



# HYDRAULIC GRAB

## OPERATING & MAINTENANCE MANUAL



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# 1 INTRODUCTION



**Hydraulic Grab**

Congratulations on purchasing a Norm Engineering Pty Ltd attachment. We have designed this hydraulic grab for a long, productive, and safe life. Your attachment will provide you with years of service provided regular maintenance and correct usage is applied.

This manual offers a guide on how to safely assemble, mount, operate and maintain your hydraulic grab. While the manual attempts to cover most situations, there are many unforeseen risks and events that are not included due to the capability of the hydraulic grab. On this basis the owner and/or operator must determine if this attachment is suited for a particular purpose.

Norm Engineering Pty Ltd can accept no responsibility or liability for how you operate your equipment: we can only provide warning notes and safety precautions in relation to the standard operation of the hydraulic grab.

The illustrations and data used in this manual were current at the time of printing but due to possible engineering and/or production changes, this product may vary slightly. Norm Engineering Pty Ltd reserves the right to redesign and/or change components as may be necessary without notification.



## 2 SAFETY DEFINITIONS: TERMS AND SYMBOLS

We will use the ANSI Z535.4-2011(R2017) standard for the definitions of signal words as described in conjunction with colours red, orange, and yellow. These are used with the Safety Alert Symbol:

- **Signal word:** Are defined as the words used in the signal word panel. The signal words for hazard alerting signs are “DANGER”, “WARNING”, and “CAUTION”. Safety notice signs use the signal word “NOTICE”. Safety instruction signs use signal words that are specific to the situation.
- **DANGER:** Indicates a hazardous situation, which, if not avoided, **will** result in death or serious injury. This signal word is to be limited to the most extreme situations. (White letters on a red background) 
- **WARNING:** Indicates a hazardous situation, which, if not avoided, **could** result in death or serious injury. (Black letters on an orange background) 
- **CAUTION:** Indicates a hazardous situation, which, if not avoided, **could** result in minor or moderate injury. (Black letters on a yellow background) 
- **NOTICE:** Indicates information considered important, but **not** hazard-related (e.g., messages relating to property damage). (White letters on a blue background) 
- **SAFETY INSTRUCTIONS:** Indicates a type of safety sign, where specific **safety-related instructions** or **procedures** are described. More definitive signal words are encouraged, where practical (e.g., SAFE SHUTDOWN PROCEDURE, SAFE OPERATING PROCEDURE). (White letters on a green background) 

### 3 SAFETY INSTRUCTIONS



Obey all the safety instructions listed in this section and throughout this manual. Failure to follow instructions could result in death or serious injury.

#### NOTICE

Before attempting any type of assembly operation, maintenance, or other work on or near this product:

- READ and COMPLETELY UNDERSTAND:
  - This manual,
  - The manuals provided with the power unit being used with this attachment.
- Read and understand all safety signs associated with the equipment being used.
- Know all your controls and know how to quickly stop all power unit movement, the attachment movement, and the engine in case of an emergency.

**SAFETY IS YOUR RESPONSIBILITY AS THE OPERATOR OF THE EQUIPMENT**

Inappropriate and/or irresponsible use of a hydraulic grab may cause serious injury and trauma. The operator must have all relevant industry competencies, qualifications, certificates and/or licenses.

The operator must understand their responsibilities under the relevant acts and regulations of the governing body. Failure to comply with your legal obligations under the act may result in prosecutions against you.

As the equipment operator you are responsible to familiarise yourself, and anyone else who will assemble, operate, maintain, or work around this product with the safety information contained within this manual. You must make certain that all operators and maintenance personnel have a complete understanding of the full and exact contents of this manual and those of the power unit.

There are usually specific precautions and steps in the power unit operating manual to be taken to ensure your safety prior to engaging the attachment.

Conduct a job site survey during the planning phase of any construction project to identify potential hazards and develop and implement appropriate control measures to protect workers.

Accidents are preventable if the equipment operator is careful and responsible. No accident prevention program can be successful unless there is a wholehearted commitment and cooperation of the person who is directly responsible for the operation of the equipment.

Make sure anyone who will be installing, maintaining, repairing, removing, and/or storing this product applies the Workplace Health and Safety Act requirements. This includes ensuring that the person has been instructed in the safe operation of this product and of the power unit to which this attachment is likely to be attached.

Know and follow good work practices, some of these include:

- To optimise the physical environment such as having a well-lit, level surface that is clean and dry to work on.
- Use properly grounded, test and tagged electrical outlets and tools.
- Use the right tool for the job at hand.
- Make sure that your tools are in good condition for performing the required function.
- When using tools, wear the protective equipment specified by the tool manufacturer (hardhat, safety glasses, work gloves, protective shoe...)
- When the attachment has been out in the sun, remember to wear protective gloves as the metal will be hot to touch.
- Before starting, know the job duration, job complexity, and best procedure.
- Ensure workers have the capacity to do the job.
- Check that all hazards have been identified and control measures implemented.
- Clear communication so everyone present knows what is happening.
- Clear emergency stop procedure so there is no confusion in an emergency.
- Ensure the use of tyre stoppers and securing framework to stop the plant and plant attachment moving during maintenance.

## 3.1 IMPORTANT POINTS

When your power unit is used during any type of assembly, operation, maintenance, or other work on or near this product:

- Before leaving the operator's station or before beginning any type of work on this product, lower this product to the ground, apply your power unit's parking brake, stop the engine, remove the starter key, wait for all moving parts to stop, and then relieve all pressure in the hydraulic lines. Refer to your power unit's operating manual for instructions on preparing the equipment for hitching up an attachment and relieving hydraulic pressure in lines.
- Know your power unit's safe lifting and operating capacity and the weight of this product. (Check the power unit's operator manuals for safe operating limits).
- Only allow the operator to be around the power unit or this product when either is in motion. Ensure work area is clear of all personnel.
- Apply all safety guidelines in relation to the operator and the equipment.
- Only operate controls from the operator's station.
- Maintain operator presence at all times when the engine is running, or the product is raised on the power unit.
- Reduce speeds when additional weight and width need to be considered especially over rough ground.
- Consider the operating environment if dust is a concern reduce the machine speeds.
- Whilst in motion keep the product close to the ground and under control.



## 4 PREDELIVERY

The following steps should be performed when fitting this attachment to a power unit for the first time. Failure to perform these checks may lead to damage of the attachment, the power unit and be a risk to safety. Warranty claims that arise as a result of skipping these steps may be challenged.

### 4.1 CHECK PICKUP FIT

Perform '5.1 Hitching Up the Hydraulic Grab' to check how the attachment fits the coupler. Check for the following:

- Does the hitch lock onto the pickups?
- Is it a tight fit?

### 4.2 CHECK RANGE OF MOTION

Carefully go through the attachment and power units full range of motion together. If unexpected contact occurs, contact Norm Engineering to discuss. Due to the capabilities of this product some contact with the power unit may be unavoidable. In this case place the warning sticker provided on the attachment and inform the owner/operator.



### 4.3 CHECK HYDRAULIC HOSES

If you are unsure how to route the hydraulic hoses, contact Norm Engineering. Connect hoses and once again thoroughly check full range of motion to make sure:

- They do not pull tight.
- They do not have excessive length.

If the hose length is not correct, call Norm Engineering first for assistance.

## 5 ASSEMBLY INSTRUCTIONS



Obey all instructions listed in this section of the manual. Failure to follow the instructions listed below could lead to serious injuries.

For any assistance with the following processes, please contact Norm Engineering.

### 5.1 HITCHING UP THE HYDRAULIC GRAB



All safety precautions pertaining to both the power unit and the hydraulic grab need to be followed. Sufficient planning should be made prior to any work commencing in case of an emergency situation.

**Step one:** Before beginning any work on this product, lower the product to the ground on a firm level surface that is large enough to accommodate this product, the power unit, and workers involved in the hitching up the hydraulic grab.

**Step two:** Refer to your power unit's operating manual for instructions on hitching up this attachment. Visually inspect to ensure the attachment is fully engaged to the power unit hitch.

**Step three:** Engage the locking mechanism. A visual inspection should be performed to confirm all locking systems are secured. Give the hydraulic grab a few short sharp movements close to the ground to ensure it is engaged.

**Step four:** Rest the attachment on the ground and refer to the power unit operating manual to release the pressure in the hydraulic system.

**Step five:** Connect the hydraulic couplings on the hydraulic grab to the power unit couplings following all safety precautions specified in the power units operating manual.

**Step six:** Start the power unit and cycle the hydraulic grab cylinder several times before taking it near other personnel.

## 5.2 REMOVING THE HYDRAULIC GRAB

### **⚠ DANGER**

All safety precautions pertaining to both the power unit and the hydraulic grab need to be followed. Sufficient planning should be made prior to any work commencing in case of an emergency situation.

**Step one:** Remove the power unit from anywhere near other personnel and onto a firm level surface large enough to safely accommodate this product, the power unit and all workers involved in removing the hydraulic grab.

**Step two:** Rest the hydraulic grab on the ground.



**Step three:** Disconnect the attachments hydraulic couplings from the power unit following all safety precautions. Refer to your power unit's operating manuals.

**Step four:** Disengage the locking mechanism. A visual inspection should be performed to make sure the hydraulic grab is fully disengaged.

**Step five:** Refer to your power unit's operating manual for instructions on removing the attachment and confirm the hitch is fully disengaged from the hydraulic grab.

**Step six:** Store safely.



## 6 OPERATING INSTRUCTIONS

**⚠ DANGER** When using the hydraulic grab, ensure all personnel wear appropriate personal protective equipment at all times. All personnel must stand well clear of the hydraulic grab during operation. Contact with the attachment, power unit or flying debris and dust could cause injury to personnel working in the vicinity of the power unit.

### 6.1 SPECIFIED OPERATIONS

The hydraulic grab has been designed to grapple, lift, and position rocks, logs, and other debris such as construction sit rubble.



It may be use on a construction/demolition site or alternatively would be an effective tool on many landscaping jobs.

#### NOTICE

The serrated teeth on the grab may not be suitable for lifting softer rocks such as sandstone. They may leave marks on the surface of the rock.

The hydraulic grab uses the power units auxiliary hydraulics. Refer to the power units operating manual on controlling the auxiliaries to open and close the grab.

 **DANGER**

**NEVER** release the hydraulic pressure or divert the hydraulic oil away from the auxiliary circuit whilst grabbing and lifting with the hydraulic grab.

 **DANGER**

**NEVER** lift an object over a person working in the vicinity of the power unit.

## 6.2 SPECIFIED LIMITATIONS

Misuse may damage the attachment or lead to injury and trauma.

 **DANGER**

- **DO NOT** exceed the lifting capacity of the power unit (Refer to the power units operating manual for safe operating limits).
- **DO NOT** shackle/sling any load from the structure of the grab.
- **DO NOT** use the grab to lift or carry any persons.
- **DO NOT** divert hydraulic flow away from the auxiliary circuit whilst lifting with the grab.
- **DO NOT** release objects from the grab from an unsafe height or onto an uneven surface.
- **DO NOT** swing the grab into heavy objects in an attempt to move them (The grab is **NOT** a battering ram).



## 7 MAINTENANCE AND CARE

### 7.1 HYDRAULICS



Read and understand all safety requirements prior to beginning any maintenance to any hydraulic connections. It is imperative that if there are any fittings, repairs etc. required these must be conducted by a fully certified and qualified hydraulics fitter.

### 7.2 PRIOR TO USE

Prior to use, the hydraulic grab shall be visually inspected to verify the attachment is in an operational state. The inspection will check for:

- Signs of wear, including corrosive and abrasive wear.
- Markings are legible.
- Welds are not damaged, cracked or worn.
- Hydraulic hoses, fittings and cylinders are in good conditions with no leaks.
- All fasteners are in place and correctly torqued.
- Inspect the wear around the tyne teeth.
- Grease all fittings – this needs to be performed on a daily basis.

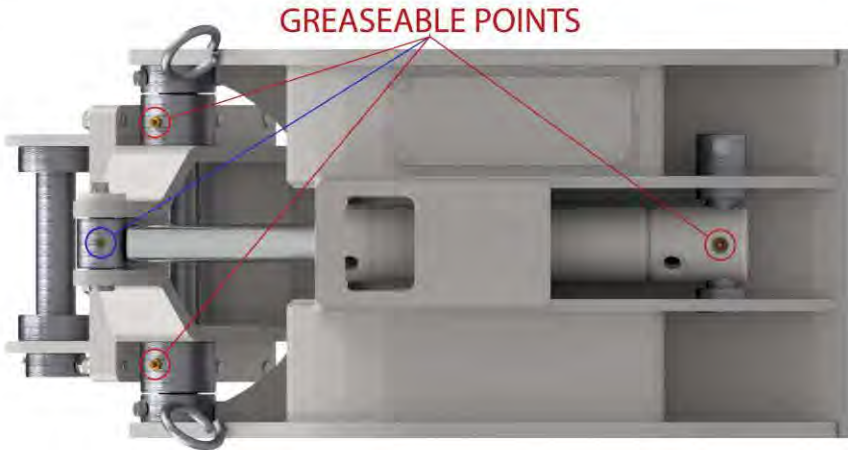
### 7.3 ROUTINE INSPECTION (EVERY 12 WEEKS)

Routine inspections should include but is not limited to the following:

- Fittings, hoses, and hydraulics must be checked to ensure there are no leaks.
- Pins and bushes should be inspected for signs of excessive wear and replaced before the wear damages the structure of the hydraulic grab.
- Inspect the attachment for wear, particularly around the tyne teeth, and seek advice on repairs if wear is excessive.
- Check to ensure attachment markings are legible.
- Organise for a certified and qualified hydraulics fitter to inspect and replace hydraulic hoses and seals in the hydraulic parts, as necessary. For additional information refer to section '12 Warranty'.

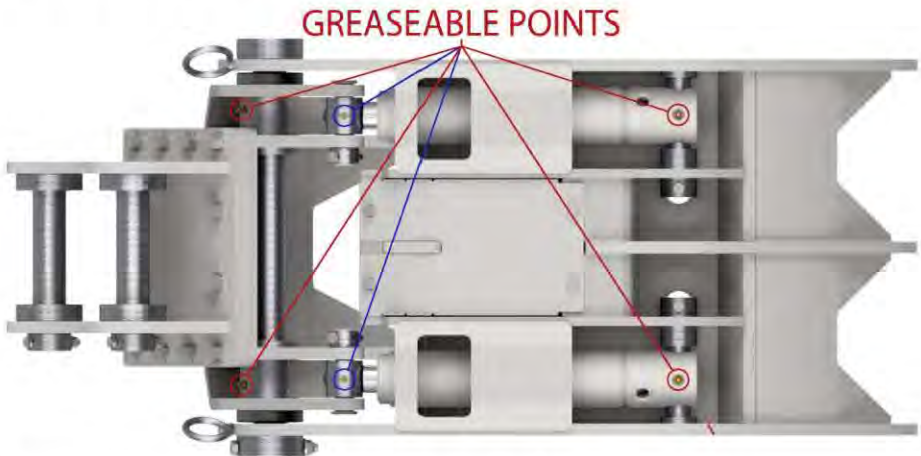
## 7.4 SINGLE CYLINDER GREASEABLE POINTS

The hydraulic grab is fitted with four greaseable points, two on the main pivot pin and one in each end of the hydraulic cylinders. These points should be greased on a regular basis to extend the life of the grab.



## 7.5 DUAL CYLINDER GREASEABLE POINTS

The hydraulic grab is fitted with six greaseable points, two on the main pivot pin and one in each end of the hydraulic cylinders. These points should be greased on a regular basis to extend the life of the grab.



# 8 RISK ASSESSMENT

Assessment Team: Norman Pesch, John Pesch, Sam Ramsden

Date of Assessment: 28/04/2022

Manufacturer: Norm Engineering Pty Ltd

Location: Brisbane

Contact Person: Norman Pesch

Attachment: Hydraulic Grab

Weight: 270-1270kg

Intended use: Grabbing of Materials

Construction material: Steel

Air Operated: NO

Hydraulic Operated: YES

Manually operated: YES

NOTE: When assessing Risk, you **MUST** consider the following

Inherent Risk:

(Risk before ANY controls). I.e., Before guarding / safety features are fitted.

Residual Risk:

(Risk after controls are fitted). I.e., after guarding / safety features are fitted.

Non Standard Operating Risk:

(Cleaning, Maintenance). I.e., What other risks can these tasks create.

Predictable Misuse:

I.e., What risks could occur due to misuse of the attachment.

## HAZARD INFORMATION

The plant must be assessed against the hazards listed for the probability of harm to operators working in close proximity and the environment.

### Probability

- A – Common or repeating occurrence
- B – Known to occur or “It has happened”
- C – Could occur, “I’ve heard of it happening”
- D – Not likely to occur
- E – Practically impossible

### Consequence

- 1 – Catastrophic – Fatalities
- 2 – Major – Major injury, LTI
- 3 – Moderate – Minor Injury
- 4 – Minor – First aid, slight injury
- 5 – Insignificant – Minimal risk of injury

	A	B	C	D	E
1	H	H	H	S	S
2	H	H	S	S	M
3	H	H	S	M	L
4	H	S	M	L	L
5	S	S	M	L	L

H = High

S = Significant

M = Medium

L = Low

### Entanglement:

<p>Can anyone's hair, clothing gloves, necktie, jewellery, rags, and other materials become entangled with moving parts of plant, or materials in motion?</p> <p><b>People in close proximity and not following SOP while the plant and plant attachment are in use can become entangled in the moving parts. i.e., hydraulic cylinders, and pivoting plates.</b></p>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	A	<input type="checkbox"/>	1	<input type="checkbox"/>	High Significant Medium Low	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
		B	<input type="checkbox"/>	2	<input type="checkbox"/>		
		C	<input type="checkbox"/>	3	<input checked="" type="checkbox"/>		
		D	<input checked="" type="checkbox"/>	4	<input type="checkbox"/>		
		E	<input type="checkbox"/>	5	<input type="checkbox"/>		

### Crushing:

<p>Can anyone be crushed due to falling, uncontrolled or unexpected movement of plant attachment or its load, lack of capacity to slow, stop or immobilise the plant, tipping or rolling over, parts of plant attachment collapsing, contact with moving parts during testing, inspection, maintenance, cleaning, or repair, thrown off, under or trapped between plant and materials or fixed structures?</p> <p><b>People in close proximity to the plant and plant attachment during operation could be crushed if the operator is not being sufficiently observant, or control over the plant is lost.</b></p>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	A	<input type="checkbox"/>	1	<input checked="" type="checkbox"/>	High Significant Medium Low	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
		B	<input type="checkbox"/>	2	<input type="checkbox"/>		
		C	<input type="checkbox"/>	3	<input type="checkbox"/>		
		D	<input checked="" type="checkbox"/>	4	<input type="checkbox"/>		
		E	<input type="checkbox"/>	5	<input type="checkbox"/>		

### Cutting, Stabbing, Puncturing:

<p>Can anyone be cut, stabbed, or punctured by coming in contact with moving plant or parts, sharp or flying objects, work pieces ejected, work pieces disintegrated, or other factors not mentioned?</p> <p><b>The plant attachment is designed with reinforced teeth used to grip different surfaces. These teeth can have shape edges which are capable of piecing skin.</b></p>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	A	<input type="checkbox"/>	1	<input type="checkbox"/>	High Significant Medium Low	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
		B	<input type="checkbox"/>	2	<input checked="" type="checkbox"/>		
		C	<input type="checkbox"/>	3	<input type="checkbox"/>		
		D	<input checked="" type="checkbox"/>	4	<input type="checkbox"/>		
		E	<input type="checkbox"/>	5	<input type="checkbox"/>		

### Striking:

<p>Can anyone be struck by moving objects due to plant or work pieces being ejected or disintegrated, mobility, uncontrolled or unexpected movement of the plant or other factors?</p> <p><b>People in close proximity to the plant and plant attachment during operation could be seriously hurt if they came into contact with the plant, or plant attachment if the operator is not being sufficiently observant, or control over the plant is lost.</b></p>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	A	<input type="checkbox"/>	1	<input checked="" type="checkbox"/>	High Significant Medium Low	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
		B	<input type="checkbox"/>	2	<input type="checkbox"/>		
		C	<input checked="" type="checkbox"/>	3	<input type="checkbox"/>		
		D	<input type="checkbox"/>	4	<input type="checkbox"/>		
		E	<input type="checkbox"/>	5	<input type="checkbox"/>		

### Slipping, Tripping, Falling:

<p>Can anyone using the plant or in the vicinity of the plant, slip, trip or fall due to the working environment or other factors? poor housekeeping, dust on the floor around machines, slippery or uneven work surfaces or lack of guardrails.</p>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	A	<input type="checkbox"/>	1	<input type="checkbox"/>	High Significant <input type="checkbox"/> Medium <input checked="" type="checkbox"/> Low <input type="checkbox"/>
		B	<input type="checkbox"/>	2	<input type="checkbox"/>	
		C	<input type="checkbox"/>	3	<input checked="" type="checkbox"/>	
		D	<input checked="" type="checkbox"/>	4	<input type="checkbox"/>	
		E	<input type="checkbox"/>	5	<input type="checkbox"/>	

### Shearing:

<p>Can anyone's body parts be cut off between two parts of the plant, or between a part of the plant and a work piece or structure? For example, on a metal guillotine can a finger fit under the guard.</p> <p><b>People in close proximity and not following SOP while the plant and plant attachment is in use can have body parts caught between the moving parts.</b></p>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	A	<input type="checkbox"/>	1	<input checked="" type="checkbox"/>	High Significant <input checked="" type="checkbox"/> Medium <input type="checkbox"/> Low <input type="checkbox"/>
		B	<input type="checkbox"/>	2	<input type="checkbox"/>	
		C	<input checked="" type="checkbox"/>	3	<input type="checkbox"/>	
		D	<input type="checkbox"/>	4	<input type="checkbox"/>	
		E	<input type="checkbox"/>	5	<input type="checkbox"/>	

### Friction:

<p>Can anyone be burnt due to contact with moving parts or surfaces of the plant, or material handled by the plant? For example, on the grinder is there more than 1 mm gap between the tool rest and the wheel?</p>	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	A	<input type="checkbox"/>	1	<input type="checkbox"/>	High Significant <input type="checkbox"/> Medium <input type="checkbox"/> Low <input type="checkbox"/>
		B	<input type="checkbox"/>	2	<input type="checkbox"/>	
		C	<input type="checkbox"/>	3	<input type="checkbox"/>	
		D	<input type="checkbox"/>	4	<input type="checkbox"/>	
		E	<input type="checkbox"/>	5	<input type="checkbox"/>	

### High Pressure Fluid:

<p>Can anyone come into contact with fluids under high pressure, due to plant failure or misuse of the plant?</p> <p><b>The plant attachment utilizes the plants high pressure hydraulic system, if a failure occurs it is possible to come into contact with high pressure fluid.</b></p>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	A	<input type="checkbox"/>	1	<input type="checkbox"/>	High Significant <input checked="" type="checkbox"/> Medium <input type="checkbox"/> Low <input type="checkbox"/>
		B	<input type="checkbox"/>	2	<input checked="" type="checkbox"/>	
		C	<input type="checkbox"/>	3	<input type="checkbox"/>	
		D	<input checked="" type="checkbox"/>	4	<input type="checkbox"/>	
		E	<input type="checkbox"/>	5	<input type="checkbox"/>	

### Electrical:

<p>Can anyone be injured by electrical shock or burnt due to damaged or poorly maintained leads or switches, water near electrical equipment, working near or contact with live electrical conductors, lack of isolation procedures or the factors not mentioned? For example, are any switches broken, is there a red emergency stop? Can each machine be locked off for repairs?</p>	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	A	<input type="checkbox"/>	1	<input type="checkbox"/>	High Significant <input type="checkbox"/> Medium <input type="checkbox"/> Low <input type="checkbox"/>
		B	<input type="checkbox"/>	2	<input type="checkbox"/>	
		C	<input type="checkbox"/>	3	<input type="checkbox"/>	
		D	<input type="checkbox"/>	4	<input type="checkbox"/>	
		E	<input type="checkbox"/>	5	<input type="checkbox"/>	



**Dust:**

<p>Can anyone suffer ill health or injury due to exposure to dust?                  For example, cutting, living silica                  Lack of vision – External influences causing the dust.                  Plant operation causing the dust.</p> <p><b>Depending on the working environment and working material, excessive dust can cause vision problems which can lead to more dangerous incidents.</b></p>	Yes	No	A	<input type="checkbox"/>	1	<input type="checkbox"/>	High Significant Medium Low	<input type="checkbox"/>
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	B	<input type="checkbox"/>	2	<input checked="" type="checkbox"/>		<input type="checkbox"/>
			C	<input type="checkbox"/>	3	<input type="checkbox"/>		<input type="checkbox"/>
			D	<input type="checkbox"/>	4	<input type="checkbox"/>		<input type="checkbox"/>
			E	<input checked="" type="checkbox"/>	5	<input type="checkbox"/>		<input type="checkbox"/>
								<input type="checkbox"/>

**Noise:**

<p>Can anyone suffer hearing discomforts while the plant is in use? For example, the plant is noisy, and it is difficult to hear.</p> <p><b>Hearing discomfort may be experienced by persons due to the noise generated by the plant. This can also lead to miscommunication.</b></p>	Yes	No	A	<input type="checkbox"/>	1	<input type="checkbox"/>	High Significant Medium Low	<input type="checkbox"/>
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	B	<input type="checkbox"/>	2	<input type="checkbox"/>		<input type="checkbox"/>
			C	<input type="checkbox"/>	3	<input checked="" type="checkbox"/>		<input type="checkbox"/>
			D	<input checked="" type="checkbox"/>	4	<input type="checkbox"/>		<input type="checkbox"/>
			E	<input type="checkbox"/>	5	<input type="checkbox"/>		<input type="checkbox"/>
								<input type="checkbox"/>

**Vibration:**

<p>Can anyone suffer injury due to the vibration of the plant?</p>	Yes	No	A	<input type="checkbox"/>	1	<input type="checkbox"/>	High Significant Medium Low	<input type="checkbox"/>
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	B	<input type="checkbox"/>	2	<input type="checkbox"/>		<input type="checkbox"/>
			C	<input type="checkbox"/>	3	<input type="checkbox"/>		<input type="checkbox"/>
			D	<input type="checkbox"/>	4	<input type="checkbox"/>		<input type="checkbox"/>
			E	<input type="checkbox"/>	5	<input type="checkbox"/>		<input type="checkbox"/>
								<input type="checkbox"/>

**Environmental:**

<p>Can the plant operation cause an environmental issue? For example – pollution, waste materials, noise.</p>	Yes	No	A	<input type="checkbox"/>	1	<input type="checkbox"/>	High Significant Medium Low	<input type="checkbox"/>
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	B	<input type="checkbox"/>	2	<input type="checkbox"/>		<input type="checkbox"/>
			C	<input type="checkbox"/>	3	<input type="checkbox"/>		<input type="checkbox"/>
			D	<input type="checkbox"/>	4	<input type="checkbox"/>		<input type="checkbox"/>
			E	<input type="checkbox"/>	5	<input type="checkbox"/>		<input type="checkbox"/>
								<input type="checkbox"/>

**Risk Evaluation**

Overall risk category of plant:	High	Significant	Medium	Low
---------------------------------	------	-------------	--------	-----

**Risk Controls**

Most Desirable

- |          |  |   |
|----------|--|---|
| <p>↓</p> | <ul style="list-style-type: none"> <li>• Elimination</li> <li>• Substitution</li> <li>• Engineering Controls</li> <li>• Isolation</li> <li>• Administrative Controls</li> <li>• PPE</li> </ul> | <ul style="list-style-type: none"> <li>- The best way to eliminate the risk is to remove the hazard.</li> <li>- Substitute the hazardous plant with a safer part, alternative process.</li> <li>- Design modification, installation of guarding, automation/ventilation.</li> <li>- Isolate the plant, barricades, crossing, bunting, etc.</li> <li>- Permits, clearances, lock out systems, certification.</li> <li>- Short term control measure.</li> </ul> |
|----------|--|---|

Least Desirable

Hazard	Controls
Entanglement	<p>Isolation – Ensure the operating and maintenance manual provided with the plant attachment recommends the operator of the plant always follows SOP. The operator must make everybody working in the vicinity of the attachment aware of the dangers and before moving the plant ensure people are safe distance away.</p> <p>PPE – Ensuring all people who will be in the vicinity of the plant attachment during operation be wearing clothes with no loose ends that can become entangled in the plant attachment.</p>
Crushing, Striking	<p>Isolation – Ensure the operating and maintenance manual provided with the plant attachment recommends the operator of the plant always follows SOP. The operator must make everybody working in the vicinity of the attachment aware of the dangers and before moving the plant ensure people are safe distance away.</p> <p>PPE – The use of the correct PPE for the worksite will minimize the damage caused by an incident. A hard hat, steel cap boots and tough worksite clothes as an example.</p> <p>PPE – The use of high visibility PPE will help reduce the case of incidents occurring from impaired vision or operator distraction.</p>
Cutting, Stabbing, Puncturing	<p>Isolation – Ensure the operating and maintenance manual provided with the plant attachment recommends the operator of the plant always follows SOP. The operator must make everybody working in the vicinity of the attachment aware of the dangers and before moving the plant ensure people are safe distance away.</p> <p>PPE – The use of correct PPE for the worksite will minimize the risk of cutting when working in and around the attachment. Gloves, safety glass, hard hat and tough work clothes will reduce that risk.</p>
Slipping, Tripping, Falling	<p>Isolation – The plant attachment has NOT been designed to stand on unless entering or exiting the plant. This will be stated in the operating and maintenance manual. It is the responsibility of the operator to ensure that no persons stand on the plant attachment.</p> <p>PPE – Wearing the correct work boots will reduce chances of slipping.</p>
Shearing	<p>Isolation – Ensure the operating and maintenance manual provided with the plant attachment recommends the operator of the plant always follows SOP. The operator must make everybody working in the vicinity of the attachment aware of the dangers and before moving the plant ensure people are safe distance away.</p> <p>Administrative Controls – A warning sticker should be placed in a visible position on the plant attachment highlighting the potential risk.</p>

<p>High Pressure Fluid</p>	<p>Engineering Controls – The routing of the hydraulic hoses and the design of the plates which guard the hydraulic motor minimize the risk of the hydraulic failure and exposure to high pressure fluids.</p> <p>Administrative Controls – The manual will address correct maintenance schedules for the plant attachment hydraulics to reduce the risk associated with hydraulic component failure. Only authorized hydraulics fitters should perform repairs on hydraulic systems.</p> <p>Administrative Controls – A warning sticker should be placed in a visible position on the plant attachment highlighting the potential risk.</p>
<p>Dust</p>	<p>Isolation and Administrative Controls – To reduce the hazards associated with dust, the manual should instruct the operator to consider their working environment and operate in a manner to reduce the risk of dust being kicked up. This can be managed by operating at a sensible speed.</p> <p>PPE – If the environment is such that the dust cannot be sufficiently controlled, the onsite supervisor should ensure all workers are wearing the correct PPE.</p>
<p>Noise</p>	<p>PPE – To reduce the risk associated with excessive noise the correct PPE should be worn whilst operating or being within a vicinity of the plant and plant attachment during operations.</p>

### **Any Modification to Plant Attachment Voids Risk Assessment**

**Purchaser and User are required to conduct their own risk assessment to identify hazards prior to use.**

This risk assessment does not necessarily cover all possible hazards associated with this product and should be utilized in conjunction with the purchasers and users individual risk assessments to identify all environmental, health, and safety risks associated with specific tasks, locations, and personnel.

# 9 PARTS

## QUALITY BACKUP

*We manufacture 90% of our parts inhouse.  
This means we can get your parts to you... quickly.*

### 9.1 ORDERING PARTS

For ordering parts contact either your dealer or Norm Engineering directly. Contact details are included at the front of this manual. To assist, note the details of your hydraulic grab in the spaces provided under *Section 9.1.1 Reference Information*.

#### 9.1.1 REFERENCE INFORMATION

Always refer to the model and serial number when ordering parts or requesting from you dealer. The serial number for this product is located on the identification place of your hydraulic grab.

Model Number:

.....

Make:

.....

Serial Number:

.....

Date Purchased:

.....

# 10 PARTS LIST

When ordering replacement parts, please include the following information:

- The machine make and model
- The serial number on the attachment
- The item number, as indicated by the following figures and tables.
- Parts with a part number of “∴” indicate a component that varies dependent on machine make and model. A serial number and item number is essential if ordering these parts.

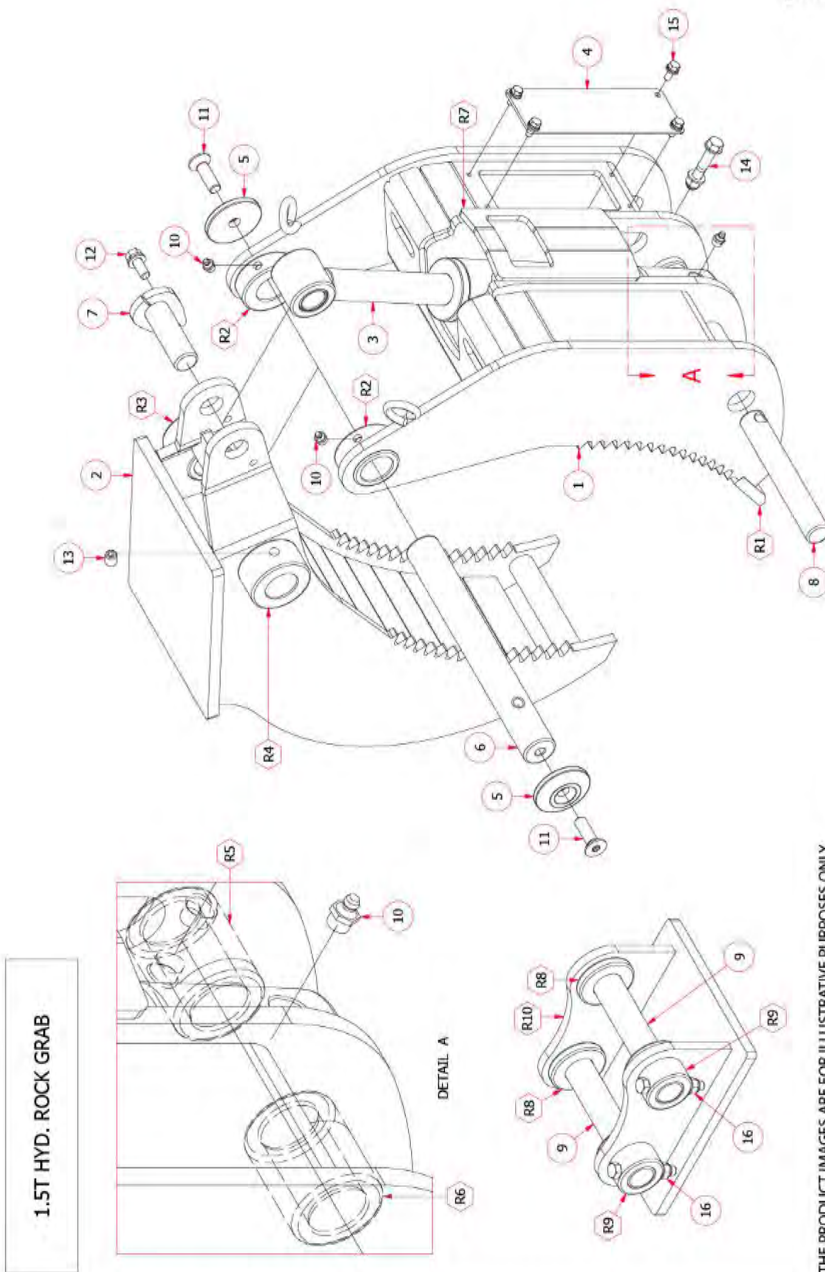
Items numbers with a “R” before the number indicate parts that require specialty tools and some knowledge in fabrication and welding to replace.

## 1.5T HYDRAULIC ROCK GRAB PARTS LIST

Item	Part Number	QTY	Description	Diagram
1	HRG015001UN	1	1.5T HYDRAULIC GRAB – FRONT HALF	1
2	HRG015002UN	1	1.5T HYDRAULIC GRAB – REAR HALF	1
3	C2015-C2016	1	2” BORE HYDRAULIC CYLINDER	1
4	HRG015018UN	1	HYDRAULIC MANAGEMENT COVER PLATE	1
5	BU252	2	CENTRE PIN END HAT	1
6	PI276	1	CENTRE PIN	1
7	PI277	1	TOP HYDRAULIC CYLINDER PIN	1
8	PI278	1	BOTTOM HYDRAULIC CYLINDER PIN	1
9	∴	2	EXCAVATOR PICKUP PIN	1
10	NS2001	4	3/8” GREASE NIPPLE	1
11	-	2	BOLT KIT – CENTRE PIN	1
12	-	1	BOLT KIT – TOP HYD. CYLINDER PIN	1
13	-	1	BOLT KIT – CENTRE PIN SET SCREW	1
14	-	1	BOLT KIT – BOTTOM HYD. CYLINDER PIN	1
15	-	4	BOLT KIT – COVER PLATE	1s
16	-	2	BOLT KIT – EXCAVATOR PICKUP PIN	1
R1	HRG015015UN	1	CUTTING EDGE BLADE	1
R2	BU249	2	CENTRE OUTSIDE PIVOT BUSH	1
R3	BU250	1	CENTRE INSIDE PIVOT BUSH	1
R4	RE075	1	CENTRE INSIDE PIVOT RETAINER	1



R5	RE76	1	BOTTOM HYD. CYLINDER RETAINER	1
R6	BU251	1	BOTTOM HYD. CYLINDER BUSH	1
R7	HRG015016UN	1	1.5T CYLINDER PROTECTION PLATE	1
R8	∴	4	EXCAVATOR PICKUP BUSH	1
R9	∴	2	EXCAVATOR PICKUP RETAINER	1
R10	∴	1	EXCAVATOR PICKUP EAR PLATE	1



1.5T HYD. ROCK GRAB

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## 2T HYDRAULIC ROCK GRAB PARTS LIST

Item	Part Number	QTY	Description	Diagram
1	HRG020013UN	1	2T HYDRAULIC GRAB – FRONT HALF	2
2	HRG020014UN	1	2T HYDRAULIC GRAB – REAR HALF	2
3	C2570-C2571	1	2.5" BORE HYDRAULIC CYLINDER	2
4	HRG020023UN	1	HYDRAULIC MANAGEMENT COVER PLATE	2
5	BU046	2	BRONZE INSERT	2
6	PI050	1	CENTRE PIN	2
7	PI047	1	TOP HYD. CYLINDER PIN	2
8	PI045	1	BOTTOM HYD. CYLINDER PIN	2
9	∴	2	EXCAVATOR PICKUP PINS	2
10	NS2001	4	3/8" GREASE NIPPLE	2
11	-	2	BOLT KIT – CENTRE PIN	2
12	-	1	BOLT KIT – TOP HYD. CYLINDER PIN	2
13	-	1	BOLT KIT – BOTTOM HYD. CYLINDER PIN	2
14	-	4	BOLT KIT – COVER PLATE	2
15	-	2	BOLT KIT – EXCAVATOR PICKUP PIN	2
R1	HRG020015UN	1	CUTTING EDGE BLADE	2
R2	HRG020002UN	2	FRONT HALF HARDENED TEETH	2
R3	HRG020017UN	2	FRONT HALF CENTRE HARDENED TEETH	2
R4	HRG020003UN	2	REAR HALF HARDENED TEETH	2
R5	RE029	2	CENTRE PIVOT RETAINER	2
R6	BU080	2	CENTRE PIVOT BUSH	2
R7	RE081	1	BOTTOM HYD. CYLINDER RETAINER	2
R8	BU037	1	BOTTOM HYD. CYLINDER BUSH	2
R9	HRG020009UN	1	2T CYLINDER PROTECTION PLATE	2
R10	∴	4	EXCAVATOR PICKUP BUSH	2
R11	∴	2	EXCAVATOR PICKUP RETAINER	2
R12	∴	1	EXCAVATOR PICKUP EAR PLATE	2



### 3T HYDRAULIC ROCK GRAB PARTS LIST

Item	Part Number	QTY	Description	Diagram
1	HRG030013UN	1	3T HYDRAULIC GRAB – FRONT HALF	3
2	HRG030026UN	1	3T HYDRAULIC GRAB – REAR HALF	3
3	C2570-C2571	1	2.5" BORE HYDRAULIC CYLINDER	3
4	∴	1	3T BOLT-ON UNIVERSAL PICKUP PLATE	3
5	HRG020023UN	1	HYDRAULIC MANAGEMENT COVER PLATE	3
6	BU046	2	BRONZE INSERT	3
7	PI050	1	CENTRE PIN	3
8	PI047	1	TOP HYD. CYLINDER PIN	3
9	PI045	1	BOTTOM HYD. CYLINDER PIN	3
10	∴	2	EXCAVATOR PICKUP PINS	3
11	NS2001	4	3/8" GREASE NIPPLE	3
12	-	2	BOLT KIT – CENTRE PIN	3
13	-	1	BOLT KIT – TOP HYD. CYLINDER PIN	3
14	-	1	BOLT KIT – BOTTOM HYD. CYLINDER PIN	3
15	-	4	BOLT KIT – COVER PLATE	3
16	-	12	BOLT KIT – BOLT-ON PICKUP PLATE	3
17	-	2	BOLT KIT – EXCAVATOR PICKUP PIN	3
R1	HRG030015UN	1	CUTTING EDGE BLADE	3
R2	HRG030002UN	2	FRONT HALF HARDENED TEETH	3
R3	HRG030017UN	1	FRONT HALF CENTRE HARDENED TEETH	3
R4	HRG030003UN	2	REAR HALF HARDENED TEETH	3
R5	RE043	2	CENTRE PIVOT RETAINER	3
R6	BU045	2	CENTRE PIVOT BUSH	3
R7	RE081	1	BOTTOM HYD. CYLINDER RETAINER	3
R8	BU037	1	BOTTOM HYD. CYLINDER BUSH	3
R9	HRG030009UN	1	3T CYLINDER PROTECTION PLATE	3
R10	∴	4	EXCAVATOR PICKUP BUSH	3
R11	∴	2	EXCAVATOR PICKUP RETAINER	3

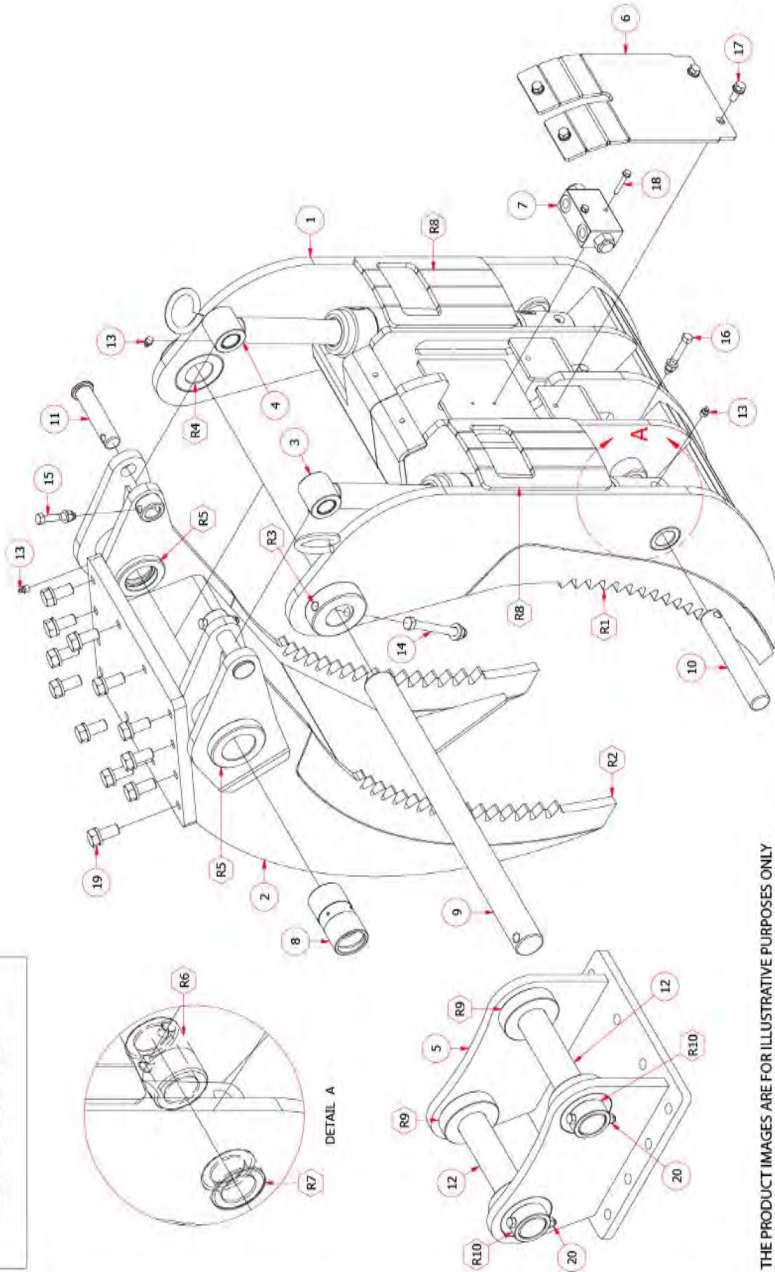




## 5T HYDRAULIC ROCK GRAB PARTS LIST

Item	Part Number	QTY	Description	Diagram
1	HRG050035UN	1	5T HYDRAULIC GRAB – FRONT HALF	4
2	HRG050036UN	1	5T HYDRAULIC GRAB – REAR HALF	4
3	C2570	1	RHS 2.5" BORE HYDRAULIC CYLINDER	4
4	C2571	1	LHS 2.5" BORE HYDRAULIC CYLINDER	4
5	∴	1	5T BOLT-ON UNIVERSAL PICKUP PLATE	4
6	HRG050056UN	1	HYDRAULIC MANAGEMENT COVER PLATE	4
7	FPDL38	1	LOCK VALVE	4
8	BU010	2	BRONZE INSERT BUSH	4
9	PI002	1	CENTRE PIN	4
10	PI003	1	BOTTOM HYDRAULIC CYLINDER PIN	4
11	PI298	1	TOP HYDRAULIC CYLINDER PIN	4
12	∴	2	EXCAVATOR PICKUP PINS	4
13	NS2001	6	3/8" GREASE NIPPLE	4
14	-	1	BOLT KIT – CENTRE PIN	4
15	-	2	BOLT KIT – TOP HYDRAULIC CYLINDER PIN	4
16	-	2	BOLT KIT – BOTTOM HYDRAULIC CYLINDER PIN	4
17	-	4	BOLT KIT – COVER PLATE	4
18	-	2	BOLT KIT – LOCK VALVE	4
19	-	12	BOLT KIT – UNIVERSAL PLATE	4
20	-	2	BOLT KIT – EXCAVATOR PICKUP PIN	4
R1	HRG050040UN	2	FRONT HALF HARDENED TEETH	4
R2	HRG050041UN	2	REAR HALF HARDENED TEETH	4
R3	RE045	1	CENTRE OUTER PIVOT RETAINER	4
R4	BU002	1	CENTRE OUTER PIVOT BUSH	4
R5	BU000	2	CENTRE INSIDE PIVOT BUSH	4
R6	RE030	2	BOTTOM HYDRAULIC CYLINDER RETAINER	4
R7	BU037	2	BOTTOM HYDRAULIC CYLINDER BUSH	4
R8	HRG050013UN	2	5T CYLINDER PROTECTION PLATE	4
R9	∴	4	EXCAVATOR PICKUP BUSH	4
R10	∴	2	EXCAVATOR PICKUP RETAINER	4

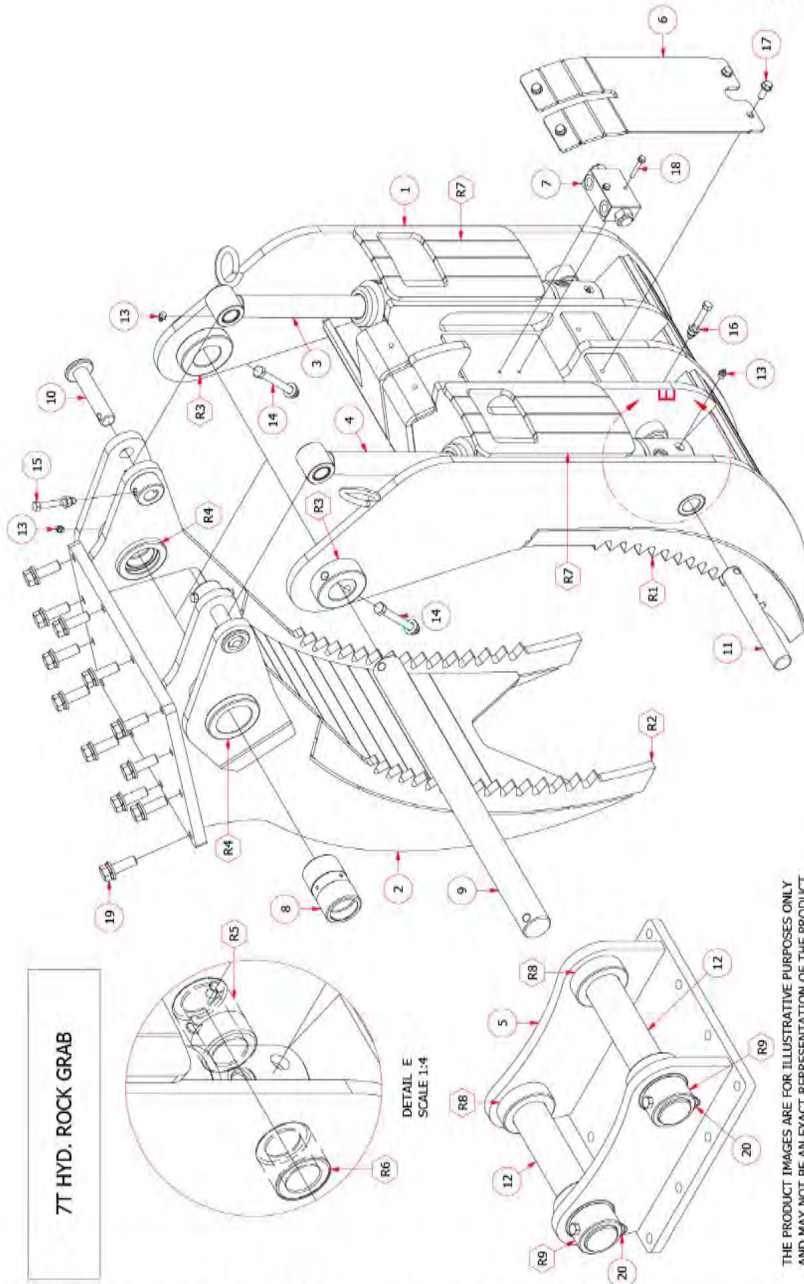
5T HYD. ROCK GRAB



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7T HYDRAULIC ROCK GRAB PARTS LIST

Item	Part Number	QTY	Description	Diagram
1	HRG070044UN	1	7T HYDRAULIC GRAB – FRONT HALF	5
2	HRG070043UN	1	7T HYDRAULIC GRAB – REAR HALF	5
3	C3001	1	LHS 3" BORE HYDRAULIC CYLINDER	5
4	C3002	1	RHS 3" BORE HYDRAULIC CYLINDER	5
5	HRG070030UN	1	7T BOLT-ON UNIVERSAL PICKUP PLATE	5
6	HRG070040UN	1	HYDRAULIC MANAGEMENT COVER PLATE	5
7	FPDL38	1	LOCK VALVE	5
8	BU084	2	BRONZE INSERT BUSH	5
9	PI401	1	CENTRE PIN	5
10	PI089	1	TOP HYDRAULIC CYLINDER PIN	5
11	PI086	1	BOTTOM HYDRAULIC CYLINDER PIN	5
12	∴	2	EXCAVATOR PICKUP PINS	5
13	NS2001	6	3/8" GREASE NIPPLE	5
14	-	1	BOLT KIT – CENTRE PIN	5
15	-	2	BOLT KIT – TOP HYDRAULIC CYLINDER PIN	5
16	-	2	BOLT KIT – BOTTOM HYDRAULIC CYLINDER PIN	5
17	-	4	BOLT KIT – COVER PLATE	5
18	-	2	BOLT KIT – LOCK VALVE	5
19	-	12	BOLT KIT – UNIVERSAL PLATE	5
20	-	2	BOLT KIT – EXCAVATOR PICKUP PIN	5
R1	HRG070005UN	2	FRONT HALF HARDENED TEETH	5
R2	HRG070028UN	2	REAR HALF HARDENED TEETH	5
R3	RE033	2	CENTRE OUTER PIVOT RETAINER	5
R4	BU085	1	CENTRE INSIDE PIVOT BUSH	5
R5	RE030	2	BOTTOM HYDRAULIC CYLINDER RETAINER	5
R6	BU083	2	BOTTOM HYDRAULIC CYLINDER BUSH	5
R7	HRG070035UN	2	7T CYLINDER PROTECTION PLATE	5
R8	∴	4	EXCAVATOR PICKUP BUSH	5
R9	∴	2	EXCAVATOR PICKUP RETAINER	5



7T HYD. ROCK GRAB

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## 14T HYDRAULIC ROCK GRAB PARTS LIST

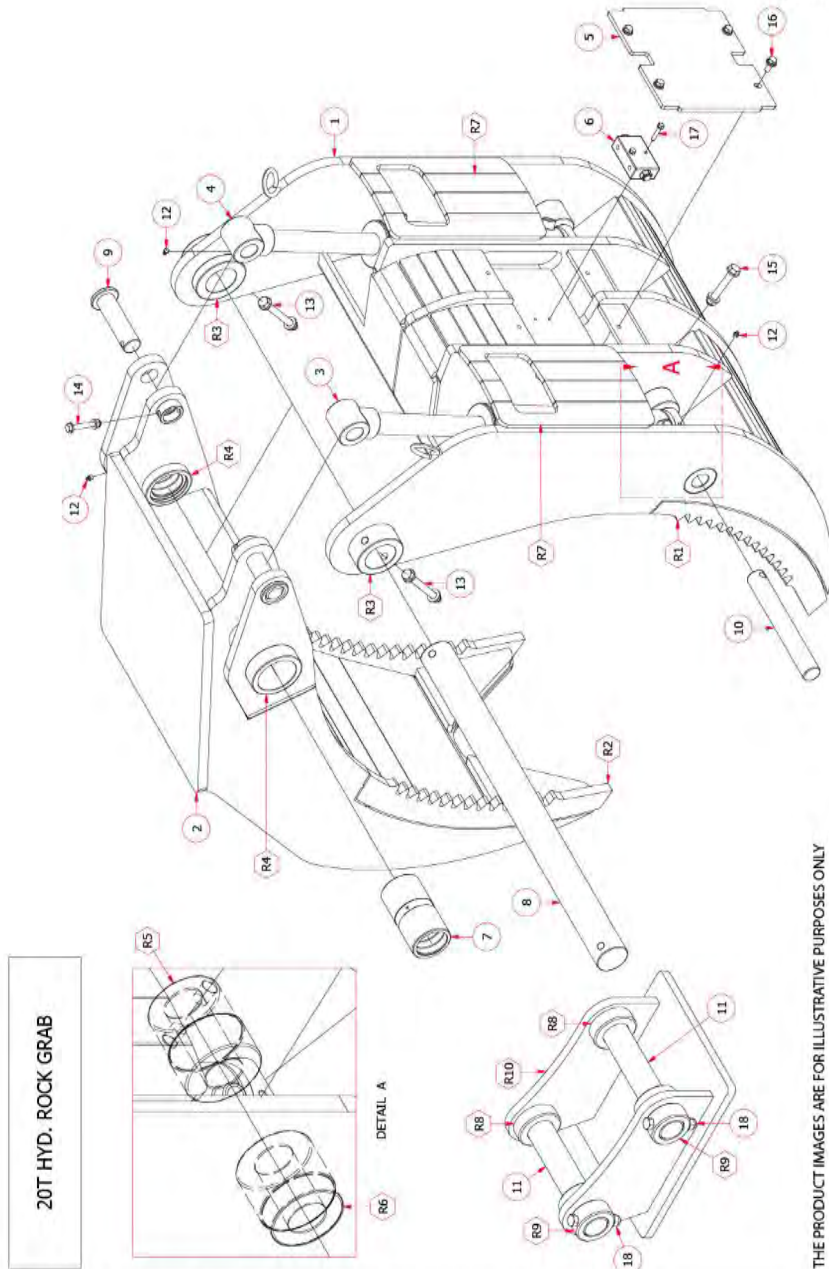
Item	Part Number	QTY	Description	Diagram
1	HRG140021UN	1	14T HYDRAULIC GRAB – FRONT HALF	6
2	HRG140022UN	1	14T HYDRAULIC GRAB – REAR HALF	6
3	NI35SE2XU0302R17E1	1	RHS 3.5" BORE HYDRAULIC CYLINDER	6
4	NI35SE2XU0302R17E1	1	LHS 3.5" BORE HYDRAULIC CYLINDER	6
5	HRG140032UN	1	HYD. MANAGEMENT COVER PLATE	6
6	FPDL38	1	LOCK VALVE	6
7	BU109	2	BRONZE INSERT BUSH	6
8	PI124	1	CENTRE PIN	6
9	PI126	1	TOP HYDRAULIC CYLINDER PIN	6
10	PI125	1	BOTTOM HYDRAULIC CYLINDER PIN	6
11	∴	2	EXCAVATOR PICKUP PINS	6
12	NS2001	6	3/8" GREASE NIPPLE	6
13	-	1	BOLT KIT – CENTRE PIN	6
14	-	2	BOLT KIT – TOP HYD. CYLINDER PIN	6
15	-	2	BOLT KIT – BOTTOM HYD. CYLINDER PIN	6
16	-	4	BOLT KIT – COVER PLATE	6
17	-	2	BOLT KIT – LOCK VALVE	6
18	-	2	BOLT KIT – EXCAVATOR PICKUP PIN	6
R1	HRG140012UN	2	FRONT HALF HARDENED TEETH	6
R2	HRG140007UN	2	REAR HALF HARDENED TEETH	6
R3	RE048	2	CENTRE OUTER PIVOT RETAINER	6
R4	BU108	2	CENTRE INSIDE PIVOT BUSH	6
R5	RE046	2	BOTTOM HYD. CYLINDER RETAINER	6
R6	BU107	2	BOTTOM HYDRAULIC CYLINDER BUSH	6
R7	HRG140016UN	2	14T CYLINDER PROTECTION PLATE	6
R8	∴	4	EXCAVATOR PICKUP BUSH	6
R9	∴	2	EXCAVATOR PICKUP RETAINER	6
R10	∴	1	EXCAVATOR PICKUP EAR PLATE	6





## 20T HYDRAULIC ROCK GRAB PARTS LIST

Item	Part Number	QTY	Description	Diagram
1	HRG200022UN	1	20T HYDRAULIC GRAB – FRONT HALF	7
2	HRG200021UN	1	20T HYDRAULIC GRAB – REAR HALF	7
3		1	RHS 4" BORE HYDRAULIC CYLINDER	7
4		1	LHS 4" BORE HYDRAULIC CYLINDER	7
5	HRG200025UN	1	HYD. MANAGEMENT COVER PLATE	7
6	FPDL12	1	LOCK VALVE	7
7	BU116	2	BRONZE INSERT BUSH	7
8	PI139	1	CENTRE PIN	7
9	PI141	1	TOP HYDRAULIC CYLINDER PIN	7
10	PI140	1	BOTTOM HYDRAULIC CYLINDER PIN	7
11	∴	2	EXCAVATOR PICKUP PINS	7
12	NS2001	6	3/8" GREASE NIPPLE	7
13	-	1	BOLT KIT – CENTRE PIN	7
14	-	2	BOLT KIT – TOP HYD. CYLINDER PIN	7
15	-	2	BOLT KIT – BOTTOM HYD. CYLINDER PIN	7
16	-	4	BOLT KIT – COVER PLATE	7
17	-	2	BOLT KIT – LOCK VALVE	7
18	-	2	BOLT KIT – EXCAVATOR PICKUP PIN	7
R1	HRG200009UN	2	FRONT HALF HARDENED TEETH	7
R2	HRG200003UN	2	REAR HALF HARDENED TEETH	7
R3	RE053	2	CENTRE OUTER PIVOT RETAINER	7
R4	BU115	2	CENTRE INSIDE PIVOT BUSH	7
R5	RE051	2	BOTTOM HYD. CYLINDER RETAINER	7
R6	BU114	2	BOTTOM HYDRAULIC CYLINDER BUSH	7
R7	HRG200017UN	2	20T CYLINDER PROTECTION PLATE	7
R8	∴	4	EXCAVATOR PICKUP BUSH	7
R9	∴	2	EXCAVATOR PICKUP RETAINER	7
R10	∴	1	EXCAVATOR PICKUP EAR PLATE	7



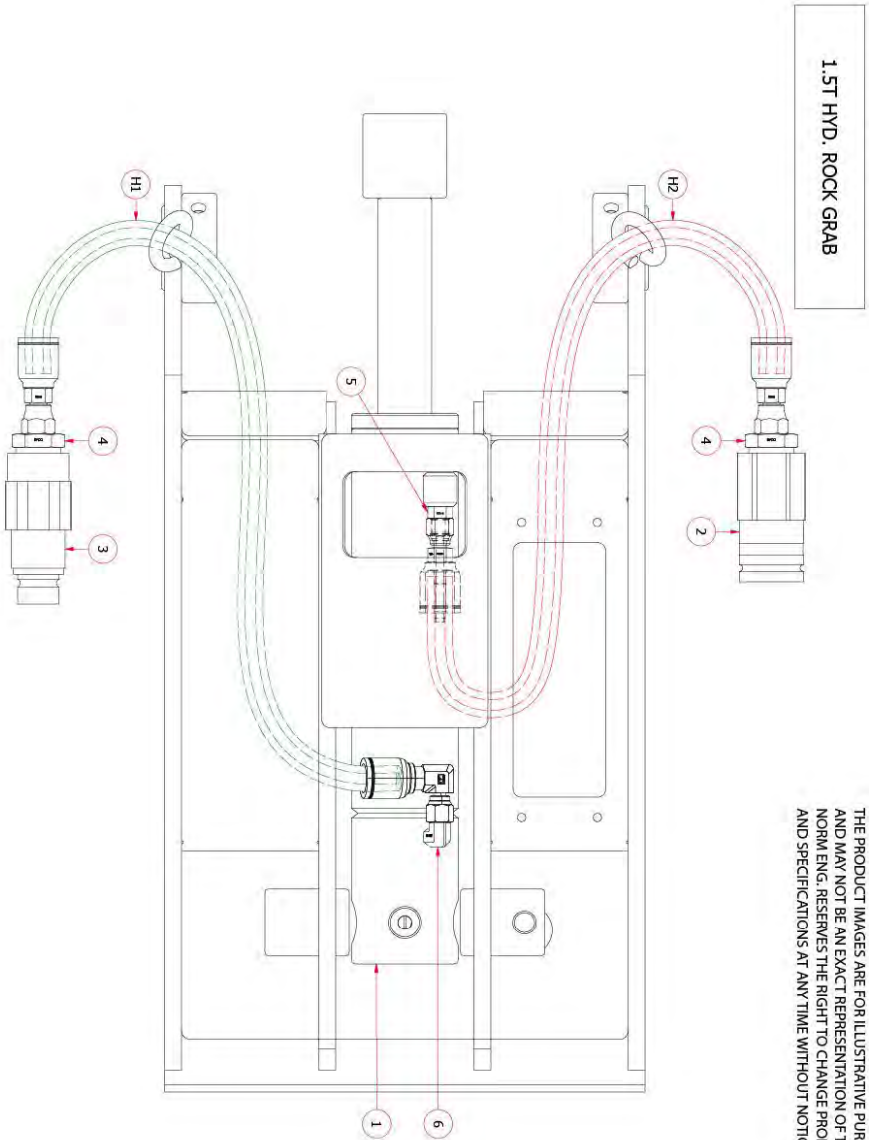
20T HYD. ROCK GRAB

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### 1.5T HYDRAULIC ROCK GRAB – HYDRAULIC PARTS LIST

Item	Part Number	QTY	Description	Diagram
1	C2015-C2016	1	2" BORE HYDRAULIC CYLINDER	8
2	F A13 ½ BSP	1	1/2" FLAT FACE STUCCHI FEMALE	8
3	M A13 ½ BSP	1	1/2" FLAT FACE STUCCHI MALE	8
4	B-G-0809	2	ST – ADAPTOR 1/2" BSPPM – 9/16" JICM	8
5	A-G-0207	1	ST – ADAPTOR 1/8" BSPTM – 7/16" JICM	8
6	A-G-90-0207	1	90 – ADAPTOR 1/8" BSPTM – 7/16" JICM	8
H1	∴	1	HYD. HOSE – MALE COUPLER TO BTM CYLINDER	8
H2	∴	1	HYD. HOSE – FEMALE COUPLER TO TOP CYLINDER	8

Diagram 8



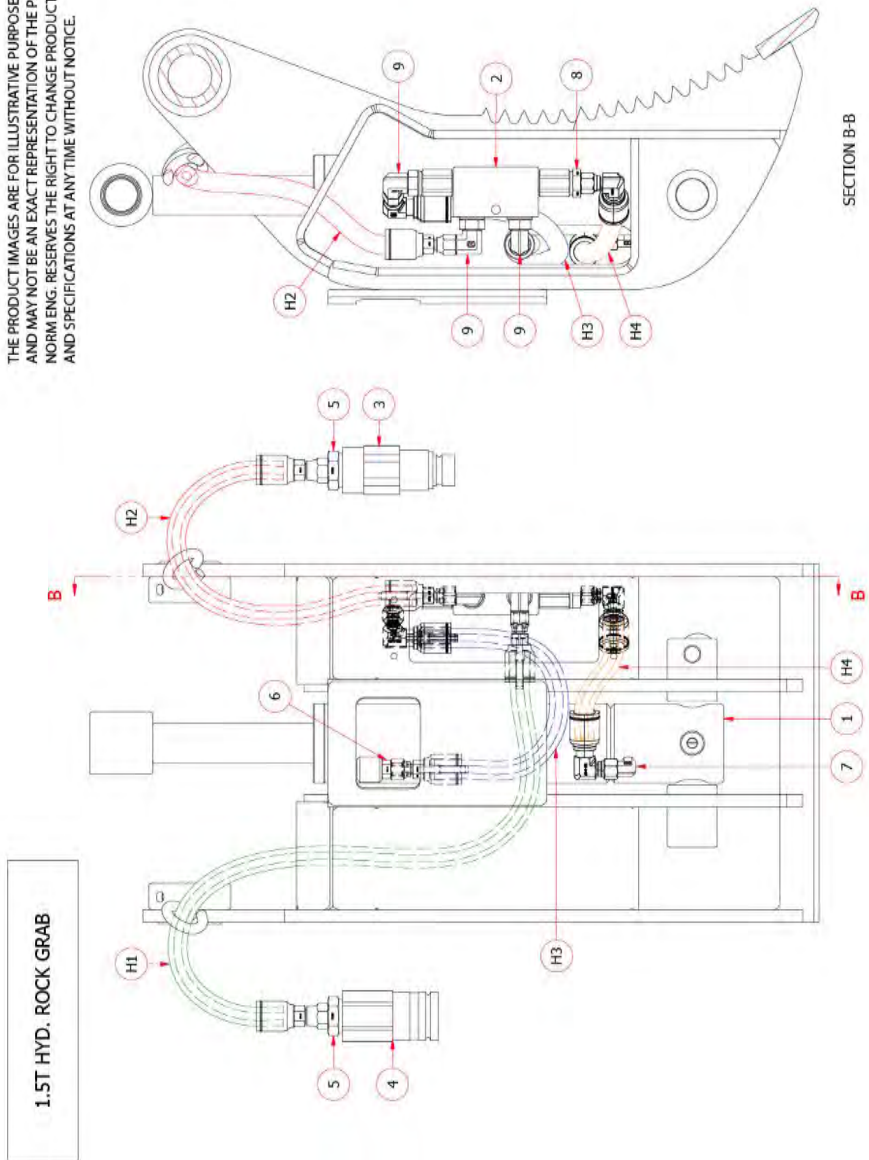
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1.5T HYDRAULIC ROCK GRAB – LOCK VALVE – HYDRAULIC PARTS LIST

Item	Part Number	QTY	Description	Diagram
1	C2016-C2016	1	2" BORE HYDRAULIC CYLINDER	9
2	HKV18650400	1	DOUBLE PILOT OPERATED CHECK VALVES	9
3	M A13 ½ BSP	1	1/2" FLAT FACE STUCCHI MALE	9
4	F A13 ½ BSP	1	1/2" FLAT FACE STUCCHI FEMALE	9
5	B-G-0809	2	ST – ADAPTOR – 9/16" JICM – 1/2" BSPPM	9
6	A-G-0207	1	ST – ADAPTOR – 1/8" BSPTM – 7/16" JICM	9
7	A-G-90-0207	1	90 – ADAPTOR – 1/8" BSPTM – 7/16" JICM	9
8	B-G-0407	1	ST – ADAPTOR – 1/4" BSPPM – 7/16" JICM	9
9	G-BP-90-0704	3	90 – ADAPTOR – 1/4" BSPPM – 7/16" JICM	9
H1	∴	1	HYD. HOSE – FEMALE COUPLER TO CHECK VALVE	9
H2	∴	1	HYD. HOSE – MALE COUPLER TO CHECK VALVE	9
H3	∴	1	HYD. HOSE – CHECK VALVE TO TOP CYLINDER	9
H4	∴	1	HYD. HOSE – CHECK VALVE TO BTM CYLINDER	9

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2T HYDRAULIC ROCK GRAB – HYDRAULIC PARTS LIST

Item	Part Number	QTY	Description	Diagram
1	C2570-C2571	1	2.5" BORE HYDRAULIC CYLINDER	10
2	F A13 ½ BSP	1	1/2" FLAT FACE STUCCHI FEMALE	10
3	M A13 ½ BSP	1	1/2" FLAT FACE STUCCHI MALE	10
4	B-G-0809	2	5T – ADAPTOR – 1/2" BSPPM – 9/16" JICM	10
5	G-NP-90-0912	2	90 – ADAPTOR – 3/4" UNOM – 9/16" JICM	10
H1	∴	1	HYD. HOSE FEMALE COUPLER TO BTM CYLINDER	10
H2	∴	1	HYD. HOSE MALE COUPLER TO TOP CYLINDER	10

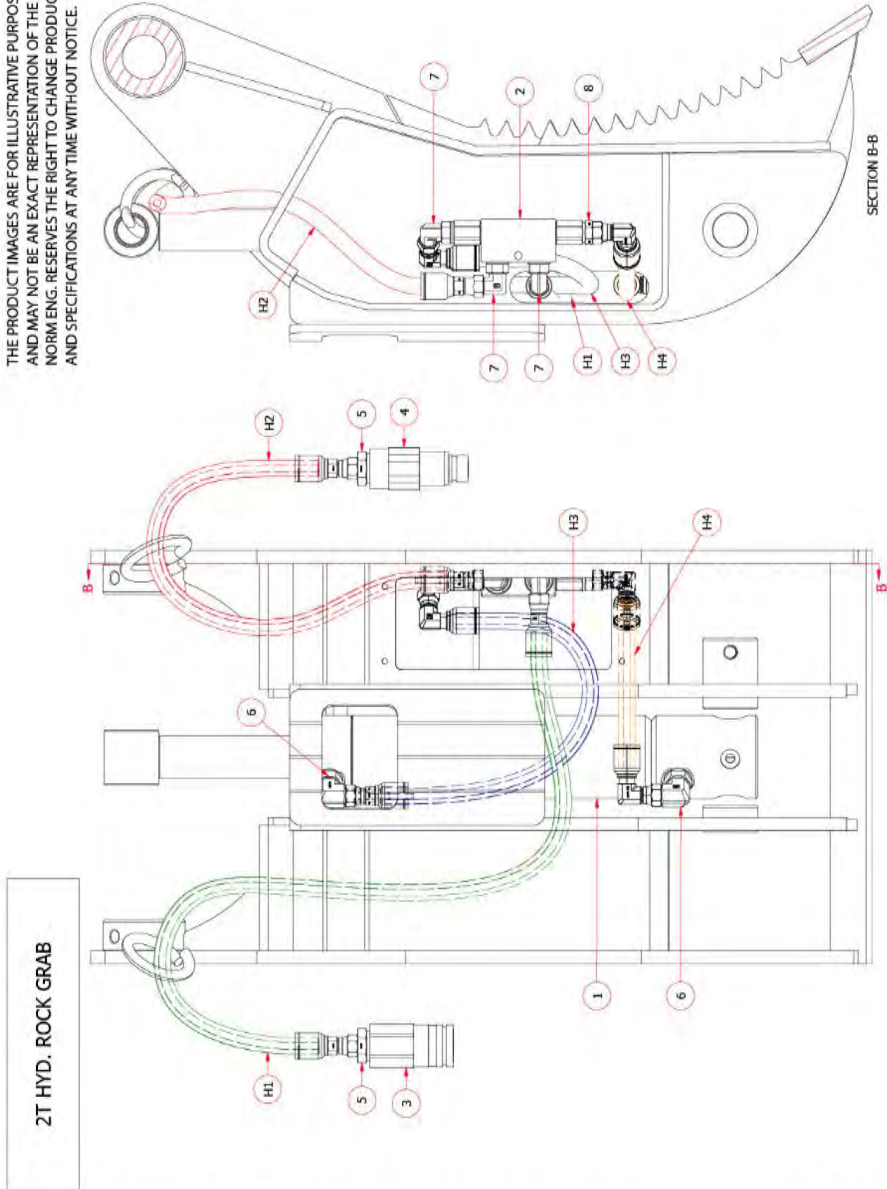


2T HYDRAULIC ROCK GRAB – LOCK VALVE – HYDRAULIC PARTS LIST

Item	Part Number	QTY	Description	Diagram
1	C2570-C2571	1	2.5" BORE HYDRAULIC CYLINDER	11
2	HKV18650400	1	DOUBLE PILOT OPERATED CHECK VALVES	11
3	FA13 ½ BSP	1	1/2" FLAT FACE STUCCHI FEMALE	11
4	MA13 ½ BSP	1	1/2" FLAT FACE STUCCHI MALE	11
5	B-G-0809	2	ST – ADAPTOR – 1/2" BSPPM – 9/16" JICM	11
6	G-NP-90-0912	2	90 – ADAPTOR – 3/4" UNOM – 9/16" JICM	11
7	G-BP-90-0904	3	90 – ADAPTOR – 1/4" BSPPM – 9/16" JICM	11
8	B-G-0409	1	ST – ADAPTOR – 1/4" BSPPM – 9/16" JICM	11
H1	∴	1	HYD. HOSE FEMALE COUPLER TO CHECK VALVE	11
H2	∴	1	HYD. HOSE MALE COUPLER TO CHECK VALVE	11
H3	∴	1	HYD. HOSE CHECK VALVE TO TOP CYLINDER	11
H4	∴	1	HYD. HOSE CHECK VALVE TO BTM CYLINDER	11



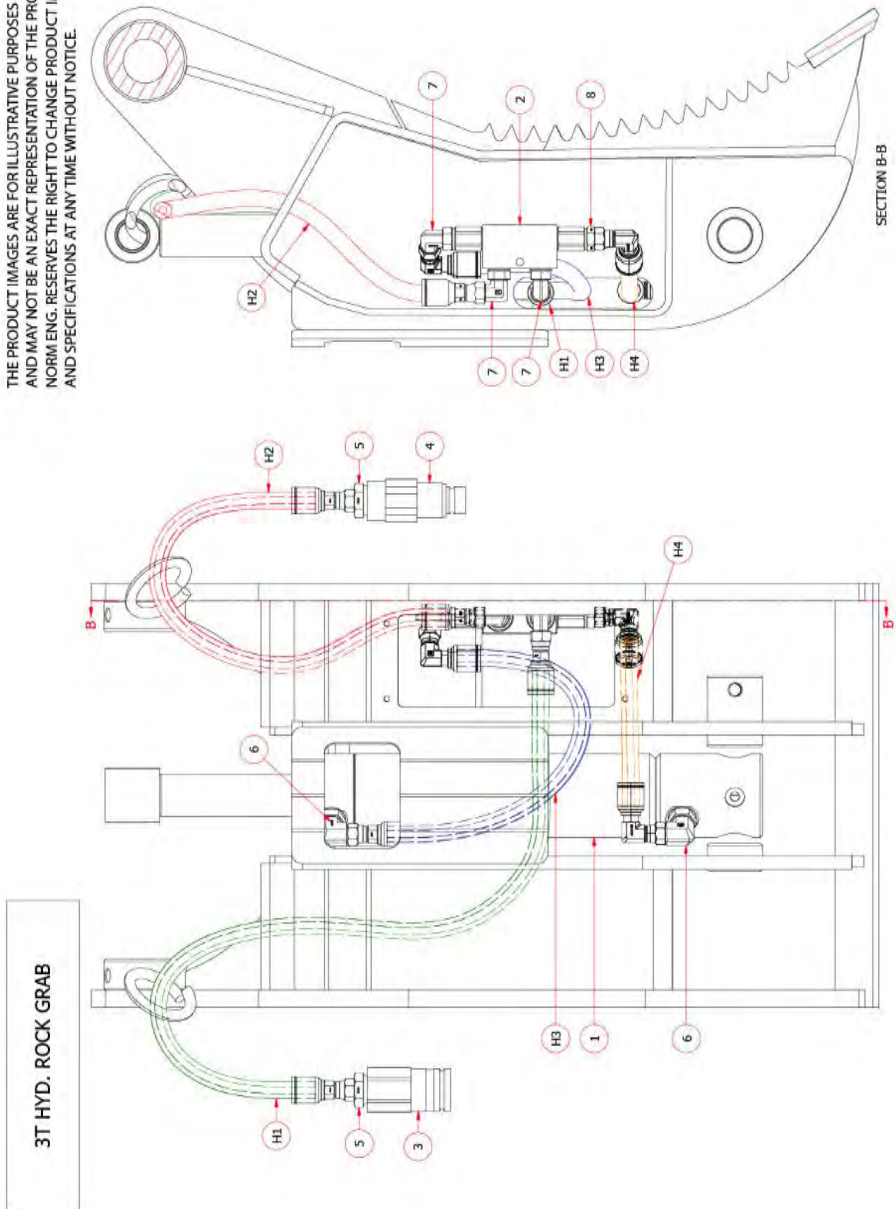
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3T HYDRAULIC ROCK GRAB – LOCK VALVE – HYDRAULIC PARTS LIST

Item	Part Number	QTY	Description	Diagram
1	C2570-C2571	1	2.5" BORE HYDRAULIC CYLINDER	12
2	HKV18650400	1	DOUBLE PILOT OPERATED CHECK VALVES	12
3	FA13 ½ BSP	1	1/2" FLAT FACE STUCCHI FEMALE	12
4	MA13 ½ BSP	1	1/2" FLAT FACE STUCCHI MALE	12
5	B-G-0809	2	ST – ADAPTOR – 1/2" BSPPM – 9/16" JICM	12
6	G-NP-90-0912	2	90 – ADAPTOR – 3/4" UNOM – 9/16" JICM	12
7	G-BP-90-0904	3	90 – ADAPTOR – 1/4" BSPPM – 9/16" JICM	12
8	B-G-0409	1	ST – ADAPTOR – 1/4" BSPPM – 9/16" JICM	12
H1	∴	1	HYD. HOSE – FEMALE COUPLER TO CHECK VALVE	12
H2	∴	1	HYD. HOSE – MALE COUPLER TO CHECK VALVE	12
H3	∴	1	HYD. HOSE – CHECK VALVE TO TOP CYLINDER	12
H4	∴	1	HYD. HOSE – CHECK VALVE TO BTM CYLINDER	12

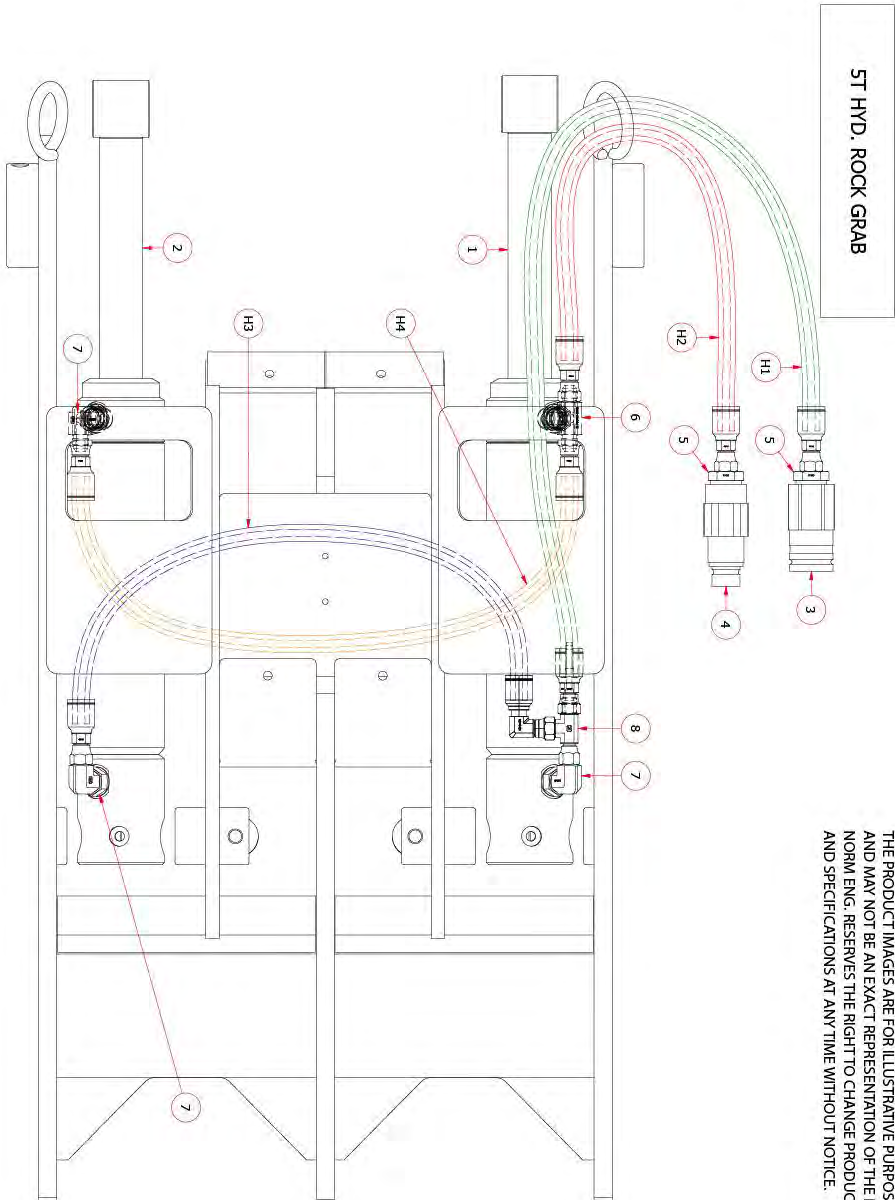
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5T SAME SIDE HYDRAULIC ROCK GRAB - HYDRAULIC PARTS LIST

Item	Part Number	QTY	Description	Diagram
1	C2571	1	LHS 2.5" BORE HYDRAULIC CYLINDER	13
2	C2570	1	RHS 2.5" BORE HYDRAULIC CYLINDER	13
3	F A13 1/2 BSP	1	1/2" FLAT FACE STUCCHI FEMALE	13
4	M A13 1/2 BSP	1	1/2" FLAT FACE STUCCHI MALE	13
5	B-G-0809	2	ST- ADAPTOR – 1/2" BSPPM – 9/16" JICM	13
6	G-G-NP-090912	1	T-ADAPTOR – 3/4" UNOM – 2 x 9/16" JICM	13
7	G-NP-90-0912	3	90 - ADAPTOR – 3/4" UNOM – 9/16" JICM	13
8	G-G-J-090909	1	T-ADAPTOR – 9/16" JICF – 2 x 9/16" JICM	13
H1	∴	1	HYD. HOSE FEMALE COUPLER TO BTM LHS CYL.	13
H2	∴	1	HYD. HOSE MALE COUPLER TO TOP LHS CYL.	13
H3	∴	1	HYD. HOSE BTM LHS CYL. TO BTM RHS CYL.	13
H4	∴	1	HYD. HOSE TOP LHS CYL. TO TOP RHS CYL.	13

Diagram 13

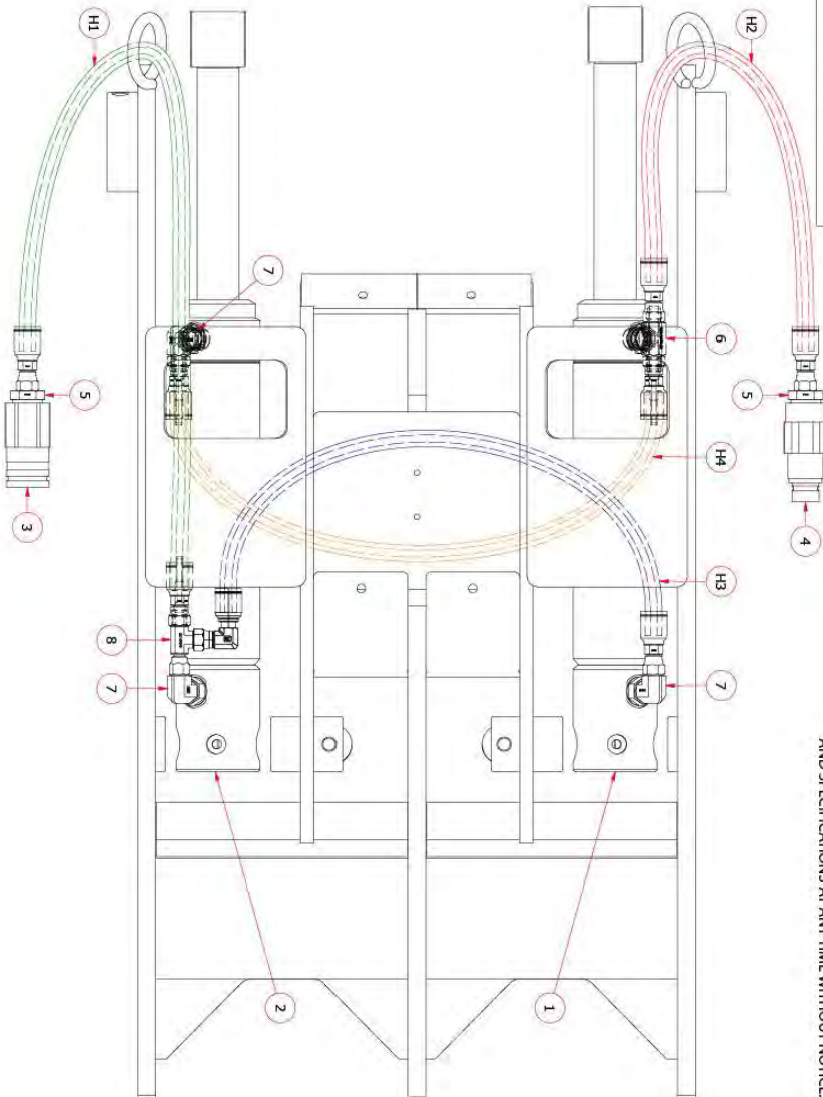




5T SPLIT HYDRAULIC ROCK GRAB - HYDRAULIC PARTS LIST

Item	Part Number	QTY	Description	Diagram
1	C2571	1	LHS 2.5" BORE HYDRAULIC CYLINDER	14
2	C2570	1	RHS 2.5" BORE HYDRAULIC CYLINDER	14
3	F A13 1/2 BSP	1	1/2" FLAT FACE STUCCHI FEMALE	14
4	M A13 1/2 BSP	1	1/2" FLAT FACE STUCCHI MALE	14
5	B-G-0809	2	ST- ADAPTOR – 1/2" BSPPM – 9/16" JICM	14
6	G-G-NP-090912	1	T-ADAPTOR – 3/4" UNOM – 2 x 9/16" JICM	14
7	G-NP-90-0912	3	90 - ADAPTOR – 3/4" UNOM – 9/16" JICM	14
8	G-G-J-090909	1	T-ADAPTOR – 9/16" JICF – 2 x 9/16" JICM	14
H1	∴	1	HYD. HOSE FEMALE COUPLER TO BTM RHS CYL.	14
H2	∴	1	HYD. HOSE MALE COUPLER TO TOP LHS CYL.	14
H3	∴	1	HYD. HOSE BTM RHS CYL. TO BTM LHS CYL.	14
H4	∴	1	HYD. HOSE TOP LHS CYL. TO TOP RHS CYL.	14

5T HYD. ROCK GRAB

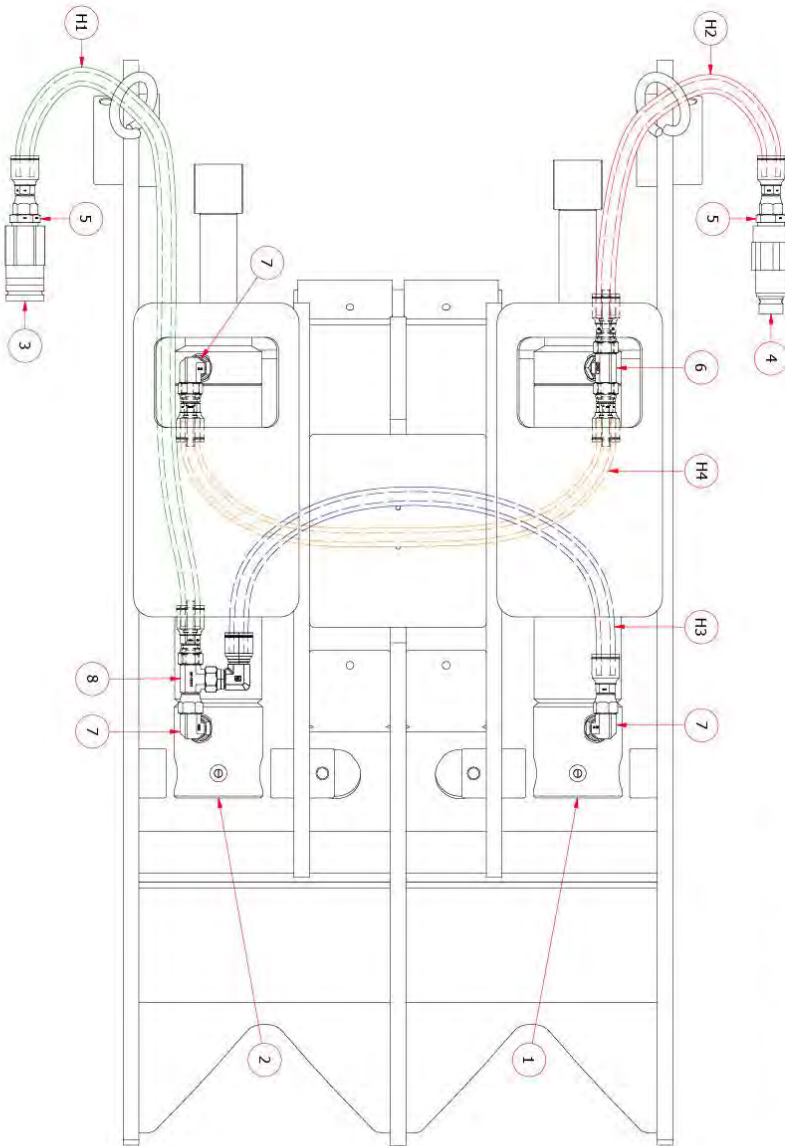


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7T SPLIT HYDRAULIC ROCK GRAB - HYDRAULIC PARTS LIST

Item	Part Number	QTY	Description	Diagram
1	C3001	1	LHS 3" BORE HYDRAULIC CYLINDER	15
2	C3002	1	RHS 3" BORE HYDRAULIC CYLINDER	15
3	F A13 1/2 BSP	1	1/2" FLAT FACE STUCCHI FEMALE	15
4	M A13 1/2 BSP	1	1/2" FLAT FACE STUCCHI MALE	15
5	B-G-0812	2	ST – ADAPTOR – 1/2" BSPPM – 3/4" JICM	15
6	G-G-NP-121212	1	T-ADAPTOR – 2 x 3/4" JICM – 3/4" UNOM	15
7	G-NP-90-1212	3	90- ADAPTOR – 3/4" UNOM – 3/4" JICM	15
8	G-G-J-121212	1	T-ADAPTOR – 3/4" JICF – 2 x 3/4" JICM	15
H1	∴	1	HYD. HOSE FEMALE COUPLER TO BTM RHS CYL.	15
H2	∴	1	HYD. HOSE MALE COUPLER TO TOP LHS CYL.	15
H3	∴	1	HYD. HOSE BTM RHS CYL. TO BTM LHS CYL.	15
H4	∴	1	HYD. HOSE TOP LHS CYL. TO TOP RHS CYL.	15

7T HYD. ROCK GRAB

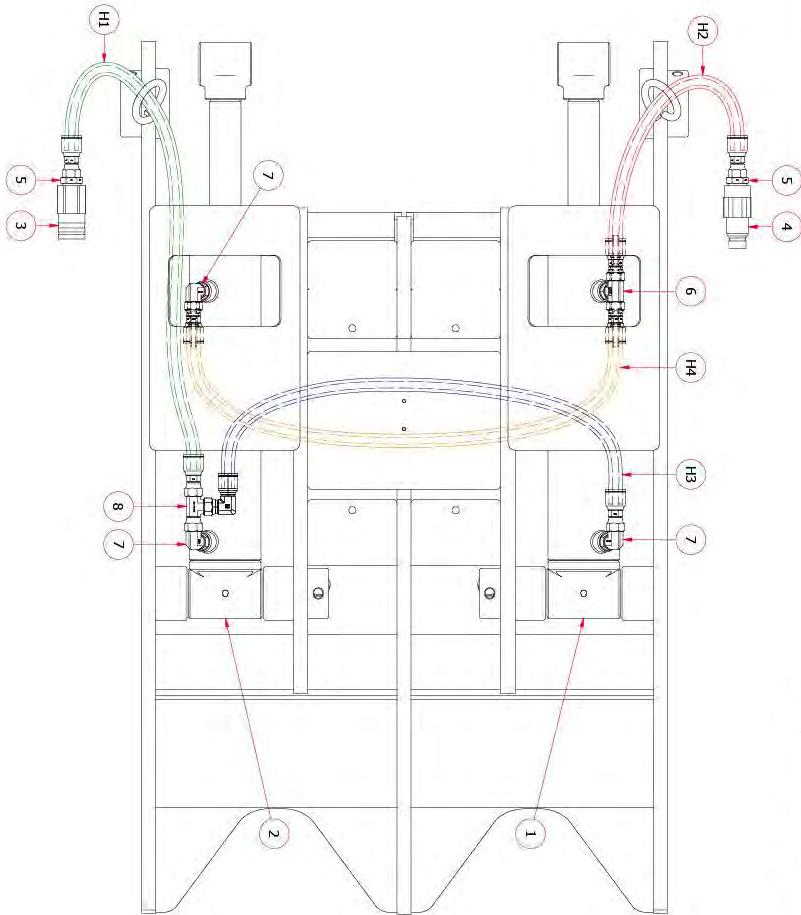


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14T SPLIT HYDRAULIC ROCK GRAB - HYDRAULIC PARTS LIST

Item	Part Number	QTY	Description	Diagram
1		1	LHS 3.5" BORE HYDRAULIC CYLINDER	16
2		1	RHS 3.5" BORE HYDRAULIC CYLINDER	16
3	F A13 1/2 BSP	1	1/2" FLAT FACE STUCCHI FEMALE	16
4	M A13 1/2 BSP	1	1/2" FLAT FACE STUCCHI MALE	16
5	B-G-0812	2	ST – ADAPTOR – 1/2" BSPPM – 3/4" JICM	16
6	G-G-NP-121214	1	T-ADAPTOR – 2 x 3/4" JICM – 3/4" UNOM	16
7	G-NP-90-1212	3	90 – ADAPTOR – 3/4" UNOM – 3/4" JICM	16
8	G-G-J-121212	1	T-ADAPTOR – 3/4" JICF – 2 x 3/4" JICM	16
H1	∴	1	HYD. HOSE FEMALE COUPLER TO BTM RHS CYL.	16
H2	∴	1	HYD. HOSE MALE COUPLER TO TOP LHS CYL.	16
H3	∴	1	HYD. HOSE BTM RHS CYL. TO BTM LHS CYL.	16
H4	∴	1	HYD. HOSE TOP LHS CYL. TO TOP RHS CYL.	16

14T HYD. ROCK GRAB



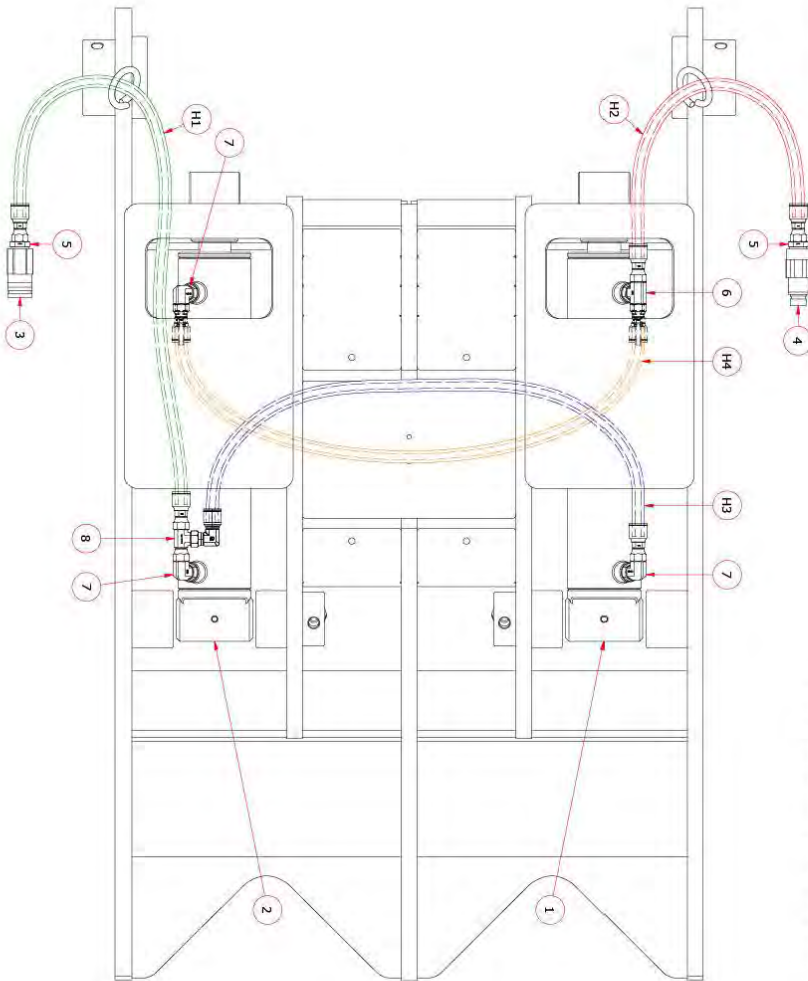
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20T SPLIT HYDRAULIC ROCK GRAB - HYDRAULIC PARTS LIST

Item	Part Number	QTY	Description	Diagram
1		1	LHS 4" BORE HYDRAULIC CYLINDER	17
2		1	RHS 4" BORE HYDRAULIC CYLINDER	17
3	F A13 1/2 BSP	1	1/2" FLAT FACE STUCCHI FEMALE	17
4	M A13 1/2 BSP	1	1/2" FLAT FACE STUCCHI MALE	17
5	B-G-0812	2	ST – ADAPTOR – 1/2" BSPPM – 3/4" JICM	17
6	G-G-NP-121214	1	T-ADAPTOR – 2 x 3/4" JICM – 7/8" UNOM	17
7	G-NP-90-1214	3	90 – ADAPTOR – 7/8" UNOM – 3/4" JICM	17
8	G-G-J-121212	1	T-ADAPTOR – 3/4" JICF – 2 x 3/4" JICM	17
H1	∴	1	HYD. HOSE FEMALE COUPLER TO BTM RHS CYL.	17
H2	∴	1	HYD. HOSE MALE COUPLER TO TOP LHS CYL.	17
H3	∴	1	HYD. HOSE BTM RHS CYL. TO BTM LHS CYL.	17
H4	∴	1	HYD. HOSE TOP LHS CYL. TO TOP RHS CYL.	17

20T HYD. ROCK GRAB



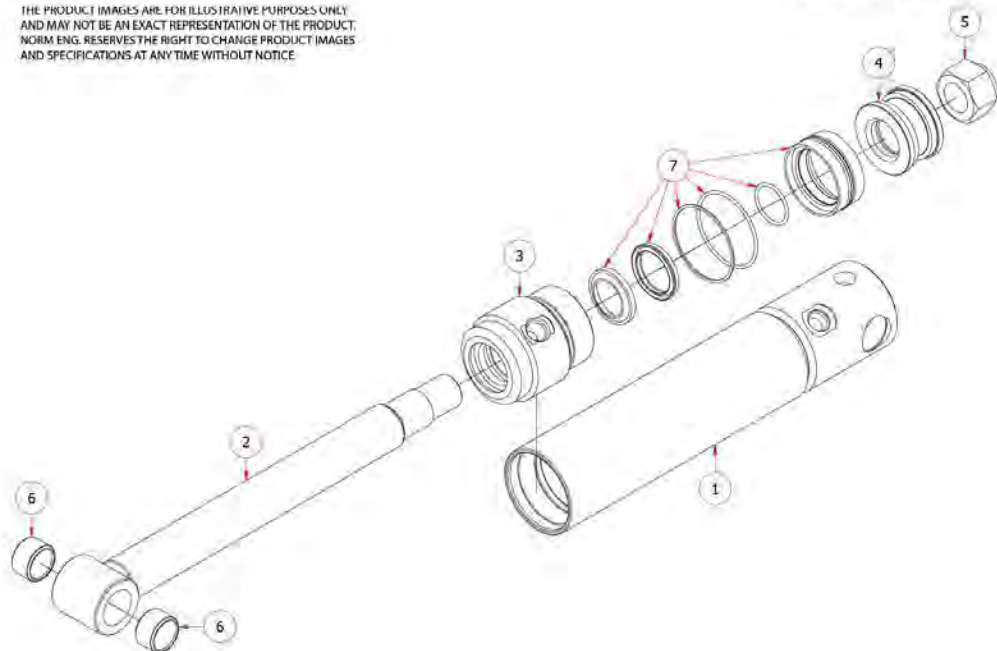
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## HYDRAULIC CYLINDER PARTS LIST

Item	QTY	Description	Diagram
1	1	HYDRAULIC BARREL ASSEMBLY	18
2	1	ROD ASSEMBLY	18
3	1	GLAND END CAP	18
4	1	PISTON	18
5	1	PISTON NUT	18
6	2	HARDEN INSERT BUSH	18
7	1	SEAL KIT	18

**Diagram 18**

THE PRODUCT IMAGES ARE FOR ILLUSTRATIVE PURPOSES ONLY AND MAY NOT BE AN EXACT REPRESENTATION OF THE PRODUCT. NORM ENG. RESERVES THE RIGHT TO CHANGE PRODUCT IMAGES AND SPECIFICATIONS AT ANY TIME WITHOUT NOTICE



# 11 APPENDICES

## 11.1 SAFETY SIGN LOCATIONS

Item	Description
1	Warning   Pinch point
2	Danger   High pressure fluid
3	Warning   Attachment can contact machine
4	Danger   Read the Manual



ITEM 1



ITEM 2



ITEM 3



ITEM 4

### Instructions

- Keep all safety signs clear and legible.
- Replace all missing, illegible, or damaged safety signs.
- When replacing parts which have safety signs attached make sure the replacement part has the safety sign.

# 12 WARRANTY

## 12.1 DEFINITION

**“Dealer”** means a dealer that purchases products directly from Norm Engineering Pty Ltd.

**“End consumer”** means a consumer that purchases products either directly from Norm Engineering Pty Ltd or directly from a “dealer” as defined above.

**“Products”** includes goods and services.

## 12.2 WARRANTY

Norm Engineering Pty Ltd welcomes you as a purchaser of its products. All Norm Engineering products are designed to ensure the highest standards, reliability, and performance.

Norm Engineering Pty Ltd warrants hydraulic cylinders against defects in manufacture for a period of twelve months from date of sale by the dealer or Norm Engineering Pty Ltd to the end consumer. The warranty in relation to hydraulic cylinders ceases upon the occurrence of damage to the piston rod of the hydraulic cylinder.

No warranty applies to hoses, tubes, and fittings in relation to any of the products.

Norm Engineering Pty Ltd warrants all its other products against defects in manufacture for a period of twelve months from the date of sale by the dealer or Norm Engineering Pty Ltd to the end consumer.

Norm Engineering Pty Ltd will, subject to the terms of this warranty, in relation to defective goods:

- a) replace the defective goods at no cost to the end consumer; or
- b) repair the defective goods at no cost to the end consumer; or
- c) pay the cost of having the defective goods repaired.

Norm Engineering Pty Ltd will, subject to the terms of this warranty, in relation to defective services:

- a) supply the services again to the end consumer at no cost to the end consumer; or
- b) pay the cost of having the service supplied again to the end consumer.

Warranty claims may be sent either to Norm Engineering Pty Ltd., P.O. Box 178, Mt Ommaney, Qld. 4074 or to the dealer.

All warranty periods shall commence from the date of sale by Norm Engineering Pty Ltd or the dealer to the end consumer. It is the end consumer's responsibility to establish the date of sale of the product to the end consumer by the dealer.

The end consumer may establish the date of sale by producing to Norm Engineering Pty Ltd the dated contract of sale between the end consumer and the dealer with its warranty claim.

If the end consumer is not able to establish the date of sale of the product to the end consumer by the date of its warranty claim, the warranty period shall be deemed to commence from the date of sale of the product by Norm Engineering Pty Ltd to the dealer.

This warranty will not apply if the end consumer does not use the product in accordance with Norm Engineering Pty Ltd's recommendation.

This warranty will not apply if the end consumer does not use products applied or fitted to any machine, equipment, or plant, in accordance with Norm Engineering Pty Ltd's operating recommendation for the product.

This warranty does not apply to any loss or damage caused through consequential neglect. Unless the end consumer indicates to Norm Engineering Pty Ltd prior to purchasing the product that it intends to use the product for a particular purpose, there is no implied warranty that the product will fit for that particular purpose. Ask Norm Engineering for clarification of the intended use is not included in the manual.



Only a dealer authorised in writing, or issued with an order number, by Norm Engineering Pty Ltd may carry out warranty repairs. Prior written approval must be obtained from Norm Engineering Pty Ltd before warranty repairs are carried out. Norm Engineering Pty Ltd will not recognise any warranty claim for reimbursement of repair costs unless the repairs have been carried out by an authorised dealer with prior written approval from Norm Engineering Pty Ltd to carry out the repairs.

Norm Engineering Pty Ltd limits its liability, as follows:

1) Pursuant to Section 68A of the Trade Practices Act 1974, this clause applies in respect of any of the goods or services supplied under this contract which are not of a kind ordinarily acquired for personal, domestic, or household use or consumption, provided that this clause will not apply if the end consumer establishes that reliance on it would not be fair and reasonable.

2) Liability for breach of a condition or warranty implied into this contract by the Trade Practices Act 1974 other than a condition implied by Section 69 is limited:

a) In the case of goods, to any one of the following as determined by Norm Engineering Pty Ltd:

i. the replacement of goods

ii. the repair of the goods

iii. the payment of the cost of having the goods repaired, excluding travelling and freight charges.

b) In the case of services, to any one of the following as determined by Norm Engineering Pty Ltd.

i. the supplying of the services again; or

ii. the payment of the cost of having the services supplied again

Expenses incurred by the end consumer in connection with making a warranty claim shall be borne by the end consumer unless otherwise agreed by Norm Engineering Pty Ltd.

To the extent permitted by law, all implied conditions, and warranties in the contract of sale between Norm Engineering Pty Ltd and the end consumer are hereby excluded.

The benefits conferred by this warranty on the end consumer are in addition to all other legal rights and remedies that the end consumer has in respect of the products.

Contracts of sale for products, and this warranty are submitted to the exclusive jurisdiction of the courts of Queensland.









## WARRANTY NOTICE

**DEALER:** .....

STATE: ..... SIGNED: .....

**END CONSUMER:**

NAME: .....

ADDRESS: .....

.....

.....

STATE: ..... POSTAL CODE: .....

PHONE: ..... SIGNED: .....

DATE OF SALE TO THE END CONSUMER: ...../...../.....

DESCRIPTION OF PRODUCTS: .....

.....

.....

.....

SERIAL NO: .....

DELIVERY DOCKET NO: .....

DELIVERY DATE: ...../...../.....

**NOTE: THIS FORM IS TO BE COMPLETED BY THE DEALER**

**AND RETURNED TO: NORM ENGINEERING - P O BOX 178**

**MT OMMANEY, BRISBANE, QUEENSLAND, AUSTRALIA, 4074**