and provided for review. | M | Ensure that each party performs their own risk assessment and does not rely on a risk assessment prepared or intended for other parties;<br><br>Update hazard ID as necessary;<br><br>Implement risk control measures as necessary having regard to the hierarchy of control measures available. | | | |
| 0.10 | Due to failure to observe or rectify safety upgrades from manufacturer. | Local importer keeps database of customers who purchased this model and attachments from them. | M | Ensure that the owner of each machine is registered with the manufacturer;<br><br>Periodically check the status in respect of safety bulletins or upgrades applying to the machine;<br><br>Ensure that safety upgrades provided by the manufacturer are implemented;<br><br>Ensure the manufacturer is advised when the machine is disposed of or sold. | | | |
| 0.11 | Strains/sprains when performing certain maintenance activities with the unit. | Maintenance instructions provided in operating and maintenance manual . | L | Establish appropriate work procedures for all anticipated maintenance issues arising;<br><br>Periodically review these SWP's. | | | |
| 0.12 | Persons may be injured as the result of poor maintenance and/or adjustment procedures. | Maintenance instructions provided in operating and maintenance manual . | H | Ensure that the unit is tested by a competent person prior to being returned to normal service after repairs and/or adjustment of critical components or systems. | | | |
| 0.13 | Persons injured handling heavy or unsupported items. | Notes in manual regarding the use of appropriate supports to be used when it is necessary to raise the boom during maintenance. | M | Instruct personnel in respect of proper maintenance procedures including the necessity to support items during maintenance. | | | |
| 0.14 | Persons could be injured if sunlight or bright lights in close proximity impair the operator's vision. | Sun shade option available. | L | Instruct the operator in relation to the sighting of lights;<br><br>Ensure that operators wear appropriate PPE depending on the site conditions. | | | |
| **1** | **Mechanical hazards (due to events that may arise during normal operation)** | | | | | | |
| **1.1** | **Crushing hazard** | | | | | | |

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| A | B | C | D | E | F | X | Y |
|---|---|---|---|---|---|---|---|
| **Hazard No.** | **Hazard Description -** | **Is there any risk?** | **Risk Level** | **Proposed SUPPLEMENTARY risk control measure** | **Are the control measures practicable?** Yes/No | **For Action by Whom** | **Confirmation that the necessary action has been completed** |
| | **(the situation or parts of plant which could cause injury or illness)** | **Describe the risk control measures ALREADY implemented** | | | | | |
| 1.1.1 | Operator is crushed as a result of operation – due to the load being lifted. | Operator's seat located in cabin and fitted with a seat belt. The lifting mechanism cannot be reached from the normal operating position.<br><br>The cabin is fitted with roll over protection.<br><br>Cabin affords operator protection from falling objects, FOPS level II.<br><br>ROPS & FOPS is tested and certified by manufacturer.<br><br>Facility provided for load backrest to be installed. | H | Ensure that operators, observe the surroundings and move at appropriate speeds;<br><br>Ensure that ground personnel are available to observe and take corrective action if necessary;<br><br>Ensure they are familiar with emergency operation procedures detailed in the operators manual;<br><br>Ensure that operators are trained with respect of load handling operations;<br><br>Ensure operators wear the seat belt when operating machine;<br><br>Ensure that the lifting mechanism is only operated from the operator's seat. | | | |
| 1.1.2 | Operator is crushed as a result of operation – in the lifting mechanism. | Operator's seat located in cabin and fitted with a seat belt. The lifting mechanism cannot be reached from the normal operating position. | H | Ensure operators wear the seat belt when operating machine;<br><br>Ensure that the lifting mechanism is only operated from the operator's seat. | | | |
| 1.1.3 | Operator is crushed as a result of operation – within attachment mechanism. | Attachments can be detached and exchanged for alternatives from the cabin without the need for the operator to be near the attachment.<br><br>Instructions provided in the operators manual for the correct procedure for connection of different attachments. | M | Ensure that operators are trained with respect of attachment interchange operations;<br><br>Ensure that ground personnel are available to observe and take corrective action if necessary; | | | |
| 1.1.4 | Operator is crushed as a result of operation – between telehandler and obstacles. | The normal operating position is within the cabin seated in the operator's seat with the seat belt fastened.<br><br>Safety interlock system validating operator's presence which automatically disengages transmission if operator is not seated properly. | M | Ensure that operators, observe the surroundings and move at appropriate speeds;<br><br>Ensure that ground personnel are available to observe and take corrective action if necessary;<br><br>Ensure they are familiar with emergency operation procedures detailed in the operators manual;<br><br>Ensure that operators are trained with respect of load handling operations;<br><br>Ensure operators wear the seat belt when operating machine. | | | |
| 1.1.5 | Operator is crushed as a result of operation – between telehandler and road wheels. | Controls comply with AS1418.19 – 2007 section 2.5<br><br>Parking brake fitted.<br><br>Normal operating position in the cabin away from hazard.<br><br>Safety interlock system validating operator's presence which automatically disengages transmission if operator is not seated properly. | M | Ensure the controls are maintained as per the maintenance instructions in the manual;<br><br>Ensure that the operator applies the parking brake when they leave the cabin. | | | |
| 1.1.6 | Personnel crushed in articulation area. | Telehandler is not articulated. | NA | | | | |
| 1.1.7 | Ground personnel crushed whilst machine is operating – in lifting mechanism. | Access to the boom articulation area is restricted due to the location.<br><br>Warning signs fitted which warn personnel to keep clear of telehandler when it is in use. | L | Ensure that personnel remain clear of the telehandler when in use. | | | |

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| A | B | C | D | E | F | X | Y |
|---|---|---|---|---|---|---|---|
| **Hazard No.** | **Hazard Description -** | **Is there any risk?** | **Risk Level** | **Proposed SUPPLEMENTARY risk control measure** | **Are the control measures practicable?** Yes/No | **For Action by Whom** | **Confirmation that the necessary action has been completed** |
| | **(the situation or parts of plant which could cause injury or illness)** | **Describe the risk control measures ALREADY implemented** | | | | | |
| 1.1.8 | Ground personnel crushed as a result of the attachment not being properly locked to the carriage. | The proper engagement of the locking device can be seen from the operator's position in the cabin when the booms are raised to approximately 10° (about 1.5m off the ground) , in accordance with AS1418.19 clause 2.7.7 (c).<br><br>Instructions are provided in the manual regarding the proper installation technique and includes checks to ensure the locking pin is inserted correctly. | L | Ensure that operators always check that the locking pin is inserted correctly after connecting different attachments. | | | |
| 1.1.9 | Bystanders or ground personnel are crushed within drum clamp mechanism during operation. (When used with Drum Clamp Attachment) | Mechanism can only be operated from the cabin position.<br><br>Good vision exists from the operating position to the clamping mechanism. | L | Ensure that personnel stand clear when the mechanism is in operation. | | | |
| 1.1.10 | Ground personnel crushed whilst machine is operating – between telehandler and obstacles. | Flashing light fitted to the cabin roof to increase the visibility of the telehandler to bystanders.<br><br>Horn fitted as per AS1418.19 – 2007 clause 2.11.4 to enable the operator to warn other personnel of impending collision.<br><br>Visibility provided for the operator as per AS1418.19 – 2007 clause 2.12.<br><br>Mirrors fitted on the machine.<br><br>Reversing camera offered as an option. | M | Ensure personnel stand clear of the telehandler when in operation;<br><br>Ensure that the windows are maintained in a clean condition;<br><br>If not fitted, consider fitting the cameras (reverse and/or side) which is offered by the manufacturer. | | | |
| 1.1.11 | Ground personnel crushed whilst machine is operating – between telehandler and road wheels. | Driver's position offers good vision.<br><br>Guards are fitted to the wheels in accordance with AS1418.19 clause 2.8.3. | H | Ensure personnel stand clear of the telehandler when in operation. | | | |
| 1.1.12 | Persons exposed to vehicular traffic while operating telehandler. | See clause 14.6.1. | | | | | |
| 1.1.13 | Ground personnel crushed while lifting machine. | Lifting instructions are provided in the manual.<br><br>Lift points are provided on the machine and are identified by labels.<br><br>The unladen mass of the telehandler is provided on the manufacturer's plate installed in the cabin. | L | Ensure that operators are aware of the precautions and operational requirements specified in the manual;<br><br>Ensure persons abide by the instructions<br><br>Ensure that the crane and lifting slings used to lift the machine has adequate capacity;<br><br>Ensure that the persons slinging the telehandler and operating the crane are competent and hold appropriate certificates of competency. | | | |
| 1.1.14 | Ground personnel crushed when machine is being loaded onto a truck or float via ramps. | Loading instructions are provided in the manual which include precautions and warnings. | M | Ensure that operators are aware of the precautions and operational requirements specified in the manual;<br><br>Ensure persons abide by the instructions<br><br>Ensure that the ramps provided are suited to the vehicle and the gradient is not exceeded. | | | |
| 1.1.15 | Persons or property injured when telehandler falls off truck while being transported. | Tie down points are provided on the telehandler and identified with labels.<br><br>Instructions are provided in the manual to properly tie down the machine during transport. | M | Ensure that operators are aware of the precautions and operational requirements specified in the manual;<br><br>Ensure persons abide by the instructions<br><br>Ensure that the chains and wheel chocks are provided and used to secure the unit to the vehicle tray. | | | |

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| | **(the situation or parts of plant which could cause injury or illness)** | **Describe the risk control measures ALREADY implemented** | | | | | |
| 1.1.16 | Persons crushed by booms and lifting mechanism whilst performing maintenance. | Maintenance able to be performed at ground level.<br><br>Boom support provided for maintenance purposes.<br><br>Instructions for the use of the boom support are included in the manual. | H | Train operators to be aware of these hazards;<br><br>Ensure maintenance personnel always chock the booms when performing maintenance. | | | |
| 1.1.17 | Operator's fingers crushed by closing door. | Door seals provide some cushioning effect. | L | Train operators with respect to this hazard. | | | |
| **1.2** | **Shearing hazard** | | | | | | |
| 1.2.1 | Shearing hazard at boom articulation joints. | Warning decals fitted at shear hazard locations.<br><br>Operator located away from hazard during normal operation.<br><br>Joint clearance distances provided in accordance with AS1418.19 clause 2.8.5. | M | Ensure personnel are trained and aware of this hazard and keep clear of the telehandler when it is in operation. | | | |
| 1.2.2 | Shearing hazard within attachment mechanism | Attachments can be coupled to the telehandler by the operator while in the normal operating position in the cabin away from the danger zone. | M | Ensure personnel stay clear of the attachment when it is being coupled to the telehandler. | | | |
| **1.3** | **Cutting or severing hazard** | | NS | | | | |
| **1.4** | **Entanglement hazard** | | | | | | |
| 1.4.1 | Operator becomes entangled with components in the engine compartment. | All rotating parts are suitably enclosed and guarded against possible entanglement. | M | Ensure that covers are always in place prior to operation. | | | |
| **1.5** | **Drawing-in or trapping hazard** | | NS | | | | |
| **1.6** | **Impact hazard** | | | | | | |
| 1.6.1 | Operator suffers impact injury when the telehandler is being driven. | Seat belt provided which complies with ISO6683.<br><br>Operator's seat provided which offers support to the operator when in the driving position.<br><br>Fully enclosed operators cabin fitted which provides protection against impacts and collisions.<br><br>Steering controls are fitted which enable the operator to control the steering direction precisely.<br><br>Braking system fitted which complies with AS1418.19 – 2007 clause 2.4.<br><br>Mud guards are fitted to prevent rocks and debris from being thrown up by the wheels and striking the operator. | M | Ensure that the seat, seat belts, brakes, steering controls and other systems are maintained in accordance with the manufacturers recommendations<br><br>Ensure that the operator wears the seat belt whenever driving the telehandler. | | | |
| 1.6.2 | When the telehandler is unattended. | Telehandler cabin is lockable and an ignition key switch is also fitted to prevent unauthorised use. | L | Ensure the machine is locked when unattended. | | | |
| 1.6.3 | Impact injuries from falling objects including load being handled. | Operator's seat located in cabin and fitted with a seat belt.<br><br>The cabin is fitted with roll over protection which has been tested in accordance with EN/ISO 3471:2008.<br><br>Cabin affords operator protection from falling objects, tested in accordance with EN/ISO 3449:2009, level II.<br><br>ROPS & FOPS is tested and self-certified by manufacturer.<br><br>Facility provided for load backrest to be installed. | M | Ensure that loads are handled at speeds recommended by the manufacturer;<br><br>Ensure that only properly balanced loads are handled;<br><br>Ensure that the telehandler is operated by suitably trained and qualified personnel.<br><br>Consider fitting of a load backrest where possible. | | | |

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| | **(the situation or parts of plant which could cause injury or illness)** | **Describe the risk control measures ALREADY implemented** | **Risk Level** | **Proposed SUPPLEMENTARY risk control measure** | **Are the control measures practicable?** Yes/No | **For Action by Whom** | **Confirmation that the necessary action has been completed** |
| 1.6.3.1 | Impact from drums falling through drum clamp arms. (when used with Drump clamp attachment) | Clamping force pressure retention checked as part of attachment testing in compliance with AS1418.19 clause 2.7.7(b). | M | Ensure that the clamping mechanism is maintained as detailed in the operator's manual. | | | |
| **1.7** | **Stabbing or puncture hazard** | | NS | | | | |
| **1.8** | **Friction or abrasion hazard** | | NS | | | | |
| **1.9** | **High pressure fluid injection hazard** | | | | | | |
| 1.9.1 | Injury as a result of a high pressure hydraulic leak while operating the unit. | Operator is located in the fully enclosed cabin away from hydraulic components.<br><br>A pressure relief valve is installed which limits the maximum system pressure.<br><br>Pipes and connections designed for twice maximum pressure.<br><br>Burst pressure of hoses at least three times the maximum pressure.<br><br>All other components are designed to withstand the pressures they are likely to experience including, during set-up, testing, inspection and normal maintenance.<br><br>A pressure gauge connection port is provided on the manifold block allowing maintenance personnel check and set the pressure relief valve correctly. | M | Ensure that personnel are properly trained and aware of the hazard;<br><br>Hydraulic Hose burst sleeves can be fitted on external exposed hydraulic hoses<br><br>Ensure that hoses and pipes are replaced with suitably rated items when required;<br><br>Ensure that the correct pressure setting is maintained as per the operation manual instructions. | | | |
| 1.9.2 | Injury as a result of a high pressure hydraulic leak while maintaining the unit. | | M | Ensure that personnel are trained with respect of this hazard and do not place hands or other body parts in front of escaping hydraulic fluid. | | | |
| 1.9.3 | Injury during hydraulic maintenance of high pressure sources such as accumulators. | Hydraulic circuit diagram provided in manual. | M | Ensure that only properly trained personnel attempt any maintenance on the telehandler;<br><br>Ensure that only trained technicians are involved with the maintenance of the accumulator. | | | |
| **1.10** | **Ejection of parts** | | NS | | | | |
| **1.11** | **Loss of stability (of machinery and machine parts)** | See section 16.1. | | | | | |
| **1.12** | **Slip, trip and fall hazards** | | | | | | |
| 1.12.1 | Operator slips and falls while entering or exiting the cabin. | Access steps comply with AS1418.19 – 2007 clause 2.8.2.<br><br>Grab handles are fitted on either side of the door to provide three points of contact while accessing or egressing from the cabin. | M | Ensure that access points and steps are maintained and free of obstacles, slick surfaces and slip resistant;<br><br>Ensure that damaged steps are repaired or replaced as required. | | | |
| 1.12.2 | Falling whilst performing maintenance checks. | Pre-operational checks able to be performed at ground level. | M | Ensure that appropriate equipment is used during maintenance where access at height is required. | | | |
| **2** | **Electrical hazards** | | | | | | |
| **2.1** | **Electrical contact (direct or indirect)** | | | | | | |
| 2.1.1 | Persons could be injured due to contact or approach to live overhead electrical apparatus. | Legislative requirements to maintain clearances see figure 5.7.3 in AS2550.19.<br><br>Warnings in AS2550.19 clause 4.9.1(a). | H | Ensure persons observe the limits of approach as specified by regulation and as indicated on the signs attached. | | | |

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| | **(the situation or parts of plant which could cause injury or illness)** | **Describe the risk control measures ALREADY implemented** | | | | | |
| 2.1.2 | Due to improper procedures following contact with live conductors. | See AS2550.19 clause 5.7.4 for requirements if contact is made with live conductors. | H | Ensure that all personnel are trained and aware of the necessary procedures required following the accidental contact with live overhead conductors;<br><br>Ensure that the unit is withdrawn from service and appropriately assessed by a competent person;<br><br>Immediately isolate the unit for 24 hours. | | | |
| 2.1.3 | Persons could be injured if struck by lightning | | M | Ensure telehandler is not used during storms. | | | |
| **2.2** | **Electrostatic phenomena** | | NS | | | | |
| **2.3** | **Thermal radiation** | | NS | | | | |
| **2.4** | **External influences on electrical equipment** | | | | | | |
| 2.4.1 | Control malfunction as a result of external influences. | The electrical installation is designed to comply with the requirements of the EMC directive (2004/108/EC) and so is not easily susceptible to interference. Individual manufacturers have provided EMC certificates for their parts and therefore do not constitute a risk. | L | Ensure that the Telehandler is not used in environments which include strong electro-magnetic fields. | | | |
| **3** | **Thermal hazards** | | | | | | |
| **3.1** | **Burns and scalds by possible contact of persons with flames or explosions and also with radiation from heat sources** | | | | | | |
| 3.1.1 | During work in an explosive atmosphere. | Warning in the manual not to operate telehandler in an explosive environment unless the machine is suitably modified by an authorized agent of the manufacturer. | M | Ensure unit is not used in a hazardous environment. | | | |
| 3.1.2 | During refueling. | Refueling procedures are included in the manual. | L | Ensure refueling procedures listed in manual are followed when refueling. | | | |
| 3.1.3 | Contact with hot engine components. | Engine is covered; exhaust pipe is out of reach of the normal operating operator's position. | L | Ensure properly trained personnel are the only personnel involved in checking engine components. | | | |
| 3.1.4 | Batteries explode due to sparks induced during maintenance. | Warning in manual regarding the dangers of sparks etc. near batteries. | M | Ensure that only trained personnel conduct maintenance on or near batteries. | | | |
| 3.1.5 | Maintenance personnel suffer burns as a result of exposure to hot oil. | | L | Ensure personnel wear appropriate PPE while performing maintenance with hot oil.<br><br>Ensure that personnel are trained and aware of this hazard. | | | |
| **3.2** | **Health-damaging effects from hot or cold work environment** | | | | | | |
| 3.2.1 | Operator injured due to extreme cold temperatures. | Heater fitted in cabin as standard.<br><br>Cabin is fully enclosed.<br><br>Controls are designed so that they may be operated while wearing gloves. | L | Ensure operators are provided the appropriate PPE for the working environment.<br><br>Ensure that the period of exposure is kept within acceptable levels. | | | |
| 3.2.2 | Operator injured due to extreme hot temperatures. | Air conditioning available as an option.<br><br>Sun shades are available as an option. | L | Consider the fitment of AC & sun shades as standard features for Australian market.<br><br>Ensure operators are provided the appropriate PPE for the working environment.<br><br>Ensure that the period of exposure is kept within acceptable levels. | | | |
| **4** | **Hazards generated by noise** | | | | | | |
| **4.1** | **Hearing loss (deafness), other physiological disorders (e.g. loss of balance, loss of awareness, etc.)** | | | | | | |

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| | **(the situation or parts of plant which could cause injury or illness)** | **Describe the risk control measures ALREADY implemented** | **Risk Level** | **Proposed SUPPLEMENTARY risk control measure** | **Are the control measures practicable?** Yes/No | **For Action by Whom** | **Confirmation that the necessary action has been completed** |
| 4.1.1 | Noise generated by telehandler causes hearing loss to operator. | The maximum continuous A-weighted sound pressure level measured inside the machine cabin is dB and is measured in accordance with EN12053. | M | Ensure that if noise exposure exceeds acceptable levels that either ear protection is worn and/or the operators are removed from the noisy environment;<br><br>Ensure that the exhaust muffler is maintained in good condition. | | | |
| 4.1.2 | Noise generated by telehandler causes hearing loss to bystanders. | The maximum guaranteed sound power level is dB (A) and complies with the essential health and safety requirements of European Directives 2006/42/EC and 2004/108/EC. | M | Competent person to assess the noise impact on bystanders taking into consideration the environment and other machines operating nearby;<br><br>Ensure that the exhaust muffler is maintained in good condition. | | | |
| **4.2** | **Interference with speech communication, acoustic signals, etc.** | | | | | | |
| 4.2.1 | Injuries exacerbated as a result of insufficient communication procedures or equipment. | The maximum continuous A-weighted sound power level measured on the machine is less than dB (A). This is not sufficient to block the acoustic signals on the machine nor is it sufficient to drown out a shouted warning. Since the Engine, the main source of noise is covered; verbal communication will not be hindered. | M | Establish and audit routine emergency procedures;<br><br>Ensure that all operators are equipped with portable communications equipment where necessary;<br><br>Establish protocols and procedures to ensure a timely and appropriate response in emergencies;<br><br>Ensure all operators report in when attending site and on a routine basis thereafter. | | | |
| **5** | **Hazards generated by vibration** | | | | | | |
| **5.1** | **Vibration caused by machinery** | | | | | | |
| 5.1.1 | Vibration caused by engine. | The vibration measured at the upper limbs does not exceed 2.5 $m/s^2$ (RMS) and the vibration exerted on the operator's body does not exceed 0.5 $m/s^2$ (RMS). | L | Ensure that use of the machine in continuous shifts is limited to prevent operator fatigue which may result from exposure to machine vibration. | | | |
| **6** | **Hazards generated by radiation** | | | | | | |
| **6.1** | **Electrical arcs** | | NS | | | | |
| **6.2** | **Lasers** | | NS | | | | |
| **6.3** | **Ionizing radiation sources** | | NS | | | | |
| **6.4** | **Machines using high-frequency electromagnetic fields** | | | | | | |
| 6.4.1 | Uncontrolled motions in high-frequency electromagnetic fields. | See clause 2.4.1. | | | | | |
| **7** | **Hazards generated by materials and substances processed, used or exhausted by machinery** | | | | | | |
| **7.1** | **Hazards resulting from contact with or inhalation of harmful fluids, gases, mists, dusts and fumes** | | | | | | |
| 7.1.1 | Persons could be injured if the unit is operated indoors without adequate ventilation. | Fully enclosed cabin is fitted which has ventilation filters.<br><br>Note in AS2550.19 clause 4.8 regarding the additional ventilation that shall be provided when the telehandler is used in a poorly ventilated location. | M | Ensure that the unit is operated only in well-ventilated areas;<br><br>Ensure that ventilation filters are maintained as per the manufacturer's instructions. | | | |
| 7.1.2 | Persons could be injured by inhaling exhaust gases during normal operation. | Exhaust is directed away from the operator's positions.<br><br>Fully enclosed cabin is fitted which has ventilation filters. | L | Ensure exhaust system and cabin ventilation filters are maintained in accordance with manufacturer's requirements;<br><br>Ensure that all personnel are aware of the hazard and take appropriate action. | | | |

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| **7.2** | **Fire or explosion hazard** | | | | | | |
| 7.2.1 | During refueling. | See clause 3.1.2. | | | | | |
| 7.2.2 | During battery maintenance. | See clause 3.1.4. | | | | | |
| **7.3** | **Biological and microbiological (viral or bacterial) hazards** | | NS | | | | |
| **8** | **Hazards generated by neglecting ergonomic principles in machine design (mismatch of machinery with human characteristics and abilities)** | | | | | | |
| **8.1** | **Unhealthy postures or excessive efforts.** | | | | | | |
| 8.1.1 | Due to operating position. | Seat fitted which provides adequate adjustments to cater for different body dimensions.<br><br>Controls are positioned to provide comfortable body positions during normal operation. | L | Ensure that shift durations are not too long. | | | |
| **8.2** | **Inadequate consideration of human hand-arm or foot-leg anatomy.** | | | | | | |
| 8.2.1 | Due to pedal and control positions. | Cabin layout designed taking into account ergonomic principles.<br><br>A variety of different seat options are available from the manufacturer. | L | Ensure that if an operator is uncomfortable using the standard operator's seat than an alternative is sourced from the manufacturer which provides better adjustment range. | | | |
| **8.3** | **Neglected use of personal protection equipment** | | | | | | |
| 8.3.1 | Persons could be injured due to exposure to UV. | Cabin sun shades are available as an option from the manufacturer. | L | Consider the fitment of the optional sun shades when purchasing the telehandler;<br><br>Develop and provide specification for appropriate UV protection and its use;<br><br>Provide UV protective equipment;<br><br>Instruct operators on the requirements for its use. | | | |
| 8.3.2 | Persons could be injured if equipment is operated while not wearing appropriate PPE. | Requirement for PPE specified in AS2550.19 clause 5.3. | M | Provide specification for appropriate PPE including gloves, safety glasses, hard hat and safety footwear as appropriate;<br><br>Instruct operators on the requirements for its use.<br><br>Ensure PPE is inspected and certified on a routine basis. | | | |
| **8.4** | **Inadequate area lighting** | See section 12.1. | | | | | |
| **8.5** | **Mental overload or under load, stress, etc.** | | | | | | |
| 8.5.1 | Persons could be injured if the operator's performance was inhibited by excessive fatigue. | Warning in manual not to operate machine whilst fatigued. | M | Implement a system to ensure that operators do not work excessive or continuous shifts and manage peak demands.<br><br>Ensure that operators do not continue use of the equipment if they feel tired or are suffering from fatigue. | | | |
| **8.6** | **Human error** | | | | | | |
| 8.6.1 | Injury due to "horse play" or inappropriate use. | Note in manual that the machine should be used by properly qualified and trained staff. | M | Ensure operators do not engage in horse play or stunt driving;<br><br>Ensure that only properly trained personnel use the telehandler. | | | |
| 8.6.2 | Persons could be injured if the unit is operated by persons under the influence of drugs and/or alcohol. | | M | Ensure that operators do not use the equipment while under the influence of alcohol or drugs.<br><br>Instruct the operator that operation while under the influence of alcohol or drugs are prohibited. | | | |
| 8.6.3 | Persons could be injured if the operator's performance is inhibited by poor health or medication with side effects. | | M | Instruct the operator that he/she must report to the supervisor if suffering poor health and safe operating performance could be affected. | | | |

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| 8.6.4 | Persons could be injured from incorrect control selection. | The direction of movement resulting from each control is clearly indicated on an instruction sheet in the cabin (with loadcharts) and in the operators manual.<br><br>Controls are arranged for logical operation as far as possible.<br><br>Comprehensive instructions are provided in the operator's manual regarding the control functions.<br><br>Note in manual that the machine should be used by properly qualified and trained staff. | M | Ensure that only properly trained personnel are permitted to operate the telehandler. | | | |
| 8.6.5 | Failure to apply parking brake when leaving the cabin. | A warning audible signal warns the operator when he leaves the seat without engaging the handbrake.<br><br>The transmission automatically desengage after 2 seconds when the operator leaves the seat.<br><br>The Park Brake automatically engages when the engine is switched off. | L | Ensure that the safety systems are maintained in accordance with the manufacturer's recommendations. | | | |
| 8.6.6 | Persons could be injured if a machine that is known to be faulty is operated. | | L | A "Danger – Don't Use" tag should be attached if the Telehandler or equipment thereon is faulty;<br><br>Remove device from use;<br><br>Execute repairs; | | | |
| **9** | **Hazard combinations** | | | | | | |
| 9.1 | | Risks are not increased by the combination of the hazards which are considered in isolation. | NS | | | | |
| **10** | **Hazards caused by failure of energy supply, breakdown of machinery parts, and other functional disorders** | | | | | | |
| **10.1** | **Failure of energy supply (of energy and/or control circuits)** | | | | | | |
| 10.1.1 | Uncontrolled motions due to control system failure. | Solenoid control valves stop movement on power failure.<br><br>Emergency stop push button fitted at cabin controls. | M | Ensure that the operators perform the pre-operational checks in accordance with the instructions contained within the operators manual;<br><br>Ensure that all control system faults are logged and reported to service personnel;<br><br>Ensure that the telehandler is not operated if any faults exist. | | | |
| 10.1.2 | Uncontrolled travel movement in case of failure of energy supply. | Emergency stop push button fitted at cabin controls. | L | Ensure that the machine is maintained in accordance with the manufacturer's instructions. | | | |
| 10.1.3 | Failure of control circuit due to poor design of electrical circuits. | Electrical circuits designed using well tried and tested principles by experienced manufacturer. | L | Ensure that all inspections and tests are carried out in accordance with the manual. | | | |
| 10.1.4 | Failure of control circuit due to poor design of load management system. | Load management system undergoes extensive testing during design phase.<br><br>QA testing conducted on every machine before it leaves the factory. | L | Ensure that the machine is maintained in accordance with the manufacturer's instructions. | | | |
| **10.2** | **Unexpected ejection of machine parts or fluids** | | | | | | |

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| 10.2.1 | Boom lowering as a result of hose failure. | Load holding valves fitted to all load holding cylinders.<br><br>Inspection of all hoses and pipes is required by qualified maintenance personnel as per AS2550.19. | L | Ensure that hydraulic system is maintained in accordance with manufacturer's instructions. | | | |
| 10.2.2 | Injury as a result of accumulated deterioration during long term storage. | | M | Ensure that an annual inspection is comprehensively performed before returning the unit to service. | | | |
| **10.3** | **Failure/malfunction of control system** | Emergency stop switch fitted at the control position.<br><br>Control systems designed in accordance with AS1418.19 clause 2.5 & EN15000. | L | Ensure that all pre-operational inspections are performed in accordance with the manufacturer's instructions prior to use;<br><br>Ensure that all control system faults are logged and reported to service personnel;<br><br>Ensure that the telehandler is not operated if any faults exist. | | | |
| **10.4** | **Errors of fitting** | | | | | | |
| 10.4.1 | Error due to incorrect hose connections following repairs. | Maintenance manual provided which covers anticipated aspects of maintenance required for telehandler. | L | Ensure that only qualified service personnel are charged with the maintenance of the telehandler.<br><br>Ensure that full functional checks are carried out following hydraulic repairs. | | | |
| 10.4.2 | Attachment becomes detached from telehandler due to incorrect fitting by operator. | Instructions given in manual for the correct fitting procedure for attachments.<br><br>Separate locking mechanism provided which prevents pin from coming loose once it is engaged. | M | Ensure that only trained operators are permitted to use telehandler;<br><br>Ensure operators are properly trained to connect attachments. | | | |
| **10.5** | **Overturn, unexpected loss of machine stability** | See section 16.1. | | | | | |
| **11** | **Hazards caused by (temporary) missing and/or incorrectly positioned safety- related measures/means** | | | | | | |
| **11.1** | **All kinds of guards** | | | | | | |
| 11.1.1 | Guard on engine missing | Lock provided on engine bonnet.<br><br>Engine compartment fitted with some guards to prevent operator from injury | M | Ensure that engine boonnet is not removed and only opened by authorised / trained personnel.<br><br>Ensure that guards are not removed, or altered. | | | |
| **11.2** | **All kinds of safety-related (protection) devices** | | | | | | |
| 11.2.1 | Due to safety switches being overridden or missing. | Warning in manual not to modify the forklift in any way without written approval of the manufacturer | M | Ensure that safety devices are not tampered with and are in good condition before use of machine.<br><br>If any faults are discovered do not use machine until all faults are rectified. | | | |
| **11.3** | **Starting and stopping devices** | | | | | | |
| 11.3.1 | Emergency stop switches malfunction or missing components. | | M | Ensure that the pre-start inspection checks are performed as per instructions in manual. | | | |
| **11.4** | **Safety signs and signals** | | | | | | |
| 11.4.1 | Personnel injured due to missing or illegible safety signs. | Note in manual that safety stickers should be kept in prime condition and must always be present on the machine. | M | Conduct pre-operational checks which include safety stickers;<br><br>Maintain signs and replace as necessary. | | | |
| **11.5** | **All kinds of information or warning devices** | | | | | | |
| 11.5.1 | Operations manual missing from machine. | Facility provided in cabin to enable storage for the operator's manual. | M | Ensure that the operators check that the operations manual is present before operating telehandler. | | | |
| **11.6** | **Energy supply disconnecting devices** | | NS | | | | |

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|---|---|---|---|---|---|---|---|
| **Hazard No.** | **Hazard Description -** | **Is there any risk?** | | | | | |
| | **(the situation or parts of plant which could cause injury or illness)** | **Describe the risk control measures ALREADY implemented** | **Risk Level** | **Proposed SUPPLEMENTARY risk control measure** | **Are the control measures practicable?** Yes/No | **For Action by Whom** | **Confirmation that the necessary action has been completed** |
| **11.7** | **Emergency devices** | | | | | | |
| 11.7.1 | Emergency stop missing. | Emergency stop switch located in cabin. | L | Ensure that emergency stop switch is present and functions correctly before use of telehandler (Pre-operational check). | | | |
| **11.8** | **Feeding/removal means of work pieces** | | NA | | | | |
| 11.9 | Essential equipment and accessories for safe adjusting and/or maintaining | | L | Ensure that the instructions included in the maintenance manual are followed;<br><br>Ensure that only genuine spare parts are used for replacement. | | | |
| 11.10 | Equipment evacuating gases, etc. | Exhaust pipe is directed away from the operator cabin. | L | Ensure that the exhaust system is maintained in accordance with the maintenance instructions provided by the manufacturer. | | | |
| **12** | **Inadequate lighting of moving/working area** | | | | | | |
| 12.1 | Collision with structures, objects or ground personnel due to inadequate lighting of work site. | Road and Work lights are fitted to the telehandler. | M | Ensure that sufficient lighting is provided;<br><br>Ensure that operators do not use the machine if the lighting is insufficient or becomes insufficient during the performance of the job. | | | |
| **13** | **Hazards due to sudden movement/instability during handling** | | | | | | |
| 13.1 | Telehandler tips due to tyre failure. | Tyre inspection required as part of periodic maintenance schedule, every 10 hours of operation.<br><br>Warning in manual to not use the Telehandler if the tyres are incorrectly inflated, damaged or excessively worn. | M | Ensure that operators perform checks of the tyres before operating telehandler;<br><br>Ensure that the telehandler is not operated if the tyres are in an unsuitable condition. | | | |
| **14** | **Inadequate/non-ergonomic design of driving/operating position** | | | | | | |
| 14.1 | Hazards due to dangerous environments (contact with moving parts exhaust gases, etc.) | Control position located away from hot parts and exhaust gases.<br><br>Exhaust outlet points away from operating position.<br><br>Engine fitted with covers to prevent contact with moving parts and or hot exhaust system. | L | Ensure that covers are maintained in the original condition;<br><br>Ensure the machine is not used if the covers are damaged or missing. | | | |
| 14.2 | Inadequate visibility from driver's/operator's position | Operator's position in cabin offers a good position to see all necessary parts of the telehandler structure and load.<br><br>Windscreen wipers provided to clear rain from the front and rear window.<br><br>Demister provided to clear the fogged front window.<br><br>Window provided in roof to aid the visibility of the load in the raised position.<br><br>Note in manual that the operator is to keep the machine in a clean condition. | L | Ensure that wipers and demisters are maintained in accordance with the manufacturer's recommendations;<br><br>Ensure the telehandler is kept in a clean condition. | | | |
| 14.3 | Inadequate seat/seating (seat index point) | See clause 8.1.1. | | | | | |
| 14.4 | Inadequate/non-ergonomic design/positioning of controls | See clause 8.2.1. | | | | | |
| 14.5 | Starting/moving of self-propelled machinery | Safety system fitted which disengages the transmission after 2 seconds when the operator leaves the normal driving position (seat). | M | Ensure the work area is controlled at all times so that other ground personnel are not permitted to enter the area around the operation of the telehandler unless under emergency conditions. | | | |
| **14.6** | **Road traffic of self-propelled machinery** | | | | | | |

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| | **(the situation or parts of plant which could cause injury or illness)** | **Describe the risk control measures ALREADY implemented** | | | | | |
| 14.6.1 | Injury as a result of collision with other vehicular traffic while at work site. | A flashing light is fitted to the cabin roof to increase the visibility of the telehandler to surrounding traffic. | M | Ensure the flashing light is fitte dto the cabin roof and in correct functionning order.<br><br>Implement a traffic management system;<br><br>Ensure a traffic management system is enforced, should the telehandler be exposed to vehicular traffic. | | | |
| 14.6.2 | Injury when travelling on public roads. | A flashing light is fitted to the cabin roof to increase the visibility of the telehandler to surrounding traffic.<br><br>AS2550.19 section 2 states that: where operation occurs on public roads a traffic management plan shall be developed and implemented. | M | Ensure that if the telehandler is to be driven on public roads that a traffic management plan is developed and implemented. | | | |
| 14.7 | Movement of pedestrian-controlled machinery | | NA | | | | |
| **15** | **Mechanical hazards (due to failure of systems or devices)** | | | | | | |
| **15.1** | **Hazards to exposed persons due to uncontrolled movement** | | | | | | |
| 15.1.1 | Booms lower due to hose failure. | See clause 10.2.1. | | | | | |
| 15.1.2 | Personnel exposed to hazards as a result of brake system failure. | An Emergency Stop button is fitted in the cabin to apply the park brake and stop the machine.<br><br>A sensor is fitted which alerts the operator if the brake fluid falls below the critical level.<br><br>A hydrostatic transmission is fitted which is capable of retarding the motion of the machine. | M | Ensure that the necessary checks are performed on the brake system as described in the manual. | | | |
| **15.2** | **Hazards due to break-up and/or ejection of parts** | | | | | | |
| 15.2.1 | Structural failure due to thermal expansion of hydraulic oil if telehandler is left fully raised for a long period. | Load holding cylinders fitted with over-center valves which provide thermal relief. | L | Ensure that hydraulic system is maintained in accordance with manufacturer's instructions. | | | |
| 15.2.2 | Structural failure of telehandler due to inappropriate long term storage. | Pre-operation checks included in the operator's manual.<br><br>Maintenance schedule included in th eoperator's manual. | M | Ensure the necessary checks and maintenance are performed as per manufacturer instructions prior to the machine returning to service. | | | |
| 15.2.3 | Structural failure of attachments due to careless storage when not in use. | Pre-use checks of the attachment included in the operator's manual. | M | Ensure the necessary checks and maintenance are performed as per manufacturer instructions prior to the attachment returning to service. | | | |
| **15.3** | **Hazards due to rolling over (roll over protection – ROP)** | | | | | | |
| 15.3.1 | Operator injured as a result of telehandler roll over. | ROPS certified cabin is fitted which complies with ISO3471. | M | Ensure that the ROPS cabin is not altered in any way. | | | |
| 15.3.2 | Operator unable to exit from the cabin as a result of damage caused by a roll over. | There are two separate emergency exits provided on the telehandler which are identified in the manual. | M | Ensure the operator is trained with respect to the emergency exits available and the correct operation. | | | |
| **15.4** | **Hazard due to falling objects (falling object protection – FOP)** | | | | | | |
| 15.4.1 | Operator struck by falling objects. | The cabin is designed and tested to provide FOPS protection in accordance with ISO3449 for level II. | M | Ensure that the ROPS cabin is not altered in any way. | | | |
| 15.4.2 | Ground crew or passerby being struck by falling objects. | Note in manual that personnel are not permitted to enter the working area. | M | Barricade area from public access;<br><br>Ensure that materials do not exceed the confines of the forks or attachment and load backrest. | | | |
| **15.5** | **Inadequate means of access** | See clause 8.1.1. | | | | | |
| **15.6** | **Hazards caused due to towing, coupling, connecting, transmission** | | | | | | |
| 15.6.1 | Injury from unsecured vehicle whilst transporting. | Tie down lugs fitted to chassis and are marked.<br><br>Instructions for transportation included in operator's manual. | M | Ensure that the unit is secured in accordance with the requirements in the manual and the local transport regulation. | | | |

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| | **(the situation or parts of plant which could cause injury or illness)** | **Describe the risk control measures ALREADY implemented** | | | | | |
| 15.6.2 | Injury from unsecured vehicle whilst towing. | Tow point fitted to chassis and is marked.<br><br>Instructions for towing included in operators manual. | M | Ensure that the instructions provided in the operator's manual are followed. | | | |
| **15.7** | **Hazards due to batteries, fire, emissions, etc.** | | | | | | |
| 15.7.1 | During battery maintenance. | See section 3.1.4. | | | | | |
| **16** | **Hazards due to lifting operation** | | | | | | |
| **16.1** | **Lack of stability** | | | | | | |
| 16.1.1 | Lack of stability due to overload. | Stability testing conducted in accordance with AS1418.19 appendix B & appendix D which includes overloads of 1.33 (75% of tipping load) for fixed attachments & 1.5 (66.7% of tipping load) for pick & carry positions for freely suspended loads.<br><br>Load charts developed from stability test results to ensure the correct stability margins are maintained in accordance with AS1418.19 appendix B.<br><br>Stability testing conducted for all approved attachments as listed on the loadcharts fitted to the telehandler.<br><br>Load charts are installed in cabin for all approved attachments.<br><br>Longitudinal stability indicator & limiter fitted in accordance with EN15000 clauses 5.2 & 5.3.<br><br>Boom length & angle indicators fitted to aid the operator in correctly positioning the load according to the load chart. | L | Ensure that only trained personnel are permitted to operate the telehandler;<br><br>Ensure that only authorised attachments are used;<br><br>Ensure that the correct load charts are fitted to the telehandler prior to use;<br><br>Ensure that the operator respects the load charts at all times;<br><br>Ensure that the telehandler is not used to pull fixed loads which are stuck in the ground, e.g. stumps or posts;<br><br>Ensure that the load management system is maintained as described in the operator's manual. | | | |
| 16.1.2 | Lack of stability during travelling. | Machine stability tested extensively by independent third party engineer in accordance with AS1418.19 for all approved attachments.<br><br>Load charts are provided for all approved attachments which list the slope and speed limits.<br><br>Instructions provided in AS2550.19 clause 5.4. | M | Ensure that only trained personnel are permitted to operate the telehandler;<br><br>Ensure that the telehandler is operated in accordance with the instructions provided in the manual and within the limits provided on the load charts. | | | |
| 16.1.3 | Lack of stability due to operation on excessive slope. | Maximum permitted slopes for pick & place and pick & carry operations are listed on the load charts.<br><br>Stability testing conducted on the maximum permitted slopes as listed on the load charts.<br><br>Lateral stability tests conducted on slopes as listed in AS1418.19 appendix D which exceeds those permitted for operation.<br><br>Instructions provided in AS2550.19 clause 5.4.3 & 5.4.4 regarding the operation when slopes exceed 1%. | M | Ensure that only trained personnel are permitted to operate the telehandler;<br><br>Ensure the operator does not use the telehandler to lift loads on slopes which exceed the maximum permitted slopes as listed on the load charts. | | | |

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| | **(the situation or parts of plant which could cause injury or illness)** | **Describe the risk control measures ALREADY implemented** | | | | | |
| 16.1.4 | Lack of stability due to incorrect tyres being fitted to telehandler. | Approved tyres have been tested according to the stability requirements of AS1418.19 appendix B & appendix D.<br><br>The approved tyres are listed on the load charts and/or referenced in th eoperator's manual along with the tyre pressure.<br><br>A list of approved tyres is included in the operator's manual. | M | Ensure that only approved tyres are used on the telehandler. | | | |
| 16.1.5 | Lack of stability due to dynamic effects when boom movement is stopped suddenly. | EN15000 system fitted which slows the boom movement just before it stops if the controls are released or the LMS stops the boom extending into a load zone which is not permitted.<br><br>Load factors used in stability testing are intended to account for the dynamic effects during load handling. | L | Ensure that travel movements are performed at speeds which do not cause instability. | | | |
| 16.1.6 | Lack of stability due to low tyre pressure. | Decals fitted to the wheels which list the correct tyre pressure.<br><br>Warning in manual that tyres are to be inflated to the pressure as listed in the manual. | M | Ensure that the tyres are inflated to the minimum inflation pressure as listed in the instruction manual prior to operation. | | | |
| 16.1.7 | Lack of stability due to excessive wind speed. | The maximum permitted wind speed is listed on the load charts, 10 m/s.<br><br>A warning is given in the operator's manual against use of the telehandler if the wind speed exceeds 10 m/s.<br><br>A copy of the beufort scale is provided in the manual and in the operator's cabin to assist in determining the wind speed.<br><br>Warning in manual that the operator shall never attach components or materials which increase the wind load due to the sail effect. | M | Ensure that operators are familiar with using the beufort scale to estimate wind speeds;<br><br>Ensure that operators are trained and are aware of this hazard. | | | |
| 16.1.8 | Lack of stability due to use of incompatible or unauthorised load attachment. | Load charts are provided for approved attachments.<br><br>Warnings in the manual not to use attachments which have not been authorized for use. | M | Instruct operators to only used approved load attachments<br>AND<br>to refer to applicable load chart for the corresponding attachment<br>AND<br>To ensure the attachment is properly attached to the boom at all times. | | | |
| 16.1.9 | Lateral instability due to use of the stabilisers when the booms are at height. | N/A | NA | | | | |
| 16.1.10 | Instability caused by poor ground conditions. | Note in manual that the machine is not to be used on muddy, sandy or soft ground.<br><br>Note in manual that the ground should be checked to ensure that it can support the loaded machine.<br><br>The machine mass is listed on the manufacturers plate attached to the cabin. | H | Ensure the telehandler is not used on ground which is unable to support the mass of the fully laden telehandler. | | | |
| 16.1.11 | Instability caused by movement of liquid loads. | Warnings in manual to take precautions when handling liquid loads. | M | Ensure that the operators take care when handling liquid loads and move at appropriate speeds. | | | |

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| | **(the situation or parts of plant which could cause injury or illness)** | **Describe the risk control measures ALREADY implemented** | | | | | |
| 16.1.12 | Instability caused by swaying load. | Instructions provided in AS2550.19 section 5.4 for freely suspended load handling.<br><br>Stability tests are conducted in the designated pick and carry positions as listed on the load charts using the required test load factor as listed in AS1418.19 table B1. | M | Ensure that machine travel motion is performed at speeds which do not induce swinging of the loads;<br><br>If the load starts to sway then the operator must slow the machine gradually to a stop;<br><br>The operator should use ground personnel with tag lines to help prevent the freely suspended load from swaying;<br><br>Ensure that the correct pick and carry position is used for load travel, in accordance with the plck & carry loadchart. | | | |
| **16.2** | **Derailment of machinery** | Hi-Rail gear not fitted. | NA | | | | |
| **16.3** | **Loss of mechanical strength of machinery and lifting accessories** | | | | | | |
| 16.3.1 | Telehandler could collapse as a result of poor structural/mechanical condition due to fatigue/wear. | Structural classification of the telehandler declared in accordance with AS1418.1 to enable the competent person to determine when the design life has been reached.<br><br>Inspection program offered by the Manufacturer / Dealer Entworks to carry out inspections as per AS2550.19: TELESAFE Program. | M | Inspect the machine in accordance with the instructions outlined in the service manual;<br><br>Undertake inspection regime as per per AS2550.19, especially yearly and 10 years Major inspection.. | | | |
| 16.3.2 | Persons could be injured by the unit if operating in poor mechanical or hydraulic condition. | | M | Ensure that the unit is checked, repaired and maintained by a competent person in accordance with the checklists contained in the operation manual;<br><br>Modify maintenance program according to use;<br><br>Instruct the operator/competent person to report all faults to management;<br><br>Ensure all inspections, servicing, replacement of parts and modifications are entered into logbook;<br><br>Use equivalent replacement parts;<br><br>Log replacement. | | | |
| 16.3.3 | Structural failure because of loose or missing fasteners. | Maintenance schedule provided in operators manual | M | Provide a logbook for use by the operator and service personnel;<br><br>Ensure that the unit is checked, repaired and maintained in accordance with the checklist contained in the operation & service manuals, by a competent person<br><br>Results are entered into the logbook. | | | |
| 16.3.4 | Structural failure due to loose or missing pivot pins. | Maintenance schedule provided in operators manual | M | Ensure that pre-operational inspections are performed and the results documented;<br><br>Perform regular maintenance checks as listed in the operator's and maintenance manuals. | | | |
| 16.3.5 | Persons could be injured as a result of fatigue failure – Road Transport. | Tie-down points are provided and labeled at the front and rear of the telehandler. | M | Ensure the operators are instructed to properly stow unit prior to transportation;<br><br>Ensure the booms are restrained during transportation. | | | |
| 16.3.6 | Structural failure due to collision with buildings, vehicles etc. | Control position provides the operator with visual contact with the resulting travel and extending structure movements. | M | Ensure that all collisions and/or damage are reported and any damage is rectified before further use. | | | |

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| 16.3.7 | Structural failure due to corrosion. | All ferrous metals are primed and painted to prevent corrosion.<br><br>Inspection program offered by the Manufacturer / Dealer Entworks to carry out inspections as per AS2550.19: TELESAFE Program. | M | Ensure that the telehandler and attachments are inspected on a regular basis for evidence of corrosion by a competent person.<br><br>Undertake inspection regime as per AS2550.19, especially yearly and 10 years Major inspections. | | | |
| 16.3.8 | Structural failure of fork arms due to poor design. | Fork arms are sourced from reputable manufacturer. | L | Ensure that only approved fork arms are fitted to machine. | | | |
| 16.3.9 | Structural failure of authorized attachment. | All authorized attachments have been load tested to 2.5 times the maximum rated capacity in accordance with AS2359.1 clause 6.7.2. | L | Ensure that only authorised attachments are used with the telehandler. | | | |
| 16.3.10 | Structural failure of unauthorized attachment. | List of authorized attachments included but not limited to Operators' manual, Cabin loadcharts. Check with Manitou Dealer if attachment is authorised. | M | Ensure that only authorised attachments are used with the telehandler. | | | |
| 16.3.11 | Injury from using the telehandler in an unsuitable condition. | Note in manual that the operator is to check the machine very carefully before use.<br><br>Inspection instructions in the manual. | L | Ensure that the operator performs an inspection of the telehandler and any attachments before use. | | | |
| 16.3.12 | Injury using the telehandler when it is worn or used beyond its life cycle. | Note in manual that the operator is to check the machine very carefully before use. | M | Inspect the machine in accordance with the instructions outlined in the service manual;<br><br>Undertake inspection regime as per AS2550.19, especially yearly and 10 years Major inspections. | | | |
| **16.4** | **Uncontrolled movements** | | | | | | |
| 16.4.1 | Boom lowers as a result of hose failure. | See clause 10.2.1. | | | | | |
| **17** | **Inadequate view of trajectories of the moving parts** | | | | | | |
| 17.1 | Ground personnel crushed by moving booms. | Control positions provide the operator with visual contact with the resulting travel and extending structure movements. | M | Ensure that personnel do not enter the area in which the telehandler is operating unless in emergencies. | | | |
| **18** | **Hazards caused by lightning** | | | | | | |
| 18.1 | Persons could be injured if the unit is operated during storms. | See clause 2.1.3. | | | | | |
| **19** | **Hazards due to loading/overloading** | | | | | | |
| 19.1 | Maximum rated capacity is exceeded. | Load management system fitted, which limits the maximum load and the permitted load which can be lifted to within the allowable rated capacity zone.<br><br>Load charts provided which indicate the load which may be lifted for a given boom angle and extension.<br><br>Boom angle indicator fitted.<br><br>Boom length indicators (letters) painted on boom. | M | Verify expected loading and confirm it is less than Rated Capacity. | | | |
| **20** | **Hazards due to lifting persons** | | | | | | |
| 20.1 | Mechanical strength | | NA | | | | |
| 20.2 | Loading control | | NA | | | | |

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| **21** | **Controls** | | | | | | |
| 21.1 | Movement of work platform | | NA | | | | |
| 21.2 | Safe travel control | Maximum pick and carry speeds listed on load charts. | M | Ensure the system speeds are maintained as per the manufacturer's instructions. | | | |
| 21.3 | Safe boom speed control | Precise and smooth controls fitted which allow the operator to slow the boom movement close to the desired position. | M | Ensure the system speeds are maintained as per the manufacturer's instructions. | | | |
| **22** | **Falling of persons** | | | | | | |
| 22.1 | Personal protective equipment | | NA | | | | |
| 22.2 | Trapdoors | | NA | | | | |
| 22.3 | Work platform tilt control | | NA | | | | |
| **23** | **Work platform falling/overturning** | | | | | | |
| 23.1 | Falling/overturning | | NA | | | | |
| 23.2 | Acceleration/braking | | NA | | | | |
| **24** | **Markings** | | | | | | |
| 24.1 | Safety decals/labels are incomplete. | Safety decals and their location listed in operator's manual.<br><br>All markings as required by AS1418.19 are fitted during at latest during PDI on delivery of machine. | M | Ensure that the operator carries out the pre-operational check of safety decals before use and replaces any illegible or missing decals. | | | |

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