

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The questions and answers will not be published but factsheets are available for each module to cover the topics.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

Other categories held:

Crawler crane
Lorry loader
Mobile crane
Slinger/signaler

Needs only to book:

Crawler crane
Lorry loader
Mobile crane
Compact 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

Preparation and completing work *(Preparation)*

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

- The term 'compact crane' covers the range of cranes with a lift capacity of up to 10 tonnes. There are many variants, such as those mounted on a tracked chassis with a self-propelled capability, a rotating upper structure fitted with telescopic boom and the ability to slew through 360 degrees. Many come equipped with stabilisers (commonly known as spider cranes) to undertake static duties. Other variants have a wheeled chassis and can travel with a load, or are trailer-mounted and host a 360 slewing luffing jib. Compact cranes can be operated by dedicated operators or non-dedicated operators who have other roles or trades, but all of whom should be trained and certificated for the particular type of crane. Incidents do occur, particularly because of instability, and this factsheet aims to highlight some of the factors that cause instability as well as other issues where incidents can and have occurred. Proper pre-use checks are required for the safe operation for any type of plant, including compact cranes. The operator (anyone who is authorised to operate the crane) is expected to undertake these checks at the required intervals. Failure to properly check all relevant crane components before work could mean that, faults affect performance and safety, potentially causing incidents or injuries.
- The checks and inspections that need to be made are indicated in the operator's manual for the crane. Although the frequency of checks will be determined by the manufacturer, extreme or unusual operating conditions may require more frequent checks. Operators generally tend to undertake the daily checks, but they can also undertake more in-depth weekly-type checks and adjustments providing they have had additional training on the checks required for the model of crane, and are competent to do so.
- 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 needs to identify all risks, the mitigating measures to be taken, the sequence of work and the number of personnel involved in the lifting operation. It is also important that all of those involved in the lifting operation are informed of the plan's contents and required actions. The operator must take note of the lift plan contents and what is required as they may notice an error or that something is not correct or missing. The operator should immediately relay any concerns with 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.
- When it arrives at a site or place of work, the crane needs to get to the lifting area which, in many cases, means manoeuvring within busy areas with restricted room and possibly negotiating steep inclines. The route to the lifting area must be clear of all hazards, other plant and equipment, and personnel. The operator needs 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. Smaller variants of compact crane, when carrying out lifting operations inside a building, may need to climb internal stairways. The operator must check that the stairway is both sufficiently wide and can safely support the weight of the crane, and that the incline of the stairs is within the manufacturer's recommendations.
- As compact cranes work in busy, confined areas, the method statement should also identify additional external operations that may affect the lifting operation, such as nearby MEWP operations. Where there is a risk of contact with other plant, a sequence of operations needs to be planned before lifting operations begin. When work has been completed at the end of the shift, or if the operator takes a break, the boom or jib of the compact crane must be lowered sufficiently so that there is no risk of other plant or equipment striking the crane's boom or jib.
- Certain types of compact cranes are fitted with outriggers or stabilisers (depending on type) which provide stability when employed. In most cases, maximum stability is only achieved when they are fully extended. It may not be possible to fully extend outriggers if space is limited but a crane can only be operated with partially extended outriggers if it is authorised to do so by the crane manufacturer. In many cases, the lifting capacity is reduced, and this must be noted by the operator.

- Some compact cranes work at height to lift materials or components up from ground level, or to place loads below ground level, both of which require long lengths of hoist rope. Before work starts, the length of hoist rope needed for the operation should be checked (which should be identified within the lift plan) and also checked that there is sufficient hoist rope left on the winching drum when the hook block is at its lowest position.

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

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

- All lifts should not only be planned but the crane should also be kept within the rated lifting capacity for the relevant configuration e.g. radius, height and boom or jib length. 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 and must never be overridden by anyone during lifting operations, otherwise over-lifting could occur with the crane at risk of overturning.
- All cranes, including compacts, 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 situation can occur. The rated capacity of a compact 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 when being lifted can again overload the crane.
- When the operator needs to calculate the overall weight being lifted by the crane, they also need to add the weight of any lifting accessories or gear and any additional packing. When the weight of a load is being determined, where a porous type load (such as aerated breeze-type blocks) has been left outside for some time in wet weather, the overall weight may be more than that listed or marked.
- 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 for 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 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. Some types of compact crane are operated using a remote control unit which may be radio-operated or connected to the crane by an umbilical cord. Although it is possible, it is generally recommended that the operator does not sling the loads as they need to use both hands to operate the controls in order to maintain safety.

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 or jib must be kept well clear of any overhead power lines. Guidance from the Health and Safety Executive advises that at least 9 metres plus the maximum reach of the boom or jib and any extension is kept from power lines mounted on wooden poles, whilst 15 metres plus the length of the boom or jib must be kept from power lines mounted on metal pylons. Wind speeds should be regularly monitored so that the crane only operates when winds are below the maximum authorised speed stipulated by the crane manufacturer. If the crane is situated between two buildings, wind speeds may be higher than indicated because of the funnelling effect. 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 to go out of line vertically, which could cause the crane to go out of radius.
- Compact cranes can generally only lift loads when the crane is level both longitudinally (forward/backward) and laterally (sideways), with the outriggers providing 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, which places 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 of 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 boom or jib, again, to be subjected to additional side stress. It could also cause the load to overshoot the landing place and strike a structure or object.

- In many cases of compact crane operations, various numbers of additional personnel people are used within some lifting operations. Where a signaller is required to assist in placing a load out of direct or sufficient sight of the operator, an agreed code of signals must be agreed between the operator and each signaller before work starts. The signals given must be clear for what is required for each movement and should follow the recommended signals code.
- Due to their size and usefulness, compact cranes are used to lift building materials from ground level and into position, such as wall cladding and glazing. This means that the crane is working near to the edge of a building and at height. A full working at height risk assessment should have taken place and edge protection and other measures should be in place to minimise the risk of the machine from tipping over the edge. Operators may need to, wear fall restraint or fall arrest equipment to minimise or reduce the risk of falling over an edge.

Stability

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

- Compact cranes have become unstable and overturned, with the usual costly consequences. Effective planning must take into account the ground, working area and other environmental factors before setting up begins. The weight of a load must be identified or calculated before it is lifted, as instability of the crane is a likely outcome of incorrect guesses of the weight or when the load is too heavy for the configuration (radius and height).
- Ground conditions or support base strength play an important part in stability and they should be checked by a suitable and competent person to ensure the ground or base can support the weight of the crane and any bearing pressure applied through an outrigger or stabiliser for all expected loads and configurations. When working inside a building, particularly near to the edge of the building, a competent person needs to establish the ability of the floor to support the weight of the crane and any load.
- The operator should take into account changes to the ground. For example, heavy rain can weaken the ground, as can changes made to the structure of a building. Ground or support 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) as sinking in soft ground has caused cranes to exceed their maximum radius and overturn.
- On units fitted with outriggers or stabilisers, as the boom or jib rotates through 360 degrees, the weight is at its maximum when a fully extended boom or jib lifting a heavy load is directly over each leg. Ground-bearing pressure can be reduced through each outrigger by using spreader or support mats to spread the applied pressure. The larger the mat, then in principle there is a reduction in applied pressure. The minimum size of any mat should be determined by an appropriate expert.
- Working near to the edge of a bank or trench has caused accidents and requires a minimum distance to be kept from the edge as ground is liable to give way and collapse. Guidance indicates that the horizontal distance from the outrigger or edge of the crane to the foot of the slope should, in principle, be twice the vertical height of the slope. The diagram below indicates the minimum distance required.

