

USAGE RULES AND PROCEDURES FOR ALL NSC CRANES

NOTICE

PER NSC BY-LAW No.1, PARAGRAPH 3.5

USE THIS CRANE AT YOUR OWN RISK

BY USING IT, YOU ACCEPT ALL RISKS ASSOCIATED WITH ITS OPERATION, ACCEPT ALL RESPONSIBILITY FOR ANY DAMAGE OR INJURY, AND ABSOLVE NEPEAN SAILING CLUB OF ANY LIABILITY

- ◆ **If you are not sure of the procedure ask for assistance.**
- ◆ **Load limits: 10,000 lbs on north or south lifting cranes; 300 lbs on south masting crane; 1,000 lbs on north masting crane.**
- ◆ **Do not use at times of sustained wind or gusts of more than 60 kph.**
- ◆ **Do not use under the influence of drugs or alcohol.**
- ◆ **Follow procedures as described on the NSC website & elsewhere.**
- ◆ **At least three able-bodied persons are required for crane use.**
- ◆ **NEVER work under a boat not supported by chained jack stands, trailer, cradle or chained jackstands – and NEVER when suspended by slings alone.**
- ◆ **NEVER leave boat unattended in slings.**
- ◆ **Insure boats stay horizontal/as close to level fore & aft as possible during lifting. If not, lower & reposition slings as necessary.**
- ◆ **NEVER use any crane to lift a person.**

Part 1 - HAUL-OUT / SOUTH CRANE

1. Inspect all lifting equipment and report any suspect equipment immediately.
2. Back in trailer, center line of trailer in line with marks on concrete.
3. Secure the boat in the well, bow out. The boat MUST be backed into the well & secured with 4 lines, one to each corner of the well.
4. Release transverse lifting bar (yellow) & hoist with electric crane controller. Hoist lifting arm to clear your boat (mast is already down) when you swing the crane boom & lifting arm over your boat which is floating in the well, bow pointed out.
5. Ensure the lifting bar is oriented across the boat, never along the boat, bow to stern.
6. Attach slings to hooks on one end of lifting bar, making sure safety clip closes, taking special care not to drop slings in the well because they will sink quickly! Then pass forward sling around & under bow of boat & back to the hook on the other end of the lifting bar, ensuring there are no twists in the sling. Then pass the aft sling under the rudder & stern of the boat & around to the hook on the other end of the lifting bar, again ensuring there are no twists. Make sure aft sling is not under keel, propeller or sail drive. Lifting point marks

on side of hull are helpful, if you don't have any, mark position of sling on hull before next launch (see below Launch item 8).

7. Have one crew member hold the aft sling back towards the stern to the lifting point & another crew member hold the forward sling forward to the lifting point. Take up the slack by hoisting the boat, but do not lift the boat out of the water. Lift only to a point at which the boat's weight stops the straps from slipping.
8. Everyone must be off the boat at this point.
9. Hoist boat just clear of water to determine correct balance. The boat must be horizontal or nearly so when raised out of the water. If the boat appears to be well balanced, make sure that slings have cleared drive shafts & rudders so you don't lift the boat on the drive shaft or outdrive.
10. If all is OK, continue to lift; if not, lower the boat into the water & reposition the slings. Return to Step 7.

Diagram 1 – PLAN VIEW Ready to hoist

Green & red = crane control lines

Grey = boat mooring lines

Yellow = transverse lifting bar

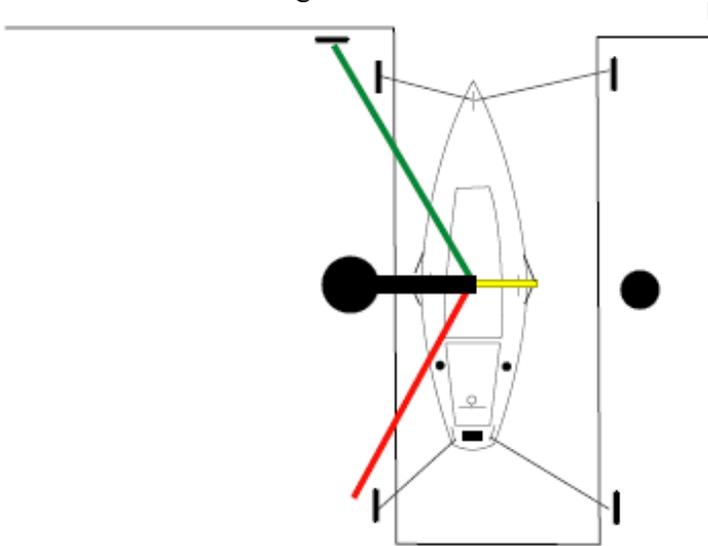
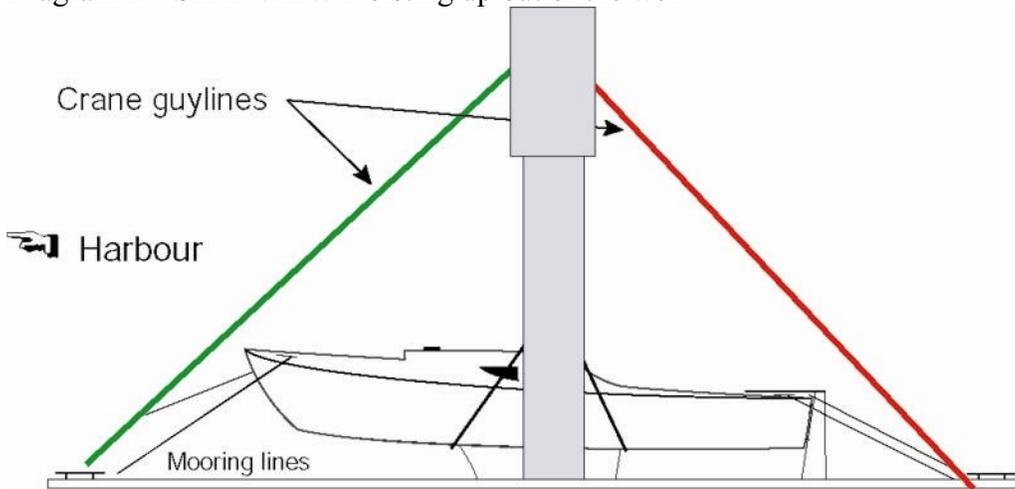
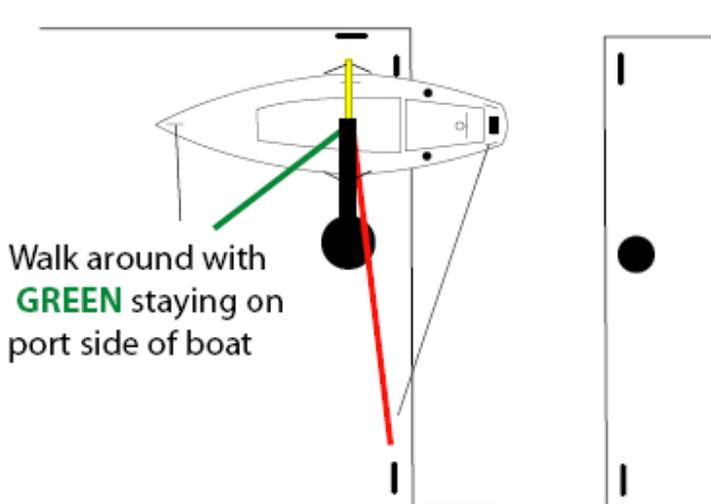


Diagram 2 – SIDE VIEW Hoisting up out of the well



11. Ensure that Crane control lines and Boat mooring lines are kept on the same side of the boat as the crane arm at all times, both launching and hauling out.
12. Hoist the boat up carefully to clear the well.

Diagram 3 – PLAN VIEW - once boat clears the well, swing counter-clockwise to trailer/cradle. Here the boat has been rotated 90° on its way towards trailer/cradle



13. Keep Boat oriented at right angles to the crane arm and watch for interference with the masting crane and its lines during the following operation.

14. Move the crane boom & lifting arm from over the boat well, 180° degrees counter clockwise until it is over the trailer using the rope guys. Control this motion by putting a turn around the cleats on the wall. When the boat is centered on the trailer, lower in a continuous controlled manner. Do not introduce jerking movement by stopping and starting the crane motor.
15. When the boat is sitting on the trailer pads, stop the lowering. Go aboard by ladder & remove the slings carefully to ensure you don't drop them on crew.

Diagram 4 – END VIEW - boat 90° rotated towards trailer

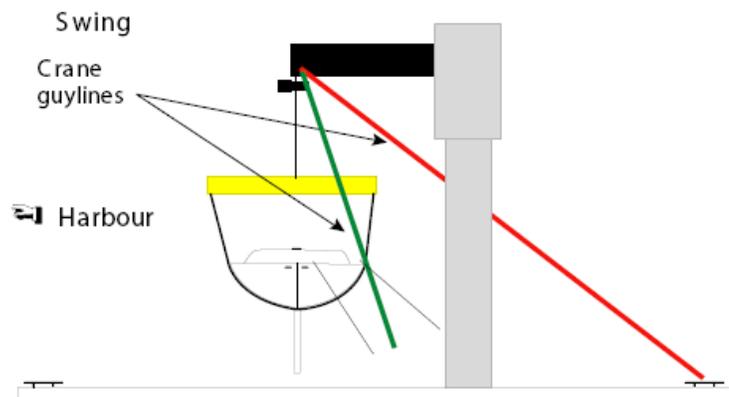


Diagram 5 – SIDE VIEW boat suspended over trailer being lowered on trailer pads

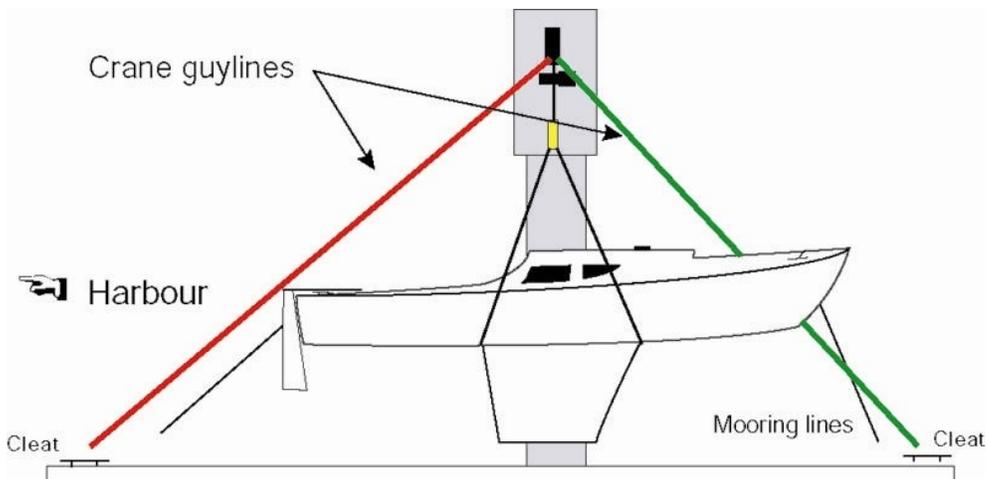
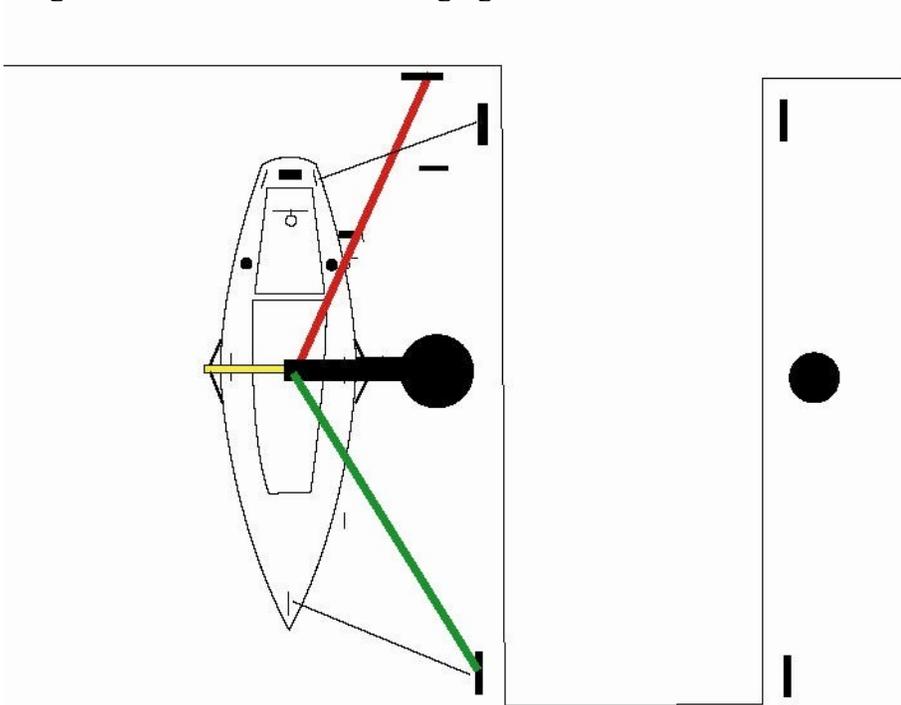


Diagram 6 – PLAN VIEW – swinging boat counter clockwise onto trailer/cradle



16. Lower lifting arm, remove slings and lay out along walkway in order to dry.

17. Park trailer in designated area or take it home.

Part 1 – Launch / SOUTH Crane

1. Inspect all lifting equipment and report any suspect equipment immediately.
2. Back in trailer/cradle, center line of trailer in line with marks on concrete crane pad.
3. Release transverse lifting bar (yellow) & hoist with electric crane controller. Hoist lifting arm to a height that will clear your boat when you swing the crane boom & lifting arm over your boat which is on its trailer/cradle.
4. Ensure the lifting bar is oriented across the boat, never along the boat, bow to stern.
5. You need one person to climb up a ladder onto your boat while it is sitting on its trailer/cradle. You need at least two persons on the ground on either side of the boat to pass the slings to the person on the boat. Attach slings to hooks on lifting bar on one side of the boat making sure safety clip closes. Then pass forward sling around & under bow of boat & back to the hook on the other end of the lifting arm making sure not to have any twists in the sling. Then pass the aft sling under the rudder & stern of the boat & around to the hook on the other end of the lifting bar. Make sure that sling is not under drive shaft, propeller or sail drive Again make sure the sling is not twisted.
6. Everyone must be off the boat at this point.
7. Have one crew member hold the aft sling back towards the stern to the lifting point & another crew member hold the forward sling forward to the lifting point. This can be done standing on the ground beside the trailer/cradle or up on the boat.

8. Hoist boat just clear of the trailer/cradle to determine correct balance. The boat must be horizontal or nearly so when raised off the trailer/cradle. If the boat appears to be well balanced, make sure that slings have cleared drive shafts & rudders so you don't lift the boat on the drive shaft. Mark the correct lifting points for the slings so they are clearly visible for next time.
9. If all is OK, continue to lift; otherwise put the boat back on the trailer/cradle again & reposition the slings. Take up the slack by hoisting the boat, continue at step 7.

Diagram 1 – SIDE VIEW - Ready to hoist

Green & red = crane control lines

Grey = boat control lines

Yellow = transverse lifting bar

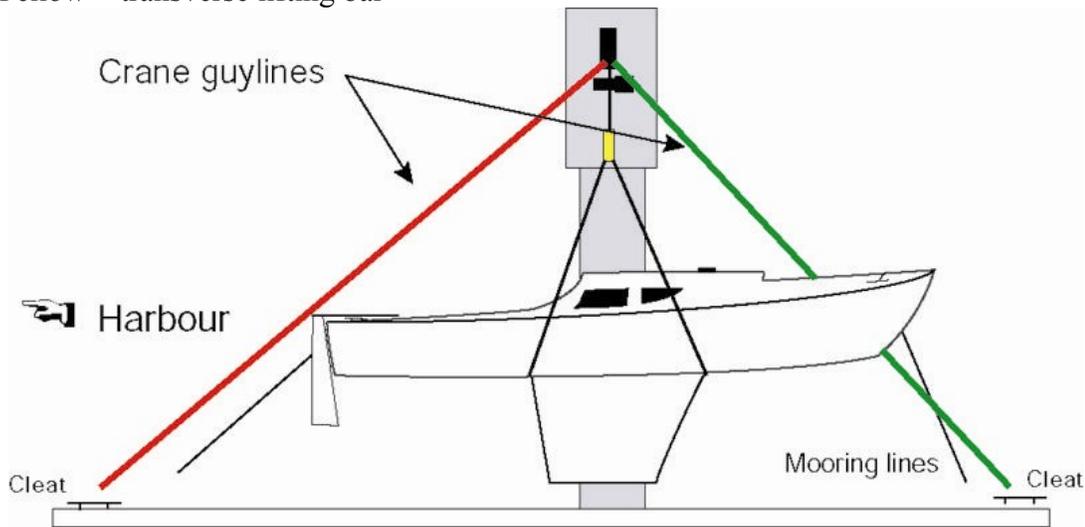


Diagram 2 – PLAN VIEW – ready to swing boat clockwise over well

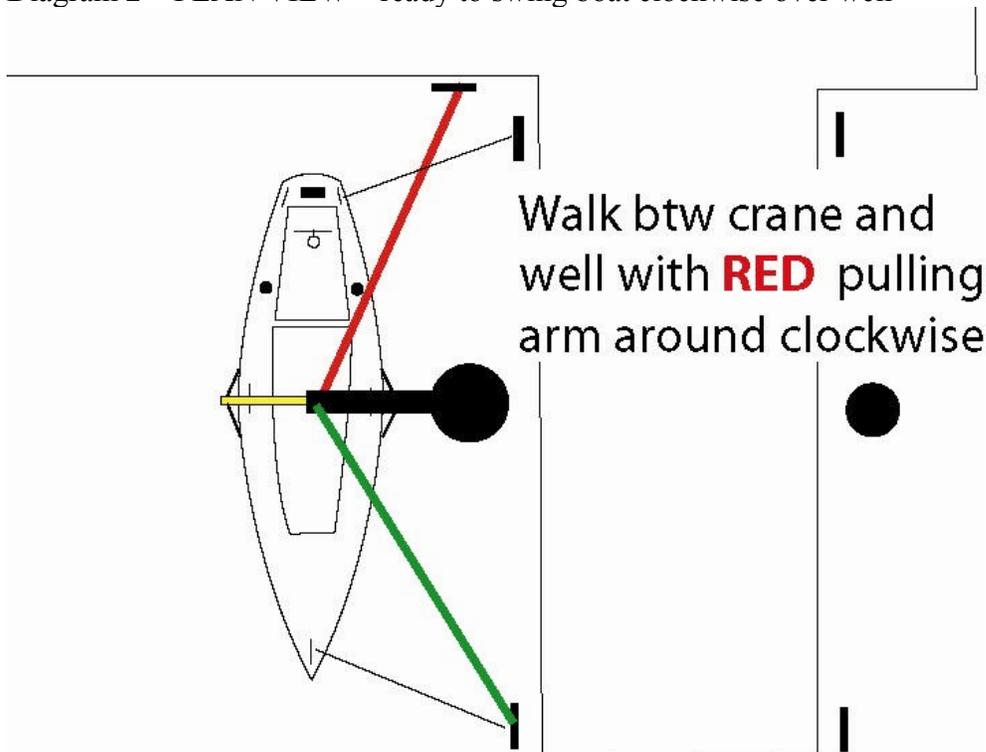
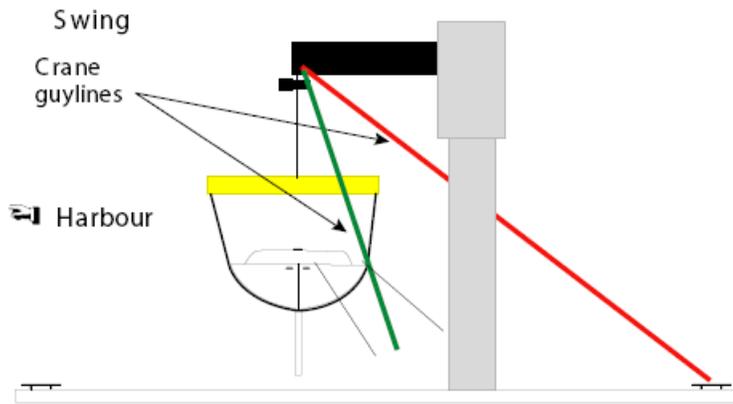


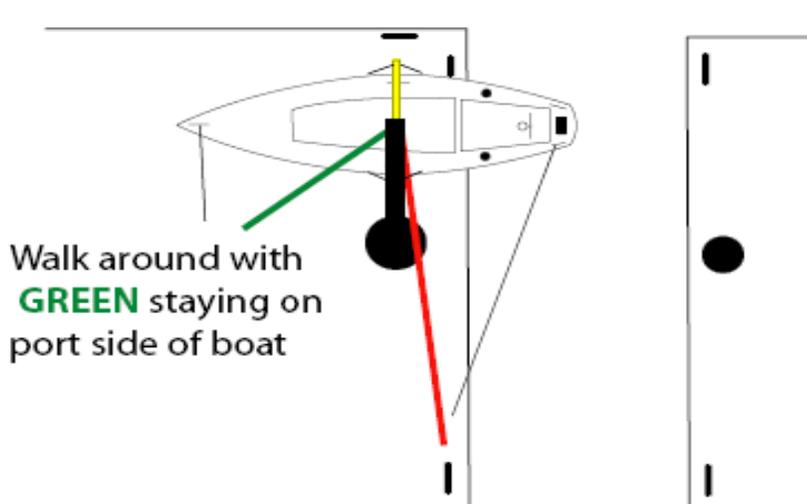
Diagram 3 – END VIEW boat 90° rotated towards well



10. Ensure that Crane and Boat control lines are on the same side of the boat as the crane arm at all times, both launching and hauling out..

11. Hoist the boat up so that it clears the trailer/cradle

Diagram 4 – PLAN VIEW - once boat clears the trailer/cradle, swing clockwise over well. Here the boat has been rotated 90° on its way towards well



12. Keep Boat oriented at right angles to the crane arm and watch for interference with the masting crane and its lines while rotating the boat & crane arm. .

13. Move the arm from over the trailer, 180° clockwise until it is over the well using the crane control lines/rope guys. Control this motion by putting a turn around the cleats atop the wall. When the boat is centered over the well, lower in a continuous controlled manner by pressing the down button on the crane controller. Do not jerk by stopping and starting the crane motor.

14. When the boat is sitting in the water in the well, stop lowering. Go aboard & check for leaks. If any are detected, haul out and repair. If dry, remove the slings carefully to ensure you don't drop them in the water because they sink.

Diagram 5 – SIDE VIEW boat being lowered into well

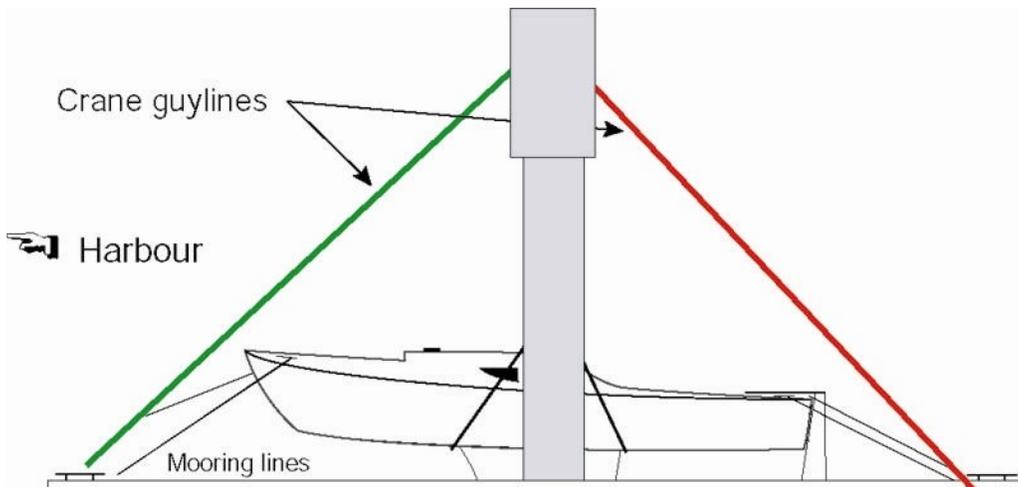
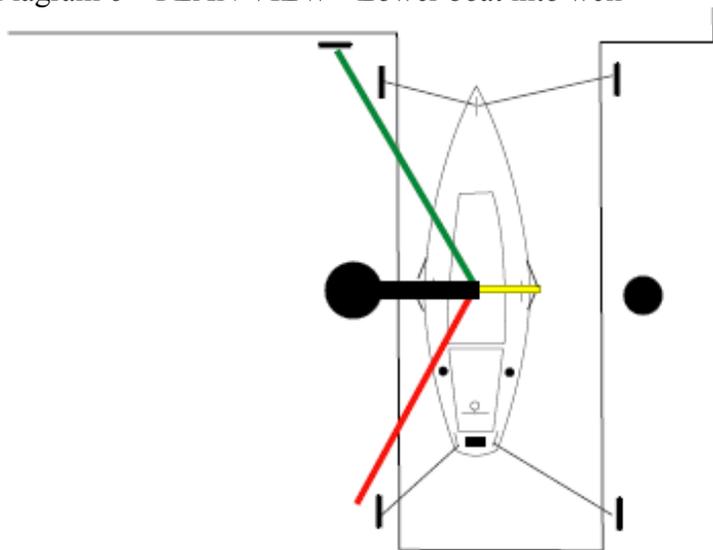


Diagram 6 – PLAN VIEW - Lower boat into well



15. Secure the boat in the well. It will now be bow out. The boat should be secured with 4 lines in the well, one to each corner of the well particularly if masting.
16. Lower lifting arm, remove slings and lay out along walkway in order to dry.
17. Park trailer in designated area or take it home for the summer.

Part 2 - HAUL-OUT & LAUNCH /NORTH CRANE

The North lifting Crane has a maximum weight restriction of 10,000 lbs, identical to the south crane. The rotation of the Crane arm on the North Crane is operated by an electric motor, controlled by a switch at the base of the North Crane. There are no crane arm control lines as there are for the South Crane. The use of the North Crane for both haulout and launch is identical to that of the South Crane with the exception that the rotation of the North Crane arm is controlled electrically, not by crane control lines. For this reason it is important to rotate the crane arm so as to ensure that the lifting cable is vertical, especially when lifting the boat off the trailer. Otherwise the boat will swing as it lifts off the trailer. This is not a problem in the case of the South crane as long as the crane arm control lines are left slightly slack to allow the arm to rotate freely. In addition the North Crane has an adjustable length Traverse Lifting Bar (Yellow). Most users will use the bar with the pins locking the bar at its shortest length. In any case make sure that the locking pins are installed in the same hole both sides and that the clips are fitted to secure the pins.

Part 3 – MASTING CRANES

The use of a crane to set the mast on a boat or to remove a mast from a boat is a significantly more complicated operation than lifting a boat into or out of the water. Issues such as the rigging layout, number of spreaders, deck or keel stepped means that these instructions can only be very general. If you have never lifted your mast before, you are strongly advised to seek advice and help from one of the more experienced members.

There are two masting cranes, the North is electrically powered, the South is totally manual operation.

General comments applicable to both cranes

Before bringing your boat to a well for mast removal and while the boat is still at your slip, remove all sails, boom, bimini, dodger and other accessories. Slacken off stays to the point where the mast is still supported but clevis pins or turnbuckles can be easily removed. If the mast is keel stepped and the mast is supported by deck wedges, all stays can be removed. If mast is deck stepped, all stays except uppers side stays, forestay and backstay can be disconnected and secured to the mast.

If the mast is being stepped then all stays, roller furler, masthead gear, sail halyards, flag halyards etc. must be checked and untangled before bringing the boat to the crane. Also all electrical connections between mast foot and boat must be disconnected.

You will need two or three capable individuals on the boat plus one to operate the crane and a further individual to adjust lines, fetch tools etc.

You will need to bring the boat to the chosen well and to secure the boat securely with fore and aft lines on both sides so that it is in the centre of the well longitudinally and so that the mast step lines up with the crane column. You can step and remove the mast with either bow or stern into the well. Experience will show you what suits your boat best.

It is essential that you are aware of the balance point of the mast before lifting on to or off of the boat. The mast **MUST** be picked up with more weight to the foot of the mast, but still manageable by a helper on the boat. If your mast has two or more sets of spreaders this will mean that the lift point will be above the lower spreaders.

For single spreaders, pick up the mast from the bow side (mainsail track down) using the canvas strap provided so that the furler and all halyards are OUTSIDE the strap. In this way the weight of the mast will be carried by the underside of the spreaders close to the mast. If you are removing the mast, position the crane arm so that it is about 2 - 3 ft below the masthead. With the North crane this is accomplished by adjusting the height of the arm using the control buttons, with the South crane, you will need to manually adjust the height of the arm end. This will minimise the likelihood of damage to masthead gear (windex, light, etc.). If you are stepping the mast, fit the windex on just before the mast is lifted. In this case you will need to estimate the crane arm height so that when the mast is picked up the arm will be about 2 – 3 ft below the masthead.

For multiple spreaders you will need a loop of line of sufficient strength and knotted to comfortably pick up the mast. This loop is to be passed around the mast below the second spreaders – furler, backstay, and all upper stays, and all halyards must be OUTSIDE the loop, lower stays inside the loop. The loop must be sufficiently short so that when the crane takes the weight of the mast by passing the crane hook through the loop the crane hook is below the masthead, but long enough for the loop to be reached from the deck after the mast is stepped. The tail end of the loop rope must be sufficiently long that it can be reached to pull the loop down, the knot untied and the rope loop removed when the mast is installed. THIS IS A TRICKY PROCESS – IF YOU HAVE NOT DONE IT BEFORE GET HELP.

Using the South Mastng Crane

Once the boat has entered the well and is secured with a line in each corner, swing the arm of the masting crane over the mast of the boat and secure the arm in place with the masting crane control lines. If removing the mast, gently raise the hook using the manual winch on the side of the crane. Rotate the crane arm as necessary to position the hook in front of the mast and for a vertical lift. If the arm end is above the masthead, lower the arm end to approximately 2- 3 ft below the masthead. It may be necessary to adjust the position of the boat in the well to maintain a vertical lift. Continue raising the hook until the canvas strap is just tight, no further. At least 2 capable persons should board the boat, being careful crossing the gap between ladder and boat. They will disconnect the remaining side shrouds, then the backstay and forestay. If the boat is equipped with roller furling one person will have to remain at the bow to support the weight of the furler. If there is a bolted attachment at the mast step it should now be removed, if keel stepped the wedges and other fasteners must be removed. Now the lift should continue with the person at the furler guiding this away from the boat and a second person steadying the foot of the mast. When the furler is clear of any bow fittings, the person at the mast foot begins walking towards the bow as the crane hook is gently lowered. As soon as possible the furler should be secured to the front of the mast with a line, the tail end of this line can then be used by the person on the boat to guide the foot of the mast as it is removed. As the mast is lowered to a more horizontal position, a person on the dock wall should take hold of the top of the mast and hold it down as the crane hook is moved so that the mast is in a horizontal position. Those on the boat continue to steady the mast until the shore crew have control of the mast. The crane arm can then be rotated so that the horizontal mast moves over the concrete walkway and the mast trolley can be moved under the mast, the mast then lowered on to the trolley and the canvas strap removed.

Stepping the mast is essentially the reverse of the above. Make sure that the mast is reasonably well balanced with the front of the mast on top (mainsail track down), but heavier at the foot before picking it up off the mast trolley. Ensure that there is a good line from the bottom of the mast, which can be used by the person on the boat to guide the mast. After lifting the mast from the trolley and holding it horizontal, rotate the mast so that the foot of the mast is towards the bow of the boat. Then swing the mast over the boat; at the same time the person on the boat will pull the foot of the mast down using the line. When the foot of the mast is approximately over the mast step, raise the crane hook gently, at the same time pulling the crane arm around so that the mast becomes upright over the mast step. At the same time a second person on the boat is walking the furler (if fitted) to the bow. Lower the mast into its step and fasten, attach the forestay/furler at the bow, then the backstay and upper side stays sufficiently tight to secure the mast. If it is a keel stepped mast it can be lowered gently through the deck opening (**WATCH YOUR FINGERS**). A person will go inside the boat and ensure that the mast foot sits correctly on the keel step (**WATCH YOUR FINGERS**). The deck wedges should then be installed. After

the mast is secured the crane hook can be lowered, the canvas strap pulled down using the tail end provided, the strap disconnected and the crane moved clear.

Using the North Masting Crane

If removing the mast, you will have positioned the crane arm approximately 2 – 3 ft below the masthead and in front of the mast using the arm control on the side of the crane. Gently raise the hook using the crane winch control on the pendant cable. Both of these controls have high and low speeds; push the button gently for low speed, harder for high speed. Rotate the crane arm as necessary to position the hook for a vertical lift using the wheel on the side of the crane. Check again - if the arm end is above the masthead, lower the arm end to approximately 2- 3 ft below the masthead. Continue raising the hook until the canvas strap is just tight, no further. At least 2 capable persons should board the boat, being careful crossing the gap between ladder and boat. They will disconnect the remaining side shrouds, then the backstay and forestay. If the boat is equipped with roller furling one person will have to remain at the bow to support the weight of the furler. If there is a bolted attachment at the mast step it should now be removed, if keel stepped the wedges and other fasteners must be removed. Now the lift should continue with the person at the furler guiding this away from the boat and a second person steadying the foot of the mast. Either the arm or winch control can be used to lift the mast. When the furler is clear of any bow fittings, the person at the mast foot begins walking towards the bow as the crane hook is gently lowered. As soon as possible the furler should be secured to the front of the mast with a line, the tail end of this line can then be used by the person on the boat to guide the foot of the mast as it is removed. As the mast is lowered to a more horizontal position, a person on the dock wall should take hold of the top of the mast and hold it down as the crane hook is moved until the mast is in a horizontal position. Those on the boat continue to steady the mast until the shore crew have control of the mast. The crane arm can then be rotated so that the horizontal mast moves over the concrete walkway and the mast trolley can be moved under the mast, the mast then lowered on to the trolley and the canvas strap removed. Note that the crane hook must **NEVER** be lowered to a point where it is lower than the top of the well kerb.

Stepping the mast is essentially the reverse of the above. Make sure that the mast is reasonably well balanced, but a little heavier at the foot, before picking it up off the mast trolley with the front of the mast on top (mainsail track down). Ensure that there is a good line from the bottom of the mast, which can be used by the person on the boat to steady the mast. After lifting the mast from the trolley and holding it horizontal, rotate the mast so that the foot of the mast is towards the bow of the boat. Then swing the mast over the boat; at the same time the person on the boat will pull the foot of the mast down using the line. When the foot of the mast is approximately over the mast step, raise the crane hook gently, at the same time pulling the crane arm around so that the mast becomes upright over the mast step. At the same time a second person on the boat is walking the furler (if fitted) to the bow. Lower the mast into its step and fasten, attach the forestay/furler at the bow, then the backstay and upper side stays sufficiently tight to secure the mast. If it is a keel stepped mast it can be lowered gently through the deck opening (**WATCH YOUR FINGERS**). A person will go inside the boat and ensure that the mast foot sits correctly on the keel step (**WATCH YOUR FINGERS**). The deck wedges should then be installed. After the mast is secured the crane hook can be lowered. Note that the crane hook must **NEVER** be lowered to a point where it is lower than the top of the well kerb. Then the canvas strap may be pulled down using the tail end provided, the strap disconnected and the crane moved clear.