

BS 7121-13:2009



BSI Standards Publication

Code of practice for safe use of cranes –

Part 13: Hydraulic gantry lifting systems

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Foreword

Publishing information

This part of BS 7121 is published by BSI and came into effect on 31 August 2009. It was prepared by Subcommittee MHE/3/11, *Crane safety and testing*, under the authority of Technical Committee MHE/3, *Cranes and derricks*. A list of organizations represented on this committee can be obtained on request to its secretary.

Relationship with other publications

The Lifting Operations and Lifting Equipment Regulations (LOLER) [1] and the Provision and Use of Work Equipment Regulations (PUWER) [2] came into force in December 1998. Details of the Regulations, an Approved Code of Practice plus Health and Safety Executive (HSE) guidance can be found in the HSE books *Safe use of lifting equipment* [3] and *Safe use of work equipment* [4].

BS 7121-1 provides general recommendations for crane types not covered in an additional part of BS 7121. BS 7121-2 covers in-service inspection, thorough examination and, where appropriate, testing for the safe use of all types of cranes. Subsequent parts of BS 7121 deal with the specific crane types as follows:

- Part 3: Mobile cranes;
- Part 4: Lorry loaders;
- Part 5: Tower cranes;
- Part 6: Derrick cranes;
- Part 7: Overhead/under-hung travelling and goliath cranes;
- Part 8: High pedestal and portal jib dockside cranes;
- Part 9: Container handling cranes;
- Part 10: Rail mounted cranes;
- Part 11: Offshore cranes;
- Part 12: Recovery vehicles and equipment;
- Part 13: Hydraulic gantry lifting systems;
- Part 14: Side boom pipelayers.

When all parts of BS 7121 have been published, CP 3010 will be withdrawn and BS 5744 will be revised to cover manually operated and light cranes only.

Information on the background to the development and use of the BS 7121 series since the initial publication of BS 7121-1 in 1989 is given in Annex C.

The BS 7121 series has been accepted as representing the consensus of practical experience for safety on cranes.

Information about this document

This document is intended to be used in conjunction with other parts of BS 7121 to ensure, so far as is reasonably practicable, that lifting operations are carried out safely.

The Health and Safety Executive (HSE) commends the use of this British Standard to those who have duties under the Health and Safety at Work etc. Act 1974 [5]. This standard was drawn up with the participation of HSE representatives and will be referred to in relevant HSE publications.

Use of this document

As a code of practice, this British Standard takes the form of guidance and recommendations. It should not be quoted as if it were a specification, and particular care should be taken to ensure that claims of compliance are not misleading.

Any user claiming compliance with this British Standard is expected to be able to justify any course of action that deviates from its recommendations.

It has been assumed in the preparation of this British Standard that the execution of its provisions will be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

Presentational conventions

The provisions in this standard are presented in roman (i.e. upright) type. Its recommendations are expressed in sentences in which the principal auxiliary verb is “should”.

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

1 Scope

This part of BS 7121 gives recommendations for the safe use of hydraulic gantry lifting systems (HGLS). Subjects covered include safe systems of work, management, planning, selection, erection and dismantling, inspection, testing, examination, training, operation and maintenance.

NOTE 1 This part of BS 7121 has been developed along the lines of BS 7121-1 with significant modifications to incorporate HGLS-specific aspects. The modifications include some information contained in the US Specialized Carriers and Rigging Association (SC&RA) document, Recommended Practices for Hydraulic Jacking Systems [6].

This part of BS 7121 is intended to be used in conjunction with BS 7121-2, which provides general guidance on the inspection, testing and examination of all types of cranes.

NOTE 2 Annex A and Annex B give detailed recommendations on the training of HGLS personnel. Annex C provides background information on the BS 7121 series.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS 7121 (all parts), *Code of practice for safe use of cranes*

3 Terms and definitions

For the purposes of this part of BS 7121, the following terms and definitions apply.

3.1 appointed person

person nominated (typically by the employing organization) to plan, and to have overall control of, the lifting operations

3.2 competent person

person who has such practical and theoretical knowledge and experience of the HGLS and the equipment used in the lifting operation as is necessary to carry out the function to which the term relates in each particular context

3.3 control/power unit

remote station that hydraulically or electronically provides the energy that actuates the cylinders in the jacking units

NOTE On hydraulically powered machines, this unit contains a motor and pump that provides oil flow to the control levers. This flow is then transmitted to the jacking unit via hoses. On electrically powered machines, the control unit sends electrical signals to the jacking unit which contains the motor, pump and oil. On this type of system, only electric cables connect the jacking units to the control units.

3.4 cross beam

second set of header beams (or beam) placed across the first set and used to attach the lifting object

3.5 header beam

structural section, usually a wide flange rolled shape or a fabricated box section

NOTE This beam is placed on the header plates. Lifting accessories can be attached to this beam and the lifting object to facilitate lifting or lowering the lifting object.

3.6 header plate

plate attached to the top of the lift cylinder or lift boom with a swivel fitting, used to attach the header beam to the jacking unit

NOTE This fitting is usually designed such that swivel is possible in one plane only.

3.7 HGLS lift supervisor

person who controls the lifting operation, and ensures that it is carried out in accordance with the appointed person's safe system of work

3.8 HGLS operator

person who operates the HGLS for the purpose of lifting and positioning loads

3.9 HGLS slinger/signaller

person, other than the HGLS operator, who is actively involved in the lifting operation and undertakes tasks such as attaching and detaching the load and directing the HGLS operator to ensure the safe movement of the HGLS

3.10 in-service

condition where the HGLS is handling loads not exceeding the rated capacities with acceptable wind speeds (as stated in the Beaufort Wind Speed Scale) and other conditions as specified by the manufacturer

3.11 jacking unit

structured box supported on wheels having one or more vertical lift cylinders or a vertical lift boom mounted on top

NOTE These units can be free wheeling or self-propelled. The cylinders or booms of these jacking units (usually two or four operated as a set) are extended or retracted to lift or lower the lifting object. The jacking unit can move longitudinally (see 3.18) to transport loads horizontally (see 3.19).

3.12 lateral direction

horizontal direction perpendicular to the axis of the jacking system track

3.13 lift boom

assembly of two or more nested structural boxes that telescopes as the lifting object is lifted or lowered and provides structural strength to resist vertical (and also horizontal) forces that might occur during the lift

NOTE The telescoping of the boom is driven by one or more internal or external hydraulic cylinders. The lift boom can also provide vertical support to the lifted object by means of devices that mechanically lock the sections of the boom to one another. These might be incorporated in a jacking unit.

3.14 lift cylinder

telescopic hydraulic cylinder, either single stage or multiple stage

NOTE Lift cylinders can be single-acting (pressure extend, gravity retract) or double-acting (pressure extend and pressure retract).

3.15 lift link

structural fitting used to provide a point of attachment between the header beam(s) and the lifting accessories attached to the lifting object

NOTE Typically, lift links are made from a piece of flat plate that is cut out to fit around the beam and drilled at the bottom to allow for attachment of a shackle or other pinned fitting. Other designs are also in use, some of which are self propelled.

3.16 lifting accessory

equipment from which the load can be suspended

NOTE Typical lifting accessories include shackles, wire rope slings, synthetic slings, chains, and slings made from wire rope and clips.

3.17 lifting object

component or load lifted (and moved) by an HGLS

3.18 longitudinal direction

horizontal direction parallel to the axis of the jacking system track

NOTE The propel motion of the jacking unit (along a pair of tracks for example) is always in the longitudinal direction.

3.19 propel

longitudinal movement of a jacking system unit along the floor or track

NOTE There are three basic concepts for propel devices:

- a) *built in:* the jacking unit has a motor (usually hydraulically driven) that drives some or all of the wheels of the unit through chains or gears;
- b) *external cylinder:* used on free wheeling jacking units, a cylinder is pinned close to the bottom of the unit's base at one end and to the track at the other. The cylinder is extended and retracted repeatedly to move the jacking units;
- c) *external drive wheels:* one or more motor-driven drive wheels are mounted on the base of the jacking units.

3.20 rated capacity

maximum load that the HGLS is designed to lift with the telescopic cylinder(s) at a specific stage

NOTE The rated capacity was formerly known as "safe working load" (SWL).

3.21 rated capacity indicator

RCI

device that warns of the approach to overload and prevents the HGLS from being overloaded

NOTE 1 This was previously known as an "automatic safe load indicator (ASLI)" and "overload protection". For information on ASLIs, see BS 7262.

NOTE 2 Further information on RCIs is given in BS EN 12077-2.

3.22 side shifting

lateral movement of a suspended lifting object, usually accomplished by means of hydraulically propelled skates built into the lifting links or rack and pinion travelling device

3.23 track

assembly consisting of two parallel beams, usually tied together at regular intervals, to guide the wheels of the jacking unit

NOTE 1 The beams are either wide flange shapes or fabricated box sections, and are typically fitted with one or more structural elements that guide the jacking unit's wheels. The beam gauge is equal to the transverse wheel spacing of the jacking unit. Most track is designed in short sections that can be bolted together end to end.

NOTE 2 The track members can be designed to carry the jacking unit wheel loads over significant clear spans or to be fully supported by the underlying surface, functioning only to provide a smooth, guided surface for the jacking unit's wheels. Since jacking units are usually operated in pairs, two track assemblies (parallel to one another) are usually required for a lifting operation.

4 Management of installation and the lifting operations

4.1 Safe system of work

A safe system of work should be established and this should be followed for every lifting operation, whether for an individual lift or a group of repetitive operations. The same principles should be applied when the lifting operations are carried out at a temporary site or when the HGLS is being used in a permanent fixture for a length of time.

The safe system of work should include:

- a) planning of the operation (by way of the method statement; see 6.3);
- b) selection, provision and use of a suitable HGLS configuration and associated equipment (may be included in risk assessment; see 6.2);
- c) any necessary preparation of the site and erection and dismantling of the HGLS;
- d) maintenance, examination and, where necessary, testing of the HGLS and equipment;
- e) the provision of properly trained and competent personnel who have been made aware of their relevant responsibilities under the Health and Safety at Work etc. Act 1974 [5], the Management of Health and Safety at Work Act 1992 [7] (which is specific to risk assessments and method statements) and Regulation 9 of PUWER [2];
- f) adequate supervision by properly trained and competent personnel having the necessary authority given by the operator company;
- g) ensuring that all necessary reports of thorough examination and other documents are available;
- h) preventing unauthorized movement or use at all times;
- i) ensuring the safety of persons not involved in the lifting operation.

The safe system of work should be communicated to all parties concerned with the lifting operation.

It is essential for the safety of the operation to ensure that all personnel can communicate clearly in the same language.

NOTE Attention is drawn to PUWER [2] Regulation 4 and 20 on "Suitability of work equipment" and "Stability" respectively and LOLER [1] Regulation 4 on "Strength and stability" in relation to the safe system of work.

4.2 Control of the lifting operation

4.2.1 General

In order to implement the safe system of work effectively, one person should be appointed to have overall control of the lifting operation to act on behalf of the management of the employing organization. The appointment of the person does not remove any legal responsibility from the management but enables them to use the appointed person's expertise, the better to fulfil their responsibilities. The person appointed may have other duties and need not be an employee of the employing organization. The appointed person should have adequate training and experience to enable these duties to be carried out competently.

NOTE The appointed person is appointed by either the employing organization or by the HGLS company, depending on the contractual circumstances. Occasionally, for the duration of the actual lifting operation, the role of the appointed person may be delegated to the HGLS lift supervisor if this is considered to be more appropriate.

4.2.2 Selection and assessment of appointed person

NOTE To assist in the selection of an appointed person, some examples of lifting operations that require different levels of expertise, training and experience, and that impose different duties on the appointed person, are given in 4.3. Recommendations for installation operations are given in Clause 12 and Clause 13.

When selecting an appointed person, the employing organization should take into account the variety and complexity of the operation, as well as all the problems that could arise from proximity hazards and environmental courses. The appointed person should be notified formally in writing of their appointment. The appointed person should be given authority to carry out the duties involved, including consulting others with specialist knowledge and experience, and should be able to delegate duties and tasks for any part of the safe system of work to suitably qualified individuals.

The employing organization should review and assess the performance of the appointed person periodically. The complexity of the installation/lifting operations might entail selection of a more experienced appointed person, as appropriate, or provision of additional training to the existing appointed person.

4.2.3 Avoidance of collisions

On sites where there is a risk of collision between the HGLS and other equipment, the appointed person should plan the sequence of HGLS movements to prevent collisions. Any corresponding instructions from the appointed person to the HGLS lift supervisor should be given directly or via the respective signallers. In such circumstances, the signallers should obtain the agreement of the appointed person before carrying out any operation.

The positioning of the HGLS and components in the out-of-service condition, as specified by the manufacturer's instructions, should be such that no collisions can take place. This activity should be part of the initial planning process.

4.3 Duties of the person appointed to control the lifting operation

4.3.1 General

The appointed person's duties should include the following:

- a) assessing the lifting operation to provide such planning, selection of HGLS, its configuration and lifting accessories, instruction and supervision (by personnel with the necessary competence, experience and qualifications) as is necessary for the task to be undertaken safely. This might include consultation with other responsible bodies, if necessary, and ensuring that, where different organizations are involved, they collaborate as necessary;
- b) ensuring that adequate inspection/examination and maintenance of the HGLS and associated lifting accessories has been carried out;

NOTE 1 For further information, see BS 7121-2.

- c) ensuring that there is an effective procedure for reporting defects and incidents and taking any necessary corrective action;
- d) taking responsibility for the organization and control of the lifting operation.

The appointed person should be given the necessary authority for the performance of all these duties and, in particular, the authority to stop the operation whenever they consider that danger is likely to arise if the operation were to continue.

Duties may be delegated to another person (perhaps the HGLS lift supervisor) where considered appropriate.

NOTE 2 See 4.2.1 regarding delegation of the role of the appointed person to the HGLS lift supervisor during the actual lift if considered to be more appropriate.

The duties of appointed persons for HGLS operations can vary according to the complexity of the operation. The duties for a basic lift are considerably fewer and less demanding than for a lift at a hazardous location. An appointed person employed for a basic lift might not be suitably trained or experienced for a more complicated operation, and another appointment could be required for this. The information given in 4.3.2 to 4.3.4 can be used so that an appropriate appointment is made and a suitable method statement produced for each lifting operation. The requirement for an appointed person with appropriate training and experience also applies to installation operations.

4.3.2 Basic lift

If the mass of the load(s) can be simply established, the lift is a static lift (straight up and down lift; see 15.2.2) and there are no significant hazards or obstructions within the area of the operation, then the duties of the appointed person should include the following:

- a) establishing the mass of the load. This can be by a reliable source of information, weighing the load, or calculation (with allowance for possible inaccuracies);

NOTE If HGLSs are used to lift loads from water, the load could also include forces due to water flow or suction and the effect of loss of buoyancy.

- b) selecting the HGLS, based on the mass of the load, including the hook block and any lifting tackle, and the maximum height of lift. The rated capacity of the HGLS should be specified by the manufacturer in the information for use supplied with the HGLS, or else on the current report of thorough examination issued by the competent person. The manufacturer's sales leaflets should not be relied on for the rated capacity for a specific HGLS;
- c) considering the location of the operation, taking into account the access and egress required for the HGLS, and the suitability of the ground to take the loads imposed on the HGLS during preparation for the lift and during the lift itself;
- d) ensuring that the HGLS is not operated in wind speeds in excess of those given in the instruction manual for the HGLS. Consideration should also be given to the wind area of the load to ensure that its movement in the wind does not present a hazard;
- e) ensuring that the HGLS has been thoroughly examined at least within the previous 12 months (including testing, where appropriate), inspected and checked before use;
- f) ensuring that a system for reporting defects is in place;
- g) selecting appropriate lifting accessories, including their method of attachment to the load, and any protection used to prevent damage;
- h) ensuring that lifting accessories have been thoroughly examined, at least within the previous six months, inspected and checked before use;
- i) designating a person to check the lifting accessories and any lifting points that are provided on the load to ensure they are free from any obvious defects before attaching the load to the HGLS;
- j) briefing all persons involved in the lifting operation to ensure that the safe system of work described in the method statement is understood. All persons involved in the lifting operation should be instructed to seek advice from the appointed person if any change is required to the lifting operation, or if any doubts about safety arise. If handlines/taglines are required to give more control of the load, the appointed person should designate persons to handle the lines;
- k) checking that no changes are required in the safe system of work if numerous loads are to be lifted over a long period;
- l) ensuring that there is an HGLS lift supervisor designated to direct personnel and that the operation is carried out in accordance with the method statement.

The appointed person and HGLS lift supervisor should be aware of the limits of their knowledge and experience concerning lifting operations, and, when conditions exceed these limits, further advice should be sought.

4.3.3 Standard lift

If there are significant hazards, either within the working area of the HGLS or on the access route to the working area, or the lifting operation includes longitudinal travel (see 15.2.3), the duties of the appointed person should include the following, in addition to the duties listed in 4.3.2:

- a) investigating all hazards in the operating area, including any areas required for access or erection/dismantling of the HGLS;

NOTE 1 Hazards can be from surrounding buildings, or overground or underground services.

- b) taking account of increased risks if the load is lifted from a structure at a height above the standing position of the HGLS;

NOTE 2 Additional risks can arise from the HGLS lift supervisor not being able to observe the load while taking the initial strain, and movements due to deflections as the load is lifted clear of the supporting structure making it not possible to put the load back down.

- c) liaising with any other person or authority, as required to overcome any hazard, by including any necessary corrective action or special measures in the safe system of work;
- d) considering the effect of the lifting operation on surrounding property or persons, including the general public. This should lead to arranging for appropriate action to minimize any adverse effects, and to giving appropriate notice to all persons concerned.

4.3.4 Complex lift

If the lifting operation includes topping and tailing, side shifting or the use of more than four jacking units (see 15.2.4 and 15.2.5), is at a location with exceptional hazards (for example, at a chemical plant), or involves lifting a load from height, or if the load being lifted is a complex shape or with a large wind area, the appointed person should ensure, in addition to the duties listed in 4.3.2 and 4.3.3, that:

- a) the mass of the load and the position of its centre of gravity are accurately known;
- b) the wind area of the load is known and a limiting wind speed for lifting is established;
- c) any lifting points provided on the load are adequate for the loads applied;
- d) the method statement includes access, ground conditions, erection etc., as well as the exact sequence of operations when lifting the load.

NOTE The lifting of persons with an HGLS is regarded as a complex lift. Further guidance is given in BS 7121-1.

4.4 Duties and responsibilities of other persons

As described in 4.3, the appointed person needs to plan HGLS lifting operations on the basis that personnel with the necessary competence, experience and qualifications are available.

An adequate number of personnel should be used as considered necessary to complete a safe HGLS lifting operation. This always involves an HGLS lift supervisor, assisted by an HGLS operator/s and one or more HGLS slingers/signallers. The number of personnel should be selected so that all of the jacking units and associated equipment can be satisfactorily observed throughout the operation. Every effort should be made to ensure that no personnel are positioned within the lifting area during the lifting operation.

NOTE Attention is drawn to LOLER [1] Regulation 8(1)(c), which requires that lifting operations are carried out in a safe manner.

5 Contract lift or HGLS hire

5.1 General

Given the wide variety of contractual arrangements, it is important to ensure that the planning, organization control and management of lifting operations is not compromised. In general, any organization requiring a load to be moved by an HGLS, which does not have its own lifting equipment, has two basic options: hiring an HGLS (hired HGLS) or employing a contractor to carry out the lifting operation (contract lift). The difference between the two options is summarized in Figure 1.

If an individual or organization does not have expertise in lifting operations they should not hire an HGLS but should opt for a contract lift. Before entering into a contract, the employing organization should satisfy itself that the contractor has the necessary competence to carry out the work.

NOTE Responsibilities for insurance in terms of the HGLS, personnel, the load and third parties might also need to be clarified.

5.2 Contract lifting operations

The employing organization may enter into a contract with a contractor who undertakes the work on their behalf.

The parties to the contract should ensure that:

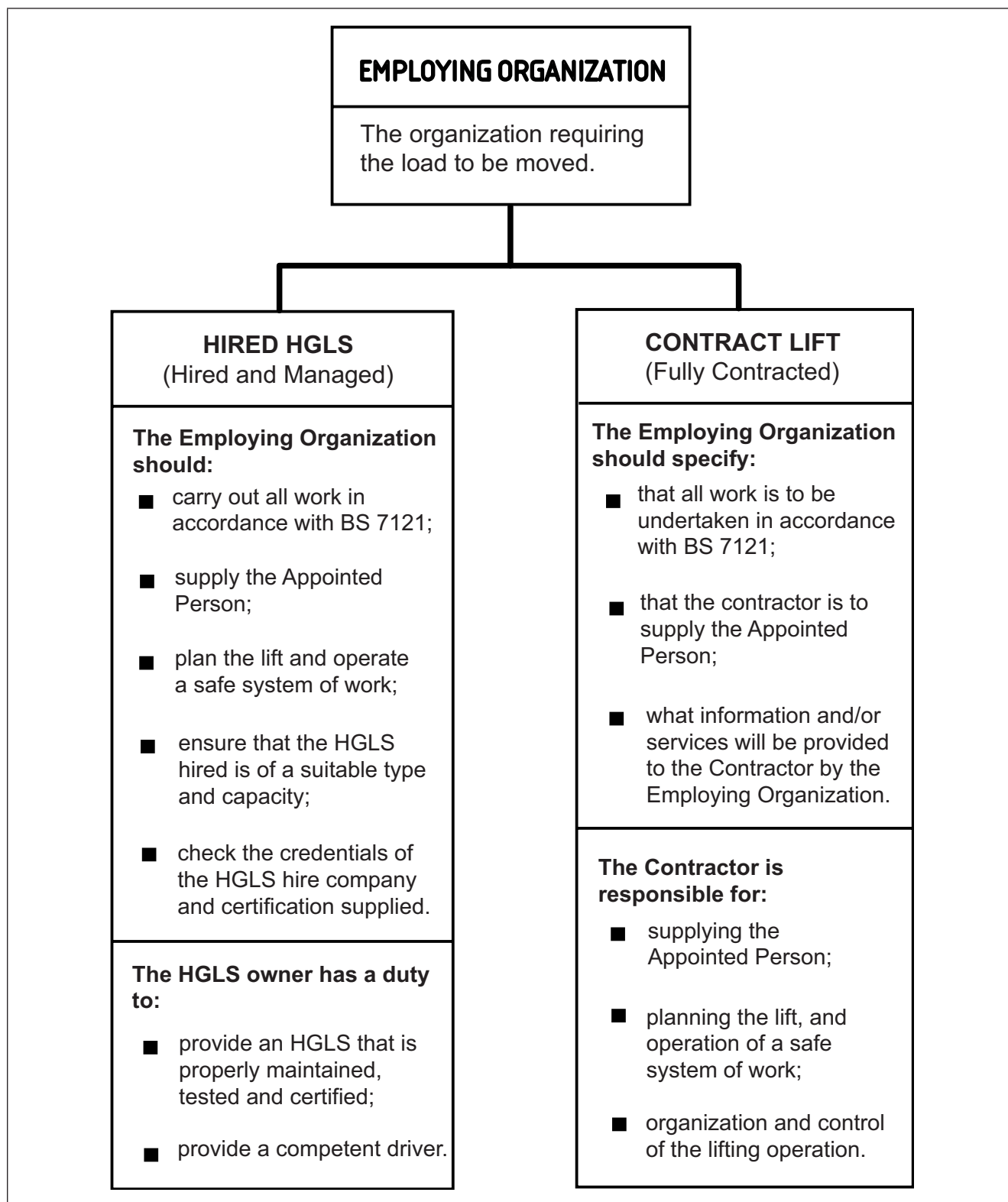
- a) all work is carried out in accordance with the BS 7121 series;
- b) the contractor appoints a person, in accordance with 4.3, to the satisfaction of the employing organization;
- c) all information or services provided by the employing organization to facilitate compliance with the BS 7121 series are notified to the contractor in writing.

The contractor should carry out lifting operations in accordance with the BS 7121 series. The contractor should be given full authority by the employing organization to work in accordance with the BS 7121 series including, where appropriate, authority to control and instruct the employing organization's personnel.

NOTE Although the BS 7121 series is intended to assist organizations to comply with their statutory and common law obligations, it does not relieve them from these obligations.

Before entering into a contract, the employing organization should ensure that the contractor has the necessary competence to carry out the work in accordance with the BS 7121 series.

Figure 1 HGLS contract options



5.3 User's duties when using a hired HGLS

When an HGLS is hired out from a third party, together with an HGLS operator, to the user organization, the HGLS owner should provide a competent HGLS operator (see 7.2.2 and 8.2) and an HGLS that is properly maintained, inspected, thoroughly examined, tested

in accordance with BS 7121-2 and has a current report of thorough examination (see 11.7, 11.8, 14.2, 14.3, 14.5 and Clause 17).

The user organization retains the responsibility for nominating the appointed person in accordance with 4.2 and for following the recommendations given in the BS 7121 series. Notwithstanding any advice the HGLS owner might have offered concerning the selection of a particular HGLS or any other relevant matter, the responsibility for ensuring that the HGLS is of a suitable type, size and capacity for the task being undertaken, and for planning the operation, remains with the user organization. The appointed person should be fully involved in the planning process in conjunction with the HGLS owner.

Therefore, if an individual or organization does not have expertise in lifting operations, they should not hire an HGLS but should opt for a contract lift.

6 Planning of the lifting operation

6.1 General

All lifting operations should be planned to ensure that they are carried out safely and that all foreseeable risks have been taken into account. Planning should be carried out by an appointed person who has the appropriate knowledge for the lift being undertaken (see 4.3.2 to 4.3.4).

In cases of repetitive or routine basic lifting operations, this planning might only be necessary in the first instance, with periodic reviews to ensure that no factors have changed.

Planning of the lifting operation should take into account:

- a) the load, its characteristics and the method of lifting;
NOTE It might also be necessary to make allowance for any adhesion between the load and its support.
- b) the selection of a suitable HGLS configuration appropriate to the operation ensuring that adequate clearances are maintained between the load(s) and the HGLS structure;
- c) the selection of accessories for lifting/lifting attachments, the mass to be taken into account when assessing the load on the HGLS;
- d) the position of the HGLS and of the load before, during and after operation;
- e) the site of the operation, including proximity hazards, space availability and suitability of the grounds or foundations;
- f) the way in which the lift is to be performed, particularly in terms of the location of the running tracks (where appropriate);
- g) the access route to where the lift is to be carried out in terms of transporting and erecting the HGLS equipment;
- h) power supply details (if required);
- i) any necessary erection and dismantling of the HGLS;
- j) the environmental conditions (lighting, heating, weather – including wind – conditions) that exist or could occur at the site of the operation, which could necessitate stopping the operation when conditions are unsuitable.

Although information and records provided by the employing organization on aspects relating to items c) and h) should be considered, the information should always be confirmed by a competent person when this is deemed necessary. As a general rule, a competent person (e.g. structural engineer) should always be consulted if there is any doubt whatsoever about the structural integrity of the floor.

If possible, the mass of the lifting object and the position of the centre of gravity should also be checked on the day of the lifting operation. The requirement for these checks to be undertaken should be included in the method statement, as should the requirement to recheck the floor conditions if this is considered to be necessary (in case of heavy rain on an outside site, for example).

If the required capacity (load) of an HGLS is not available for a given lift, then it is usually acceptable for a higher capacity (load) system to be used. However, in considering this, a re-assessment of the floor loadings should be carried out to allow for heavier equipment.

An HGLS lift supervisor and HGLS operator with the required training and experience should be selected. It is not acceptable for a person to be substituted (due to illness or other reasons) by a person unless he/she has the equivalent training and experience. To this end, it is important for operator companies to maintain good training of their personnel by ensuring that they have constant exposure to new experiences and job types (see Clause 9).

6.2 Risk assessment

The risk assessment carried out by the appointed person as part of the planning process should identify the significant hazards associated with the proposed lifting operation. The assessment should evaluate the risks involved, and the nature and extent of any measures required to mitigate those risks. The appointed person should take into consideration hazards identified by the overall site risk assessments.

NOTE The HSE has produced guidance in a leaflet entitled Five steps to risk assessment – A step by step guide to a safer and healthier workplace [8].

Generic risk assessments are unlikely to be sufficient since most sites have hazards that are unique to that situation and should be taken into account in the separate site-specific assessment.

The results of the risk assessment should be recorded in writing and used in the preparation of the method statement (see 6.3) for that site.

The risk assessment, together with the manufacturer's instructions, should then be used to develop a detailed method statement for the safe transportation, assembly, erection, use and dismantling of the equipment at that site.

6.3 Method statement

Once the risk assessment has been carried out, the appointed person should ensure that a full method statement is prepared, detailing the safe system of work (see 4.1) for the lifting operation and including the risk assessment.

The appointed person should, when necessary, consult with others with specialized knowledge and experience to assist in the planning process for which the appointed person retains responsibility.

A copy of the method statement and associated operating instructions should be given to all those involved in the planning of the lifting operation, including the employing organization and the owner of the HGLS. The method statement may be based on an existing template or written specifically for the job. The HGLS operator should adhere to the method statement.

The method statement might include engineering documents prepared for all aspects of the job. These plans might include one or more of the following:

- a) drawings or sketches of the lifting equipment;
- b) layout views of the HGLS at the lift site;
- c) specifications for all equipment;
- d) other pertinent information, e.g. site topography (site levels).

If unforeseen situations arise which necessitate deviations from the method statement to be made, the HGLS lift supervisor should formally assess the method statement and, accordingly, refer back any changes to the appointed person. Such changes should always be recorded in a written form by the appointed person.

7 Selection and duties of personnel

NOTE See 4.2 and 4.3 for the selection and duties of the appointed person.

7.1 Selection of personnel

Safe HGLS lifting operations (including installation) depend upon the selection of suitable personnel who are competent to carry out the required duties. Records of training and experience of persons such as the HGLS lift supervisor and HGLS operator assist in the selection of personnel for particular applications (including when substitution might be required). HGLS lift supervisors, HGLS operators and HGLS slingers/signallers should be trained in accordance with Annex A and Annex B, as appropriate.

Those responsible for the selection of personnel should ensure that the personnel involved in the operation are efficiently organized in order to ensure good teamwork in the working situation.

Work associated with lifting operations should not be carried out by personnel whose efficiency is impaired by alcohol, drugs or other influences. All personnel in the team should be made aware of both this fact and their other duties (see 7.2).

Where personnel are undergoing training, they should be supervised by appropriate personnel.

NOTE For basic lifts, it might be appropriate for one person to undertake more than one of the duties identified in 7.2, depending on the hazards identified by the risk assessment.

7.2 Duties of personnel

7.2.1 HGLS lift supervisor

The HGLS lift supervisor should be responsible for:

- a) directing the on-site erection and dismantling of the HGLS assembly;
- b) supervising the moving of the lifting object;
- c) supervising the correct operation of the HGLS in accordance with the manufacturer's instructions and within the safe system of work (see 4.1) as detailed in the method statement;
- d) in the absence of the appointed person, briefing the lifting team members on the safe system of work;
- e) consulting with the appointed person in the event of any deviation from the safe system of work.

The HGLS lift supervisor should ensure that all necessary guidance and help is provided from other personnel (i.e. the HGLS slingers/signallers) nominated by the appointed person on behalf of the employing organization.

7.2.2 HGLS operator

The HGLS operator should be responsible for:

- a) moving the lifting object under the guidance of the HGLS lift supervisor;
- b) the correct operation of the HGLS in accordance with the manufacturer's instructions and within the safe system of work (see 4.1) as detailed in the method statement.

7.2.3 HGLS slingers/signallers

HGLS slingers/signallers and their appointment are the responsibility of the appointed person or employing organization. The HGLS slingers/signallers should be positioned around the HGLS unit to monitor and give feedback during the operation so as to ensure that the lift is carried out satisfactorily and in a safe manner. Typical duties that these HGLS slingers/signallers might be asked to perform include:

- a) erecting and dismantling the HGLS assembly in accordance with the manufacturer's instructions (see Clause 13);
- b) attaching and detaching the lifting object to and from the HGLS;
- c) monitoring certain aspects of the lifting operation and providing appropriate information to the HGLS lift supervisor by way of signalling, the use of radio control, television monitoring or other appropriate methods.

An HGLS slinger/signaller might be required to be positioned so as to be able to observe at least one jacking unit and associated equipment and be visible to the HGLS operator (see 4.4 on positioning of personnel outside the lifting area). All slings and attachments should be observed at all times during a lifting operation by one or more HGLS slingers/signallers (and/or by the HGLS operator). Viewing aids, such as closed-circuit

television (CCTV), laser monitoring or binoculars, should be used for this purpose whenever they are considered necessary.

7.2.4 Maintenance personnel

Maintenance personnel should be responsible for maintaining the HGLS and associated equipment and ensuring its safe and satisfactory operation. They should carry out all necessary maintenance in accordance with the manufacturer's maintenance manual and within the safe system of work (see 4.1). Wherever necessary, the manufacturer's maintenance manual may be supplemented by the operator company to suit their particular needs and requirements. Such information should be passed on to the manufacturer.

8 Minimum attributes of personnel

8.1 HGLS lift supervisor

The HGLS lift supervisor should be:

- a) competent to perform the tasks required of them (including the ability to judge distances, heights and clearances);
- b) fit, with particular regard to eyesight, hearing and reflexes;
- c) physically able to supervise the HGLS safely;
- d) adequately trained (see 9.2 and Annex A) for the type of HGLS being operated, with sufficient knowledge of the HGLS and its safety devices;
- e) fully conversant with the duties of the HGLS operator and HGLS slingers/signallers (see 7.2.2 and 7.2.3) and should understand signal coding (as defined in BS 7121-1) and any alternative methods of relaying relevant information;
- f) authorized by the employing organization to supervise the HGLS.

8.2 HGLS operator

The HGLS operator should be:

- a) competent to perform the tasks required of them (including the ability to judge distances, heights and clearances);
- b) fit, with particular regard to eyesight, hearing and reflexes;
- c) physically able to operate the HGLS safely;
- d) adequately trained (see 9.3 and Annex B) for the type of HGLS being operated, with sufficient knowledge of the HGLS and its safety devices;
- e) fully conversant with the duties of the HGLS slingers/signallers (see 7.2.3) and should understand signal coding (as defined in BS 7121-1) and any alternative methods of relaying relevant information;
- f) authorized by the employing organization to operate the HGLS.