

# CPCS renewal test factsheet



## Introduction to the CPCS renewal test

The industry-led CPCS Management Committee has determined that key safety-related knowledge must be checked on each category prior to the renewal of a CPCS Competent Operator (blue) card. The CPCS renewal test is the means by which blue cardholders will be tested on topics that reflect safety issues identified through consultation, that occur regularly on site.

For each topic identified there is a set of questions, from which a number will be included in the test and for which supporting information is provided in this factsheet. Each test will ask a total of 15 questions selected randomly to ensure all topics are covered.

The test will cover all categories within the scheme through modules. Some modules have been devised to cover a range of similar CPCS categories.

The CPCS renewal test is available on the CITB-ConstructionSkills Testing Services platform alongside the Health, safety and environment test.

The questions and answers will not be published but factsheets are available for each module to cover the topics.

## How to use this factsheet

Prior to taking the test, cardholders are advised to carefully study the factsheet, which will prepare them in deciding the correct answer or answers to each given question. Correct answers are based on legislation or good practice adopted, in the majority of cases, by the construction and allied sectors.

It is acknowledged that variations may occur depending on the nature of the operation or on how the machine is used. However the correct answer to each question is based on common practices or manufacturers' requirements for the majority of machine types within each module, and applies to this test irrespective of how a machine may be used within a particular activity or sector. It is important, therefore, that this factsheet is studied carefully.

The questions are selected randomly and will not appear in the order that topics appear in this factsheet.

If the card holder does not answer all the questions correctly, the score report issued after completing the test will indicate the topic areas in which the questions were answered incorrectly. The cardholder should, prior to retaking the test, re-study all topic areas.

## Scoring the test

To be successful in this module, cardholders need to correctly answer a minimum of 12 out of the 15 questions presented. However, because many of the questions are safety-related, in the majority of cases, a minimum number of questions per topic need to be answered correctly. Failure to do so, even if the overall minimum number of correct answers has been reached, may mean that the cardholder is unsuccessful on the test.

The top of each topic states the number of questions that will be presented for each topic and the minimum number of questions that must be answered correctly in order to pass the test.

## Concessions

To avoid duplication of questions where similar categories are held, booking concessions are provided. This means that, if several similar categories are held, only one module needs to be booked. The following chart indicates if there is a booking concession for this category.

Concessions are provided to holders of the category of Mobile crane.

### Other categories held:

Compact crane  
Singer/Signaller  
Crawler Crane

### Needs only to book:

Mobile crane

**Note:** *The above concessions are an outline of what tests you may have to book; please refer to Module matcher for details of full concessions where more than one category is held.*

This factsheet has been designed to highlight only topics that have been identified through industry consultation area with safety issues or where good practice is often not complied with. The questions within the CPCS renewal test for this category also reflect this.

It is not intended as a training tool and cannot list all essential knowledge and understanding for this category. Operators must always follow manufacturers' requirements, industry good practice and be aware of their own limitations with the machine, and seek further guidance and help where needed.

Further information about the CPCS renewal test can be found at [www.cskills.org/cpcs](http://www.cskills.org/cpcs)

## Preparation and completing work *(Preparation)*

Topic scoring information: 2 correct answers required out of 4 questions presented to pass

- Mobile cranes are cranes mounted on a wheeled or road vehicle-based chassis. They have a rotating upper structure fitted with telescopic boom, and the capability both to slew through 360 degrees and vary the working radius. Although equipped with stabilisers for static duties, they also have the capability, in some cases, of travelling with a load. The majority of mobile cranes travel on the public highway to their place of work, which can involve large distances. Although mobile cranes tend to be operated by dedicated operators, accidents and incidents do occur, particularly because of instability, and this factsheet aims to highlight some of the factors involved incidents that can and have occurred. Proper pre-use checks are a requirement for the safe operation for any type of plant, including mobile cranes, and the operator is expected to undertake these at the required intervals. As with all plant and machinery, failure to properly check all relevant crane components before work could mean that incidents or injuries occur because faults can affect both performance and safety.
- Checks and inspections that need to be made are indicated in the operator's or user's manual for the crane. Although the frequency of checks will be determined by the manufacturers, unusual operating conditions may require more frequent checks, such as when lifting in extreme conditions such as cold, heat or inclement weather. As with all lifting equipment, mobile cranes must undergo a thorough examination where all components must be thoroughly examined by a competent person who will also determine when examinations should take place. Although operators tend to undertake the daily checks, they should only undertake in-depth weekly checks and adjustments if they have had the additional training for the checks required on that model of crane.
- A requirement under legislation is the devising of a lift plan for the particular lifting operation that is to be carried out, as constructed by the lift planner/appointed person. Amongst many factors, the lift plan would have identified all risks, the measures to be taken, the sequence of work and the number of personnel involved in the lifting operation. It is also important for all those involved in the lifting operation to be informed of the contents and required actions. All personnel, including the operator, must take note of the lift plan contents and what is required of each individual as they may notice an error or that something is not correct or missing. The operator should immediately relay any concerns about the lift plan to the lift supervisor or appointed person/lift planner if they are present. If the lift plan needs amending before or during the lifting operation, only the lift planner/appointed person is allowed to alter the lift plan.
- The method statement should further identify additional external operations that may affect the lifting operation, such as nearby tower cranes. If the mobile crane is working close to a tower crane, the sequence of operations should be determined before work starts and on larger sites, where there may be various crane operations happening at the same time, a crane-co-ordinator may be present who will determine the sequence of work between each crane. When work has been completed at the end of the shift or before a break, the boom of the mobile crane must be lowered sufficiently so that there is no risk of striking the jib of the tower crane. This is particularly important at the end of the shift, as the jib of the tower crane must be placed into free slew, and will weather vane or be moved by the wind direction.
- When it arrives on site, the crane may need to travel to the place of lift, which can involve manoeuvring within busy or restricted areas. The travel route must be clear of all hazards, other vehicles and personnel. The operator and members of the lifting team need to identify any hazards or obstructions and inform the site manager, who is responsible for ensuring clear and unrestricted access to the place of lift.

## Lifting practices and working with others *(Working tasks)*

Topic scoring information: 1 correct answer required out of 3 questions presented to pass

- All lifts should not only be planned but the crane must also be kept within the rated lifting capacity for the relevant configuration e.g. radius, height and boom length. Many types are also equipped with an extension or jib, which is usually stowed on the boom and swung-around when required to increase the height and reach. The crane's rated capacity indicator (RCI) provides warnings to the operator and others nearby when the crane both approaches and exceeds maximum rated capacity for the configuration. Some RCIs can be

overridden but this is purely for diagnostic and testing purposes during the maintenance programme. They must never be overridden by anyone during lifting operations, otherwise over-lifting could put the crane at risk of overturning.

- All cranes, including mobiles, are designed to lift a load vertically, which means that the hook of the crane must be placed above the centre of gravity for the load. If the hook is offset to the load, when the load is at the point of lift, it can drag along the ground – if the load snags whilst being dragged, an overload can occur. The rated capacity of a mobile crane only applies to a freely suspended load so where the load is attached to a structure or embedded in the ground, the increased resistance during a lift can again overload the crane.
- The lifting of personnel in a specifically-designed personnel carrier can take place providing a specific method statement is undertaken for the lifting of persons. This would include additional considerations such as an additional number of thorough examinations (6 monthly) and plans for evacuation at height in case of emergencies or crane malfunction.
- Lifting operations take place in a variety of places, including near or next to areas with public access. The area of lift and the area of placing the load must be segregated from pedestrians. This also applies to a site where non-lifting personnel, such as other workers, must be kept clear of the lifting and landing areas. Wherever possible, moving a suspended load above other workers or pedestrians should be avoided. Where this is not possible, other measures such as putting netting around a load or additional securing or protection features should be considered.

## Working safely and at height *(Working at height)*

Topic scoring information: 1 correct answer required out of 3 questions presented to pass

- Conditions on site need to be taken into account before, during and after work. The boom must be kept well clear of any overhead power lines. Guidance from the Health and Safety Executive advises that at least 15 metres plus the maximum reach of the boom and any extension is kept from power lines mounted on metal pylons. Wind speeds should be regularly monitored so that they are below the maximum authorised speed as stipulated by the crane manufacturer. Gusts of wind may also need to be taken into account, even if overall wind speeds are below the set limit. Loads with a large surface area can, in high winds, move and/or swing, making the hoist rope go out of line vertically, which could cause the crane to go out of radius.
- Mobile cranes can generally only lift loads when the crane is level both longitudinally (forward/backward) and laterally (sideways). The stabilisers provide some levelling effect on shallow slopes. If a heavy load is lifted and the crane is not level laterally, the load will be hanging offset, placing a side loading on the boom or jib. Excessive lateral leaning could cause the crane to become unstable and overturn, particularly as the load is raised higher. Slewing with a load, especially one that is near to the rated capacity for the configuration, needs to be undertaken with caution as slewing too fast can cause the jib or boom, again, to be subjected to additional side stress. This could also cause the load to overshoot the landing place and strike a structure or object.
- Pre-use checks or reconfiguring requires, in most cases, access to many parts of the crane that in some cases requires working at height. Where a portable ladder is being used to access part of the crane, amongst other requirements, it should be secured and there should be at least three rungs or a minimum of 1 metre beyond the landing level. Where temporary or inbuilt access ladders are being used, there should be sufficient foot penetration on each rung – that is, the centre of the foot can reach the rung, providing sufficient foot grip and minimising any slipping.

## Stability

Topic scoring information: 1 correct answer required out of 2 questions presented to pass

- Due to the various factors mentioned, mobile cranes have become unstable and overturned, with the usual costly consequences. Effective planning of the ground conditions, working area and other environmental factors must be taken into account before setting up. Ground conditions naturally play an important part for stability and a suitable and competent person should ensure the ground can support the bearing pressure applied through each outrigger for all expected loads and configurations.

# MOBILE CRANE

- Ground conditions are crucial for maintaining stability of a mobile crane during operations. The lifting team, including the operator, need to take into account changes to the ground, such as heavy rain which can weaken the ground and cause instability. Ground conditions must be checked by a competent person not only for static lifting duties but also when a load needs to be travelled (pick and carry duties). The sinking of one or more of the outriggers has caused cranes to exceed maximum radius and an overturn can or has occurred.
- When a crane is being moved from one lifting location to another within the same site, it is normal to only partially de-rig the crane. This has meant that, in certain instances, the upper structure has rotated during travel as it was not correctly locked or braked to the chassis, with the result that the crane has tipped up or tipped onto its side.
- Working near to the edge of a bank or trench has caused accidents. A minimum distance needs to be kept from the edge as the ground is liable to give way and collapse. Guidance indicates that the horizontal distance that an outrigger of a crane must be kept from the edge of an unsupported vertically walled trench is twice the height of the trench. If the trench has a sloped edge, the horizontal distance from the foot to the top of the slope is added to the horizontal distance from the top edge of the trench to the crane. The diagram below indicates the minimum distance required.

## Travelling to and from sites *(Travelling)*

Topic scoring information: 1 correct answer required out of 3 questions presented to pass

- Mobile cranes, in most cases, spend a reasonable proportion of their working time travelling to and from a site for which Road Traffic Act requirements need to be followed. Before joining the public highway, the overall height of the vehicle when it is in road transport configuration needs to be checked and noted. Under the Road Traffic Act, the height of the vehicle when it is above 3 metres must be displayed in the cab. Bridge strikes by over-height vehicles are common. Traffic warning or prohibition signs on or at bridges show the maximum permitted vehicle height when the bridge height is less than 16 foot 6 inches/5.03 metres. Bridges that have an arch tend to have goal posts which the crane must be kept between.
- If a crane does strike a railway bridge, the first course of action by the driver or other person is to immediately call the telephone number shown on the bridge, quoting the bridge number. When a large crane having an authorised mass in excess of 100 tonnes is travelling on the public highway, an escort vehicle is required, which must have constant contact with the crane driver. Oil leaks that are present prior to the crane driving on the public highway must be addressed before the crane can travel. Road users have been fatally injured after oil leaking from a mobile crane contaminated the road surface.
- When travelling to a site or even on a site, the crane may need to travel or manoeuvre on temporary roadways or haul roads. In some cases this can involve large distances and driving up or down long inclines. In most cases, these types of temporary roads do not have kerbs. Driving too close to the edge of a temporary or minor roadway can (and has) caused the sides of the roadway to collapse and cranes have been known to overturn when driving too close, severely injuring the driver.

