



# TILT CONTROL COUPLER

## OPERATING & PARTS MANUAL



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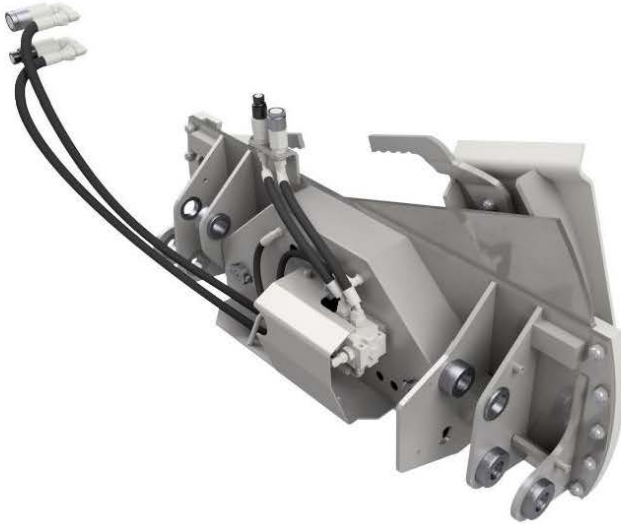
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# 1 INTRODUCTION



## **Tilt Control Coupler**

Congratulations on purchasing a Norm Engineering Pty Ltd attachment. We have designed this tilt control coupler 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 tilt control coupler. 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 tilt control coupler. 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 tilt control coupler.

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



#### **WARNING**

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 tilt control coupler 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 tilt control coupler.

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 operator manual 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 power unit speed.
- 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 POWER UNIT REQUIREMENTS

For the hydraulic locking version of this attachment requires a minimum of 45 bar from the power unit to safely and reliably activate the systems locking mechanics.

For the electrical locking version of this attachment a minimum 30Amps @ 12V is required to be provided by the power unit.

### 4.2 CHECK PICKUP FIT

Perform '5.1 Hitching Up the Tilt Control Coupler' to check how the attachment fits the coupler. Check for the following:

- Do the pins lock?
- Is it a snug fit?

### 4.3 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.



## 4.4 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 **DON'T** pull tight.
- They **DON'T** have excessive length.

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

## 4.5 CHECK ELECTRICAL CONNECTION

We take every opportunity to supply the attachment as a plug and play solution with a factory matching electrical connector, but unfortunately this is not possible for all power units.

Norm Engineering recommends using a certified and qualified electrical technician to perform these modifications to the power unit. For additional information refer to section '13 Warranty'.

If wiring is required Norm Engineering recommends connecting the attachment via a relay to a momentary push button on the opposite control switch to the one that operates the standard flow auxiliary hydraulics. Wire polarity is not important and max current draw is under 5 Amps.

## 4.6 HYDRAULIC CYLINDER RUNNING-IN

To maximise the life of the unit, it must be run in for a period. To carry out the running in procedure, ensure there are no bystanders within the nominated radius as defined in the risk assessment completed prior to commencing any works.

Operate the hydraulic cylinders to their open and closed positions five times and note the sensitivity of the operation. If there are any issues with the cylinder movements call Norm Engineering first for assistance.

## 5 ASSEMBLY INSTRUCTIONS



### WARNING

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 TILT CONTROL COUPLER



### DANGER

All safety precautions pertaining to both the power unit and the tilt control coupler need to be followed.

**Note:** This procedure is not power unit specific, you may need to refer to the power units operating manual for instructions suitable to your power unit model.

**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 all workers involved in the installing up the tilt control coupler.

**Step two:** If you have not already done so, refer to the power units operating manual for instructions to remove the standard quick coupler.



**Step three:** With the tilt control coupler on the ground, drive the power unit carefully up behind the coupler. Align the loader arms with the bushes on the coupler.

Using the OEM pins, fasten the tilt control coupler to the loader arms.

ENSURE any fasteners are correctly torqued (refer parent operating manual).



**Step four:** Carefully extend the crowd cylinders until the rod ends align with the bushes in the coupler.

Using the OEM pins, fasten the tilt control coupler to the loader arms.

**ENSURE** any fasteners are correctly torqued (refer parent operating manual).

**Note:** Norm Engineering Pty. Ltd. always attempts design the tilt control coupler to suit the OEM coupler pins. However for some power units this is not possible. If this is the case, your tilt control coupler will be supplied with suitable pins.

**Step five:** To complete the installation of the tilt control coupler, attached the tilt control coupler power unit hoses into the auxiliary hydraulic couplings on your power unit.

You will also need to connect the electrical plug to your power unit electrical accessory harness.

**Note:** Norm Engineering Pty. Ltd. endeavours to supply attachments that are plug and play with the power unit however not all power unit's come standard with an electrical accessory harness. You may be required to contract an auto-electrician to fit this to your power unit in order to utilise the tilt functions available in this coupler.

## 5.2 REMOVING THE TILT CONTROL COUPLER



All safety precautions pertaining to both the power unit and the tilt control coupler need to be followed.

**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 tilt control coupler.

**Step two:** Rest the tilt control coupler on the ground.

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

**Step four:** Remove the pins that secure the crowd cylinders. Carefully store the pins for future use. Retract the crowd cylinders until they are clear of the coupler frame.

**Step five:** Remove the pins that secure the loader arms. Carefully store the pins for future use.

It should now be possible to carefully reverse the power unit away from the v.

## 6 OPERATING INSTRUCTIONS



### DANGER

When using the tilt control coupler, ensure all personnel wear appropriate personal protective equipment at all times. All personnel must stand well clear of the tilt control coupler 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 AND LIMITATIONS



### DANGER

The tilt couple is **NOT** to be used:

- To carry people;
- As a lifting point;
- To pull or push over objects.

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

### NOTICE

The tilt control coupler has been designed to pick up attachments with universal pickup plates. It is **NOT** to be used for any other purpose.



### DANGER

Under no circumstances should the tilt control coupler be used to pick-up, and move an

attachment around without first engaging the locking mechanism.



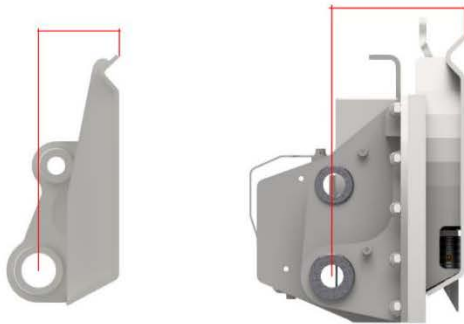
### WARNING

The tilt control coupler should not be used to pick up attachments that have not been

designed to suit your power unit. Using attachments that are not suitable for the power unit may reduce the life of both the tilt control coupler and the power unit.

## 6.2 LIFTING CAPACITY

In order to incorporate the tilting mechanism, the distance between the loader arm pins and the top of the universal pickup plate will be larger than a standard OEM quick coupler. This increases the load centre distance on all of your standard attachments.



OEM coupler and a tilting quick coupler.

In general, the difference between a standard quick coupler and a tilting quick coupler is **approximately 100mm**. This will vary depending on the configuration of the power unit.

There is also a weight difference between a standard



The combination of both of these factors will reduce the safe working load of your power unit. This must be considered by the operator when consulting the lifting charts. Contact your power unit supplier for information regarding the reduction in lifting capacity.

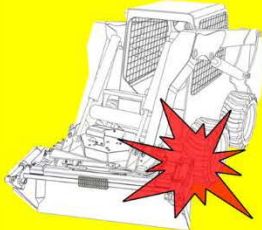
## 6.3 RANGE OF MOTION



### NOTICE

As the tilt control coupler increases the range of motion of your attachments it is possible to contact the power unit. It is important that all operators of this power unit are aware of this danger.

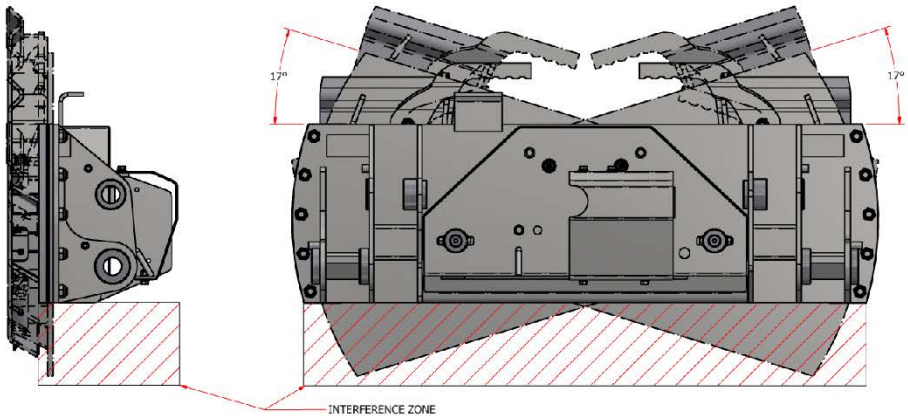
# WARNING



THE CONFIGURATION OF THIS MACHINE MAY MAKE IT POSSIBLE TO CONTACT THE MACHINE WHEN TILTING YOUR BUCKET OR ATTACHMENT.

To assist with ensuring all operators are aware of this danger, Norm Engineering has provided a warning sticker with the coupler. If placed in the cab, all operators of the power unit will be reminded of the danger.

The tilt control coupler is capable of tilting up to 17 degrees in both directions.



## NOTICE

Norm Engineering cannot guarantee that the tilt control coupler will be able to tilt every

attachment available on the market. Clearance is required beneath (and behind) the universal pickup for the tilt mechanism to work.



## 6.4 HITCHING UP AN ATTACHMENT



All safety precautions pertaining to both the power unit, the coupler, and the attachment

must be followed. Sufficient planning should be made prior to any work commencing in case of an emergency situation.

**Step one:** Before beginning this procedure, ensure that the attachment is on a firm level surface large enough to accommodate the attachment, the power unit and any workers involved in the hitching up process.

**Step two:** Ensure the tilt control coupler is in its neutral position. Refer to your power unit's operating manual for instructions on hitching up an attachment. The installation of a tilt control coupler does not affect this process.

**Step three:** The operator must visually inspect to ensure the attachment is fully engaged into the power unit coupler.

**Step four:** Engage the locking mechanism. A visual inspection should be performed to ensure all locking systems are fully engaged. Give the attachment a couple of quick short movements close to the ground to test it is firmly engaged.

**Step five:** Rest the attachment on the ground and refer to the power unit's operating manual to ensure the release of pressure in the hydraulic system.

**Step six:** Connect the hydraulic couplings on the attachment to the auxiliary couplings provided on the tilt control coupler.

**Step seven:** Start the power unit and cycle the tilt cylinders to check all clearances and to verify that all hitching procedures have been successfully completed.

## 6.5 REMOVING AN ATTACHMENT



All safety precautions pertaining to both the power unit, coupler, and the attachment

need to be followed. Sufficient planning should be made prior to any work commencing in case of an emergency situation.

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

**Step two:** Rest the attachment on the ground.

**Step three:** Disconnect the hydraulic couplings on the attachment from the tilt control coupler auxiliary couplings following all safety precautions. Refer to your power unit's operating manuals for instructions on relieving hydraulic pressure in lines.

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

**Step five:** Refer to your power unit's operating manual for instructions on removing an attachment and ensure the coupler is completely disengaged from the attachment. Store attachment safely.

## 6.6 OPERATING INSTRUCTIONS

### NOTICE

The following information is a generic overview on how to tilt control coupler operates. For power unit specific

instructions, including the location and operation of the electrical accessory harness button please consult your power units operating manual or contact your machinery dealer.

If you would like further advice, please do not hesitate to call Norm Engineering.

The tilt control coupler has been plumbed up to automatically direct the flow from the power units auxiliary lines through to the auxiliary lines on the coupler. This means operation of any of your attachments hydraulic functions will remain unaffected by the installation of the tilt control coupler. The procedure and controls should remain the same.

In order to tilt your coupler, you will need to activate the diverter valve in the coupler. This is generally done by pressing (and holding) a button located on the left control stick. Note, the location of this button **WILL** vary depending on the power unit model. Refer to the power unit manual for specific instructions.

Whilst the button is activated, you simply need to operate the power units auxiliary controls to tilt the coupler in either direction.



By engaging the tilting mechanism, the flow of oil is diverted from your attachments auxiliaries to the tilt control coupler cylinder.

**NEVER** perform this action whilst clamping any load with your attachment.

## 7 MAINTENANCE AND CARE

### 7.1 HYDRAULICS

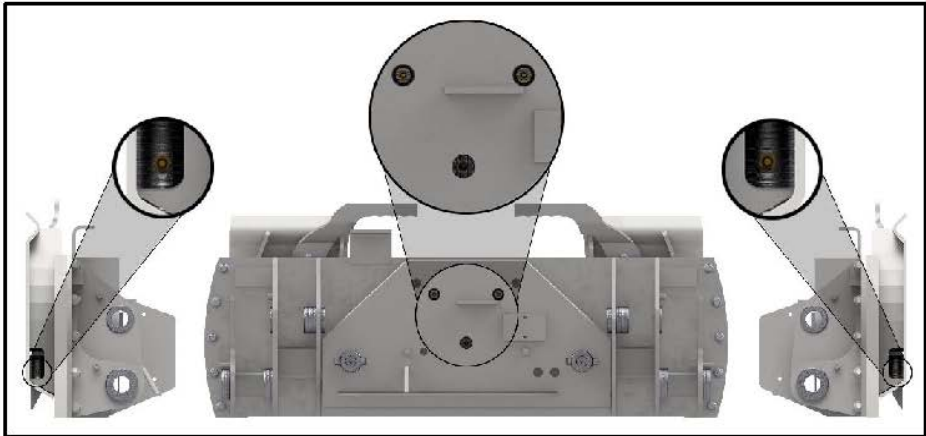


Read and understand all safety requirements prior to beginning any maintenance to any hydraulic connections.

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 GREASE POINTS

The tilt control coupler has five grease nipples in addition to the grease points of the power unit. It is important that all these points are greased on a daily basis to extend the life of the tilt control coupler.



### NOTICE

On a regular basis unlock the coupler, remove the attachment, and grease the locking pins (shown on the left and right in the above image). If this is not performed, the pins will bind up and you will not be able to unlock your coupler.

## 7.3 PRIOR TO USE

Prior to use, the tilt control coupler 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 in the tilt plates.
- Grease all fittings – this needs to be performed on a daily basis.

### 7.3.1 INSPECT FOR MATERIAL BUILD-UP

Due to the nature of the tilt mechanism, under some environmental conditions it is possible to get a build-up of material in-between the two sliding plates of the tilt hitch.

If left unattended, material build-up may restrict the tilting mechanism and lead to premature wear. Adding this simple check to your pre-start checklist will greatly increase the life of your coupler.

The easiest method for clearing away any material build-up is to have the operator carefully tilt the hitch (with nothing attached) whilst someone else washes the dirt away.

## 7.4 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 tilt control coupler.
- Inspect the attachment for wear, particularly around the tilt plates, 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 '13 Warranty'.

# 8 TROUBLESHOOTING

What is the problem?	Possible reasons?	What can be done?	Who carries out the activity?
Tilt control coupler does not tilt	Material build-up	See <i>Section 7.3.1</i> for instructions on cleaning away excessive material build-up.	Operator and assistant
	Electrical fault	<p>Step 1. If the couplers auxiliary circuit continues to function (i.e. 4in1 continues to open and close) whilst you are trying to tilt the coupler, you have an electrical fault.</p> <p>Step 2. To verify the source of the electrical fault, isolate the coupler electrically from the machine. Provide an external 12-volt power source to the coupler and then attempt to tilt the coupler. If the coupler tilts, the electrical fault is with the machine.</p> <p>If the fault is with the coupler, contact Norm Engineering.</p> <p>If the fault is with the power unit's electrical circuit, contact your machinery dealer.</p>	Step 1. Operator Step 2. Qualified person
	Damaged hose and/or fittings	<p>Step 1. Inspect hoses and fittings for damage and/or leaks.</p> <p>Step 2. Replace hydraulic hoses and/or fittings if required.</p>	Step 1. Operator Step 2. Qualified person
	Defective cylinders	<p>Step 1. Inspect cylinders for physical damage and/or leaks.</p> <p>Step 2. Replace or repair cylinder if required.</p>	Step 1. Operator Step 2. Qualified person
	Power unit hydraulic fault	<p>Step 1. Disconnect a hitch and plug another attachment directly into the power units auxiliary couplers.</p> <p>If the fault is in the power units hydraulic circuit, contact your machinery dealer.</p>	Operator

# 9 RISK ASSESSMENT

**Assessment Team:** Norman Pesch, John Pesch, Sam Ramsden

**Date of Assessment:** 12/05/2022

**Manufacturer:** Norm Engineering Pty Ltd

**Location:** Brisbane

**Contact Person:** Norman Pesch

**Attachment:** Tilt Control Coupler

**Weight:** 200-230kg

**Intended use:** Fast Attachment Mounting

**Construction material:** Steel

**Air Operated:** NO

**Hydraulic Operated:** YES

**Manually operated:** NO

*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>Persons working in close proximity to the plant attachment may become entangled in moving components, i.e., hydraulics, tilt control plates, etc.</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 checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
			C	<input checked="" type="checkbox"/>	3	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
			D	<input type="checkbox"/>	4	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
			E	<input type="checkbox"/>	5	<input type="checkbox"/>		<input type="checkbox"/>	<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>Persons working in close proximity to the plant attachment could be crushed with the movement of the hydraulics, motion of the plant attachment or if SOP is not followed.</b></p>	Yes	No	A	<input type="checkbox"/>	1	<input checked="" type="checkbox"/>	High Significant Medium Low	<input checked="" type="checkbox"/>	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	B	<input type="checkbox"/>	2	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
			C	<input checked="" type="checkbox"/>	3	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
			D	<input type="checkbox"/>	4	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
			E	<input type="checkbox"/>	5	<input type="checkbox"/>		<input type="checkbox"/>	<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>If persons are working in the vicinity of the plant, they could be punctured by the plant or components on the plant attachment (e.g., pivoting plates).</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"/>	<input type="checkbox"/>
			C	<input type="checkbox"/>	3	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
			D	<input checked="" type="checkbox"/>	4	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
			E	<input type="checkbox"/>	5	<input type="checkbox"/>		<input type="checkbox"/>	<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>If persons are in the vicinity of the working plant and plant attachment, they could be struck by the plant or plant attachment.</b></p>	Yes	No	A	<input type="checkbox"/>	1	<input type="checkbox"/>	High Significant Medium Low	<input checked="" type="checkbox"/>	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	B	<input checked="" type="checkbox"/>	2	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
			C	<input type="checkbox"/>	3	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
			D	<input type="checkbox"/>	4	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
			E	<input type="checkbox"/>	5	<input type="checkbox"/>		<input type="checkbox"/>	<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> <p><b>Depending on the operating location, the working environment could cause a person to slip trip or fall. Persons standing on the plant or plant attachment could slip and/or fall from it.</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 checked="" type="checkbox"/>	3	<input type="checkbox"/>		<input checked="" type="checkbox"/>
			D	<input type="checkbox"/>	4	<input checked="" type="checkbox"/>		<input type="checkbox"/>
			E	<input type="checkbox"/>	5	<input type="checkbox"/>		<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>Persons not following SOP's or plant guidelines could become injured from misuse or working in the vicinity of the plant and plant attachment.</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 checked="" type="checkbox"/>	4	<input type="checkbox"/>		<input type="checkbox"/>
			E	<input type="checkbox"/>	5	<input type="checkbox"/>		<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	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"/>

### 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	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 checked="" type="checkbox"/>	4	<input type="checkbox"/>		<input type="checkbox"/>
			E	<input type="checkbox"/>	5	<input type="checkbox"/>		<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> <p><b>The plant attachment utilizes auxiliary electrical connection to operate a diverter valve on the attachment. Wear or improper installation of electrical components could lead to damage.</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 checked="" type="checkbox"/>	3	<input type="checkbox"/>		<input checked="" type="checkbox"/>
			D	<input type="checkbox"/>	4	<input checked="" type="checkbox"/>		<input type="checkbox"/>
			E	<input type="checkbox"/>	5	<input type="checkbox"/>		<input type="checkbox"/>
								<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>	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"/>

**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 checked="" 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 checked="" 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
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## Risk Controls

### Most Desirable

<ul style="list-style-type: none"> <li>• Elimination</li> <li>• Substitution</li> <li>• Engineering Controls</li> <li>• Isolation</li> <li>• Administrative Controls</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>
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### 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 only operate if people are a safe distance away.</p> <p>PPE – Ensuring all people who will be in the vicinity of the plant attachment during operation be wearing clothes that mitigate the chances of becoming entangled by accident.</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 only operate if people are a 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 a safe distance away.</p> <p>PPE – The use of the correct PPE for the worksite will minimize the risk of cutting when working in and around the attachment. Gloves and tough work clothes will reduce the risk associated with touching or bumping into sharp edges on the attachment whilst it is not in operation.</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 visible position on the plant attachment highlighting the potential risk.</p>
High Pressure Fluid	<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.</p> <p>Administrative Controls – A warning sticker should be placed in a visible position on the plant attachment highlighting the potential risk.</p>
Electrical	<p>Engineering Controls – The routing of the electrical cable is designed to minimize the risk of the cable being damaged and exposed wires leading to injury.</p> <p>Administrative Controls – The manual will address correct maintenance schedules for the plant attachment to reduce the risk associated with risk caused by improper maintenance, or installation. Only authorized technicians should perform repairs on electrical components</p>
Noise	<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.

# 10 PARTS

## QUALITY BACKUP

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

### 10.1 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 tilt control coupler in the spaces provided under *Section 10.1.1 Reference Information*.

#### 10.1.1 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 tilt control coupler.

Model Number:

.....

Make:

.....

Serial Number:

.....

Date Purchased:

.....

# 11 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.

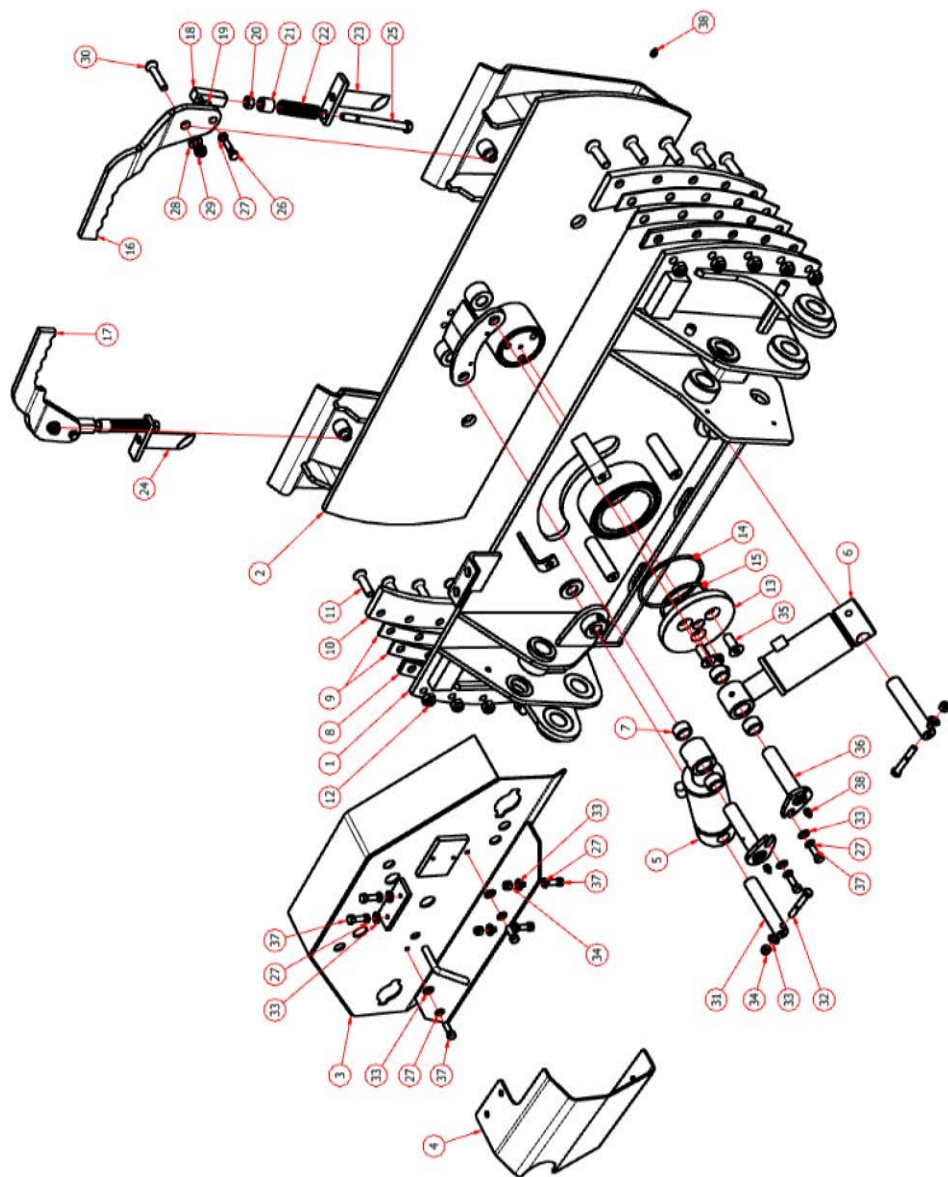
## PARTS LIST

Item	Part Number	QTY	Description	Diagram
1	Machine dependent	1	Back half weldment	1
2	Machine dependent	1	Front half weldment	1
3	Machine dependent	1	Removable hydraulic cover	1
4	Machine dependent	1	Removable valve cover	1
5	C2565	1	L.H.S. tilt coupler cylinder	1
6	C2566	1	R.H.S. tilt coupler cylinder	1
7	NS3041	4	Hardened bush insert	1
8	STH-P0-0023	2	8mm tilt packer	1
9	STH-P0-0022	4	3mm tilt packer	1
10	STH-P0-0024	2	Tilt skid clamp plate	1
11	-	10	M16 x 60 countersunk bolt – G12.9	1
12	-	10	16MM nyloc nut	1
13	STH-P0-0025	1	Centre pivot cap	1
14	-	1	O-ring – 130mm I.D. – 5.7mm	1
15	-	1	O-ring – 90mm I.D. – 5.7mm	1
16	STH-P0-0020	1	R.H.S. locking handle	1
17	STH-P0-0021	1	L.H.S. locking handle	1
18	STH-P0-0027	2	Threaded locking block	1
19	STH-P0-0031	2	Locking mechanism pivot boss	1
20	-	2	Locking mechanism lock nut	1

## PARTS LIST CONTINUED

Item	Part Number	QTY	Description	Diagram
21	STH-P0-0029	2	Locking mechanism spacer	1
22	STH-P0-0032	2	Locking mechanism spring	1
23	PI294	1	R.H.S. locking pin	1
24	PI297	1	L.H.S. locking pin	1
25	-	2	Locking mechanism bolt	1
26	-	2	3/8 x 1.5 UNC bolt – G12.9	1
27	-	10	3/8" spring washer	1
28	-	2	12mm washer	1
29	-	2	12mm nyloc nut	1
30	-	2	12mm x 70 countersunk bolt – G12.9	1
31	PI295	2	Bottom cylinder pin	1
32	-	2	3/8 x 2.5 UNC bolt – G12.9	1
33	-	12	3/8" washer	1
34	-	4	3/8 UNC nyloc nut	1
35	-	3	M16 x 40 countersunk bolt – G12.9	1
36	PI296	2	Top cylinder pin	1
37	-	8	3/8 x 1 UNC bolt – G12.9	1
38	NS2001	5	1/8 BSPT grease nipple	1
39	-	1	VS280 6 port diverter valve	2
40	-	2	M8 x 65 socket head bolt – G12.9	2
41	-	1	Machine hose #1	2
42	-	1	Machine hose #2	2
43	-	1	External tilt hose #1	2
44	-	1	External tilt hose #2	2
45	-	1	Auxiliary hose #1	2
46	-	1	Auxiliary hose #2	2
47	-	2	Internal tilt hose #1	2
48	-	2	Internal tilt hose #2	2
49	-	2	1/2" flat face couplings - female	2
50	-	2	1/2" flat face couplings - male	2



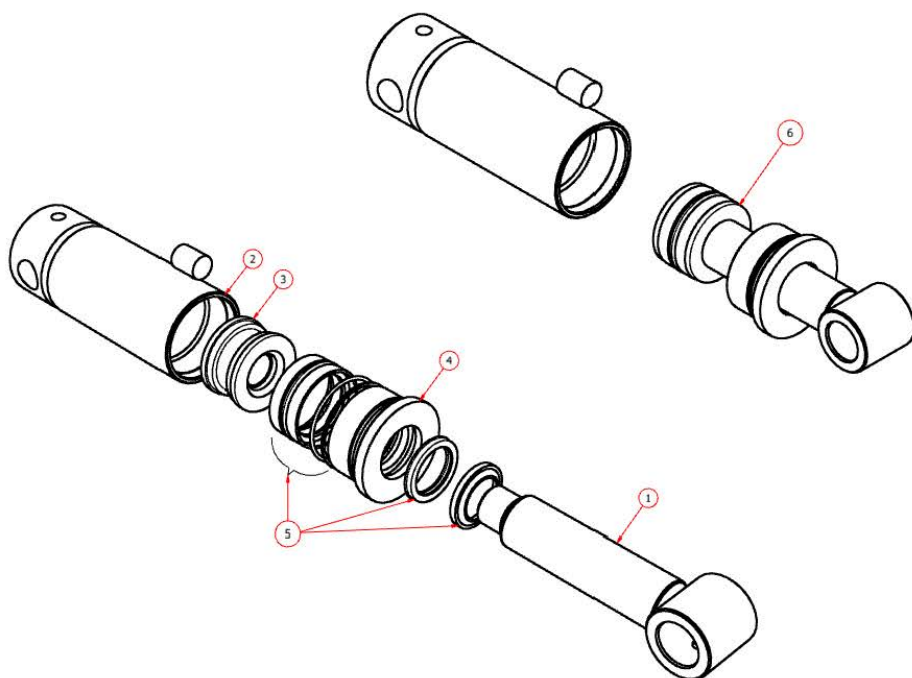




## TILT CYLINDER PARTS LIST

Item	QTY	Description	Refer to Diagram
1	1	Rod weldment	3
2	1	L.H.S. barrel weldment	3
3	1	Piston	3
4	1	Gland	3
5	1	Seal kit	3
6	1	Rod + gland + piston + seal kit assembly	3
7	1	R.H.S. barrel weldment	Not shown

Diagram 3



# 12 APPENDICES

## 12.1 SAFETY SIGN LOCATIONS

Item	Description
1	Warning   Pinch point
2	Warning   Attachment can contact machine
3	Danger   High pressure fluid
4	Danger   Keep clear
5	Danger   Read the manual



ITEM 1



ITEM 2



ITEM 3



ITEM 4



ITEM 3

### 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.

# 13 WARRANTY

## 13.1 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.

## 13.2 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