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# OPERATION MANUAL

DOUBLE LOCK QUICK COUPLER  
DOUBLE LOCK TILT COUPLER  
ACTUATOR TILT COUPLER

## INTRODUCTION

Thank you for choosing Robur Attachment Ltd.'s attachments. This manual should be read thoroughly and understood by the operators and installers to ensure safe operation of the Double Locking Quick Hitch and Tilt. It is provided for use and warranty, and to provide satisfactory and safe performance.

To ensure correct use of the product, please ensure this manual is read and understood carefully.

- All operators must be trained to use the Double Locking Quick Hitch and Tilt Hitch in a safe manner.
- The Double Locking Quick Hitch and Tilt Hitch is designed for safe and reliable performance when installed, operated, and maintained correctly.
- This manual is intended solely for the use of the Double Locking Quick Hitch and Tilt Hitch.
- Failure to follow the given instructions and operate the equipment correctly can result in serious injury or death. It can also result in premature wear of the hitch and all warranties will be voided.

This Document is applicable to the following models:

WEIGHT CLASS		PRODUCT CODE	
Tonnage	Quick Hitch	Tilt Hitch	Actuator Tilt
3-3.9T	RDLC3	-	RPTC3
4-4.9T	RDLC4	RDLTC4	RPTC5
5-5.9T	RDLC5	RDLTC5	RPTC5
6-7.9T	RDLC7	RDLTC7	RPTC7
8-9.9T	RDLC8	RDLTC7	RPTC7
10-14.9T	RDLC12	RDLTC12	RPTC12
15.1-17.9T	RDLC16	RDLTC16	RPTC16
18.1-23.9T	RDLC20	RDLTC20	RPTC20
24-29.9T	RDLC25	RDLTC25	RPTC25
30-39.9T	RDLC30	RDLTC25	
40-50T	RDLC40	RDLTC45	



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## DOUBLE LOCKING QUICK HITCH OVERVIEW



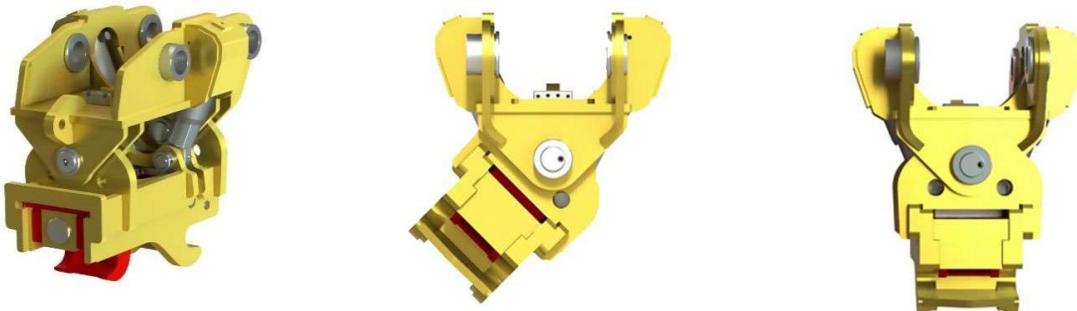
The Double Locking Quick Hitch allows quick and easy changeover of attachments without leaving the comfort of the excavator cabin. The hitch utilises a sliding plate which allows the locking and releasing action of both hooks simultaneously, and simplifies any existing designs by reducing it to one moving part – avoiding many problems. The sliding plate is designed, manufactured, and patented by Bruce Short 28 years ago<sup>1</sup>. Most attachments in the world are copied from this basic design. The hitch design also has a multi pick-up feature which can pick up different attachments with a range of pin centres.

The top half of the hitch mounts onto the excavator, whilst the lower half hooks and wedges onto the pins of the attachment with the second hook acting as a safety lock. The wedging action dramatically reduces wear, and the hydraulic locking system also includes a spring, which acts as an additional safety feature in an event of power or hydraulic leak/failure.

Patent: International Application No.: **PCT/NZ2017/050122**

International Publication Number: **WO 2018/056841 A1**

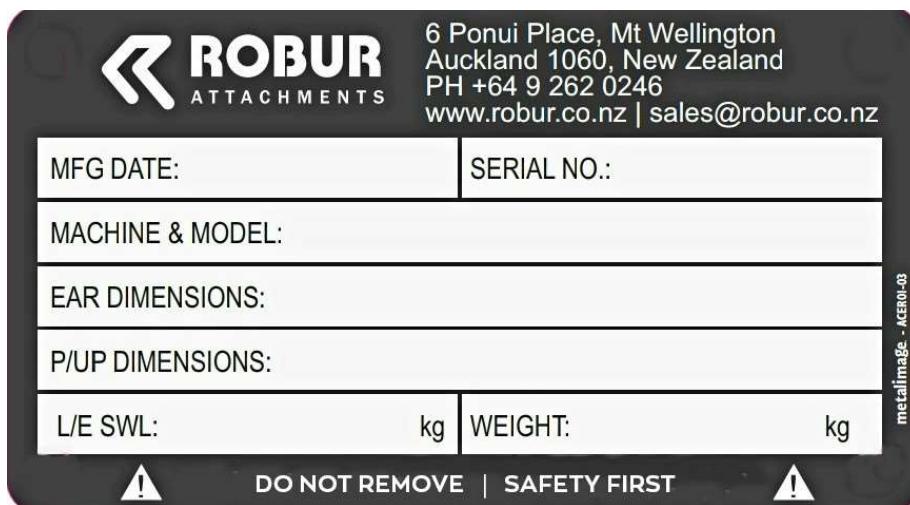
## DOUBLE LOCKING TILT HITCH OVERVIEW



The Double Locking Tilt Hitch is a simple and easy design to operate as it is designed to pivot 45° each way from horizontal. It can complete difficult, earthmoving tasks with ease, and can pick up any attachment at any position. The Tilt Hitch utilises a slide hook which is tapered and wedges the pin in place. This significantly reduces wear and firmly locks the attachment pins in position. This design also includes a spring for a secondary safety mechanism and utilises induction hardened chrome spears for increased strength and reduced wear.

## IDENTIFICATION

An identification plate is fitted onto each hitch.



This identification plate contains the following information:

- Manufacture date
- Serial number
- Machine and model
- Ear dimensions
- Pick up dimensions
- Lifting eye safe working load capacity
- Weight of the hitch

Ensure the hitch supplied is the correct model and meets the specifications of your machine.  
Do not attach the hitch to any other machine than its intended machine.

Inspect the hitch before installation.

## STANDARDS

The Double Locking Quick Hitch complies with AS4772:2008 – Earth-moving Machinery – Quick hitches for excavators and backhoe loaders

It has been built and designed to the following standards:

ISO 6015:2012 International Standard for Earthmoving machinery

AS4991:2004 – Lifting Devices

AS1418.1-2002 – Cranes, hoists, and winches

AS3990:1993 – Mechanical Equipment-Steelwork

AS/NZS1554.1:2011 – Structural Steel Welding

## RISK ASSESSMENT AND SAFETY

To ensure the safety for all, it is of absolute importance that this manual is read carefully and understood before installation and operation. The weight of the attachment must be considered when calculating the machine's lifting capacity. For all operations it is necessary to carry out a site-specific risk assessment.

Excavator operators shall familiarise themselves with the operation of the hitch and the associated attachments. This shall include practicing engaging and disengaging the attachment. The view of the operator from the CAB shall be clear to see that the hitch is secured in place. Always follow safe lifting procedures to ensure the safety of the users.

The attachment pins shall be bolted and torqued and shall be checked prior to work.

**Recommended Assembly Torques for Class 8.8 ISO Metric Course Pitch Bolts**

Diameter	Pitch (mm)	Recommended Assembly Torque (Nm)
M10	1.50	44
M12	1.75	77
M16	2.00	190
M20	2.50	372
M24	3.00	640

If the main pin loses its locking bolt and breaks, the mounting brackets will bend. The hitch must be sent to the manufacturer or to be repaired only by a qualified engineer and then re-certified.

Keep the pressure on the cylinders at min 3,000psi. Use double braided hose rated 5,000psi with a safety factor of 3. Only use hydraulic oil that is compatible with the machine hydraulic system.

Wiring shall be done by a certified electrician only. It is important that the correct voltage is selected for the control actuator.

The on and off switch shall be placed away from the operator's comfort zone, but located so that its operation may occur without loss of vision to the quick hitch. The switch shall be labelled to avoid accidental disengagement of the hitch. The switch shall make a buzzer activate when in off position. Alarm must also sound whenever the host machine is in the mode that allows for the controls to be operated to engage or disengage attachments (whenever the switch cover is raised). Without this, the machine shall not be used.

The hydraulic control valve shall be on and off only without neutral position. Otherwise the cylinder will not receive full pressure.

Accuracy is needed when lining up the hitch to the attachments. If the hitch is placed to one side about 50mm out of alignment, the bucket ears could rupture the hydraulic ram.

Only use attachments that are manufactured to the hitch pick-up measurements (refer to identification plate on quick hitch). Attachments that are fitted out of the standard measurements could cause a major failure with severe consequences or death.

Hitch without attachment shall not be forced into rocks as damage could occur. Hydraulic lines could be damaged by sticks or reinforcing bars. Loose stones trapped on the top of the hitch shall be removed. Check that the return safety spring is not damaged. Any suspected damaged hoses & parts shall be replaced.

Do not paint the cylinder spear & hydraulic hoses. The paint could damage the seals and will cause leakage.

Hoses shall be fitted in a safe layout to avoid damage. See page 5.

Machine Model: \_\_\_\_\_

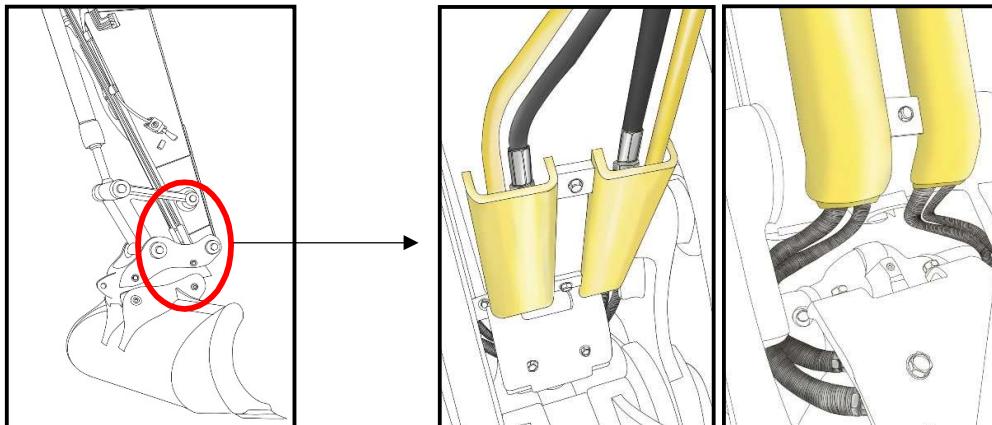
Double Locking Quick Hitch Serial No: \_\_\_\_\_

Date Prepared: \_\_\_\_\_

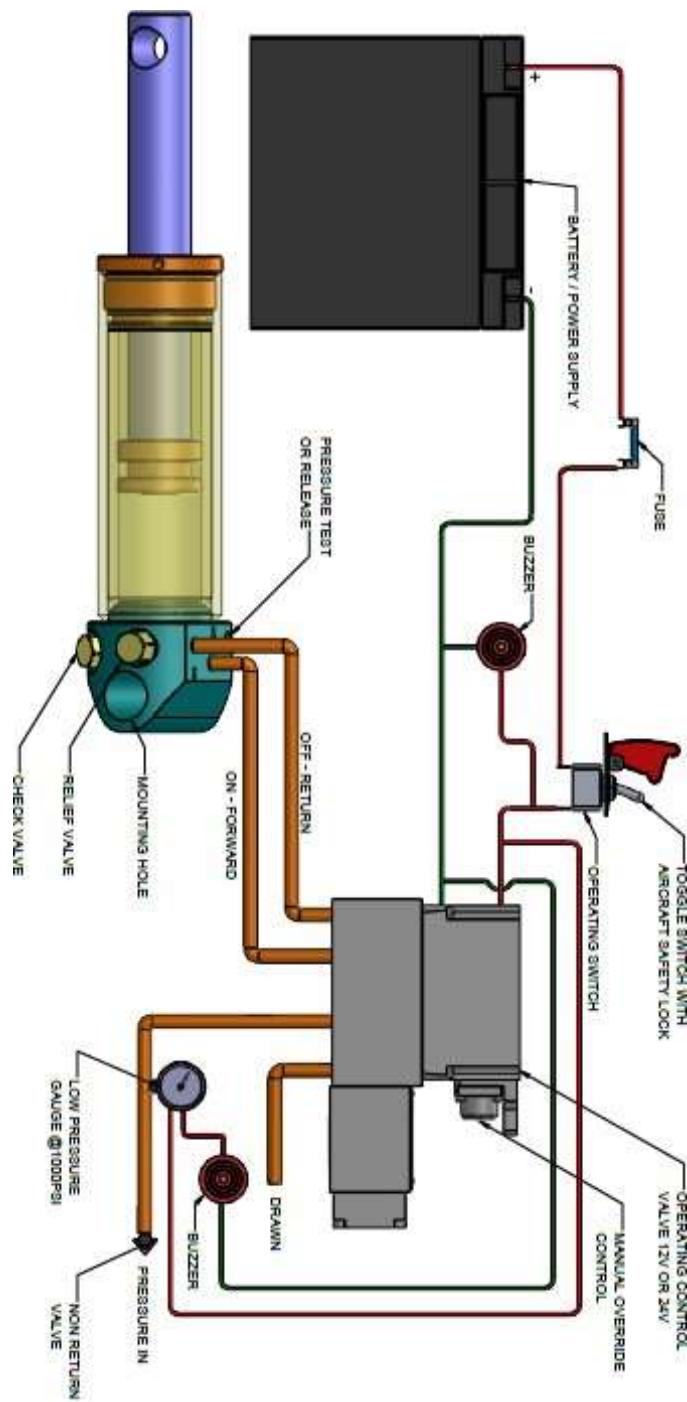
## HITCH HYDRAULIC GUIDELINES

- Ensure hydraulic pressure of the system is between 3000psi (20MPa) and 3500psi (24MPa).
- Hoses and fittings used shall be rated at least 5000psi (35MPa).
- Hydraulic pressure for the tilt hitch follows the following:
  - The hitch rams run at 3000psi (20MPa).
  - The tilt rams run at between 3500psi (24MPa) and 4500psi (30MPa).
  - Pipelines to the tilt shall be  $\frac{1}{4}$  inch (or 6mm).
  - This may need a 1.5mm restrictor if the flow is too fast.
- Check hydraulic oil is clean. Hydraulic hoses shall be flushed.
- Hydraulic hoses shall only be long enough to operate effectively at both ends of crowd travel, while ensuring that under any operation position, have a radius greater than 100mm.
- Check the hydraulic system for leaks – Never use your bare hands as hydraulic fluid under pressure can penetrate the skin!
- Check all fittings and fasteners are tight and secure.
- Move the hitch through its entire range of motion – checking for any chafing and mechanical interferences.
- Place hitch control switch in a suitable position in the cab where it cannot be accidentally actuated. Use toggle switch with aircraft safety cover. Additionally, an alarm shall sound whenever the toggle switch is raised.
- The hitch hydraulic circuit shall follow the existing hydraulic lines on the machine. Contact Robur Attachments where this is not possible.
- Hosing brackets or junction blocks shall be welded to the excavator boom carefully.
  - They shall be positioned carefully according to the machines linkage geometry.
  - Care shall be taken to ensure they do not foul on any linkages or the hitch at both extremes of crowd travel.
  - Anything welded shall be in the direction of the grain, not across the grain to avoid cracking with minimum weld. All welding to the excavator boom & dipper arm shall be to manufacturer's specifications.

A good example of locating dipper arm hoses to the quick hitch on the tip of the excavator arm is shown below:

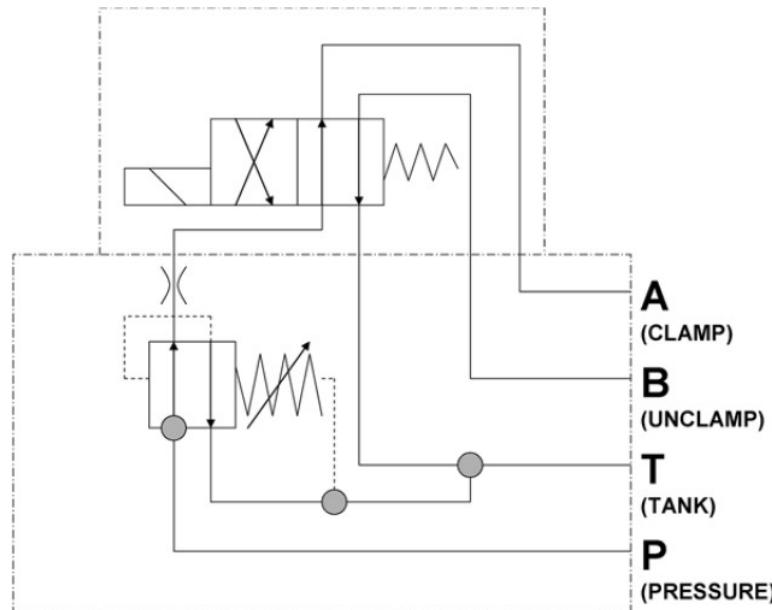


## HYDRAULIC DIAGRAM

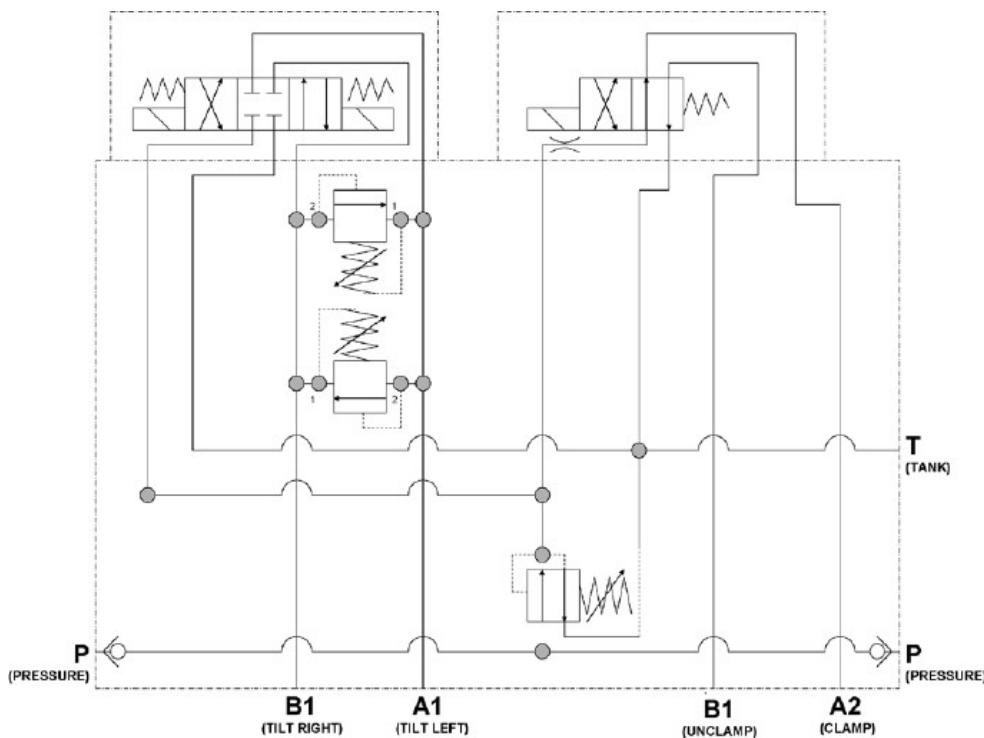


## CONTROL DIAGRAM

For Quick Hitch: Use  $\frac{1}{4}$ " Hose



For Tilt Hitch: Use  $\frac{1}{4}$ " Hose



## OPERATOR SIGNALS

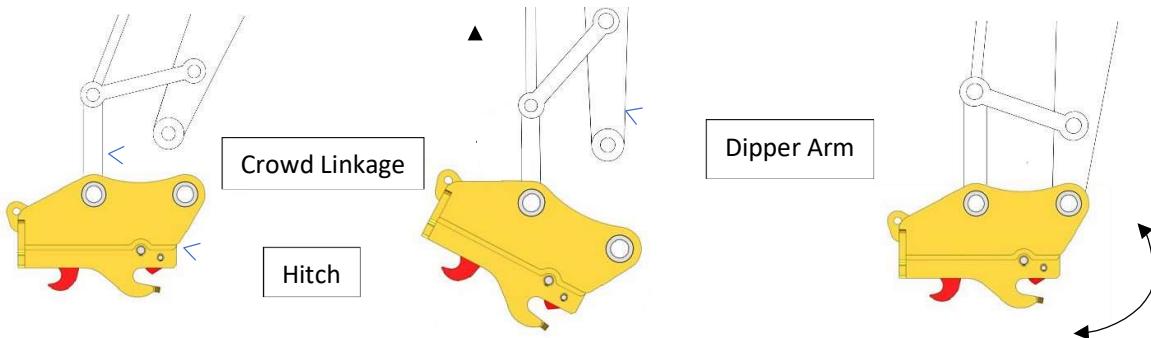
The following items must be installed by a competent person for safe operation of the quick hitch. Failure to do so will endanger property and/or result in loss of life or serious injury.

1. Lower pressure alarm. A low pressure alarm must be installed in the cab as shown on page 7. The purpose of this alarm is to alert the operator to a pressure loss in the system that may compromise performance of the primary retention system on the quick hitch (hydraulic cylinder). The quick hitch must not be used while the low pressure alarm sounds. Before operation continues, the quick hitch system must be inspected by a trained service technician.
2. Audible alarm on the aircraft toggle switch cover. The alarm is to sound continuously whenever the cover is raised. The purpose is to minimise risk of accidental release of the quick hitch during operation by ensuring the engagement switch is guarded at all times during operation.

## HITCH OPERATION

Ensure correct operation of the hitch at all times to avoid premature wear of the hitch. Failure to follow the correct operating procedures may result in serious injury or death. Any wear or failure caused by incorrect use and maintenance will void all warranties.

### ATTACHMENT OF THE HITCH ONTO EXCAVATOR



1. Clear the surrounding area and remove any existing attachments from the excavator arm.
2. Sit the O-rings on top of the hitch bosses.
3. Lower excavator arm into position between the hitch until crowd linkage and pin holes are lined up.  
Note: O-rings will fall in place when the excavator arm is lowered.
4. Insert pin into the crowd linkage.
5. Insert bolts and tighten. Ensure pin is locked securely into position.
6. Raise excavator arm above ground about 1m – The dipper arm will lower in position and adjust accordingly.
7. Push the other end of the hitch upwards and line up with the dipper arm.
8. Insert O-rings and align pin.
9. Tighten bolts and lock pin securely into position.
10. Apply grease to appropriate grease nipples and lubricate thoroughly.

Test excavator and hitch connection by rotating the hitch to the extremes of the ram in both directions. Check for clearance between hitch and excavator arm and check hydraulic hoses do not crimp during operation.

#### NOTE:

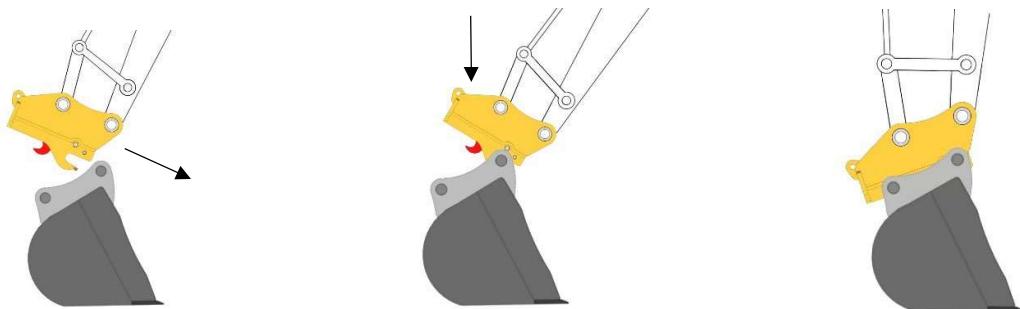
- Hitch shall be unlocked daily to ensure satisfactory operation.
- If the machine is inactive for a long period of time, it is recommended to release any attachments to remove the possibility of seizing.
- If in unlocked position, a buzzer will sound alerting the operator. Alarm must also sound whenever the host machine is in the mode that allows for the controls to be operated to engage or disengage attachments (whenever the switch cover is raised).

## ATTACHMENT AND HITCH CONNECTIONS

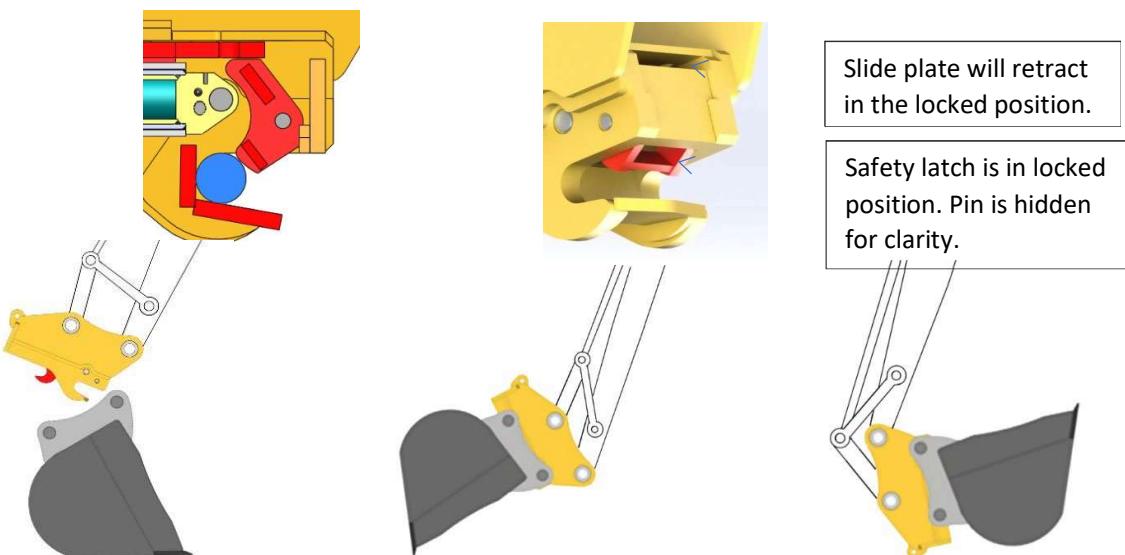
### CONNECTING ATTACHMENTS



Before commencing installation, the hydraulic system must be re-pressurized. Curl the hitch towards the cab to obtain operating pressure. Check that the safety spring is intact.  
Ensure no persons come within five metres of the machine during attachment procedures.  
Attachment operations must cease if persons enter this exclusion zone.



1. Lower excavator arm in line with the attachment.
2. Raise the cover on the aircraft toggle switch. An alarm will sound continuously while this cover is raised. Move the aircraft toggle switch to the disengaged position.
3. Engage attachment pin closest to the cab first. Make sure that the hook jaw is fully engaged to the attachment pin to prevent the safety latch from jamming.
4. Lower or raise other end of the hitch accordingly to engage other attachment pin.
5. Move the aircraft toggle switch to the engaged position. The hydraulic cylinder will extend and the slide plate will retract from the slotted hole. At this point, it shall be visible that the red painted latch will swing over the attachment pin. See Page 18 for complete view of the hitch sectioned in locked position. If the red painted latch is not visible, check for correct engagement before proceeding.
6. Lower the cover on the aircraft toggle switch.



Slide plate will retract in the locked position.

Safety latch is in locked position. Pin is hidden for clarity.

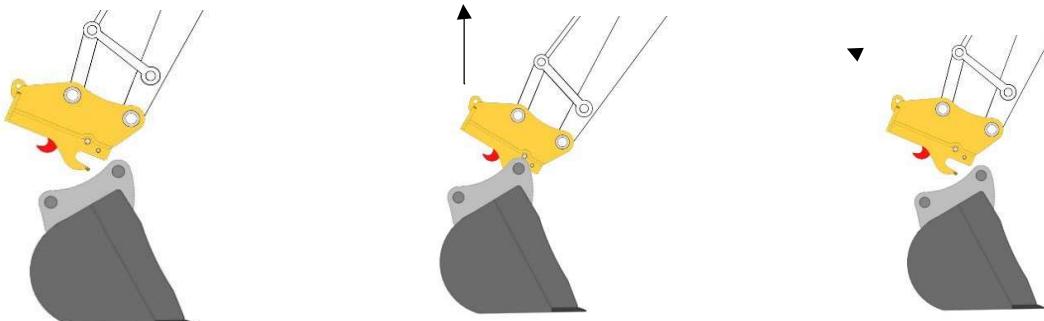
Test attachment and hitch connection by shaking the attachment away from all personnel. If this is unsuccessful, disconnect the attachment and repeat the connection procedure. If problem persists, **contact Robur Attachments for assistance**.

Visually check to see if the red front safety latch is visible from the excavator cabin. This shall be visible at all times during the operation of the hitch. The red slide plate shall not be visible. It is important for the slide plate to retract in order to block the safety latch from swinging back. Contact Robur Attachments for assistance if the safety latch doesn't engage.

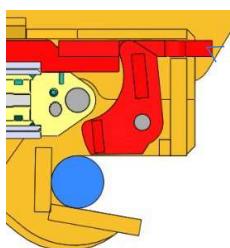
### RELEASING ATTACHMENTS



Before commencing release operation, the hydraulic system must be re-pressurized.  
Curl the hitch forward to obtain operating pressure. Attachment shall be lowered to the ground before disengagement. Ensure no persons come within five metres of the machine during attachment procedures. Attachment operations must cease if persons enter this exclusion zone.



1. Clear the surrounding area.
2. Lower attachment to ground.
3. Release any hydraulic or other couples that connect the attachment to the machine.
4. Raise the cover on the aircraft toggle switch. An alarm will sound continuously while this cover is raised.
5. Move the aircraft toggle switch to the disengaged position. The red painted safety latch will hide inside the body and the red slide plate will come out of the slotted hole. See page 18 for complete view of the hitch sectioned in release position.



Slide plate will be visible in the release position.

6. Curl the hitch to release the pin away from the slide hook.
7. Raise the dipper arm and move the hitch away from the attachment.
8. Lower the cover on the aircraft toggle switch.

## LIFTING ATTACHMENT

The quick hitch is supplied with a lift point. The working load limit of the lifting eye (stated on the identification plate) must not be exceeded and must be used in conjunction with chains or slings that are rated appropriate to the lifting task. The sling angle must not exceed 15° from parallel to the lifting eye. Lifting operations must consider any limitations imposed on lifting by the manufacturer of the host machine.

**The quick hitch and lifting eye must not be used for lifting of work boxes or other personnel lifting devices.**

## TROUBLESHOOTING

If any operational feature on the quick hitch malfunctions, cease operations and contact a service provider.

## MAINTENANCE

The Double Locking Quick Hitch must be well maintained to ensure it is always working in the correct manner. Incorrect maintenance could result in serious injury or death and void all warranties. Maintenance shall be performed only by qualified personnel.

Before starting maintenance, ensure the machine is in neutral position, hydraulic flow has been shut off to the hitch connection and hydraulic system has been de-energised.

### Daily checks:

- Grease all grease points daily.
- Visually check hydraulic components for any leakages or wear.
- Check hitch body for any signs of damage, wear, and cracks.
- Check all pins for tightness.
- Check attachment pins for wear. The wear shall not exceed 0.8mm. If needed, immediately replace pins.
- Clear away any material build-up.
- Check light on low pressure alarm is operation.

### Weekly Checks:

- Carry out as in daily checks with foreman or manager.

### Periodic Inspection every 12 months or 2,000 hours

Period inspections shall be carried out by a competent person (CPEng or Robur Attachments nominated person). The hitch may have to be removed from the machine to be able to carry out the inspection thoroughly.

- Check for cracks on pin locations.
- Check for cracks on welds.
- Check for cracks of stress areas.
- Visual inspection of lifting eye for damage or excessive wear. Excessive wear with respect to the lifting eye is any reduction in thickness or dimension by 10% or more of the original nominal section.
- Proof load of lifting attachment using certified 6,000 kg test weight in accordance with Section 12 of AS4991:2004.
- Visual check of wear on hooks & slide areas.

### Maximum Wear

Tonnage	Hooks	Slides
2T – 5T Hitches	3mm	4mm
5T – 9T Hitches	4mm	4mm
10T – 24T Hitches	5mm	5mm
25T – 45T Hitches	7mm	6mm

- Check movement of the jaw safety latch. Measure the clearance from the tip of the latch to the flat bottom plate of the jaw at 90 degrees. The maximum clearance is calculated as per table below:

### Maximum Clearance of the Safety Latch

Tonnage	Maximum Clearance (mm)
2T – 5T Hitches	Pin dia + 5mm
5T – 9T Hitches	Pin dia + 6mm
10T – 24T Hitches	Pin dia + 8mm
25T – 45T Hitches	Pin dia + 10mm

- Pressure test hydraulic lines.
- Pressure test all cylinders & check for leakage.
- Check low pressure alarm is functional (lower operating pressure of the system)
- Check all signs, signals and plates are legible and in place.
- Inspection and test of electrical components for damage by competent person.

Warning: Do not operate the hitch if there are any signs of damage or extreme wear. Contact Robur Attachments immediately for any repairs if necessary.

#### **Welding repair & Build-up of worn parts:**

In the event that a welding repair needs to be made to the attachment(s), please consider the following guidelines and only perform the welding process with qualified operators.

- Clean the affected area & remove any paint and rust, with a grinding wheel for example.
- Select a welding process from below and use qualified welders, equipment, and consumables.
- 

Process	Consumable	Shielding Gas
Manual Metal Arc (MMA/Stick)	E7018	Not Applicable
Gas Metal Arc Welding (MIG)	ER70S-6	100% CO2 or Ar/CO2 blend
Flux Cored Arc Welding (FCAW)	E71T-1	100% CO2

- Weld procedures to be qualified to AS/NZS 1554.1 SP Category. Minimum 100% visual inspection
- Prepare the welding area so the surfaces are flush and proper finish for paint.
- Coat the affected area with primer and paint to prevent rust.

## SAFETY SIGNS & DECALS

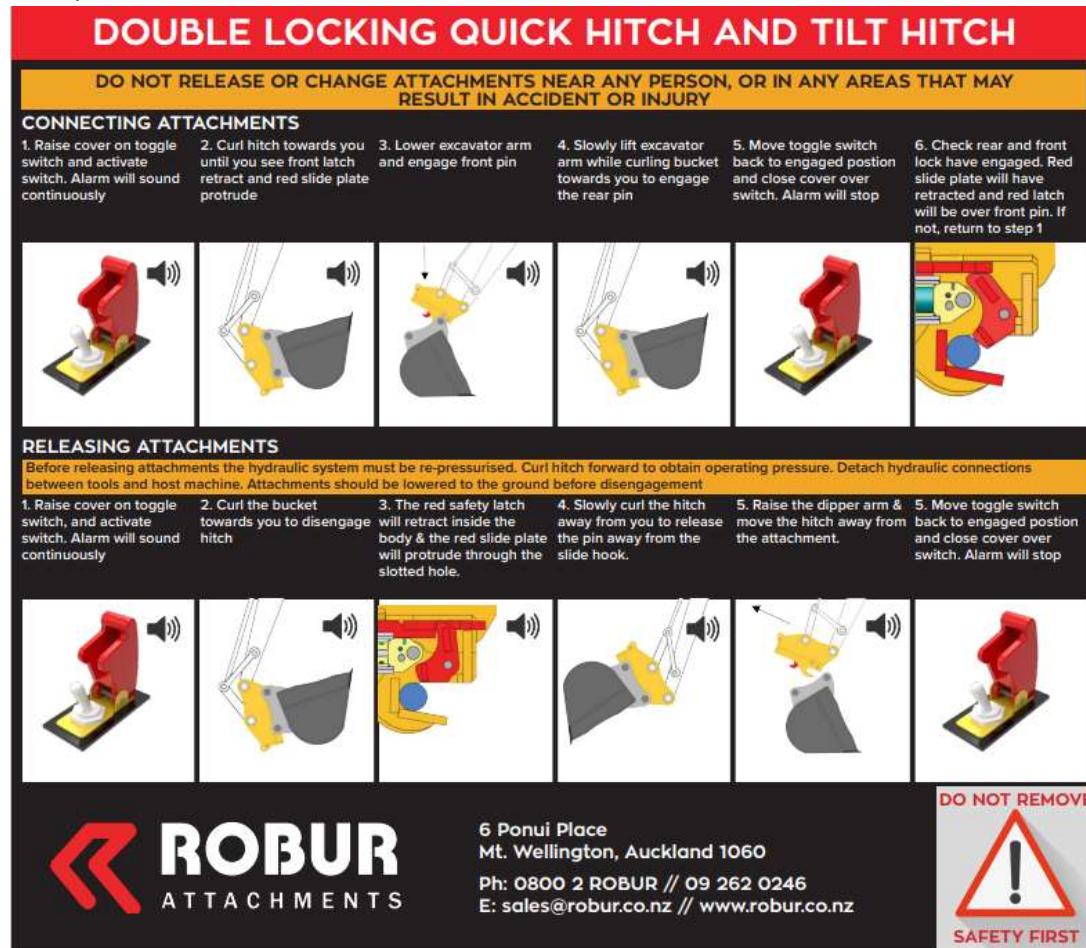
This sign is to be fitted inside the CAB visible from the outside.



This sign is to be fitted beside the toggle switch in clear view of the operator.



This operation instructions decal is to be fitted beside controls in the CAB in clear view of the operator.



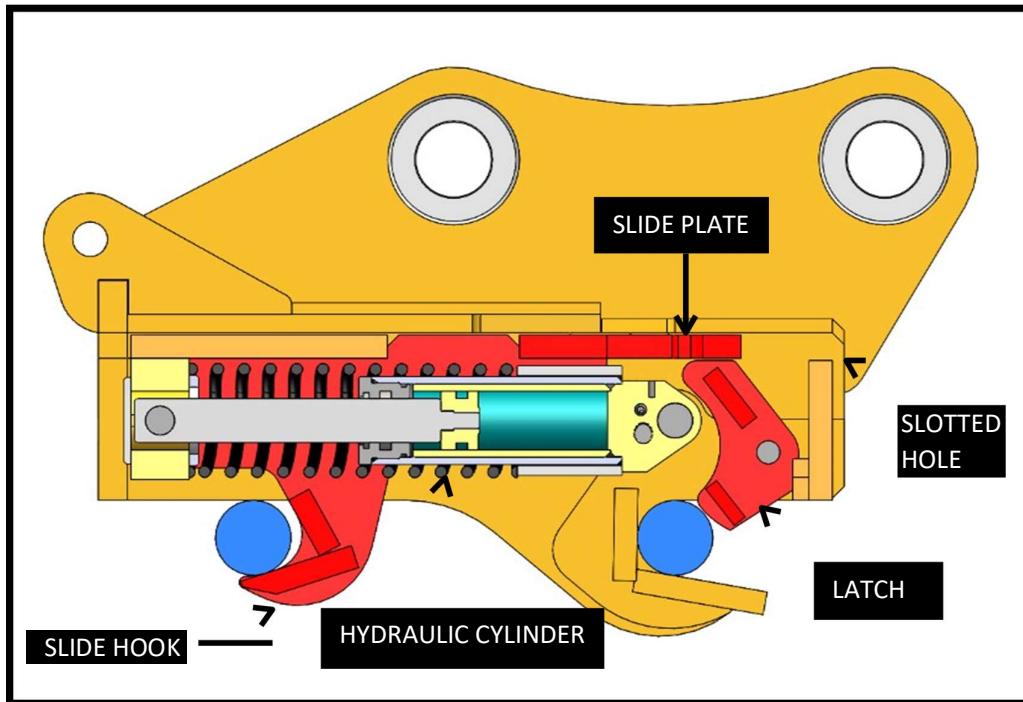
## **WARRANTY**

Equipment sold by Robur Attachments Ltd is warranted for a period of 24 months from the date of purchase, or 2000 hours, whichever occurs first. This warranty covers replacement of parts that have defects in the material or workmanship. Any attachment or part replaced under the terms of this warranty shall keep the warranty period pertaining to the product's original date of purchase.

This warranty does not cover defects unrelated to the manufacturing process, including, but not limited to, mishandling, neglect, improper installation, misuse, and any alteration to the part.

Thank you for choosing Robur Attachments!

## LOCKED VIEW



## RELEASED VIEW

