



SAFE USE OF QUICK HITCH DEVICES



National Construction College

The training division of  constructionskills

Objectives

- Identify the risks associated with quick hitch devices
- Describe the operators legal duties with respect to the use of quick hitches
- Describe and apply safe working practices for the use of quick hitches
- Practically connect and disconnect attachments safely
- Know when and how to conduct visual inspections of the quick hitch equipment
- Maintenance of quick hitch equipment
- Apply the appropriate methods for testing connections
- Realize the importance of following manufacturer specification for use



Trained Person

- Practical and theoretical knowledge
- Experience
- Training



The Risks

- The bucket becomes disconnected from the quick-hitch resulting in personal injury or death
- Being struck by disconnected quick-hitch attachments has been found to be the most common cause of excavator accidents and fatalities
- Many disconnections (near misses) will no doubt go unreported.



The Risks

- Cuts, abrasions and other injury to hands, for example when conducting maintenance/inspection or changing attachments, particularly when attempting to insert a pin using a hammer
- Injury to eyes, in the same instances
- Injury to feet, limbs and so forth, through attachments falling on personnel in the work area when being connected or disconnected.



The Risks

- This accident resulted in the death of a ground worker
- What do you think caused this?
- **The safety pin had not been replaced**



The Reasons Why Accidents Happen

- An operator, due to carelessness or being in a hurry, failing to engage the quick-hitch properly;
- An operator failing to actuate any secondary locking device;
- Primary or secondary locking mechanisms failing due to wear or poor maintenance;
- The quick-hitch and / or the attachment being overloaded;
- The quick-hitch and / or the attachment being used to point of failure in an application they are not designed for;
- Or any combination of these.



Root Causes of Quick-hitch Accidents

- Inadequate, or lack of, operator training on the subject;
- Inadequate supervision by supervisors and site management;
- Poorly trained banksmen or ground workers;
- A tendency for workers to encroach into an excavator's operational envelope whilst it is working.



The Health and Safety at Work Act 1974

- Under section 2 of the Act:
“It shall be the duty of every employer to ensure, so far as is reasonably practicable, the health, safety and welfare at work of all his employees.”
- Section 7(a) of the Act states that:
“It shall be the duty of every employee while at work to take reasonable care for the health and safety of himself and of [any] other persons who may be affected by his acts or omissions...”



The Provision and Use of Work Equipment Regulations 1998

- Regulation 5 requires that work equipment is maintained so that it works efficiently and safely.
- Regulation 6 requires work equipment to be inspected at suitable intervals to ensure its safety and so that any defects found can be reported
- Regulations 8 and 9 place duties on employers to ensure that anyone who uses, supervises or manages work equipment has access to adequate information, instruction and training relating to the use of that equipment.



The Lifting Operations and Lifting Equipment Regulations 1998

- Regulation 6 requires that lifting equipment must be positioned or installed to minimise risks from either the equipment or load striking a person, or from the load falling or being released unintentionally.
- Regulation 7 states that machinery and accessories for lifting loads must be clearly marked to show their safe working loads.
- Regulation 9 requires lifting equipment to be thoroughly examined (at specified periods)



British Standard BS EN 474-1

- It is the responsibility of the manufacturer of an attachment, to provide instructions concerning its mounting (connection) and use.
- Quick-hitches must have a locking system that:
 - Prevent the attachment becoming detached
 - Shall preferably have a separate control to prevent against inadvertent activation
 - Must include a continuous acoustic signal for the duration of activating the unlocking function.
- Attachments must be permanently marked with specified information, which includes its weight (Kg)



Legal Consequences

Failure to adhere to previous legislative requirements could result in prosecution which will lead to a heavy fine or a jail sentence



Types of Quick Hitch

Type of Quick Hitch System	Typical Method of Engagement	Typical Locking / Security System
Manual	Manually retained e.g. by sprung latch operating with a lever	Manually inserted safety pin
Semi - automatic	Hydraulically operated retaining latch mechanism	Manually inserted safety pin
Fully - automatic	Hydraulically operated retaining latch mechanism	Hydraulically operated safety mechanism (may incorporate hydraulic and / or sprung safety system)



Examples of Manual Quick Hitch



Example of a Semi-automatic Quick Hitch



Examples of a Fully-automatic Quick Hitch



Disconnecting and Connecting Attachments



Disconnecting and Connecting Attachments

- Never swing the bucket over the workers and never let the workers under the bucket
- Never operate an unsafe coupler. Report it immediately to your supervisor
- Never operate the coupler without the supplemental safety device in place
- Never Use retaining pins which have not been designed for this specific use



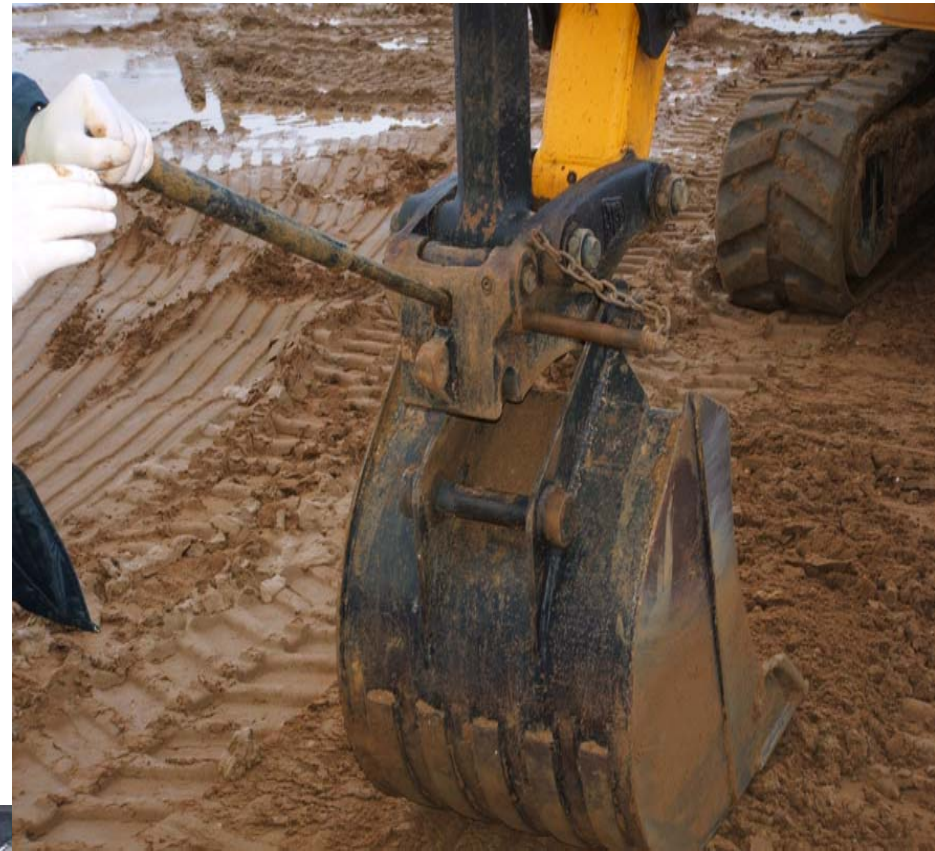
Disconnecting and Connecting Attachments

- Always establish a safe zone free from other workers when undertaking any detachment or attachment activities
- Ensure the retaining pin has been replaced correctly and inspected before starting work again



The Manual System

- Position the bucket such that the lynch pin and safety pin are accessible (on this model positioned at the rear of the quick-hitch)



The Manual System

- Remove the lynch pin and store it safely



The Manual System

- Remove the safety pin and store it safely



The Manual System

- Insert the tommy-bar



The Manual System

- Use the tommy-bar as a lever to free the rear pivot pin retaining mechanism
- Rear pivot pin is released from quick-hitch jaw



The Manual System

- Lower the bucket to the floor



The Manual System

- Raise the dipper arm to release the front pivot pin from the front quick-hitch jaw (the bucket has rolled back)
- in this instance due to its rounded exterior shape – keep feet a safe distance away!)



The Manual System

- To reconnect the bucket follow the procedure in reverse
- Remember do not forget to replace the safety pin
- Then carry out a shake test keeping the bucket low to the ground before using



The Manual System



Semi Automatic Quick Hitch

- Remove the lynch pin
- Store in a safe place



Semi Automatic Quick Hitch

- Remove the safety pin
- Place in a safe place



Semi Automatic Quick Hitch

- Fully close the bucket to increase the pressure in the quick hitch ram



Semi Automatic Quick Hitch

- Place the bucket on the floor
- Then open the bucket to release the hitch from the first pin



Semi Automatic Quick Hitch

- Move the dipper away from the second pin
- Then raise the boom to clear the bucket



Semi Automatic Quick Hitch

- To reattach a bucket follow the above procedure in reverse
- Complete a shake test keeping the bucket low to the ground before starting work again
- **Replace the safety pin immediately in the correct position**



Semi Automatic Quick Hitch



Fully-automatic Quick Hitch System

- Ensure all grease points within the device are greased in accordance with the manufacturer's instructions
- Put the bucket in the correct position in accordance with the manufacturer's instructions
- Then activate the quick hitch release system



Fully-automatic Quick Hitch System

- Place the bucket on the ground
- Open the bucket to release the quick hitch from the first pin



Fully-automatic Quick Hitch System

- Now move the dipper away to release the second pin
- And then raise the boom to clear the bucket



Fully-automatic Quick Hitch System

- To reconnect an attachment complete the procedure in reverse
- Check that the safety locking device has returned to its correct position
- **Do not forget to carry out a shake test keeping the bucket low to the ground before starting work**



Fully-Automatic Quick Hitch System



Manufactures Connection Procedures

- The manufactures connection procedures must be followed at all times
- All operators must be trained in the correct connection methods relating to specific quick hitch makes and models



Summary

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Any Questions

