



## **Installation and User Manual**

**This manual must be kept within the cab of the machine to which the Thumb is fitted at all times and be available to all personnel who require this manual.**

**Ensure that the manual is read and understood BEFORE using or performing any work upon the Thumb.**

The information in this document can be subject to change without prior notice and should not be regarded as an undertaking from Hill Engineering Limited. Hill Engineering Limited assumes no responsibility for errors that can appear in this document.

Hill Engineering Limited cannot anticipate all dangers and hazards that may arise in the fitting and use of the Thumb. Therefore the warnings and safety information included within this document and on any labels provided is not inclusive. Any item or method not specifically recommended by Hill Engineering Limited may be unsafe to yourself or others. It is therefore the responsibility of the customer or his representative to assess the risk and ascertain that it is safe before proceeding.

The customer or his representative must also ensure that the safety of the product is not damaged or made unsafe by the operation, maintenance or repair of the Thumb.

Hill Engineering Limited is not responsible for damage incurred by the use of this document or the Thumb described in this document.

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Document TEF – R1

Issued 23/10/15

Hill Engineering Limited  
Unit 6  
Carnbane Business Park  
Newry  
County Down  
BT35 6QH  
Northern Ireland

### **IMPORTANT INFORMATION**

The thumb must only be fitted, used or maintained by personnel who have undertaken the correct and appropriate training and have attained the necessary skill level to safely perform that specific function.

Operators must undergo instruction on the correct use of the thumb before use.

Hill Engineering Limited cannot be held responsible for hazards, damage or injuries caused through the fitting, maintenance, or use of the Thumb by personnel who have not undergone the required training and reached a skill level appropriate for safely carrying out their appointed task.

It is the responsibility of the customer to ensure that correct and adequate training has been given to all personnel and that they can perform their appointed tasks in a safe and competent manner.

Any personnel working installing, using or maintaining the Thumb must fully read and understand this manual before commencing.

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## Revisions

The contents of the manual may be subject to revision where necessary.

The memo accompanying the revision information should be kept with this manual at all times.

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### General information

May we take this opportunity to thank you for purchasing a Hill Thumb. The Thumb has been tailored to the operator's needs. The Thumb provides a quick and efficient means of handling awkward or bulky material/items. The Thumb is a quality engineered, well-designed product capable of providing years of good service, thereby increasing the productivity of your excavator. If any additional information is required then please contact the service department at Hill Engineering Limited or the nearest authorised distributor.

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### Safety

All personnel working with the equipment must be well conversed with all of the applicable safety directives/regulations, procedures and precautions. Particular attention should be paid to personal safety while installing, using or maintaining the Thumb. Please ensure that all the correct procedures are followed at all times. The user of the Thumb is responsible for all precautionary measures concerning personnel working within the excavator risk area.

### Think Safety, Work Safely, Be Safe

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In this manual there are parts tagged with one of the following safety warnings. Particular care must be exercised with regard to these statements when performing the work described within that section.



This warning is used where there is a high probability of death or serious injury if the instructions are not followed correctly.



This warning is used where there is a possibility of injury to yourself or others if the instructions are not followed correctly.



This warning is used where there is a possibility of damage to the machine if the instructions are not followed correctly.



**The Thumb is heavy. Ensure that it is lifted carefully using suitable approved lifting equipment and methods.  
Inspect the Thumb and fitting kit for damage before installation.**

## Identification

Each Thumb is fitted with an identification plate.

This plate lists

- The Thumb Type.
- The Serial Number.
- The mass of the Thumb.
- The working hydraulic pressure.
- The date of manufacture.

TEFRA		CE	
COUPLER TYPE	COUPLER MASS	KG	P11111 1111111
SERIAL NUMBER	LIFTING EYE CAPACITY	KG	G 8 1011111.1
DATE	LIFTING CAPACITY WITH ATTACHMENT	KG	G 8 1001111.1
WORKING PRESSURE	ATTACHMENT PIN DETAILS	KG	00 2011101101111
BAR	DIA(METRES) MIN CENTRE	US	G 8 1011111.1
MPa	MAX CENTRE	US	G 8 1011111.1
			US 1001111.1

Hill Engineering Limited, Unit 8, Carbone Business Park,  
Newry, County Down, Northern Ireland, BT36 6QH.  
Tel +44 (0)28 30252555 www.hilltecho.com



**Ensure that the supplied Thumb is the correct model for your machine by referring to the machine type and model on the identification plate. Only fit a Thumb to the machine type as specified upon the serial plate.  
Ensure that the attachments used are suitable for your machine by reference to the serial plate.**

## Fitting Kit

Where the Thumb has been delivered with a fitting kit, this kit will contain all the parts for the full installation of the Thumb to the machine. Each fitting kit is unique to the type of excavator for which the Thumb was originally intended.



**Do not use the fitting kit for any excavator other than the machine type and model for which the Thumb was originally supplied. The supplied fitting kit is intended for use with the Hill Thumb. Hill Engineering Limited accepts no responsibility for the suitability of the fitting kit for use with any other Thumb from any other manufacturer whether fitted to the intended excavator machine type and model or not.**

## Clamp Function

The Thumb requires a double acting circuit to control the clamp function, ensure the machine has suitable pipework terminating at the end of the dipper arm.

## Recommended flow rate for Thumb

Flow rates will vary depending on thumb size and application,  
An adjustable restrictor should be used to ensure the thumb operates correctly

## Operating pressure for Thumb

The thumb circuit pressure should be set to prevent possible damage to the thumb or other attachment.

<i>Machine Size</i>	<i>Max Operating Pressure (Bar)</i>
7T	150
13T	150
20T	150



**Hill Engineering Ltd accepts no liability for damage caused to either Thumb / attachment or machine due to incorrect setting of pressure / flow rate.**

**Check settings with relevant and suitably calibrated equipment**



**Installation should only be attempted by skilled and competent personnel who have read fully and understood the information contained within this manual.**

The Thumb installation within the manual is broken down into basic steps, which must be followed. These are as follows: -

- Any Existing attachment must be removed
- The Thumb must be fitted to the end of the excavator's arm.
- The cylinder must be installed into the thumb
- The Ram Pivot must be fitted to the dipper arm
- The hoses must be routed from the Thumb to the excavator's arm.

### BEFORE BEGINNING THE INSTALLATION

Read all the relevant sections within this manual before beginning the installation.

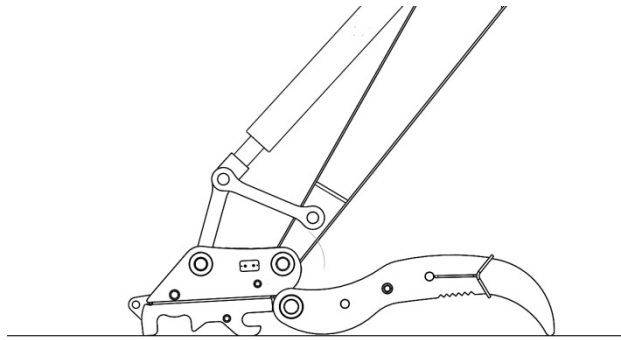
Make sure you have the proper fittings needed to connect to the main hydraulic pressure system and also to the hydraulics return system.

Determine the best route for running the hoses on the excavator where they will not contact or interfere with other excavator parts and linkages.

Place the excavator and Thumb along with any tools and supplies required on flat secure ground.

Place the safety lever in the locked position before leaving the cab.

## Removing the Existing Attachment



Remove any attachment from the machine by following the steps recommended by the coupler manufacturer.

Place the thumb on the ground with the toes pointing towards the excavator cab, and towards the ground.

Place the coupler flat on the ground between the bosses of the thumb.

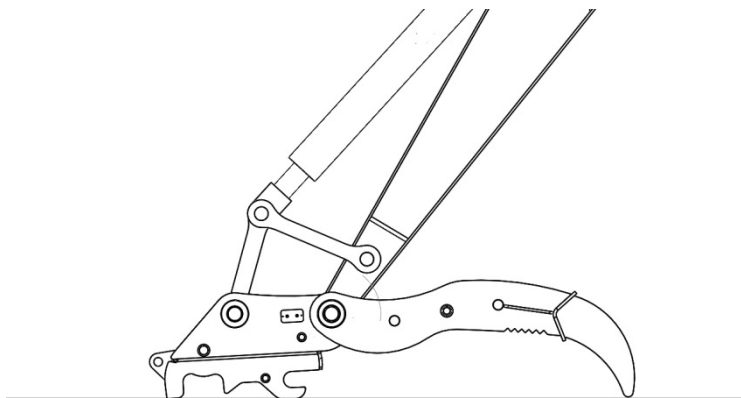
Remove the nut from the locking bolt and withdraw the locking bolt from the dipper pin bush on the coupler.

Withdraw and discard the original dipper pin.



**The attachment pins are heavy.  
Assistance / appropriate lifting equipment may be required**

## Fitting the Thumb



Using appropriate lifting equipment raise the thumb attachment until the bosses align with the coupler bosses.

Install the new machine pin (supplied with the thumb) taking care to ensure the bolt hole in the pin is aligned with the bolt hole in the coupler boss.

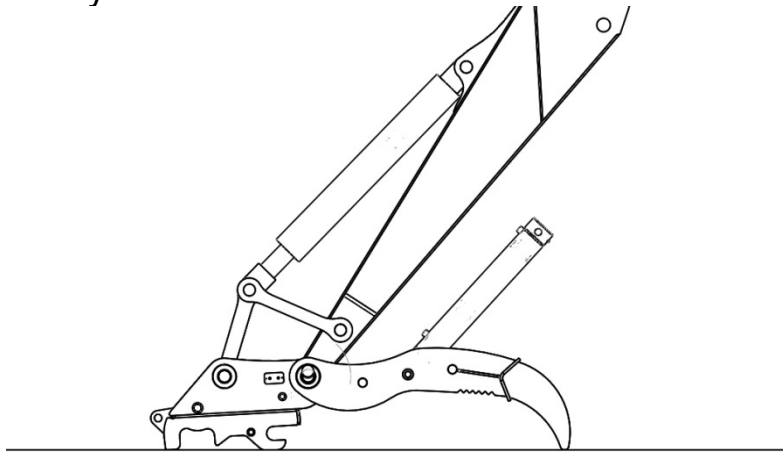
At this stage ensure that any shims/ grease seals which were installed with the coupler are still present. Use a mallet to drive the pin in to place if required. Once the bolt hole in the pin is aligned with the bolt hole in the coupler boss insert a suitable bolt complete with nut.



**Thoroughly grease the dipper arm (stick) pin as per the  
manufacturer's instructions.**



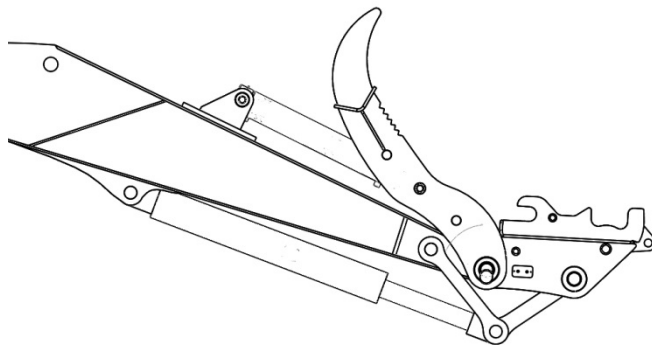
## Installing the cylinder into the thumb



Using appropriate lifting equipment lift the thumb cylinder and lower the rod eye between the ram pivot bosses. Once aligned insert the supplied ram pivot pin and secure using an appropriate nut and bolt.

Again using appropriate lifting equipment lift the ram pivot plate and align the hole with the hole in the base of the ram. Once aligned insert the supplied ram pivot pin and secure using an appropriate nut and bolt.

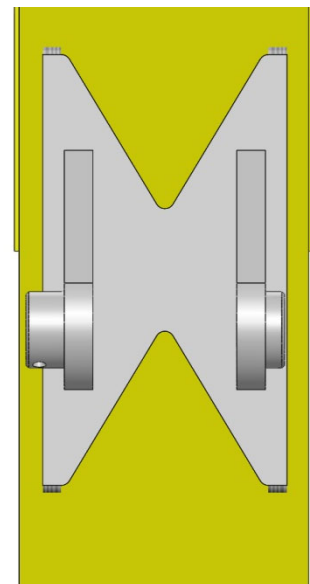
## Fitting the ram pivot plate to the Dipper Arm



Operate the excavator controls to first slowly raise the thumb clear of the ground, then slowly crowd the coupler to bring the coupler into contact with the thumb. Once the thumb and coupler have made contact continue to crowd the coupler until fully crowded.

Position the dipper arm so the hydraulic cylinder is vertical, taking care and using any appropriate lifting equipment bring the cylinder and ram pivot plate into contact with the dipper arm. The thumb can then be rotated manually until it makes contact with either the cylinder or the dipper arm. If it comes into contact with the dipper arm a spacer should be inserted to give approximately 20mm clearance.

When positioning the ram pivot plate ensure the cylinder is fully retracted. Mark the area which is to be welded, clean and grind ensuring the area is clean from dust, paint and other debris. Attach the ram pivot plate using 4 small tacks as shown opposite.



## Installing the hoses from the thumb to the excavator



Hoses should be suitably routed from the ram ports to the double acting circuit. Normally this will be the quick release fittings on the hammer circuit however an independent circuit may also be used. Care should be taken so that the hoses cannot become entangled in the thumb or other attachments and should be routed such that they will not rub or chafe on any moving parts.

Once the hoses have been connected flows and pressures should be adjusted as per the instructions in section 1 of this manual.



**Lock off excavator using plant procedure before commencing work.  
Before connecting any hoses always flush with clean hydraulic oil to prevent  
contamination of the hydraulic system.  
Do not allow hydraulic oil to come into contact with the eyes or skin. Wear safety  
glasses and gloves at all times.**



**Hydraulic fluid under pressure can penetrate the skin.  
Do not test for leaks with bare hands.  
Wear overalls, gloves and a full-face shield.  
Use containers and absorbent materials to contain any leakage.**

## Testing the rotation of the thumb

Once all of the above has been carried out the thumb is ready to test, raise the dipper of the excavator clear of the ground and ensuring that the area is clear of all personnel operate the thumb circuit. Please note there may be some delay while the pipe work and cylinder fills with oil. Once the thumb begins to move operate the thumb circuit in the opposite direction to fill the other side of the cylinder with hydraulic oil. Once the thumb returns to its starting position it is ready to be put through its full range of motion. While moving the thumb check for clearance from the coupler and from any other areas of the excavator. Also at this time ensure that hoses are correctly routed to provide full range of motion.

Once clearances and range of motion have been checked return the thumb to its closed position. When fully welding the ram pivot plate it is recommended that the cylinder be removed to prevent any damage caused by welding heat. This should be done by reversing the installation process.

Welding should only be carried out by an appropriately trained individual and should be carried in accordance with the excavator manufacturer's guidelines.



**Before proceeding with any welding, battery leads must be removed from the battery. Always check with the excavator dealer to take appropriate measures when welding on the machine.**

**Welding may cause fires.**

**Always remove combustible materials from the vicinity.**

**Protect all hoses and wiring from weld spatter.**

**Keep a fire extinguisher available in case of fire.**

**Always use the correct personal protective equipment.**



**Never neglect the daily maintenance.  
Failure to perform the daily maintenance correctly could lead to dangerous undetected faults that could result in the unexpected disengagement of the attachment during normal working.**

## Daily Maintenance

1. Always ensure that Health and Safety regulations are followed.
2. Grease the thumb pivot pin, and both hydraulic cylinder pivot pins as necessary with general purpose grease.
3. Check the Thumb body for fractures.
4. Check the thumb cylinder, and hydraulic pipes for damage and replace or repair as necessary.
5. Check the Thumb for any dirt or debris and clean regularly.
6. Check all bolts for tightness; retighten if necessary

## Weekly Maintenance

Thoroughly clean the thumb and closely inspect all the thumb body for fatigue fractures.

If any distressed welds are detected on a thumb then they must be repaired immediately to prevent propagation of the damage.

Check the pivot pins for wear and replace if necessary.

Failure to comply with the Daily and Weekly Maintenance listed above or any attempt of an unauthorised repair will invalidate the warranty.

### Hydraulic leaks.

**Probable cause:** Loose or damaged hoses.  
**Remedy:** Check, tighten/replace as necessary.

### Thumb does not operate

**Probable cause:** Double acting circuit not functioning.  
**Remedy:** Check function of double acting circuit and repair as necessary

### Thumb will not remain in set position

**Probable cause:** Cylinder seals defective  
**Remedy:** contact Hill engineering for replacement seals

### Thumb will not remain in set position

**Probable cause:** Double acting circuit valve leaking internally  
**Remedy:** Check function of double acting circuit and repair as necessary

## SECTION 5

## THUMB WARRANTY POLICY

### General Application

Hill Engineering Limited (as defined in the General Conditions of Sale) warrants that Hill Products, supplied by Hill Engineering Ltd shall be free from defects in design, materials and workmanship and shall be fit for their purpose.

All warranty, repair and replacement actions are contingent on verification of the defect(s) or malfunction(s). Should any such defect occur within the warranty period, as stated below, Hill Engineering will repair or replace the unit free of charge.

Any repair or replacement shall not result in an extension of the original warranty period. Hill Engineering's sole and exclusive liability for defects in materials and workmanship shall be limited to repair or replacement of the unit. Hill shall not be liable for incidental, contingent or consequential damages.

#### Warranty period

In the case of Hill Thumbs only, the period of warranty against frame defects in design, materials or manufacture is 12 months or 2000 hours; whichever occurs first.

Normal wear and tear or failure to follow the manufacturer's recommended maintenance and operating instructions. Neither shall the warranty apply to any failures or defects which arise from work carried out by any fitter or engineer who has not been appointed or authorised by the Hill Engineering service department.

1. Consumable parts such as, but not limited to, nuts, bolts & washers, grease, oil, cable ties, welding rods etc.
2. Parts which can be repaired or corrected with minimum action such as but not limited to, changing of seals, tightening or adjustment..
3. Damage caused by the Purchaser's failure to store, maintain or operate the equipment properly, or due to overloading or failure to pay proper attention to service and operating instructions or caused by accident by working beyond rated capacities.
4. If the product becomes inoperable due to material not being cleared from the thumb daily.
5. Any direct or indirect consequential damage including but not limited to loss of revenue or profit, loss of production or loss of any equipment.
6. Product improvements/updates made available by Hill Engineering, unless otherwise specified.
7. Warranty claims less than Fifty Pounds (GBP 50) or the equivalents in another currency are not considered by Hill Engineering.
8. Warranty will be invalid where the original parts are found to have been replaced with non-Hill supplied parts or where product specification has been altered without Hill's agreement.

9. Warranty claims must be sent in writing (email) to the contact below. Claims should include digital photographs of the failure where appropriate. The claim shall be delivered to Hill Engineering Ltd within fourteen (14) days from the time when the purchaser discovered or should have discovered the alleged defect. Claims lodged after this period will be declined.
10. The warranty of a replaced or repaired part expires at the same time as the original warranty of the supplied equipment.
11. Diagnostic time. Hill Engineering will not cover excessive time required to diagnose a warranty problem. This includes labour, travel and mileage.
12. Any costs such as accommodation, meals, flights, transportation or other similar costs.
13. If the damage or defect is the result of an accident, act of God, customer abuse, misuse or operation of the product beyond the capacity for which it was designed, unauthorised alteration or repair by third parties, or vandalism.
14. If deteriorated or failed components such as: electrical wiring and connections, hoses, seals and hydraulic cylinder caused by chemicals, falling objects, dirt, salt and sand, rust, corrosion, moisture or extreme environmental temperatures.
15. The warranty shall not be suspended on the grounds of non-use, intermittent use or for any other reason.
16. The warranty provided herein does not apply when failure to return failed equipment to Hill Engineering Ltd for investigation does not occur. It is the responsibility of the dealer to return failed equipment with freight prepaid. Parts are only to be returned to Hill Engineering if requested by Hill Engineering personal.

Hill Engineering provide a period of appeal for each decision in warranty claim, which is fourteen (14) days as of the date of decision, after which the said decision is final.

#### **Notification/Warranty Procedure**

Any warranty issues must be notified to the Service Manager by email. The Warranty Claim must include information such as the date of purchase, serial number and detail of the problem experienced unless the potential repair is of such magnitude as to render the product likely to require replacement.

Hill Engineering shall not be obligated to service or supply parts for any unit after 6 years from date of purchase.

All warranty claims must be submitted to Service Manager, Hill Engineering at **info@hillattach.com**. Full contact details are located in the Service Level Agreement.

#### **Product Recall**

If a repetitive defect or an otherwise significant problem in the products or any range becomes apparent, an investigation shall be instigated to determine the cause of the defect, to evaluate any safety effects, and to establish any required remedial action

If it is determined that the relevant defect affects machine safety or general function, Hill Engineering shall implement an adequate recall or service action campaign. If necessary, such products as are or may prove to be defective shall be repaired or replaced as appropriate.

## Storage

If the Thumb is to be stored for any period the following procedure should be followed.

- Remove Thumb from machine.
- Fit blanking plugs/caps to all open hydraulic ports/hoses.
- Remove any oil, grease, debris from the Thumb e.g. by power hosing.



**Do not pollute drains or waterways.**

- Grease all greasing points thoroughly using a grease gun containing general purpose grease.
- Apply a smear of grease to all exposed/unprotected metal surfaces e.g. bushes to prevent rusting.
- The Thumb should be placed in a secure position where it cannot fall or be knocked off/over and kept in a cool dry environment.

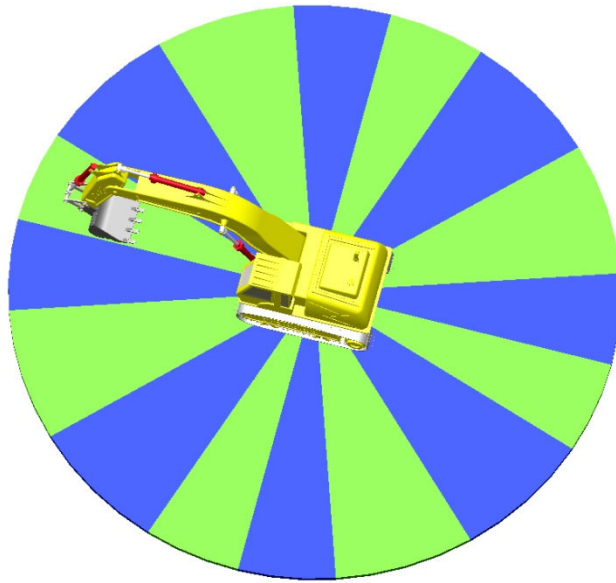
## Disposal

If the Thumb is to be disposed of the following procedure should be followed.

- Drain all hydraulic oil from the cylinder into suitable containers.
- Remove any oil, grease, debris from the Thumb e.g. by power hosing.

The Thumb can now be returned to Hill Engineering for recycling.

**IMPORTANT INFORMATION**



**Keep all personnel out of the machine danger area indicated above at all times during use. If the machine is stopped then ensure the attachment is placed upon the ground.**