Job Safety Analysis

Use These Forms Before You Begin Any Job to Alert You of Any Hazards That May Exist

RT Crane W/Outrigger Units Assembly

Customer Name:	**Job Location:**	**Unit #:**	**Job#:**

REQUIRED PERSONAL PROTECTION EQUIPMENT:	***MSDS(s) ASSOCIATED WITH THE JOB:***
Hard hat, ear plugs, safety glasses with side shields, gloves, steel toed boots, fall protection & all other required site specific personal protective equipment.	Chemicals normally used on the crane or stored on Service trucks

To improve readability and comprehension of this field document, we have detailed all common hazards and the recommendations for safe work at the beginning of this JSA. It is understood and assumed that any time during the assembly of this crane, any or all of these hazards may become relevant. This JSA is to be used in conjunction with the operator's manual. If there is ever a discrepancy between the two the operator's manual takes precedence.

Common Hazards	Safe Job Practices
• **Slips, Trips and Falls**	• Use of personal fall protection system is mandated when working where employees are exposed to falls greater than 4 feet. • To reduce the risk of slipping, non-skid material (sand in paint) has been applied to painted walkways and platforms. However, walkways and platforms can be slippery when wet and when oil or grease is spilled on them. ***Keep walkways and platforms clean and dry to prevent slipping on them.*** When non-skid material wears out, reapply it • Wear shoes with a highly slip-resistant sole material. Clean any mud or debris from shoes before entering the crane cab or climbing onto crane. • Do not use top of mast, boom, or jib as walkways (unless they have optional catwalks). • Use ***both hands*** and handrails, steps and ladders provided to climb onto and off crane. • Lift tools and other equipment which cannot be carried in pockets or tool belts onto and off crane with hand lines or hoists. • Boom and gantry are not intended as ladders. **DO NOT** attempt to climb lattice work of boom or gantry to get to maintenance points.
• **Crushing Injury Hazard**	• Barricade all accessible areas to crane so personnel cannot be struck or crushed when upper works is swung. • Do not climb on or off crane while upper works is being swung or crane is being traveled. • Signal operator that you need to climb on or off crane. • Operator: do not swing or travel while personnel are climbing on or off crane. Stop swing and travel motions. Apply swing brake and turn on Travel Brake. • Use of dedicated spotters and signal persons when flying objects with cranes. • Use of tag lines when a rotating load may become a hazard.
• **Struck By/ Caught Between/Pinch Point Hazards**	• Hard Hats and Safety Glasses shall be worn at all times during the assembly/disassembly of this crane. • Never handle wire rope with bare hands. Always wear heavy-duty gloves to prevent being cut by broken wires. • Use extreme care when handling coiled pendants. Stored energy can cause coiled pendants to uncoil quickly with considerable force. • Do not attempt to maintain or repair any part of crane while engine is running, unless absolutely necessary. • If engine must be run, keep your clothing and all parts of your body away from moving parts. ***Maintain constant verbal communication between person at controls and person performing maintenance or repair procedure.*** • Do not use your hands to check for air and hydraulic oil leaks • Relieve pressure before disconnecting air, coolant, and hydraulic lines and fittings. • Do not attempt to lift heavy components by hand. Use a hoist, jacks, or blocking to lift components.

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- **Struck By/ Caught Between/Pinch Point Hazards**

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- Store tools, oil cans, spare parts, and other necessary equipment in toolboxes. Do not allow these items to lie around loose in operator's cab or on walkways and stairs.
- Use of dedicated spotters to direct and signal all vehicle traffic.
- Before a crew member goes to a location that is out of view of the operator and is either in, on, or under the equipment, or near the equipment (or load) where the crew member could be injured by movement of the equipment (or load), the crew member must inform the operator that he/she is going to that location. Where the operator knows that a crew member went to a location covered by the above sentence, the operator must not move any part of the equipment (or load) until the operator is informed in accordance with a prearranged system of communication that the crew member is in a

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- **Dropped Loads and equipment damage**

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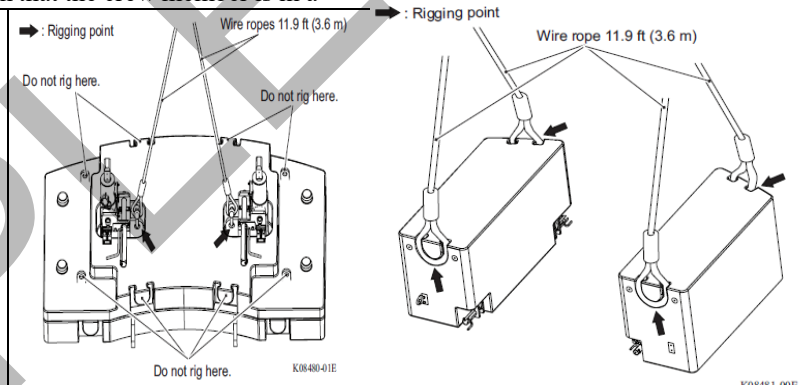
- Select a suitable location for counterweight assembly. It must be firm, level, and be free of obstructions. It should have enough open space to accommodate the crane, the length of boom, and - if required - movement of an assist crane or other equipment. If possible, secure the area to keep unauthorized personnel and vehicles away.

- Sling Counterweights at the designated rigging points. If the counterweights are slung at other points, it can fall or cause machine damage



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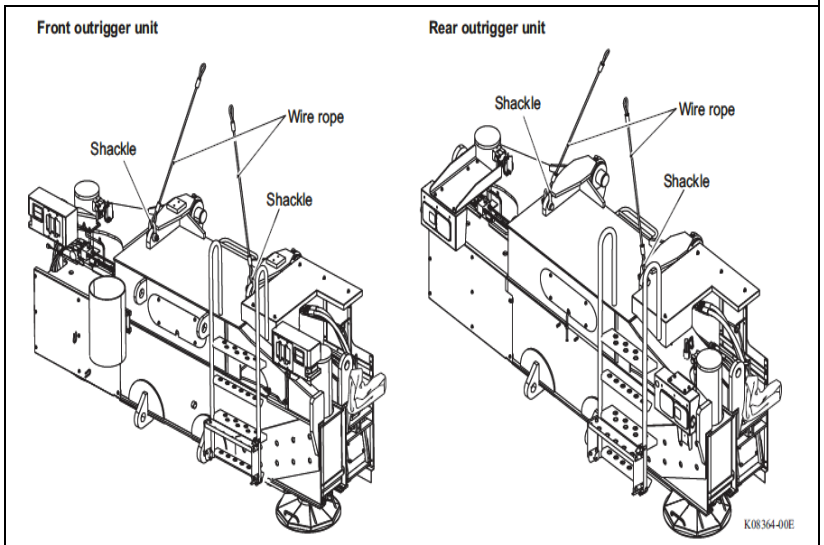
- Inspect all rigging prior to the start of the day and before each use to ensure rigging is not damaged and capable of lifting the load safely.

  - Standard weight + Extra weights
    - 64,600 lbs.
  - Standard weight only
    - 40,100 lbs.
  - Outrigger Units (Right / Left)
    - 9,900 lbs.

  - Check load capacities of each piece of rigging to ensure proper use.



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RT Crane W/Outrigger Units Assembly

• **Designate Assembly Area**	• Select a good location to assemble the crane • Ensure ground conditions are firm, level and uniformly supportive in compliance with engineer's soil data. • Select an area large enough and free of any underground or overhead obstructions or hazards to accommodate the crane, assist crane, and the movement of trailers. • Erection area should not interfere or pose a hazard to other onsite personnel. Erection area to be clearly marked and barricaded. • There should be at least 2 feet of clearance between the counterweights and nearest obstacle. • Ground support as specified in the erection drawings is complete and in compliance with the stated requirements.
• **Assist Crane Requirements (If used)**	• The assist crane shall be sized in accordance with site restrictions and manufacturers specifications. • Site conditions and matting must be suitable for maximum loading of the assist crane. • Assist crane will assembled in accordance with manufacturer's instructions.
• **Rigging Failure**	• Rigging shall be inspected per applicable OSHA/ASME standards, at a minimum, daily and prior to use. Examples of unserviceable rigging would be bird caging, kinks, and broken wires.
• **Electrical Shock Hazard**	• Ensure adequate clearance from power lines is continuously maintained per ASME B30.5.
• **Operational Test Loads (if required)**	• Test loads shall not exceed 100% of the manufacturers load rating. Any request to load test a crane above the manufacturers load rating must be approved by a Regional Vice President. • Test loads shall never exceed 110% of manufacturers load rating. • Test loads must be freely suspended. Testing using static loads is prohibited. • All rigging must be inspected and approved prior to load testing. • The weight and radius of the load test shall be determined by: - Manufacturers load chart. - Site Conditions. - Winch line pull, (i.e. the test load must be lifted while staying within the line pull capacity of the drum being utilized).

Note: At no time will a trainee, apprentice, or an oiler operate any crane during the assembly, reconfiguration, and/or disassembly process or while the crane is in bypass.

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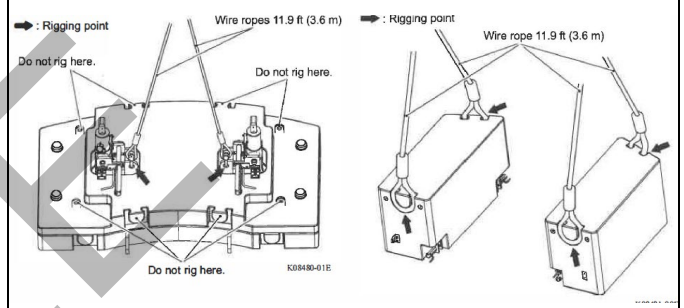
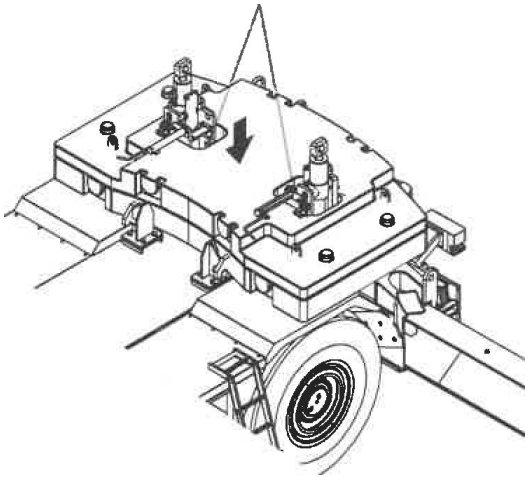
BASIC JOB STEPS	POTENTIAL HAZARDS	SAFE JOB PRACTICES
• **Park the crane on a level ground,** ○ *Return the shift lever to "N"* ○ *Place Chocks on rear wheels* ○ *Make sure outrigger cylinders are fully retracted and connection pins are fully puled out* ○ *Remove aux hook block if stowed* ○ *Check that lock pins are inserted, and all hoses / cables are stowed*	**See Common Hazards Above** **Crushing hazards, Pinch Points** **Damage to equipment, Caught between** **Moving Equipment** *NOTE Make sure that the outrigger connection pins are fully pulled out. If you mount the outrigger unit while the outrigger connection pins are not pulled out, the machine can be damaged.*	***See Safe Job Practices Above*** ***Refer to operator's manual for detailed procedures. Monitor levels. Ensure cribbing and base are is level. Use of designated spotter to direct truck drivers.*** ***Gloves to be worn for all hands-on work,*** ***Constant communication.***
• **Rig and lift Outrigger unit** ○ *Attach the rigging wire ropes to the front outrigger unit.* ○ *Lift the front outrigger unit and mount it so that the upper outrigger connection pins will be engaged in the support on the chassis frame.* ○ *Wind down the winch to set unit on crane* ○ *Stop Engine* ○ *Connect all hoses and Electrical wires*	**See Common Hazards Above** **Crushing hazards, Pinch Points, Hydraulic leaks** **Damage to equipment, caught between, Spills** **Moving Equipment** ***NOTE** Check that there is a 0 to 0.05 in. {Oto 1.5 mm} misalignment between the boss hole on the outrigger unit and the boss hole on the chassis frame in the direction where the outrigger unit approaches to the frame.*	***See Safe Job Practices Above*** ***Refer to operator's manual for detailed procedures.*** ***Use of designated spotter to direct truck drivers*** Arrange for containment and/or spill prevention. Release all pressure on system before connection of hydraulic lines. ***Monitor levels. Ensure cribbing and base are is level.***
• **Complete Outrigger Unit Connection** ○ *Connect the mounting/dismounting remote controller to the connection port* ○ *Start Engine* ○ *Finish set-up with remote controller using "Insert" button.* • The outrigger mounting /dismounting cylinder is extended, and the outrigger connection pins are engaged. ○ *Set the lock to lock outrigger unit into place.* ○ *Stop Engine and remove remote controller*	**See Common Hazards Above** **Crushing hazards, Pinch Points, Hydraulic leaks** **Damage to equipment, caught between, Spills** **Moving Equipment** **NOTE** The left and right outrigger connection pins are not securely inserted if the lock support is not set to "LOCK". Extend the mounting/dismounting cylinder fully, and insert left and right outrigger connection pins securely with the remote controller	***See Safe Job Practices Above*** ***Refer to operator's manual for detailed procedures.*** ***Monitor levels. Ensure cribbing and base are is level. Use of designated spotter to direct truck drivers.*** ***Gloves to be worn for all hands-on work, Constant communication.***

RT Crane W/Outrigger Units Assembly

Crane Assembly

BASIC JOB STEPS	POTENTIAL HAZARDS	SAFE JOB PRACTICES
• **2nd Outrigger Unit Connection** ○ *Refer to the steps above. and mount the rear outrigger unit in the same manner as the front outrigger unit.*	**See Common Hazards Above** **Crushing hazards, Pinch Points, Hydraulic leaks Damage to equipment, caught between, Spills Moving Equipment** **NOTE** Do not let the rear outrigger unit touch with the engine cover when the rear outrigger unit is mounted.	***See Safe Job Practices Above*** ***Refer to operator's manual for detailed procedures.*** ***Monitor levels. Ensure cribbing and base are is level.*** ***Use of designated spotter to direct truck drivers.*** ***Gloves to be worn for all hands-on work, Constant communication.***
• **Complete installation of Outrigger Units** ○ *Set the PTO switch to "ON", and check that the outrigger connection pin lock warning lamp is not lit.* ○ *The outrigger connection pin lock warning lamp lights up when the electric cable is connected and the lock support for the outrigger mounting/dismounting cylinder is out of the "LOCK" position.*	**See Common Hazards Above** **NOTE**: If you operate the crane while an outrigger connection pin is not securely inserted, the crane can overturn, resulting in a serious accident. Visually check that the outrigger mounting/dismounting cylinder is fully extended, and the left and right outrigger connection pins are securely inserted.	***See Safe Job Practices Above*** ***Refer to operator's manual for detailed procedures.*** **The outrigger unit is not mounted correctly if the outrigger connection pin lock warning lamp is on. Check the status of the connection pins and the lock support for the outrigger mounting/dismounting cylinder, according to the mounting/dismounting procedure.**
• **Install Counterweight** ○ *Refer to the Counterweight Assembly Drawings in OPS Manual for steps and procedure*	**See Common Hazards Above** **Tipping Hazard, crushing hazards, Pinch Points, Hydraulic leaks, Damage to equipment, caught between, Moving Equipment, Fire Hazard, Falling objects, Hydraulic Oil Spills** ***NOTE: When you remove the connectors of hydraulic hoses, turn the collar until the notch in the collar fits the pin on the hose connector. When connecting and removing connectors After connecting the hoses, turn the collar so that the notch is out of the pin position to prevent the hose from coming off.***	***See Safe Job Practices Above*** ***Refer to operator's manual for detailed procedures.*** **Do not enter the area under or around the boom during counterweight mounting operation.** **If the counterweight falls or tumbles down, a serious accident can occur. Do not stand or leave objects on the counterweight during counterweight mounting operation. A falling accident can occur. Also, the counterweight can tilt to one side, resulting in machine damage. Be careful of hydraulic oil spill when you disconnect the hydraulic hose connectors. If operation is continued without removing the spilled oil, it can cause a fire. Immediately remove hydraulic oil if it is spilled. Do not bring fire nearby when you remove the hydraulic hose connectors.**

RT Crane W/Outrigger Units Assembly

BASIC JOB STEPS	*POTENTIAL HAZARDS*	*SAFE JOB PRACTICES*
• **Rig up and Lift counterweights** ○ Sling the counterweight at the designated rigging points. If the counterweight is slung at the other points, it can fall or cause machine damage. ○ Extend outriggers fully and set-up machine horizontally. ○ Check that the counterweight fixing pins (2 points) and the counterweight cylinder connection pins (2 points) are not in the lock positions	**See Common Hazards Above** **Tipping Hazard, crushing hazards, Pinch Points, Hydraulic leaks, Damage to equipment, caught between, Moving Equipment, Fire Hazard, Falling objects, Hydraulic Oil Spills**	 ***See Safe Job Practices Above*** ***Refer to operator's manual for detailed procedures.***
• **Place Standard Weight in Carrier** ○ Place the standard weight so that the markings on the standard weight are aligned with the holding supports. ○ Place the extra weight on the standard weight ○ Fix the Standard and extra weights with the connection pins ○ Slew the boom rearward until the counterweight/boom mount/dismount position indicator lights up. ○ Stop the engine and connect the remote controller. ○ Connect all hoses **NOTE: Do not let the extra weight touch the counterweight cylinder.**	**See Common Hazards Above** **Tipping Hazard, crushing hazards, Pinch Points, Hydraulic leaks, Damage to equipment, caught between, Moving Equipment, Fire Hazard, Falling objects, Hydraulic Oil Spills** **NOTE: Do not lift the counterweights while the extra weights are placed on the standard weight. The extra weights can fall, leading to a serious accident. Lift the standard weight only.**	***See Safe Job Practices Above*** ***Refer to operator's manual for detailed procedures.*** 

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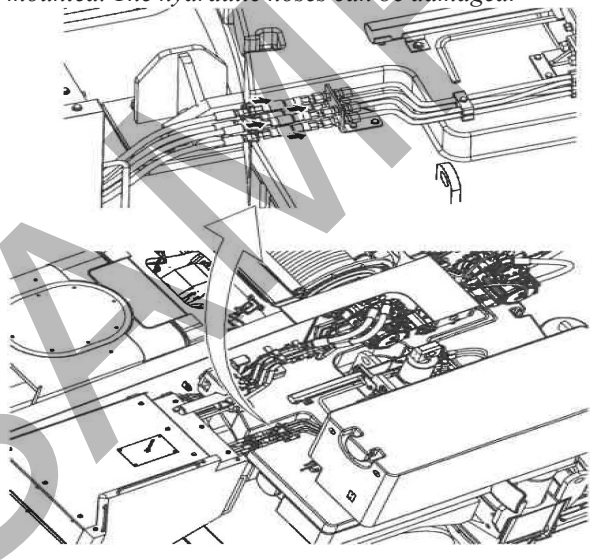
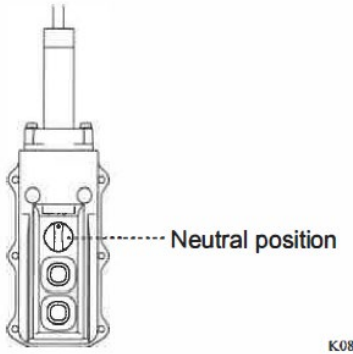
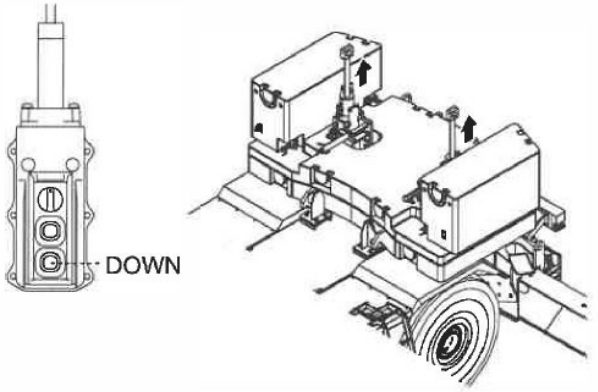
• **Complete Counterweight installation** ○ Start Engine ○ Extend the Cylinders fully using the remote controller ○ Check that the pin holes on the left and right of the slewing table are aligned with the pin holes on the cylinders. ○ Insert the left and right counterweight cylinder connection pins and turn the pins to fix them. • **Counterweight installation complete**	**See Common Hazards Above** **Tipping Hazard, crushing hazards, Pinch Points, Hydraulic leaks, Damage to equipment, caught between, Moving Equipment, Fire Hazard, Falling objects, Hydraulic Oil Spills** **NOTE:** *Do not slew the boom until the counterweight is mounted. The hydraulic hoses can be damaged.* 	***See Safe Job Practices Above*** ***Refer to operator's manual for detailed procedures.***  

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Additional Comments (include any additional observations or comments on this job task below)
All personnel shall review the job safety analysis prior to work activity and sign below. Perimeter of work area shall have yellow caution or red warning tape installed to prevent any unnecessary jobsite personnel being exposed to these hazards.

PRINT	**SIGNATURE**

Assembly/Disassembly Director: _____ **Date:** _____