



Safe Use of Quick Hitches on Excavators



Strategic Forum for Construction Best Practice Guide



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Working in Partnership

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Foreword

Every year, the construction industry is responsible for causing deaths and serious injury. The industry has done much to improve its performance which I welcome, but there is still room for improvement. Our industry is innovative and is constantly evolving new equipment and processes to increase efficiency. This has consequences for site management who must ensure that operators are competent, capable of operating equipment safely and are following safe working procedures.

A quick hitch (also known as a quick coupler) saves time and makes an excavator a far more versatile piece of construction equipment. When used safely, quick hitches reduce the risk of injuries through manual handling and crushing during the bucket changing process, whilst also giving benefits in improved productivity.

Unfortunately over the past few years there have been a significant number of accidents involving the use of quick hitches, which have tragically included fatalities. These could have been prevented by correct use, effective maintenance and adequate inspection. In addition to the terrible cost in human suffering, accidents have a financial cost. There is a very strong business case for improving safety performance.

This guidance has been prepared by the industry to provide clarity about the safe use of quick hitches including planning, equipment selection, training of personnel, provision of information, familiarization, safe use, maintenance, inspection and thorough examination, together with monitoring of the whole process. The guidance is straightforward, comprehensive and easy to adopt. It represents best practice.

I thank those who have been involved in its preparation and commend the guidance to anyone who owns, supplies or controls the operation of quick hitches on excavators. Please read the publication and turn the advice into action.



Phillip White

HM Chief Inspector of Construction
Chair of the Health and Safety Executive's Construction Industry Advisory Committee (CONIAC).

1.0 Introduction

The quick hitches fitted to excavators and other earthmoving plant make a valuable contribution to the construction process by enabling buckets and other attachments to be attached and detached rapidly, as required. Unfortunately there have been a significant number of accidents involving the use of quick hitches, which have tragically included a number of fatalities.

This document is intended to provide best practice guidance on the management of the use of quick hitches on construction sites including planning, equipment selection, selection and training of personnel, provision of information, familiarization, safe use, maintenance, inspection and thorough examination, together with monitoring of the whole process. It is essential that in managing the use of quick hitches, adequate attention is paid to all aspects of the process – selection of the correct equipment for the application, planning its use by competent people, monitoring the activity and rectification of issues; if any one aspect is ignored the probability on an incident will increase significantly, putting both the machine operator and people in the vicinity at risk.

The advice given in this document is based on the current state of the art of quick hitch design. As new designs are developed, this document will be updated to reflect any such changes to the state of the art.

Whilst the document is aimed specifically at the construction industry, its guidance will be of benefit to other sectors of industry where quick hitches are used.

Attention is drawn to the following statutory regulations:-

- The Health and Safety at Work etc. Act 1974;
- The Lifting Operations and Lifting Equipment Regulations 1998 (LOLER);
- The Provision and Use of Work Equipment Regulations 1998 (PUWER);
- The Management of Health Safety & Welfare Regulations 1999 (MHSWR);
- The Supply of Machinery (Safety) Regulations 2008;
- The Construction (Design and Management) Regulations 2007 (CDM);
- Personal Protective Equipment at Work Regulations 1992 (PPE);
- The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 (RIDDOR);

2.0 Definitions

attachment

bucket or other device which can be attached to the dipper arm of an excavator, either directly or via a quick hitch

excavator operator

person who is operating the excavator for the purpose of excavation or carrying out other tasks using attachments fitted to the excavator

exclusion zone

a zone which excludes all personnel from the area into which an excavator attachment can fall

NOTE: This zone may include areas outside the working radius of the excavator

method statement

document produced to describe the safe system for the use of a quick hitch

non-destructive testing (NDT)

testing carried out on the structure of a machine to establish the presence, location and extent of any defects that can affect the integrity of that structure

NOTE: The techniques employed for non-destructive testing are such that they do not damage or alter the material under test. NDT is also known as non-destructive examination (NDE).

quick hitch

device to facilitate the efficient connection and removal of attachments to excavators equipment

NOTE: Also known as Quickhitches, Quick Couplers or Attachment Brackets

site management

person or organisation responsible for operations on a construction site or part of a construction site

NOTE: This includes Principal, package and sub contractors

supervisor

person responsible to management for the day-to-day performance of a small group, guiding the group toward its goals, ensuring that all members of the team are safe, productive and resolving problems as they arise

thorough examination

examination by a competent person in such depth and detail as the competent person considers necessary to enable them to determine whether the equipment being examined is safe to continue in use

NOTE: The thorough examination is not part of the maintenance regime for the equipment but provides owners with information which could be used to determine the effectiveness of the regime.

3.0 Planning

All operations on site should be planned to ensure that they are carried out safely and that all foreseeable risks have been taken into account. Poor planning is one of the major causes of accidents arising from the use of quick hitches.

3.1 *Identifying the task to be undertaken*

As the first stage in the planning process, the task to be undertaken should be clearly identified, together with the location and sequence.

3.2 *Identifying the hazards associated with the task*

The hazards associated with the task should be identified. These might be associated with the location where the work is to be carried out, the nature of the quick hitch, the people associated with the task or located in the vicinity.

3.3 *Carrying out a risk assessment*

Having identified the hazards associated with the task, a risk assessment should be carried out to identify who might be harmed, the chance of them being harmed and the consequences of any harm. This assessment should be recorded.

An example of a risk assessment is given in **Annex B**

NOTE: *The assessment of language skills should form part of all risk assessment carried out as part of the planning process for the safe use and maintenance of quick hitches.*

3.4 *Identifying control measures*

Once the risk assessment has highlighted the risks involved in the task, the procedures and measures required to control them should be identified.

3.5 *Developing the method to be used*

Having identified the hazards, evaluated the risks and worked out the control measures required to carry out the task safely, these components should be developed into a coherent plan. Any contingency measures and emergency procedures should be included in the plan.

3.6 *Recording the planning in a Method Statement*

Once the plan has been developed it should be recorded in a Method Statement. The length and detail of this document depends on the complexity of the task to be undertaken and on the risks involved. The Method Statement should include the following information:

- Equipment description;
- Sequence of operations;
- Requirements for Exclusion Zones and any sequencing of other activities to maintain safe areas;
- Training for operator, banksman and supervisor;

- Authorisation of operator and supervisor;
- Communicate safe method of work;
- Arrangements for ensuring that equipment provided is maintained and fit for purpose;
- Arrangements for ensuring that equipment is examined and tested at appropriate intervals;
- Arrangements for adequate supervision of operations.

An example of typical requirements included in a Method Statement is given in **Annex C**.

3.7 Communicating the plan to all persons involved

One of the most important aspects of successful planning is to ensure that the contents of the plan are communicated effectively to, and between, all parties involved taking account of language differences. Arrangements should be made to ensure that copies of any Method Statements are given and explained to the appropriate people (including the Principal Contractor) and that others involved in the job are fully briefed. Similarly any changes to the plan should be communicated to all parties.

3.8 Reviewing the plan before the job starts

Immediately before a job starts the risk assessment and method should be reviewed to check if any aspect of the job has changed and the effect that these changes could have on the safety of the operation. If any modifications to the plan are required these should be communicated to all those involved. The competent person should amend the Method Statement and initial any significant changes.

3.9 The Use of Quick Hitches With Attachments Other Than Buckets

Quick hitches are generally used with buckets, where a number of different excavation tasks are carried out during the working day and rapid bucket changing increases productivity. They may however be used with other attachments such as hydraulic breakers, heavy duty ripper teeth, clay spades, rakes, grapples and forks, when permitted by the hitch, excavator and attachment manufacturer's. Care should be taken to ensure that the persons fitting the attachments are fully familiar with the attachment to be fitted.

In every case the use of the quick hitch must be planned in accordance with **3.1** to **3.8**.

NOTE: Many quick hitch and breaker manufacturers recommend that where a hydraulic breaker is fitted to an excavator for more than 50% of its operating time, the breaker should be direct mounted and not via a quick hitch. This will avoid excessive wear of pins and other components which could lead to failure of the quick hitch.

3.10 Further guidance

Further guidance on planning is given in:

- HSE Leaflet INDG218 – *Guide to Risk Assessment*,
- HSE Leaflet INDG163 – *Five Steps to Risk Assessment*.

4.0 Types of Quick Hitch

When hydraulic excavators were first developed, buckets and other attachments were connected to the end of the dipper arm by two round pivot pins held in place by lynch pins or nuts and bolts. To remove a bucket the pivot pins had to be withdrawn by hand, this could often be a time consuming procedure with pins being difficult to remove due to wear and rust and the consequent risk of hand and eye injuries to persons knocking out the pins. Buckets frequently need to be changed for ones of a different size several times a day to meet the needs of the construction process and so quick hitches were developed to speed up the process and reduce unproductive time.

Quick hitches fall into two broad categories:–

- **Dedicated quick hitches**

The dedicated quick hitch is specific to a particular machine or series of attachments and has the advantage that the original bucket geometry of the machine is generally maintained, with the characteristic that specific buckets with matching engagement lugs must be used with the system.

- **“Pin system” quick hitches**

Pin system quick hitches attach to the standard pivot pins on the bucket, which has the advantage of allowing a wide range of buckets to be attached and the disadvantage that the original radius of bucket movement is altered, due to the thickness of the quick hitch, causing a change of bucket tip radius and breakout force. The majority of quick hitches sold and used in the UK are of the “pin system” type.

All quick hitches have to engage with the pins or lugs in the attachment and then retain the engagement with a latching mechanism which must then be secured to ensure that inadvertent disconnection does not occur. Quick hitches are further subdivided into three types, depending on their method of operation:–

4.1 Manual Quick Hitches

Manual quick hitch systems require the operator to manually operate the latching mechanism. This may be by a variety of means such as winding a screw thread or using a bar to open a spring operated latch. Once the attachment has been connected the latching mechanism should be locked (e.g. a safety pin inserted manually) to prevent inadvertent disconnection.

Although a manual quick hitch is faster than changing an attachment which is directly connected to the dipper arm, it is still quite slow, requires the operator to get down from the machine cab and relies on the operator to install the locking device.

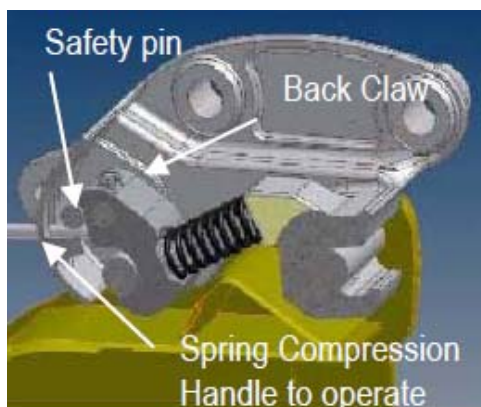


Figure 1 – Spring Latch Mechanism

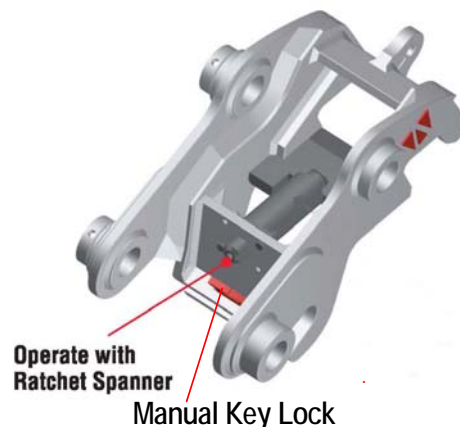


Figure 2 – Ratchet Operated Mechanism

4.2 *Semi Automatic Quick Hitches*

Semi-automatic quick hitches utilise a hydraulic cylinder to operate the latching mechanism which means that this part of the operation can be carried out quickly from the machine cab. Once the quick hitch has been connected to the attachment the operator must get down from the cab and manually insert a locking pin which will hold the latching mechanism in its closed position. This pin cannot be inserted unless the latching mechanism is in its fully closed position.

The semi-automatic quick hitch is significantly faster than the manual type but has the possibility that the operator, having carried out the latching operation from the cab may, deliberately or inadvertently, not get out of the cab to manually insert the safety pin. There is also a possibility on some quick hitches with multiple pin holes, of inserting the pin into the wrong hole.

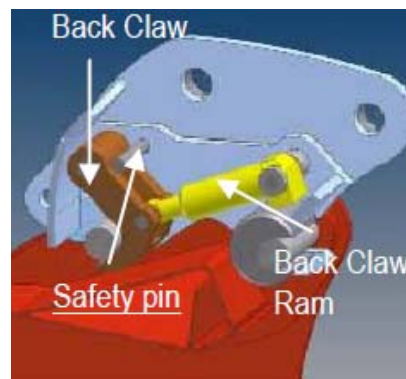


Figure 3 – Semi-automatic Quick hitch

4.3 *Fully Automatic Quick Hitches*

Fully automatic quick hitches are designed to be operated completely from the cab as they normally incorporate an independent locking system to secure the latching mechanism once it is fully closed. These systems should also have an indicator on the quick hitch so that the operator can verify from the cab that the locking system has fully engaged. Some fully automatic quick hitches have a fixed front claw which is engaged on the bucket front pin, the rear movable claw is then engaged with the bucket rear pin by a hydraulic cylinder, operated from the cab and is then automatically locked in place by a gravity locking bar or other means.

Other designs of fully automatic quick hitches have an additional front coupler claw which is engaged over the bucket front pin and locked in place by a gravity device or other feature.

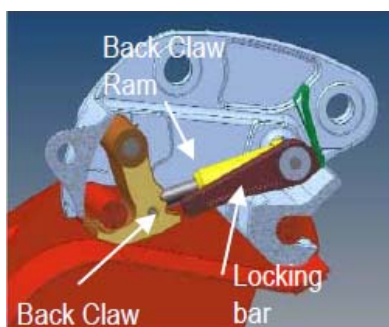


Figure 4 - Single Claw Lock Type

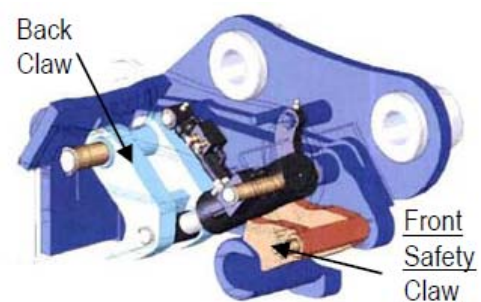


Figure 5 - Double Claw Lock Type

The fully automatic quick hitch enables attachments to be changed very quickly. As however, the securing or locking of the latching mechanism relies on automatic devices rather than the manual insertion of a locking pin, it is essential that these quick hitches are regularly inspected and maintained to ensure that wear, damage or the ingress of foreign bodies does not prevent the locking mechanism from functioning correctly.

It is essential that operators get out of the cab to physically ensure that all quick hitches are securely locked before starting work with a newly attached attachment.

5.0 Selection of Equipment

It is important that when the use of quick hitches is being considered, the correct equipment is selected to ensure compatibility between the quick hitch and the excavator to which it is to be fitted. The selection process should at least take into account the following points:-

- Which make and model of excavator is the quick hitch going to be fitted to?
- What attachments will be fitted to the quick hitch?
- Are the attachments, including buckets, compatible with the quick hitch?
- Which type of quick hitch is the excavator operator both familiar with and competent to operate?
- Who will be carrying out fitting and removal of the quick hitch?
- Are there particular hazards associated with the location and/or the task to be carried out?
- Which type of quick hitch is best suited to the application? (See 4.0)
- Will the quick hitch be sourced from the excavator manufacturer, from a quick hitch manufacturer or from a third party?
- Will the quick hitch be sourced from the excavator owner's own stock?

It is important that the end user is consulted during the selection process.

5.1 *Host Excavator*

The make and model of the excavator to which the quick hitch will be fitted must be established so that the correct size and type of quick hitch can be selected. The excavator's hydraulic and electrical systems must be compatible with the control and actuating system of the quick hitch if it is either of the "semi-automatic" or "fully automatic type".

5.2 *Attachments to be fitted to the Quick Hitch*

The attachments that are intended to be fitted to the quick hitch must be considered at the selection stage, as not all attachments will fit all quick hitches. For example, a "dedicated" quick hitch supplied by the excavator manufacturer will generally only fit attachments supplied by the excavator manufacturer and not those manufactured by third party attachment suppliers.

5.3 *Location and Task*

The location where the quick hitch is to be used and the task for which it is required will have a bearing on selection. If buckets or attachments are required to be changed frequently, a semi-automatic or fully automatic type may be more appropriate, whereas if buckets or attachments need to be changed less frequently, a manual quick hitch may be appropriate.

5.4 *Hazards*

The task and location where the quick hitch is to be used may have hazards associated with them which may influence the selection of the quick hitch. For example:-

- Uneven ground or areas of water increasing the risk of slips, trips and falls;

- Restricted access due to other activities or limited clearances;
- Hazardous environments such as dust.

5.5 Operator Familiarity

If the quick hitch chosen is not one with which the operator is familiar, additional instruction, information, familiarisation, training and supervision will be required.

5.6 Quick Hitch Type

The type of quick hitch will depend on a number of factors such as operator familiarity, frequency of attachment changes and user (Principal or Sub Contractor) preference.

5.7 Quick Hitch Source

There are four main sources of quick hitches for excavators:-

5.7.1 Excavator Manufacturer

The majority of excavator manufacturers supply both quick hitches and attachments for their ranges of machines. The advantage of sourcing the quick hitch from the machine manufacturer is single sourcing and compatibility. The machine manufacturer will have designed the excavator, quick hitch and attachments to work together and there should not be any issues with fitting or control systems. Dedicated systems have the advantage that the original bucket geometry of the machine is maintained and there will also be a single point of contact for any warranty issues. The disadvantage may be that a “dedicated” quick hitch will limit the choice of attachments that can be fitted.

5.7.2 Quick Hitch Manufacturer

Most quick hitch manufacturers supply quick hitches which are fitted to the standard bucket attachment pins on the dipper arm. This has the benefit of allowing a particular model of quick hitch to be fitted to a wide range of excavators from different manufacturers and for a wide range of attachments to be attached to the quick hitch. The pin system has the disadvantage that the original radius of bucket movement is altered, due to the thickness of the quick hitch, causing a change of bucket tip radius and reduction in breakout force.

The fitting of a third party quick hitch will, on “semi-automatic” and “fully automatic” units, require a quick hitch hydraulic supply and control system to be fitted to the excavator. This will involve tapping into the excavator’s hydraulic and electrical systems, and the fitting of steel pipes and hoses to the booms, often by welding. If this installation work is not carried out in an approved manner, it may be unsafe, raise compatibility issues with the hydraulic system, cause damage to the machine or hitch, and invalidate warranties.

5.7.3 Third Party Sources

Quick hitches can also be sourced from third party suppliers who offer a wide variety of new and second-hand units. The purchase of second-hand units should be approached with caution as they may be worn, faulty or be incomplete and are unlikely to come with the original manufacturer’s fitting kit or instructions. If units are purchased from outside the European Union they may well not comply with the Machinery Directive and meet the standards required for use in the UK (See **Annex D**).

5.7.4 Excavator Owner's Stock

Excavator owners may well have built up a significant stock of quick hitches over time and these are often “recycled” between machines. A stock of quick hitches should be treated as a valuable asset with adequate records to ensure that the type, location and maintenance history of individual quick hitches can be easily established. Quick hitches work in arduous conditions and will suffer damage and wear over time. Owners should ensure that before a quick hitch is taken from existing stock that it is in a safe condition for use.

6.0 Provision of Information

6.1 Introduction

The wide variation of designs and the increasing complexity of quick hitch technology make it essential that supervisors and operators are supplied with adequate information to enable them to carry out their duties effectively and safely. Information comes in various forms and from several sources.

Excavator/quick hitch owners must ensure that a robust system is in place to provide adequate up to date information to users and maintenance personnel. This may be achieved in a number of ways including:-

- Provision of paper manuals using a system which will ensure frequent updating is taking place;
- Provision of electronic manuals using a system which will ensure frequent updating is taking place;
- A central technical information function which can be contacted for up to date information whenever maintenance is taking place.

NOTE: It is essential that a system is in place to ensure that manual updates, safety alerts and other information are communicated speedily to those who need to know.

NOTE: It is essential that information is provided in appropriate languages for non English speakers. The assessment of language skills should form part of all risk assessment carried out as part of the planning process for the safe use and maintenance of quick hitches.

6.2 Manufacturer's Information

Information supplied by both the excavator and quick hitch manufacturers will be the main source of instructions and specifications when fitting, using and maintaining quick hitches. The primary document will be the maintenance manual for the specific quick hitch model (and in some cases serial number), supplemented by technical information bulletins.

Care should be taken to ensure that the information is up to date and relevant to the quick hitch that is being fitted, used and maintained.

Manufacturer's manuals are not always complete and in the case where a particular task is not covered, the manufacturer must be contacted for information **BEFORE** the task is undertaken.

6.3 Overlaps and Shortfalls

The combination of an excavator and a quick hitch may not have been supplied by one manufacturer. Frequently the quick hitch will have been supplied by a specialist quick hitch manufacturer for retrofitting to an existing excavator. Consequently the information covering the excavator/quick hitch combination will have come from at least two sources and there is the danger that information may either overlap in a conflicting fashion or have gaps where a significant piece of information is missing from both sources. In this case the user must consult both manufacturers to ensure that any shortfalls in information are rectified.

6.4 Instruction and Warning Labels

Most excavator/quick hitch manufacturers provide short form instructions on adhesive labels which should be fitted to the excavator's cab in a position where it can be clearly seen by the operator. Care should be taken to ensure that the instruction labels are current and apply to the model of quick hitch being used. Warning labels such as those

shown in **Figure 6** are frequently fitted to the dipper arms of excavators fitted with quick hitches. The condition of all labels should be part of the daily checks and replaced as soon as they are found to be damaged or illegible.

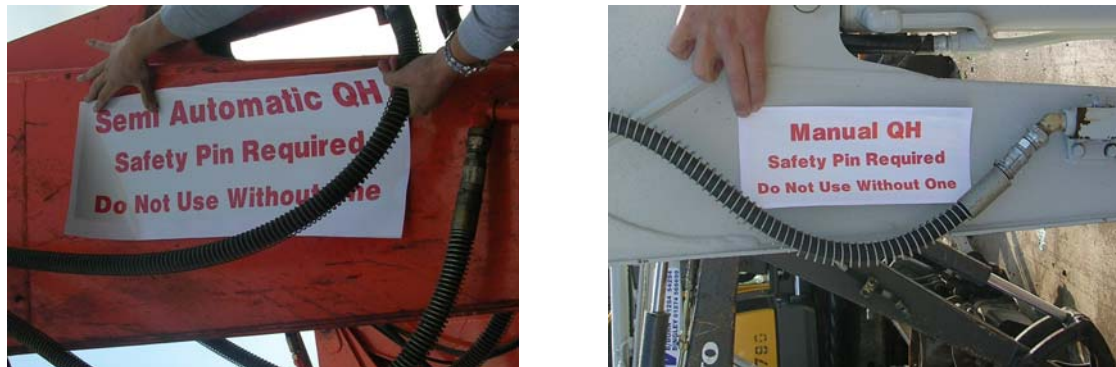


Figure 6 – Typical Warning Labels on Dipper Arms

6.5 In-House Technical Information

Some excavator/quick hitch owners will have their own technical information dealing with specific issues relating to the quick hitches in their fleet. This can be a useful source of information for personnel but care should be taken to ensure that information is current and all out of date information has been withdrawn.

6.6 Machine History

The history of the repairs and maintenance carried out to a quick hitch is often very helpful when trying to diagnose faults and repeated failures. Maintenance personnel should be encouraged to contact their manager or supervisor to request relevant machine history details when appropriate.

6.7 Information Formats

Paper information such as manuals and bulletins is rapidly being replaced by electronic formats such as CD-ROM and website downloads. This has the advantage that physical storage space is kept to a minimum and, in the case of website downloads; information should be up to date at the point of access. However the use of electronic display devices, such as laptop computers, during maintenance is not always easy or practical. Information may therefore have to be printed out for use on site, in which case, care should be taken that for any subsequent use the data is still current and relevant.

6.8 Management of Information

Information should be managed effectively if it is to be of maximum benefit to those involved in the maintenance process. Outdated information can at best waste time and at worst may well affect safety. It is therefore essential that organisations carrying out maintenance on quick hitches ensure that they have robust systems and procedures to ensure that maintenance personnel are supplied with adequate information that is both up to date and accurate.

7.0 Familiarisation

Quick hitches come in a variety of shapes and sizes with significant differences in operating characteristics. It is therefore essential that operators and supervisors are given adequate familiarisation on an unfamiliar type or model of quick hitch before they begin operations.

Familiarisation is generally carried out by an experienced person employed by the excavator owner but may also be carried out by a representative of the quick hitch manufacturer. The person giving familiarisation should have been assessed to ensure that they are competent to do so.

All familiarisation should be recorded.

Familiarisation for the operator of a quick hitch should include the following:-

- Identification of all areas of risk whilst using quick hitch devices;
- Understand the legal ramifications for plant operators using quick hitches, ie, HSWA, LOLER, PUWER and BS EN 474 1.
- Demonstrate the safe working procedures for the use of the quick hitch in accordance with manufacturer's recommendations.
- Demonstrate the safe working procedures for connection and disconnection of attachments.
- Demonstrate when and how to undertake visual inspections of the quick hitch attachment.
- Demonstrate "pre start checks" and maintenance requirements as recommended by the manufacturer.
- Practically demonstrate the safe method by which a connection of an attachment can be tested.

8.0 Supervisory and Operating Personnel

8.1 General Work Related Competence for Quick Hitch Operations

An often used definition of a competent person is “a person who has such practical and theoretical knowledge and experience as is necessary to safely carry out the function to which the term relates in each particular context”. A person who is competent to carry out one task will not necessarily be competent to carry out another with the same equipment.

Employers must ensure that their managerial, supervisory and operating personnel are generally competent to work safely with Quick-hitch operations. Employers must therefore assess the competence of their staff and, where necessary, provide training to achieve the level of competence required. The training needs to reflect the ability and level of responsibility of the individual, degree of complexity of the task and the risks involved.

Competence requirements for the various roles involved in the procurement and use of quick hitches are shown in **Table 1**.

8.2 Attributes and Selection

It is essential that both supervisory and operating personnel involved with the selection, fitting and use of quick hitches have the necessary attributes to ensure that they will be able to carry out their duties both effectively and safely. The necessary attributes for both supervisory and operating personnel are set out below.

8.2.1 Supervisor Attributes

- Understand how the hitch works;
- Understand what the hitch can and can't be used for;
- Understand how to attach and detach an attachment in the prescribed manner;
- Understand how to carry out checks to ensure that the attachment has been correctly engaged;
- Understand which checks and inspections are required on a daily or weekly basis;
- Understand what day to day cleaning and lubrication is required;
- Understand what can happen if the hitch is incorrectly attached;
- Understand what can happen if the hitch is poorly maintained;
- Understand that the hitch must not be used to move attachments without being fully engaged;
- Understand that work must be carried out to the Method Statement unless it is unsafe to do so in which case work must stop;
- Be aware of accidents and incidents caused by incorrect operation;
- Be aware of the increased risk when operating in the vicinity of other people and ensure/maintain an exclusion zone wherever possible;
- Carry out an effective observation and know what to look for;
- Able to communicate effectively with operators and line managers;
- Recognise bad practice and unsafe behaviour;
- Develop good working relationships;
- Active in raising H&S standards;

- Consistent and persistent;
- Not afraid of conflict where an issue needs to be raised and addressed;
- Understand his responsibilities under the Health and Safety at Work Act.

8.2.2 Operator Attributes

- Understand how the hitch works;
- Understand what the hitch can and can't be used for;
- Able to attach and detach an attachment in the prescribed manner;
- Able to carry out checks to ensure that the attachment has been correctly engaged;
- Understand he must physically leave the cab and check the quick-hitch before work commences or recommences following attachment.
- Able to carry out the required checks and inspections on a daily or weekly basis as required;
- Able to carry out the day to day cleaning and lubrication required;
- Understand what can happen if the hitch is incorrectly attached;
- Understand what can happen if the hitch is poorly maintained;
- Understand that the hitch must not be used to move attachments without being fully engaged;
- Understand that he must work to the Method Statement unless it is unsafe to do so in which case he must stop;
- Understand that if he is concerned or unsure about anything he must stop;
- Aware of accidents and incidents caused by incorrect operation;
- Aware of the increased risk when operating in the vicinity of other people;
- Understand his responsibilities under the Health and Safety at Work Act.

8.3 *Assessment of Training Needs*

Following selection, or as part of it, an assessment should be made of the extent of training which is needed for an individual, bearing in mind that this could be influenced by any previous training and experience. When supervisors or operators are recruited it is essential that employers check that their qualifications and experience relate to the job they are to do. Where the type of quick hitch to be used is outside the employee's previous experience, additional training should be provided. In any event, some further training is likely to be necessary to familiarize the employee with specific requirements of the new job.

8.4 *Training*

Once a supervisor or operator has been selected, any deficiencies in their knowledge, skills or understanding must be remedied by suitable training. This may be carried out in-house or by an external training provider. At the end of the training period the trainee should be assessed to ensure that the training objectives have been met.

An example of a nationally and industry recognised training schemes for the selection, fitting and use of quick hitches is the Construction Plant Competence Scheme (CPCS) short course on *Connecting and Disconnecting Attachments using Quick Hitch Coupling Systems*.

8.5 Assessment

Employers should ensure that personnel are assessed to establish that they are competent to carry out the tasks they are required to undertake. This applies equally to personnel completing training and those experienced workers who have been recently recruited.

Assessment should contain both practical elements to demonstrate the skills and standards achieved and the answering of questions to demonstrate relevant underpinning knowledge. The assessment should be carried out by occupationally competent and authorised assessors.

Competences	Activity	Operation	Supervision/Monitoring	Assessment	Procurement	Planning	Compilation of Information
Knowledge & Understanding of	Available devices - How they work, benefits, limitations				✓	✓	✓
	Provided components - How they work, benefits, limitations	✓	✓	✓	✓	✓	✓
	Particular combination - How they work together	✓	✓	✓	✓	✓	✓
	Maintenance & Inspection - Daily, weekly, periodic	✓	✓	✓	✓	✓	✓
	Recent developments - Modifications, working practices	✓	✓	✓	✓	✓	✓
	Accidents & Incidents - Causes, actions/ remedies, translation	✓	✓	✓	✓	✓	✓
	Company procedures	✓	✓	✓	✓	✓	✓
	Work context - Environment, people, tasks	✓	✓	✓	✓	✓	✓
	Behaviour - Operator, others	✓	✓	✓	✓	✓	✓
Skills	Effective observation		✓		✓		
	Decision making	✓	✓	✓	✓	✓	✓
	Good communication	✓	✓	✓	✓	✓	
	Relationships	✓	✓	✓	✓	✓	
	Analytical				✓	✓	✓
Attitude	Actively H&S positive	✓	✓	✓	✓	✓	✓
	Consistent	✓	✓	✓	✓	✓	✓
	Persistent		✓	✓			
	Sees competence as a range		✓	✓		✓	
	Not afraid of conflict		✓	✓		✓	

Table 1 – Competence Matrix

9.0 Safe Use of Quick hitches

9.1 General

The safe operation of a quick hitch starts with site management. The decision to buy or provide a specific quick hitch may well have been made as a corporate decision, or the equipment hired in, but it is the site management who are ultimately responsible for it being put into use. The site management must therefore ensure that the operation to be carried out has been effectively planned (See **Section 3.0**) taking into consideration all the safety issues which can arise, even where these are as a result of predictable misuse. The following points highlight some of the potential issues:-

- When there is a quick hitch accident the plant operator is immediately implicated. It is therefore essential that he is given sufficient training and information to enable him to know how to operate and check the quick hitch. He also needs to be authorised to do so.
- As all equipment on an excavator is subject to wear and deterioration it is important that the quick hitch is adequately inspected and maintained to avoid failure of the quick hitch or its mechanism.
- All fatalities involving quick hitches have occurred when a bucket or other implement has become detached and struck someone. To do this the victim has to be in an unsafe position either under the implement, or on its path as it becomes detached whilst slewing, lifting and or lowering. The site management needs to make sure no-one is required to be beneath the bucket or implement at any time, and to segregate high risk activities such as bucket changing preferably in clearly defined exclusion zones.
- Different types of quick hitches and quick hitches from different manufacturers have very different characteristics, with some providing a secure grip on both pins, and others which rely on a single grip. Some use a high pressure system and some a low pressure. Some can be used with a bucket or implement mounted off-face where others are potentially unstable when used in this way. The site management needs to consider the range of uses to which the hitch is to be put, and to ensure that the hitch is compatible with its intended use.

9.2 Supervision

Where an operator fails to operate a quick hitch correctly, such as omitting to insert a pin into a semi-automatic quick hitch, this may be for a number of reasons such as:-

- It is the first time this has happened;
- It has happened before but has never been observed by others;
- It has been observed, but due to complacency, lack of knowledge or concern has not been acted upon;
- It has been acted upon but has been repeated.

These alternative scenarios can be applied to any safety failure such as moving buckets without engaging the quick hitch at all (hooking), or failing to swap buckets in a safe area. Poor performance in one area may indicate a general neglect for health and safety.

To ensure that unsafe acts are minimised it is essential that supervision is effective and ensures that forgetfulness is prevented from developing into habit. The supervisor is critical in this respect. With a semi-automatic quick hitch there is a clear indicator of diligent operation of the hitch, the presence of the pin/bar. This can help the supervisor,

so long as periodically the hitch is checked for abuse. Unfortunately fully automatic quick hitches are less easily checked and so a more intrusive check involving the stopping of the machine needs to be made.

The supervisor therefore needs to:

- Check that the Method Statement is being worked to;
- Check that the method is as safe as possible;
- Check that people are kept clear of hazardous areas;
- Check that quick hitches are being used correctly;
- Check that tasks are carried out by authorised people;
- Take people to task for not working safely and correct poor or bad practice;
- Report unsafe behaviour.

9.3 Fitting of Buckets

When fitting buckets to a quick hitch the following points should be observed:-

- The bucket should be compatible with the quick hitch;
- The operator should be familiar with the attachment process for the specific make and model of quick hitch;
- Bucket fitting/removal should be carried out in an area designated for the purpose, from which other personnel are excluded;
- Before lifting the quick hitch and bucket the operator should ensure that any locking device (this will depend on the type and make of quick hitch) is in place and secure. This will generally involve the operator getting out of the cab to physically ensure that the quick hitch is securely locked before starting work with a newly attached attachment. In the case of certain types of fully automatic quick hitches in limited and closely defined circumstances, to carry out visual verification from the cab providing that the operator has a clear view of the latching indicator and can determine, unambiguously, whether the attachment is securely attached;
- After the bucket has been attached, locked and physically checked, the quick hitch should be crowded out and shaken vigorously to ensure that the bucket is secured to the quick hitch.

9.4 Fitting of Other Attachments

When fitting other attachments such as hydraulic breakers, piling hammers, heavy duty ripper teeth, clay spades, rakes, grapples and forks the points detailed in **9.3** should be observed. In addition care should be taken to ensure that the size of the attachment does not exceed the limits specified by the excavator/quick hitch manufacturer.

Not all quick hitch manufacturers approve their use with attachments such as breakers. The quick hitch manufacturer should always be consulted

It is essential that attachments are always fitted to both jaws of a quick hitch. Attachments must never be attached to the quick hitch by a single pin.

Attachments requiring the freedom to articulate such as breakers, piling hammers and grabs should be attached to a two pin adaptor, which is in turn fitted to the quickhitch. This adaptor should be fully compatible with the make and model of quick hitch being used. **Figure 7** illustrates typical adaptors.



Figure 7 – Examples of Swivel Adaptors

9.5 Removal and Re-installation of a Quick Hitch on an Excavator

WARNING

Always wear safety gloves, safety glasses and safety boots when installing, removing or during maintenance operations due to the possibility of sharp edges, residual oil pressure in the hydraulic system when disconnecting hoses and involuntary movement of heavy components. Both operators and service personnel must be fully conversant with the correct installation and operating procedures for the specific Quick hitch and Excavator.

Ensure Excavator is placed on firm and level ground away from site traffic.

The following procedure covers the removal and reinstallation of most quick hitches, **however** the manufacturer's instructions for the specific quick hitch and excavator must be obtained and followed whenever a quick hitch is being removed or re-installed.

9.5.1 Removing the Quick Hitch from the Dipper of the Machine.

Remove the bucket or attachment from the quick hitch in a safe location. **DO NOT** remove the quick hitch from the dipper of the machine whilst still connected to a bucket or attachment. This may cause damage or injury if the combination moves unexpectedly when disconnected from the dipper end of the machine.

Lower the quick hitch in a level position onto a pallet or similar structure and stop the machine using the relevant SAFETY SHUTDOWN PROCEDURE. Ensure that all hydraulic pressure has been released from the hydraulic circuit.

Disconnect the clamps securing the quick hitch hoses to the dipper of the machine.

Disconnect the quick hitch hoses from the machine circuit and immediately plug the hoses and cap the relevant pipe work on the machine. This will prevent contamination from entering both the quick hitch hydraulics and the machines hydraulic circuits and preventing internal damage. It will also minimise the risk of hydraulic oil being spilt and contaminating the surrounding area.

Remove the pivot pins from the end of the dipper and the tipping link and disconnect the quick hitch. Retain any shims that may have been fitted to the pivot to reduce lateral movement. Restart the machine and carefully move the dipper away from the quick hitch unit, ensuring that the hoses do not become trapped or damaged during the movement of the excavator end. Re-install the hose clamps to the dipper to prevent loss.

Ensure that any safety pins or locks are re-fitted to the quick hitch prior to storing the unit. Do not leave them loose with the unit to prevent loss.

If the quick hitch hoses are to be removed from the unit, immediately cap off the hose connections on the hitch ram to prevent ingress of contamination into the system and plug the hoses to prevent oil spillage. Check the hoses for damage and if they are to be disposed of, ensure all relevant disposal regulations are followed. If they are to be stored, then place them in an area that will prevent any accidental damage occurring to the hoses.

If the hoses are to remain connected to the quick hitch, wrap them and secure them to the body of the unit in such a way as to prevent accidental damage during storage of the unit (Also any pivot shims). Remove any dirt or debris from around the operating mechanism of the quick hitch before placing in storage.

9.5.2 Re-installing the Quick Hitch to the Dipper of the machine.

Position the quick hitch on the ground in front of the host machine, with the lifting eye orientated away from the machine. (See **Figure 8**)



Figure 8 - Positioning the Quick Hitch

Check that the quick hitch is complete with all the required safety pins or locks in place. The hitch must not be used if any of these items are missing.

If the hoses need to be refitted or new hoses fitted, check for any damage to the hoses and connections, remove the protective plugs and caps and connect the hoses to the quick hitch mechanism connections. If the plugs or caps are missing from the connections or hoses then do not assemble together until you are sure that no contamination has entered hydraulic components. The hoses need to be connected to

the quick hitch at this stage because in many cases the connections are not accessible once the quick hitch is fitted to the dipper of the machine.

Check for any dirt or debris in the mechanism of the quick hitch and remove if necessary.

Start the machine and carefully manoeuvre the dipper into position in the quick hitch, apply grease to the pivot pins before installing and fit into position ensuring the locking holes are correctly aligned. If required, fit pivot shims whilst installing the pivot pins to reduce lateral movement of the quick hitch at the dipper end and tipping link. Fit the locking bolts or clips.

NOTE: Use original specification hardened pivot pins to connect the quick hitch to the machine. Use the dummy pins for the bucket or attachment only. DO NOT USE THE DUMMY PINS TO MOUNT THE QUICK HITCH TO THE MACHINE.



Figure 9 – Checking Hose Clearance

Carefully raise the quick hitch from the ground by 500mm and then fully extend the bucket ram of the machine and switch off the engine. Ensure the hydraulic safety lock is in the lock position to prevent accidental movement in the hydraulic system.

Feed the hydraulic hoses around the nose of the dipper and secure the hoses to the first clamp on the dipper. Ensure that there is some play in the hoses as they pass around the dipper nose when the hitch is fully crowded (See **Figure 9**).

Route the hoses along the dipper to the connection point, remove the hydraulic plugs and caps and make the required connection. Secure the hoses to the dipper using cable ties or clamps as appropriate.

Restart the engine and slowly rotate the quick hitch around the dipper and check that the hoses do not become trapped or kinked at any point during the rotation or foul the tipping link.

Operate the circuit hydraulics and check that the operating mechanism is operating fully and correctly. Repeat this process a number of times to ensure that:

- Full system pressure is entering the circuit;
- The quick hitch ram/pins are operating to full extent;
- Any air in the circuit is purged out.

Check the connections for any hydraulic oil leaks.

Engage the quick hitch to the required bucket or attachment and fully check the operation. Ensure that all relevant locking pins/ clips are fitted and secured.

The quick hitch and bucket/attachment are now ready for use.

9.6 Use of Lifting Eyes

Many quick hitches are fitted with a lifting eye but should only be used for lifting if the excavator to which they are fitted is rated and equipped for lifting duties, as required by the Lifting Operations and Lifting Equipment Regulations 1998 (LOLER), and, together with the quick hitch, has a current report of thorough examination (See **Section 12**).

Under no circumstances should lifting be carried out with a quick hitch that is not fitted with a lifting eye.

Any lifting eye on a quick hitch should be marked with a Rated Capacity (Safe Working Load) which must not be exceeded; the Rated Capacity of the quick hitch may be less than the Rated Capacity of the excavator or vice versa. It is important that the lower of the two values is used to determine the Rated Capacity of the combination. When working out the total weight of the load to be lifted the weight of the quick hitch and any lifting accessories (shackles, slings etc.) must be taken into account.

NOTE: *The retro fitting of a quick hitch will affect the Rated Capacity information supplied with the excavator.*

Lifting with a quick hitch must always be carried out with the coupler vertical so that the load can hang free without contacting the hitch body and the lifting accessories are not subjected to loads for which they were not designed.

Further detailed guidance on the use of quick hitches and excavators for lifting is given in:-

- *Guidance on Lifting Operations in Construction When Using Excavators.*
Construction Plant-hire Association

10.0 Review and Monitoring of the Safe Use of Quick hitches

10.1 General

Review and monitoring of the safe use of quick hitches is an ongoing process and involves a number of parties.

10.2 Management systems (directly supervising organisation)

The organisation directly supervising the works involving the use of the quick hitch may be a sub-contractor, contractor or principal contractor dependent on the contractual arrangements. They must have in place suitable management processes for the planning and implementing of safe systems of work when using quick hitches. These processes must include details for;

- The selection of equipment / quick hitches
- Inspection and maintenance of quick hitches
- The development of safe systems of work and communication
- The appointment of trained competent persons as operators, supervisors and other relevant operatives.

The organisation must review these management processes to ensure their completeness, effectiveness and the implementation by staff /employees at all levels, including management (onsite or off site) and supervision.

It is suggested that the organisation's management systems are reviewed at least annually, or before, if significant incidents occur, and that implementation at site level is monitored via site visits / reviews at maximum monthly intervals. Any necessary corrective actions should be recorded and closed out.

10.3 Site management (directly supervising organisation)

The site management (based on or off site) of the organisation directly supervising the works must ensure that;

- The works are adequately planned and co-ordinated.
- The equipment and quick hitch selected is appropriate for the specific task to be undertaken.
- Equipment is inspected and maintained correctly.
- Safe systems of work are developed for the specific quick hitch to be used in the specific task, have been communicated and are implemented
- Competent persons have been appointed to undertake the specific works (plant operators and others).
- Competent persons have been appointed to supervise the works.
- An effective monitoring and review process is in place for the above.

The supervising organisation's site management must, by observation, monitor site activities and employee actions including supervisors, operators or others, to ensure the safe system of work is adhered to and continually assess the competency of all staff.

10.4 Pre-work reviews / monitoring.

Before using an excavator, quick hitch or attachment, the operator's training and experience must be checked to assess their competency. Training must include adequate familiarisation training on the specific equipment and quick hitch to be used.

Formal certification of training together with entries in the operator's log book, countersigned by their supervisor / manager may assist in this assessment. Observation of a new operator or an operator using new equipment, in a safe location away from other personnel, may also help those making the competency assessment.

Before commencing any task for the first time the operator together, with other relevant parties, must receive a safe system of work briefing from the supervisor. Immediately following this briefing, the operator and others involved should be closely monitored to ensure they understand and are working to the safe system of work.

10.5 Supervisor responsibilities

Each day the supervisor should re-brief the operator and others on the task and ensure they are put to work safely. The supervisor should take this opportunity to;

- Reinforce the key elements of the safe system of work including
 - Strict adherence to exclusion zones
 - The correct safe methods when fitting/removing attachments with the quick hitch.
 - Consult the operator and others regarding any issues/comments they have in adhering to or the effectiveness of the safe system of work, and where appropriate instigate changes.
- Check that the operator has undertaken the relevant daily checks
- Check the required maintenance has been undertaken.
- Inspection/maintenance log/check sheet has been completed and signed. The supervisor's signature on the check list/log may be used as verification that they have carried out the check.

As part of the supervisor's ongoing duties, they must throughout the day monitor that the safe system of work is being adhered to including, maintenance of exclusion zones, that no one is working below attachments at any time and quick hitches are being used as manufacturer's recommendations including the correct use of any safety pins or locking devices.

The Supervisor should regularly check that the manufacturers manual for operating the hitch is in the cab, that any relevant decals regarding hitch operation are displayed in the cab and or dipper arm and that the next service date by a fitter has not expired and that the quick hitch has a current certificate of thorough examination. The daily check list (See **Annex E**) will provide evidence of some of these points.

10.6 Monitoring by the contractor / principal contractor

When the organisation directly supervising the works is not the main contractor or where the project is notifiable under CDM the principal contractor, then the contractor / principal contractor must undertake suitable monitoring to enforce the safe use of quick hitches.

This should include, before a task or individual commences on site, the review of;

- Any safe systems of work before work commences and any subsequent changes.

- Operators and supervisors training and competency before commencement.
- Equipment thorough examination certification before the equipment is put to use.

The contractor / principal contractor should also monitor the following, which may be done during normal management site inspections / tours;

- That safe systems of work are being implemented.
- That only competent operators are using the equipment / quick hitch. Random questioning of the operators and sight of training records may assist in this.
- That daily and weekly checks and maintenance are being undertaken, and that manufacturers documentation is in the cab, by random inspection of the cab and records.
- Pre-start task briefings must also be monitored to ensure they are taking place and are adequate; this may be done by random auditing of records and ad hoc attendance at briefing talks.

Any unsatisfactory issues found should be recorded and the necessary actions and time scales for rectification agreed with the organisation directly supervising the works.

Quick Hitch Safe Use Monitoring Guide

Item to be monitored/ reviewed	Monitoring / review by				
	Senior management of organisation directly supervising the works	Site level management of organisation directly supervising the works	Supervisor	Operator	Contractor / principal contractor
Overall Management systems for the planning and implementation of the safe use of quick hitches.	Reviews and monitors overall management system at max 12 monthly intervals or after an incident or reason to believe review is required.	N/A	N/A	N/A	Assesses as part of pre order competency check.
Management systems at specific site level for the planning and implementation of, the safe use of quick hitches.	Monitors at maximum monthly intervals by auditing of documentation and site inspection	Reviews at maximum weekly intervals by site inspection / observation of activities and review of documentation taking into account potential changes to risks.	N/A	N/A	Reviews as part of pre-start on site checks.
Equipment selection.	Ditto	Ditto	May assist in selection process- Observes suitability of equipment in use and advises management if inadequate.	Operator advises supervisor if they feel equipment is not correct for task or faulty.	
Equipment checks inspection and maintenance.	Ditto	Ditto	Checks at max weekly intervals that operator is carrying out daily and weekly checks.	Undertake daily and weekly checks as safe system of work / manufacturers' recommendations and records. Advises supervisor of any faulty equipment.	Reviews relevant documentation before equipment used on site, i.e. current thorough examination. Once operations commence, undertakes random sample checks off equipment documentation / inspection/ maintenance records.

Quick Hitch Safe Use Monitoring Guide

Item to be monitored/ reviewed	Monitoring / review by				
	Senior management of organisation directly supervising the works	Site level management of organisation directly supervising the works	Supervisor	Operator	Contractor / principal contractor
Safe system of work development.	Monitors at maximum monthly intervals by auditing of documentation and site inspection	Reviews at maximum weekly intervals by site inspection / observation of activities and review of documentation taking into account potential changes to risks.	May assist in development. - Observes on site suitability of Safe System of Work as part of normal daily supervisory role. Stops work if inadequate and advises management.	May assist management in development.	Reviews before implementation and after any changes
Safe system of work implementation.	Ditto	Ditto	Observes operatives working as part of normal daily supervisory role. Stops work and takes corrective action if not fully implemented.	Adheres to safe system of work. Advises supervisor of any areas of improvement.	Reviews as ongoing process during site tours.
Initial task safety briefings	Ditto	Ditto	Undertaken by Supervisor	N/A	Carries out random sample checks of documentation and attendance at briefing.
Daily task re-briefs.	Ditto	Ditto	Undertaken by Supervisor	N/A	Carries out random sample checks by questioning operators.
Manufacturers instructions and information in cab	Ditto	Ditto	Checked weekly by supervisor	Ensures they are available in cab.	Carries out random sample checks of documentation
Operator competency	Ditto	Checks made by site management and reviewed as above.	May assist in initial checks. Monitors via normal daily observation of operator.	N/A	Carries out random sample checks of documentation and observation / questioning of operators, or after an incident
Supervisor Competency	Ditto	Reviews competency at maximum weekly intervals by site inspection / observation of activities and review of documentation	N/A	N/A	On going process via site tours- adherence on sit of teams to Safe System of Work, random checks of maintenance documentation, reviews of site incidents.

11.0 Maintenance and Inspection

11.1 General

The effective maintenance of a quick hitch is an essential part of safe operation. As with all machines the quick hitch wears and deteriorates over time and the maintenance process, including checks and inspections, both monitors, prevents and rectifies this deterioration. It is important that the personnel asked to carry out these tasks have the necessary machine-specific training, experience and competence in both periodic and breakdown maintenance.

Both the user and owner of the quick hitch and the excavator, on which it is mounted, have a responsibility to ensure that the quick hitch is maintained in a safe working condition. In practice the maintenance is normally undertaken by the excavator owner.

Quick hitches require the manufacturer's preventative maintenance instructions to be strictly complied with, if safety is to be maintained in use. Checks and inspections should be carried out taking account of the frequency of use of the quick hitch and the environmental conditions in which it regularly works. If the operator is considered to be competent, they may be authorized to carry out routine pre-use and weekly checks.

The employer of the person carrying out these checks should ensure that the machine is taken out of use for the period of time required to carry them out. Also, the employer or authorized person carrying out the checks should ensure that a safe system of work is in place to prevent personnel from being exposed to risk, for example from the inadvertent operation of the equipment.

Basic checks and inspections should be carried out in accordance with company instructions and the manufacturer's recommendations:

- Daily Pre-use Checks - these are carried out at the start of every shift (or day) and include checks for damage, build up of dirt and correct functioning of the quick hitch (See list in **Annex E**)
- Weekly Inspections - these are additional inspections to the pre-use checks. (See **Annex E**).

These checks and inspections should be recorded

If there is a defect that affects the safe operation of the quick hitch it must be reported and repaired immediately. If it does not affect the immediate safe operation of the quick hitch the defect should be reported to the supervisor so that repairs may be carried out in a timely manner.

11.2 Precautions

Extreme care must be taken when carrying out maintenance procedures on quick hitches. On hydraulic models care must be taken to ensure that maintenance personnel do not place their hands on or into the quick hitch (See **Figure 10**) before first ensuring that the hydraulic circuit is de-activated. Even with the excavator's engine switched off the hydraulic system may still be pressurised, consequently the replacement or repair of hydraulic hoses or fittings should be approached with extreme caution.

11.3 Modifications

Quick hitches should not be modified without the express written permission of the quick hitch manufacturer. Unauthorised modifications will affect the warranty and may compromise safety.

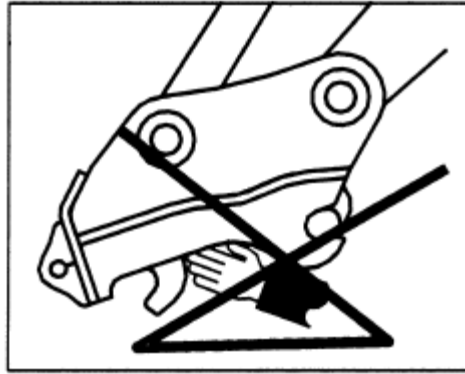


Figure 10 – Do Not Place Hands in the Quick hitch

11.4 *Scheduled Lubrication*

Operators may be required to carry out lubrication of certain items, such as the greasing of sliding parts, at specified intervals. They should only undertake such tasks if they are competent to do so and should be provided with the necessary equipment and instructions to carry this out safely.

11.5 *Scheduled Maintenance*

It is the responsibility of the site management to ensure that all excavators/quick hitches are adequately maintained in efficient working order and in a state of good repair. A scheduled preventative maintenance program helps to meet these requirements. The frequency at which the maintenance activities are carried out must take into account the machine usage and the working environment. A record of maintenance should be kept for each quick hitch.

The excavator/quick hitch owner should inform the site management at the time the hire contract is placed of the intervals at which maintenance will take place and the length of time the machine will be taken out of service on each occasion.

11.6 *Breakdowns*

Breakdowns should be avoided by adequate inspection and preparation of the quick hitch prior to delivery on site. Repairs on site should only be undertaken following a thorough job and site specific risk assessment and the implementation of a safe system of work, including inspection of the work following completion.

11.7 *Replacement Components*

Replacement components should be in accordance with the quick hitch manufacturer's specification.

11.8 *Actions in the Event of Defects and Breakdowns*

- All defects that make the quick hitch unsafe for use should be recorded and immediately reported to both the quick hitch owner and site's appropriate representative (such as service manager, site manager, or supervisor), and work with the excavator and quick hitch should cease. Steps should be taken to ensure that the excavator and quick hitch cannot be used by others in the absence of the nominated operator;
- All other defects should be recorded and reported as soon as possible;

- All breakdowns should be reported promptly to the quick hitch owner and steps should be taken to ensure that the excavator and quick hitch cannot be used by others in the absence of the nominated operator;
- Following a breakdown or identification of a significant defect, steps should be taken to ensure that the excavator and quick hitch cannot be used until repairs have been carried out or the defect has been assessed by a competent person;
- Repairs or adjustments should only be carried out by authorised persons;
- The record of all defects and breakdowns should be signed by the person rectifying the defects and breakdowns on completion.

11.9 Non Destructive Testing

Checks and inspections of quick hitches may reveal indications of cracking or other defects which require further investigation to determine the extent and nature of these defects. This is normally carried out using NDT techniques such as dye penetrant examination, magnetic particle examination or ultrasonic examination. The technique chosen will depend on the design of the structure and location of the defect. NDT techniques should be carried out by appropriately qualified personnel.

NOTE: Further information on NDT is available from the British Institute of Non-destructive Testing at <http://www.bindt.org>.

12.0 Thorough Examination

The Lifting Operations and Lifting Equipment Regulations 1998 (LOLER) require that all lifting equipment is thoroughly examined by a competent person at specified intervals. In the case of an excavator fitted with a quick hitch having a lifting eye, it should be thoroughly examined as follows:-

- When the quick hitch is first installed on the machine (LOLER Reg. 9(2)(a))
- When the quick hitch is reinstalled on the machine (LOLER Reg. 9(2)(b))
- At regular intervals of:-
 - a period not exceeding 12 months if the quick hitch is permanently attached to the excavator (LOLER Reg. 9(3)(a)(i));
 - a period not exceeding 6 months if the quick hitch is easily removable from the excavator (LOLER Reg. 9(3)(a)(ii));

NOTE: *It is best practice for all quick hitches to be thoroughly examined at intervals not exceeding 6 months.*

- After any major alteration or damage (event) (LOLER Reg. 9(3)(a)(iv)).

All quick hitches subject to thorough examination must be marked with a unique identification number. If a quick hitch does not have such a number, the owner/user must ensure that one is applied.

Reports of thorough examination should contain the details required by Schedule 1 of LOLER (See **Annex F**).

Thorough examinations should be carried out by competent persons who are sufficiently independent and impartial.

12.1 *Thorough Examination of Lifting Accessories*

LOLER requires that lifting accessories are thoroughly examined at intervals not exceeding six months.

12.2 *Further guidance*

Further detailed guidance on the thorough examination of quick hitches is given in:-

- BS 7121 *Code of practice for safe use of cranes – Part 2: Inspection, testing and examination.*
- *Guidance on Lifting Operations in Construction When Using Excavators.* Construction Plant-hire Association.
- L113 *Safe Use of Lifting Equipment - Lifting Operations and Lifting Equipment Regulations 1998 Code of Practice* - ISBN 0 7176 1628 2.
- HSE Contract Research Report 429 – *Thorough examination of particular items of lifting equipment – Annex 14* – HSE Books.

Annex A – Incident Reporting

If you are an employer, self-employed or in control of premises, you have a duty to report some accidents and incidents at work under RIDDOR (the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995).

You must report:

- deaths;
- major injuries;
- over-3-day injuries – where an employee or self-employed person is away from work or unable to perform their normal work duties for more than 3 consecutive days;
- injuries to members of the public or people not at work, where they are taken from the scene of an accident to hospital;
- some work-related diseases;
- some dangerous occurrences – a near miss, where something happens that does not result in an injury, but could have done.

It is advisable to ring and report the incident as soon as possible, by calling the HSE Contact Centre (ICC) on 0845 300 9923 (*Monday to Friday 8.30 am – 5.00 pm*)

Alternatively, online or e-mail forms can also be completed 24 hours a day on www.hse.gov.uk/riddor/index.htm .

Deaths, major injuries and dangerous occurrences must be notified without delay, however only the following need to be notified out of normal working hours:

- fatal accidents at work;
- accidents where several workers have been seriously injured;
- accidents resulting in serious injury to a member of the public;
- accidents and incidents causing major disruption, such as evacuation of people, closure of roads, large numbers of people going to hospital etc.

Over-3-day injuries must be reported within ten days.

Further detailed guidance on the reporting of injuries is given in:

- *A guide to the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995*, HSE Books.

NOTE: This may be down loaded free of charge from <http://www.hse.gov.uk/pubns/books/I73.htm>

Annex B – Example Risk Assessment

Risk Assessment Working with Quick Hitches				
Location:	Date:	Ref no:		
HAZARDS IDENTIFIED <ul style="list-style-type: none"> • Work Equipment • Lifting devices • Ergonomics • Entanglement • Crushing. • Access/egress • Slip, trip and fall • Hand rails and guard rails • Warning signs • Plant movement • Warning devices on equipment • Noise • Vibration • Fumes • Access/egress • Environmental • Temperature • Dust <p style="text-align: center;">NOTE: This list is not exhaustive</p>				
People Affected		YES	NO	N/A
Involved in activity				
Close to activity				
Everyone on site				
Members of the public				
Expected Precautions		YES	NO	N/A
Has the operator been adequately trained on the use of Quick Hitches in general?				
Is the operator competent to use the specific hitch on the machine they use?				
Is the manufacturer's specified retaining pin available on the machine? NOTE: Operators should only use pins which have been designed for this specific use				
Is there a system for checking that the pin is in place on the hitch prior to work start every time a different attachment is fitted?				
Is the operator aware they must not operate the machine unless they are satisfied that the quick hitch is secured in place?				
Can the operator see from the cab in poor weather that the quick hitch is secured in place?				
Are the pins or clips retained or attached to the quick hitch?				
Is the area around the safety pin insertion holes painted to make it clear where they should be inserted?				
Does the quick hitch have a current Thorough Examination Certificate?				
Expected Precautions continued		YES	NO	N/A

Is there a risk assessment for the bucket detachment?			
Is there a checklist of daily, weekly inspection and maintenance?			
Is there a written procedural system for checking manual safety pins are in place?			
Is there a manual and/or instruction card available in the cab for the type of quick hitch system?			
Is all information available in a language appropriate for the language skills of the person requiring that information?			

Risk Rating	HIGH	MED	LOW	Action By
HIGH <input type="checkbox"/>				
MED <input type="checkbox"/>				
LOW <input type="checkbox"/>				
PPE TASK RELATED				
Hard Hat <input type="checkbox"/>	Hi Vis Vest <input type="checkbox"/>	Safety Boots <input type="checkbox"/>	Gloves <input type="checkbox"/>	
Ear Protection <input type="checkbox"/>	Safety Glasses <input type="checkbox"/>	Other <input type="checkbox"/>		

SITE SPECIFIC HAZARDS	ADDITIONAL CONTROLS
	Pre Start briefing
Assessed By	Reported To
Name:	Name:
Date:	Position: Date:

Annex C – Example of Typical Requirements Included in a Method Statement

Applicability	Item	Requirement
All Types of Quick Hitch	1.	All personnel will maintain safe distance from excavator when working.
	2.	Site supervisors will ensure that all personnel maintain safe working distances.
	3.	The equipment owner will provide daily & weekly checklists with the equipment.
	4.	The equipment owner will supply instructions for the safe operation of the hitch with the equipment.
	5.	The site management (user) will ensure that the operator has been provided with the information detailed in Items 3 and 4, together with a clear briefing on the task to be carried out and the method to be used.
	6.	The operator's employer and the site management (user) will ensure that the operator is trained, competent and authorised to use the specific quick hitch.
	7.	The operator will check the quick hitch daily at the start and end of each shift and record that the check has been carried out.
	8.	The operator will inspect the quick hitch weekly & record all findings.
	9.	Daily check and weekly inspection records will be kept with the instructions in the excavator cab.
	10.	The site management (user) will arrange for maintenance of the quick hitch to be carried out at recommended intervals
	11.	The site management (user) will arrange for thorough examination of the quick hitch to be carried out:- <ul style="list-style-type: none"> • At initial installation; • At reinstallation; • At 6 month intervals; • After any major alteration or damage (event).
	12.	The operator must get out of the cab to physically ensure that the quick hitch is securely locked before starting work with a newly attached attachment.
	13.	The operator will check proper engagement of the quick hitch using the shake test and following the manufacturer's instructions.
	14.	Site supervisors will check that operator is complying with all instructions.
Semi-automatic Quick Hitches	15.	The equipment owner will supply the safety pin c/w securing device, for the quick hitch.
	16.	The site management (user) will ensure, through supervision, that the safety pin is available for use at all times.
	17.	The operator will manually insert the safety pin at all times, in accordance with instructions.
	18.	Site supervisors will check that operator is complying with requirement to insert the safety pin at all times.

Annex D – Grey Imports

Standards for 'Grey Import' Quick hitches

This annex is based on guidance and advice given by the HSE to their inspectors on the controversial issue of “grey import” machines coming from outside the EU. This advice is reproduced, (apart from a few changes to clarify the meaning,) to help readers understand the standards that the inspectors look for when inspecting any quick hitches imported from outside the EEA (European Economic Area – EU States plus Norway, Iceland and Liechtenstein), in particular those that do not meet EU requirements.

Introduction

There is concern in the UK about the safety of machines manufactured and imported from outside the EU that were not originally designed and constructed to meet European standards.

These machines, some of which are quick hitches, should meet the same essential health and safety requirements (EHSRs) as any other machine under the Supply of Machinery (Safety) Regulations 2008 (SM(S)R).

Under SM(S)R all new quick hitches are presumed to comply with the EHSRs if they have been made to the European Standard BS EN 474-1 or equivalent standards, and are safe to use. The design, hazard analysis and material specification for the machine has to be kept in a technical file that is normally held by the manufacturer, and is required by whoever carries out the conformity examination.

In order to meet the standards of safety under SM(S)R, the Provision and Use of Work Equipment Regulations 1998, the Lifting Operations and Lifting Equipment Regulations 1998 and the Noise at Work Regulations 1989, machines must comply with the following requirements:

- (1) All quick hitches should be supplied with installation, operator and routine maintenance instructions in English. Operating instructions are needed for routine maintenance and all written directions in the cab must also be in English.
- (2) Controls must be appropriately marked to indicate their function and mode of operation, and must be positioned, and protected so that the desired effect, where a risk is involved, cannot occur without intentional operation.
- (3) Any quick hitch that has a lifting eye with a rated capacity in excess of one tonne must only be used for lifting with an excavator that:
 - (a) has a rated capacity indicator fitted to it, providing visual warning to the driver before the safe working load (SWL) is reached, with both visual and audible warning to the driver and anyone else in the vicinity of the machine, when the SWL is reached;
 - (b) is fitted with hose burst protection valves on at least the boom raise cylinder(s);
 - (b) has provision for switching off the indicator when the machine is operating in the excavator mode;
 - (c) be clearly marked with their SWL (eg 2 tonne). This marking should be clearly visible to the operator and be positioned either on the boom or in the operator’s cab.

There are additional requirements in BS EN 474-1 that may well not be met by quick hitches imported from countries outside the EEA.

CE Marking Issues

With the recent introduction of the new Machinery Directive 2006/42/EC and the implementing UK regulations, the Supply of Machinery (Safety) Regulations 2008, the position of quick hitches is currently unclear. Once the situation has been clarified, this guidance will be revised to include guidance on this issue.

Annex E – Example of a Daily (pre-use) and Weekly Check List

Quick hitch Pre-use Check Sheet							
OPERATOR'S NAME:	EXCAVATOR:						
QUICK HITCH MAKE AND MODEL:	DATE:						
Items to be checked by Operator before and during Operation – MARK ✓ or X							
	Mon	Tue	Wed	Thur	Fri	Sat	Sun
In Cab							
Quick hitch Operating Controls							
Operating Instructions (labels)							
Operator's Manual							
Hydraulic System							
Wear or Damage to Hoses or Fittings							
Security of Hoses							
Hydraulic Oil Leaks							
Quick hitch							
Damage to Quick hitch							
Correct Functioning of Safety Device (include springs, clips and cylinder)							
Build up of Dirt and Debris from around Safety Device							
Build up of Dirt and Debris from Hooks							
Wear on Quick hitch Hooks							
Wear on Mechanism							
Wear and Damage to Bucket/Attachment Pins and Retainers							
Security of Mounting Pins, Locking Bolts and Nuts							
Is the quick hitch safe to use? Y/N							
Lubrication							
Greasing in accordance with manufacturer's instructions							
Remarks:							

Operator's Signature **Manager's Signature**

Annex F – Information to be contained in a report of a thorough examination

The following is an extract from the Lifting Operations and Lifting Equipment Regulations. Schedule 1 of Regulation 10 is quoted here in full. It details information to be contained in a report of a thorough examination.

- 1) The name and address of the employer for whom the thorough examination was made.
- 2) The address of the premises at which the thorough examination was made.
- 3) Particulars sufficient to identify the equipment including where known its date of manufacture.
- 4) The date of the last thorough examination.
- 5) The safe working load of the lifting equipment or (where its safe working load depends on the configuration of the lifting equipment) its safe working load for the last configuration in which it was thoroughly examined.
- 6) In relation to the first thorough examination of lifting equipment after installation or after assembly at a new site or in a new location:
 - a) that it is such thorough examination;
 - b) (if such be the case) that it has been installed correctly and is safe to operate.
- 7) In relation to a thorough examination of lifting equipment other than a thorough examination to which paragraph 6 relates -
 - a) whether it is a thorough examination:
 - i) within an interval of 6 months;
 - ii) within an interval of 12 months;
 - iii) in accordance with an examination scheme;
 - iv) after the occurrence of exceptional circumstances;
 - b) (if such be the case) that the lifting equipment is safe to operate.
- 8) In relation to every thorough examination of lifting equipment:
 - a) identification of any part found to have a defect which is or could become a danger to persons, and a description of the defect;
 - b) particulars of any repair, renewal or alteration required to remedy a defect found to be a danger to persons;
 - c) in the case of a defect which is not yet but could become a danger to persons –
 - i) the time by which it could become such a danger;
 - ii) particulars of any repair, renewal or alteration required to remedy it;
 - iii) the latest date by which the next thorough examination must be carried out;
- 9) Where the thorough examination included testing, particulars of any test;
 - a) The date of the thorough examination.
 - b) The name, address and qualifications of the person making the report; that he is self-employed or, if employed, the name and address of his employer.
- 10) The name and address of a person signing or authenticating the report on behalf of its author.

The date of the report.

Annex G – Further Information and Guidance

Legislation

Health and Safety at Work etc. Act 1974. London: The Stationery Office.
Provision and Use of Work Equipment Regulations 1998 (PUWER).
L22 *Safe use of work equipment*, HSE Books.
The Lifting Operations and Lifting Equipment Regulations 1998 (LOLER).
L113 *Safe use of lifting equipment*, HSE Books.
The Management of Health and Safety at Work Regulations 1999 as amended (MHSWR).
Work at Height Regulations 2005 (WAHR).
The Supply of Machinery (Safety) Regulations 2008 (SM(S)R).
The Construction (Design and Management) Regulations 2007 (CDM).
Personal Protective Equipment at Work Regulations 1992 (PPE).
The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 (RIDDOR);

Standards

BS 6166-3:1998, *Lifting slings — Part 3: Guide to the selection and safe use of lifting slings for multi-purposes*
BS 6210:1983, *Code of practice for the safe use of wire rope slings for general lifting purposes*
BS 6968:1988, *Guide for use and maintenance of non-calibrated round steel lifting chain and chain slings*
BS 7121-1:2006, *Code of practice for safe use of cranes — Part 1: General*
BS 7121-2:2003, *Code of practice for safe use of cranes — Part 2: Inspection, testing and examination*
BS 7262:1990, *Specification for automatic safe load indicators*
BS EN 474-1:2006+A1:2009, *Earth-moving machinery. Safety. General requirements*
BS EN 474-4:2006+A1:2009, *Earth-moving machinery. Safety. Requirements for backhoe loaders*

Other Publications

HSE Leaflet INDG218 – Guide to Risk Assessment;
HSE Leaflet INDG163 – Five Steps to Risk Assessment.
HSE publication L73 - *A guide to the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995*, HSE Books.
HSE Contract Research Report 429 – *Thorough examination of particular items of lifting equipment – Annex 14* – HSE Books
Guidance on Lifting Operations in Construction When Using Excavators, Construction Plant-hire Association
Guidance on the Safe Use of Excavator Quick-hitch Devices, OPERC
Code of practice for the safe use of lifting equipment. Lifting Equipment Engineers' Association.

Useful Websites

Construction Plant-hire Association	www.cpa.uk.net
ConstructionSkills	www.constructionskills.net
Health and Safety Executive	www.hse.gov.uk
Lifting Equipment Engineers Association	www.leea.co.uk
Off-highway Plant and Equipment Research Centre	www.operc.com
Safety Assessment Federation	www.safed.co.uk
Strategic Forum for Construction	www.strategicforum.org.uk
UK Contractors Group	www.ukcg.org.uk

Annex H - Working Group Membership

Strategic Forum for Construction Plant Group –

Safe Use of Quick hitches – Best Practice Guide Working Group

Member	Employer	Representing
K Minton - <i>Chairman</i>	CPA	SFfC Plant Safety Group
L Barnes	Engcon UK Ltd	Engcon UK Ltd
J Bohm	HSE	HSE
C Bushell	National Construction College	CSkills
A Crago	Hydrex	Rail Plant Association
M Dix	National Construction College	CSkills
A Dodman	Barhale Construction	CECA
J Hallows	ConstructionSkills	CSkills
M Norton BEM	Norton Training and Testing	Norton Training and Testing
M O'Connor	HSE	HSE
G O'Neill	Jim Ennis Construction Ltd	North West Safety Initiative
R Taylor	Rob Taylor Plant Hire	CPA
S Vickers	Hewlett Civil Engineering	Hewlett Civil Engineering
I Wallace	Bovis Lend Lease	UKCG
I Watson	Bovis Lend Lease	UKCG
R Wells	Balfour Beatty	Rail Plant Association
P Wilson	UCATT	UCATT
P Wright	CLM Delivery Partners	Olympic Delivery Authority
T P Watson - <i>Editor</i>	CPA	SFfC Plant Safety Group

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