

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The questions and answers will not be published but factsheets are available for each module to cover the topics.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

TRUCK MOUNTED BOOM CONCRETE PUMP

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 Truck mounted boom concrete pump.

Other categories held:

Trailer mounted concrete pump

Needs only to book:

Truck mounted boom concrete pump

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

TRUCK MOUNTED BOOM CONCRETE PUMP

Preparation for work *(Preparation)*

Topic scoring information: 0 correct answers required out of 1 question presented to pass

- Truck mounted boom concrete pumps, as the name suggests, are designed to pump concrete to a given location. They use a pipework system that is secured to a placing boom that can, in most cases, slew up to 360 degrees and have reaches of up to 60 metres. Additional ground-laid pipework can allow concrete to be pumped over great distances. Although mainly operated by dedicated specialist operators, accidents and incidents do happen and proper pre-use checks are required for safe operation. Failure to properly check the vehicle or pump components before work could mean that, as with all plant and machinery, incident or injuries occur because faults can affect both performance and safety.
- The necessary checks and inspections are indicated in the operator's or user's manuals for both the host vehicle and the pump. Although the frequency of checks will be determined by the manufacturer, extreme or unusual operating conditions, such as continually undertaking high pumping pressures, may require more frequent checks.
- Virtually all truck mounted pumps are equipped with stabilisers/outriggers which, prior to road travel, need to be both in the transport position and locked, with any locking pins in place and secured. Although it has arisen with other vehicles, pedestrians have been killed when a vehicle's stabiliser/outrigger has slid out whilst it was driving along a public road.
- When on site, it is important that a method statement should have been devised which has amongst many factors, identified the risks, the measures to be taken, the sequence of work and the number of personnel involved in the pumping operation. It is also important that all those involved in the operation are informed of the method statement's contents and required actions. The method statement should also identify additional external operations that may affect the pumping operation, such as nearby tower cranes for which the sequence of operations determined by the relevant site or team supervisors before work starts.

Travelling to and from sites *(Travelling)*

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

- Truck mounted pumps 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 measured. The height of the truck when above 3 metres must be, under the Road Traffic Act, displayed clearly in the cab and the overall height checked to see that is displayed correctly in the cab as bridge strikes by over-height vehicles are common. Bridges having a clearance of less than 16 foot - 6 inches/5.03 metres are marked with maximum permitted truck height and bridges with a full or partial arch tend to have goal posts or markers which the vehicle must be kept between. **Note:** Network rail guidance states that bridge markings are applied where the clearance is less than 16 foot - 3 inches/4.95 metres.
- A practice which has taken place by the pumping sector is the coating of various surfaces of the pump and vehicle with diesel fuel in order to minimise concrete splashes from sticking to various components. Dripping diesel has contaminated the road surface and can cause incidents and accidents on the public highway.
- When travelling to a site or whilst on a site, the vehicle may need to travel on temporary roadways, haul roads and inclines which in most cases are not equipped with kerbs. Driving too close to the edge of a temporary or minor roadway can cause the sides to collapse and vehicles have been known to overturn when driving too close.

Working with and near to others *(Working safely)*

Topic scoring information: 0 correct answers required out of 2 questions presented to pass

- The pumping operation requires the co-ordination of various personnel within and external to the pour team. Effective and constructive dialogue between the site and pumping personnel means that any safety issues

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can be quickly identified and actions taken. This solves problems more effectively, with the result that an effective and safe pumping team can gain repeat business with clients and contractors.

- During pumping operations, constant checks need to be made to ensure efficiency and safety during the pour. For example, the hopper should be kept topped up, as letting the hopper become empty can cause concrete blowback, which spreads concrete over a wide area. The mixer driver is highly vulnerable to blowback. When pumping operations are taking place on or near to the public highway, pedestrians, who may be oblivious to the dangers of concrete pumping, can also be affected and therefore must be kept well clear by segregating them from the loading and pumping areas. When pumping is taking place on or next to the public highway, the splashing of concrete onto nearby structures, buildings and cars also needs to be controlled.
- Reversing vehicles are a major hazard on any construction or related site. When a mixer vehicle is being reversed towards the pump, its path must be clear of all personnel, including the pump operator or marshaller.

Pumping safely and dealing with concrete *(Working tasks)*

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

- Conditions and hazards on site need to be taken into account before, during and after work, with risks identified and control measures applied. The boom must be kept well clear of any overhead power lines and guidance from the Health and Safety Executive advise that at least 15 metres plus the length of the boom is kept from power lines mounted on metal pylons. Wind speeds should also be regularly monitored so that they are below the maximum authorised by the pump manufacturer. Gusts of wind should be constantly monitored, even though overall wind speeds are below the set limit, as gusts of wind can cause overloading of the boom.
- Hose whip has caused severe injuries and deaths. The recommended danger zone of a placing hose – the flexible hose at the end of the boom – is twice the radius of the hose. During the setting up phase and particularly when grouting the line, the pour team need to be made aware of the dangers of any hose whip and kept clear of the hose whip area when grouting is going to take place. When the boom is repositioned during a pour, the operator must take into account the speed of the slew as slewing too fast can cause a greater side stress on the boom, and possibly overshoot the intended location and striking a structure or object.
- The operator needs to know the required type of mix as pumping pressures can vary due to different mixes. Mixtures with a high cement content normally require additional pumping pressure. High pumping pressures can also cause accelerated wear on the pump and pipeline which, as stated earlier, may require more frequent checks and inspections. Concrete delivery schedules form part of the planning process. If the delivery of concrete is delayed, the operator needs to take into account that any residual concrete within the pipeline can begin to set, which may cause a blockage and, if left too late, may require a change of the pipework.
- Wet concrete is a known alkaline which is corrosive to human tissue and can cause third degree burns if it is not removed in time. No skin should be exposed whilst handling wet concrete during any preparation, pumping and cleaning work. During setting up and whilst pumping, the operator may need to access parts of the pump, truck or boom. This means that work at height requirements come into effect. Where a ladder is required to reach, for example, the pumping area of the truck, then amongst many requirements, it must be at least three rungs or at least 1 metre beyond the landing level. This requirement aids egress from the ladder onto the landing area by providing additional hand-hold support.

Grouting and cleaning out procedures *(Maintenance)*

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

- During preparation work, if a pipeline has been insufficiently grouted, then a blockage within the pump or pipeline could occur. When the grout is being mixed in the pump's hopper, water must be added with care as excessive water pressure from a hose can cause an ejection of the cement powder, leading to possible health and respiration issues. During the pumping operation, it has been known for mixer drivers to wash their

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delivery shutes and direct the water run-off into the hopper. This affects the mix and can cause segregation, possibly leading to a blockage.

- Cleaning out can be the most hazardous part of concrete pumping operations so additional care must be taken and the correct cleaning procedures followed. Before the hopper is cleaned, the engine must be switched off and then any hydraulic pressure within the system should be vented to eliminate any remaining pressure.
- Using compressed air to clean the pipeline has caused injury and death so must only be undertaken when all other options are not feasible, and only if it follows a planned safe system of work. As hose whip of the placement hose can occur during cleaning out procedures, it must be suitably restrained to prevent movement and cleaning must only be undertaken in a segregated area. If a sponge ball is used during the cleaning, the ball catcher must be in place before cleaning begins. Sponge balls ejected at high speed have struck nearby personnel with fatal consequences.
- As the cleaning out process removes remaining concrete which requires partial or full flushing with water, the procedure and the containment of the contaminated water needs to be planned and controlled before cleaning commences. This is a major consideration when working on the public highway, as collecting and containing waste materials can present difficulties.

Stability

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

- Various factors have caused truck mounted pumps to become unstable and overturn, with the usual and costly consequences. Effective planning of the ground, working area and other environmental factors must be carried out before setting up begins. Ground conditions naturally play an important part in stability and should be checked by a suitable person to ensure the ground can support the bearing pressure applied through each stabiliser/outrigger. As the boom of the concrete pump rotates through 360 degrees, the weight on each stabiliser/outrigger increases dramatically when a fully extended boom that is pumping concrete is positioned directly over each leg.
- Ground bearing pressure can be reduced through each stabiliser/outrigger by using sole plates, which spreads the applied pressure. The larger the sole plate, then (in principle) there should be a reduction in applied pressure. The minimum size of a sole plate should be determined by an appropriate expert. Even if the supported ground has been approved for the size of the pump, regular checks should take place and if there has been a period of heavy rain, the ground should be thoroughly rechecked before work starts as the ground may have softened.
- A minimum distance must be kept from a bank or sloped edge, as the ground is liable to give way and collapse. The recommended distance that the vehicle should be kept from a sloped edge is that, in principle, the horizontal distance from the nearest stabiliser/outrigger to the top edge of the slope is two times greater than the vertical height of the slope.
- In certain pumping locations, the size of the given area means that the stabilisers/outriggers cannot be fully extended. Operators therefore have only partially extended them with the result that the vehicle becomes less stable and investigations have shown that this is a common cause of vehicle overturns. Manufacturers' guidance on when partial or short rigging can take place must be followed at all times. It cannot take place under any other circumstances unless it has been approved by a suitably qualified and authorised person.