

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The questions and answers will not be published but factsheets are available for each module to cover the topics.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

Other categories held:

Compact crane
Singer/Signaller
Mobile crane

Needs only to book:

Crawler crane
Crawler crane
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

Preparation and completing work *(Preparation)*

Topic scoring information: 3 correct answers required out of 5 questions presented to pass

- Crawler cranes are travelling cranes mounted on a tracked chassis fitted with a lattice-type jib (although telescopic boom units do exist). They are capable of both slewing through 360 degrees and varying their working radius. They are also capable, in most cases, of travelling with a load and, although they tend to be operated by dedicated operators, accidents and incidents do occur, often because of the loss of stability. This factsheet aims to highlight some of the factors that cause instability and other issues that can, and do, cause incidents. The operator must undertake proper pre-use checks at required intervals for the safe operation of any type of plant, including crawler cranes. As with all plant and machinery, failure to properly check 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 manuals for the crane. Although the frequency of checks will be determined by the manufacturer, extreme or unusual operating conditions may require more frequent checks, such as when continually lifting using long lengths of hoist ropes e.g. working at minimum radius and placing loads at or below ground level. As with lifting equipment, all cranes including crawlers must undergo a thorough examination during which all components are thoroughly examined by a competent person who will determine when these examinations should take place. Although operators do usually undertake the daily checks, weekly-type checks that normally require more in-depth checks and adjustments should only be undertaken by the operator if they have had the additional training on the checks required for the particular 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 needs to identify all risks, the measures to be taken to mitigate these risks, the sequence of work and the number of personnel involved in the lifting operation. It is also important that all those involved in the lifting operation have been informed of the contents of the plan and what is required of each of them. If they notice an error or something that is not correct, they should immediately relay any concerns they have with the lift plan to the lift supervisor or appointed person/lift planner. Only the lift planner/appointed person is allowed to alter the lift plan if it needs amending before or during the lifting operation.
- The lift plan should identify additional external operations that may affect the lifting operation, such as nearby tower cranes, with the sequence of operations determined before lifting operations begin. If the crawler crane is working close to a tower crane, the sequence should be determined before work starts and, on larger sites where there may be various crane operations, a crane-co-ordinator may be present who will determine the order of operations between each crane. When work has been completed at the end of the shift or for a break, the jib of the crawler crane must be lowered sufficiently so that there is no risk of the jib or boom striking the jib or boom of any nearby cranes. This is particularly important at the end of the shift as the jib of a tower crane must be placed into free slew, and will weather vane (be moved by the wind direction).
- In the majority of cases when crawler cranes are used for lifting operations within the construction sector, they are transported to site as separate loads and rigged or re-constructed at the site. This is usually undertaken at a different location from where the lifting operation is to take place. Once the crane has been rigged and before it goes to the place of lift, or even from one lifting place to another, 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 that there is 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

- 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/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 RCIs must never be overridden during lifting operations, otherwise the crane may over-lift and risk overturning.

- All cranes, including crawlers, are designed to lift a load vertically. This 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, the load can drag along the ground when it is at the point of lift, and an overload situation can occur if the load snags whilst being dragged. The rated capacity of a crane only applies to a freely suspended load and where the load is attached to a structure or embedded in the ground, the increased resistance when being lifted can again overload the crane.
- Personnel can be lifted in a specially designed personnel carrier providing a method statement is undertaken relating to the lifting of persons. This would include additional considerations such as six-monthly checks and a plan for evacuation at height in case of emergencies or crane malfunction.
- Lifting operations occur 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 nearby 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, the moving of a suspended load above other workers or pedestrians should be avoided. Where this is not possible, other measures such as netting around a load or additional securing or protection features should be considered.

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

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

- Conditions on site need to be taken into account before, during and following work. The jib or 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 jib or boom is kept from power lines mounted on metal pylons. Wind speeds should be regularly monitored so that work is only undertaken when they are below the maximum authorised speed 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 to go out of line vertically and could cause the crane to go out of radius.
- Crawler cranes can generally only lift loads when the crane is level both longitudinally (forward/backward) and laterally (sideways). If a heavy load is lifted and the crane is not level laterally, the load will be hanging offset and this places a side loading on the boom or jib. Excessive lateral leaning could cause the crane to become unstable and overturn. 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 subject the jib or boom to additional side stress, and could also cause the load to overshoot the landing place and strike a structure or object.
- Rigging, pre-use checks or reconfiguring requires, in most cases, access to many parts of the crane which involve both access to and working at height. Where a portable ladder is being used to reach part of the crane, it should be secured and there should be at least three rungs or at least one metre beyond the landing level. Where temporary or inbuilt access ladders are being used, there should be sufficient foot penetration on each rung (the centre of the foot can reach the rung) and the rung must provide sufficient foot grip to minimise slipping.

Stability

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

- Due to the various factors mentioned, crawler cranes have become unstable and overturned, with the usual costly consequences. Effective planning of the ground, working area and other environmental factors must be taken into account before setting up begins. Ground conditions naturally play an important part in stability and

CRAWLER CRANE

should be checked by a suitable and competent person to ensure the ground can support the bearing pressure applied through each track.

- The bearing pressure applied through each part of each track varies depending on the configuration, the position of the jib or boom and the weight of the load being lifted. For example, where the jib or boom is in line with the crane's tracks, no load is on the hook block and the jib or boom is near to or fully raised, ground bearing pressure is concentrated equally across the rear of the tracks because the counterweight biases weight towards the rear. As a load is lifted and boom lowered, the bearing pressure shifts towards the front of the tracks.
- Ground conditions are crucial for maintaining stability of a crawler crane during operations, and the lifting team, including the operator, need to take into account changes to the ground, such as after heavy rain, which can weaken the ground and cause instability. Ground conditions must be checked (by a competent person) not only before carrying out static lifting duties but also when a load needs to be travelled (for pick and carry duties) as the sinking of one of both tracks has caused a crane to exceed maximum radius and an overturn can or has occurred.
- Travelling with a load is requires further considerations. For example, travelling on uneven ground can cause load swing, whilst travelling along a slope means that the crane's centre of gravity moves to the downside of the slope. The centre of gravity can fall outside the width of the tracks and, in principle, could cause an overturn.
- Working near to the edge of a bank or trench has caused accidents. A minimum distance must be kept from the edge as ground is liable to give way and collapse. Guidance indicates that the horizontal distance that a crane must be kept from the edge of an unsupported vertical-walled trench must be 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.

