GEITH | TILTING QUICK COUPLER
OPERATION & INSTALLATION

WWW.GEITH.COM

PN. 823000069422

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WARNING

AVOID INJURY OR DEATH

Instructions are necessary before operating or servicing attachment/machine. Read and understand the Operation & Maintenance Manual and signs (decals) on attachment/machine. Follow warnings and instructions in the manuals when making repairs, adjustments or servicing. Check for correct function after adjustments, repairs or service. Failure to follow instructions can cause injury or death.

Product Introduction

Thank you for purchasing a Geith Tilting Coupler. Geith attachments are designed and manufactured to the highest quality standards and backed up by Geith's commitment to service and parts support.

Only properly trained and skilled personnel should install and operate the Geith Tilting Coupler. Please ensure that you take the time to read this manual fully and carefully.

- It is important all users/operators are familiar with and fully understand all aspects of the information contained in this manual.
- All operators must be properly trained in the use of the specific model of Geith Tilting Coupler intending to be used.
- It is the responsibility of the machine owner to ensure only properly trained operators use the Geith Tilting Coupler.
- Failure to operate and maintain equipment correctly can result in serious injury or death.

Content in this Operation and Installation Manual applies to all current product models unless noted otherwise. The Geith tilting couplers are designed for use with all makes of excavators, combined with a wide range of attachments, to suit a wide range of work applications.

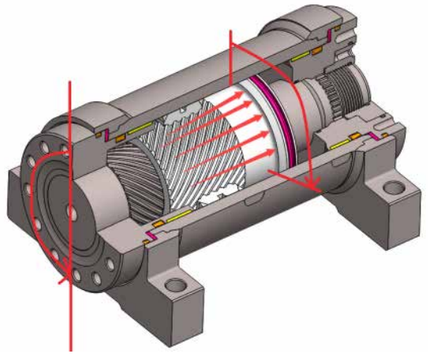
The Tilt Coupler can increase the productivity, profitability and versatility of backhoes or excavators by simply tilting the attachment instead of moving the entire machine.

The Tilting coupler is ideal for performing everyday tasks, or completing jobs that haven't been tried.

Technology

The Geith Tilting Coupler uses innovative, sliding-spline operating technology to convert linear piston motion into powerful shaft rotation. Each actuator is composed of a housing and two moving parts — the central shaft and piston.

Helical spline teeth on the shaft engage matching teeth on the piston's inside diameter. A second set of splines on the piston's outside diameter mesh with the gear in the housing.



How it works?

When hydraulic pressure is applied to one side of the piston it moves along its axis, the helical gearing of the fixed gear and piston cause the piston to twist while moving along it axis. There is similar helical gearing on the inside diameter of the piston and the shaft shaft which is connected to the quick coupler. Applying pressure to the opposite port will return the piston and shaft to their original starting positions..

Product Overview

Specifications for Geith Tilting Quick Coupler

Model GT		GT05	GT07	GT10	GT14	GT23	GT27	GT35
Model QC		QC35-40	QC45	QC45	QC60	QC70	QC80	QC90
			QC50	QC50	QC65	QC80	QC90	QC100
				QC55				
				QC60				
Max. Machine Weight	kg	5,000	7000	10,000	14,000	23,000	27,000	35,000
	lb	11,000	15,400	22,000	30,900	50,700	59,500	77,200
Total tilt	°	180	180	180	134	134	134	134
Output Torque	Nm	2,800	4,700	7,300	10,500	14,000	18,000	24,000
	in lbf	24,782	41,599	64,610	92,933	123,910	159,313	212,418
Holding Torque	Nm	6,800	12,000	18,000	26,000	35,000	46,000	59,000
	in lbf	60,185	106,209	159,313	230,119	309,776	407,134	522,194
Approx Geith Tilting Quick Coupler Weight*	kg	99	153	208	326	592	747	927
	lb	218	337	459	719	1,305	1,647	2,044

General Safety Guidelines

Safety Instructions

The following information provides safety notices and information relating to the safe installation and use of the Geith Tilting Coupler. Check the rules and regulations at your location. The rules may include an employer‘s work safety requirements, local regulations or on site best practices.

SAFETY ALERT SYMBOL

Be Prepared - Get to know all operating and safety instructions.

This is the Safety Alert Symbol. Wherever it appears in this manual or on safety signs on the attachments or machine you must be alert to potential for personal injury or accidents. Always observe safety precautions and follow recommended procedures.

DANGER

DANGER - This signal word is used on safety messages and safety labels and indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

WARNING - This signal word is used on safety messages and safety labels and indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

CAUTION - This signal word is used on safety messages and safety labels and indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.

IMPORTANT

This signal word identifies procedures which must be followed to avoid damage to machine.

WARNING

TIPPING CAN CAUSE SERIOUS INJURY OR DEATH
Do not exceed Rated Lift Capacity. Read and understand lift capacity charts for your excavator.

- The lift capacity of the excavator is reduced when fitted with a Geith Tilting Coupler. The weight of the Geith Tilting Coupler must be subtracted from the lift capacity of your machine.
- Operate the Geith Tilting Coupler and attachment through its full range of motion to ensure there is no interference between the attachment and machine that could damage the machine, Geith Tilting Coupler or attachment.
- Installation of the Geith Tilting Coupler should be carried out by properly trained and qualified personnel only. Failure to comply with this requirement can cause serious injury or death.

WARNING

AVOID INJURY OR DEATH
Read the attachment and machine Operator’s Manual before installing and/or operating this attachment. Operator must have instructions before operating the attachment/machine. Untrained operators can cause injury or death.

- Geith strongly recommends use of the hydraulic kit and control system designed to operate the Geith Tilting Coupler to ensure the quick coupler operates as intended.
- Connection of a Geith Tilting Coupler to other manufacturer‘s coupler control systems may result in unintended release of an attachment which could cause serious injury or death. Geith takes no responsibility for the performance of the Geith Tilting Coupler in these circumstances.
- Always wear appropriate personal protective equipment when working with hydraulic equipment.

General Safety Guidelines

- When installing the Geith Tilting Coupler you must use only approved/certified lifting equipment.
- Exercise extreme caution when carrying out maintenance procedures on the Geith Tilting Coupler, particularly when working with pressurized fluids such as hydraulic oil.

Before commencing any inspection or maintenance work.

- Always ensure the Geith Tilting Coupler and attachment is supported in a stable position.
- Stop the engine and remove the key (in order to prevent any unintentional or unexpected movement of Geith Tilting Coupler or attachment). Follow the service and maintenance instructions given in your machine owner‘s and service manual.

WARNING

AVOID INJURY OR DEATH
Before leaving the machine:
• Lower the attachment to the ground.
• Stop the engine & remove the key.

- Be aware of residual oil pressure in the hydraulic system when loosening or removing any hose or pipe connections.
- Always depressurize the system before starting maintenance work on the Geith Tilting Quick Coupler
- Never inspect for oil leaks with bare hands as pressurized oil can penetrate the skin and cause serious injury or death. Use a piece of wood or cardboard to search for leaks.

WARNING

AVOID INJURY OR DEATH
Hydraulic fluid under pressure can penetrate skin and eyes, causing serious injury or death. Fluid leaks under pressure may not be visible. Use a piece of cardboard or wood to find leaks. Do not use your bare hand. Wear safety goggles. If fluid enters skin or eyes, get immediate medical attention from a physician familiar with this injury.

Keep bystanders away from the swing area and operating area of the machine.

- Never swing an attachment over the heads of bystanders.
- Never use the Geith Tilting Coupler or attachments to transport or lift persons.

WARNING

AVOID INJURY OR DEATH
• Always keep bystanders away from the work area and travel path.
• The operator must always look in the direction of travel.

When working with hydraulic oil, every precaution should be taken to prevent oil spillage on the equipment or ground. Oil can seep into drains, and waterways through run off systems or through ground soakage causing danger to people and the environment. Oil spillage on equipment or ground can cause risk of slippage or fire which may lead to serious injury or death or property damage.

Use collection vessels to collect and retain any oil being released from the system. Dispose of unwanted oil and oily rags/materials in compliance with all applicable environmental laws and regulations.

WARNING

Fluid such as engine oil, hydraulic fluid, coolants, grease, etc. must be disposed of in an environmentally safe manner. Some regulations require that certain spills and leaks on the round must be cleaned in a specific manner. See local government regulations for the correct disposal.

The maintenance of quick couplers is important for the proper operation of the equipment and should be carried out by competent persons only. Inspections and maintenance are to be carried out on a scheduled basis to assist early identification of issues that may develop into more serious problems.

General Safety Guidelines

Cautionary Notices

Before beginning disassembly of the Geith Tilting Coupler, there are several cautionary notices that should be considered. If you are not comfortable with repair or maintenance of this product, contact your local dealer or Geith technical support for assistance.

WARNING

To avoid personal injury and machinery damage:

Read the Service and Repair Manual for proper installation, maintanance and repair procedures.

WARNING

Pinch point hazard:

Moving parts can cause serious injury.
Keep hands clear during operation.

WARNING

To avoid personal injury and machinery damage:

Make sure Geith Tilting Coupler and/or attachment does not come in contact with boom, bucket cylinder and/or operator area, particularly in fully curved position.

WARNING

To avoid personal injury and machinery damage:

Make sure no personnel are standing within the arc described by the movement of the attachment.
The Geith Tilting Coupler increases the swing radius of buckets and tools.

WARNING

To avoid personal injury and machinery damage:

Do not use Geith Tilting Coupler for lifting or craning materials. The Geith Tilting Coupler should only be used to perform tasks for which it was designed.

WARNING

To avoid damage to seals or other internal components:

Do not weld directly into the Geith Tilting Coupler when it is fully assembled.

Modifications may void product warranty.

Other Safety Guidelines and Precautions

1. The Geith tilting coupler should only be used to perform tasks for which it was designed. Abusing the product and/or using it for purposes for which it was not intended can expose the operator and others to hazards as well as result in damage to the Tilting coupler, carrier and/or other attachments.
2. Modification to the Geith Tilting Coupler is done at the owner‘s risk and may void the product warranty.
3. The Tilting coupler is designed for a maximum bucket width as noted below. Applying the full force of the excavator or backhoe to the corner of a wide bucket (e.g. corner digging with a wide bucket) may cause premature wear and/or reduced equipment life. It is also recommended that the bucket widths are not exceeded.

Maximum Recommended Bucket Width for Use with Tilting coupler	
GT-05	1.2m (47”)
GT-07	1.4m (55”)
GT-10	1.5m (59”)
GT-14	1.7m (66”)
GT-23	1.8m (70”)
GT-27	2.1m (82”)
GT-35	2.4m (94”)

4. A decrease in breakout force may be experienced due to the increased tip radius and the added weight of the tilting coupler to the stick.
5. It is the owner‘s responsibility to be sure all safety equipment is in place and operating properly at all times. If safety decals fade, are damaged or become unreadable from a distance of 3m, they should be replaced immediately.

General Safety Guidelines

Be sure to post the warning decal provided by Geith to the cab of the carrier machine.

6. The Geith Tilting coupler should be used in conjunction with attachments that do not adversely affect the stability of the machine.

Important Notice

Geith does not assume any responsibility beyond the design and performance of its construction equipment attachment products. The customer is solely responsible for all associated components related to the installation of the product and its ultimate application.

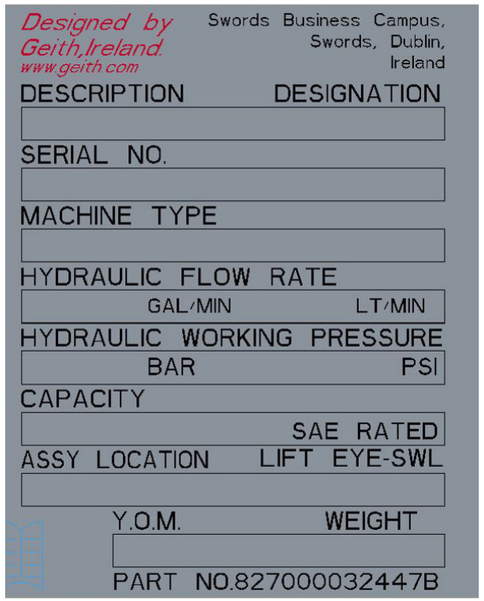
WARNING

Improper selection, installation or use of Geith products or systems may result in failure and cause death, personal injury or property damage.
It is important to thoroughly analyse all aspects of your application and review current product information and guidelines.

Product Identification

Tilting coupler Identification

A unique serial number is located on each Geith Tilting coupler.This serial number is stamped on the quick coupler frame and is also located on an aluminum CE badge shown here. The serial number may be required before parts and/ or service issues can be resolved. It may be necessary to remove paint to expose the serial number.



Application Recommendations

The Geith Tilting Coupler is designed for use with all makes of excavators, combined with a wide range of attachments, to suit a wide range of work applications. Owners and operators please take note however that all possible applications, operations and uses for the quick coupler cannot be predicted or anticipated. It is therefore the responsibility of the owner and operators of the Geith Tilting Coupler to ensure that the coupler is properly used and maintained according to the instructions provided with the coupler. Failure to properly operate or maintain the coupler can cause death or serious injury or property damage.

Intended Use

Geith Quick couplers are primarily designed to withstand loading situations that direct and transmit the working forces of the excavator and attachment through key load points. Failure by the owner or operator to use the Geith quick coupler appropriately may result in premature wear of the quick coupler and may lead to failure.

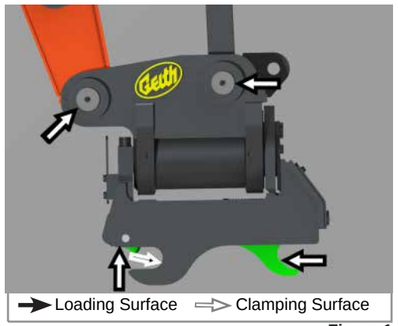


Figure 1

Operations that are compatible with quick couplers are excavating tasks such as digging, using grabs/grapples and also crushing and breaking of rock/debris. When used in accordance with the manufacturer‘s instructions, rock breakers can be fitted and used the Geith tilting coupler.

Never use the rock breaker as a leveraging tool (see Fig. 2) as this not only damages the rock breaker but will also lead to damage of the quick coupler. In the event of sustained use of this type of equipment and where change of attachments is infrequent, it may be best to temporarily remove the quick coupler from the excavator. This will save wear on the quick coupler and in some instances improve the performance of the attachment.

All attachments to be connected to the quick coupler MUST be connected using the two attachment pins (see Fig. 3). Never connect any attachment using only one of the attachment pins. Typical examples where this might occur are with some types of material handling grab and piling hammers. In these cases a two pin adapter bracket designed for the purpose must be used.

Figure 2

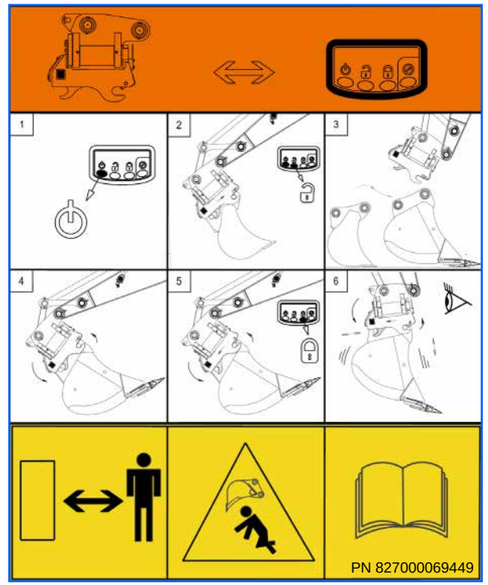
Figure 3

Decal Guidelines

Instruction and warning decals are supplied with the Geith Tilting Coupler. They must be fitted onto the inside of the cab window where they can easily be seen. Replace any damaged instruction and warning decals and be sure they are in the correct locations. Replacement decals are available from Geith.

NOTICE If the machine is already equipped with warning decal (3), it is not necessary to install an additional warning decal.

1. Operating Instructions decal.
See page 24 for detailed instructions on engaging and removing attachments. Install decal inside of the cab window.



2. Pinch Hazard decal.
WARNING MOVING PARTS CAN CAUSE SERIOUS INJURY

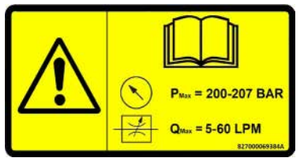
The decal below will be located on the quick coupler. Keep hands and fingers away from moving parts.

3. Interference with Machine Decal.

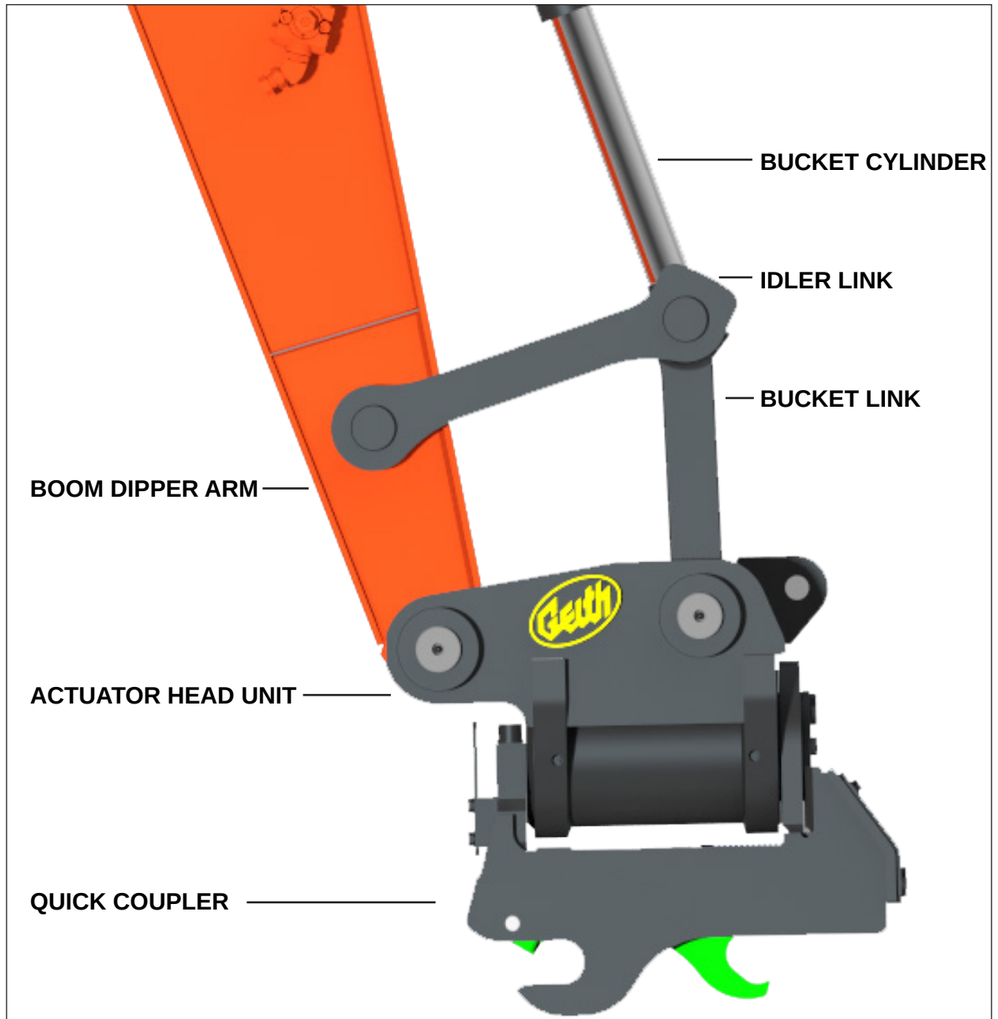
Operate Geith Tilting Coupler and attachment through its full range of motion to check interference between attachment and machine that could damage the machine, coupler or attachment. Install decal inside of the cab window. The Geith Tilting Coupler increases the swing radius of buckets and tools.

4. Geith Tilt Warning Decal
Pinch point hazzard. Moving parts can cause serious injury. Keep hands clear during operation. To avoid personal injury and machinery damage, make sure no personnel are standing within the arc described by the movement of the attachment.

5. Geith Tilt Pressure and Flow Decal
Max pressure set to 200-207 BAR Max flow set set to 5-60LPMFailure to do so may damage coupler and void warranty



Component Identification



Installation and Mounting

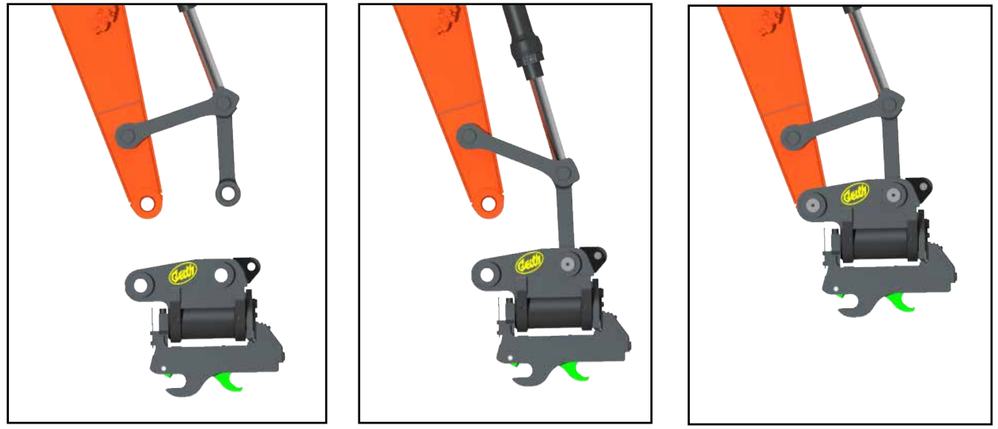
The Geith Tilt coupler is optimized for a particular backhoe or excavator and is intended to be mounted directly on the machine.

Two sets of pins are needed when using the Geith Tilt Coupler. One set for mounting the Tilting coupler to the dipper stick and a second set for mounting the bucket or the attachment.

Note: Hardened pins must be fitted to the dipper, unhardened pins can be used in attachments

NOTICE Do not attach a bucket or attachment to the Tilting coupler until the Tilting coupler's hydraulic tool circuit is installed and operating correctly

Tilting Coupler Installation



• Position the Tiliting Quick Coupler on solid, level ground. Use safe and correct lifting equipment to move the quick coupler.

• Move the machine so that the dipper arm and Tiliting Quick Coupler are correctly aligned

• Operate the machine controls to line up the hole in the dipper arm with the dipper hole in the Tilting Quick Coupler.

• Install the OEM Dipper Pin, O-rings, Shims (where required). Secure the Dipper Pin with bolt and nut, torque to manufacturers specification (retaining method will vary depending on machine manufacturer)

• Operate the machine controls to line up the hole in the Bucket Link with the Link hole in the Tilting Quick Coupler.

• Install the OEM Link Pin, O-rings, Shims (where required). Secure the Link Pin with bolt and nut, torque to manufacturers specification (retaining method will vary depending on Machine manufacturer)

Hydraulic Requirements and Plumbing

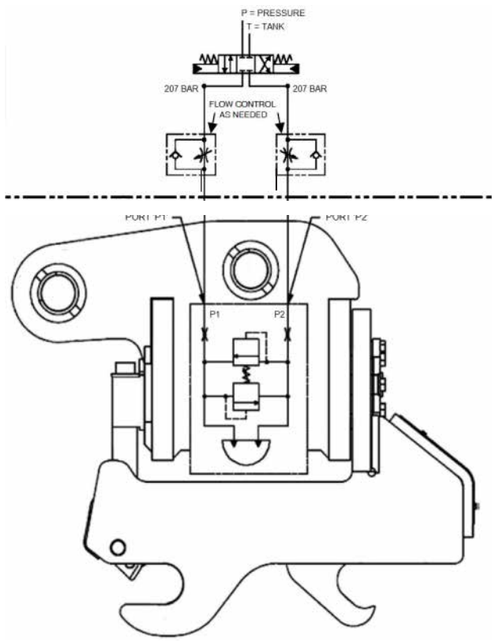
Hydraulic Requirements

The Typical Geith Tilting Coupler Circuit Chart and the Tool Circuit Requirements Table (shown on this page) illustrate the Geith Tilting Coupler control circuit requirements. Hydraulic pressures and flow requirements must be observed or the actuator may be damaged.

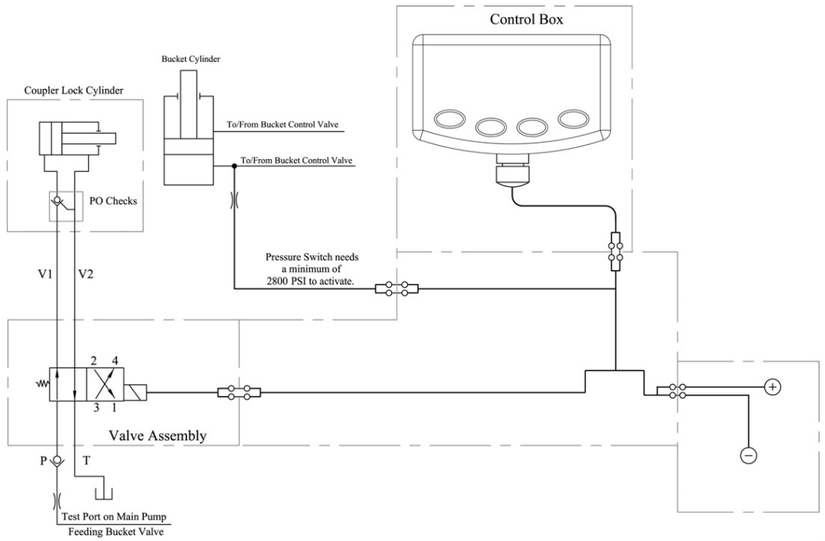
The Geith Tilting Coupler installer is responsible for choosing the control circuits compatible with the excavator and meeting the requirements of the device circuit. For additional control circuits and methods to control the Geith Tilting Coupler, the Geith technical support team should can be contacted.

The Geith Tilting coupler has an integrated cross-port relief valve mounted inside the shaft. Every version of the Geith Tilting Coupler is manufactured with two P1 and two P2 ports. This is done to help with the routing of the hose. For the suggested routings, see the Suggested Hose Routings Diagram on page 15.

While installing a new tool circuit or hydraulic lines, flush all the tool circuit lines with clean hydraulic oil before attaching the Geith Tilting Coupler. It eliminates any contamination from the circuit components that may have accumulated during manufacturing and/or installation.



QC Circuit Diagram



INSTALLATION AND MAINTENANCE

Hydraulic Requirements and Plumbing

Plumbing

Recommendations for hose and tube size can be found in the Tool Circuit Requirements Chart shown below

For reliable operation, the position of the hoses is important. For suggested hose routings, see the Suggested Hose Routings diagram.

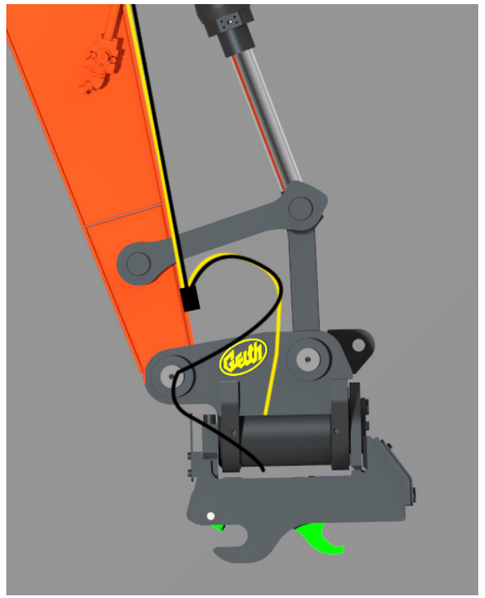
Hoses should be routed between the housing brackets and not through the holes in the brackets opposite to the ports which are used for access during installation. It may be best to cover the hoses with protective sheathing, depending on the configuration of the system.

Connect hydraulic hoses to ports using appropriate fittings. Before use opeate the Geith Titling coupler through its full working range to make sure that the hoses do not cross, foul, crush or chafe.

Repeat this hose routing check for all possible tilting positions and all attachments to be used with the Geith Tilting Coupler.

Instantly repair any oil leaks or damaged hosing.

Suggested hose routings



Tool Circuit Requirements for GT Geith Tilting Coupler Range

Model Sizes		GT05	GT07	GT010	GT14	GT23	GT27	GT35
Displacement	***cm³*** **(in³)**	*525* (32)	*1,060* (62)	*1,460* (89)	*1,935* (118)	*2,600* (159)	*3,515* (215)	*4,540* (277)
Required Oil Flow* **	***liters/minute*** **(gpm)**	*5-16* (1.3-4)	*11-32* (3-9)	*15-44* (4-12)	*19-58* (5-15)	*26-78* (7-21)	*35-105* (9-27)	*45-136* (12-36)
Port Connections*	**BSPP**	*1/4*	*1/4*	*1/4*	*1/4*	*1/4*	*1/4*	*3/8*
Hydraulic Hose and Tube Sizing Hose, Tube (Optional)	**in** ***(mm)***	3/8 *(10)*	3/8 *(10)*	3/8 *(10)*	1/2 *(12)*	1/2 *(12)*	5/8 *(16)*	5/8 *(16)*
Whip Hose	**in** ***(mm)***	1/4 *(6)*	1/4 *(6)*	1/4 *(6)*	3/8 *(10)*	3/8 *(10)*	3/8 *(10)*	3/8 *(10)*
Hydraulic Pressures								
Cross Port Relief Valve Pressure**		3,050-3,450 psi *(210-238 bar)*						
Circuit Pressure		2,900-3,000 psi *(200-207 bar)*						
Maximum Circuit Back Pressure		580 psi *(40 bar)*						

*** All Geith Tilting couplers have BSPP port connections**
**** All Geith Tilting Couplers are equipped with factory-installed integral cross port relief valves.**
***** Suggested oil flows produce a rate of 6 seconds at the low end and 2 seconds at the high end, stop to stop.**

Hose Installation

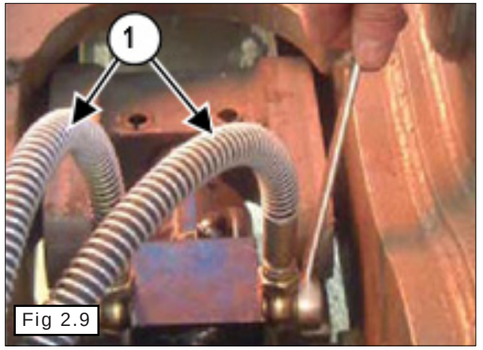


Fig 2.9

Locate the two link hoses

Install and tighten the two link hoses (1) [Figure 2.9] to the quick coupler hydraulic cylinder.

Install the quick coupler onto the machine.

NOTE:
Verify that all O-ring seals required are fitted to the quick hitch on both link and dipper positions.

Route the link hoses from the quick coupler cylinder along the arm and boom hoses.


Fig 3.0

Using the dipper block supplied, follow [figure 3.0] connect up the Quick Coupler jumper hoses.

Hose Installation


Fig 3.1

With the Quick Coupler fully curled inwards as shown, position the dipper block on the dipper arm with the hose connections pointing up the dipper arm towards the excavator cab.


Fig 3.2

Position the dipper block so that the jumper hoses to the quick coupler have freedom of movement through a full coupler rotation cycle. The dipper block can be welded or bolted onto the dipper arm of the machine. As per [Figure 3.2]

Hose Installation

Hose Installation using Manifold Block

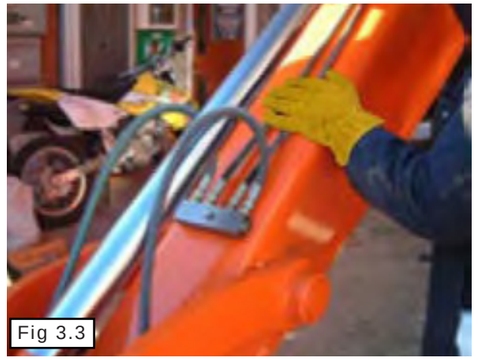


Fig 3.3

Attach the supply hoses to the remaining two ports and run and secure the hoses up the dipper arm to the top hose clamp block.


Fig 3.4

At this point you should check the dipper block hose arrangement throughout the working cycle, to ensure adequate hose clearance and movement especially in the curled out position as shown. It is important that the hoses do not get trapped in the arm linkages as this will cause wear and hose burst problems. Continue to [Figure 3.4]

Hose Installation using clamps

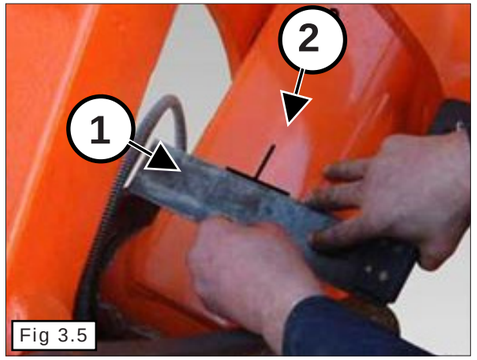


Fig 3.5

Place a straight edge square on the side of the dipper, place a mark at the top of the straight edge (1). Place a second mark (2) [Figure 3.5]. in the centre (left to right) of the dipper.

Move up the arm and place the straight edge square on the side of the dipper. Place a mark at the top of the straight edge (on the left side of dipper).

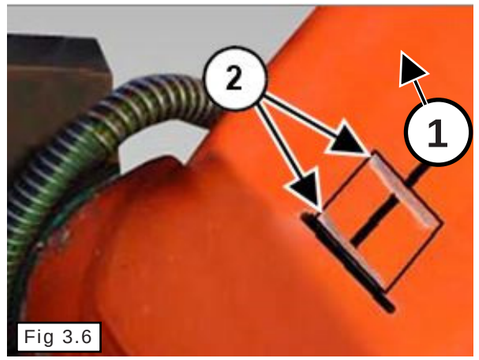


Fig 3.6

Locate the two twin clamps. Using one of the twin clamps, mark the shape (1) [Figure 3.6] of the base of the clamp at each of the previously marked positions on the dipper.

NOTE: Ensure top clamp is located to one side and angled slightly to direct hoses along the side of the boom.

Hose Installation

⚠ WARNING

Eye and body protection is required when grinding or welding. Wear approved goggles, helmet and clothing. Failure to wear eye and body protection can result in serious injury.

Using a sharp edged tool, scrape off paint at edges (2) [Figure 3.6] of marked areas to allow good contact to metal for welding of the hose clamp bases.

⚠ WARNING

Before welding, disconnect battery cables. Connect the welding ground as close as possible to the area being welded.

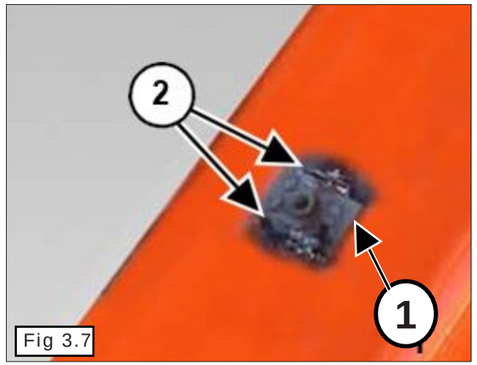


Fig 3.7

Position the clamp base plates (1) in the marked positions. Weld along top and bottom (2) [Figure 3.7] edges of the clamp base plates to secure in position.
Repeat this procedure on all clamps. Clean all welded surfaces.

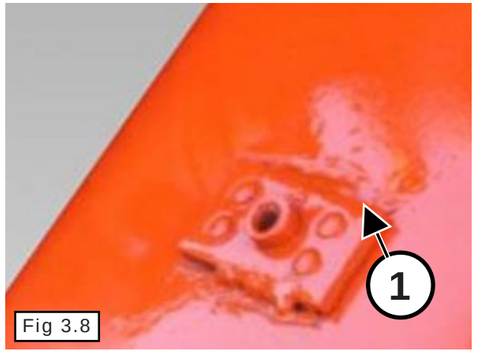


Fig 3.8

Paint the clean welded area (1) [Figure 3.8] to match the dipper at all clamp locations.
Install lower section of the clamp.

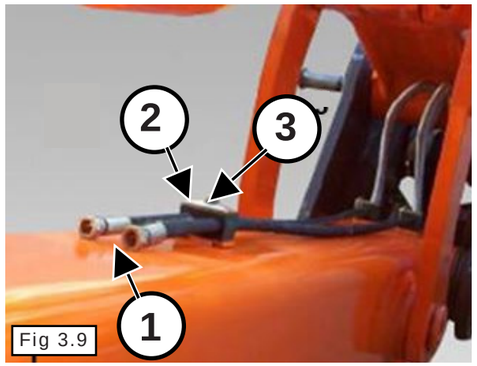


Fig 3.9

Push back the spring cover (if required) on the two link hoses (1) [Figure 3.9], place each hose in the clamp. Install the top section (1) of the clamp and install and tighten bolt (3) [Figure 3.9].

Hose Installation

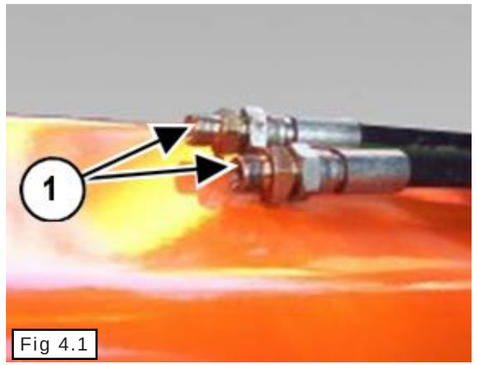


Fig 4.1

Locate two 3/8” BSP fittings

Install the two 3/8” BSP fittings (1) [Figure 4.1] into the link hoses.


Fig 4.2

Locate two hoses
Install and tighten the two hoses onto the 3/8” BSP fittings [Figure 4.2].

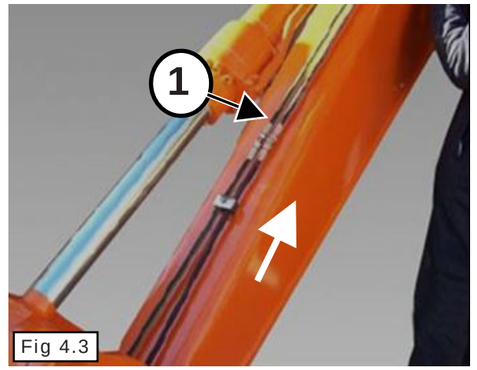


Fig 4.3

Route the two hoses (1) [Figure 4.3] up the dipper and installing the hoses into the clamps as needed.

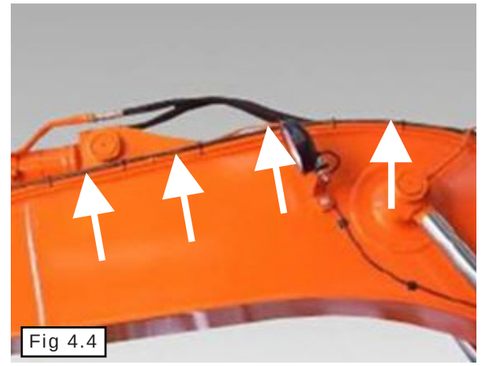


Fig 4.4

With hoses secured to dipper arm, route the hoses along the existing dipper ram supply hose line [Figure 4.4].

Secure hoses with cable ties along the full length of the boom [Figure 4.4]

NOTE: Leave approximately 300 mm (12 in.) between cable ties.

Hose Installation

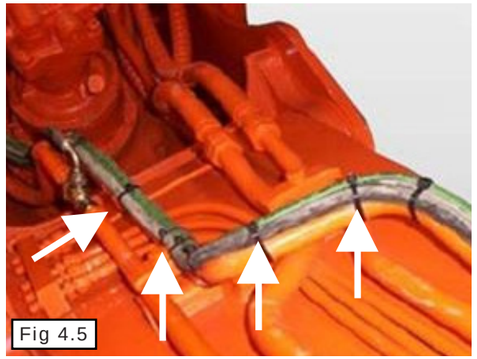


Fig 4.5

Route hoses along existing boom supply hose line at the base of the boom [Figure 4.5].

Secure hoses with cable ties along the base of the boom [Figure 4.5].

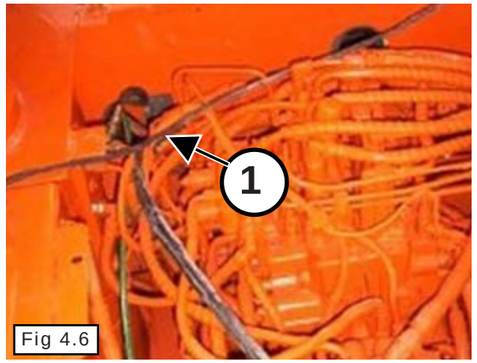


Fig 4.6

Locate a position for placement of solenoid valve in pump housing compartment. Mark location of valve retaining holes for drilling.
NOTE: Location of the solenoid valve usually use mounting bracket supplied or on the compartment wall.

Drill holes in previously marked position.
NOTE: Be careful not to drill into any part or component that maybe located on opposite side of the compartment wall being drilled.

NOTE: Do not mount valve at this time.

Confirm the tank pressure is released from the tank (1) [Figure 4.7]. (See the Excavators Operation And Maintenance Manual for procedure.)

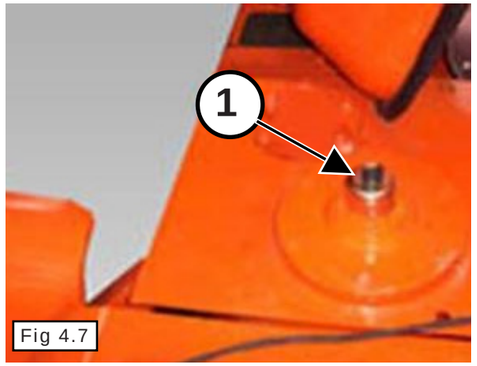


Fig 4.7

Connect tank `T' fitting (1) [Figure 4.8] to tank port and connect hose to branch.

Route hose through compartment panel (2) [Figure 4.8].

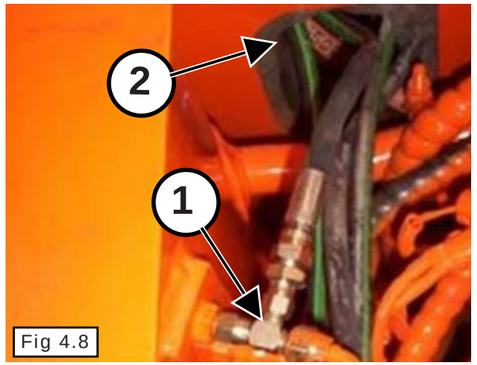


Fig 4.8

Hose Installation

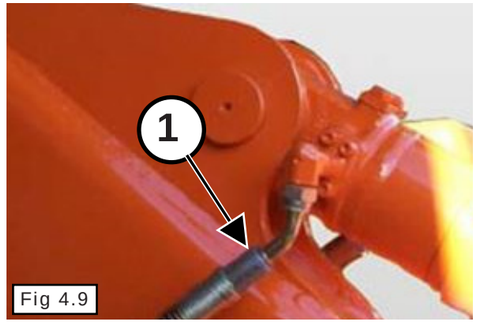


Fig 4.9

Locate and follow the dipper arm bucket ram outstroke port supply
Line (1) [Figure 4.9] to the base of the boom

Locate the bucket ram `T' fitting in the kit.

Insert T fitting or flange fitting in suitable location along the bucket digging ram outstroke hydraulic line.

Position within reach of the pressure switch electrical wiring to allow easy connection.

Connect the pressure switch to the T piece or flange fitting branch.

Connect the hydraulic hose (RED) to the hydraulic pump test port.

NOTE:
On a twin hydraulic pump system connect the hydraulic hose (RED) to the hydraulic pump test port that operates the dipper and bucket cylinders.
NOTE:

It is recommended to install a T fitting between the hydraulic pump test port and the hydraulic hose for future hydraulic pump testing.

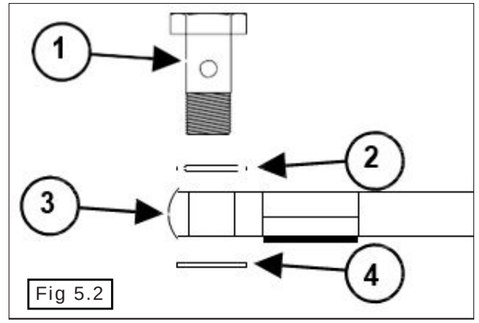


Fig 5.2

When connecting hydraulic hoses to the valve body [Figure 5.3] and quick coupler [Figure 5.4], connect the hydraulic hoses in the following order: banjo bolt / hitch bolt (1) through the bonded washer (2), hydraulic hose (3), bonded washer (4) [Figure 5.2] then into the valve body (not shown).

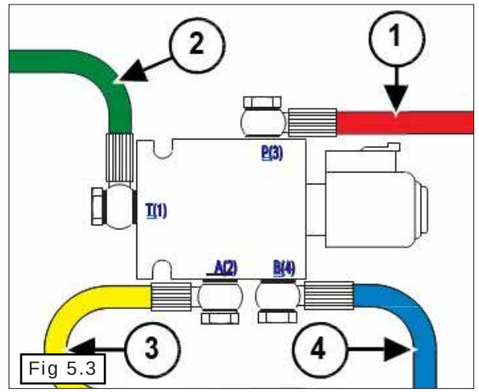


Fig 5.3

Connect the hydraulic hose (RED) (1) [Figure 5.3] valve port P(3).

Connect the hydraulic hose (GREEN) (2) [Figure 5.3] valve port T(1).

Connect the hydraulic hose (YELLOW) (3) [Figure 5.3] valve port A(2).

Connect the hydraulic hose (BLUE) (4) [Figure 5.3] valve port B(4).

Hose Installation

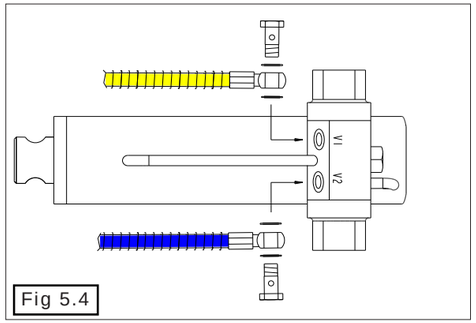


Fig 5.4

Connect hydraulic hose (YELLOW) (1) [Figure 5.4] to the (V1) port on the quick coupler.
Connect hydraulic hose (BLUE) (2) to the (V2) port on the quick coupler

Electrical (Full Kit)

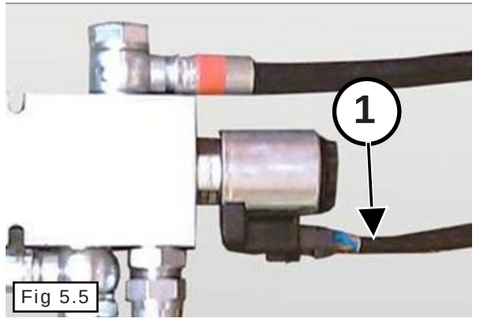


Fig 5.5

Connect the wiring harness (1)
[Figure 5.5] to the coil of the 4 port solenoid valve

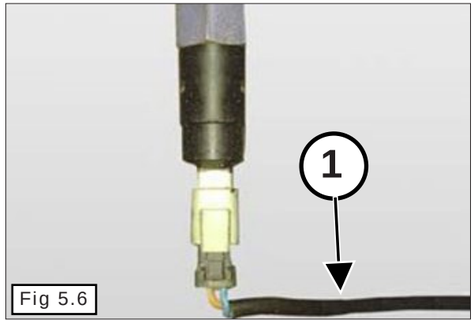


Fig 5.6

Connect the wiring harness (1) [Figure 5.6] to the pressure switch at the boom base.

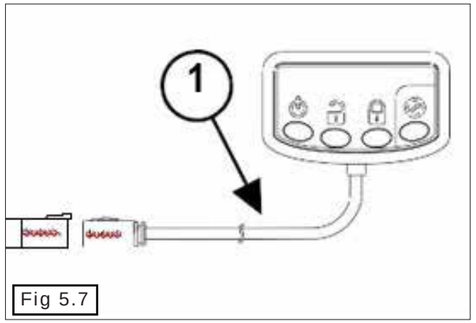


Fig 5.7

Connect control box (1) [Figure 5.7] to wiring harness.

COMPLETION AND TESTING

For all excavator operation, see the excavator's Operation And Maintenance Section within the Manual.
Enter the excavator. Start the engine. Install the quick coupler.
Operate the quick coupler through several cycles. With the engine
running have a second person check for leaks.

Load Test

NOTE:
This is to be carried out in an area clear of personnel and obstacles.

Connect attachment to the quick coupler.
Open or curl the coupler.
Lower attachment to within 300 mm (12 in.) of the ground. [Figure 8.3]
Shut off machine.
Do not touch controls for ten minutes.
If no movement occurs testing is complete.

NOTE: If movement occurs see the quick coupler's Operation and Maintenance section of the Manual.

Maintenance

Daily

1. Grease the thrust washer with high-quality lithium-based grease on the two grease fittings. Apply grease until clean grease flows from the grease reliefs. Severe operating conditions, such as abrasive dust or prolonged water submersion, can require more frequent applications of grease.

2. Make sure the grease reliefs are functioning properly. Open or replace non-functioning grease reliefs immediately.

NOTICE Never replace the grease relief valves with grease fittings or plugs.

NOTICE Do not operate the Geith Tilting Coupler if the grease reliefts are not functioning.

3. Inspect the Geith Tilting Coupler for loose, worn or damaged components and replace or repair immediately.

4. Mounting pins should be greased upon installation and thereafter according to the equipment manufacturer's instructions.

5. Check torque and idler feet bolts for signs of loosening. If loosening, remove one by one, clean with wire brush and degreaser, reapply thread lock glue and torque to specified torque page 50.

Weekly

Flush hydraulic fluid through the Geith Tilting Coupler. Position the Geith Tilting Coupler so that the hydraulic ports are facing downward.

Swing the bucket to the end of the rotation and then run the Geith Tilting Coupler circuit over the cross-port relief valve for one minute to flush all hydraulic fluid. Reverse the fluid direction and repeat so that both sides of the piston are flushed.

NOTICE The Geith Tilting Coupler cannot be flushed unless the circuit pressure is higher than the relief valve setting.

Monthly

Check shaft end play. When the end play exceeds 0.38 mm, the end cap must be tightened according to the End Cap Torque Specifications Chart on Page 46.

NOTICE The end cap should not be tightened over the life of the thrust washer by more than one-half turn

The tightening of the end cap after 1/2 turn may cause the end cap to gall to the shaft. If there is still excess end play, the thrust washers should be replaced. The end cap can be tightened using either of the methods described below.

1. Torque Wrench

Torque the end cap according to the End Cap Torque Chart on Page 46 with the lock ring removed

2. Hydraulic Pressure

With the lock ring removed, keep the end cap stationary and hydraulically pressurize Port P2 according to the End Cap Torque Chart on page 46.

This technique would involve the use of a pressure gauge mounted either in-line or to one of the P2 ports on the Geith Tilting Coupler. For more information, contact Geith.

1. Idler Bolts **2.** Grease Points **3.** Torque Bolts

Maintenance

Measuring PowerTilt Side to Side Movement

The table below shows the tolerances allowed for complete side to side movement, which includes actual gear backlash, movement / compression of hydraulic seals, and compression of oil with no endplay.

Maximum Backlash Measured at Outside Diameter of Shaft for a New Geith Tilting Quick Coupler

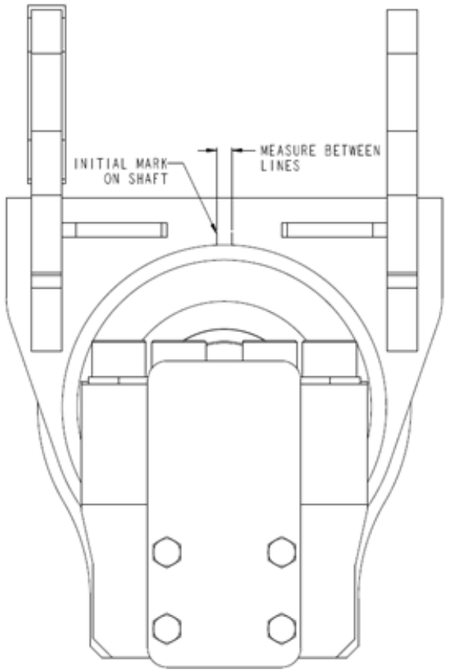
Model	Measurement
GT05	2.0mm
GT07	2.4mm
GT10	2.7mm
GT14	3.1mm
GT23	3.5mm
GT27	3.8mm
GT35	4.1mm

These measurements represent 1.5° of backlash. Measurements should be taken with the bucket in the air and with the machine shut off and pressure relieved.

One person (or heavy weight) can stand on one corner of the bucket with a wide bucket installed, make matching marks on the shaft and housing as shown in the diagram, then stand (place heavy weight) on the other corner of the bucket and make a second mark on the housing and measure the marks on the housing.

This technique is not precise but can be useful in helping to determine the source of motion. Air in the system or shaft endplay may lead to and should be watched for the potential backlash
A new unit should have a total backlash of 1 – 1.5 °, which includes actual clearance between the internal splines, seal movement and a small amount of oil compression.

If a new Geith Tilting coupler causes more backlash, the trigger is most likely air in the Geith Tilting coupler. Bleed the air out of the Geith Tilting coupler and inspect the tank's level of hydraulic oil. A low oil level in the hydraulic tank may introduce air into the hydraulic system.



Engaging Attachments

⚠ WARNING

AVOID INJURY OR DEATH
Keep bystanders away when engaging and releasing attachments.

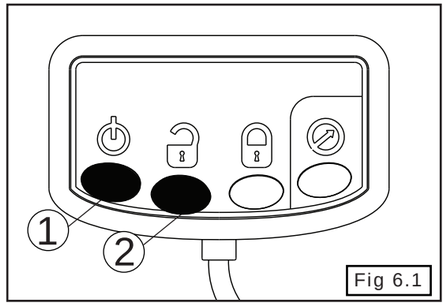


Fig 6.1

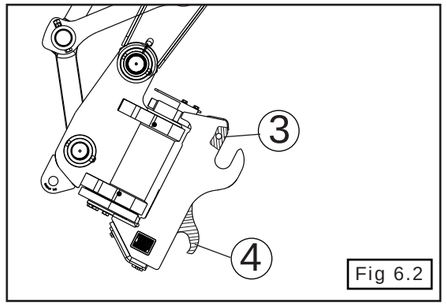


Fig 6.2

1. Press power button (1) [Figure 6.1]. Press unlock button (2) [Figure 6.1]. Within six seconds of pressing power button, Curl to build the pressure to open the front (3) and rear (4) safety locks. [Figure 6.2]

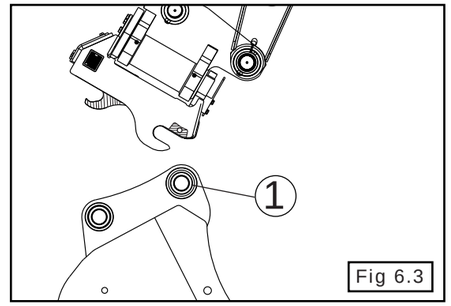


Fig 6.3

2. Lower the quick coupler and engage the front pin (1) [Figure 6.3] of the attachment.

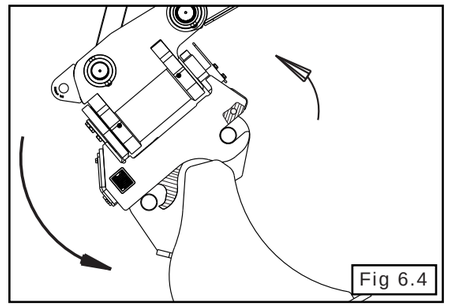


Fig 6.4

3. Always lift with the quick coupler vertical, allowing the attachment link pin to contact the coupler body [Figure 6.4].

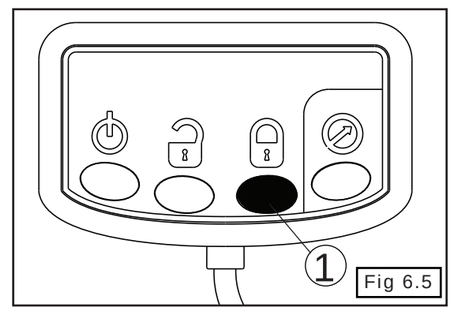


Fig 6.5

4. With the quick coupler crowded fully, press the lock button (1) [Figure 6.5]

Engaging Attachments

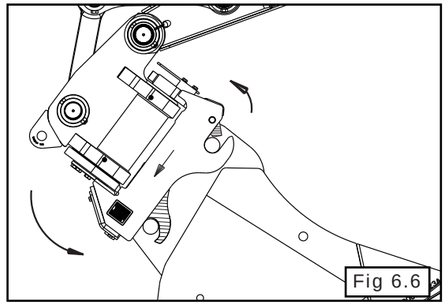


Fig 6.6

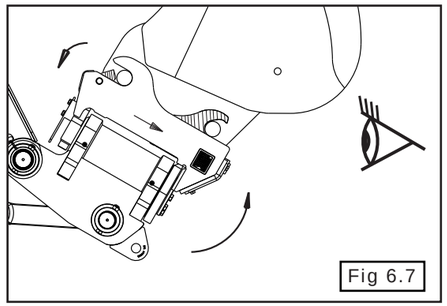


Fig 6.7

5. Continue to crowd the quick coupler fully for ten seconds or until the front and rear safety locks engage the attachment pins [Figure 6.6] [Figure 6.7].

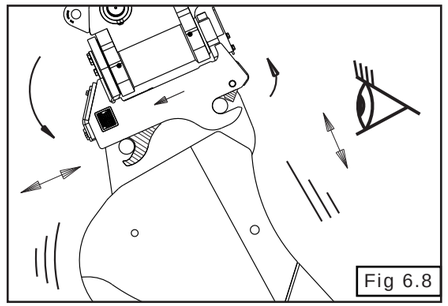


Fig 6.8

6. Roll out the quick coupler, shake the attachment vigorously and lower the boom to the ground and apply down pressure to the quick coupler and attachment to check that the attachment is fully engaged and locked to the quick coupler.
[Figure 6.8].

AVOID INJURY OR DEATH

⚠ WARNING

Failure to fully engage front and rear safety locks before operating can allow the attachment to come off.

Releasing Attachments

⚠ WARNING

AVOID INJURY OR DEATH
Keep bystanders away when engaging and releasing attachments.

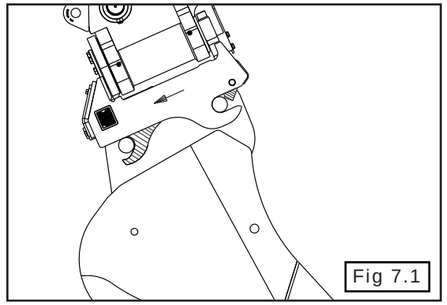


Fig 7.1

1. Lower quick coupler and attachment to the ground [Figure 7.1].

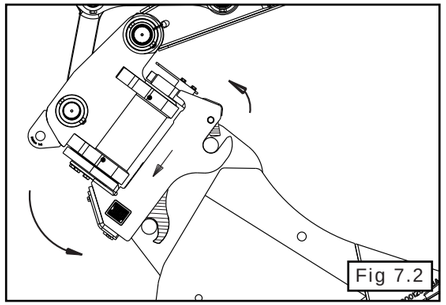
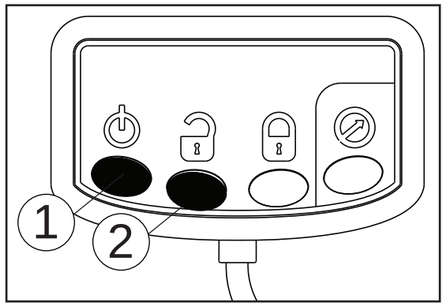


Fig 7.2

2. Fully crowd the quick coupler inward [Figure 7.2].



3. Press power button (1) [Figure 7.3].
Press unlock button (2) [Figure 7.3] within six seconds of pressing power button. Continue to crowd the quick coupler until the pressure signal LED (3) [Figure 7.3] illuminates.

⚠ WARNING

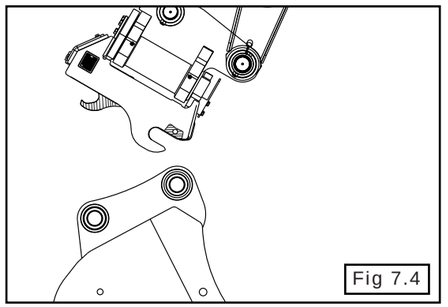


Fig 7.4

4. Lower the attachment to the ground. Move the quick coupler away from the attachment [Figure 7.4].

Releasing Attachments Pressure Signal Bypass

⚠ WARNING

PRESSURE SIGNAL BYPASS
To open the coupler, the standard Geith control system requires the operator to fully crowd the coupler to obtain a pressure signal. With large attachments or specific attachments (such as pallet forks & drilling attachment) this may not be possible. By following a different opening sequence, we can bypass the pressure signal and still maintain a safe opening procedure.

AVOID INJURY OR DEATH
Keep bystanders away when engaging and releasing attachments.

⚠ WARNING

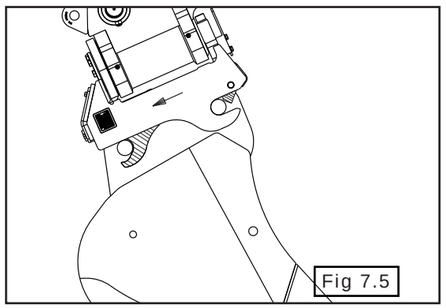


Fig 7.5

1. Lower quick coupler and attachment to the ground [Figure 7.5].

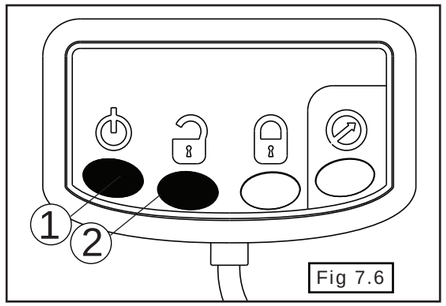


Fig 7.6

2. Press power button (1) [Figure 7.6].
Press unlock button (2) [Figure 7.6] within six seconds of pressing power button.

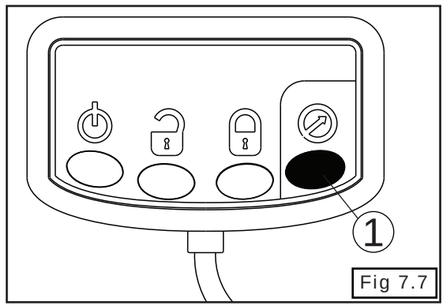


Fig 7.7

3. Press and HOLD pressure bypass (1) [Figure 7.7] (six seconds) until the pressure signal illuminates.

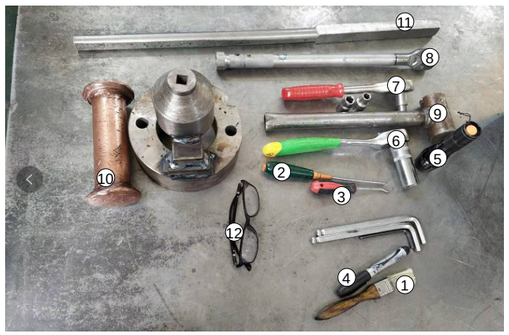
With the safety locks released, move the quick coupler away from the attachment.

NOTE:
The safety locks will open at a slower rate. To speed up the opening rate, make small adjustments to the bucket curl lever (open and closing).

GT HEAD MAINTENANCE

Component Identification

The Geith Tilting Coupler is comprised of the following components:
1. Housing with integral ring gear **2.** Shaft **3.** Piston sleeve assembly **4.** End cap **5.** Lock ring



⚠ CAUTION

Spraying fluids:

Contents under pressure. Wear approved eye protection. Use caution when removing port plugs

⚠ CAUTION

To avoid injury or damage to product:

Secure product to work

NOTICE

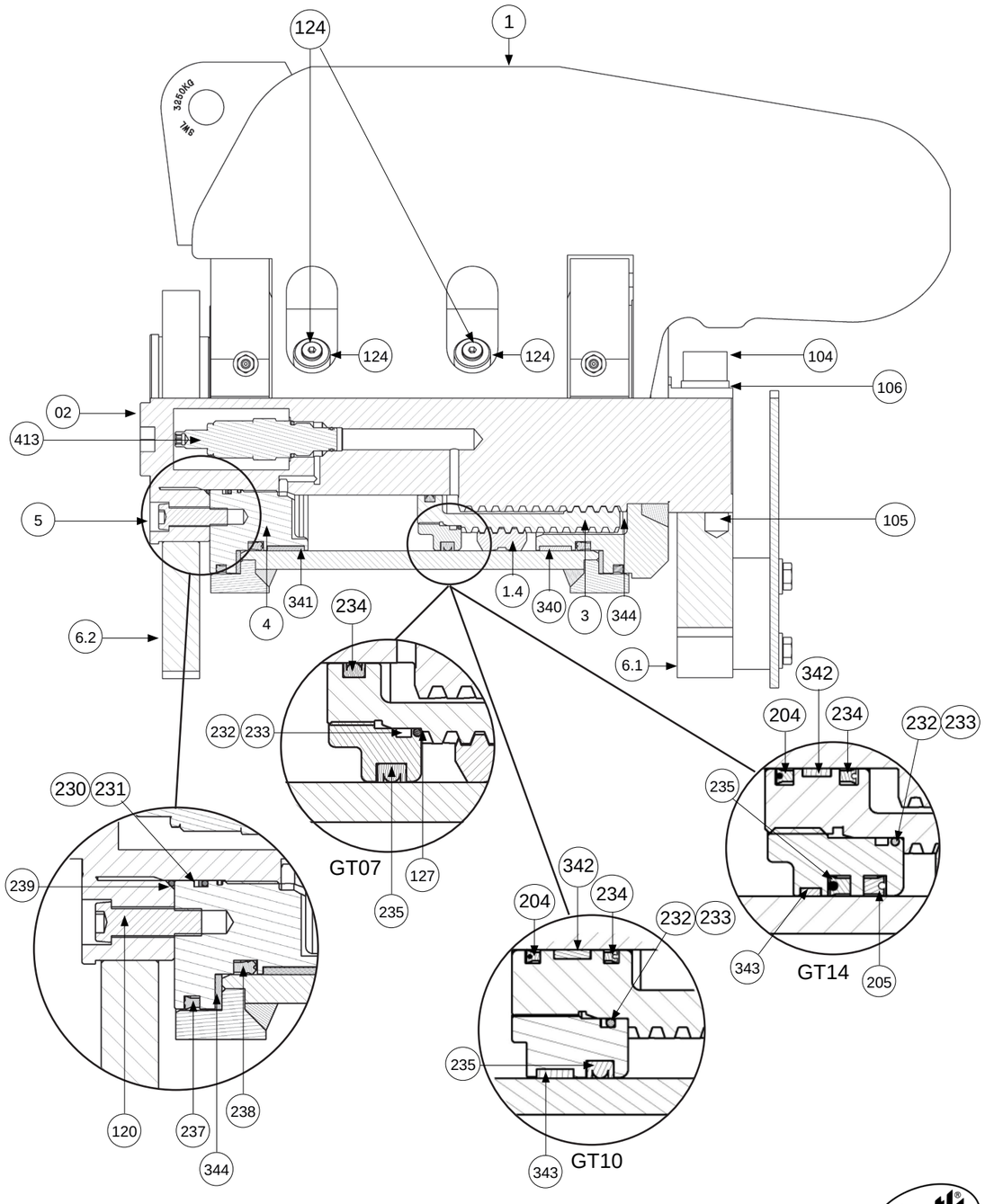
To avoid contamination to machined parts:

Make sure work area is clean.

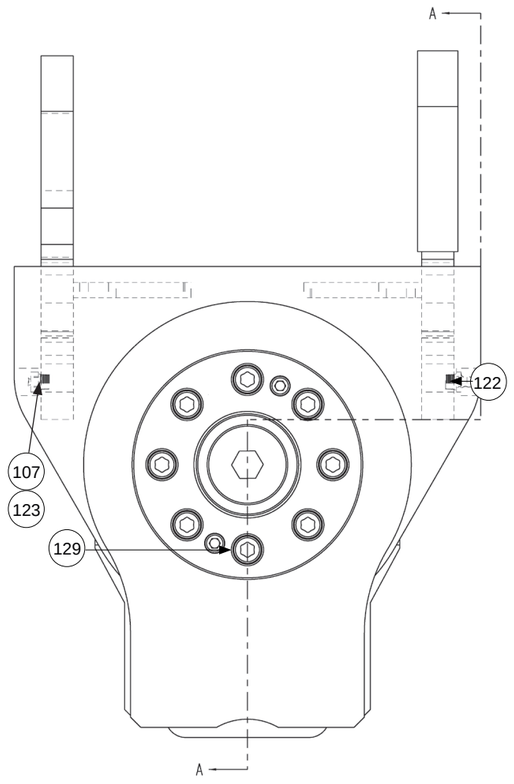
Several basic tools are required for the disassembly and reassembly of the Geith Tilting Coupler. The suggested tools are outlined below:

1. Brush
2. Customized end cap tool
3. Customized seal tools
4. Permanent marker
5. Flashlight
6. Hex driver
7. Hex wrenches
8. Large socket wrench
9. Plastic or rubber mallet
10. Plastic mandrel
11. Pry bar
12. Safety glasses
13. Threaded bolts
14. Torque wrench

Head Unit Component Identification



Head Unit Component Identification



PARTS LIST

Item	Description	Quantity
1	Housing	1
1.4	Ring Gear	0
2	Shaft	1
3	Piston Sleeve	1
4	End Cap	1
5	Lock Ring	1
6.1	Torque Foot*	0
6.2	Idler Foot*	0
101	Port Plug, Shaft	1
104	Shaft Mounting Screw*	
GT 05	M16 x 2.0	4
GT 07	M20 x 2.5	4
GT 10	M24 x 3.0	4
GT 14	M24 x 3.0	4
GT 23	M30 x 3.5	4
GT 27	M30 x 3.5	6
GT 35	M30 x 3.5	6
105	Shaft Dowel Pin	1
106	Plate Washer	1
107	Grease Relief Cover	2
120	Lock Ring Screw*	
GT 05	M12 x 1.75	6
GT 07	M12 x 1.75	8
GT 10	M16 x 2.0	6
GT 14	M16 x 2.0	8
GT 23	M16 x 2.0	8
GT 27	M16 x 2.0	8
GT 35	M20 x 2.5	8
122	Grease Fitting	2
123	Grease Relief	2
124	Port Plug	4
127	Dowel Pin Retainer	1
129	Lock Ring Set Screw	2
413	Cross Port Relief Valve	1

* All shaft mounting screws are Grade 129 / All lock ring screws are Grade 109

SEAL KIT

Item	Description	Quantity
204	Piston Seal	1
205	Piston Seal	1
230	End Cap O-ring	1 or 2
231	End Cap Back-up Ring	2
232	Piston O-ring	0 or 1
233	Piston Back-up Ring	0 or 2
234	Piston Seal	1
235	Piston Seal	1
237	Exclusion Seal	2
238	Pressure Seal	2
239	Lock Ring O-ring	1

BEARING KIT

Item	Description	Quantity
340	Shaft Bearing	2 or 3
341	Shaft Bearing	1 or 2
342	Piston Bearing	1
343	Piston Bearing	1 or 2
344	Thrust Washer	2

Product Inspection

Make sure the Geith Tilting Coupler is thoroughly cleaned prior to disassembly. Continue to clean all machined parts in a wash tank and dry with compressed air. Inspect the Geith Tilting Coupler for corrosion prior to disassembly.

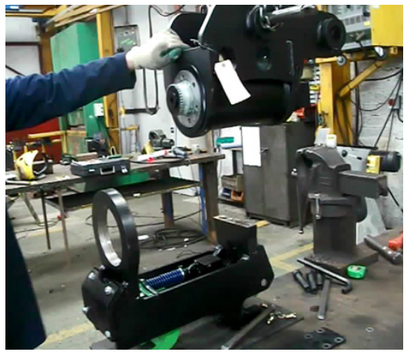
Severe corrosion can make it difficult to remove the lock ring screws (120) or set screws (129) and unthread the end cap (04). If corrosion is evident, soak the screws with penetrating oil for several hours before disassembly.

Standard Tilting Coupler Removal

1. Remove the port fittings and plugs (124) to drain the hydraulic oil into a suitable container.

2. Remove the shaft mounting screws (104) before removing the quick coupler torque and idler feet (6.1),

3. Secure the coupler using a hoist or similar device.



⚠ CAUTION

To avoid injury or damage to product:

Secure the standard pin-on coupler before removing the lock ring screws.

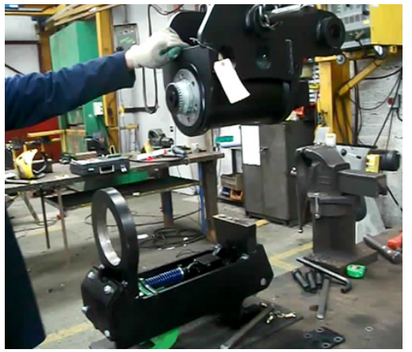
4. Unthread and remove the lock ring screws (120).

Standard Tilting Coupler Removal

5. Tighten the two lock ring set screws (129) into the lock ring (05). Turn the set screws equally, backing the lock ring off the end cap (04) and idler foot (6.2).

6. Insert threaded bolts into the lock ring (05) and pull the lock ring straight out.

7. Using a hoist or similar lifting device, lift off the Quick coupler or feet (6.1, 6.2).



NOTICE

There is an alignment dowel pin (105) between the shaft and the torque foot (6.1) to prevent sliding.

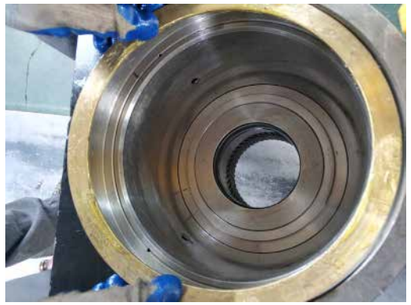
End Cap, Lock Ring and Cross Port Relief Valve

1. Remove the cross port relief valve (413) by unthreading the port plug (101) on the end of the shaft.

2. Carefully remove the lock ring O-ring (239) from the shaft.

3. Unthread the end cap (04) from the shaft (02) using two bolts and a pry bar.

4. Remove the thrust washer (344) from the end cap (04) or the housing collar.



Shaft Removal

NOTICE

Do not remove the shaft (02) at this point. Component gearing is aligned for correct timing/ positioning which is critical for correct operation of the Geith Tilting Coupler.

1. Rotate the shaft (02) completely clockwise, then slowly rotate the shaft counterclockwise while tapping the threaded end of the shaft to begin removing the shaft from the piston sleeve assembly (03). Stop when the shaft gearing becomes visible.

2. Locate the timing marks on the housing ring gear (1.4), piston sleeve assembly (03) and shaft (02). Small punch marks are usually found on the face of the piston teeth and ring gear. The shaft timing marks may be located in the root or V of the helical gearing. Piston sleeve timing marks are best seen when the splined end of the piston sleeve is flush with the ring gear inside the housing.

If you are unable to locate the factory-made timing marks, use a paint stick or a permanent marker to mark the orientation between the housing ring gear, shaft and the piston sleeve assembly.

3. Remove the shaft (02) by rotating and sliding the shaft gear teeth out of engagement with the inside diameter gear teeth of the piston sleeve assembly (03).

NOTICE

To avoid damage to gear teeth and housing bore:

Carefully support the weight of the shaft as it clears the housing.

Piston Sleeve Assembly Removal

1. Before removing the piston sleeve assembly (03), double check the timing/position marks of the housing ring gear (1.4) in relation to the piston sleeve assembly. If the timing marks have worn off, re-apply timing marking to aid assembly process

2. Using a rubber or plastic hammer and mandrel, gently tap the piston sleeve assembly (03) to disengage the O.D. gear teeth from the housing ring gear teeth inside

NOTICE

To avoid damage to gear teeth and housing bore:

Carefully support the weight of the piston as it clears the housing.

Seal and Bearing Removal

NOTICE

To avoid damage to machined parts:

Carefully remove seals using removed tools with rounded edges.

1. Use the seal tools to remove all seals, wear guides and thrust washers (344) from the piston sleeve assembly (03), end cap (04) and shaft (02).

Note that several product models may not have wear guides on the I.D. and/or O.D. of the piston sleeve assembly (03).

2. Remove the grease fittings (122), grease relief covers (107) and grease reliefs (123).

NOTICE Replace all seals, bearings and thrust washers (344) as required.

Component and Timing Mark Inspection

1. Clean all machined components thoroughly in a wash tank and dry with compressed air.
2. Carefully inspect all critical areas: Seal grooves, wear guide grooves, thrust surfaces, shaft surfaces, housing bore and gear teeth for any wear, corrosion and any other signs of damage.
3. Locate the timing marks on the shaft (02), piston sleeve assembly (03) and housing ring gear (1.4). Re-mark with a permanent marker or paint stick if needed.

Dry Assembly

⚠ CAUTION

Spraying fluids:

Contents under pressure. Wear approved eye protection. Use caution when removing port

⚠ CAUTION

To avoid injury or damage to product:

Secure product to work bench.

NOTICE

To avoid contamination to machined parts:

Make sure work area is clean.

If you are unfamiliar with the assembly process it is recommend you carry out a dry assembly or pre-assembly to better understand the correct gear alignment to ensure proper performance of the unit.

The dry or preassembly is carried out without the seals but does require the wear guides and thrust washers to be installed in the process.

Seal and Bearing Installation

Before installing seals and bearings, coat the seals and machined surfaces with a high quality hydraulic oil.

NOTICE Replace all seals, bearings and thrust washers (344) as required.

NOTICE The exact location and number of seals or bearings used varies by product model.

End Cap Seals and Bearing Installation

Before installing the end cap seals and bearings in the below sequence, lay the end cap (04) on the table with the inside facing up. Note orientation of all seals on assembly drawings before installing.

1. First install the O.D. exclusion seal (237).

Seal and Bearing Installation

2. Lightly coat both sides of the thrust washer (344) with lithium grease and install on the thrust face of the end cap (04).

3. Next install the O.D. pressure seal (238) with the lip facing inboard toward the hydraulic pressure.

4. Then install the wear guides (340, 341) in the wide groove of the end cap (04).

5. Now install the O-ring (230) and backup ring (231) into the I.D. seal groove on the end cap (04).

Seal and Bearing Installation

Piston Seal and Bearing Installation

1. Before installing the cup seals on some Geith Tilting Coupler models, remove the energizer O-ring from one O.D. and one I.D. seal and install them nearest to the piston gearing. Failure to do so may cause premature seal wear and pressure trapping.

NOTICE

To avoid premature seal wear and pressure trapping on some Geith Tilting Coupler models:

Remove the energizer O-ring from one I.D. and one O.D. seal nearest to the piston gearing.

2. For product models with cup and/or T-seals, install the seals on the O.D. and I.D. (234, 235) of the piston sleeve assembly. Note that the lips are facing away from each other on models with cup seals.

3. When used, install the wear guide(s) on the O.D. and/or I.D. (342, 343)

Seal and Bearing Installation

Shaft Seal and Bearing Installation

1. First install the exclusion seal (237) onto the shaft (02).

2. Lightly coat both sides of the thrust washer (344) with Lithium grease and install onto the shaft (02).

3. Install the pressure seal (238) with the lip facing inboard, toward the hydraulic pressure.

4. Install the wear guides (340, 341).

Piston Sleeve Installation

1. Before installing the piston sleeve assembly (03), coat the piston and housing bore with high quality hydraulic oil to reduce chance of seal damage.

2. Carefully slide the piston sleeve assembly (03) into the housing (01). Gently tap the piston to compress the seals through the housing chamfer. Continue tapping until the piston sleeve contacts the housing ring gear (1.4).

3. Confirm proper timing by aligning the piston sleeve assembly (03) timing marks with the housing ring gear (1.4) timing marks.

4. Using a plastic or rubber mallet and mandrel, engage the piston sleeve (03) into the housing ring gear (1.4). Continue tapping until the piston sleeve bottoms out against the housing ring gear.

Shaft Installation

1. Before installing the shaft (02), coat the shaft with high quality hydraulic oil.

NOTICE Temporarily cover the shaft threads with tape to prevent seal damage. Remove the tape after the shaft has been installed.

2. Insert the shaft (02) into the piston sleeve assembly (03), carefully aligning the timing marks on the shaft with the piston (03). Take care not to damage the I.D. piston seals (204, 205) with the threaded end of the shaft.

3. Verify timing marks before rotating the shaft all the way into the housing (01).

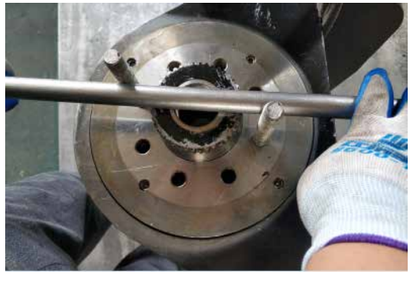
4. Use a pry bar to rotate the shaft (02) in until it is completely bottomed out in the housing (01).

End Cap and Lock Ring Installation

1. Before installing the end cap (04), coat the end cap and shaft threads with anti-seize grease.

2. Install two screws into the end cap. Thread the end cap (04) onto the shaft (02) until the seal contacts the housing.

3. Using a pry bar, continue to rotate clockwise and tighten until the thrust washer (344) makes contact with the housing (01) collar.



4. Remove the two screws and tighten the end cap (04) using a torque wrench and customized end cap tool to the torque specifications shown on the End Cap Torque Chart on Page 48.

5. Install the lock ring (05), trying different splines to find the best alignment between the lock ring splines and the end cap (04) holes. If the holes do not align, thread the end cap by no more than one spline tooth to align the holes.

End Cap and Lock Ring Installation

6. Make an alignment mark between the lock ring (05) and shaft (02) splines. Then remove the lock ring.

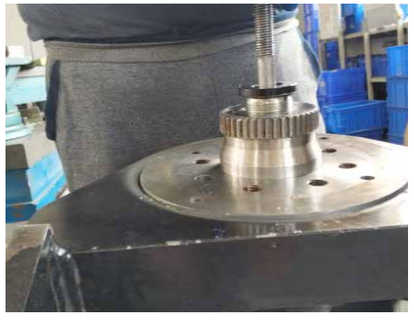
End Cap Torque Specifications

Model	Torque (Nm)	Hydraulic Pressure (bar)
GT-05	475–680	35–40
GT-07	750–910	35–40
GT-10	1360–1630	40–45
GT-14	1770–2175	35–40
GT-23	2210–2650	35–40
GT-27	2780–3330	35–40
GT-35	3500–4200	35–40

Cross Port Relief Valve Installation

1. Reinstall the cross port relief valve (413) with new O-rings and back up rings and torque to 60 Nm.

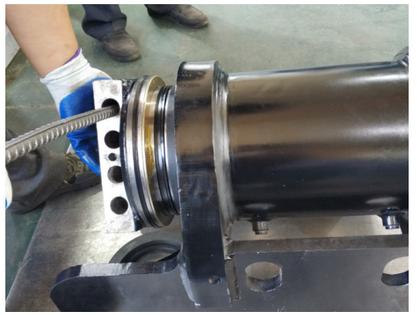
2. Coat the shaft port plug (101) threads with Loctite 242 and install into the end of the shaft (02) and torque to 305 Nm.



Standard Tilting Coupler Installation

1. Reinstall the lock ring (05), aligning the timing marks. Then install and tighten two screws into the lock ring (05) to lock the end cap (04) and shaft (02) together.

2. Then using a pry bar, rotate the shaft until the torque foot (6.1) mounting surface is horizontal.

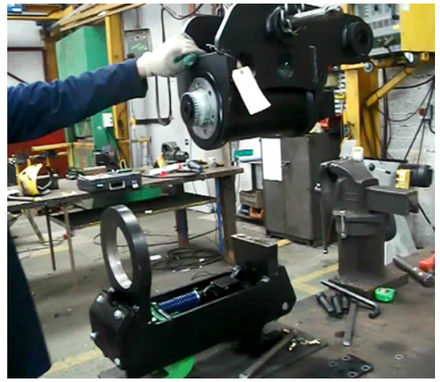


Standard Tilting Coupler Installation

3. Remove the two screws and lock ring (05).

4. Install the alignment dowel pin (105) into the torque foot (6.1) if it is not already in place.

5. Install the coupler onto the shaft (02). Align the dowel pin (105) on the shaft to the torque foot (6.1).



6. Coat the end of the shaft (02), the lock ring (05)and the outside of the end cap (04) with waterproof grease.

Standard Tilting Coupler Installation

7. Install the lock ring O-ring (239) onto the shaft.

8. Install the lock ring (05) using two threaded bolts as handles.

9. Coat the lock ring screw (120) threads with Loctite 242, install and torque per the Fastener Torque Chart on Page 52.

10. Coat the lock ring set screws (129) with Loctite 545, thread until tight and torque to (41 Nm).

Standard Tilting Coupler Installation

11. Coat the shaft mounting screw (104) threads with Loctite 242 and install.

12. Torque the fasteners to the specifications shown on the Torque Specifications Charts.

Fastener Torque Specifications

Torque Values for Port Plugs

Plug Size	Torque Value - Hollow Hex Head Plugs Nm	Torque Value – Hex Head Port Plugs Nm
BSPP G1/8	14 +/- 1	14 +/- 1
BSPP G1/4	31 +/- 1	31 +/- 1
BSPP G3/8	65 +/- 4	65 +/- 4

Torque Values for Metric Fasteners

Fastener Size	Socket Head Bolt (grd 12.9) Nm	Hex Head Bolt (grd 10.9) Nm	Jam Nut (grd 12.9) Nm
M10 x 1.50	60 +/- 3	44 +/- 3	27 +/- .2
M12 x 1.75	103 +/- 5	75 +/- 4	41 +/- .3
M16 x 2.00	258 +/- 7	187 +/- 5	54 +/- .5
M20 x 2.50	502 +/- 20	365 +/- 14	61 +/- 1
M24 x 3.00	868 +/- 27	630 +/- 20	68 +/- 2
M30 x 3.50	1723 +/- 41	1253 +/- 34	

* All Shaft mounting screws are Grade 12.9 / All Lock Ring screws are Grade 10.9.

Testing and Greasing

⚠ CAUTION

Pinch point hazard:

Moving parts can cause serious injury.
Keep hands clear during operation.

⚠ CAUTION

Spraying fluids:

Contents under pressure.
Wear approved eye protection. Use caution when removing port plugs

⚠ CAUTION

To avoid injury or damage to product:

Secure product to work bench.

NOTICE

To avoid contamination to machined parts:

Make sure work area is clean.

Testing the Carrier's Hydraulic System

If symptoms of poor performance develop, refer to the Troubleshooting Guide on Page 64 for general instructions. If you need help with more specific application issues, contact Geith Technical Support for assistance.

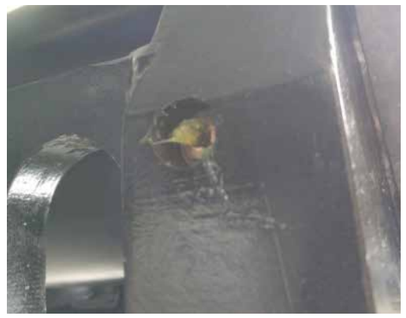
It is the responsibility of your service technician to verify that the carrier and hydraulic circuit are operating correctly. The Geith Tilting Coupler receives its power from the carrier hydraulic system, a thorough check of the carrier hydraulic system is mandatory before performing any Geith Tilting Coupler service or adjustments.

Testing and Greasing

Attach the Geith Tilting Coupler to either a hydraulic test bench or portable pump for greasing and testing. Make sure the Geith Tilting Coupler is secured to prevent movement. Install the grease fittings, grease reliefs and covers.

1. After the Geith Tilting Coupler is assembled but before it is put back into service, the exclusion seals and thrust washers must be packed with Lithium grease.

2. Locate the grease fittings (122) or ports on the end of the Geith Tilting Coupler and using a grease gun, pack the exclusion seal and thrust washer with grease until it exhausts from the grease reliefs (123).



3. Cycle the Geith Tilting Coupler slowly and re-grease as necessary. During testing, it is recommended the Geith Tilting Coupler be cycled 20 to 30 times to check for leaks and the proper degrees of rotation.

Testing and Greasing

Testing for Internal Leakage

1. Connect a 350 bar test gauge into the hydraulic line to Port P1. Pressurize until the shaft reaches the end of rotation and bottoms out externally, e.g. the shaft bracket or torque foot contacts the housing or mounting bracket.

NOTICE If the shaft is not completely bottomed out, hydraulic fluid will exhaust from Port P2 at a high velocity.

2. Remove and cap the hydraulic line to Port P2. Pressurize Port P1 to 175 bar. Check for leakage at Port P2 and from around the main shaft and end cap seals. Leaks indicate improperly installed parts.
3. Reconnect the hydraulic line to Port P2 and pressurize as in Step 1 above.
4. Check for leaks at Port P1 and around the main shaft and end cap seals as in Step 2 above.

Testing the Cross Port Relief Valve

The integral cross port relief valve vents hydraulic oil around the internal piston assembly of the Geith Tilting Coupler at approximately 210 to 238 bar.

To test the valve:

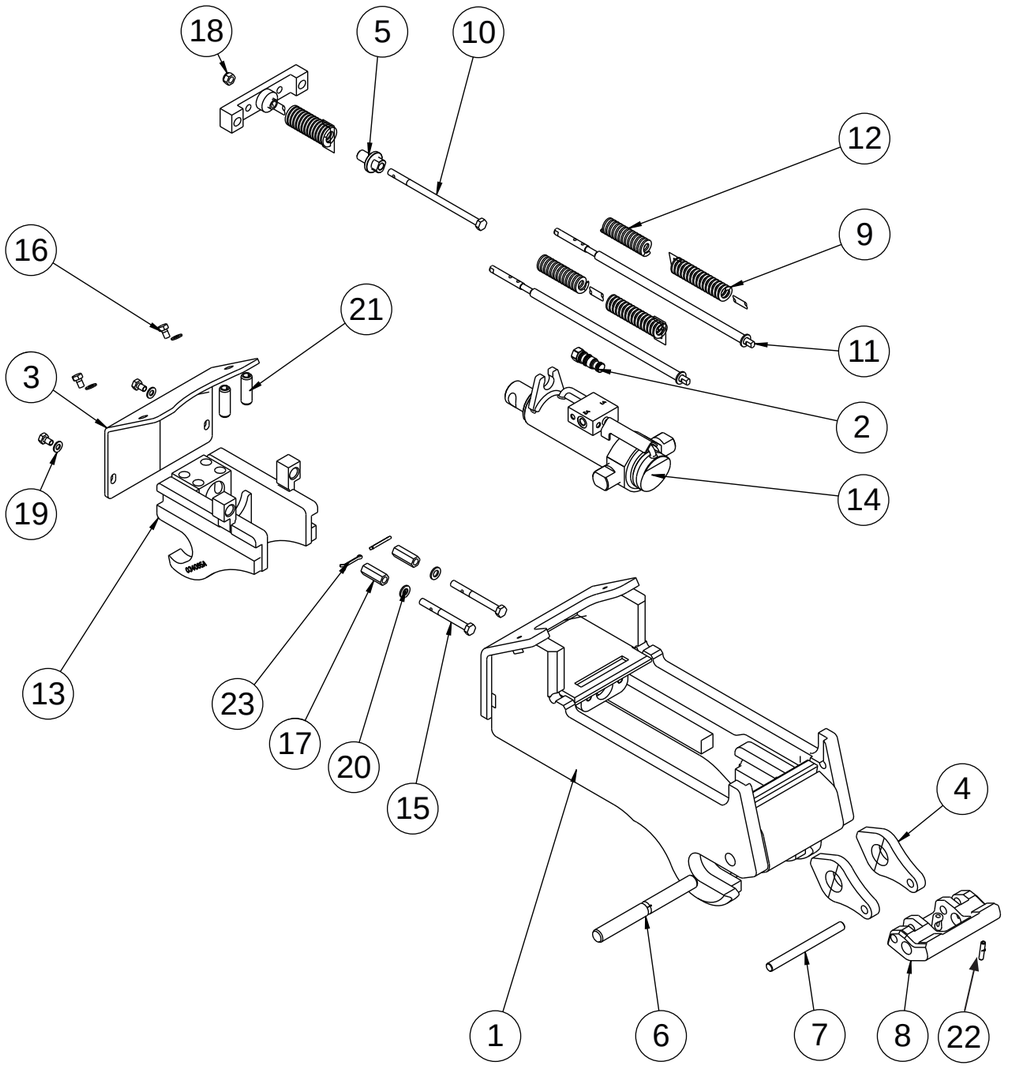
1. Connect a 350 bar test gauge into the line to Port P1. Pressurize until the shaft reaches the end of rotation and bottoms out externally, e.g. the shaft bracket or torque foot contacts the housing or mounting bracket.
2. Relieve pressure to P2 and disconnect the hydraulic hose and cap it.
3. Install a temporary hydraulic hose to P2 with the end of the hose vented to an appropriate container.

NOTICE The cross port relief valve is set at the factory and cannot be adjusted.

4. Slowly pressurize Port P1 noting the pressure at which oil flows from P2. The relief should vent at approximately 210 to 238 bar.
5. Test at Port P2 using the same procedure.
6. If test pressure does not meet specification, the valve must be replaced. If piston seal leakage is suspected, relief port test plugs can be installed to verify the fault.

QC BASE MAINTENANCE

Quick Coupler Base Exploded View



Quick Coupler Base Parts List

Item	Description	Quantity
1	GT FRAME	1
2	CHECK VALVE	1
3	COVER PLATE ASSY	1
4	LINK	2
5	DIE SPRING BUSHING	1
6	LOCK PIN	1
7	LOCK LINK PIN	1
8	CAST-LOCK	1
9	DIE SPRING	2
10	BOLT WITH HOLE	1
11	GUIDE PIN SUB-ASSY	2
12	DIE SPRING	2
13	ENGAGING PLATE	1
14	QC HYDRAULIC CYLINDER	1
15	SCREW WITH HOLE	2
16	BOLT	4
17	BARREL NUT	2
18	NYLON LOCKNUT	1
19	WASHER	4
20	WASHER	4
21	ROLL PIN	2
22	ROLL PIN	1
23	SPLIT PIN	3

QC Base Maintenance Instructions

WARNING

AVOID INJURY OR DEATH

Before servicing the quick coupler:
- Lower the quick coupler to the ground.
- Stop the engine and remove the key.

NOTICE Correct maintenance of a Tilting coupler is critical in ensuring that the quick coupler is working in the correct manner and prevents degradation of the quick coupler under normal wear patterns. Ensure any residual pressure in the hydraulic system is released and machine is turned off before any work is carried out on the Tilting coupler.

Routine Inspection/Maintenance Checks

- Maintenance work must be carried out by competent personnel in accordance to manufacturer‘s instructions.
- Never use bare hands to look for hydraulic fluid leaks. Use a piece of wood or cardboard when searching for leaks.

General Inspection and maintenance Equipment required

1. Measuring equipment – measuring tape, vernier callipers.
2. Cleaning equipment – Brush, cloths, de-greaser.
3. Straight edge.
4. Hose swaging equipment.
5. Selection of hand tools (spanners, vice grips, screw driver set, hammers, etc.).

Scheduled Inspections—when and what to check

1. After installation – check and inspect hose routings and connections after 15 minutes of work as they could loosen after machine has heated up.
2. Structure – inspect for weld cracking, damage, excess wear to structure and parts.
3. Moving components – fit up, looseness, linkages, clearances, sticking/jamming.
4. Hydraulics – hose wear/leaks, joints damage/ leaks, solenoid valve (control) for leaks, cable damage, cylinder (signs of wear on housing) leaks.
5. Electrical – control panel function and general condition.
6. Springs – condition, presence.
7. Fit up of Geith Tilting Coupler to machine – wear in bushings.
8. Fit up of quick coupler to attachments – correct attachment pin centers.
9. Check for cylinder condition (cylinder leakage, rod damage, holding capacity, pressure loss etc).
10. Check that quick coupler warning signs (decals) are installed and not damaged.

QC BASE MAINTENANCE

QC Base Maintenance Instructions

Daily checks

Before starting work with the excavator the operator should carry out a thorough visual inspection of the Geith Tilting Coupler:

1. Remove any dirt and debris from the quick coupler, especially around the internal mechanisms (hydraulic cylinder, linkage, spring mechanism).
2. Check quick coupler fixed hooks (1) and sliding hook (2) to ensure there is no build-up of dirt.

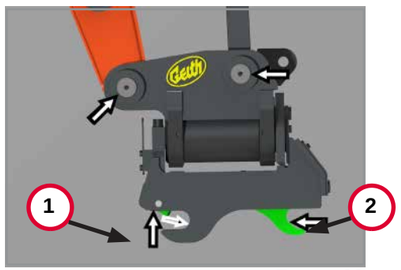


Figure 22

3. Check quick coupler structure for signs of damage, especially the load bearing hooks and hydraulic cylinder (3) .
4. Check all fixing points (bolts, nuts, clips, pins etc) for signs of wear or damage.
5. Check all hydraulic hoses and connections for evidence of oil leakage.

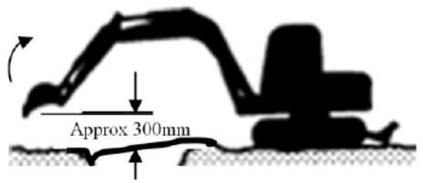
Figure 23

6. Remove all lifting accessories from the quick coupler prior to installing attachments.
7. The quick coupler should not be operated until all issues are repaired or replacement parts are installed.

Weekly checks

1. Clean quick coupler and visually inspect the structure for signs of excessive wear.
2. Visually check the hydraulic cylinder for leaks at hydraulic lines and rod seal. Replace if necessary.
3. Internal piston seals can wear over time and are more difficult to check for performance degradation. One method of checking these seals is as follows:

Cylinder Test



- This test is to be carried out in a secure, controlled area.
- Connect an attachment to the Geith Tilting Coupler and open or curl the Geith Tilting Coupler back to load the hydraulic cylinder with the weight of the attachment.
- Lower the attachment to within **300mm (12 in.)** from ground level.
- **Stop the engine** and leave machine at rest for a nominal period of **10 minutes**. Observe any change to the position of the quick coupler sliding hook. **If the position is seen to drift inwards (hydraulic cylinder is in- stroking)** then it is an indication of an internal piston seal oil leak in the hydraulic cylinder or a potential problem with the cylinder check valve leaking.

Should this occur please carry out following maintenance procedure.

Cylinder maintenance Instructions

Cylinder maintenance procedure:

1. Note: this test should be performed with the attachment removed from the quick coupler. Crowd the bucket cylinder to fully extend the Geith Tilting Coupler hydraulic cylinder.
2. Lower the Geith Tilting Coupler on to the ground and stop the engine.

WARNING

AVOID INJURY OR DEATH

Before leaving the machine:
- Lower the quick coupler to the ground.
- Stop the engine and remove the key.

3. Remove the hose from cylinder port V2 and plug the removed hose to prevent loss of oil. There may be residual pressure in the hydraulic hose.
4. Clean away oil residue from cylinder port.
5. Start machine and repeat step 1 above.
6. Observe the cylinder V2 port for further or continued oil flow/seep.
7. If oil flow is evident then there is an indication that the piston seals need replacement.
8. Replace the piston seals and repeat the test procedure once more.
9. If there is continued drift then the cylinder check valve should be replaced and again a re-test should be carried out to confirm resolution of the problem and the cylinder functions correctly.
10. If cylinder drift continues after the pistons seals and check valve have been replaced, immediately contact your dealer for additional service.

Storage

Short-term and Long-term

- Thoroughly clean the attachment.
- Lubricate the attachment.
- Inspect all welds on the attachment for wear and damage.
- Replace worn or damaged parts.
- Check for damaged or missing decals. Replace if necessary.
- Place the attachment in a dry protected shelter.
- Place the attachment flat on the ground

Removing Parts from Coupler

Tools Required

1. Ratchet Spanner
2. Ratchet Spanner
3. Long nose pliers
4. Extended socket wrench
5. Hammer / Mallet

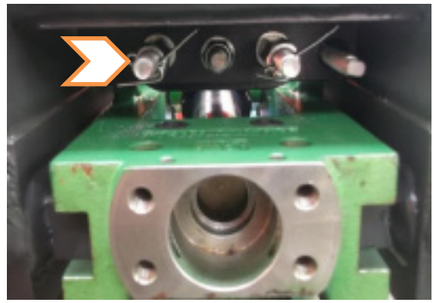
Removal Instructions

1. Partially curl in the Geith Tilting Coupler (link pin lower than dipper pin). This is for ease of removing the small roll pin.
2. Retract the quick coupler cylinder.
3. Stop the engine and exit the machine.
4. Using the punch tool and hammer remove the safety clasp roll pin.

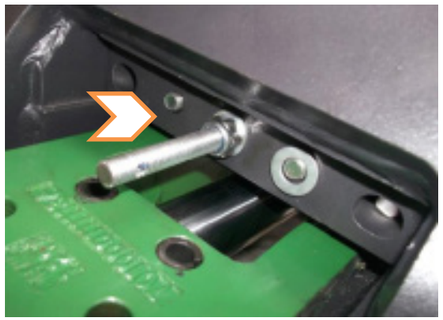
5. Enter the machine and start the engine. Place the Geith Tilting Coupler on the ground.
6. Stop the engine and exit the machine.
7. Remove machine dipper and link pins from the Geith Tilting coupler.
8. Enter the machine and start the engine. Reposition the machine arm and linkage so that you can easily access the Geith Tilting coupler hoses.
9. Stop the engine and release any hydraulic pressure in the system. Exit the machine.
10. Remove the hoses from the Geith Tiliting coupler and hydraulic cylinder.
11. Take the Geith Tilting coupler to a suitable work area. Remove the quick coupler base from Geith Tilting coupler head (see pages 34 & 35 of Geith Tilting Coupler instruction manual)
12. Remove Protective Cover Plate.

Removing Parts from Coupler

13. Remove split pin and barrel nuts. Long nose pliers maybe required here as the space is confined.

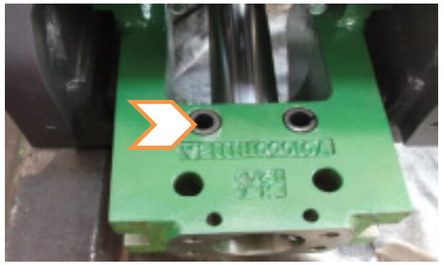


14. Take out the Back Locking Plate Assembly.

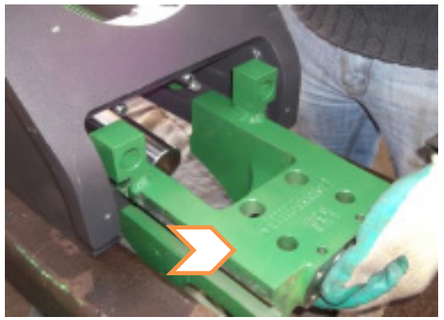


15. Remove the locking clasp main pivot pin.

16. Use the punch tool and hammer to remove the engaging plate / wedge retaining roll pins.



17. Take out engaging plate.

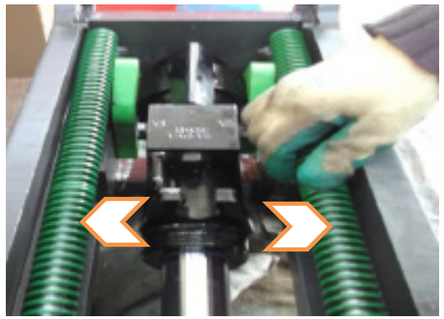


QC BASE DISSAMEBLY

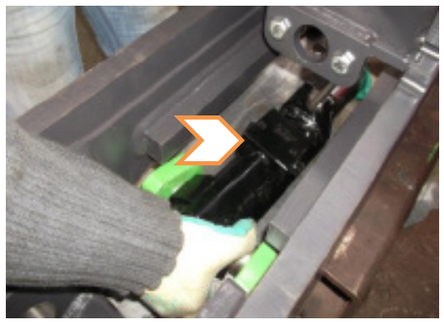
Removing Parts from Coupler

18. Remove front lock link pin.

19. Remove the two spring assembly's from the Coupler.



20. Remove Hydraulic Cylinder from underneath.



21. To fit parts, repeat steps in reverse.

Troubleshooting Guide

PROBLEM	CAUSE	CORRECTION
Control box intermittently working or not working at all.	Control box harness connections.	Check harness connections.
		Replace wire harness.
	Blown fuse.	Replace fuse.
	Control box is faulty.	Replace control box.
Tilt Coupler will not unlock.	Damaged hydraulic hose(s).	Check for leaks. Repair or replace hydraulic hose(s).
	Hydraulic cylinder damaged.	Repair or replace hydraulic cylinder.
	Electrical fault.	Check wire connections. Replace control harness and / or control box.
Tilt Coupler will not stay locked.	Damaged, worn or stuck locking bushings, damaged spring.	Repair, replace or clean locking assembly/spring.
Tilt Coupler does not hold position.	Excessive down pressure applied by the machine causing a pressure buildup which is opening the cross port relief valve.	This is normal. The cross port relief valve is designed to protect the Tilt Coupler from excessive internal pressures that can damage unit.
	Control valve leaking oil.	pressures that can damage unit.
	Cross port relief valve.	Remove and inspect cross port relief valve for damage or debris. Repair or replace as needed.
		Incorrect cross port relief valve pressure setting.
	Seals leaking oil.	Replace seals as needed.
Tilt Coupler only swings in one direction.	Single directional control valve is being used.	Replace / use bi-directional control valve.
	Cross port relief valve damaged.	Repair or replace as needed.
	Hydraulic lines connected incorrectly.	Connect hydraulic lines correctly.
Tilt Coupler has spongy feel side to side.	Air in hydraulic circuit.	Bleed air from circuit and check for cause.
	Hydraulic hose length / diameter too large.	Install hydraulic hose with correct length / diameter.
		Install pilot operated check valve in lines as close to Tilt Coupler as possible.
Shaft end play in the housing.	Worn or missing thrust washers.	Replace or install thrust washers as required. Tighten end cap. Contact your Geith dealer.
Side to side bucket movement.	Some movement is normal due to clearance required between internal spline teeth.	1° to 1-1/2° of movement is normal. If greater, check end shaft play. Excessive end play can contribute to side to side movement. If shaft end play is not within limits, consult your Geith dealer.
Tilt Coupler grease fitting will not take grease.	Grease relief valve is not functioning, or has been replaced with a grease fitting or plug.	Clean or replace grease relief valves.

Warranty Information

WARRANTY PROGRAM

The Company warrants the Equipment (except for parts) sold by it to the Purchaser to be free of defects in material and workmanship for a period of twelve (12) Months from the date of shipment or 1000 hours of use, whichever first occurs unless formal documentation can be produced when the product has been put into use. A period of six (6) months shelf life will be accepted on all products.

Any product not put into use before the six (6) months stocking and twelve (12) warranty period will forfeit any warranty given on the product. The Geith generic installation/hose assemblies will be covered for a period of six (6) months from the date of shipment (installation kit covered only in Europe).The applicable warranty time period for parts shall be six (6) months from the date of shipment and for reconditioned parts or products shall be three (3) months from the date of shipment. No warranty will be accepted for wear/damage on products or components thereof.

The Company will provide a new part or repaired part, at its election, in place of any part which is found upon its inspection to be defective in material or workmanship during the periods described above. Such part will be repaired or replaced without charge to the Purchaser providing the warranty cost does not exceed the standard cost which has been set out by the company in the standard cost table (this cost is available upon request).

The company will accept maximum warranty costs not exceeding the original sale value. The replacement or repair must be carried out during normal working hours at the place of business of a distributor of the Company authorised to sell the type of Equipment involved or other establishment authorized by the Company. The purchaser must report failures within a maximum time of 30 days of occurrence and file a warranty claim within a maximum of 30 days thereafter. Warranty claims outside this period of time will forfeit the warranty cover.

Warranty Information

Purchaser must present proof of purchase (and purchase date) at the time of making a claim under this warranty. Warranty claims do not apply to failures occurring as a result of abuse, misuse, negligent repairs, corrosion, erosion, normal wear and tear, alterations or modifications (which includes use of non Geith control systems) made to the Equipment without express written consent of the Company, or failure to follow the recommended operating practices, or service and maintenance procedures as provided in the Equipment's operating and maintenance publications. All maintenance, service and repair work must be completed by an authorised Company distributor or establishment and only genuine Company parts shall be used in such work. Failure to comply strictly with these requirements shall invalidate this warranty. The warranty provided herein does not apply to any components which are not supplied by the company (this includes engines, hydraulic systems, boom, dipper etc.) which are manufactured by others as they are warranted by their respective manufacturers directly to the Purchaser.

THE COMPANY DISCLAIMS AND EXCLUDES ALL OTHER CONDITIONS, WARRANTIES REPRESENTATIONS OF ALL KINDS, EXPRESS OR IMPLIED, STATUTORY OR OTHERWISE (EXCEPT THAT OF TITLE), INCLUDING ALL IMPLIED WARRANTIES AND CONDITIONS RELATING TO MERCHANTABILITY, SATISFACTORY, QUALITY AND FITNESS FOR A PARTICULAR PURPOSE.

Corrections by the Company of nonconformities whether patent or latent, in the manner and for the period of time provided above shall constitute fulfilment of all liabilities of the Company for such nonconformities, whether based on contract, warranty, tort, negligence, indemnity, strict liability or otherwise with respect to or arising out of such Equipment.

LIMITATION OF LIABILITY

THE REMEDIES OF THE PURCHASER SET FORTH HEREIN ARE EXCLUSIVE AND THE TOTAL LIABILITY OF THE COMPANY WITH RESPECT TO THE CONTRACT OR THE EQUIPMENT AND SERVICES FURNISHED HEREUNDER, IN CONNECTION WITH THE PERFORMANCE OR BREACH THEREOF OR FROM THE MANUFACTURE, SALE, DELIVERY, INSTALLATION, REPAIR OR TECHNICAL DIRECTION COVERED BY OR FURNISHED UNDER THE CONTRACT, WHETHER BASED ON CONTRACT, WARRANTY, TORT, NEGLIGENCE, INDEMNITY, STRICT LIABILITY OR OTHERWISE, SHALL NOT EXCEED THE PURCHASE PRICE OF THE UNIT OF EQUIPMENT UPON WHICH SUCH LIABILITY IS BASED. THE COMPANY AND ITS SUPPLIERS SHALL IN NO EVENT BE LIABLE TO THE PURCHASER, ANY SUCCESSORS IN INTEREST OR ANY BENEFICIARY OR ASSIGNEE OF THE CONTRACT FOR ANY CONSEQUENTIAL INCIDENTAL, INDIRECT,

SPECIAL OR PUNITIVE DAMAGES ARISING OUT OF THE CONTRACT, OR ANY BREACH HEREOF, OR ANY DEFECT IN, OR FAILURE OF, OR MALFUNCTION OF THE EUQIPMENT SUPPLIED HEREUNDER WHETHER BASED UPON LOSS OF USE, LOST PROFITS, REVENUE OR INTEREST, LOST GOODWILL, WORK STOPPAGE, IMPAIRMENT OF OTHER

WARRANTY

Warranty Information

GOODS, LOSS BY REASON OF SHUTDOWN OR NON-OPERATION, INCREASED EXPENSES OF OPERATION, COST OF PURCHASE OF REPLACEMENT POWER OR CLAIMS OF THE PURCHASER OR CUSTOMERS OF THE PURCHASER FOR SERVICE INTERRUGTION, WHETHER OR NOT LOSS OR DAMAGE IS BASED ON CONTRACT, WARRANTY, TORT, NEGLIGENCE, INDEMNITY, STRICT LIABILITY OR OTHERWISE.

VIOLATIONS OF LAW

The Company shall not be bound by or required to adhere to any term or provision of a purchase order, quotation, bid, letter of credit or like document or any provision of law, regulation or custom, which would cause the Company, its parent or any of its affiliates to be in violation of or fail to comply with the export laws, taxing statutes or regulations of the country wherein the Equipment is manufactured or from which it is exported or is otherwise subject to jurisdiction.

GOVERNING LAW

The rights and obligations of the Purchaser and the Company shall be governed and construed in accordance with the laws of the Republic of Ireland and the Purchaser submits to the exclusive jurisdiction of the Irish Courts.

MODIFICATIONS, SEVERABILITY AND ENTIRE AGREEMENT

The Company shall not be bound by any amendment or any modification to the Contract until approved in writing by an officer of the Company. The Contract when so approved, shall supersede all previous communications, either oral or written. If any clause of the Contract is held by any competent authority to be invalid or unenforceable in whole or in part, the other clauses of the Contract and the remainder of the clause in question shall not be affected thereby. The detailed description of terms and conditions of sale can be found on QR39 Geith Terms & Conditions.

Geith terms and conditions of sale which was attached to your order acknowledgement. If you do not have a copy you can contact your nearest Geith Distributor.

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