

Grove GMK3060

60T ALL-TERRAIN

Plant Risk Assessment



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Plant Risk Assessment

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INFORMATION

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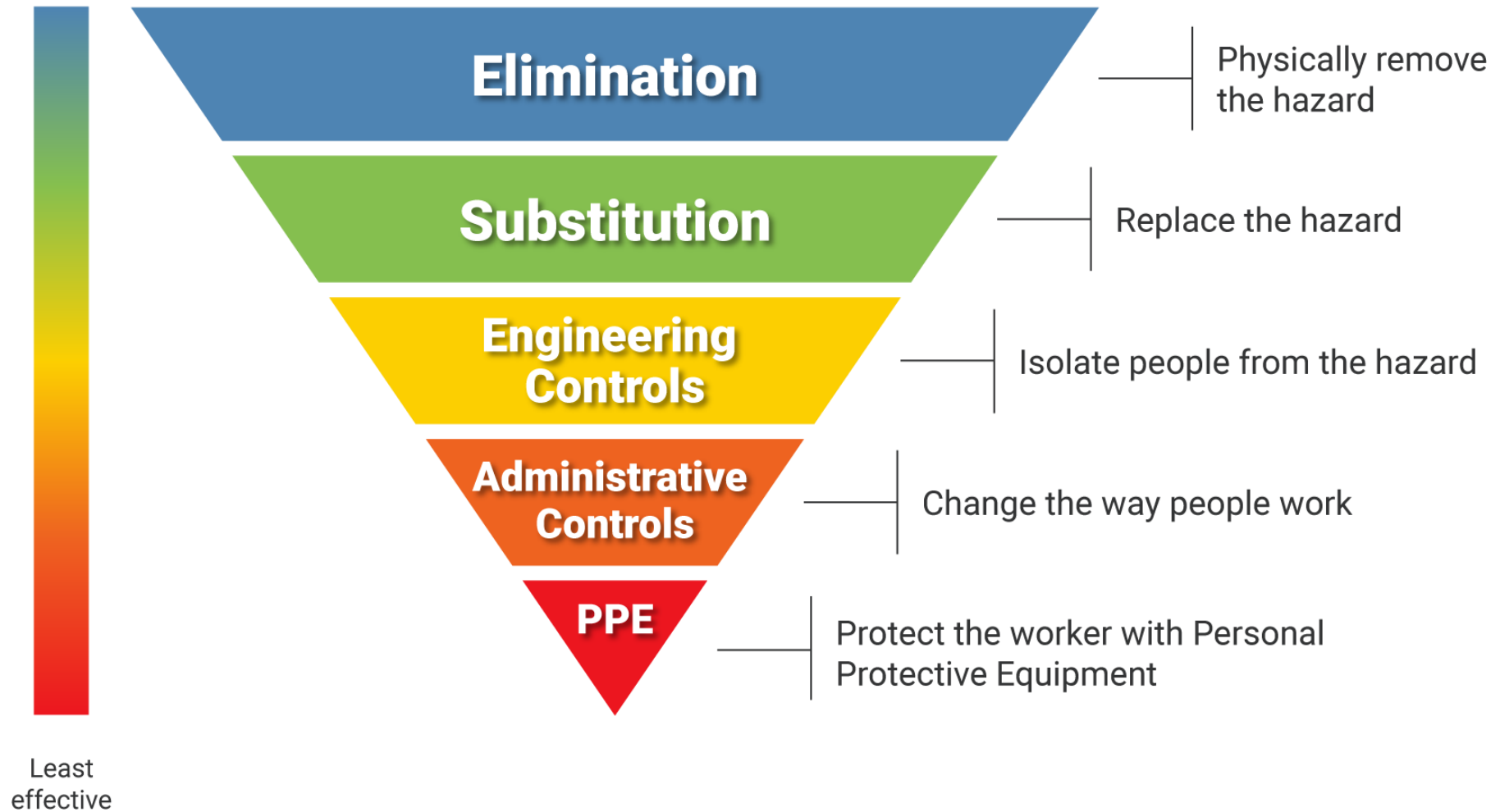


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Risk Matrix							
Consequence	Probability (Likelihood)						
	Severity		A	B	C	D	E
			<1% probability of occurring Never Heard of in Industry	>1% probability of occurring Heard of in Industry	>10% probability of occurring Happened in Company or More than Once per Year in Industry	>50% probability of occurring Happened at the Location Multiple Times	99% probability of occurring Occurs Frequently
			Remote	Highly Unlikely	Unlikely	Likely	Almost Certain
	1	Zero	Low	Low	Low	Low	Low
	2	Insignificant	Low	Low	Low	Low	Medium
	3	Minor	Low	Low	Low	Medium	Medium
	4	Serious	Low	Low	Medium	Medium	High
	5	Critical	Medium	Medium	Medium	High	High
	6	Catastrophic	Medium	Medium	High	High	High



Consequence Categories							
		Health and Safety of People	Damage to Assets (financial impact)	Damage to Environment	Damage to Metcalf Reputation	Law (Compliance with regulations)	Community and Social Damage and Impact
1	Zero	No injury or health effect	Zero	Zero effect	Zero impact	Zero Legal impact	Zero community/social impact Nil damage to
2	Insignificant	Slight injury (First Aid) or health effect or the potential for either	Slight damage or potential to cause slight damage up to \$5000	Slight effect or potential to have a slight effect Contained by Engineered means	Slight impact or potential to have a slight impact Public concern restricted to local complaints	Local investigation, minor breach of regulation or technical non-compliance – Prosecution not likely	Inconsequential short-term impact. Public concern restricted to local complaints Negative local media reports
3	Minor	Minor injury (recordable) or health effect or the potential for either	Minor damage or potential to cause minor damage \$5,000 up to \$50,000	Minor effect or potential to have a minor effect Short term effect on location	Limited impact or potential to have a limited impact Negative local media	Breach of law/regulation or non-compliance. Minor legal issues, minor litigation possible	Repairable damage to objects of cultural/heritage
4	Serious	Severe Injury (lost time) or multiple minor injuries or potential for either	Local damage or potential to cause local damage From \$50,000 up to \$500,000	Local effect off location or potential to have a local off location effect Moderate-term effect off location	Considerable impact or potential to have a considerable impact Negative state media	Major breach of regulation and significant prosecution Performance Infringement Notice (PIN)	Permanent damage to objects of cultural/heritage significance Major disruption to community wellbeing and social networks for a period of months
5	Critical	Permanent Disability, Fatality or Severe Injury or potential for any	Major damage or potential to cause major damage From \$500,000 up to \$5m	Major effect or potential to have a major effect Widespread impacts to sensitive public or private areas ground water or water bodies	Major national impact or potential to have a major national impact Negative National Media	Very significant fines and prosecutions, Multiple prosecution and fines	Reduced quality of life within community Significant loss or damage to objects of cultural/heritage significance Severe disruption to community wellbeing and social networks for up to two years
6	Catastrophic	Multiple Fatalities or Multiple Permanent Disabilities or potential for either	Extensive damage or potential to cause extensive damage More than \$5m	Massive effect or potential to have a massive effect Widespread impact to sensitive public or private areas, ground water or water bodies	Major international impact or potential to have a major national impact Negative International Media	Potential jail terms and/or very high fines for company and individuals. Prolonged multiple litigations	Community ability to support itself severely impaired Widespread loss of objects of cultural/heritage significance Severe disruption to community wellbeing and social networks for a period of many years



Generic Hazards that Apply to Multiple Sections

Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
1	Slips, trips and falls Risk of slips, trips and falls due to slippery surfaces. Risk of slips trips and falls due to loose covers and debris.	C	4	M	Inspect all walkways, access ladders, steps and grab-rails for damage or presence of oils, greases, mud or slippery substances that could cause a slip. Wipe away or properly clean any substance that will cause a risk. Ensure that walking surfaces are coated with a non-slip coating. Inspect all covers and guards are secured in place. Remove any debris from ground around the machine, the cabin areas, carrier deck areas and access ways that may create any trip hazards. Dispose of debris correctly and safely.	B	4	L	Prior to use
2	Cuts and abrasions Risk of cuts and abrasions due to sharp edges or damaged surfaces.	C	4	M	Wear protective gloves when inspecting or cleaning access devices as protection against any sharp edges or chemical contamination. Inspect for any evidence of damage, corrosion, broken welds, loose bolts, metal fatigue or any other factor that may cause a loss of strength to walkways, access ladders, steps and grab-rails.	B	4	L	Prior to use
3	Use of OEM ladders Risk of fall from ladders if used incorrectly or unsafely.	C	4	M	Ensure that any OEM removable ladders are positioned correctly and locked into their respective holders before using them for access. Refer to the Operators Manual for more information.	B	4	L	Prior to use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
4	Use of portable ladders Risk of fall from ladders if used incorrectly or unsafely.	D	5	H	Ensure that any portable ladders are positioned on a firm level base. Ensure step ladders are fully opened and locked. Do not stand any higher than the third step from the top. Ensure standard ladders are elevated to approximately 75% (1:4), and are secured at the base and the top. If this is not possible, have a second person foot and steady the ladder. Only perform tasks that would normally be done using one hand. Maintain three points of contact on the ladder at all times. Do not over-reach. Do not attempt to carry tools up or down the ladder while holding them in your hands. Ensure that all OEM ladders are stowed and secured on the vehicle when not in use. Do not jump off the crane structure. Use provided access ladders. Face the ladder when climbing. Use proper hand-holds. Do not use control levers, seats or other non-secured items as hand-holds.	B	5	M	Prior to use
6	Falls from Height Risk of injury due to falls from heights.	D	5	H	Where access ways and edge protection is not provided in certain sections of the superstructure, utilise scaffolding or elevating work platforms to conduct the inspections. Where these control measures are not possible, the use of fall prevention, fall restraint, or fall arrest devices and appropriate anchors and systems will be required. Do not attempt to gain access to the crane when it is in motion.	B	5	M	Prior to use
7	Protruding objects Risk of head injuries!	C	5	M	Where necessary, use protective headwear such as a safety helmet to protect against head bumps on protruding objects such as hook blocks, boom sections and counterweights.	B	5	M	Prior to and during use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
8	Pressurised or high temperature fluids Risk of serious injury due to hot/pressurised fluids.	D	5	H	Follow manufacturers instructions regarding checking of fluid levels. Ensure that wherever possible that pressure is relieved in all reservoirs prior to opening. For engine coolant tank instruction Refer to the Operators Manual. Ensure that all fluids have had sufficient time to cool down prior to opening the reservoir. Wear protective gloves, protective eyewear and appropriate protective clothing. Wear long sleeved protective clothing when checking the vehicle engine oil. It is necessary to reach between the back of the drivers cab and the exhaust system to access the engine dipstick. Ensure that you do not touch the hot exhaust system. Refer to the Operators Manual for procedure. Do not conduct fluid level inspections when the engine is running or if systems are energised. Do not attempt to remove inspection caps or covers when the engine is running or system is energised. If a hydraulic leak is suspected in a hose or pipe, do not use bare hands to locate the leak when the system is energised and pressurised. Be sure to read applicable Material Safety Data Sheets prior to working with fluids and abide by the advice given for appropriate PPE.	B	5	M	Prior to use
9	Refuelling, servicing, repair work Risk of environmental contamination when handling fuels, lubricants and other fluids.	C	5	M	Ensure that any oil or fuel spills or leaks are either cleaned up or rectified. Ensure that oil-spill kits are available on-site. Wipe up any fuel spillage and secure fuel caps when refuelling is complete.	B	5	M	Prior to and during use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
10	Batteries Danger of explosions due to batteries emitting vapours.	D	5	H	Be aware of hydrogen gases emitted from batteries. Do not allow metal objects to arc across battery terminals. Ensure terminal covers are in place. Do not smoke or use naked flames in the vicinity of batteries. Ensure that any maintenance or checks carried out on batteries are conducted in a well-ventilated area.	C	5	M	Prior to and during use
11	Flammable materials Risk of fire.	D	5	H	Do not leave any rags or clean-up materials on the machine that could catch fire due to heat build-up. Switch off the engine, heater and all additional heating devices prior to refuelling. Ensure that the appropriate types and numbers of fire extinguishers are fitted to the crane, or a fire suppression system is fitted. Ensure that all fire extinguishers comply with appropriate standards, and have been tagged and inspected. Ensure that operators and crane crew members have had training in the use of fire extinguishers. Do not smoke or use naked flames in the vicinity of oil or fuel. Extinguish all sources of ignition when handling these types of materials.	C	5	M	Prior to and during use
12	Areas of low light/darkened areas Risk of accidents due to a lack of available light.	C	5	M	Ensure that inspections are carried out in a well lit area where clear vision available to all parts of the crane. In areas where seeing is difficult, utilise lighting plants, spotlights or torches to enable a clear view of the task being performed. Ensure that the light source does not itself create a hazard from generated heat.	B	5	M	Prior to use



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13	Crush zones Risk of crushing in limited access areas.	C	5	M	Ensure that crane is switched off when inspecting items located in crush zones. Place warning tags on operating controls and remove keys and battery isolator switch while performing inspections. Where applicable place "Danger – Crush Zone" warning stickers in appropriate areas.	B	5	M	During use
14	Safety labels and signage Risk of accidents due to lack of visual warning.	C	5	M	Ensure that all warning labels and stickers are in appropriate places and legible. Clean warning labels and stickers when obscured with water and mild detergent. Do not use organic solvents to clean labels and stickers. Replace labels or stickers that have become illegible or damaged.	B	5	M	Prior to use
15	Statutory signage Risk of accidents due to lack of appropriate signage	C	5	M	Ensure that all appropriate signage is displayed upon the carrier of the truck crane prior to on-road driving. In this way you will minimise the risk of other road users being uninformed about the truck cranes characteristics. Ensure that "Caution – Left Hand Drive" warning labels are displayed in appropriate positions on the front and/or rear of the vehicle. Ensure that "Oversize" warning labels are displayed in appropriate positions on the front and/or rear of the vehicle. Ensure that "Do not Overtake Turning Vehicle" warning labels are displayed in appropriate positions on the front and/or rear of the vehicle. Ensure that the operator of the crane is the holder of the appropriate driver's licence for on-road operation. Ensure that the operator complies with applicable State or Territory traffic laws when operating the crane on public roads.	B	5	M	Prior to use



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		P	C	R		P	C	R	
16	Collision with objects Risk of accidents due to objects being out of the operator's field of vision.	D	4	M	If operating in close proximity to other vehicles or plant, ensure that another person is used to guide the operator while the machine is in motion. In this way you will prevent the truck crane from colliding with objects, other plant or on-site personnel.	C	4	M	During use
17	Access and Egress Danger of falls due to objects being mistaken for hand-holds.	D	4	M	Beware not to use the front window support strut or the front panel support bar as hand holds when entering the crane cab. These items look like hand-holds but are not designed as such and may collapse under a person's weight, causing a fall or damage to the component.	C	4	M	During use
18	Operator Physical Condition Danger of accidents due to physical condition of operator	D	6	H	Prior to operating the machine, ensure that the operator is not suffering from fatigue or is under the influence of drugs or alcohol. Where required ensure that the operator has undergone a recent medical examination.	B	6	M	Prior to use
19	System Unfamiliarity Risk of accidents due to operator not receiving full instruction	D	6	H	Ensure that the operator has been fully instructed by a suitable competent person on the operational aspects of the crane functions, the CCS crane control system and the EKS/RCI Rated Capacity Indicator. Failure to do so may result in damage to the crane and it's systems, or cause an accident that may result in personal injury to the operator or other members of the crane crew, or innocent bystanders.	B	6	M	Prior to use



Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
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Description of the Truck Crane Vehicle Section

1	Windows Risk of crushing when closing windows.	C	4	M	Monitor the window and let go of the rocker button as soon as someone reaches into or leans through the window. If the window winder encounters resistance, it does not stop but continues with reduced power.	B	4	L	During use
2	Ladder Risk of ladder falling down.	C	4	M	Secure the ladder in the appropriate holder after each use. In this way, you prevent the ladder from falling down during on-road driving, which could endanger vehicles behind you or people standing at the side of the road.	B	4	L	During use
3	Fire Extinguisher Risk due to fire extinguisher not working.	D	6	H	Proper functioning of the fire extinguisher is no longer guaranteed once the service interval on the label has expired.	C	4	M	Prior to use
4	Folding Berth Risk of accidents due to berth falling down.	C	5	M	Always check after folding up whether the berth is securely locked, and put the back-rest of the driver's and passenger's seat up again. In this way you can avoid the folding berth falling down upon braking, which could lead to uncontrolled manoeuvres due to fright. Always fold the folding berth up after each use. When the folding berth is folded down, the elements on the side instrument panel, which is needed for driving, are inaccessible.	B	5	M	During use



Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	

Diesel Engine

1	Checking the shut-off valves in the hydraulic system Risk of damage to the hydraulic pumps.	C	5	M	The diesel engine may only be started if all four shut-off valves in the suction lines of the hydraulic pumps are open. The shut-off valves are open when the handles are parallel to the suction lines.	B	5	M	Prior to use
2	Checking the coolant level Risk of scalding when the cooling circuit is hot.	C	5	M	The hot coolant circuit is under pressure. If you open the expansion tank while the cooling system is hot, you can burn yourself on the hot steam and possibly the hot coolant that escapes. Wear appropriate protective gloves and cover the plug on the expansion tank with a rag before you open it. Turn the lid slowly to the first detent in order to allow the excess pressure to be released.	B	5	M	Prior to use
3	Checking the diesel engine oil level Damage may occur to the engine if the oil pressure is too low	C	5	M	If the Diesel Engine Oil Pressure warning light has not gone out after 10 seconds, switch off the diesel engine and look for the cause. Refer to Malfunctions to the diesel engine in the Operator's Manual.	B	5	M	Prior to use
4	Checking the diesel engine oil level Risk of burning yourself on the hot exhaust system	C	5	M	You have to reach between the back of the driver's cab and the exhaust system to access the dipstick. Make sure you do not touch the hot exhaust system. Wear appropriate protective clothing.	B	5	M	Prior to use



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		P	C	R		P	C	R	
5	Topping up engine oil Damage may occur to the engine if the oil level is too high.	C	5	M	Do not put in too much oil. The oil level must not exceed the upper arrow mark (max). Drain oil if necessary. <i>Refer to Operating instructions of the diesel engine manufacturer.</i>	B	5	M	Prior to use
6	Refuelling Risk of fire due to flammable gases. Risk off splash-back while refuelling. Risk of accidents if fuel tank is not closed.	D	5	H	Switch off the diesel engine, the heater and all additional heating devices before refuelling. Do not smoke while refuelling. Extinguish all naked flames and sources of heat in the immediate area and ensure that an appropriate fire extinguisher is available. As the fuel tank approaches being full, there is a risk that escaping air from the fuel tank may cause a splash-back of fuel. Wear appropriate face/eye protection, and appropriate protective gloves during refuelling. Screw the fuel cap back on securely after each refuelling. In this way you prevent following vehicles from being endangered by the fuel cap falling off or fuel escaping.	C	5	M	Prior to and during use
7	Switching on the ignition Risk of damage due to faulty warning lamps.	C	5	M	When starting the ignition or the diesel engine, indicator lamps which serve as warning lamps for functions that fail during operation are tested. Replace any defective lamps immediately.	B	5	M	Prior to use
8	Starting the diesel engine Risk of explosions when using starter fluids/sprays	C	5	M	A warm diesel engine must never be started using starter fuel (e.g. starter spray). Starter fuel sprayed into the engine intake can ignite.	B	5	M	Prior to use



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		P	C	R		P	C	R	
9	Checking instruments Risk of damage to the engine. Risk of accidents due to the truck crane steering not functioning.	C	5	M	If the Diesel Engine Oil Pressure warning light does not go out after about 10 seconds, switch off the engine. Too low an oil pressure on a running diesel engine can cause damage to the engine. If one or both warning lamps Steering Circuit I or II do not go out, follow the information in Section Monitoring the Control Instruments while Driving in the Operator's Manual.	B	5	M	Prior to use
10	Under normal circumstance with the ignition lock Risk of accidents due to truck crane steering not functioning.	C	5	M	Turn off the diesel engine only when the truck crane is at a standstill. If you remove the ignition key, the steering will lock and you will lose control of the truck crane if it is moving.	B	5	M	Prior to use

Driving the Truck Crane

1	Checking the tyres Risk of damage to the tyres.	C	5	M	Always check the tyre pressure in or-road driving mode when the tyres are cold. The tyre pressure increases when the tyres become hot while driving. Never let out the increased air pressure of tyres which are warm from driving.	B	5	M	During use
2	Checking the compressed air and brake systems Risk of accidents due to unchecked movement of the truck crane.	D	6	H	Use the service brake to stop the truck crane moving when the parking brake is released for a function check. Push the parking brake lever to the back (closed) position before you fill up the compressed air. This way you prevent the parking brake from releasing when it reaches the releasing pressure and the truck crane starting to move inadvertently.	C	4	M	Prior to use



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		P	C	R		P	C	R	
3	Checking the suspension Risk of damage to the axle lines.	C	5	M	The suspension must not be locked during on-road driving. The steering behaviour may also change when the suspension is locked.	C	4	M	Prior to use
4	Checking the steering locks Risk of accidents when driving on-road with unlocked steering.	C	5	M	Before on-road driving, ensure that all locking procedures are completed and the Steering Unlocked warning lamp goes out. The truck crane is only in a safe condition for on-road driving when the Steering Unlocked warning lamp has gone out.	C	4	M	Prior to use
5	Boom Not Set Down warning lamp Risk of damage to the truck crane.	C	5	M	If the Boom Not Set Down warning lamp is lit, the vehicle is higher than specified. If you drive under a bridge or low headroom (tunnel), an accident may occur which could cause extensive damage to the truck crane, bridge or tunnel. Set the boom down correctly in the boom rest and ensure that on-road level is set. Obtain a list of clearances applying to bridges and tunnels along your route from the appropriate Road Transport Authority in your state or territory.	C	4	M	Prior to use
6	Adjusting the steering column Risk of accidents when the steering column is unlocked.	C	5	M	Always stop the vehicle before you unlock the steering column. When the steering column is unlocked, the vehicle can no longer be properly steered.	C	4	M	Prior to use
7	Changing diagram sheets Risk of damage to the tachograph drawer	C	5	M	Open the tachograph drawer only to insert or remove diagram sheets and do not use the opened drawer as a shelf or surface (e.g. to mark the diagram sheets). By doing this you can prevent contamination and damage.	C	4	M	Prior to use



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		P	C	R		P	C	R	
8	Inserting diagram sheets Risk of malfunctions in the electronics.	C	5	M	If a diagram sheet has been damaged by being marked several times, this might cause malfunctions in the electronics. Therefore always insert the plastic sheet diagram supplied should you not need to use the tachograph.	B	5	M	Prior to use
9	Starting Danger from unexpected rolling.	C	5	M	Also apply the parking brake before starting on sloping ground. The gear will only be engaged after you step on the accelerator. This can lead to the truck crane starting to roll (also backwards) while you are moving your foot from the brake pedal to the accelerator.	B	5	M	Prior to use
10	Driving and changing gears Risk of accidents due to switching over while driving in position N or in the opposite driving direction.	C	5	M	If, while driving, you switch the Transmission rotary switch to the neutral position N or to the transmission mode for the opposite direction (depending on the driving to R or D), the transmission switches the transmission to the neutral position and the drive line is interrupted. As a result, you will no longer be able to accelerate the truck crane in the event of an obstacle avoidance manoeuvre, for example, and the engine retarder will have no effect.	B	5	M	Prior to use
11	Shifting the transmission to neutral position Risk of accidents from switching to neutral position while driving	C	5	M	If you switch the transmission to neutral position while driving, the drive line is interrupted. As a result, you will no longer be able to accelerate the truck crane in the event of an obstacle avoidance manoeuvre, for example, and the engine retarder will have no effect.	B	5	M	Prior to use
12	Manoeuvring mode Risk of accidents from unexpected acceleration	C	5	M	If you press the accelerator too far or the speed becomes too high, the electronic gear system deactivates the manoeuvring mode and the truck crane accelerates.	B	5	M	Prior to use



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		P	C	R		P	C	R	
13	On the roller type dynamometer Danger from unexpected moving of the rollers.	C	5	M	Always switch the transmission to neutral position N if the truck crane is on a roller type dynamometer. When the rollers are running, the electronic gear system will identify a thrust position, as when starting to move down a slope. If the transmission mode D is selected now, an adequate gear is engaged even if you do not press the accelerator. The engine braking power acts against the rollers and the truck crane can drive out of them.	B	5	M	Prior to use
14	Warning lamp for supply pressure of brakes Risk of accidents if a brake circuit fails.	C	5	M	The effectiveness of the service brake is reduced when one of the brake circuits fails. If a warning lamp lights up, stop the truck crane immediately and try to find the cause! You may only continue at a low travelling speed until you reach the next workshop.	B	5	M	Prior to use
15	Warning lamp for supply pressure of brakes Risk of accidents if both brake circuits fail.	C	5	M	If the pressure in both brake circuits drops to less than 5.5 bar, the truck crane can only be stopped by applying the holding brake. Stop the truck crane immediately and do not drive any further until the truck crane has been repaired.	B	5	M	Prior to use
16	Warning lamps for steering circuits I and II Risk of accidents if one of the steering circuits fails.	C	5	M	Reduce the driving speed, stop the truck crane at the next opportunity and look for the reason if one of the two warning lamps is on at a speed of over 10km/h. If one of the steering circuits fails, you may only continue driving at a low travelling speed until you reach the next workshop.	B	5	M	Prior to use



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17	Warning lamps for steering circuits I and II Risk of accidents if both steering circuits fail.	C	5	M	Stop the truck crane immediately if both warning lamps are on at a speed of over 10 km/h. You must stop driving immediately, as the truck crane can no longer be steered due to the high steering force.	B	5	M	Prior to use
18	Diesel engine oil pressure warning lamp Risk of damage to the engine when the oil pressure drops.	C	5	M	Stop the truck crane immediately if the warning lamp lights up or the warning signal sounds. Turn off the diesel engine immediately and attempt to find the cause! In no event should you restart the diesel engine before the cause has been found and the problem eliminated. Refer to Malfunctions of the Diesel Engine in the Operator's Manual.	B	5	M	During use
19	Starting on a slope Danger when driving in neutral position N. Danger of the truck crane starting to roll in an unexpected direction.	D	6	H	If the transmission is in neutral position N, the drive line is interrupted and the engine brake will have no effect. Therefore, always turn the Transmission rotary switch to position D or R for the desired direction of driving before you start. If you switch to position N while driving, the truck crane may accelerate. Hold the truck crane with the parking brake until the gears have engaged when starting to reverse on a slope. Starting to move in the opposite direction to the one selected before engaging a gear may cause an undefined status in the electronic system and prevent the gear from being engaged. This causes the truck crane to move in the opposite direction.	B	5	M	During use
21	Monitoring the maximum permissible engine speed Risk of damage due to excessive engine speed.	C	5	M	Shift to a higher gear or slow the truck crane down when the maximum permissible engine speed has been reached. In this way you prevent the engine running at an excessive speed and the transmission from getting damaged.	B	5	M	During use



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		P	C	R		P	C	R	
22	Switching off the engine retarder Risk of accidents due to unexpected acceleration.	C	5	M	Keep sufficient distance when driving downhill. The effectiveness of the engine brake is interrupted during a shift operation. This may cause the truck crane to accelerate briefly.	B	5	M	During use
23	Using Tempomat Risk of accidents through carelessness.	C	5	M	Always be prepared to brake even when the Tempomat is activated. Only switch the Tempomat on if the traffic situation permits a constant speed.	B	5	M	During use
24	Driving with the Tempomat Risk of accidents due to excessive speed.	C	5	M	Do not activate the Tempomat control when you are driving downhill since the Tempomat will not have any braking effect on your truck crane. The driving speed of your truck crane could be greater than the speed which you have set on the Tempomat.	B	5	M	During use
25	Turning off the diesel engine Risk of accidents due to unchecked movement of the truck crane.	C	5	M	Always apply the parking brake before you switch off the ignition. The transmission automatically switches to neutral position N when you switch off the ignition and the truck crane may move inadvertently if the holding brake has been released.	B	5	M	During use
26	Securing the truck crane against rolling Risk of accidents due to unchecked movement of the crane.	C	5	M	The truck crane cannot be secured against rolling by selecting transmission mode (D or R) in addition to applying the parking brake. Secure the truck crane on uphill and downhill slopes using both the parking brake and the wheel chocks.	B	5	M	During use
27	Extended standstill Risk of damage to alternator.	C	5	M	When the diesel engine is running you must never disconnect the cable connection to the alternator. Switch off all power consumers. Turn off the diesel engine and remove the ignition key. Switch off the battery master switch.	B	5	M	During use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
28	Securing the truck crane against unauthorised use Danger of unauthorised use.	C	5	M	Always stow away the hand-held control in the crane cab before leaving the truck crane, and lock the door to the crane cab or the driver's cab. In this way you can stop unauthorised persons from starting the diesel engine with the hand-held control.	B	5	M	During use
29	Engaging off-road gear Risk of the transfer case not functioning properly.	C	5	M	Do not switch the off-the-road gear on or off unless the truck crane is stationary and the Transmission rotary switch is in the N position. Never press two of the three rocker buttons Transfer Case On-Road Gear, Transfer Case Neutral Position and Transfer Case Off-Road Gear simultaneously, since it will result in the transfer case not working properly.	B	5	M	During use
30	Engaging longitudinal differential locks Risk of damage to the longitudinal differential locks. Risk of damage to the transverse differential locks	C	5	M	The longitudinal differential locks must not be switched on when the vehicle is on solid ground. Do not leave the longitudinal differential locks switched on for longer than necessary and make sure you switch them off before driving on solid ground. The transverse differential locks must not be switched on when the vehicle is on solid ground. Do not leave the transverse differential locks switched on for longer than necessary. It is imperative that you switch off the transverse differential locks when driving on solid ground.	B	5	M	During use
31	Deactivating the level adjustment system Risk of accidents from exceeding the overall height permitted	C	5	M	If you switch off the level adjustment system before on-road driving, then you should always put the truck crane into the On-Road Level position. If the truck crane is on a higher level, then the specified overall height will be exceeded.	B	5	M	During use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
32	Towing free to the rear Risk of damage to the chassis.	C	5	M	Only tow the truck crane free while observing the procedure given for the pulling direction. Otherwise the chassis may be damaged or the towing eyes may bend off.	B	5	M	During use
33	Use of separate steering Risk of accidents if the steering of the third axle line is unlocked during on-road driving.	C	5	M	After driving in all-wheel steering mode, return the truck crane immediately to normal driving mode with the steering lock engaged at the third axle line and the drag rods connected between the second and fourth axle lines. The normal steering mode is only re-established once the Steering Unlocked warning lamp goes out.	B	5	M	During use
34	Engaging normal steering mode Risk of accidents if the steering of the third axle line is unlocked during on-road driving.	C	5	M	Normal steering mode with locked steering on the third axle line is not activated until the Steering Unlocked warning lamp has gone out.	B	5	M	During use
35	Deactivating the ignition Risk of accidents if the steering of the third axle line is unlocked during on-road driving.	C	5	M	If you deactivate the ignition or the key operated Level Adjustment System switch, before the steering is locked, the magnetic valve in the separate steering is inactive, without locking the steering of the third axle line. When the ignition is restarted, separate steering is immediately reactivated and the Steering Unlocked warning lamp goes out. A dangerous driving situation is the consequence.	B	5	M	During use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
36	Switching on the auxiliary heating system Risk of explosion when working with auxiliary heater. Risk of suffocation when working with the auxiliary heater.	C	5	M	Operation of the auxiliary heater is not permitted: ⌘ At service stations and tank farms ⌘ At locations where flammable gases and vapours are found or can be formed (e.g. at fuel stations and chemical factories) ⌘ At locations where explosive dust is found or can be formed (e.g. coal dust, wood dust, grain dust) Do not operate the auxiliary heater and the auxiliary heater with timer in closed rooms (e.g. garages).	B	5	M	During use
37	Security of trailer Risk of accidents from the trailer rolling away. Risk of accidents due to unexpected acceleration	D	4	M	Before coupling or uncoupling the trailer, it must be secured with the trailer parking brake as well as with wheel chocks to prevent it from rolling away. Ensure that it is still possible to swivel the front axle of the trailer. When you move slowly to the trailer, the transmission automatically shifts into manoeuvring mode. If the warning buzzer sounds when doing this, release the accelerator immediately. If you do not release the accelerator, the electronics will engage automatically within a few seconds. The truck crane could accelerate unexpectedly and people might be crushed between the trailer and the truck crane.	C	4	M	Prior to use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
38	Coupling the trailer Risk of injury if the automatic closing device is actuated. Risk of accidents if trailer is incorrectly coupled. Risk of accidents when coupling the trailer.	D	4	M	Do not put your hand into the coupling jaw when the towbar coupling is open. This can activate the automatic closing device, making the coupling pin move down with great force and seriously injuring your hand. If the control pin is protruding from the guide bushing (this can also be established in the dark by touch), the trailer is not correctly coupled and could be disengaged from the towbar coupling when you are driving. No one may stand between the truck crane and the trailer when coupling the two vehicles.	C	4	M	Prior to use
39	Connecting the supply lines Risk of accidents if the hoses are too short or incorrectly positioned.	D	4	M	The hose lines must not come off when driving around corners. When connecting the hoses, ensure that the length is sufficient and that the hoses have enough clearance.	C	4	M	Prior to use
40	Removing supply lines Risk of accidents if the following steps are not carried out in the proper order.	D	4	M	It is imperative that the hoses be disconnected in the order specified below. If the hose for the brake line is disconnected first, the trailer brake will be released and the trailer will begin to roll. ✘ First, disconnect the hose of the supply line from the red coupling head. The trailer brakes automatically. ✘ Second, disconnect the hose of the brake line from the yellow coupling head ✘ Third, pull the plugs of the trailer's electrical system out of the sockets. Pull the ABS connection cable (if one is attached) out of the respective socket.	C	4	M	Prior to use



Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
41	Uncoupling the trailer Risk of injury if the automatic closing device is actuated. Risk of injury when closing the towbar coupling by hand.	D	4	M	Do not put your hand into the coupling jaw when the towbar coupling is open. This can activate the automatic closing device, making the coupling pin move down with great force and seriously injuring your hand. Always close the coupling when no trailer is connected. When closing, the hand lever moves down with great force in the direction of the coupling jaw. Therefore start the closing process only by moving the lever briefly in the direction of the coupling jaw with the palm of your hand only. Do not grasp the hand lever. If you hold the hand lever and move it down, it may carry your hand with it and crush it.	C	4	M	Prior to use
42	Test position of the parking brake when towing a trailer Risk of accidents from the trailer rolling away.	D	4	M	In addition to the parking brake, always secure the trailer with wheel chocks when parked on uphill or downhill slopes in order to prevent rolling. Do this even if the parking brake functioned perfectly when you checked it. Observe corresponding regulations in your country when doing this.	C	4	M	Prior to use

Driving Modes and Rigging for On-Road Driving

1	Information on the axle loads Risk of accidents due to increased braking distance. Risk of damage due to premature wear.	D	4	M	When driving with axle loads in excess of 12 tonne, the braking deceleration required by the EU partial-type approval cannot be met. Please bear in mind that the braking distance of the truck crane will lengthen as a result. Even when the axle loads only briefly exceed 12 tonne, premature wear of parts (brake system, steering, tyres, wheels, suspension, drive shafts) that are under particular stress cannot be ruled out.	C	4	M	Prior to use
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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
2	Houselock Risk of accidents during on-road driving with the houselock switched on.	D	4	M	The houselock (additional equipment) will not be automatically switched off when the slewing gear freewheel is switched on. For this reason, always switch the houselock off before you place the main boom on the trailer, so that the superstructure can turn freely when driving on roads.	C	4	M	Prior to use
3	Prerequisites Risk of damage to the slewing gear brake.	D	4	M	Always close the valve on the slewing gear before switching on slewing gear freewheel. In this way you prevent the slewing gear brake from being partially closed and being damaged when the pin is pushed in.	C	4	M	Prior to use
4	Switching on Risk of accidents when driving with boom floating position switched off.	D	4	M	Always switch the boom floating position on when driving with the trailer and secure it with the padlock against being switched off by an unauthorised person. When driving with the boom floating position switched off, the trailer can hang on to the main boom with its full weight when the surface is uneven. On the one side the axle loads increase suddenly, on the other side this situation can lead to the truck crane tipping over when driving around corners.	C	4	M	Prior to use
5	Setting the main boom down on the trailer Risk of accidents due to the main boom falling down.	D	4	M	You may switch on boom floating position when the boom has been placed onto the trailer. In this way you prevent the raised boom from falling down.	C	4	M	Prior to use



Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	

Malfunctions in Driving Mode

1	Poor Visibility Risk of accidents due to poor visibility.	D	4	M	If possible, do not stop in a tunnel or directly after a curve. ☒ Secure the vehicle ☒ Turn on the hazard warning lights ☒ Secure the breakdown area o Set up a warning triangle o Set up a signal lamp or torch Warning triangles, signal lamps and torches must be set up in front of the breakdown area in such a way as to prevent rear end collisions, particularly in curves.	C	4	M	Prior to use
2	Working in danger Areas Risk of accidents during repair work in danger areas.	D	4	M	In danger areas(e.g. tunnels, crossroads, motorway bridges) even simple repairs can be dangerous. When in a danger area, only carry out repair work which is required to leave the area.	C	4	M	Prior to use
3	Towing long distances Risk of accidents and damage when towing the truck crane long distances.	D	4	M	Tow the truck crane at a maximum of 6 to 7 km/h and no further than 100 metres. Additional measures must be taken for longer distances. In these cases, contact CraneCARE at the respective location.	C	4	M	Prior to use
4	Brake system Risk of accidents and damage to vehicle due to a lack of brake supply air.	D	4	M	Vehicle must be supplied with compressed air by the towing vehicle to enable brake operation. Refer to Page 8-6 of the Operator's Manual for more information.	B	5	M	During use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
5	Drive line Risk of damage to transmission and drive line.	D	4	M	Ensure that the transmission, transfer case, axle drives and parking brake are in the correct position for towing purposes. (Refer to Page 8-7 of the Operator's Manual for further information). If damage to the service brake has occurred, it may only be possible to tow the vehicle out of the immediate danger area.	B	5	M	During use
6	Towing the truck crane out of the danger area Risk of damage to the chassis. Risk of accidents due to stiff steering. Risk of accidents and damage when towing the truck crane long distances.	C	5	M	Risk of damage to the chassis Ensure the towing vehicle only drives off slowly. Starting to tow too quickly or in jerks can damage the chassis. Remember that the steering will be sluggish. If the engine fails, only the emergency steering pump will be available, which only supports the steering from a speed of at least 2 km/h. At speeds less than 2 km/h, the truck crane can hardly be steered. • Tow the vehicle at a maximum of 6 to 7 km/h Tow the truck crane at a maximum of 6 to 7 km/h and no further than 100 metres. Additional measures must be taken for longer distances. In these cases, contact CraneCARE at the respective location.	B	5	M	During use
7	Wheels leaning against truck crane Risk of accidents from overturning wheel.	C	5	M	If you temporarily lean a wheel against the truck crane when changing a wheel, secure it against falling over with a rope. Only move the outriggers if there is no wheel leaning against the truck crane.	B	5	M	During use
8	Removing a damaged wheel Risk of accidents from overturning wheel.	C	5	M	When unscrewing the last wheel nuts, the wheel can slip of the hub and tip in your direction. Secure the wheel and step back quickly if the wheel threatens to tip.	B	5	M	During use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
9	Removing the wheel from the spare wheel holder Danger of free-on-wheels crane overturning. Risk of overturning with a rigged outrigger span of 8.10 m x 2.32 m. Risk of accidents from overturning wheel.	C	5	M	Always support the truck crane on outriggers before rotating the superstructure. You may not operate the truck crane in the Free on Wheels working position if the tyres are damaged. With an outrigger span of 8.10 m x 2.32 m, the superstructure may only be rotated if there is a maximum 6.8 tonne counterweight on the turntable and the working radius permissible in the working range is maintained according to the Lifting Capacity Table (at least 3.0 metres). Refer to Slewing with the Rigged Counterweight - in the Operator's Manual for more information. Changing the tyres without using the appropriate lifting equipment for the spare wheel is dangerous. Have someone help you change the wheel whenever possible.	B	5	M	During use
10	Mounting the spare wheel Danger of accidents.	C	5	M	Check the wheel rim, the tyres, the wheel nuts and the wheel studs for damage before mounting the spare wheel. Never mount damaged parts. Mount only the manufacturers original spare wheel or a permitted wheel of the same size and load bearing capacity.	B	5	M	During use
11	Inflation Pressure Risk of damage when tyre pressure is too high.	C	5	M	Depending on the size of the tyres, the prescribed pressure is under 10 bar. Refer to Tyres – in the operator's Manual for inflation pressure. Fill the tyres no more than the prescribed amount of pressure. In this way you will prevent the tyres becoming damaged during driving, and them bursting.	B	5	M	During use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
12	Removing the tyre inflator hose Risk of damage to the compressed air system.	C	5	M	After increasing the tyre pressure, close the tyre inflator connection with the cap. In this way you prevent the thread on the tyre inflator connection from contamination and damage, and also prevent contamination of the compressed air system.	B	5	M	During use
13	Steering wheel Risk of damage to the steering's universal joint.	C	5	M	The steering wheel may only be moved when the driver's cab is tipped to the rear and locked. When moving the steering wheel into other driver's cab positions, the steering's universal joint can be damaged.	B	5	M	During use
14	Tilting the driver's cab Risk of accidents from falling objects or doors swinging open. Risk of accidents due to driver's cab tilting. Risk of damage when the driver's cab is tilting. Risk of accidents due to the driver's cab tilting back.	C	5	M	Remove all loose objects (e.g. bags, bottles etc.) from the driver's cab so that they will not topple when tilting and close all doors of the driver's cab. This prevents liquids from getting into the inserts and doors from swinging open while tilting and injuring people. When you are tilting the driver's cab forward and while it is actually tilted forward, nobody should be in front of the driver's cab. When lifting the driver's cab, the angle between the roof of the driver's cab and the slinging rope must always be larger than 45°. Therefore use only sling gear which is long enough. If the sling gear is too short, the angle will be less than 45° and the ring bolts and the threads may become overloaded. You may only stand under the tilted driver's cab if the driver's cab has tightened the wire rope between the driver's cab and the chassis.	B	5	M	During use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
15	Lowering the driver's cab Risk of crushing due to driver's cab tilting back. Risk of accidents if the driver's cab is not locked. Risk of accidents if the driver's cab is not locked Risk of accidents due to the pump lever falling.	C	5	M	Make sure the driver's cab puts the support under tension or that the driver's cab is secured by the lifting gear against tilting back before unlocking the support. By doing this, you are preventing the driver's cab from accidentally tilting back when unlocking the support, and preventing you or another person from being crushed. Always lock the driver's cab with the two pins to the vehicle frame after the lowering process. This prevents the driver's cab from tilting forward (under the boom) when braking. Ensure the driver's cab is locked after every lowering. This prevents the driver's cab from tilting forward (under the boom) when braking. Always remove the pump lever from the hand pump after lowering the driver's cab and store it away during driving. This will prevent the pump lever from falling while driving and damaging any following vehicles.	B	5	M	During use
16	Tilting the driver's cab Risk of accidents from falling objects or doors swinging open. Risk of damage when the main boom angle is too low. Risk of accidents due to the driver's cab tilting back.	C	5	M	Remove all loose objects (e.g. bags, bottles etc.) from the driver's cab so that they will not topple when tilting and close all doors of the driver's cab. This prevents liquids from getting into the inserts and doors from swinging open while tilting and injuring people. Only tilt the driver's cab when the main boom is sufficiently raised. When the driver's cab is blocked by the main boom and you continue to use the hand pump, then the fastening breaks, the driver's cab is pushed forwards and the steering's universal joint breaks. You may only stand under the tilted driver's cab when the lifting cylinder is placed under tension.	B	5	M	During use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
17	Establishing a hose connection Risk of damage to the connecting hose.	C	5	M	When the hose is connected it may tear with the rotating movement of the superstructure. Remove the connecting hose from the connections immediately after emergency operation.	B	5	M	During use
18	Switching on continuous operation Danger due to falling loads.	C	5	M	Switch off continuous operation at both solenoid valves (Y1105 and Y1104) immediately after the emergency operation. Check whether the pins can be seen at the two open sealing caps. In this way you can prevent loads from falling down immediately after being raised in the subsequent crane operations.	B	5	M	During use
19	Information on replacing fuses Risk of damage when the ignition is switched on. Risk of damage due to overloading. Danger of fire.	C	5	M	Switch off the ignition whenever a fuse has to be replaced. In this way you can prevent the new fuse from being damaged by the increased starting current immediately after inserting it. Replace blown fuses only with new fuses of the same amperage. In this way you can prevent parts from being overloaded and damaged or the fuse from being immediately damaged again. Notify CraneCARE at the respective location if a fuse of the same amperage blows again after turning on the ignition. Never replace a defective fuse with other electrically conductive materials.	B	5	M	During use
20	Lead and lead compounds Danger! Battery components contain lead and lead compounds.	C	5	M	Battery poles, clamps, and parts of the battery itself contain lead and lead compounds. Wash your hands thoroughly following work on these parts or in these areas	B	5	M	During use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
21	Explosive gases Danger of explosion due to explosive gases.	C	5	M	Batteries may give off hydrogen gas which could explode if a source of ignition is present. Ensure that all naked flames and sources of ignition when working in the vicinity of the batteries. Do not smoke.	B	5	M	During use
22	Running diesel engine Risk of accidents from turning fan wheel.	C	5	M	Switch off the diesel engine before switching on emergency operation. If you switch the fan to emergency operation while the vehicle engine is running, the fan wheel immediately begins to turn very quickly. Objects or loose clothing can be sucked up as a result. Make sure there are no people or objects in the vicinity of the fan when switching to emergency operation.	B	5	M	During use

Description of the Crane Section of the Truck Crane

1	Fire extinguisher Risk due to fire extinguisher not working.	C	4	M	Proper functioning of the fire extinguisher is no longer guaranteed once the service interval given on the label has expired.	B	4	L	Prior to use
2	Two hook operation Danger of overturning in two-hook operation mode.	C	4	M	The safe load indicator only protects one-hook operation! Two-hook operation is not permitted and is not covered by the SLI.	B	4	L	Prior to use



Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
3	Rigging modes Danger of overturning if wrong settings are entered into the SLI. Danger of accidents due to incorrectly set SLI.	C	4	M	The SLI does not automatically record all factors during crane operation required to calculate the load limit. If the actual rigging mode is not set, the maximum load calculated by the SLI will not correspond to the actual permissible load capacity. An incorrectly set safe load indicator will give you a false sense of security. This will certainly result in overloading the truck crane and an accident!	B	4	L	Prior to use
4	Setting the lowering limit switch Danger of accidents if the lowering limit switch is incorrectly set or defective. Danger of accidents from incorrect setting of the lowering limit switch.	C	4	M	Reset the lowering limit switch after every hoist rope change, and do not do any crane work if the lowering limit switch is damaged, incorrectly set or disabled. In this way you will avoid damaging the completely unreeled hoist rope, which could then drop the load. Only unreel the hoist rope with Lower Hoist. If you unreel the hoist rope from the stationary rope drum, the lowering limit switch does not detect the number of winds and you must reset the lowering limit switch before starting crane work. This keeps the lowering limit switch from switching off too late or not at all, which could cause the load to fall.	B	4	L	Prior to use
5	Hoisting up Danger of accidents due to operational triggering of the lifting limit switch.	C	4	M	When activating the lifting limit switch at too great a speed, the hook block may hit the main boom head and the main boom head rollers. This may damage the head rollers or the hoist rope, causing the load to fall either immediately or at a later time.	B	4	L	Prior to use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
6	Overriding the lifting limit switch Danger of accidents from overridden safety devices. Danger of accident if the lifting limit switch is faulty or stuck. Danger of accidents due to overridden lifting limit switch. Danger of accident due to unintentional override.	C	4	M	When overriding the lifting limit switch with the Override key switch, crane operation is no longer monitored! For safety reasons the crane movement is stopped once when the shut-down point is reached. After renewed extension of the control lever for the same crane movement, this crane movement is released again and is not switched off again afterwards. It is not permitted to work with an overridden or defective lifting limit switch! Before beginning crane work, check whether the mechanical locking system of the lifting limit switch on the main boom is deactivated, and deactivate it if necessary. Refer to Releasing the Lock in the Operator's Manual. You may only override the lifting limit switch when carrying out maintenance or rigging work in accordance with the operating instructions. In these cases, the lifting limit switch may only be overridden when there is no load on the hook. Operate at minimum speed when driving with an overridden lifting limit switch. Crane work with an overridden lifting limit switch is not permitted. With an overridden lifting limit switch, the hook block can hit the main boom head and the main boom head rollers, which may lead to the load falling either immediately or at a later time. Always pull the key out of the Override key switch after overriding. The key must be removed from the key operated switch while the crane is in operation.	B	4	L	During use



Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	

Crane Operation

1	Operating free-on-wheels Danger of free-on-wheels truck crane overturning.	D	5	H	The superstructure of a free-on-wheels truck crane may be turned only if the turntable is loaded with a maximum 4.3 tonnes of counterweight on the turntable and the operating-area curve remains within the permissible working radius as shown on the Lifting Capacity Table (not less than 3.0 metres).	C	5	M	Prior to and during use
2	Visual inspection of the whole crane Danger if crane cannot be rigged. Risk of damage to the environment from leaking fuel.	C	4	M	Remember that loss of oil can mean that crane movements cannot be carried out even in emergency situations (e.g. when raising in emergency mode). Immediately attend to any oil, fuel or coolant leaks which occur during crane operation, or have them taken care of, so that no oil, fuel or coolant seeps into the ground or ends up in bodies of water	B	4	L	Prior to use
4	Fuel tank level Danger of fire due to flammable gases.	D	5	H	Before filling the fuel tank, switch off the diesel engine and the heating.	C	5	M	Prior to and during use
5	Checking the position of the hoist ropes Danger of accidents due to turning rope drum.	C	4	M	Keep yourself and other people away from the turning rope drum. If you take hold of the turning rope drum, your fingers and hands could be crushed between the rope drum and the hoist frame or get caught and drawn in by the turning drum.	B	4	L	Prior to use
6	Faulty safety devices Danger of accidents when working with defective safety equipment	C	4	M	It is strictly prohibited to operate the crane with non-operational or overridden safety devices. Defective equipment must be repaired immediately by CraneCARE.	B	4	L	Prior to use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
7	Checking the seat contact switch and dead man's switch system Danger of accidents if the seat contact switch is defective.	C	4	M	Do not stand beside the crane cab on the carrier during this check. If the dead man's switch is defective, the superstructure can turn and knock you off the crane. Stand inside the cab.	B	4	L	Prior to use
8	Switching on the houselock Risk of damage from slewing during the locking procedure. Risk of damage from slewing in intermediate position.	C	4	M	Always check before operating the houselock whether the slewing gear brake has been engaged. In this way you prevent the superstructure from being slewed during the locking procedure. Slewing during the locking procedure can lead to system damage. Before slewing make sure the symbol for the Unlocked end position (red) is showing. Otherwise the locking pin is partially extended and the system will be damaged during slewing	B	4	L	Prior to use
9	Switching on the ignition Danger of accidents due to faulty warning lamps.	D	4	M	When the ignition is switched on, lamps for indication light up that serve as warning and indicator lamps during operation. Always carry out the lamp tests and replace faulty lamps / have them replaced immediately. In this way you will avoid accidents and damage that occur when malfunctions are not recognised early enough.	C	4	M	During use
10	Starting the diesel engine Danger of explosions when using starter fuel.	D	4	M	The diesel engine must never be started using starter fuel (e.g. starter spray) Starter fuel sprayed into the suction unit can ignite.	C	4	M	During use
11	Suspended loads Danger of accidents due to suspended loads	D	4	M	Never turn the diesel engine off while a load is suspended. Never leave the crane cab while a load is suspended on the hook. Always keep your hands near the control levers while a load is suspended. This enables you to take corrective action at all times. Always put the load down before you interrupt work.	C	4	M	During use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
12	Switching on Danger of accidents from defective safety devices.	C	4	M	If warning lamps or the buzzer are faulty, notify CraneCARE and have the fault fixed. During the period when the buzzer is defective, pay particular attention to the warning lamps; and if the warning lamps are defective, pay particular attention to the buzzer.	B	4	L	Prior to use
13	Setting the rigging mode If the rigging mode is incompletely set there is an accident hazard.	C	4	M	The crane movements must be already enabled when you load the SLI code or the reeving. Check therefore before working with the crane that both values match the current rigging mode. In this way you prevent the SLI from incorrectly calculating the permitted load and causing the truck crane to be overloaded or overturn.	B	4	L	Prior to use
14	Saving values If rigging mode is incorrectly set there is an accident hazard.	C	4	M	Once the SLI code has been accepted the crane movements are enabled. Check however before starting work with the crane the displayed value for reeving also corresponds to the actual reeving value. In this way you prevent the SLI from incorrectly calculating the permitted load and causing the truck crane to be overloaded or overturn.	B	4	L	Prior to use
15	Entering individual components Danger of overturning due to incorrectly set rigging mode.	C	4	M	Values which have already been set may change when individual components are entered. For this reason, you should always compare the rigging mode displayed with the current rigging mode of the truck crane. In this way you prevent the SLI calculating with incorrectly set components and the truck crane becoming overloaded or tipping. Refer to Checks before Working with the Crane in the Operator's Manual.	B	4	L	During use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
16	Setting SLI Danger of accidents due to incorrectly set SLI.	C	4	M	If the actual rigging mode and the rigging mode indicated by the SLI do not coincide, the permissible load calculated by the SLI is not the actual permissible load. This will result in overloading, causing an accident.	B	4	L	During use
17	Error message Danger of accidents.	C	5	M	You must cease operating the crane immediately as soon as any error message is displayed. Repairs to the SLI may only be carried out by trained, qualified personnel.	B	5	M	During use
18	SLI override Danger of accidents if SLI is overridden. Danger in the event of a defective SLI. Danger of accidents by inadvertently switching on the Override key switch.	C	5	M	The SLI must never be overridden. It is prohibited to operate the crane if the SLI is switched off, overridden, out of service or defective. The SLI may be overridden only in an emergency, when it is absolutely necessary in order to make the condition of the truck crane safe when it is defective. In such circumstances, do not undertake any movement that would increase the load moment (extending telescopic sections, lowering the boom). If the SLI is faulty, set down the load immediately and stop operating the crane. Always remove the key from the Override key switch after overriding. The key must be removed from the key operated switch while the crane is in operation. Otherwise there is a danger of the SLI being overridden accidentally during crane operation.	B	5	M	During use
19	Horizontal alignment Danger of accidents due to the truck crane not being horizontally aligned.	C	4	M	The SLI calculates the radius using the length and angle of the main boom. If the truck crane is not in a horizontal position, the actual radius will change and the crane may overturn. Immediately before starting work with the crane, check the horizontal alignment of the truck crane on the display.	B	4	L	During use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
20	Safe distances Risk of accidents due to contact with objects.	C	5	M	When working with the crane, maintain adequate clearance distances between all parts of the truck crane including the load and objects on the site as well as all persons on the site. Pay particular attention to objects that pose a risk (e.g. scaffolding, gas containers, electrical lines).	B	5	M	Prior and during use
21	Wind speed – with or without anemometer Danger of accidents due to wind speed causing an overload.	C	5	M	Strong winds lead to the truck crane being overloaded. If necessary, find out about the forecasted wind speed from the relevant weather station. The permitted wind speed for a fully loaded truck crane can be found in the Lifting Capacity Table. Refer to the Operator's Manual of a table that indicates wind strengths, wind speeds and their effects. If an anemometer is fitted as additional equipment, you can continuously monitor the wind speed at the Anemometer display while operating the crane. Cease operating the crane immediately when the wind speed shown exceeds the maximum permitted wind speed as shown in the Lifting Capacity Table, and heed all of the instructions given in the section If the maximum permitted wind speed is exceeded in the Operator's Manual.	B	5	M	Prior and during use
22	If the maximum permitted wind speed is exceeded Danger of accidents due to high wind speeds.	C	5	M	If the wind speed exceeds the maximum listed in the Lifting Capacity Table, you must cease operating the crane and set the truck crane to the rigging mode shown in the following table. This applies also when the wind surface of the load is smaller than the permissible specified wind surface Aperm. There is no automatic shutdown.	B	5	M	During use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
23	Earthing the load Danger of accidents due to electric shocks.	C	5	M	Earth the crane before crane operation: ⌘ Near strong transmitters (radio transmitters, radio stations etc.) ⌘ Near high frequency switching stations ⌘ If a thunder storm is forecasted To prevent electrostatic charging of the load, you need: ⌘ A conductor in the form of a metal rod inserted into the ground (approx. 2.0 metre length) ⌘ An electrically conductive cable (minimum cross-section of 16mm²) ⌘ An electrically conductive metal rod with an insulated handle, used to touch the load. Ensure that the connection between the load and the ground is a perfect electrically conductive connection. • Connect one end of the cable to the metal rod that is to be inserted into the ground. Hammer the metal rod at least 1.5 metres into the ground. Moisten the soil around the metal rod for better conductivity. • Connect the other end of the cable to the metal rod with the insulated handle. Hold the metal rod by the insulated handle only. • Hold the metal rod by the insulated handle. Use the metal rod to touch the load before touching the load with your hand.	B	5	M	During use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
24	If the truck crane is free-on-wheels Danger of free-on-wheels truck crane overturning. Risk of overturning with free-on-wheels truck crane if SLI is overridden.	C	5	M	For a free-on-wheels truck crane, the superstructure may only be rotated if there is a maximum 4.3 tonnes of counterweight on the turntable and the radius permitted in the working area is maintained according to the Lifting Capacity Table (at least 3.0 metres) This prevents the truck crane from tipping to the rear. If the SLI code for working free on wheels with 4.3 tonnes of counterweight is entered, the SLI because of considerations of safety at the rear will prevent those crane movements that would call for a working radius of less than 3.0 metres. If you override the SLI and reduce the working radius further, the truck crane will overturn.	B	5	M	During use
25	General precautions Danger of accidents due to accidental operation of a hoist.	C	4	M	Always switch off the hoist that is not in use. You are not allowed to turn the drum if the hook block is unreeved and you have completely reeled in the hoist rope. ⚠ Slack rope will occur if the hoist rope is unintentionally turned in lowering direction. This causes rope loops to form on the hoist drum which can lead to load slipping and destruction of the hoist rope. ⚠ If the hoist rope is accidentally twisted in the lifting direction, the cut-out point of the lowering limit switch will change so that fewer than the required safety turns are available.	B	4	L	During use
26	General precautions Danger of accidents due to loads being lifted at a slant.	C	4	M	Loads can bend the main boom, resulting in the hoist rope no longer being aligned vertically. Compensate the deflection by raising in order to lift the load vertically. In this way you prevent the load dragging and injuring helpers, or falling at an angle into the hoist rope. Inform all helpers about this situation.	B	4	L	During use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
27	General precautions Danger due to slack rope.	C	4	M	Use only hook blocks and lifting gear with sufficient minimum safe working load in accordance with the Lifting Capacity Tables for reeving and boom length. This will avoid the development of slack rope at large heights when lifting with no load, which can lead to load slipping during subsequent lifts.	B	4	L	During use
28	Lifting and lowering Danger of accidents due to suspended loads. Danger of accidents due to overridden lifting limit switch. Danger of accidents due to defective lowering limit switch.	C	5	M	Never leave the crane cab while a load is suspended on the hook. Never turn the diesel engine off while a load is suspended. Always keep your hands near the control levers while a load is suspended. This enables you to take corrective action at all times. Always put the down the load before you interrupt work. Always leave the shutdown area after the lifting limit switch has been shut down. The shutdown must not be overridden during crane operation and while a load is suspended on the hook. If, when the shutdown is overridden, you continue to pull the hook block against the boom, the hoist rope can tear, resulting in the load falling to the ground. Do not carry out crane operation if the lowering limit switch is: • Damaged • Out of service • Misadjusted Too much hoist rope would be reeled off and the required safety turns would no longer be there.	B	5	M	During use
29	General precautions Danger of accidents when working with auxiliary hoist.	C	4	M	Before working with the auxiliary hoist, read and follow all of the safety instructions in the section Main Hoist in the Operator's Manual. When working with the auxiliary hoist, all of the safety instructions for working with the main hoist also apply, along with the information contained in section Auxiliary Hoist in the Operator's Manual.	B	4	L	During use



Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
30	General precautions Danger of accidents from damaged hoist ropes.	C	4	M	If you reeve the auxiliary hoist in addition to the main hoist, ensure that the main boom is raised to approximately 20° before operating the auxiliary hoist. This will ensure that the auxiliary hoist rope is clear of the main hoist drum. In this way you will prevent the auxiliary hoist rope from rubbing against the rotating main hoist drum and the main hoist rope, and avoid damage to the hoist ropes. This will also minimise the risk of causing immediate or subsequent rope slippage when operating the crane.	B	4	L	During use
31	Raising loads Danger of overturning while lifting loads.	D	5	H	Lifting loads by raising the boom is strictly prohibited as the SLI does not function when this is done. Raising the boom is a movement that decreases the load moment and is not deactivated by the SLI. However, raising the boom can cause the truck crane to overturn if excessively heavy loads are lifted.	C	5	M	During use
32	Lowering the main boom to the horizontal position Danger of overturning when the SLI is overridden.	D	5	H	Never override the SLI when it shuts down the boom lowering process. If the SLI shuts down the lowering, the truck crane is in a condition where the main boom may not be lowered beyond the working range (e.g. the load or the working radius is too large). If you continue to lower with the SLI overridden, the truck crane will overturn.	C	5	M	During use
33	Slewing the superstructure Danger of overturning when slewing with a rigged counterweight.	D	5	H	Always check before slewing whether slewing is permitted in the truck crane's current rigging mode (counterweight, outrigger span, working radius). Correct the rigging mode if necessary. Refer to Slewing with the Rigged Counterweight in the Operator's Manual.	C	5	M	During use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
34	Slewing Danger of overturning when turning with an overridden SLI. Danger of accidents due to a rotating superstructure. Danger of boom buckling.	D	5	H	Do not override the SLI before rotating the superstructure. When the SLI is overridden, the SLI input and the corresponding rigging mode will not be monitored. This would mean that slewing was unblocked even if it was not permitted, and the truck crane could overturn. There is a danger of being crushed by rotating machine sections. Use the horn before slewing the superstructure and check that no persons are in the slewing range of the superstructure. In this way you avoid the possibility of crushing persons between the rotating superstructure and fixed objects or between the superstructure and the carrier. Accelerate slewing speed only to such a degree that the load does not sway.	C	5	M	During use
35	Braking the slewing movement Danger of boom buckling.	D	5	H	Brake the slewing speed only to such a degree that the load does not sway. Only depress the Slewing Gear Service Brake Pedal fully in case of danger (to make an emergency stop). On no account should you switch the slewing gear off to brake it; only switch off the slewing gear when the superstructure has stopped rotating.	C	5	M	During use
36	Monitoring the oil temperature in the slewing gear brake Danger of accidents from overheating slewing gear brake.	D	5	H	When there is a warning message, always check in the Warning Message submenu if the slewing gear brake temperature is too high. If it is, stop crane operation at the next opportunity. This prevents the slewing gear brake from overheating and causing the brake plates to be damaged. When the slewing gear brake has overheated, its braking power is reduced. Only begin working with the crane again when this warning message is no longer displayed.	C	5	M	During use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
37	Switching off the slewing gear Risk of damage to the boom.	D	5	H	Always brake the slewing movement with the Slewing Gear Service Brake Pedal until it has come to a standstill before you switch off the slewing gear. When it is switched off, the slewing gear brake will be applied automatically. In this way you avoid sideward force being operated on the boom due to heavy retardation or swinging load.	C	5	M	During use
38	Checks before telescoping for the first time Risk of damage to the telescoping mechanism.	D	6	H	After switching on the ignition before the first telescoping, always check that the current telescope status is displayed on the Crane Control display. Telescoping can cause damage to the telescoping mechanism if, after a disturbance, the crane control is unable to correctly calculate the current telescope status and no error message is issued. If the current telescoping is not correctly displayed, enter the current telescoping. Refer to Entering Telescoping Values after Emergency Operation in the Operator's Manual.	C	5	M	During use
39	Control lever function Danger of accidents due to unexpected crane movements. Damage to the hoist rope.	D	5	H	If a control lever is assigned more than one function, check whether the Telescoping Mechanism On / Off indicator lamp is lit up (at the control console in the main menu or the Telescoping submenu) before moving the control lever for telescoping. In this way you prevent accidents through unexpected derricking of the main boom. Slack rope will form if the hook block is allowed to touch the ground while the boom is being retracted. This causes rope loops to form on the hoist drum which can lead to load slipping and damage to the hoist rope.	C	5	M	During use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
40	Unlocking the telescoping cylinder Risk of damage to the boom system.	D	5	H	If extending and retracting the telescoping cylinder several times does not cause unlocking, you must not move the telescoping cylinder any further against the stop. ⌘ Mechanically lock the telescoping cylinder. To do this, press the button next to the Select Lock symbol once and move the control lever. ⌘ Restart the unlocking procedure. To do this, press the button next to the Select Telescoping Cylinder Unlock symbol once and move the control lever.	C	5	M	During use
41	Unlocking the telescopic section Risk of damage to the boom system.	D	5	H	If extending and retracting the telescoping cylinder several times does not cause unlocking, you must not move the telescoping cylinder any further against the stop. ⌘ Mechanically lock the telescoping cylinder. To do this, press the button next to the Select Lock symbol once and move the control lever. ⌘ Restart the unlocking procedure. To do this, press the button next to the Select Telescoping Cylinder Unlock symbol once and move the control lever.	C	5	M	During use
42	Locking the telescopic section Risk of damage to the telescoping cylinder.	D	5	H	Move the control lever until the Select Lock symbol starts flashing. The locking process is only finished and the telescopic section is only properly attached to the telescopic section above it when the background of the symbol is shown in yellow. In this way you prevent the load from affecting the telescoping cylinder when the crane is in operation, and enable the release of a load for fixed lengths.	C	5	M	During use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
43	Moving the telescopic section through other fixed lengths before locking Risk of damage to the telescoping cylinder.	D	5	H	Move the control lever until the Select Lock symbol starts flashing. The locking process is only finished and the telescopic section is only properly attached to the telescopic section above it when the background of the symbol is shown in yellow. In this way you prevent the load from affecting the telescoping cylinder when the crane is in operation, and enable the release of a load for fixed lengths.	C	5	M	During use
44	Using high speed mode Danger of accidents due to sudden acceleration.	D	5	H	Reduce the engine speed before switching on high-speed mode so that the acceleration rate of the movement is not too high. The truck crane could start to rock and then overturn.	C	5	M	During use
45	Hoists Danger of overload. Danger of slack rope.	D	5	H	Make sure that the lifted load is at the most 50% of the maximum load according to the Lifting Capacity Table (50% maximum degree of utilisation), before you operate the hoist at high speed. Take care that slack rope does not form when the hoist is lowered.	C	5	M	During use
46	Loose objects Danger of accidents due to objects overturning in the crane cab.	C	5	M	Remove all loose objects (e.g. bags, bottles etc.) from the crane cab so that they do not fall over when tilting the crane cab. Close the door to the crane cab before inclining. In this way you prevent fluids from reaching the inserts, and you prevent the crane cab door opening by itself or unwanted operating errors being caused by fright.	B	5	M	During use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
47	Inclined cab Danger of accidents when getting on and off the crane while the crane cab is tilted.	D	5	H	Always bring the crane cab to the lowered position before leaving the crane cab. If the cab is tilted you can slip between the cab and the stepping grid, and fall down.	B	5	M	During use
48	Adjusting the direction Danger of accidents due to dazzling when driving on the road.	C	5	M	When driving on the road, always adjust the spotlights for the working area so that the reflector points downwards. This is to avoid dazzling other road users with reflections from the spotlights for the working area, which could cause an accident.	B	5	M	During use
49	Shut down areas Danger of accidents arising from situations which cannot be monitored.	C	5	M	The working range limiter only serves as an additional safety device. Brake the crane movement in time to avoid the obstacle. Do not knowingly drive into the shutdown area. You, the crane operator, are responsible for supervising the working range at all times, so that you can react accordingly in a situation that cannot be monitored electronically.	B	5	M	During use



Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
50	Clearances Danger of accidents due to limit values set too low. Risk of accidents if the statutory safe distance is not complied with. Danger of accidents due to limit values set too low.	C	5	M	When entering the limit values, be aware that, even after switching off the engine, movements can occur that would bring the load into the shutdown area (e.g. due to load swing or boom deflection). For this reason, always enter the limit value to the object with sufficient safety distance. Even when the working range limiter is switched on, always observe all safety distances according to the country's legal regulations (e.g. concerning electrical overhead cables) NOTE: For operation in Australia, refer to the Occupational Health and Safety Regulations or Codes or Practice that apply in your respective state or territory. Observe all clearances relating to NO GO zones and comply with any legislation regarding the use of observers or spotters. When entering the limit values, be aware that, even after switching off the engine, movements can occur that would bring the load into the shutdown area (e.g. due to load swing or boom deflection). For this reason, always enter the limit value to the object with sufficient safety distance.	B	5	M	During use
51	Presentation of slewing angles Danger of accidents due to incorrectly set slewing angles.	C	5	M	Observe the definitions of slewing angles A and B when moving to the shutdown points. ⚠ When the value for slewing angle A is applied, the shutdown point must always be located to the left next to the boom. ⚠ When the value for slewing angle B is applied, the shutdown point must always be located to the right next to the boom.	B	5	M	During use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
52	Switching monitoring on Danger of accidents due to erroneously set limit values!	C	5	M	If, during starting operations or after entering new limit values, you switch on the monitoring, then make sure that the settings for the limit values are correct. Approach the limit value slowly and check whether the movement is switched off at the right time. If necessary, enter new values with a larger safety distance.	B	5	M	During use
53	Bypassing shutdown Danger of accidents from overriding a shutdown.	C	5	M	Override the shutdown only if absolutely necessary and if you can clearly see the danger zone. Remember that, because of the boom deflection, the overall height of the truck crane will increase when putting down the load.	B	5	M	During use
54	Driving with lifted load Risk of accidents when driving with a lifted load.	C	5	M	The truck crane may only be moved with a lifted load when the Free-on Wheels working position and the current rigging mode is secured with the SLI code for free-on-wheels operations.	B	5	M	During use
55	Swinging load Risk of accidents due to the hook block or load swinging.	C	5	M	When driving the rigged truck crane secure the hook block and the load against swinging and switch to gear position L for driving forwards. In this way you avoid driving too fast and stop the load from swinging due to a gear change in the transmission.	B	5	M	During use
56	Obstacles Risk of accidents by not having a clear view of the entire truck crane.	C	5	M	While driving the rigged truck crane, always stay in visual or radio contact with a helper who can observe the parts which you cannot see. In this way you prevent accidents resulting from collisions with persons, other construction equipment, ledges of buildings, cables or other objects.	B	5	M	During use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
57	High engine speed Risk of accidents due to use of constant high engine speed when driving the truck crane from the crane cab.	D	5	H	Do not drive the truck crane from the crane cab at a constantly high engine speed. You may only drive the truck crane from the crane cab at the lowest speed possible.	B	5	M	During use
58	High centre of gravity Danger of overturning due to the centre of gravity being changed.	C	5	M	When driving a truck crane in rigged mode from the crane cab, take account of the position of the centre of gravity of the crane. The further the main boom is extended and the steeper the main boom, the higher the centre of gravity is above the ground. Adjust the driving speed in accordance with the centre of gravity, especially when driving around corners.	B	5	M	During use
59	Slewing Danger of overturning by slewing the superstructure while driving the truck crane.	D	5	H	Always lock the slewing gear brake (shut down the slewing gear) before driving the truck crane with a load. If you slew the superstructure when driving with a raised load, there is an increased risk of overturning due to acceleration forces.	C	5	M	During use
60	Tyre pressures Risk of damage to tyres.	C	5	M	Check the pressure in the tyres before moving the rigged truck crane. The truck crane may be moved only if the tyre pressure is at the prescribed levels. Refer to Tyres in the Operator's Manual Never reduce the tyre pressure in order to increase the bearing surface of the tyres.	B	5	M	During use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
61	Preconditions for driving with a load Risk of accidents when driving with a lifted load.	D	5	H	When driving the rigged truck crane secure the hook block and the load against swinging and switch to gear position L for driving forwards. In this way you avoid driving too fast and stop the load from swinging due to a gear change in the transmission. ☒ The hook block and the load must be secured or lashed securely ☒ For forward travel, gear position L is switched on ☒ The main boom must be at an inclination which is permissible for the working range of the SLI code that is set ☒ The driving speed is a maximum of 1.5 km/h	C	5	M	During use
62	Ground conditions Risk of overturning.	C	5	M	Please keep the load bearing capacity of the ground and the maximum axle load in mind when driving the crane. Refer to Total Weight and Axle Loads in the Operator's Manual. Pay attention to the longitudinal and transverse inclination of the truck crane. Please pay attention to the tyre pressure. Refer to Tyres in the Operator's Manual. If the tyre pressures are too low there is a risk of the truck crane tipping over, and the tyres will wear rapidly.	B	5	M	During use
63	Steering Risk of damage to the steering linkage.	C	5	M	Steer the truck crane only when the vehicle is rolling. The steering linkage can become damaged if the steering is operated while the vehicle is stationary.	B	5	M	



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
64	Driving Risk of accidents due to high wind speeds!	D	5	H	If the wind speed exceeds the maximum permissible values set out in the Lifting Capacity Table, you must not drive the rigged truck crane. In this case you must bring the truck crane into a safe condition. Refer to If the Maximum Permitted Wind Speed has been Exceeded in the operator's Manual for more information.	C	5	M	During use
65	Levelling the truck crane free-on-wheels Danger of overturning when switching off the suspension locking system.	D	5	H	You may by no means switch off the suspension locking system as long as the rigged truck crane is on wheels. The suspension is not under pressure and the suspension struts would be pressed together and damaged when the suspension locking system is switched off, and the truck crane could overturn. The procedure for alignment is the same as in the case for driving with a rigged crane. Refer to During Crane Work in the Operator's Manual for more information.	C	5	M	During use
66	Differential locks Risk of damage to the differential locks.	C	5	M	The differential locks may not be switched on when the vehicle is on firm ground. Do not leave the differential locks switched on for any longer than necessary. Make absolutely sure you switch off the differential locks when driving on firm ground.	B	5	M	During use
67	Securing the truck crane against unauthorised use Danger of unauthorised use.	C	5	M	Always stow the hand-held control in the crane cab before leaving the truck crane, and lock the door to the crane cab. In this way you can stop unauthorised persons from starting the diesel engine with the hand-held control.	B	5	M	During use
68	Battery charge Accelerated discharge of battery when the diesel engine is switched off.	C	3	L	If you run the heater whilst the engine is stopped, the batteries will run down. They will then have to be recharged after shorter periods of time.	B	3	L	During use



Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
69	Switching on the heating Danger of explosion when using the heater. Risk of suffocation when using heater.	C	6	H	Operation of the heater is not permissible: ⌘ At service stations and tank farms ⌘ At locations where flammable gas or vapours are formed or can be formed (e.g. at fuel stations and chemical factories) ⌘ At locations where explosive dust is found or can be formed (e.g. coal dust, wood dust, grain dust) Do not operate the heater and the timed heater in enclosed spaces (e.g. garages).	B	6	M	During use

Rigging Work

1	Ground/supporting surface conditions Danger of ground subsidence causing crane to overturn. Damage to underground services due to subsidence. Danger of support surface collapse due to inadequate strength.	C	5	M	Where practicable have the supporting surface for crane operations assessed by conducting soil compaction sampling, bore-logging or core sampling to determine the minimum load bearing capacity of the supporting surface. Wherever possible, obtain information regarding the location of any underground services such as water, gas, electricity, telephone or sewer lines. Avoid setting the outriggers above these underground services. Do not set up the crane on any suspended concrete slab without an engineering report being conducted by a competent person. Do not move the crane onto the suspended slab until all of the requirements of the engineering report have been completed (such as propping and extra supports) and the crane operator has personally inspected the required improvements and received a written copy of the engineering report and written verification that the requirements of the report have been completed.	B	5	M	During use
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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
2	Levelling the crane Danger of overturning when carrier of truck crane is at an angle.	C	5	M	Line up the carrier horizontally and align the truck crane horizontally with the outrigger cylinders. In this way you prevent the outrigger pads slipping from the angled carrier, or the truck crane from having an unfavourable centre of gravity owing to an incline and overturning when subject to a load.	B	5	M	During use
3	Enlarging the outrigger surface area Danger of accidents by crane overturning due to weak packing.	C	5	M	Thin boards or planks made of pine wood or bricks are not made to withstand the resulting pressure and divert it safely to the ground. Ensure that the surface area of the outrigger packing is enlarged as much as possible by using hardwood timber packing with a minimum strength rating of F14 and with minimum dimensions of 200mm wide by 75mm thick, by using steel plates, by using "bog mats" or by using OEM synthetic outrigger mats. Under no circumstances should the crane be set up for lifting without increasing the surface bearing area of the outrigger pads.	B	5	M	During use
4	Heavy outrigger packing Risk of manual handling injuries while lifting outrigger packing.	C	5	M	Ensure that correct manual handling techniques are used when handling heavy outrigger packers. Wherever possible utilise two person lifting techniques.	B	5	M	During use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
5	Placement of outrigger packing Risk of accidents and machine damage due to incorrectly placed outrigger packing.	C	5	M	Ensure that the initial layer of packing has been laid as horizontally as possible. Failure to do this will mean that the packing will not be vertically aligned and this will cause instability of the packing. There is also the risk that the outrigger pads will slide off the packing during levelling. If using hardwood timber packing to increase the surface bearing area of the outriggers, ensure that the bottom layer of packing is laid closely together with no gaps between the timbers. Each subsequent layer of timber packing should be laid at right angles (90°) to the previous layer and arranged so that the packing resembles a gently sloping pyramid. Ensure that the top layer of timber packing is placed at right angles (90°) to the outrigger beams.	B	5	M	During use
6	Clearances Danger of ground subsidence due to crane weight too close to bank or pit.	C	5	M	Avoid setting up the crane in the vicinity of trenches, slopes or excavations that may collapse under the combined weight of the crane, lifted load and other imposed forces. For guidance on appropriate distances to maintain, Refer to Safe Distance from Banks and Pits in the Operator's Manual.	B	5	M	During use
7	Earthing the load Danger of accidents due to electric shocks.	C	5	M	Earth the crane before crane operation: ☒ Near strong transmitters (radio transmitters, radio stations etc.) ☒ Near high frequency switching stations ☒ If a thunder storm is forecasted To prevent electrostatic charging of the truck crane, you need: ☒ A conductive metal rod to insert into the ground (approx. 2.0 m) ☒ An electrically conductive cable (minimum cross-section of 16mm ²) ☒ An screw clamp for welding work	B	5	M	During use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
8	Earthing the truck crane Risk of manual handling injuries while lifting outrigger packing. Danger of accidents due to electric shocks. Danger of accidents due to electric shocks.	C	5	M	Ensure that correct manual handling techniques are used when handling heavy outrigger packers. Wherever possible utilise two person lifting techniques. Ensure that the connection between the load and the ground is a perfect electrically conductive connection. • Connect one end of the cable to the metal rod that is to be inserted into the ground. Hammer the metal rod at least 1.5 metres into the ground. Moisten the soil around the metal rod for better conductivity. • Connect the other end of the cable to the screw clamp for welding work and fasten the clamp to the main boom or the superstructure. Fasten the screw clamp for welding work onto welded parts of the main boom or the superstructure only. Do not fasten the clamp to screwed on parts such as valves, cover plates, engines, gear units etc.	B	5	M	During use
9	Overhead power lines Danger of accidents due to electric shocks.	D	6	H	This truck crane is not insulated. Contact between overhead powerlines and the boom, the hoist rope, the hook block, the lifting tackle, the load itself or the guide ropes can result in serious, possible fatal injuries. If possible, have the current in the powerlines switched off or keep the truck crane, its equipment, lifting tackle and the load at a minimum safe distance as specified by local regulations for that level of voltage. NOTE: For operation in Australia, refer to the Occupational Health and Safety Regulations or Codes or Practice that apply in your respective state or territory. Observe all clearances relating to NO GO zones and comply with any legislation regarding the use of observers or spotters	C	6	H	Prior and during use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
10	Boom security Risk of accidents due to the boom falling down.	C	5	M	After switching off the boom floating position, always secure the hand lever with the padlock. The boom will fall down if the levers are accidentally operated while the boom is raised.	B	5	M	During use
11	Valve IV Danger of overheating the hydraulic oil.	C	5	M	Always close valve IV before using the crane. If valve IV is left open, the pressure in the boom pre-tensioning hydraulic circuit will increase considerably which may result in the hydraulic oil being heated to above the permitted temperature of 80°C.	B	5	M	During use
12	Movement of boom Risk of damage to the superstructure when working with the crane while the slewing gear freewheel is switched on.	C	5	M	As long as the slewing gear freewheel is switched on, the slewing superstructure cannot be braked with the slewing gear brake. Switch off the slewing gear freewheel in order to work with the crane. This prevents the superstructure from colliding with obstacles as it turns.	B	5	M	During use
13	Prerequisites Risk of accidents due to reduced brake power.	C	5	M	After switching the slewing gear freewheel off, always open the valve on the slewing gear. When the valve is closed, the slewing gear brake power is insufficient for crane operation.	B	5	M	During use
14	Before slewing Danger of free-on-wheels truck crane overturning.	D	5	H	For a free-on-wheels truck crane, the superstructure may only be rotated if there is a maximum of 4.3 tonne of counterweight on the turntable and the radius permitted in the working area is maintained according to the Lifting Capacity Table (at least 3.0 metres)	C	5	M	During use
15	Before slewing Danger of overturning with a rigged outrigger span of 8.10 m x 2.32 m.	C	5	H	With an outrigger span of 8.10 metres x 2.32 metres, the superstructure may only be rotated if there is a maximum of 6.8 tonne of counterweight on the turntable and the radius permitted in the working area is maintained according to the Lifting Capacity Table (at least 3.0 metres)	B	5	H	During use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
16	Main hoist mirrors Danger of accidents by exceeding the permitted overall height.	C	5	M	Fold the hoist mirrors and the mirrors in again for driving. When the mirrors are folded out, the overall height specified for on-road driving is exceeded.	B	5	M	During use
17	Mirrors for monitoring the outriggers Danger of accidents by exceeding the permitted overall width.	C	5	M	Fold the mirrors for monitoring the outriggers in again for driving. When the mirrors are folded out, the overall width specified for on-road driving is exceeded.	B	5	M	During use
18	After connecting it to the right hand side of the carrier Danger of unauthorised use.	C	5	M	Always keep the hand-held control in the driver's cab or in the crane cab after crane operation, and always lock the doors when you leave the truck crane. In this way you can stop unauthorised persons from starting the diesel engine with the hand-held control.	B	5	M	During use
19	Movement of outriggers Danger of being crushed by extending or retracting outrigger beams. Danger of contact with objects when extending or retracting outrigger beams.	C	5	M	You may activate the outriggers only if you yourself or a helper with whom you are in visual contact have an unobstructed view of the outrigger movements. Ensure that prior to extending the outrigger beams that there is sufficient clearance to allow full extension of the outrigger beams without collision with surrounding objects. Clear away any obstructions that may cause interference.	B	5	M	During use
20	Lowering suspension Danger of crushing when lowering suspension.	C	5	M	To allow use of the outrigger controls, the crane suspension must be fully lowered and locked. Ensure that no person is standing in a position where crushing can occur while the crane suspension is being lowered and locked.	B	5	M	During use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
21	Crane stability Danger of truck crane overturning if improperly supported.	C	5	M	When working with the crane, always: ✗ Extend the outrigger beams only to the permitted spans of 2.32 m, 5.00 m, 6.00 m, or 7.00 m. ✗ Extend all four outrigger beams to the same span ✗ Enlarge the surface area of the outrigger pad packing ✗ Raise the truck crane until all wheels are off the ground ✗ Align the truck crane horizontally	B	5	M	During use
22	Clearances Danger of accidents during on-road driving.	C	5	M	For on-road driving, ensure: ✗ All outrigger beams and cylinders have been retracted fully ✗ All outrigger beams have been pinned and secured ✗ All outrigger pads have been pushed in and secured ✗ The outriggers do not protrude beyond the outer limits of the vehicle Refer to Securing the Outrigger Beams for On-Road driving in the Operator's Manual for more information.	B	5	M	During use
23	Rotating the superstructure Danger of the truck crane overturning when slewing if it is insufficiently supported.	C	5	M	Depending on the counterweight rigged, the truck crane must be sufficiently supported and the radius permitted in the working range must be observed in line with the Lifting Capacity Table before the superstructure can be rotated. Observe all the instructions in sections 13.6.3 thru 13.6.12, as well as in the section Slewing with a Rigged Counterweigh in the Operator's Manual.	B	5	M	During use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
24	Outrigger extension Danger of the truck crane overturning if it is not properly supported.	C	5	M	Always extend all four outrigger beams to the required outrigger span, even if you are only working to one side. Otherwise the rear stability of the rigging mode according to the SLI code is no longer guaranteed. Raise the truck crane on the outriggers until none of the wheels are touching the ground.	B	5	M	During use
25	Outrigger span of 8.10m x 2.32m Danger of overturning with a rigged outrigger span of 8.10m x 2.32m.	C	5	M	With an outrigger span of 8.10 m x 2.32 m, the superstructure may only be rotated if there is a maximum of 6.8 tonne of counterweight on the turntable and the working radius permissible in the working range is maintained according to the Lifting Capacity Table (at least 3.0 m). Refer to Slewing with the Rigged Counterweight in the Operator's Manual for more information.	B	5	M	During use
26	Free-on wheels Danger of the free-on-wheels truck crane overturning.	C	5	M	With free-on-wheels cranes, the superstructure may only be rotated if there is a maximum of 4.3 tonne of counterweight on the turntable and the working radius permissible in the working range is maintained according to the Lifting Capacity Table (at least 3.0 m). Refer to Slewing with the Rigged Counterweight of the Operator's Manual for more information.	B	5	M	During use
27	Using the hand-held control Risk of damage to the outrigger beams.	C	5	M	Before extending the outrigger beams, always check that they are released. In such a way you avoid the outrigger beams bending or damaging the locking bars.	B	5	M	During use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
28	Using the hand-held control Danger of accidents when outrigger movements are performed outside your field of vision.	C	5	M	Block off the danger area of the moving outrigger beams before moving them. Monitor the movements of the outrigger beams closely or have a helper, with whom you are in visual contact, monitor the movements during operation. Nobody, including the helper, may be in the danger area of the moving outrigger beams.	B	5	M	During use
29	Using the hand-held control Danger of the truck crane overturning if it is not properly supported.	C	5	M	Only ever extend the outrigger beams to the span of a permitted outrigger span (7.00 m, 6.00 m, or 5.00 m) or retract them completely (2.32 m).	B	5	M	During use
30	Setting outrigger spans Danger of overturning when the outrigger beams are not uniformly extended.	C	5	M	All outrigger beams must be extended to the same width. Check whether all outrigger beams are extended to the necessary span and secure all outrigger beams.	B	5	M	During use
31	Locking pins and safety hoops Danger of accidents due to moving outrigger beams.	C	5	M	Always secure the outrigger beams with the locking pins and safety hoops for on-road driving. This prevents the outrigger beams from falling out while driving around corners, which could cause serious accidents.	B	5	M	Prior and during use
32	Supporting surface Danger of overturning if the load bearing capacity of the ground is too low.	C	5	M	Monitor the outrigger pressure and keep the load bearing capacity of the ground in mind during crane work. If the ground does not have sufficient load bearing capacity, you must pack the outrigger pads with a suitable material. In this way you prevent the ground giving way underneath the outrigger pad and the truck crane falling into an incline and tipping.	B	5	M	During use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
33	Outrigger packing Danger of overturning when packing is at an angle.	C	5	M	Always align the packing horizontally. In this way you prevent the outrigger pads from slipping off the inclined packing and the truck crane overturning.	B	5	M	During use
34	With the hand-held control Danger of accidents when outrigger movements are performed outside your field of vision.	C	5	M	Monitor every movement of the outrigger cylinders closely or have a helper monitor the movements during operation.	B	5	M	During use
35	With the hand-held control Danger of overturning due to slipping of the packing. Danger of accidents if the wheels touch the ground.	C	5	M	After adjusting the truck crane, check the condition and position of the packing material for the outrigger pads. Wooden packers may have slipped or been pushed out of position. Rotate the truck crane by 360° and check every individual outrigger. Do not rely on visual inspection using the mirror. Do not forget that if the ground already gives way at several points under the outrigger before or while readjustments are being made, the wheels of the crane may touch the ground again. This would cause the stability of the truck crane to change and thus increase the danger of overturning. If you are not absolutely certain that the truck crane's wheels do not touch the ground, you must get out and ensure that the truck crane is still on outriggers as prescribed. If the wheels of the truck crane are touching the ground, stop working with the crane immediately and rig it again as prescribed.	B	5	M	During use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
36	Extending the outrigger cylinders Danger of accidents when outrigger movements are performed outside of your field of vision. Risk of damage to the outrigger cylinders.	C	5	M	Block off the danger area of the moving outrigger cylinders before moving them. Monitor the movements of the outrigger cylinders closely or have a helper, with whom you are in visual contact, monitor the movements during operation. Nobody, including the helper, may be in the danger area of the moving outrigger cylinders. Move the outriggers as uniformly as possible on all four support points. This prevents the outrigger cylinders from being damaged due to one-sided pressure.	B	5	M	During the use
37	Retracting the outrigger cylinders Risk of damage to the tyres. Risk of damage to the outrigger cylinders.	C	5	M	Before retracting the outrigger cylinders, walk around the truck crane and remove any sharp-edged and pointed materials which are in the area under the tyres. By doing this you prevent the tyres bursting or being damaged when the truck crane is lowered. Move the outriggers as uniformly as possible on all four support points. This prevents the outrigger cylinders from being damaged due to one-sided pressure.	B	5	M	During use
38	From the crane cab Danger of overturning.	C	6	H	It is forbidden to readjust the outrigger with a load on the hook. Always set the load down on the ground before activating the outrigger.	B	6	M	During use



Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
39	Extending and retracting the outrigger cylinders Danger of accidents when outrigger movements are performed outside of your field of vision. Danger of overturning due to slipping of the packing. Danger of accidents if the wheels touch the ground.	C	5	M	Monitor every movement of the outrigger cylinders closely or have a helper monitor the movements during operation. After adjusting the truck crane, check the condition and position of the packing material for the outrigger pads. Wooden packers may have slipped or been pushed out of position. Rotate the truck crane by 360° and check every individual outrigger. Do not rely on visual inspection using the mirror. Do not forget that if the ground already gives way at several points under the outrigger before or while readjustments are being made, the wheels of the crane may touch the ground again. This would cause the stability of the truck crane to change and thus increase the danger of overturning. If you are not absolutely certain that the truck crane's wheels do not touch the ground, you must get out and ensure that the truck crane is still on outriggers as prescribed. If the wheels of the truck crane are touching the ground, stop working with the crane immediately and rig it again as prescribed.	B	5	M	During use
40	If the boom is raised Danger of overloading the boom.	C	6	H	Always turn the superstructure to the 0° or 180° position before you align the truck crane horizontally with a raised boom. If the superstructure is in another position, the Electronic Level registers the deformation of the frame as an additional angle and the displayed value can deviate from the actual value and the truck crane is at an incline. This side load on the boom increases when working at this incline and the boom can become overloaded.	B	6	M	During use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
41	Procedure during automatic alignment Danger of truck crane overturning if not aligned horizontally.	C	5	M	Always check the horizontal alignment on the electronic level display after automatic alignment. When the crane control ends automatic alignment, the truck crane may not necessarily be horizontally aligned (if for example one outrigger cylinder has been extended as far as possible)	B	5	M	During use
42	During crane work Danger of overturning when switching off the suspension locking system. Risk of crushing when switching off the suspension locking system. Danger of overturning!	C	5	M	As long as the rigged truck crane is on wheels, you must not turn off the suspension locking system for any reason. The suspension is no longer under pressure and when the suspension locking system is switched off, the suspension struts would be pressed together and damaged, and the truck crane could tip over. When the suspension locking system is switched off, the wheels drop down suddenly. Ensure nobody is in close proximity to the wheels when you are releasing the suspension locking system. To reduce the risk of the truck crane overturning, do not raise the outrigger pads more than 5 to 10 cm off the ground. Leave the outrigger beams extended.	B	5	M	During over
43	Identification Danger if counterweight parts are interchanged.	C	5	M	Use only the counterweight sections that belong to your truck crane while operating the truck crane. The truck crane and the counterweight parts are labelled with the same serial number. Other or additional parts may not be rigged.	B	5	M	During use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
44	Outrigger spans Danger of overturning when slewing with rigged counterweight.	D	5	H	You may only slew the superstructure with rigged counterweight if a sufficiently large outrigger span is rigged. You can find the required outrigger span in the table in the section Slewing with the Rigged Counterweight in the Operator's Manual, and support the truck crane accordingly before you slew the superstructure. This prevents the truck crane from overturning when turning.	C	5	M	During use
45	Possible counterweight combinations Danger of accidents. Danger when rigging the 19.3 tonne counterweight combination.	C	5	M	Combine the counterweights with each other only in the way prescribed in section 13.7.2 of the Operator's Manual and in the Lifting Capacity Table. Other combinations are not permitted. If other combinations are assembled, the truck crane is no longer protected against overload by the SLI. To rig and unrig the 19.3 tonne counterweight combination, at least 4.3 tonne of counterweight must be mounted on the turntable. Hoist the maximum 15.0 tonne of counterweight sections onto the counterweight platform. This prevents the counterweight lifting cylinders from being damaged while the superstructure is slewing.	B	5	M	During use
46	Appropriate slinging Danger of accidents if used incorrectly.	C	5	M	Attach the various counterweight sections only to the appropriate slinging points and use lifting gear with sufficient lifting capacity. Only lift the counterweight sections individually because the slinging points are not designed for lifting stacked counterweight sections.	B	5	M	During use
47	Free-on-wheels truck crane Danger of the free-on-wheels truck crane overturning.	C	5	M	With free-on-wheels cranes, the superstructure may only be rotated if there is a maximum of 4.3 tonne of counterweight on the turntable and the working radius permissible in the working range is maintained according to the Lifting Capacity Table (at least 3.0 m).	B	5	M	During use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
48	Outrigger span of 8.10 metres x 2.32 metres Danger of overturning with a rigged outrigger span of 8.10 m x 2.32 m!	C	5	M	With an outrigger span of 8.10 m x 2.32 m, the superstructure may only be rotated if there is a maximum of 6.8 tonne of counterweight on the turntable and the working radius permissible in the working range is maintained according to the Lifting Capacity Table (at least 3.0 m).	B	5	M	During use
49	Current rigging mode Danger of overturning when slewing with a rigged counterweight.	C	5	M	When a counterweight combination is rigged, check whether slewing is permitted with the current rigging mode (outrigger span, working radius). Correct the rigging mode if necessary. Refer to Slewing with the Rigged Counterweight in the Operator's Manual for more information.	B	5	M	During use
50	Setting down counterweight sections Danger of crushing when setting down the counterweight sections.	C	5	M	Ensure that helpers maintain sufficient clearances from the counterweight sections with all parts of their bodies during placement. Remove all objects that could become clamped or crushed from the counterweight platform.	B	5	M	During use
51	Using access ladder Danger of crushing when slewing the superstructure.	C	5	M	Anyone who climbs onto the carrier using the access ladder is in the slewing range of the superstructure. Ensure that nobody uses the access ladder (e.g. helper) while they are lifting a counterweight section from a separate vehicle onto the carrier.	B	5	M	During use
52	Slinging counterweight sections Danger of accidents caused by falling counterweight sections.	C	5	M	Only attach the counterweight sections to the appropriate slinging points and use lifting gear with sufficient lifting capacity. The counterweight sections should be lifted one at a time. The slinging points are not designed for hoisting stacked counterweight sections.	B	5	M	During use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
53	Versions that can be installed on the turntable Danger when rigging the 19.3 tonne counterweight. Risk of damage to the lifting cylinders.	C	5	M	You cannot rig or unrig directly from 1.8 tonne to 19.3 tonne. If 17.5 tonne of counterweight is on the counterweight platform, the lifting cylinders will be damaged while slewing. Mount at least 4.3 tonne of counterweight on the turntable before rigging the 19.3 tonne counterweight combination. This prevents the counterweight lifting cylinders from being damaged while slewing the superstructure.	B	5	M	During use
54	Lifting and lowering counterweight Danger of crushing when lifting and lowering the counterweight.	C	5	M	Before lifting or lowering the counterweight, remove all objects from the top counterweight section which could be clamped or crushed. Be sure nobody is on the counterweight platform while the counterweight is being lifted or lowered.	B	5	M	During use
55	Extending the lifting cylinders Risk of damage to the lifting cylinders.	C	5	M	Before extending the lifting cylinders, always check that the lifting cylinders are turned into the Unlocked position if the 2.5 tonne base plate is on the counterweight platform. Moving the lifting cylinders into the Locked position against the supporting frame of the 2.5 tonne base plate could damage the lifting cylinders.	B	5	M	During use
56	Locking / unlocking the counterweights Risk of damage to the hoist unit.	C	5	M	In the Locked position, the lifting cylinders may only be extended if the 2.5 tonne base plate is not on the counterweight framework or if the superstructure is turned to the side. This prevents the lifting cylinders from colliding against the supporting frame of the 2.5 tonne base plate and becoming damaged while extending.	B	5	M	During use
57	Removing Risk of damage to the lifting cylinders.	C	5	M	When you assemble the 19.3 tonne counterweight combination, the lifting cylinders will be damaged when you slew the superstructure after lowering down the counterweights.	B	5	M	During use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
58	Installing Risk of accidents from falling counterweights. Risk of damage to the lifting cylinders.	C	5	M	The slinging points on the 2.5 tonne counterweight sections are only designed for the dead weight of the sections. For this reason, you should always position the 2.5 tonne counterweight section on top, and under no circumstance should you mount both 2.5 tonne counterweight sections on the turntable. If 1.8 tonne of counterweight is mounted on the turntable, and you assemble the 19.3 tonne counterweight combination, the lifting cylinders will be damaged when you slew the superstructure.	B	5	M	During use
59	Setting the SLI Danger of overturning when slewing with an incorrectly set SLI.	C	5	M	The SLI only blocks slewing if you have entered the correct SLI code for the current rigging mode and if the SLI is not overridden. Always check whether the valid SLI code for the current rigging mode has been entered before slewing. This will prevent slewing in impermissible areas from being allowed, resulting in the truck crane overturning.	B	5	M	During use
60	Using the hand-held control Danger of overturning when slewing with the hand-held control.	C	5	M	When the hand-held control is connected, there is no monitoring by the SLI. Always check whether sufficient outrigger span for the rigged counterweight has been set before slewing. This prevents the truck crane from overturning during slewing because of too much counterweight mass.	B	5	M	During use
61	Picking up the hook block from the bumper Danger of accidents if your view is obstructed.	C	5	M	Have someone guide you when releasing the hook block from the holding rope because the view of the hook block is obscured by the driver's cab.	B	5	M	During use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
62	Attaching the hook block to the bumper Danger of accidents if your view is obstructed. Danger of accidents due to the hook block swinging unexpectedly.	C	5	M	The reeved hook block rope lines obstruct your view of the roadway while driving the truck crane on-road. The number of legally permissible rope lines can differ depending on the country in which you are working. If the holding rope for the hook block breaks during tightening of the hoist rope, the hook block suddenly swings forward. Therefore ensure that any helpers stand a sufficient distance to the side of the hook block. Nobody may be in front of the hook block during tightening of the hoist rope.	B	5	M	During use
63	Slewing Risk of overturning while slewing.	C	5	M	Always check before slewing whether slewing is permitted in the truck crane's current rigging mode (counterweight, outrigger span, working radius). Correct the rigging mode if necessary. Refer to Slewing with the Rigged Counterweight in the Operator's Manual for more information.	B	5	M	During use
64	Overridden SLI Danger of overturning when turning with an overridden SLI.	C	5	M	Do not override the SLI before rotating the superstructure. If slewing is not released, then enter an SLI code for the working range 360°. This prevents the superstructure from being slewed into impermissible areas and tipping.	B	5	M	During use
65	Swinging loads Danger of damage to the accompanying vehicle.	C	5	M	Only lift the hook block from the separate vehicle when the boom head is located directly above the hook block. This prevents the hook block from swaying and damaging the vehicle.	B	5	M	During use
66	Slack rope Risk of damage to the hoist rope.	C	5	M	Do not ease down too much hoist rope when picking up and reeving the hook block so as to prevent slack rope. Slack rope causes rope loops to form on the hoist drum which can lead to load slipping and destruction of the hoist rope.	B	5	M	During use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
67	Rope end clamp (wedge socket) Danger of accidents due to a falling load.	C	5	M	Only thread the hoist rope as described in section 13.8.3 and adhere to manufacturer's instructions depending on the supplier of the wedge socket termination fitting. If you thread the hoist rope differently, the load bearing section of the rope will be kinked under load, causing severe damage to the hoist rope which may cause the hoist rope to fail, leading to the load falling to the ground during crane operation. If you use a rope wedge which does not belong to the rope end clamp, the hoist rope slips out of the rope end clamp during crane operation and the load crashes uncontrolled to the ground.	B	5	M	During use
68	Positioning the hoist rope Danger due to slack rope.	C	5	M	Use only hook blocks and lifting gear with sufficient minimum safe working load in accordance with the Lifting Capacity Tables for the reeving and boom length. This will prevent the deployment of slack rope at large heights when lifting with no load, which can lead to load slipping during subsequent lifts.	B	5	M	During use
69	If the lifting limit switch is installed Risk of damage if the lifting limit switch is locked.	C	5	M	The lifting limit switch must not be locked. If the lifting limit switch is locked, remove the lock. If the lifting limit switch is locked, the hook block can catch on the bottom side of the boom head when hoisting, and the hook block, main boom head and hoist rope can be damaged.	B	5	M	During use
70	Locking Risk of damage if the lifting limit switch is locked.	C	5	M	During crane operation, the lifting limit switch with the lifting limit switch weight attached must not be locked. If the lifting limit switch is locked, release the lock. If the lifting limit switch is locked, the hook block can catch on the bottom side of the boom head when hoisting, and the hook block, main boom head and hoist rope can be damaged.	B	5	M	During use



Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
71	On-road driving Risk of damage when driving on roads.	C	5	M	Always remove the anemometer and air traffic control light before on-road driving. This prevents the given overall length from being exceeded at on-road level, and the anemometer from being damaged by air currents.	B	5	M	During use

Malfunctions during Crane Operation

1	Intended use Risk of overload if used improperly.	C	5	M	The emergency stop devices are only intended for emergencies when crane operations cannot be braked or stopped by moving the control lever appropriately. Never use this switch to brake crane movements in normal crane operation mode. Stopping the crane operations suddenly at high working speeds and with unfavourable combinations of the working position and rigging mode can result in the truck crane becoming overloaded.	B	5	M	During use
2	Suspended loads Risk of accidents due to suspended loads.	C	5	M	If a load is suspended from the hook after actuating emergency stop, make sure no one enters the danger area under the suspended load. Secure the danger area in case the error cannot be corrected quickly before you leave the operating site.	B	5	M	During use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
3	If it is possible to lower the load Risk of accidents due to suspended loads. Danger of accidents in the event of a defective SLI. Risk of accidents. Danger of accidents due to improper emergency operations.	C	5	M	It is forbidden to carry out repair work with suspended loads. You may only override the SLI in cases of emergency, e.g. if the load has to be set down due to a malfunction. Do not perform any operations which increase the load moment (telescoping, lowering the boom, lowering the lattice extension) any more if the SLI is defective and there is still a suspended load on the hook. Do not perform any crane operation that increases the load moment while a load is on the hook and the SLI is overridden. Only trained, qualified personnel may carry out emergency operations if solenoid valves have to be operated by hand while unrigging the crane.	B	5	M	During use
4	Information on replacing the fuses Risk of Damage when the ignition is switched on. Risk of damage due to overloading. Danger of Fire.	C	5	M	Switch off the ignition whenever a fuse has to be replaced. In this way you can prevent the new fuse from being damaged by the increased starting current immediately after inserting it. Replace blown fuses only with new fuses of the same amperage. In this way you can prevent parts from being overloaded and damaged or the fuse from being immediately damaged again. Notify CraneCARE at the respective location if a fuse of the same amperage blows again after turning on the ignition. Never replace a defective fuse with other electrically conductive materials.	B	5	M	During use

Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
5	General malfunctions Risk of accidents. Danger of accidents in the event of a defective or overridden SLI.	C	5	M	You must cease operating the crane immediately as soon as any error message is displayed. Repairs to the SLI may only be carried out by trained, qualified personnel. In the event of a defective SLI, first try to eliminate the error using the information in section 14.5 of the Operator's Manual. Only override the SLI if it becomes unavoidable in the event of an emergency in order to lower the load. Do not carry out any movements which increase the load moment in the event of a defective or overridden SLI. The crane operations are not monitored and shutdown procedures are not initiated when leaving the working range if the SLI is overridden.	B	5	M	During use
6	Switching off sensor / tachogenerator Danger due to failure of SLI. Risk of accidents due to defective functioning.	C	5	M	Have the error rectified before the next crane job. By doing this, the crane can then still be unrigged with SLI monitoring if the second sensor/tachogenerator fails. After switching off the faulty sensor/tachogenerator, only begin crane operations if the remaining sensors/tachogenerators are displayed correctly. In this way you prevent the SLI from not switching off when leaving the working range and the truck crane overturning as a result.	B	5	M	During use
7	Operating elements Risk of accidents if used incorrectly.	C	5	M	You may press the following buttons a maximum of twice to unlock:  and  Pressing the button excessively could cause one of the telescopic sections to be unlocked completely and consequently retract suddenly, which could cause serious accidents and damage to the truck crane.	B	5	M	During use

Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
8	Display elements Risk of damage to the main boom.	C	5	M	Never telescope the main boom if both the Extended Telescoping Cylinder Length and the Current Locking Status displays are not working. In such a situation it would not be possible to monitor operations and you could damage boom components or bring the boom into a position from which it cannot be telescoped.	B	5	M	During use
9	Retracting in the event of an error at the length indicator Danger of accidents from a sudden retraction of a telescopic section.	C	5	M	You may only press the following button a maximum of twice:  If this does not start the unlocking procedure, contact CraneCARE.	B	5	M	During use
10	Retracting the telescopic section Risk of damage to the main boom. Danger of accidents from a sudden retraction of a telescopic section.	C	5	M	You may under no circumstances press the button next to the Locking Selection symbol while telescoping a telescopic section. If you press the button, the locking pins at the telescopic section will immediately be pushed out and may damage or tear off electrical or hydraulic components in the main boom. You may only press the following button a maximum of twice:  If this does not start the unlocking procedure, contact CraneCARE.	B	5	M	During use



Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
11	Extending the telescoping cylinder without the telescopic section Risk of damage to the main boom.	C	5	M	You may under no circumstances press the button next to the Locking Selection symbol while retracting or extending the telescoping cylinder. If you press the button, the locking pins at the telescoping cylinder are immediately pushed out and can cause damage or tear off electrical or hydraulic components in the main boom.	B	5	M	During use
12	Retracting – when the display (C) fails Risk of damage if the length specifications are not observed.	C	5	M	Extend the telescoping cylinder (without telescopic section) only to the given length. This prevents the piston rod from becoming damaged if the telescoping cylinder slides out of the telescopic section.	B	5	M	During use
13	Verifying values Risk of damage during telescoping.	C	5	M	Check whether the telescope status currently displayed corresponds with the actual telescope status before beginning work with the crane. You must re-enter the actual value again if you accidentally enter an incorrect telescope status. In this way you prevent the crane control unit from calculating with incorrect values, which could result in damage and malfunctions during telescoping.	B	5	M	During use
14	Using the hand-held control Danger of overturning when driving in the shutdown ranges.	C	5	M	The power units may only be operated with the hand-held control in cases of emergency, in order to secure the truck crane. The SLI is switched off and the crane operations are not monitored when operating with the hand-held control. The truck crane will overturn if you drive in a critical range. Make sure the maximum permissible working radius according to the Lifting Capacity Table is not exceeded for the current rigging mode. Before slewing, check whether slewing in the current rigging mode is permissible with the currently rigged counterweight. Refer to Slewing with the Rigged Counterweight in the Operator's Manual for more information.	B	5	M	During use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
15	Operating the power unit Risk of overturning when operating in the shutdown ranges. Risk of accidents while operating the slewing gear.	C	5	M	Avoid operations which increase the load moment such as lowering and extending. The truck crane will overturn if you drive in the shutdown ranges when operating with the hand-held control. If operations which increase the load moment are unavoidable, make sure the maximum permissible radius according to the Lifting Capacity Table is not exceeded for the current rigging mode. Always check before slewing whether this process is permissible in the current rigging mode. Refer to Slewing with the Rigged Counterweight in the Operator's Manual for more information. Sit down in the crane cab to operate the slewing gear and make sure the connecting cable of the hand-held control does not hang down loosely. In this way you can avoid being knocked down from the carrier during slewing operations or being crushed between the superstructure and the carrier. You will also prevent the connecting cable from getting caught or torn.	B	5	M	During use
16	Operation in emergency mode Risk of accidents due to improper use. Risk of tipping if working radius is too large.	C	5	M	Only operate in hydraulic emergency mode to transport small loads in cases of emergency and have the malfunction subsequently rectified. It is prohibited to carry out crane work in emergency mode, since there is no guarantee that the safety devices work in this mode. The lowering of the boom is not switched off automatically in emergency mode. Make sure the maximum permissible working radius according to the Lifting Capacity Table is not exceeded for the current rigging mode during lowering operations.	B	5	M	During use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
17	Operation in emergency mode Danger due to falling loads. Danger due to an unexpected change in the direction of movement. Risk of damage to the hoses and transformer.	C	5	M	Switch off continuous operation immediately at both solenoid valves (Y1105 and Y1104) after operating the main hoist in emergency mode. Check whether the pins can be seen at the two open sealing caps. In this way, you can prevent the load from falling during the subsequent crane operations immediately after being lifted. Refer to Switching Off Continuous Operation in the Operator's Manual for more information. Only use the small control lever for lowering operations. The direction of movement is changed and the boom is raised if you additionally press the large control lever. Make sure the connecting hoses can be moved freely in emergency mode. In this way, you prevent the hoses from getting caught or torn.	B	5	M	During use
18	For emergency operation with the transformer Risk of damage to the connecting hoses. Risk of damage to the connecting hose!	C	5	M	Lay the connecting hoses in such a manner that they can be moved freely in order to prevent them from being crushed or torn or getting caught during the subsequent crane movements. Connect the connecting hose in such a manner that it can be moved freely in order to prevent them from being crushed or torn or getting caught during the subsequent crane movements. Remove the connecting hose from the connections immediately after emergency operation.	B	5	M	During use
19	Switching positions of the hand valves – emergency operations position Danger due to interaction of the power units.	C	5	M	Only set the valves for one power unit to Emergency Operation. The other valves must be set to Crane Operation as specified in the table in the Operator's Manual. In this way, you can avoid carrying out unintentional crane operations and also carrying out several operations unexpectedly at the same time.	B	5	M	During use



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Item#	Hazard	Risk Rating			Control Measures	Residual Risk Rating			Time of Implementation
		P	C	R		P	C	R	
20	Switching positions of the hand valves – crane operation position Danger due to interaction of the power units.	C	5	M	Switch all valves back to Crane Operation immediately after the emergency operation. The power units can interact and set each other in motion in an uncontrolled manner if one or more of the valves 1 to 5 remain open.	B	5	M	During use
21	Additional switching operations for the main hoist Danger due to falling loads.	C	5	M	Switch off continuous operation immediately at both solenoid valves (Y1105 and Y1104) after operating the main hoist in emergency mode. Check whether the pins can be seen at the two open sealing caps. In this way, you can prevent the load from falling during the subsequent crane operations immediately after being lifted. Refer to Switching Off Continuous Operation in the Operator's Manual for more information.	B	5	M	During use
22	Emergency derricking gear operation Risk of tipping over if the working radius is too large. Danger from unexpected changes in the direction of movement. Risk of damage to the hoses and transformer.	C	5	M	The SLI does not automatically switch off the lowering process if the diesel engine is off. This also applies if the SLI displays are still active after switching on the ignition. The truck crane will tilt if you exceed the maximum permissible radius for the current rigging mode specified in the Lifting Capacity Table while lowering the derricking gear. Only use the small control lever for lowering operations. The direction of movement is changed and the boom is raised if you additionally press the large control lever. Make sure that the connecting hoses do not get caught or torn off while carrying out slewing operations.	B	5	M	During use



Sign Off

We the undersigned, confirm that the PRA nominated above has been explained and its contents are clearly understood and accepted. We also confirm that our required qualifications to undertake this activity are current. We also clearly understand the controls in this PRA must be applied as documented; otherwise, work is to cease immediately.

Name	Qualification Required for this Activity	Signature	Date



Name	Qualification Required for this Activity	Signature	Date