



MOBILE CRANE

PRE-SHIFT INSPECTION AND SAFE SHUTDOWN PROCEDURES

OSHA 1926.1412

A Competent person, must begin a visual inspection prior to each shift the equipment will be used. The inspection must consist of observation for apparent deficiencies. Taking apart equipment components and booming down is not required as part of this inspection unless the results of the visual inspection indicate that further investigation is necessary. At a minimum the inspection must include the following:

1. Ground conditions around the equipment for being level, proper support, including ground settling, under and around the outrigger/ stabilizers and supporting foundations, ground water accumulation, voids and underground utilities.
2. The equipment for level position within tolerances specified by the manufacturers recommendations, (1% or .57 degrees), before each shift and after each move. Sufficient cribbing under properly extended outriggers.
3. Tires (when in use) checked for inflation and excessive wear, dry rot or any damage, loose lugs. Any damage or wear to crawler components.
4. Operators cab windows and mirrors for significant cracks, breaks, cleanliness, or other deficiencies that would hamper the operators view. Working wipers when installed.
5. Wire rope reeving, including wire rope off sheave, on wrong sheave, damaged sheaves or mounting pins, improper drum spooling, bird nesting.
6. Wire rope, in accordance with 1926.1413a, (broken wires, kinks, bird caging, crushing, corrosion, lack of lubrication, peening)
7. Hooks and latches for deformation, cracks, excessive wear, or damage such as from chemicals or heat, inoperable safety latch, weak or broken spring.
8. All fluid levels per manufacturers specifications, including engine, torque converter, hydraulics, fuel, and coolant. Adding fluids as needed, if any are found to be low.
9. Air, hydraulic and any other pressurized lines for leakage, deterioration, cracks/cuts due to rubbing, any loose fittings or end connections.
10. Drive mechanisms(e.g. clutches, brakes, rollers, idlers, sprockets, axles, drivelines) for apparent damage or excessive wear, leakage, or contamination by lubricants, water, or any other foreign matter. Checking for proper clutch adjustment.
11. Control mechanisms including levers and pedals, for proper labeling and function, calibration of any maladjusted components.
12. Safety devices and operational aids (LMI, anti two-block, horns) for correct installation, proper operation, or calibration errors.
13. Electrical system deficiencies, including malfunctioning components (lights, wipers, heaters/ a/c), excessive wiring deterioration, defective connections, dirt/moisture accumulation behind gauges.

SAFE SHUTDOWN PROCEDURES AND SECURING OF CRANE FOR OVERNIGHT

Boom at safe angle or stowed/retracted, ball/block secured or raised to safe height, all brakes and locks engaged, shut off engine, remove key, close and lock all windows and doors, outriggers retracted and secured if necessary, post inspection around crane and hoisting area.



Tips for navigating CCO mobile crane practical

- Any operator that can efficiently “catch the swing” will have an easier time navigating the CCO mobile crane practical. “Swinging or drifting” is when the headache ball is moving in a pendulum motion below the boom tip. **AN OPERATOR THAT CANNOT EFFICIENTLY STOP OR AT LEAST REDUCE THE PENDULUM MOTION WILL HAVE A VERY DIFFICULT TIME PASSING THE PRACTICAL EXAM.**
- As the operator progresses through the practical, each task will make it slightly harder to stop the pendulum action.
- To “catch the swing” the operator must wait for the headache ball to reach its apex in one direction then move the boom tip of the crane until it is directly above ball.
- In and out drift is when the ball is moving in a pendulum toward and away from the crane (Boom Drift). This is caused when starting or stopping boom up and boom down functions to quickly.
- In and out drift (Boom Drift) is compensated for by either booming up, when the load is in its inward apex (closest to the crane), or by booming down when the load is in its outward apex (furthest from the crane). Always stop when the boom tip reaches the ball. Going past the ball will cause it to continue to swing.
- Side to side drift (Swing Drift) is caused when starting or stopping swinging or slewing functions too quickly.
- Side to side is when the ball is moving in a pendulum to the left and right of the boom centerline (Swing Drift). This is compensated for by swinging the boom tip directly over the load when the load is in its side apex. When the load is in its left apex swing (or slew) the boom tip to the left until it is directly over the load. When the load is in its right apex swing (or slew) the boom tip to the right until it is directly over the load.
- Circle drift (Circle of death) and diagonal drift is caused by a combination of in and out drift (Boom Drift) and side to side drift (swing Drift).
- Circle drift and diagonal drift can be compensated for in the same ways as compensating for in and out drift (Boom Drift) or side to side drift (Swing Drift). Perform the functions for compensating one at a time. First compensate for side to side (Swing) drift and then compensate for in and out (Boom) drift.
- Moving in the opposite direction will cause the pendulum motion to INCREASE. For example swinging to the right when the ball is in its left apex will cause the ball to swing back to the right a further distance than it was swinging.
- To reduce the amount of pendulum action of the ball start all functions slowly and stop all functions slowly. Ease into and out of every function.
- Pendulum motion of the ball must always be correct as it WILL in almost all cases cause deductions and an increased amount of time to navigate the tasks.
- During practice operators should try to memorize boom angles of key points during the practical such as the stop circle, barrel 1, and barrel 2. This way the operator already knows what boom angle to be at for these key points during the practical.



- It sound counterproductive on timed tasks, but moving slowly is the quickest way to navigate the CCO practical as it creates less pendulum motion. Every time the operator must stop to correct a pendulum motion it cuts away on remaining time. Time is relevant. Going over the optimum time will be a deduction.

Task 1 Chain in stop circle (1 minute 30 seconds)

- When the proctor gives a start signal hoist the ball to clear all obstructions and personnel, then swing toward the stop circle. Next boom up or down if necessary to place the ball and chain directly above the stop circle. During practice memorize the boom angle needed to be in the center of the stop circle.
- Correct enough pendulum motion to ensure the chain will stay in the circle when it is lowered.
- Lower the chain into the circle using the hoist. Do not lift the chain off the ground after it has made contact with the ground. If it looks like the chain will swing outside the circle, let it. When it comes back into the circle, use the correct function to correct the pendulum motion.
- Lowering as much chain on the ground as you can, without the hook touching the ground, will help slow the pendulum motion.

Task 2 Hand Signals (Not timed)

- Perform the function for the hand signal given by the proctor.

Task 3 Ball in barrels (3 minutes 30 seconds for fixed and swing cab telescopic, 4 minutes for lattice)

- When the examiner gives the start signal hoist the ball to clear obstructions and personnel.
- THE NEXT TWO BULLETS MAY BE REVERSED
- Boom up to the angle necessary to place the ball directly over barrel number one. This angle can be determined during practice (usually around 65°).
- Swing toward barrel number 1.
- Once the ball is directly over the barrel use the correct crane functions to stop or reduce the pendulum motion of the ball. For very small swings the operator may decide to rub the hook against the rim of the barrel to reduce the pendulum motion. This is risky as it may move the barrel causing a deduction. There is no deduction for touching the barrel with the hook or ball.
- Lower the ball into the barrel.
- After the proctor sees the horizontal line on the ball go below the top of the barrel rim, the proctor will give a stop signal, hoist signal, and swing signal. This means go to barrel 2.
- Hoist the ball out of barrel 1 and swing towards barrel 2.

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- When over barrel 2 boom down to the correct boom angle (usually around 55°) to place the ball directly over the barrel.
- Use the correct crane functions to stop any pendulum motion.
- Lower the ball into the barrel.
- When the proctor sees the horizontal line on the ball go below the top of the barrel rim they will give a stop signal, hoist signal and stop signal. This is the end of the task.

Task 4A Zig Zag Forward (Fixed cab 4 minutes, swing cab and lattice 3 minutes)

- For this task we cannot give exact movements as they will change depending on the make and model of crane and the CCO CAD being used.
- Before this task the proctor will give you 5 minutes to get a feel of the test weight. Use this time to lift the test weight, make sure it is not going to swing, place it where you want it in the test weight circle and set it back down.
- For fixed cabs this task can be done using one function at a time as long as there is always a function moving. Taking extra time to decide which function to use may cause it to take longer than the optimum time.
- For swing cabs and lattice multiple functions at one time should be used. For example, by booming up and lowering at the same time the swing function may be used to avoid contacting the PVC pole barrier.
- While booming up and lowering use the swing function to avoid contacting the PVC pole barrier. For example, if the test weight is getting too close to the inside poles, increase the speed of the swing. If the test weight is getting too close to the outside poles, reduce the speed of the swing.
- While booming down and hoisting use the swing function to avoid contacting the PVC pole barrier. For example, if the test weight is getting too close to the inside poles reduce the speed of the swing. If the test weight is getting too close to the outside poles, increase the speed of the swing.
- For all crane types avoid getting the test weight into “inside” Corners as it increases the amount of time need to complete the task and increases the chances of deductions.(See picture below)
- Always correct excessive pendulum motion as you navigate the corridor to avoid contacting the PVC pole barrier.

Task 4B (time limits are the same as task 4A)

- This task is simply the opposite motions of task 4A.

