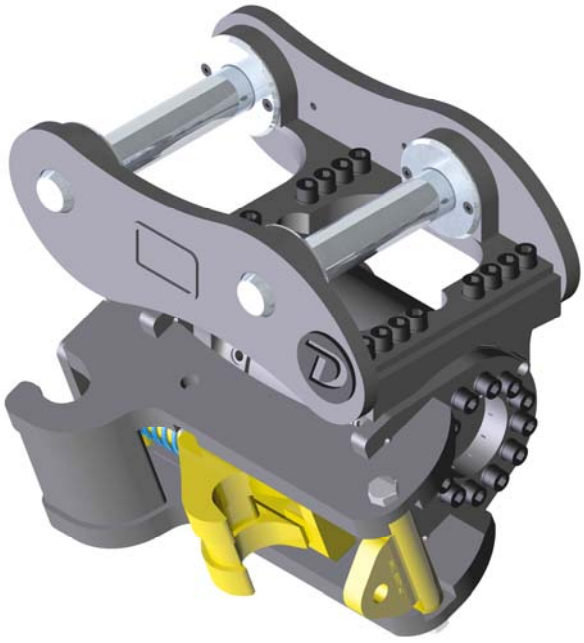
Snaplock+ Tilt Coupler
Installation and Operation manual



The Snaplock+ Tilt Coupler
(Fully Automatic with Dual Pin Locking)

International Patents pending
Release 1.1, January 2014
Reference: SA462060

IMPORTANT:

The booklet should be kept with the machine at all times during and after quick coupler installation. Machine operators must read and fully understand the operations manual before use.

Snaplock+ Couplers are compliant with Australian Standard AS4772-2008, European Standard EN474.
Snaplock+ Couplers are compliant to latest draft of proposed ISO International Standard.

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FREEPHONE AUS 1800 057 021 | 12 Cherokee Place, Mount Maunganui 3116, Bay of Plenty, New Zealand

TABLE OF CONTENTS

If at any time in the future, you require additional information on the Snaplock+ quick coupler or any aspects of its use, please do not hesitate to contact:

P +64 7 574 3000 | F +64 7 574 8030 | E sales@dohertydirect.net

FREEPHONE AUS 1800 057 021 | 12 Cherokee Place, Mount Maunganui 3116, Bay of Plenty, New Zealand

PRE DELIVERY CHECK

Installation completed by:

Company:	
Name:	
Date:	
Excavator make and model:	
Coupler Serial #	
End user name:	
End user phone number:	
End user address:	
End user email address:	

Doherty Snaplock+ keypad fitted (Recommended):	
Lock circuit pressure checked at:	PSI
Unlock circuit pressure checked at:	PSI
Tilt Circuit Pressure checked at	PSI
Tilt speed (full left to full right) timed at	Seconds
Hose routings checked and abrasion free throughout full crowd and tilt movement:	
Actuator cavity bled using lower bleed ports	
All supplied attachments locked and unlocked from coupler:	
All hydraulic connections, clean, tight and leak free:	
Please specify type and brand of control valve fitted	

This form must be returned to Doherty Engineered upon completion of Installation to validate warranty.

NOTES:

RISK ASSESMENT

This risk assessment form is supplied as a guide only. It is the responsibility of the owner / operator to ensure that this equipment is operated in a safe manner and complies with all relevant compliance regulations.

Location of risk assessment:	Date:

Typical hazards associated with this equipment	Personnel affected			
	Indicate in table below			
Type	Operator	Site personnel	Service personnel	General public
Changing Attachments				
Is there a copy of the operations manual in the machine cabin?				
Has the operator been correctly trained for use with this particular coupler and verified?				
Is the operator aware they should not operate this machine unless they are satisfied that the coupler is in a safe condition?				
Are all personnel aware that they must not remain near attachments during attachment changes?				
Falling objects				
Are all personnel aware that they must not position themselves under attachments or suspended loads?				
Lifting equipment				
Is the SWL rating of the equipment clearly displayed?				
Does all lifting equipment carry a current SWL certification?				
Warning devices and Decals				
Are all safety and operations decals clearly displayed?				
Does the operator check that the equipment warning devices are operational daily?				
Equipment malfunction				
Is there a checklist of daily, weekly, monthly inspections?				
Is there a record of all service / repair work?				

Other hazards identified:	
Plant & machinery movement Warning devices on plant and equipment Noise Environment	

Assessed by:	Reported to:
Name Date	Name Date

RISK ASSESMENT

Daily pre start check list

Operators Name:	Date:

Coupler serial number:	S	M	T	W	T	F	S
Check all attachment pin retainer bolts and nuts for tightness.							
Check attachments for pin wear							
Check all hydraulic hoses and fittings for any leaks or wear							
Clean away any material build up around cylinder guide ways, spring apertures and the pin engagement surfaces.							

Weekly pre start check list

Thoroughly clean coupler	Week ending:
Check Coupler for evidence of fatigue, weld failure or stress. Do not operate with a cracked weldment.	
Repeat daily checks above.	

Operators Name & Signature:	Managers Name & Signature:

IMPORTANT SAFETY INFORMATION

The Snaplock+ range of Quick Hitch Couplers comply to AS4772-2008 Australian standard for Earthmoving machinery – Quick hitches (Couplers) for excavators and backhoe loaders AS4772-2008 Clause 2.1.4

Remember that on any job, YOU are the key to safety. Good safe practices not only protect the people around you; they are also your own best protection. Study this section and any relevant manufacturer's operation manuals covering your equipment. Read all warning and caution instructions.

1. This manual must be READ and UNDERSTOOD before any installation and operation work begins. A copy must be kept in the operator's cabin for ongoing use.
2. Operators should note that the use of a quick coupler may affect the machine's breakout force and balance and may result in attachments being able to come into contact with the boom set and or operator's cabin.
3. Operators should note that the weight of the coupler is stamped on the ID Plate and this must be taken into account which calculating the machine's lifting capacity.
4. Doherty Engineered Attachments Couplers are designed for use with Doherty Approved attachments only. Approval must be obtained for use with non Doherty attachments.
5. In particular, bucket widths should not exceed those specified in the chart below.

Model	weight class (T)	Max bucket width (mm)	Model	weight class (T)	Max bucket width (mm)
HDT015	1-1.5	1000	HDT240	19-24	2200
HDT025	1.6-2.5	1200	HDT290	25-29	2200
HDT035	2.6-3.5	1500	HDT350	30-35	2500
HDT055	3.6-5.5	1700	HDT450	35-45	2500
HDT080	5.6-8	1800	HDT550	46-55	2500
HDT110	9-10	1700	HDT650	55-65	2800
HDT140	10-14	2500			
HDT180	15-18	2500			

6. The hydraulic actuators fitted to Doherty Tilt Couplers contain no site serviceable parts. Contact Doherty Service department BEFORE carrying out any disassembly work. Failure to do so may void any applicable warranty.
7. All DEA couplers must be connected and installed in full compliance with this manual. Any variations may cause the coupler to operate in an unsafe manner and/or void the warranty. DEA are available to advise on particular issues as required.
8. Due to the self tightening and automatic wear compensation features of this coupler it is recommended that the locking cylinder be disengaged at the end of each day.
9. The Snaplock Quick Coupler is designed to take up wear, however if mounting pin wear exceeds 5% of the original diameter, immediately replace implement pins.
10. All excavator operators should familiarise themselves with all coupler/attachment combinations before attempting to operate the coupler. This should include, but not be limited to, practicing engaging and disengaging each attachment. Furthermore when new attachments are added to the machine's fleet, the operators should proceed with the same "familiarisation" process before it is used on the job site.
11. Never use the Coupler as a prying tool.
12. Never use the Coupler as a clamping device.
13.  In the event of a loss of engagement failure, the Jaw Locking Pawls and comprssion elements MUST BE REMOVED AND REPLACED.

PRODUCT INTRODUCTION

The HDT series Snaplock Tilt couplers utilise a Hydraulic Actuator to provide the tilting action. This is a precision machined high strength component which must be correctly installed and connected to provide optimum service life. PLEASE READ this manual carefully prior to installation. If additional information is required – contact Doherty – don't assume.

The actuator contains only two moving parts, the piston and the rotating shaft which connects to the end flanges. Because the moving parts operate in clean hydraulic oil, the actuator requires no regular maintenance apart from periodic flushing and cleaning of the external end seals.

The locking system is based on the well proven sliding jaw design and incorporates a number of patented features to ensure safe and secure operation. The most obvious of these are the instant automatic locking once the locking cylinder is activated and the deliberate 4 digit pin required for unlocking activation which eliminates unintentional or accidental loss of engagement.

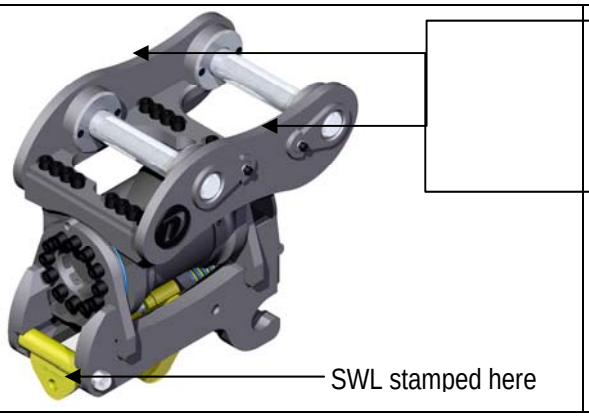
Operator maintenance is restricted to weekly cleaning of the coupler to ensure no excessive build up of material on the interior surfaces and greasing of the tertiary end seals which prevent grit from reaching the actuator hydraulic seals.

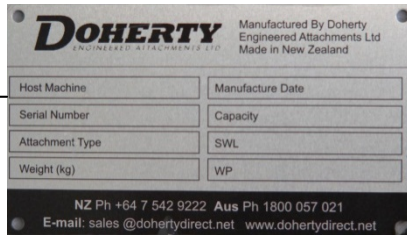
HDT Actuators BVC series (with the exception of the smallest HDT015, HDT025 & HDT035) require no special valving as the main relief valve is built into the housing. However it is important that to achieve maximum load holding, normal operating pressure must be maintained in the control lines. This may require the fitting of port check or lock valves. HDT 015,025 & 035 and all models using the BVE series of actuators will also require an external cross line relief valve to protect the actuator from overloads. Maximum flow rates and pressures are specified in this manual and these must not be exceeded as this may result in damage and/or voiding of any applicable warranty. Normal good hydraulic practice including pre cleaning of lines and hoses must be followed to ensure no contamination enters the actuator during installation.

HDT Actuator relief valves are pre-set and require no further adjustment. However the Coupler Lock / Unlock control valve will require pressure setting following installation. Pressure settings are noted on the schematics.

PRODUCT IDENTIFICATION AND DECALS

All Snaplock+ Couplers are supplied with an ID plate attached as shown below. In addition, a serial # is stamped into the top edge of the Left Hand mounting plate.





It is recommended that a copy of these details be kept in the office for future reference.

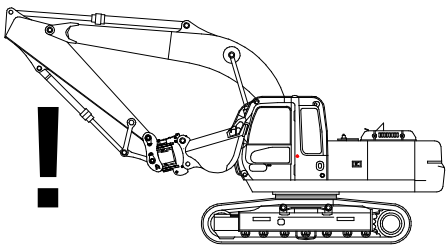
Host Machine	Manufacture Date
Serial Number	Capacity
Attachment Type	SWL
Weight (kg)	WP

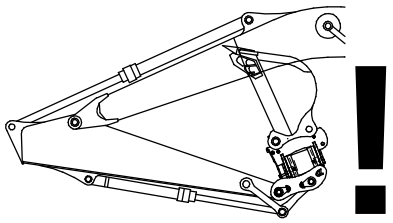
Always quote these details when contacting Doherty Engineered Attachments for Service or Parts.

In addition your Doherty Engineered Attachments may be fitted with a number of SAFETY and MAINTENANCE DECALS. These decals must be kept clean, in good condition and be visible from a distance of 3 meters. Replacements for damaged decals may be obtained from the DEA parts department.

The Snaplock+ Coupler also requires that the following OPERATOR DECALS be fitted by the Installer in the machine's cabin. These must be clearly visible from the operating position and maintained in a clean and legible condition. These decals will be supplied in the same pouch as this manual – please check that all are included. Replacements for damaged or missing decals may be obtained from the Doherty parts department.

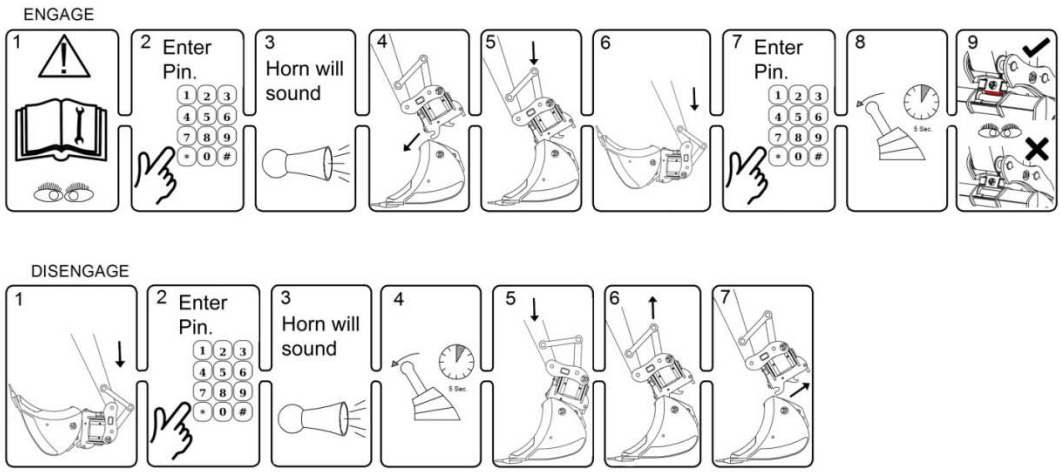
<u>Contact warning decal:</u>





PRODUCT IDENTIFICATION AND DECALS

Operation decal:



INSTALLATION

IMPORTANT INSTALLATION NOTES

- Due to the large number of Excavator Makes and Models available, it is not possible to provide a rigid set of installation instructions that will cover every situation. Modern Excavator control systems are complex and sophisticated. Auxiliary connections must be carried out with care to ensure the manufacturer's warranty is not voided. It is therefore extremely important that only appropriately qualified and experienced persons carry out the installation. It is STRONGLY RECCOMENDED that the excavator dealer be consulted to ensure the auxiliary connections are correctly made.

- Installation personnel must be competent and experienced in this type of work.

- Best hydraulic practice will be used to ensure that all components remain clean and free of contamination and that all hoses are suitably routed and armoured to prevent, crushing, pinching or chaffing damage.

- The requirements detailed in this publication must be fully understood and complied with.

- No changes to the host machine's control systems should be made without express agreement by the manufacturer and or distributor.

- All current Health and Safety Regulations pertaining to this installation and subsequent operation must be complied with.

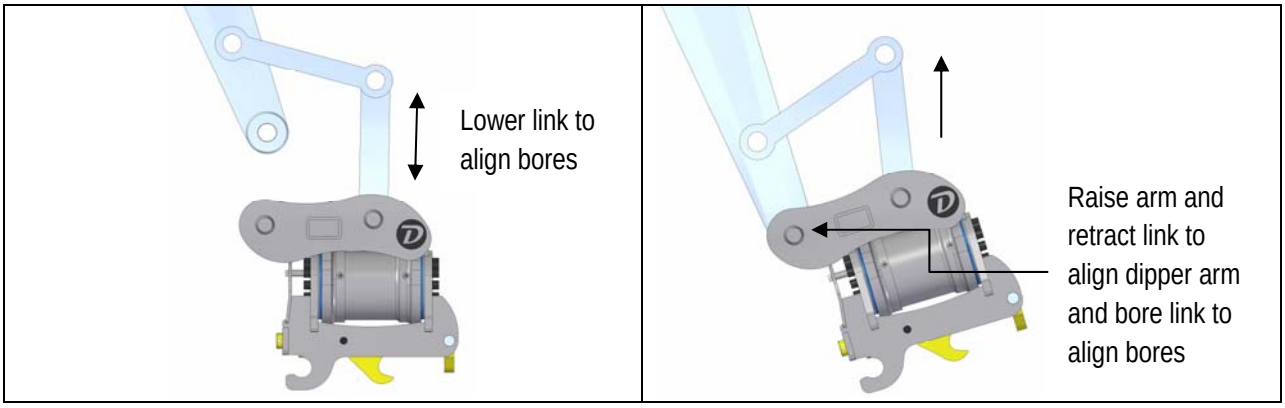
- The Pre Delivery check sheets (including pressure readings) must be fully completed, signed and returned to Doherty.

- Contact Doherty for additional assistance, if required.

- Failure to comply with these guidelines may cause equipment damage and/or void any applicable warranty.

FITTING THE COUPLER

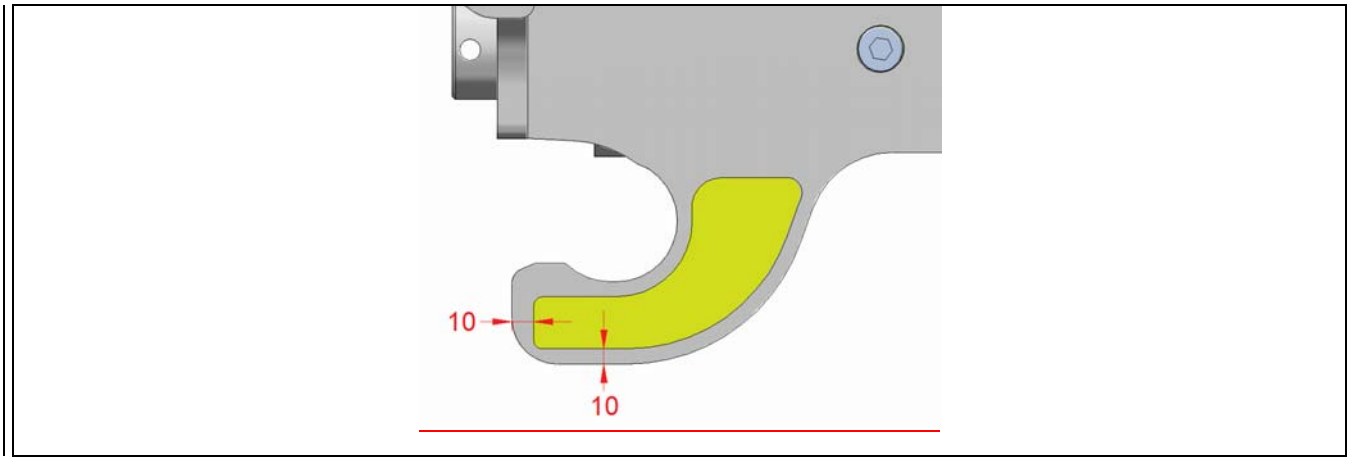
1. Remove any existing attachments from the machine. Some models of Doherty couplers are supplied with purpose designed hardened mounting pins. If these are not supplied, the coupler is mounted using the OEM pins which were supplied with your machine.
2.  NOTE Hardened pins MUST be used for this application do not use non hardened attachment pins.
3. CLEAN all bores and pin surfaces, pre-lubricate pins with grease and set aside on a clean surface.
4. Carefully align the link arm between the two bosses, which are furtherest from the cab of the machine. Ensure the O rings are correctly positioned and fit one pin. Shim as required to eliminate excessive side float. NOTE Packers and Shim sets are supplied with your new hitch and are designed to fit the machine specified on the original sales order Confirmation. Additional shims are available from Doherty Parts department if required.



5. You can now lift the coupler off the ground and use the crowd and arm controls to accurately line up the main dipper arm bore. Position the O rings and fit the second pin. Shim as required.
6. Ensure the pin retaining bolts are fitted and tightened. Use Nyloc, lock nuts or supplied bolts for Doherty supplied pins.
7. Grease up both pivot points as required.
8. Using the excavator hydraulics, carefully crowd the quick coupler to the extremes of the crowd travel and check that there is adequate clearance between the coupler and the dipper arm surfaces and linkages.

Note

If ordered, your coupler may be supplied with optional front clipper plate profiles. These are not essential but if required they can be welded to either side plate. Locate by offsetting approx. 10mm from the front pin.



CONNECTING THE COUPLER LOCK CIRCUIT

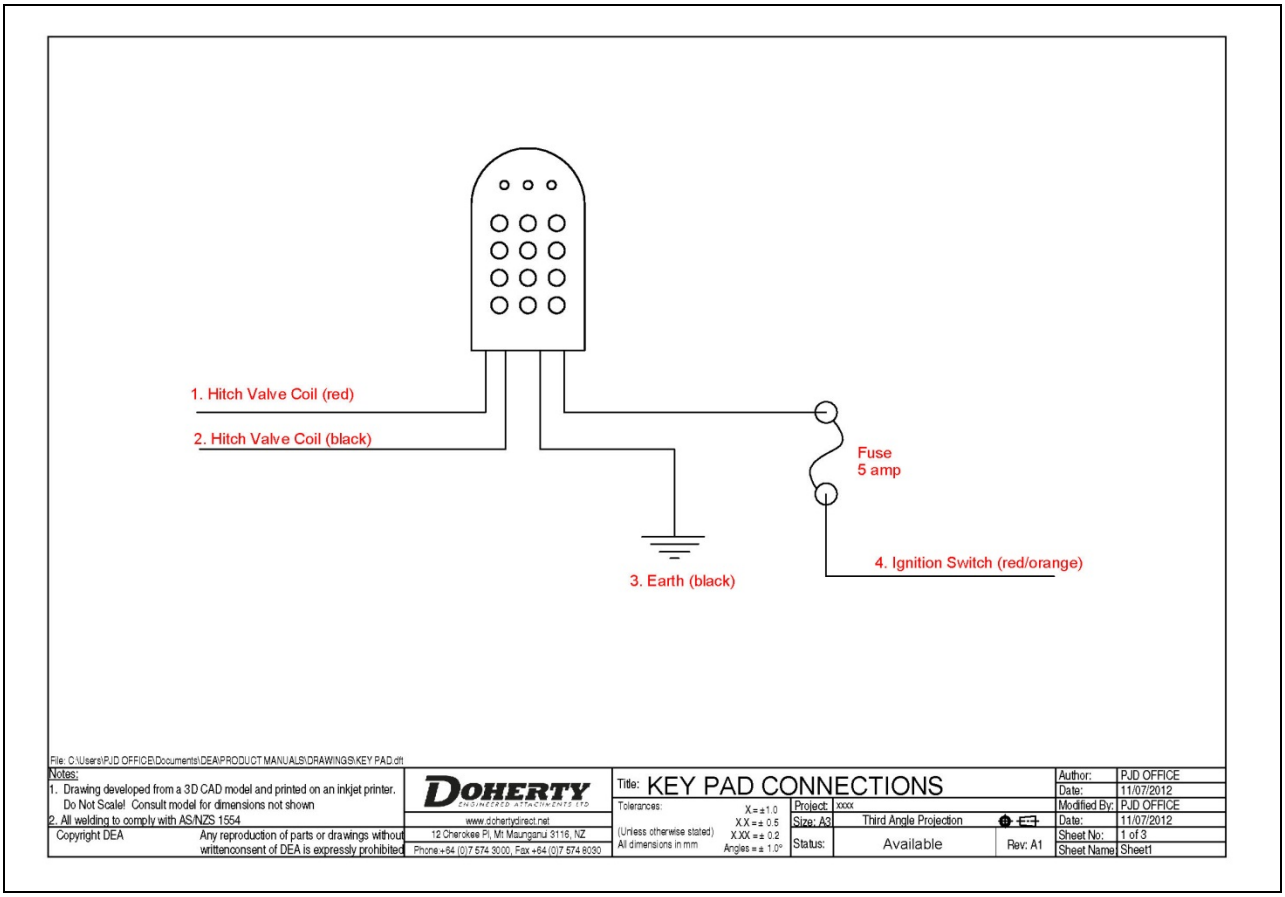
A. ELECTRICAL

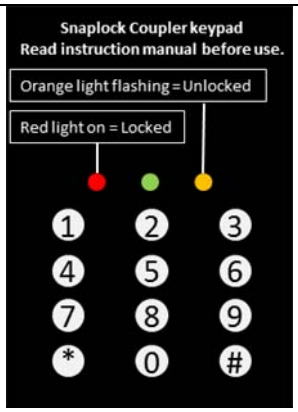
The Lock/Unlock control is operated by an electrical solenoid valve via an approved switching device. This device must:-

1. Incorporate an audible warning device.
2. Fail to safe (locked) mode in all circumstances.
3. Not be able to be accidentally operated
4. Include a self checking function when the engine started.

Doherty have available a purpose built fully compliant Snaplock+ Control Keypad which can be installed in the cabin and connected to the machine's electrical system as shown on the following schematic. Clients may fit other types of safety switches but must ensure compliance with all regulations.

NOTE: Some excavators are now equipped with factory fitted Quick Coupler lock/unlock controls. If these comply in your region then in general, these controls are suitable for use with Doherty Snaplock+ couplers, however Doherty recommend that the Snaplock+ keypad to be used. Doherty will not take any responsibility for control switch if the Snaplock+ Ked pad is not used.



Approved Ked pads are available from Doherty and will be included with all new Snaplock+ couplers.	
	
The default 4 digit pin is set to 5713#	

SETTING AND RESETTING OF THE KEYPAD 4 DIGIT CODE

The default lock / unlock code is factory set to 5713#, should you want to change the code to be different follow the instructions below:

Enter:	*7258*
Enter:	0#
Enter:	2#
Enter:	“new code” then #

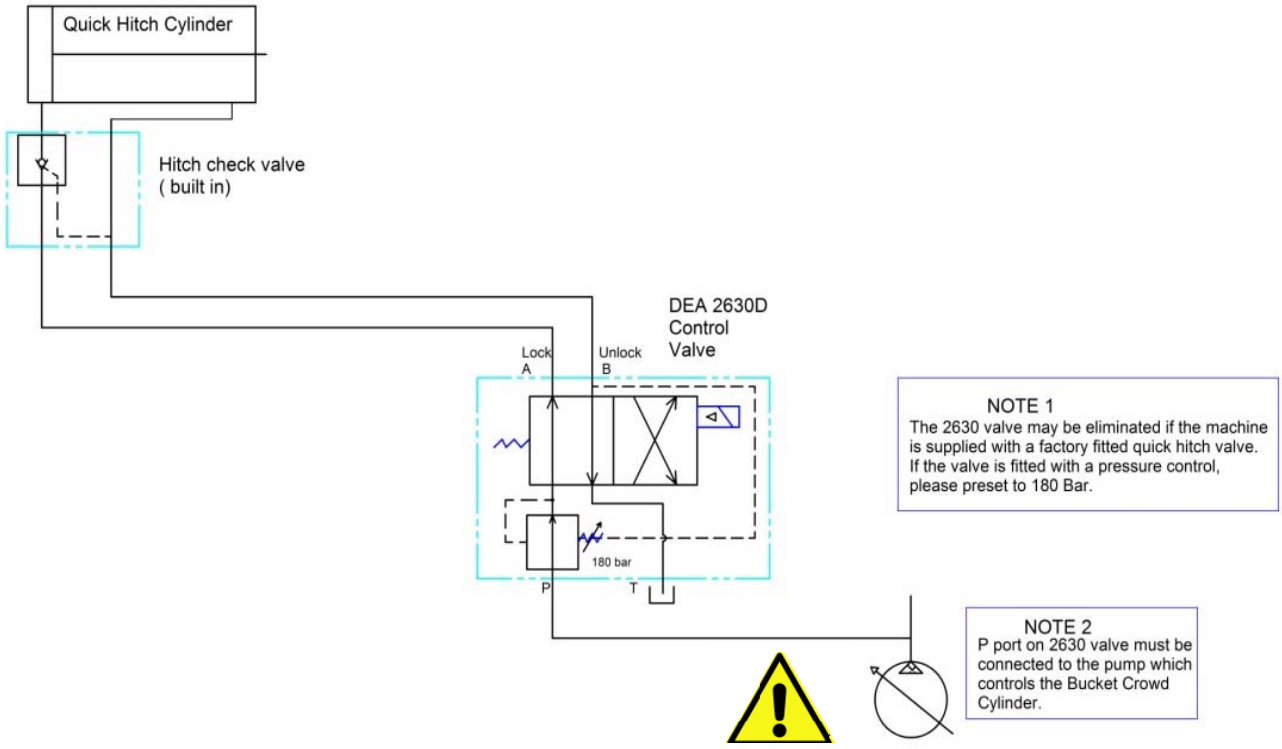
B. HYDRAULICS

The Doherty Snaplock+ is designed to operate between180 -250 bar (2500-3000 psi) and using an approved control valve. The valve must be open to the locking port so that in the event of an electric problem, the coupler will always remain locked when the machine is operating. Approved Control Valves (12 and 24V) are available from Doherty and will be included as part of the Coupler Fitting Kit if this was ordered with the coupler.

It is the installer/dealers' responsibility to ensure that any factory fitted controls fully comply with all current Health and Safety Regulations.

TYPICAL SNAPLOCK+ CONTROL CIRCUIT.

DEA DUAL LOCK CIRCUIT.



CONNECTING THE COUPLER TILT CIRCUIT

The following pages contain information and schematics which detail the hydraulic requirements for correct operation of the Doherty rotary actuator. It is the installer's responsibility to ensure that these requirements are complied with and that the selected connection method is compatible with the host machine.
Doherty strongly recommend that no changes are made to the machine control system without consulting and obtaining agreement from the Dealer / Manufacturer.
Contact Doherty for additional assistance, if required.

HYDRAULIC PIPING REQUIREMENTS.

For best performance, purpose run hydraulic tubing should be fitted to the boom and dipper arm. Two runs of 3/8" OD tube are required for the coupler lock / unlock circuit. Take care to ensure tube and hoses are adequately sized to provide the recommended flow rates.

It is recommended that a manifold block be fixed to the end of the dipper arm as shown in the following drawing. This is a convenient place to connect the coupler control hoses and allows adequate room for hose movement during bucket crowding. Please ensure all new tubing and hoses are thoroughly cleaned (blown out) before final assembly.

INSTALLATION

This chart shows the flow and pressure requirements for the tilt function of the Doherty Tilt coupler. Refer to the ID plate to select the correct model.

COUPLER	Litres / Min	MinTube Dia	Hose
HDT015-180 deg	4	¼	¼
HDT025-180 deg	4	¼	¼
HDT035-180 deg	5	¼	¼
HDT055-140 deg	10	¼	¼
HDT080-140 deg	15	¼	¼
HDT140-140 deg	45	3/8	3/8
HDT240-140 deg	60	5/8	1/2
HDT290-140 deg	60	¾	½
HDT350-100 deg	75	¾	½
HDT450-100 deg	80	¾	½
HDT650-100 deg	90	1	¾

NOTE

Some excavators have factory fitted breaker piping. This may be used for tilt coupler connections (if no breaker is to be fitted) provided:

1. The nominated operating pressure and flow rates can be maintained.
2. A directional control valve is connected.
3. Some breaker circuits employ an open centre valve spool which vents to tank when in the open position and this can cause the tilt action to be “soft” or “spongey”.
4. Excessive oil volume in larger breaker lines can cause some actuator movement due to oil compression, especially on long boom sets.

Conditions 3 and 4 above may require the installation of a port checked cross line relief valve, lock valve, or counterbalance valve, close to the coupler, to ensure correct operation.

CONECTING THE TILT COUPLER HYDRAULICS.

The recommended hose routing is shown on the sketch below. Unlike many other tilt couplers the hose connections on the Doherty Rotary Tilt do not move during tilting so there is no need to allow extra length.

To establish the correct control hose lengths, crowd the coupler right forward and make up hoses to suit. Take care when crowding back to ensure excess hose rolls up dipper arm and does not foul on anything. The use of kevlar sleeves or “spaghetti” armouring is strongly recommended.

TILT CIRCUIT NOTES

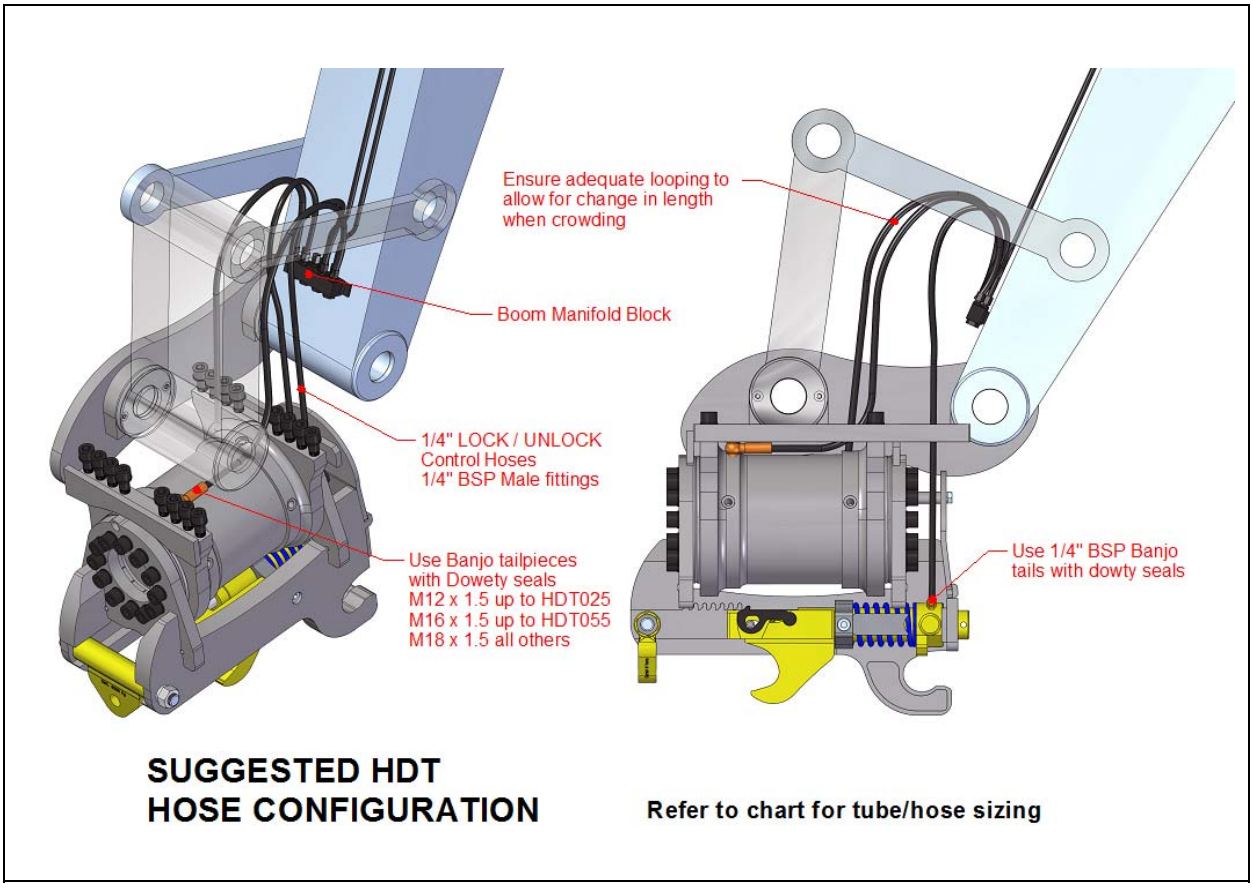
FLOW REGULATION. Refer to the chart on page 15 for recommend maximum flow rates. Suitable flow rate can be verified by timing the tilt from extreme left to extreme right. MAXIMUM TIMES should not exceed

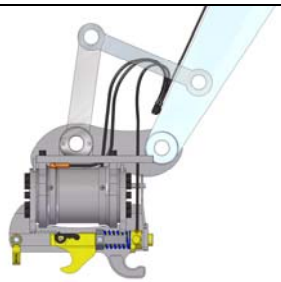
100 degree tilt	5 seconds
140 degree tilt	6-7 seconds
180 degree tilt	7-8 seconds

Faster tilt speeds will cause excessive shock loadings which may result in damage to coupler and machine and will also VOID the WARRANTY.

PRESSURE SETTING

To ensure the tilt operating pressure is correctly set the gauge should be fitted into the connections on the coupler or at the dipper arm manifold.. Maximum pressure is 180 Bar (2500 PSI).





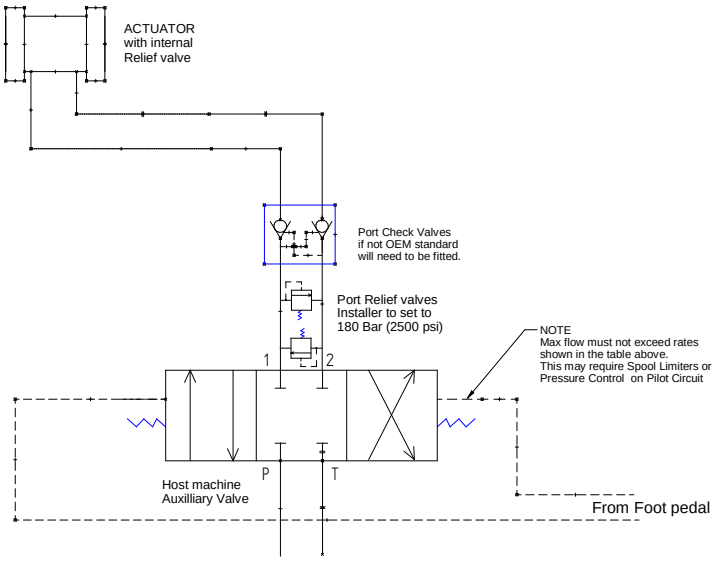
HYDRAULIC CONTROLS.

Typical control schematics are shown in the following figures. It is the responsibility of the installer to ensure that the selection method is fully compatible with the host machine.

PLEASE NOTE THAT HDT015, HDT025, HDT035 MODELS ALL REQUIRE A RELIEF VALVE TO BE FITTED.

ALL BVE MODEL ACUATORS ALSO REQUIRE A RELIEF VALVE TO BE FITTED.

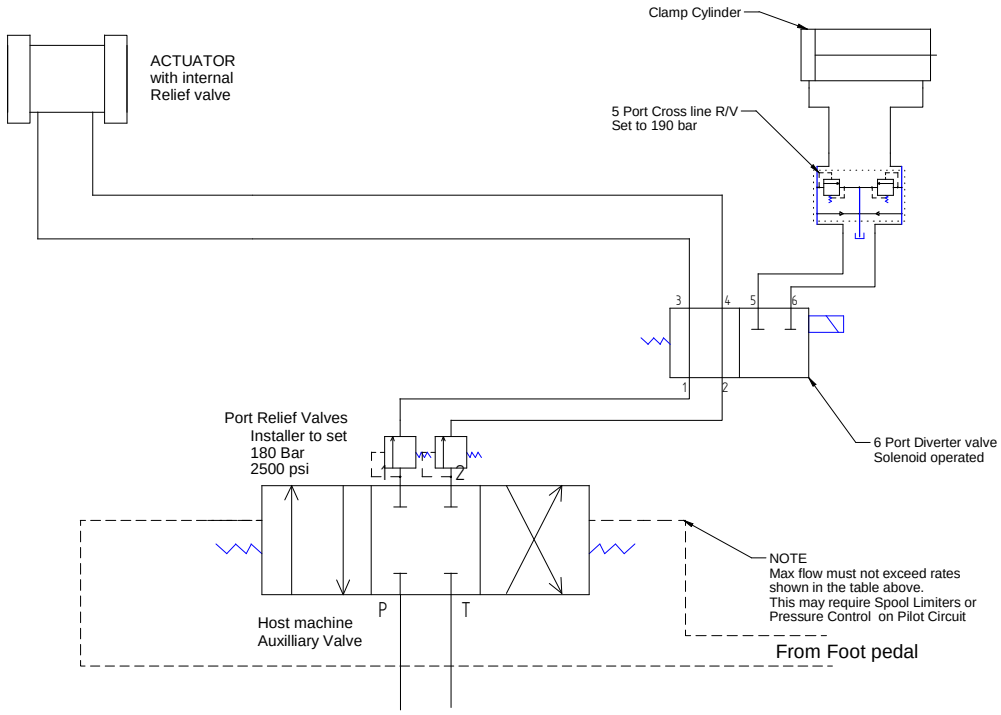
BVC ACTUATORS



FOOT PEDAL OPERATED AUXILARY VALVE

HSRC-01

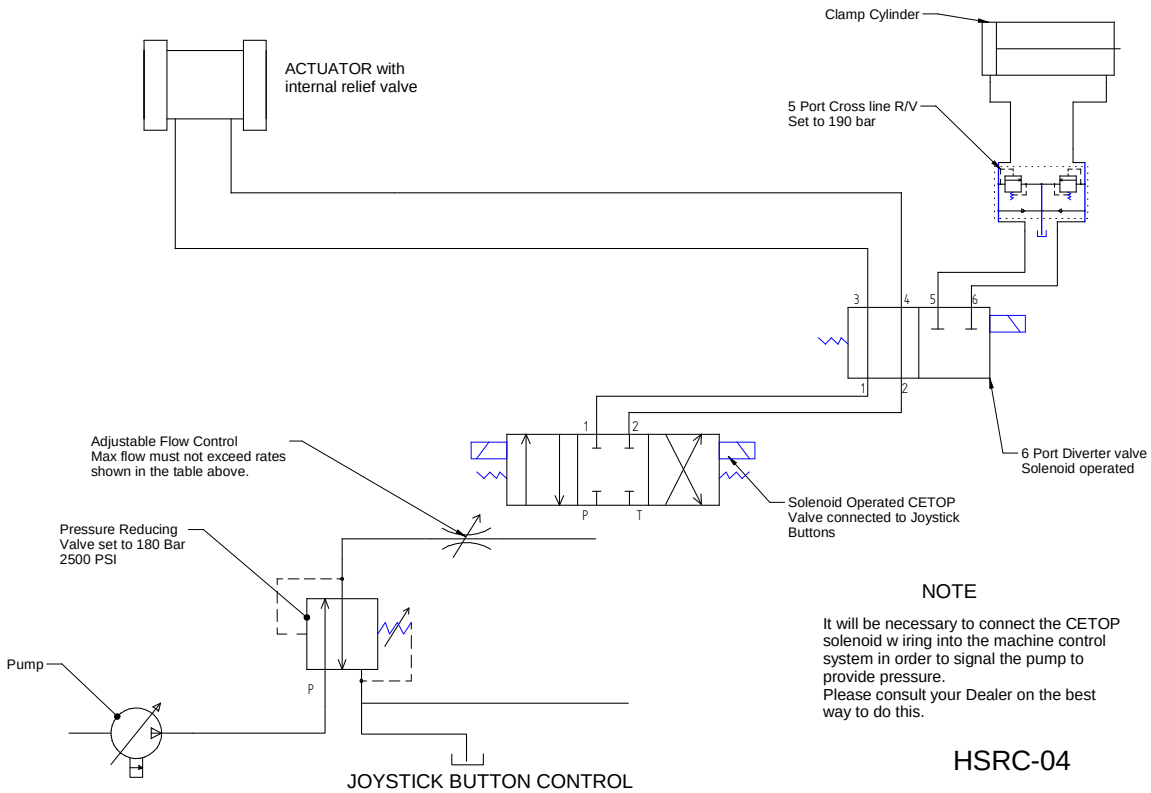
BVC ACTUATORS



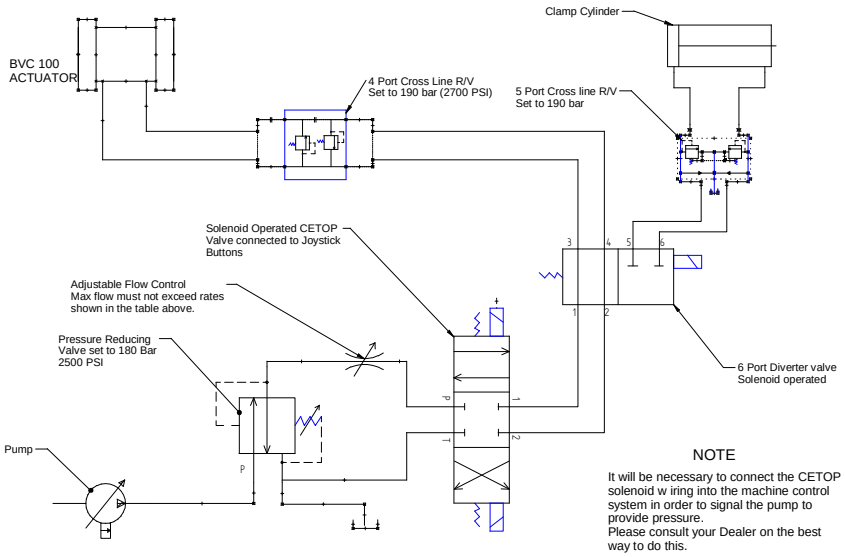
FOOT PEDAL OPERATED AUXILARY VALVE
With Clamp

HSRC-02

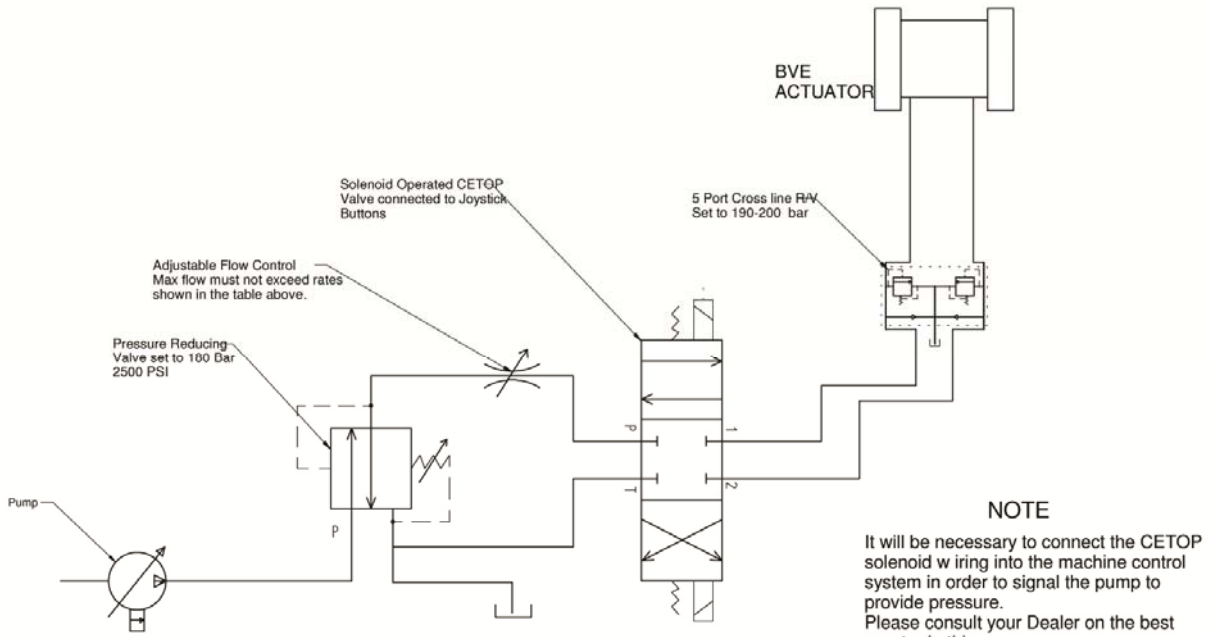
BVC ACTUATORS



BVC ACTUATORS

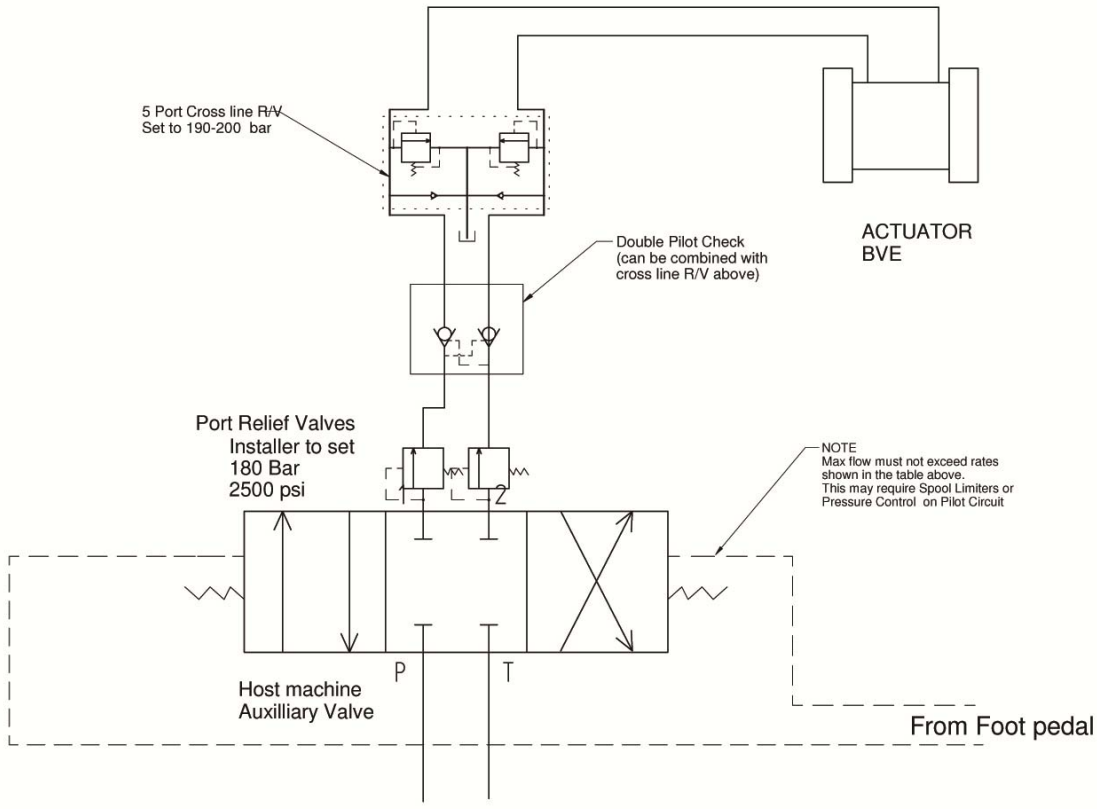


BVE ACTUATORS



JOYSTICK BUTTON CONTROL
No Internal Relief valve BVE

BVE ACTUATORS



FINAL CHECK

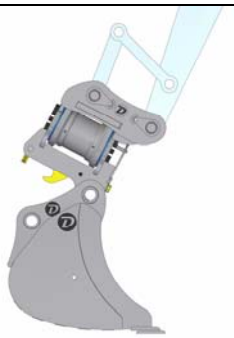
1	Verify all fittings and fasteners are tight and secure.	
2	Check the entire system for leaks.	
3	Move the Coupler through its entire motion slowly checking for: Hose chaffing Proper hose lengths Any type of mechanical interference.	
4	Test the Snaplock+ control keypad, ensure alarm sounds and light flashes when in unlock mode.	
5	Attach and detach all attachments to be supplied with the machine and ensure coupler locks securely.	
6	Ensure that all product and cab decals are correctly fitted and visible.	
7	Complete Warranty registration and Pre-delivery forms and return to Doherty Engineered Attachments to activate warranty.	
8	Ensure the this manual (or a copy) is kept in the operator's cab Additional copies of this manual are available in hard copy or electronic form from Doherty Engineered Attachments.	

OPERATION

LOCKING / UNLOCKING PROCEDURE

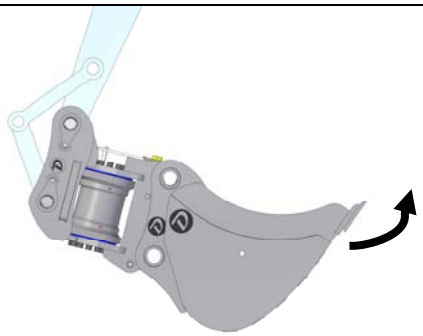
The Snaplock+ range of Quick hitch couplers comply to AS4772-2008 Australian standard for Earthmoving machinery – Quick hitches (Couplers) and requires a particular procedure for successful locking and unlocking which may vary from other couplers. It is important that all operators fully understand the correct procedure as described and illustrated below.

TO ATTACH:

STEP 1 Place coupler in the curled/crowded position. Enter keypad code– the buzzer will sound. Hold the bucket crowd lever for approx. 3-5 seconds to allow the hook to fully retract. Visually inspect to check the hook is fully retracted.	
STEP 2 Ensure that the jaw is fully retracted before attempting to engage the bucket. Place the coupler above the attachment.	
STEP 3 Curl the coupler to engage the front pin.	
STEP 4 Continue to curl the coupler until the attachment is lifted off the ground	

STEP 5

Fully curl/crowd the bucket. Re enter keypad code, the buzzer will cease. Hold the bucket crowd lever for approx. 3-5 seconds to allow jaw to fully engage and clamp the bucket pin.



DANGER – If the bucket/attachment pins have not been correctly engaged the jaw **MUST NOT** be retracted. This could cause the bucket to be unintentionally released from the coupler and could result in machine damage or personal injury. Please refer to step 8 for remedial action.

STEP 6

Visually inspect and check that the rear jaw is engaged.

If the front lock indicator is not visible:

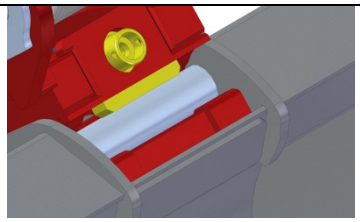
a. Fully extend the crowd cylinder

b. Re enter key pad code

c. Hold crowd on relief for 3-5 seconds

d. Re enter key pad code

e. Repeat c above and visually check again.

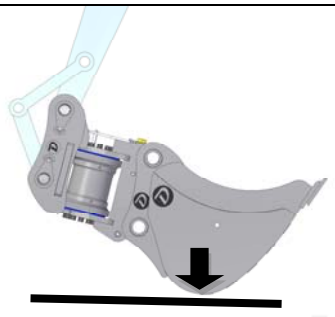


STEP 7

If it is not possible to view this from the cab then the operator must get out of the cab and stand in a safe place to visually inspect before operating the machine.

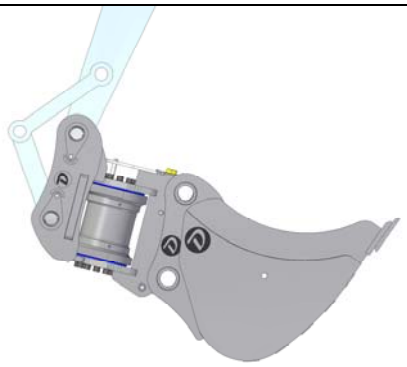
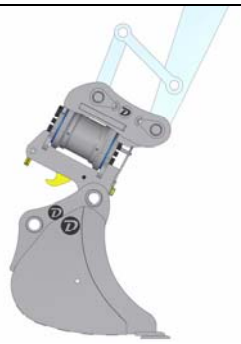
STEP 8

To ensure that the bucket pins are securely held by the coupler, apply pressure to the bucket by rotating it against the ground and away from the machine before operation. If the bucket is not correctly attached. Repeat the sequence from step 1.



OPERATION

TO RELEASE:

STEP 1 Fully extend bucket crowd cylinder. Enter key pad code – the buzzer will sound. Hold the bucket crowd on relief for 3-5 seconds to allow the hook to fully retract. **WARNING** – Do not release or change the bucket near any person or in any areas that may result in an accident or injury occurring. The key pad should be in the **attach** or **off** position at all times, except during bucket changing.	
STEP 2 Once the jaw is fully retracted, lower the attachment to ground and slowly curl the coupler back to release the rear bucket pin.	
Step 3 Lift the dipper arm until the coupler has disengaged the front bucket pin. The attachment is now safety disengaged.	

HANDY TIPS

1. Coupler should be unlocked on a daily basis to ensure satisfactory operation. This is particularly important when using hammers or digging in hard ground as the constant vibration can cause the wedged surfaces to become very tight.

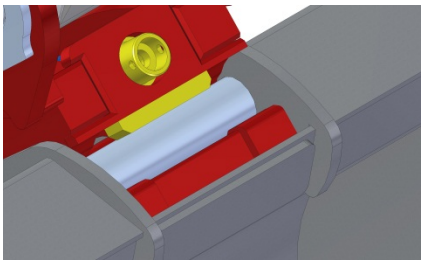
2. If your machine is to remain inactive for an extended period we suggest that the attachment be released to eliminate the possibility of seizing.

3. Keep your coupler clean. Build-up of material in the pin contact areas will affect the locking effectiveness and may cause unlocking problems.

4. The operator may experience slow or unexpected movement of functions when operating with cold hydraulic oil. Likewise, damage to the hydraulic components may result due to cold oil. Make sure to warm up hydraulic system before operation.

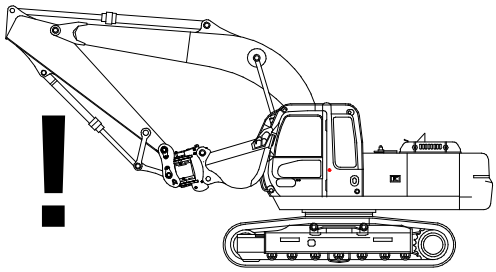
OPERATIONAL SAFETY NOTES

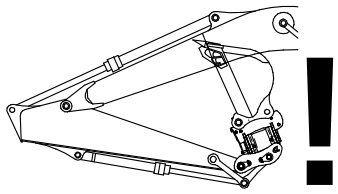
Site Personnel must stay clear when engaging and disengaging a bucket or an attachment.



If Yellow Snaplock indicator is not visible, the coupler is incorrectly attached. DO NOT OPERATE. Lower to the ground and carefully check for obstructions

If alarm continues to sound after entering keypad code to LOCK there is an electrical fault. DO NOT OPERATE THE MACHINE until this is rectified.





The installation of a quick coupler effectively lengthens the reach of your excavator's dipper arm. This may enable various attachments to come into contact with the boom set and operator's cabin. Operators must be aware of this and take appropriate care.

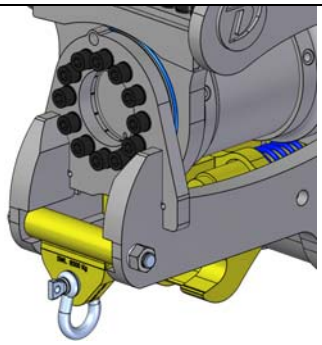
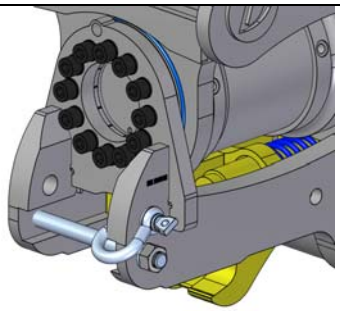
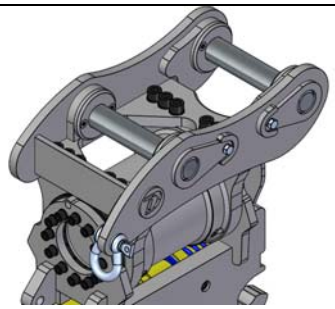
IMPORTANT SAFETY NOTICE

In the event of a loss of engagement failure, the Jaw Locking Pawls and springs/rubbers MUST BE REPLACED.

Due to the self tightening and automatic wear compensation features of this coupler it is recommended that the locking cylinder be disengaged at the end of each day.

USING THE LIFTING POINT.

The safe working load (SWL) in Kilograms is stamped adjacent to the lifting point and must not be exceeded. Note this rating must be checked against the machines lift chart ratings and the lower figure used in all situations.

		
Stamped SWL as shown	Stamped SWL as shown	Stamped SWL as shown
Shackle as shown	Shackle as shown	Shackle as shown
Depending on your model, the shackle and SWL stamp are shown as per above.		

These lifting points are designed for use only with certified BOW Shackles and no other fixing devices are to be used.

LIFTING SAFETY NOTES

Use ONLY A CERTIFIED BOW SHACKLE through the lifting point aperture.

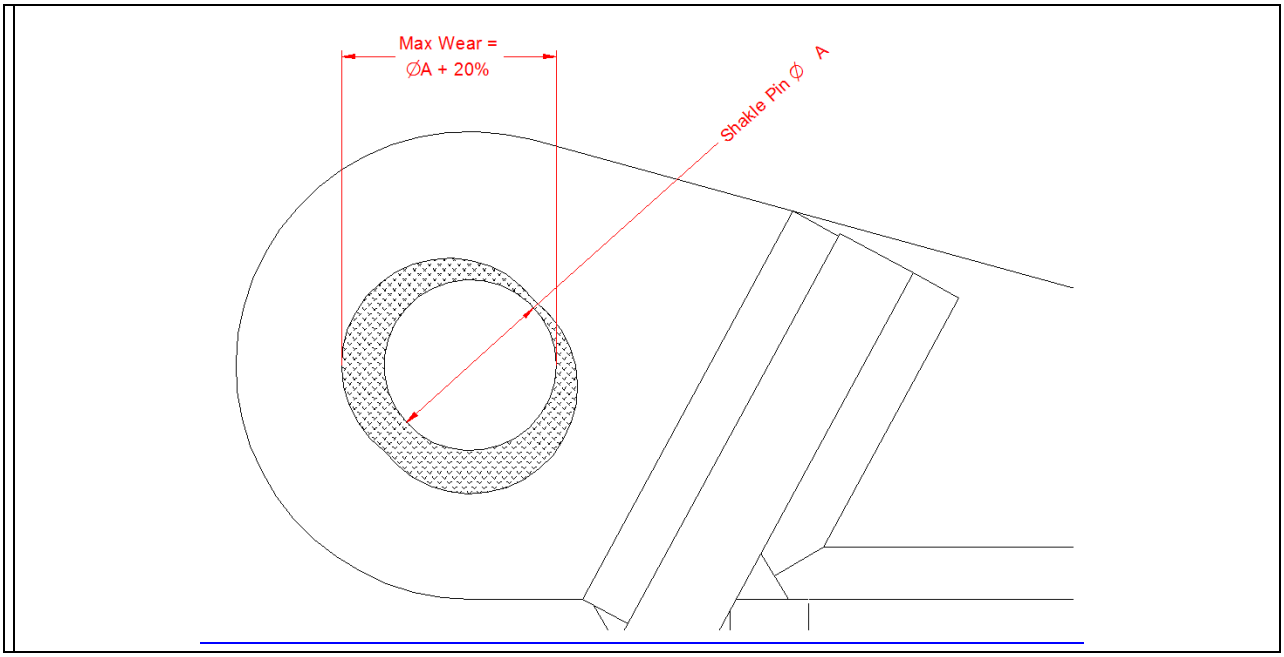
1. The safe working load (SWL) in Kilograms is stamped adjacent to the lifting point and must not be exceeded. Note this rating must be checked against the machines lift chart ratings and the lower figure used in all situations.
2. The safe working load (SWL)is also noted on the ID Plate and in this manual. THIS MUST NOT BE EXCEEDED under any circumstances.
3. ALWAYS remove the attachment from the coupler before lifting.
4. Fully extend the crowd cylinder when lifting.
5. Do not attach lifting chains or slings to any other part of the coupler.

LIFTING SAFETY WARNING

Daily inspections of the lifting eye is required, check for any wear and defects.

The lifting eye MUST be formally checked every six months for wear or damage, if the lifting eye is outside the tolerances shown in the chart below, do not use.

LIFTING EYE WEAR LIMIT



Daily Prestart Check

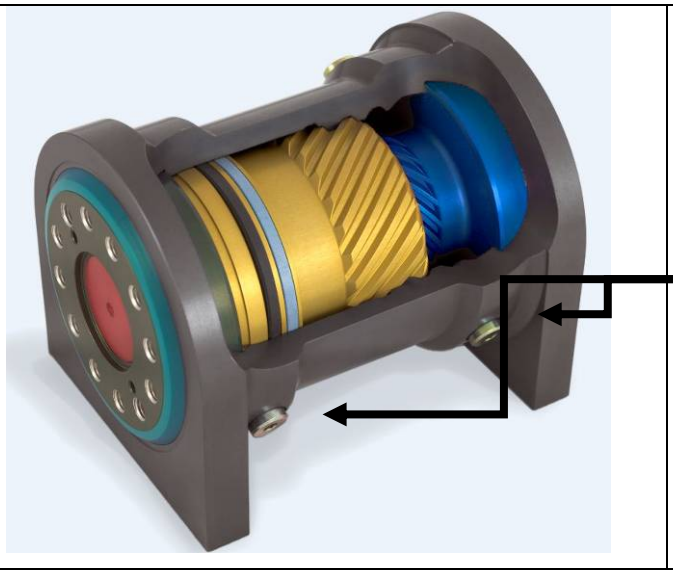
1. Disengage attachment from coupler.
2. Check all attachment pin retainer bolts and nuts for tightness.
3. Check attachments for pin wear - The Snaplock Quick Coupler is designed to take up wear, however if mounting pin wear exceeds 5% of the original diameter, immediately replace implement pins.
4. Check all hydraulic hoses and fittings for any leaks or wear.
5. Clean away any material build up around actuator end seals, cylinder guide ways, spring apertures and the pin engagement surfaces.
6. Supply one pump of grease to the actuator end seal grease nipples. Rotate fully to the Left and then to the Right and repeat the greasing procedure at each stop.

Weekly

1. Thoroughly clean coupler – (DO NOT water blast, this may damage the actuator end seals).
2. Check Coupler for evidence of fatigue, weld failure or stress. Do not operate with a cracked weldment.
3. Ensure oil is up to operating temperature. Fully tilt coupler and hold on relief for 5 seconds. Repeat in opposite direction. This will ensure that the actuator is flushed with clean oil. It is also an ideal time to check for leaks
4. Repeat daily checks above.

Monthly

1. Check all bolt torques using the schedule on the following page.
2. Remove one lower bleed plug and pump approx 1 litre of oil into a suitable waste container. Replace plug and repeat operation at the opposite end of the actuator while tilting in the opposite direction. This will ensure any internal contamination within the actuator is flushed out.



 Annually or 2000 hrs (whichever occurs first)

Annually or 2000 hrs (whichever occurs first)

1. Remove actuator from coupler and replace end seals.
2. Replace mounting bolts and lock washers. Use only Class 12.9 cap screws and torque to the table below.
3. Check all pin contact surfaces for wear. Build up and machine as required.
4. Remove Jaw and inspect Locking Pawls and Rubber. Any deformation or wear on the pawls indicates the need for REPLACEMENT. Do not reuse damaged parts.
5. Always replace the pawl rubber.

BOLT TORQUE GUIDE

Loose bolts should immediately be replaced. Use only Class 12.9 cap screws and nordlock washers. Pre lubricate with a good quality anti seize coating. Do not use "loctite".

CAP SCREW SIZE	TORQUE (NM)
M8	38
M10	75
M12	128
M16	311
M20	610
M24	1052
M27	1533
M30	2091

 INSPECTION SAFETY NOTES

Report Necessary Repairs. If your daily check uncovers any item that needs attention, repair, replacement or adjustment; REPORT IT NOW! The most minor defects could result in more serious trouble. If the machine is operated, only perform the work you are authorised to do. Do not attempt repairs you do not understand.

Check for broken, defective or missing parts and replace them. Keep equipment clean and free of dirt and oil so you can spot loose or defective parts.

Any damage to the Coupler should be reported immediately to either your site manager or directly to Doherty Engineered Attachments Ltd.

 IMPORTANT CAUTION – WELDING

Do not weld directly to the Quick Coupler without Doherty Engineered approval.

Do not weld any attachment while it is connected to the coupler. This may result in internal arc damage to the actuator and void any applicable warranty.

Always disconnect machine battery before any welding work is started.

 CAUTION

Never allow a hydraulic line or component to become contaminated. This could cause serve system damage. Contact an authorised machine distributor to obtain proper caps and plugs to be used on this machine.

 MAINTENANCE SAFETY NOTES

Improper operation and maintenance of this equipment could result in serious injury or death. Read the operator's manual and this book thoroughly before operating and/or maintaining this equipment.

Maintenance should only be performed by experienced and qualified personnel

Always wear protective clothing when performing maintenance.

Avoid oil spills. Use containers, rags, and/or absorbent towels to contain any oil leakage. Dispose of all waste oils, fluids, lubricants and other hazardous waste property

Do not operate the machine with a defective quick coupler. Inspect the Quick Coupler and all components before starting operation. Perform any necessary repairs before operating the Quick Coupler.

Make sure the Quick Coupler and any attachments connected are resting on the ground and property supported before performing any work on the Quick Coupler.

Unauthorised modification to the Quick Coupler or any of the Quick Coupler components may impair function, affect performance and affect the life of the quick coupler and the excavator. Unauthorised modification may impair personnel safety. Unauthorised modification will void your warranty.

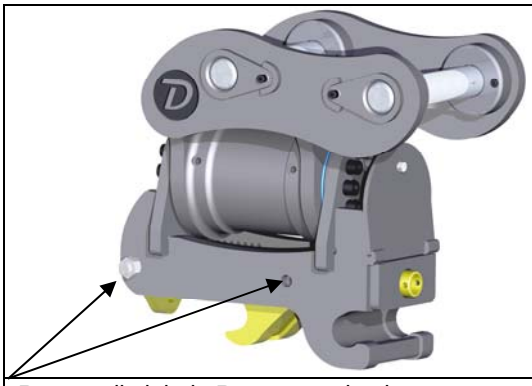
Under normal conditions, all machine hydraulic circuits are under extreme pressure. When inspecting for leaks, use a small piece of cardboard, wood or metal to locate leakages. Small (pinhole) leaks can be dangerous if contact with skin or eyes is made. Wear approved safety glasses and/or face shield, gloves, hard hat, safety shoes, and work clothes during all inspection and maintenance procedures.

All coupler/attachment combinations should be checked for possible interference before using. Ensure that the coupler engages and disengages properly and easily.

MAINTENANCE

TO REMOVE CYLINDER

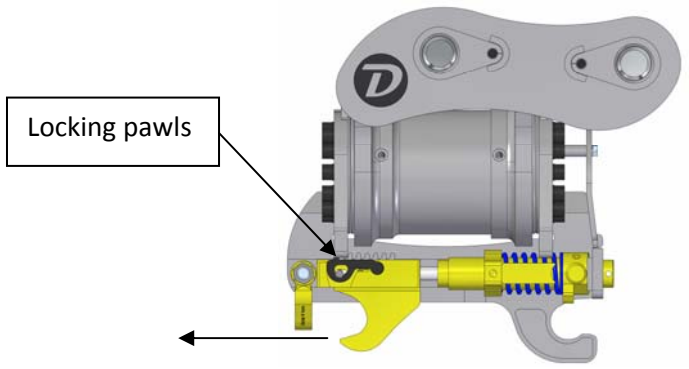
Vent pressure in hydraulic lines. Disconnect at the cylinder and plug all open ports and fittings.

	
Remove limit bolt. Remove spring locator cap screws from both sides.	Slide the jaw, spring locator and cylinder out the end as one. The jaw retaining pin can now be driven out to release the cylinder.

To refit:

1. Fit the main spring and spring locator.
2. Refit the jaw pin, ensure the pawl rubbers are in place and in good condition.
3. Fit the pawls and slide assembly into hitch coupler body.
4. Insert a length of 20 x 3 flat bar or similar between the top of the jaw and the hitch opening to depress the pawls
5. Use a G clamp to pull the spring locator into alignment and fit the cap screws.
6. Remove the flat bars and refit the rear limit bolt.



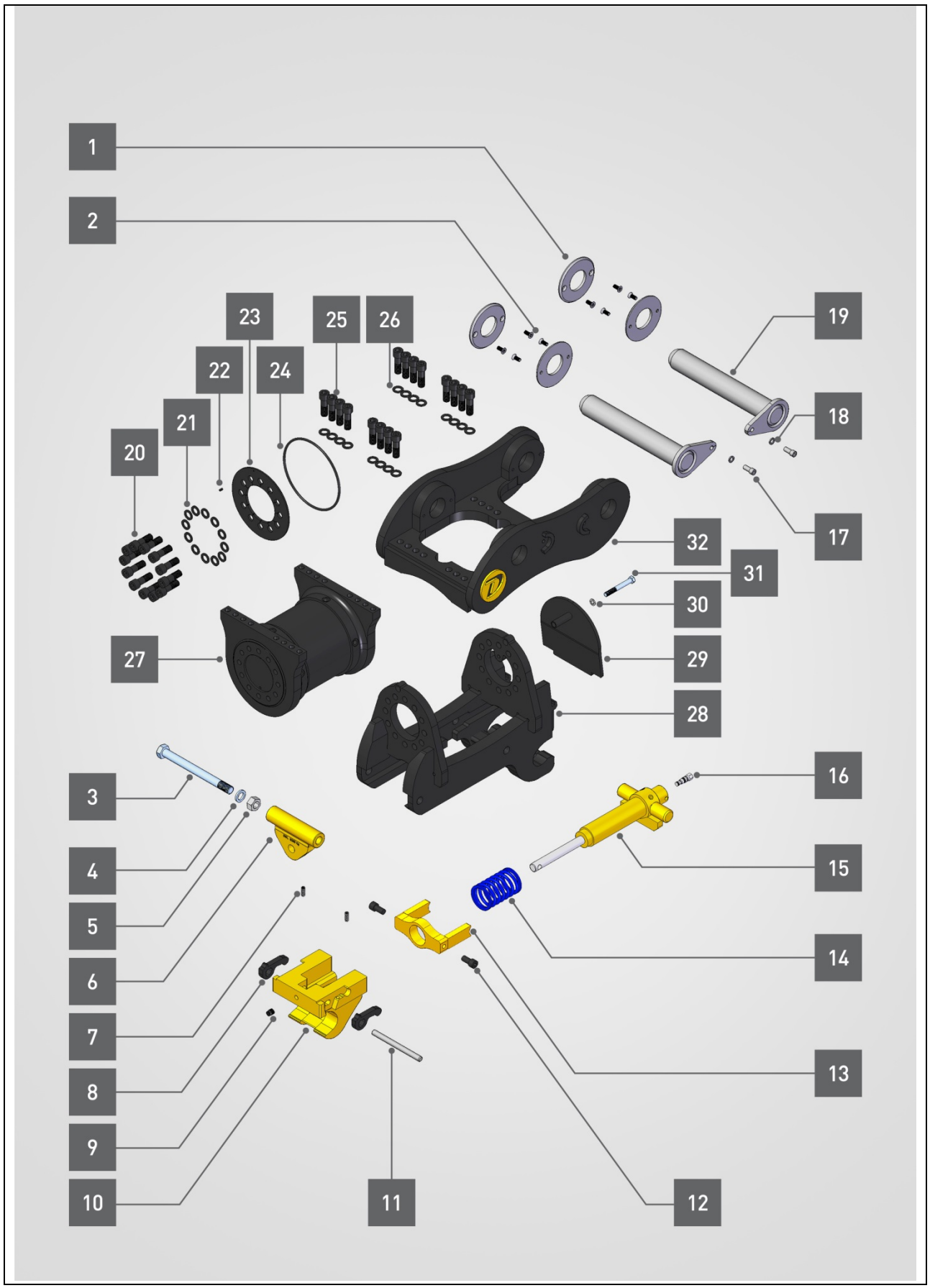
Please ensure this maintenance record is completed for any worked completed on quick coupler.

MAINTENANCE

Service record	Hour reading	Maintenance / Repair	Completed By	Date

Left blank intentionally

PARTS LIST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PARTS LIST

Reference #	Description	Quantity
1	Shim *	4
2	Shim counter sunk cap screw*	4
3	Lifting eye bolt	1
4	Lifting eye nordlock washer	1
5	Lifting eye Nut	1
6	Lifting lug	1
7	Pawl spring/rubber	2
8	Pawl	2
9	Jaw Grub Screw	1
10	Jaw	1
11	Cylinder pin	1
12	Spring locator bolt	2
13	Spring locator	1
14	Spring	1
15	Cylinder	1
16	Check valve	1
16a	Check valve seal kit	1
16b	Check valve yellow end cap	
17	Mounting pin bolts	2
18	Mounting pin nordlock washers	2
19	Mounting pins	2
20	End bolts	24
21	end nord lock washers	24
22	Grease nipple	2
23	End shim	2
24	End O ring	2
25	Top bolts	16
26	Top nordlock washers	16
27	Actulator	1
28	Bottom frame	1
29	Hose guard	1
30	Hose guard nordlock	1
31	Hose guard bolt	1
32	Top mount	1

* Supplied as a kit

WARRANTY POLICY

Warranty Period

Doherty Engineered Attachments Limited ("Doherty") standard warranty is for a period of twelve (12) months from date of sale or one thousand (1000) machine hours, whichever occurs first. The Rotary actuator used on Doherty BTA range of tilt buckets and Snaplock+ Tilt couplers is warranted for 2 years or 3000 hours (whichever occurs first).

Warranty Inclusions
This warranty covers defects in material and workmanship and is subject to receipt of supporting evidence and/or inspection by Doherty and confirmation that said attachment or part was installed and operated in accordance with Doherty's currently published instructions. Upon acceptance, Doherty shall repair or arrange for the repair and/or full or partial replacement of such attachment.

Any attachment or part repaired or replaced under the terms of this warranty policy shall retain the warranty period pertaining to the product's original date of purchase.

Warranty Exclusions

This policy does not cover machinery, parts or accessories that are warranted directly to the end user by third party manufacturers, for example hydraulic cylinders, hoses, valves, or any other portions of hydraulic kits used in Doherty products but not manufactured directly by it. Failure to follow Doherty's or the third party manufacturer's recommendations for oil pressure and flow ratings on hydraulic components will invalidate all warranty claims relating to both the attachment and the hydraulic components of the attachment.

Doherty shall not be responsible for any problems associated with hose fittings, damage or malfunction after installation regardless of cause. If in doubt, contact Doherty for assistance and advice.

This policy does not apply to parts which have been repaired by the owner or a third party without prior formal written authorisation from Doherty.

This policy does not apply to parts which in Doherty's opinion, have been subjected to or adversely affected by operator misuse, accident, negligence, improper installation, maintenance, or storage.

Normal wear parts and parts requiring regular lubrication are not covered by this warranty.

This policy is restricted to the direct repair and/or replacement cost of the said part. It does not apply to any incidental or consequential costs such as transport, travel, injury, accident downtime, consumables and any other indirect expenses.

Doherty accepts no responsibility whatsoever for the suitability or otherwise of the carrier machine or other equipment to which a Doherty attachment may be mounted upon or fitted to.

Doherty shall not be held liable for injury or damage caused to any persons, place or machine by reason of the installation, use or mechanical failure of any Doherty attachment.

Doherty shall be under no liability in respect of any defect in the goods arising from any drawing, design or specification supplied by the buyer.

In relation to the supply of buckets by Doherty the above warranty shall only apply to cracking and bending of the buckets during correct and normal usage and shall not extend to the breakage of or failure of bucket teeth, cutting edges, bucket sides or base or to any other failure in performance due to a bucket being used in applications outside of its intended specified applications, including for example where a general purpose bucket or heavy duty bucket is used for rock and concrete excavations.

Doherty shall be under no liability under the above warranty (or any other warranty, condition or guarantee) if the total price of the goods has not been paid in full.

Doherty Obligations

At its option, Doherty will repair or replace the said part. Any repair work may be carried out at Doherty's own premises, at the workshop of an authorized Service Agent/Dealer, on the site at which the part or attachment is being used, or at any other location that Doherty considers appropriate under the circumstances.

Under the terms of this warranty, Doherty's obligations are limited to the repair or full or partial replacement of the defective item(s) and do not include any costs, direct or indirect, associated with the removal or reinstallation of the attachment or part on the carry machine. This is the responsibility of the Customer.

Doherty warrants that any repair work carried out by it directly shall be conducted in a timely and professional manner. Where a third party is engaged to carry out repair work in connection with a Doherty warranty claim, Doherty's obligation and liability shall be limited to a refund of the authorized reimbursable costs charged in connection with the provision of such work.

Customer Obligations

The Customer is responsible for the correct and proper installation of the part or attachment as detailed in the Operation and Maintenance documentation supplied by Doherty, including hydraulic and electrical connections.

The Customer is responsible for the completion of the formal Pre-delivery check and the Warranty Registration forms (which form part of the above documentation) and their return to Doherty within seven days of initial commissioning.

The Customer is responsible for ensuring that the part or attachment, including any hydraulic components and fittings, is operated and maintained using best industry practice and in accordance with the Operation and Maintenance documentation supplied by Doherty. (a copy of which is available on request.)

The Customer is also responsible for notifying Doherty as soon as it identifies a defect or problem that may potentially be subject to a claim under this policy and for following Doherty's published Warranty Claim Procedure.

WARRANTY PROCEDURE

Warranty Claim Procedures

To ensure your warranty claim is processed in the fastest possible manner, please ensure the following procedures are followed:

1. Upon identification of problem/failure immediately report/notify Doherty before any work is completed on the attachment or component.

2. Complete the Doherty warranty claim form and provide all information requested and email or fax to Doherty before any work is carried out.

3. Upon receipt of the warranty claim form Doherty will assess the claim and provide in writing what action is to be taken and issue a warranty claim number if deemed warranty.

4. Any repair work may be carried out at Doherty's own premises, at the workshop of an authorized Service Agent/Dealer, on the site at which the part or attachment is being used, or at any other location that Doherty considers appropriate under the circumstances.

5. An estimate of costs must be provided in writing before any repair work commences by a third party who is not an authorised service agent/dealer.

6. Where Doherty has opted to replace in part or full, the defective components to be replaced will be dispatched as quickly as possible. Please ensure part numbers are quoted from parts manual if applicable.

7. It is the responsibility of the Customer to arrange for the delivery of the failed components.

All warranty claims are subject to Doherty's standard warranty policy.

Any repair work carried out by a third party prior to a warranty claim number been issued by Doherty will invalidate the claim. All Invoices for repair work completed by a third party must include warranty claim number, component serial number, description of work completed and date work completed.

Contacts:

New Zealand: Phone +64 7 574 3000, Fax +64 7 574 8030

Australia: Phone 1800 057 021, Fax +64 7 574 8030

All emails to be sent to customersupport@dohertydirect.net and cc'ed to your point of contact.

WARRANTY CLAIM FORM

Warranty Claim Form

Date	Warranty Claim #

Contact Information

Company	Contact	Phone	Fax
Mobile	Email	Other	

Delivery details

Provide full details

Product details

Serial number	Model	Description	Purchase date
Excavator Make	Excavator Model	Hour Metre reading	Failure Date
Description of problem, Please provide all details, photo's, video and any other information to support claim, add additional pages if required.			

Estimated repair costs

Only required if work is getting carried out by a third party which is not an authorised service agent/dealer. Please ensure estimated hours and rate is shown.

Important Notes: Please ensure Photo's are of complete item, if a component please supply photo of both component and complete product, if zoomed in for a shot, please ensure overall shot is also supplied. In regards to a Quick hitch coupler failure, please also supply photo's of the implements it is used with. Photo required of metre reading and serial plate of product.

Note: This form is available online at www.dohertydirect.net