

RISK & HAZARD MANAGEMENT – JLG TELEHANDLERS (WITHOUT BASKETS)

JLG Machine Type	Capacity @ Max. Forward Reach (kg)	Max. Capacity (kg)	Max. Height (m)
266	1000	2600	5.79
307	1350	3000	6.93
3509	1200	3500	9
3512	1000	3500	11.5
3513	1000	3500	13
4009	1200	4000	9
4013	1300	4000	13
4017	500	4000	16.7

(Ratings may vary depending on attachment used and if oscillating axles are fitted.)

INTRODUCTION/SCOPE

The aim of this report is to conduct an investigation into the hazards¹ and risks involved with the operation, maintenance, servicing, inspection, transportation and storage of the above plants². This report does not take into account the use of the JLG “Smart Basket” attachment which is not currently available in Australia. Our aim is to ensure people at work (and any other personnel) are protected against health and safety risks associated with the use of the plant detailed within this report. Possible hazards and risks are to be assessed with respect to use of the plant and control measures incorporated to maximise safety. For each identified risk the probability and consequences of occurrence are assessed and the control measures implemented to reduce this risk as far as practicable³. Additional measures taken to control risk are also listed. The following procedure will be used :

- 1. Identifying Hazards** - associated with the plant or ‘systems of work’⁴
- 2. Risk and Hazard Likelihood** - The probability of a hazard occurring, and the probable consequence associated with that hazard occurring.
- 3. Controls implemented to reduce Hazards & Risks** - these include design and any other measures which are put in place to reduce risks and hazards as far as practicable.

NOTE: This assessment is based on the design of the unit prior to additional hazard control measures incorporated into the Australian build design.

TABLE 1 : RISK & HAZARD LIKELYHOOD

HAZARD	(A) Likelihood of Occurring	(B) Consequence of Occurring	RISK SCORE*
As listed in Table 2	(1) Rare (2) Very Low (3) Low (4) Moderate (5) High (6) Very High	(1) First Aid (2) Casualty (3) Hospitalisation (4) Disabled (5) Fatality (6) Numerous Fatalities	Risk Scores* are found by adding likelihood (A) & consequence (B) of occurrence together. Risk Scores range from 2-12

¹ A hazard is anything with potential to cause injury, illness or harm when the plant is operated, maintained, serviced, repaired, inspected, transported and stored.

² Plant in this case is defined as a one of the JLG telescopic material handler models referenced in the table at the top of the page.

³ JLG considers that “reducing the risk as far as practicable” to be an undertaking of out duty of care in that we have addressed the potential to exposure to a risk during design and manufacture and have adhered to the required standards during this time. Any identified additional risks raised during this assessment have been addressed and eliminated for normal machine operation by trained personnel.

⁴ Systems of work describe all operating/maintenance procedures and in general systems used by workers in servicing, inspecting, transportation and storage

*The higher the risk score the larger the requirement for the hazard to be addressed and guarded against. Please see Table 1 for identification of hazard types checklist.

**TABLE 2
HAZARD TYPE CHECKLIST**

A. CRUSHING. ENTANGLEMENT. CUTTING. STABBING. PUNCTURING. SHEARING. FRICTION. STRIKING.	<ul style="list-style-type: none"> -can anyone's hair, clothing, gloves, cleaning apparatus or any other materials become entangled in moving parts, or objects in motion. -crushing due to material falling from plant. -uncontrolled motion or unexpected movement of plant. -inadequate stopping devices of plant to control movement. -support structure collapse. -being thrown from or within plant. -cutting, stabbing & puncturing due to contact with sharp or flying objects. -parts of plant or worksite material disintegrating or falling. -movement of plant. -can anyone's body parts be sheared between moving parts or surfaces of the plant. -can anyone be burnt due to contact with moving parts or surfaces of the plant. -can anyone be struck by moving objects due to uncontrolled or unexpected movement of plant.
B. ERGONOMIC. SLIPPING. TRIPPING. FALLING .	<ul style="list-style-type: none"> -can anyone be injured due to poorly designed seating or repetitive body movements. -constrained body posture or the need for excessive effort. -design inefficiency causing mental or psychological stress. -inadequate or poorly placed lighting of plant or workers. -lack of failsafe measures against human error. -mismatch of plant with natural human limitations.
C. HIGH PRESSURE FLUIDS. HIGH TEMPERATURES. FIRE/EXPLOSION.	<ul style="list-style-type: none"> -can anyone come into contact with fluids under high pressure, due to plant failure or misuse. -can anyone come into contact with objects at high temperatures, or objects which can cause fire or burns. -can anyone suffer illness due to exposure to high or low temperatures. -can anyone be injured by explosion of gases, vapours, liquids, dusts or other substances triggered by the operation of the plant or workpieces.
D. SUFFOCATION. DROWNING.	<ul style="list-style-type: none"> -can anyone be suffocated or drowned due to lack of oxygen, or atmospheric contamination.
E. ELECTRICAL.	<ul style="list-style-type: none"> -can anyone be injured by electric shock due to the plant coming into contact with live conductors. -plant being too close to high tension power lines. -overload of electrical circuits. -electrical wiring or switch shorting. -lack of insulation against water contact shorting. -magnetic interference from workplace corrupting electrical components.
F. STABILITY.	<ul style="list-style-type: none"> -can machine tip or roll over due to outriggers not extending. -outriggers failing mechanically, or retract unintentionally. -control valve or interlock failure. -set up on soft ground, unlevel or uneven ground, excessive slope. -driving on rough surfaces, over potholes, hitting fixed objects, excessive side loads e.g wind.
G. HYDRAULIC FAILURE.	<ul style="list-style-type: none"> -hydraulic system failure. -check valve or relief valve failure. -hose or cylinder failure - mechanical or fatigue.
H. STRUCTURAL FAILURE.	<ul style="list-style-type: none"> -boom failure due to fatigue, corrosion, or overloading. -pin, cable or linkage failure. -general overload - lifting excessive load, loading attachment in an unintended way.
I. MAINTENANCE.	<ul style="list-style-type: none"> -can anyone be injured while carrying out routine, preventative or corrective maintenance. -explosion due to welding spark etc. near charging battery -adjusting equipment for essential components faulty or seized. -guard removal.
J. TRANSPORT.	<ul style="list-style-type: none"> -can anyone be injured due to machine instability while transporting. -plant or objects falling from transport truck.
K. OCCUPATIONAL HAZARDS	<ul style="list-style-type: none"> -plant obstructing other plants at site. -unauthorised use by untrained personnel. -unintended use of duplicate controls while working. -hearing loss or communication interference due to excessive noise. -safety signs or decals removed. -energy supply failure (chemical, electrical or mechanical).

TABLE 3 - HAZARD TYPES (TELEHANDLERS W/O BASKETS)	RELEVANT CODE* ADDRESSED	RISK SCORE**	DESIGN CONTROL MEASURES (To reduce risk as far as practicable)	ADDITIONAL STEPS TAKEN TO REDUCE RISK
A. CRUSHING, ENTANGLEMENT, CUTTING, STABBING, PUNCTURING, SHEARING, FRICTION, STRIKING.	Design Code BS EN1459:1999-5.6.5- 5.6.3-5.4.4		Guards are provided in accordance with plant code requirements for guarding, eg's. <ul style="list-style-type: none"> ● Motor is enclosed under covers. ● Pinch points on boom section are out of arms reach during operation. ● Operators cabin incorporates protective bars to guard against falling objects Guarding is of a fixed permanent nature which can only be removed with tools. A back-up alarm and a horn are fitted to warn of movement. A revolving beacon option is fitted to Australian units.	Inspection and maintenance procedures are placed in the manual. Warning decals are placed on the plant, and safe operating procedures are placed in the manual.
-Entanglement		1+3	Design of plant ensures operator is protected by the cabin on all sides therefore free from areas of entanglement.	Crushing hazard decals are clearly displayed on the machine. Warnings are placed in manual to prevent entanglement.
-Crushing, shearing		1+3	A back-up alarm and a horn are fitted to warn of movement. A revolving beacon option is fitted to Australian units.	The machine is clearly labelled with warning decals due to the potential crushing hazard associated with these types of plant. Correct maintenance and operating procedures and safety instructions are placed in the manual.
-Friction		N/A, Likelihood <<1	Operators are not subject to friction as there are no high speed exposed components. Mechanical failure due to friction is reduced with wear-resistant/self-lubricating bushes & wear pads. Drive motors are self lubricating as they are hydraulic, other friction points have a grease nipple.	Lubrication instructions are in the manual. A lubrication schedule is provided along with oil/grease types to be used.

* Design Code used at time of publication was BS EN1459:1999.

** See Table 1 for Risk Ratings

TABLE 3 - HAZARD TYPES (TELEHANDLERS W/O BASKETS)	RELEVANT CODE* ADDRESSED	RISK SCORE**	DESIGN CONTROL MEASURES (To reduce risk as far as practicable)	ADDITIONAL STEPS TAKEN TO REDUCE RISK
-Striking		1+1 (operator) 1+3 (pedestrian)	Striking due to sudden machine movements when driving is restricted with smooth and accurate control of steering and braking systems. Braking is achieved through the use of closed loop hydraulics and a manual park brake lever. Operator location provides good visual access to extremities of plant.	Inspection and maintenance procedures are placed in the manual. Warning decals are placed on the plant, and safe operating procedures are placed in the manual
-Cutting, stabbing, puncturing		1+1	Contact surfaces such as cabin grab rails and latches at entry points have no sharp edges. Operator controls and seating are ergonomically designed. A seat belt is provided to ensure the operator remains in sync with the movements of the plant	As above.
B. ERGONOMIC, SLIPPING, RIPPING, FALLING	Design Code BS EN1459:1999-5.6.2- 5.6.1	1+1	Interlocks are provided to ensure against inadvertent operation by user when in a hazardous situation. Cabin door is self latching upon closure. Sprung seating and seat belt ensures operator remains at controls during operation. Grab rails and non slip step provide safe entry and exit to control station	Inspection and maintenance procedures are placed in the manual.
-Seating		0	Fully adjustable seating provides a comfortable environment for the operator	The additional security of a seat belt is provided for the operator. Safe operating procedures and limitations are provided at the control station and in the operators manual.
-Excessive effort, bad posture	Design Code BS EN1459:1999-3.21- 5.6.1	1+1	Controls are multi-funtional in operation, which reduces hand movements for the operator and aids in reducing fatigue. Boom/attachment controls are designed to operate with one hand and are either of joystick, toggle or button type. Steering is power assisted. Non-assisted controls are minimised using electrical actuation. Where controls are mechanical in nature operating effort is reduced as far as practicable. Boom/attachment controls return to neutral upon release and movement will only occur when physically actuated.	Safe operating procedures are placed in the manual.

* Design Code used at time of publication was BS EN1459:1999.

** See Table 1 for Risk Ratings.

TABLE 3 - HAZARD TYPES (TELEHANDLERS W/O BASKETS)	RELEVANT CODE* ADDRESSED	RISK SCORE**	DESIGN CONTROL MEASURES (To reduce risk as far as practicable)	ADDITIONAL STEPS TAKEN TO REDUCE RISK
-Operating stress		1+1	Control panels use illustrations for functions, and switches, which control operation in that direction. Plants are field tested for controlability and ease of use. A seat belt is provided for additional support during motion.	Warning decals in conjunction with visual and audible indicators are used to warn of incorrect operating procedures.
-Lighting		1+1	Headlights are provided to illuminate the work area. A tail light assembly provides a visual indication of stopping and turning. Turn indicators are also provided at the front of the machine. All cabin controls are illuminated.	Warning decals and operators manuals provide cautions for unusual operating conditions. Optional front and rear worklights may be fitted.
C. HIGH TEMP OR PRESSURE FIRE/EXPLOSION	Design Code BS EN1459:1999-5.6.4	1+2	High temperature components (motor and pump) are positioned within frame and are protected by covers. Exhaust system is out of arms reach, even when engine cover is raised. High pressure hydraulic hoses are secured together with fasteners and in potential failure areas (tight radius bends) are covered in spiral wrap.	These hazards are related to incorrect and or lack of maintenance. Correct inspection and maintenance procedures are placed in the manual. Regular maintenance is required. Optional air conditioning may be fitted.
-high pressure fluid jets	Design Code BS EN1459:1999	1+2	Hydraulic hoses used have a bursting pressure of three times the working pressure.	Inspection and maintenance procedures (including warnings) are placed in manual.
-high temperatures	Design Code BS EN1459:1999-5.6.4	1+1	Hot surfaces are positioned within frame covers.	Operating & maintenance procedures are placed in manual.
D. SUFFOCATION / DROWNING	N/A	0	Exhaust gas is directed away from the operator. The size of plant prevents operation in confined spaces, therefore exhaust gas inhalation is not considered to pose a problem.	Inspection and maintenance procedures are placed in the manual.
E. ELECTRICAL	BS EN1459:1999		This TMH is not fitted with high voltage (ie above 32V a.c).	Decals warning of electrical hazards are placed on the machines. Inspection and maintenance procedures are placed in the manual.
-Accidental electrical shock		1+1	Cables insulated & secured to plant. Major current carrying cables are colour coded. Cables have protective rubber boots over connection points to prevent contact shorting during maintenance	Regular inspections and maintenance procedures are placed in the manual. Maintenance is to be carried out by trained personnel.

* Design Code used at time of publication was BS EN1459:1999.

** See Table 1 for Risk Ratings.

TABLE 3 - HAZARD TYPES (TELEHANDLERS W/O BASKETS)	RELEVANT CODE* ADDRESSED	RISK SCORE* *	DESIGN CONTROL MEASURES (To reduce risk as far as practicable)	ADDITIONAL STEPS TAKEN TO REDUCE RISK
-Loose wire shorts		2+1	Insulated crimp lugs, locking plastic plugs, or permanent type clamps are used. Wiring is protected against rubbing in exposed areas with flexible sheathing.	Plants use a diagnostic type control system which warns of any abnormalities within the control system (which include high temperature, low oil, safety alerts etc). Troubleshooting section in manuals.
-Working too close to power lines	Design Code BS EN1459:1999	3+3	Plant is clearly marked with electrical warning decals to reduce the risk.	Warning decals are placed on the machine and the manuals state that the machine non-insulating. Safe operating procedures and suggested minimum distances to power lines are placed in the manual.
-Electromagnetic interference		1+1	Design is sufficient for normal use.	Plants can be fitted with shielding for special applications.
-Water bridging		2+1	Wiring looms of control boxes are covered with water resistant covers. Looms are clamped together with ties to prevent vibration damage. Control cards are encased in epoxy resin to prevent water damage. process. Electrical connections are treated with anti-corrosion compounds. Sensitive control systems are located within operators cab for additional protection.	Inspection and maintenance procedures are placed in the manual.
-Pump or motor failure; control unit failure.	Design Codes BS EN1459:1999-5.5.3.3	3+1	Hydraulic cylinders are equipped with load holding valves and will remain locked in the event of electrical or mechanical failure. Valves may be manually operated to enable lowering and retraction of the boom in the event of a control unit failure.	These plants have indicators to assist in identifying problems. Manuals contain a troubleshooting section.
F. STABILITY	Design Code BS EN1459:1999 – 5.7		The plant is designed to meet BS EN1459:1999-5.7 for stability. In and out of service braking is manually applied. Load Moment Indicator system advises operator when limits of stability are being reached and activates cut-outs.	The plant is tested in accordance with BS EN1459:1999-5.7 for stability requirements. Upon commissioning of a new machine the customer is provided with a short operator training session which reduces the chance of the machine being put in an unstable position.
-Outrigger failure	Design Code BS EN1459:1999	0	Relief valves are used to prevent over pressurizing the hydraulic system. Holding valves prevent instability in the advent of failure. Interlocks are in place to prevent cylinder retraction while the plant is elevated. Outriggers not required on all models.	Inspection and maintenance procedures are placed in the manual.

* Design Code used at time of publication was BS EN1459:1999.

** See Table 1 for Risk Ratings.

TABLE 3 - HAZARD TYPES (TELEHANDLERS W/O BASKETS)	RELEVANT CODE* ADDRESSED	RISK SCORE**	DESIGN CONTROL MEASURES (To reduce risk as far as practicable)	ADDITIONAL STEPS TAKEN TO REDUCE RISK
-Control valve or interlock failure	Design Code BS EN1459:1999-5.5.3.1	1+3	Interlocks are self monitoring i.e they are normally off/open so that in the event of malfunction motion is prevented. Holding valves are installed to prevent decent due to hydraulic failure.	Inspection and maintenance procedures are placed in the manual.
-Setup hazards (eg. slope, side force)	Design Code BS EN1459:1999	2+4	Interlocks switches provide an audible and visual alarm when plant is put in a dangerous situation. Function cutouts become active during instability or overload. The ability to level the chassis is provided in order to correct potentially unstable conditions.	A permanent type specification plate is permanently attached to the plant which shows the machine ratings. Warning decals are placed on machine, and safe operating procedures are placed in the manual. Load charts are provided. Outriggers fitted to models with more forward reach.
-Travelling hazards (eg. rough surface, dynamic loading.)	Design Code BS EN1459:1999	2+4	Indicators fitted to advise operator of xcessive slope. Design includes frame levelling cylinders.	Warning decals are placed on plant, and safe operation and transportation procedures placed in the manual. A permanent type specification plate is stamped with machine design limits.
G. HYDRAULIC FAILURE	Design Code BS EN1459:1999-5.5.3.1- 5.5.3.2		Relief valves are used to prevent over pressurising the hydraulic system. Holding valves prevent unsafe descent in the event of control or relief valve failure.	Inspection and maintenance procedures are placed in the manual.
-check or relief valve failure		1+2	Relief valves are used to prevent over pressurising the hydraulic system. Holding valves prevent unsafe descent in the event of control or relief valve failure.	Inspection and maintenance procedures are placed in the manual.
-general failure		1+2	As above	
H. STRUCTURAL FAILURE	Design Code BS EN1459:1999		Rigourous stress analysis and testing to BS EN1459:1999.	Field testing.

* Design Code used at time of publication was BS EN1459:1999.

** See Table 1 for Risk Ratings.

TABLE 3 - HAZARD TYPES (TELEHANDLERS W/O BASKETS)	RELEVANT CODE* ADDRESSED	RISK SCORE**	DESIGN CONTROL MEASURES (To reduce risk as far as practicable)	ADDITIONAL STEPS TAKEN TO REDUCE RISK
-component failure due to fatigue	Design Code BS EN1459:1999-5.5.1-6	1+4	The plant has been cyclic tested and fatigue analysis carried out as part of the design process.	Regular inspection and maintenance procedures in manuals.
-component failure due to corrosion or wear		2+4	Corrosive surfaces are painted, components subject to wear have provisions to minimise wear by using sacrificial components or lubrication eg.boom sections use wear pads along telescoping sections, pins use self lubricating bushes. Components which are not self lubricating have grease nipples provided.	Inspection and maintenance procedures are placed in the manual. Lubrication points and a schedule for maintenance are included in the manual to reduce chance of fatigue.
-general overload		1+4	A load moment indicator is used to prevent excessive loads being lifted by the plant. Special access to system is required to alter settings.	Load charts provided indicate the allowable capacities. Safe operating procedures are placed in manual. Correct pressure settings are placed in the manual.
I. MAINTENANCE	Design Code BS EN1459:1999		Historical records are used in design to reduce maintenance (and thus risk) as far as practicable.	Inspection and maintenance procedures are placed in the manual.
-routine inspection or maintenance		0	Components which require regular maintenance such as filters are placed in an easily accessed area.	Illustrated parts manuals are available for ordering replacement parts. Additional to this, JLG conducts operator and service training courses to all customers. Daily walk around inspection procedure in manual.
-battery charging		1+1	Battery is automatically charged while engine is running and, as it is only being trickle charged, gas (hydrogen) buildup is not considered a problem.	Service instructions are placed in the manual.

* Design Code used at time of publication was BS EN1459:1999.

** See Table 1 for Risk Ratings.

TABLE 3 - HAZARD TYPES (TELEHANDLERS W/O BASKETS)	RELEVANT CODE* ADDRESSED	RISK SCORE**	DESIGN CONTROL MEASURES (To reduce risk as far as practicable)	ADDITIONAL STEPS TAKEN TO REDUCE RISK
-adjusting equipment	Design Code BS EN1459:1999	0	Test points are provided for checking of all hydraulic pressure settings. Adjustment points require tools to change.	Correct adjusting procedures are placed in the manual. Hydraulic (and other) specifications are listed to enable adjustment.
-guard removal		1+2	Guarding is of a fixed permanent nature which can only be removed with tools.	Inspection and maintenance procedures are placed in the manual.
J. TRANSPORT	Design Code BS EN1459:1999	0	Provision is provided for both lifting and tie down points on chassis section.	Decals are placed on the plant to clearly label lifting/tie down points. Safe transportation procedures are placed in the manual.
-objects falling from plant	Design Code BS EN1459:1999-5.8.1	1+2	Components are designed to withstand vibration, and are tested in harsh conditions in excess of normal use. Locking type hardware is used to reduce the risk of components working loose.	Inspection and maintenance procedures are placed in the manual.
-unintended use	BS EN1459:1999	2+3	Plants have a removeable key switch which prevents operation by unintended personnel. The control cabin is lockable to prevent unintended access.	Correct operating procedures are placed in the manual. Warning decals are placed on the plant. Safety warnings are also placed in the manual. Additional to this, JLG conducts operator and service training courses to all customers.
-excessive noise	Design Code prEN 12053	1+1	Motors use baffled mufflers and are within acceptable sound limits.	Where noise is considered excessive, level testing is done to prEN 12053.

* Design Code used at time of publication was BS EN1459:1999.

** See Table 1 for Risk Ratings.

TABLE 3 - HAZARD TYPES (TELEHANDLERS W/O BASKETS)	RELEVANT CODE* ADDRESSED	RISK SCORE**	DESIGN CONTROL MEASURES (To reduce risk as far as practicable)	ADDITIONAL STEPS TAKEN TO REDUCE RISK
K. OCCUPATIONAL HAZARDS			A single control station ensures the operator has full control at all times.	Safe operating procedures are placed in the manuals.
-decal or safety sign removal	BS EN1459:1999	3+3	Decals have permanent type marking & weatherproof backing. Specification plate is stamped for longevity.	Safety warnings are placed in manual. Annual inspection requires that decals are checked for readability and are in place.
-energy supply failure	Various	1+2	See previous control measures such as holding valves.	Emergency procedures are placed in the manual.

Please see over page for other safety related initiatives undertaken on all JLG manufactured machines.

* Design Code used at time of publication was BS EN1459:1999.

** See Table 1 for Risk Ratings.

OTHER SAFETY RELATED INITIATIVES

Please Note : That the risk assesment compiled and attached is prepared in ADDITION to many other activities which have been undertaken by JLG to ensure the safety of the product.

These include:

- JLG Industries (USA) perform computer simulation/modelling of product and internal design calculatons.
- Extensive field testing of units to ensure faults and hazards are identified.
- JLG Industries (Australia) offer training and maintenance courses to any interested companies and all machines come with a world class Operators & Safety Manual. Service Manuals and Illustrated Parts Manuals are available on request.
- JLG Industries (Australia) support industry safety for operations and maintenance (being an EWPA member and a Standards Association of Australia committee member).