# GFA-OOT

Geared Front Attachment

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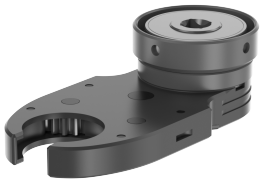
## Product Instructions

Open-end and Offset
Geared Front Attachments



⚠ WARNING

**Read all safety warnings and instructions**

Failure to follow the safety warnings and instructions may result in electric shock, fire and/or serious injury.

**Save all warnings and instructions for future reference**

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# Product Information

## *General Information*

⚠ **WARNING Risk of Property Damage or Severe Injury**

Ensure that you read, understand and follow all instructions before operating the tool. Failure to follow all the instructions may result in electric shock, fire, property damage and/or severe bodily injury.

- ► Read all Safety Information delivered together with the different parts of the system.
- ► Read all Product Instructions for installation, operation and maintenance of the different parts of the system.
- ► Read all locally legislated safety regulations regarding the system and parts thereof.
- ► Save all Safety Information and instructions for future reference.

### Safety Signal Words

The safety signal words **Danger**, **Warning**, **Caution**, and **Notice** have the following meanings:

| | |
|---|---|
| DANGER | DANGER indicates a hazardous situation which, if not avoided, **will** result in death or serious injury. |
| WARNING | WARNING indicates a hazardous situation which, if not avoided, **could** result in death or serious injury. |
| CAUTION | CAUTION, used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury. |
| NOTICE | NOTICE is used to address practices not related to personal injury. |

### Country of Origin

For the Country of Origin, please refer to the information on the product label.

## *Overview*

### System Description

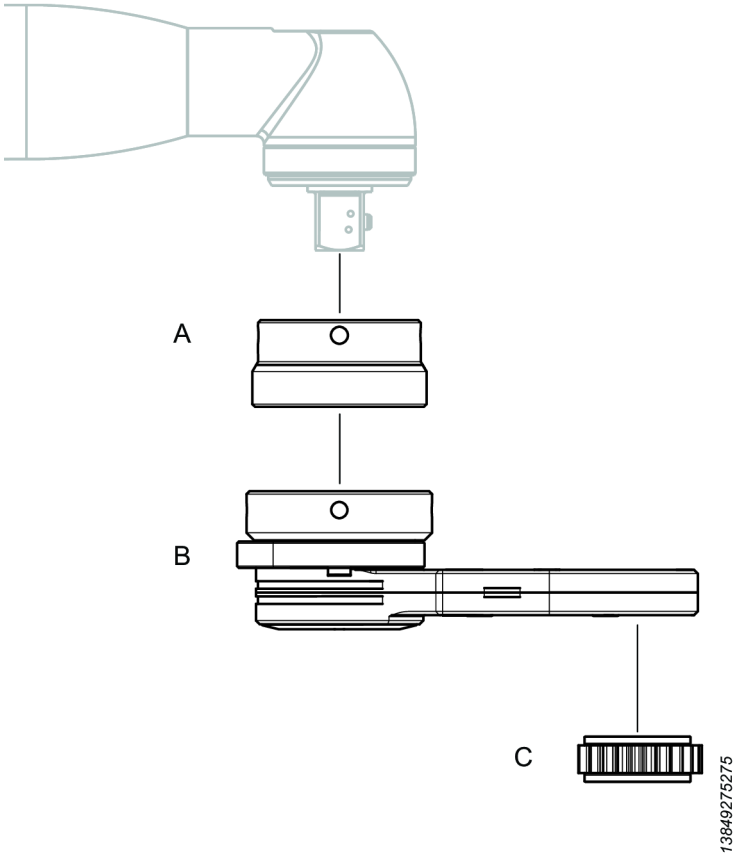
The Gear Front Attachment (GFA) system is used for tightening and loosening of screws and nuts. The system can be used for screw connections in locations that are difficult to access.

The tightening operation is controlled by a separate drive unit to which the system is fitted. The drive unit can be of either pneumatic or electric type.

The modular structure of the system allows for a wide range of configurations available for different screw connections and tightening processes.

### System Components

The modular GFA system is made up of the following main components:




| Position | Component | Function |
|---|---|---|
| **A** | Adapter | With an adapter the GFA system can be fitted to different interfaces. The interface varies depending on the drive unit model. |
| **B** | Gear Front Attachment (GFA) module | The GFA module comprises a housing which contains a number of gears, that is, the gear stage. The gear stage depends on the length of the GFA module.<br>The output gear, or output socket, can be of type open-end or closed-end. The open-end type can be used for pipe and hose connections. The closed-end type is used for regular screw connections. |
| **C** | Output socket | With different sockets the GFA system can be used for various screw profiles. |

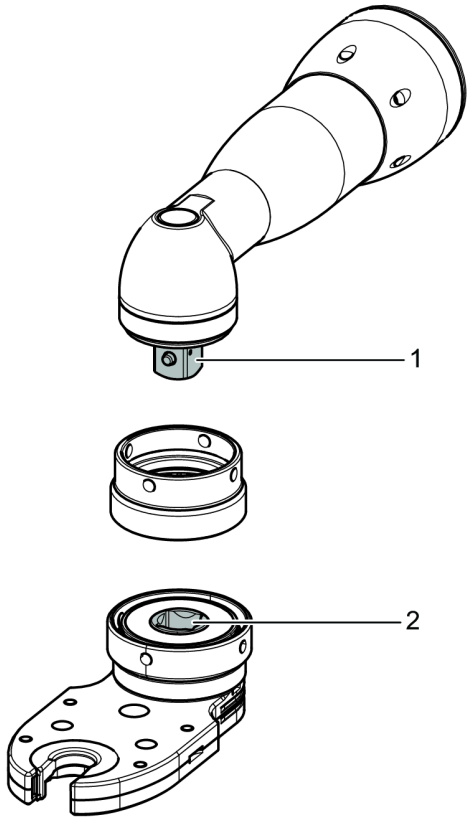
*GFA System Components*

# Installation

## *Installation Instructions*

### Assembly Instructions

The assembly procedure varies depending on the configuration. Make sure that the square drive of the drive unit (1) matches the input gear profile (square hole) of the GFA module (2).

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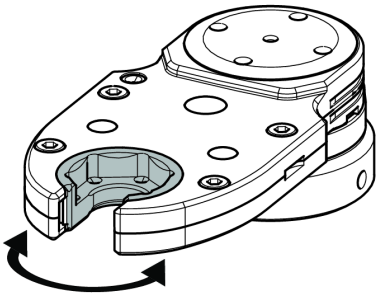
### Functional Test

Perform a functional test before the first tightening operation and after any performed maintenance activity.

**To perform a functional test:**

1. Turn the output gear wheel by hand. Turning it in one direction should lock the wheel. In the other direction the gear wheel should be turned easily. The direction for locking (clockwise or counterclockwise) depends on the configuration of the specific GFA module.



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2. If it is hard to turn, open the housing and check that all components are in the correct position.
3. Grease the system.

# Operation

## *Ergonomic Guidelines*

Consider your workstation as you read through this list of general ergonomic guidelines to identify areas for improvement in posture, component placement, or work environment.

- Take frequent breaks and change work positions frequently.
- Adapt the workstation area to your needs and the work task.
  - Adjust for a convenient reach range by determining where parts and tools need to be located to avoid static load.
  - Use workstation equipment such as tables and chairs appropriate for the work task.
- Avoid work positions above shoulder level or with static holding during assembly operations.
  - When working above shoulder level, reduce the load on the static muscles by lowering the weight of the tool, using for example torque arms, hose reels or weight balancers. You can also reduce the load on the static muscles by holding the tool close to the body.
  - Take frequent breaks.
  - Avoid extreme arm or wrist postures, particularly during operations requiring a degree of force.
- Adjust for a convenient field of vision that requires minimal eye and head movements.
- Use appropriate lighting for the work task.
- Select the appropriate tool for the work task.
- In noisy environments, use ear protection equipment.
- Use high-quality inserted tools and consumables to minimize exposure to excessive levels of vibration.
- Minimize exposure to reaction forces.
  - When cutting:

    A cut-off wheel can get stuck if the cut-off wheel is bent or not guided properly. Use the correct flange for the cut-off wheel and avoid bending the cut-off wheel during operation.
  - When drilling:

    The drill might stall when the drill bit breaks through. Use support handles if the stall torque is high. The safety standard ISO11148 part 3 recommends using a device to absorb a reaction torque above 10 Nm for pistol grip tools and 4 Nm for straight tools.
  - When using direct-driven screwdrivers or nutrunners:

    Reaction forces depend on the tool settings and joint characteristics. Strength and posture determine the amount of reaction force that an operator can tolerate. Adapt the torque setting to the operator's strength and posture and use a torque arm or reaction bar if the torque is too high.
- In dusty environments, use a dust extraction system or wear a mouth protection mask.

## *Operating Instructions*

### Operating the GFA System

**⚠ WARNING Crushing Hazard**

Never reach into the open-end head. Moving parts can crush and cut. Keep hands and fingers away from moving parts.

**⚠ WARNING Crushing Hazard**

The Dual trigger forces the user to use both hands to operate the tool. If not used, the operator can accidentally start the tool while adjusting the crowfoot, thus resulting in a serious hand injury.

- ► Make sure the tool cannot be started once the Dual trigger has been released.
- ► Always test the tool by first releasing the trigger of the Dual trigger, then push the trigger of the tool. If the tool starts; stop working.

**⚠ WARNING Risk of Injury**

Incorrect direction of rotation

- ► If the output gear is used in the opposite direction of rotation than what is required, only a limited torque can be absorbed. Exceeding the return flow limiting can lead to severe injuries and property damage.
- ► Observe the rotational direction instructions of the system.
- ► Always adapt the direction of rotation to the screwing requirements.

**⚠ WARNING Risk of Injury**

Make sure that the correct parameter file is being used. Wrong Parameter File might cause too high torque with bodily injury as a result.

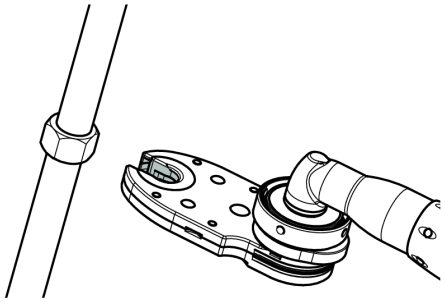
- ► Compare the maximum torque which is shown in the controller, with the maximum torque stated in the stated technical data for the tool, they should be the same.

*NOTICE* Insufficient Lubrication
If the system is not sufficiently lubricated, it may be damaged.

- ► Lubricate the system as soon as there is no longer visible grease.
- ► Apply the grease gun to every grease nipple. Fill with lubricant until it emerges on the output socket.

**Tightening procedure:**

1. Turn the output gear in reverse direction, by means of the drive unit, until the the output gear locks in the open position.
2. Place the GFA system with the output gear onto the screw connection.



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3. Check that the system is placed correctly on the screw connection.
4. Start screwing by using the drive unit.
5. When tightening is completed, lift up the GFA system from the screw connection. Turn the output gear in reverse direction, by means of the drive unit, until the output gear locks in the open position.
6. Switch off the drive unit.
7. Remove the system from the screw connection. The system can now be positioned on the next connection.

# Service

## *Service Overview*

As the gear wheels of the GFA module are exposed to hard wear it is important to regularly check their condition. If any of the gear wheels are worn or damaged, all the gear wheels must be replaced. Needle bearings are to be replaced if needed.

At regular intervals between the service, additional grease is to be supplied through the grease nipples.

## *Maintenance Instructions*

### Service Intervals and Actions

| Interval | Action |
|---|---|
| Daily | ■ Clean the GFA system<br>■ Inspect the system for any damage<br>■ Check all fastenings of the system<br>■ Run functional tests and listen for any abnormal noise |
| At least after every 30,000 tightenings | ■ Lubricate the system |
| At least after every 250,000 tightenings | ■ Service interval for overhaul and preventive maintenance |
| In case of wear-out parts or in case of faulty tightening result | ■ Change the output socket gear<br>■ Change the wear-out parts |

### Preventive Maintenance

#### *Cleaning the System*

To clean the system, wipe carefully with a clean, smooth cloth.

## *Lubrication Instructions*

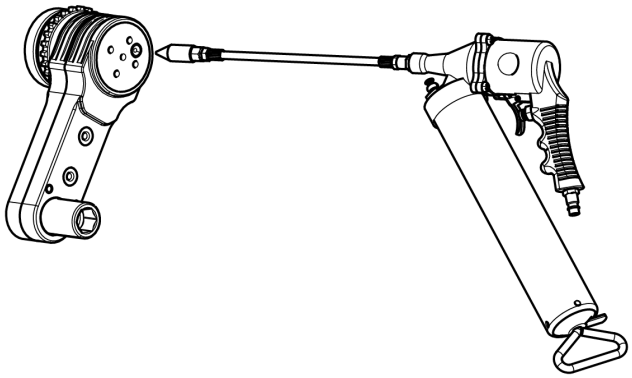
### Lubrication Instructions

| Component | Recommended Lubricant | Quantity |
|---|---|---|
| GFA module | Molykote Longterm 2 Plus | Until excess grease emerges on the output socket |

**To lubricate the GFA module:**

1. Use a grease gun to apply lubrication to every grease nipple of the GFA module.

   The number of grease nipples varies with the design of the GFA module.



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2. Operate the system a few times.
3. Remove any excess grease with a clean, smooth cloth.

## *Dismantling/Assembling Instructions*

### Dismantling the GFA Module

The instruction below shows an example of a GFA module. The module comprises a housing which contains a number of gears depending on model of the GFA system.

**To dismantle the GFA module:**

1. Secure the housing in a vice and loosen the nut.
2. Loosen the cover cap.
3. Remove the bearing housing.
4. Loosen the hex screws. The module can be fastened with two or four hex screws, depending on the model (2, 3, or 4-stage).
5. Open the housing using a flat screwdriver.
6. Remove the output gear.

   Note the direction of the output gear (hexagonal shape up or down). It should be placed in the same way when assembling the GFA module.
7. Remove the idle gears, needle roller bearings, and shafts.
8. Turn the input gear all the way back to the locked position. Then turn it forward 1/4 of a revolution. Push in the pawl by using a 0.1 mm feeler gauge. Remove the collar back latch.
9. Remove the pawl and the spring from the collar back latch.
10. Remove the nut from the bearing housing.
11. Remove the input gear from the bearing housing. Remove the ball bearing from the input gear if needed.
12. Remove the needle roller bearing from the input gear.

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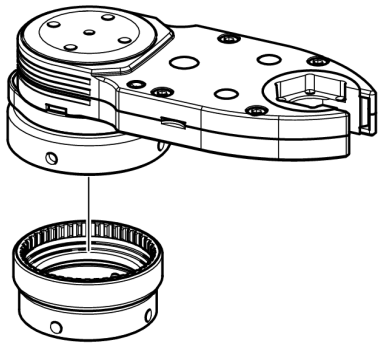

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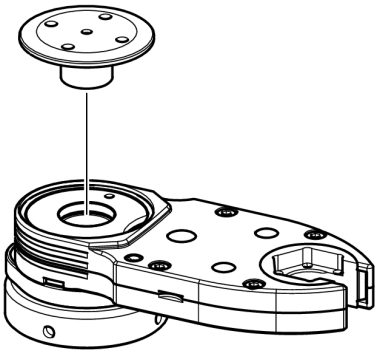

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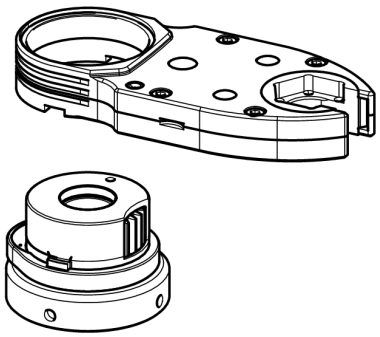

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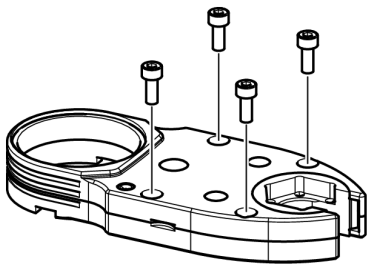

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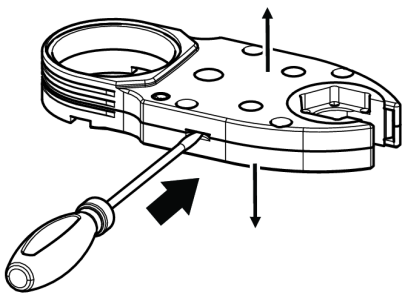

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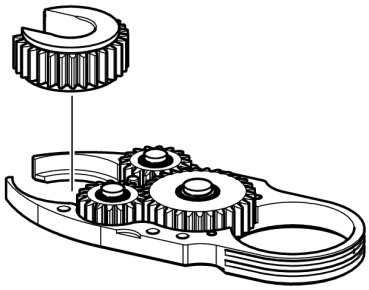

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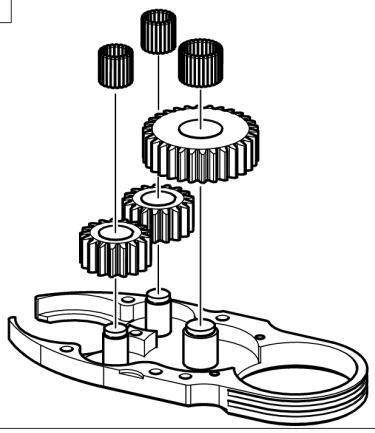

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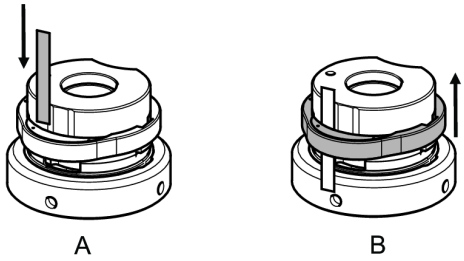


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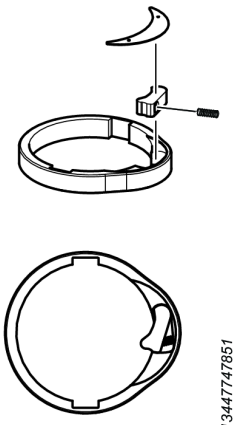

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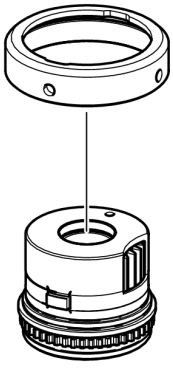

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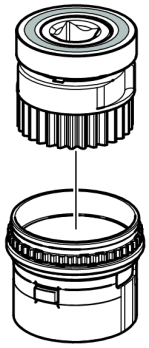

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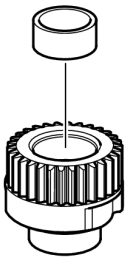

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## Assembling the GFA Module

**To assemble the GFA module:**

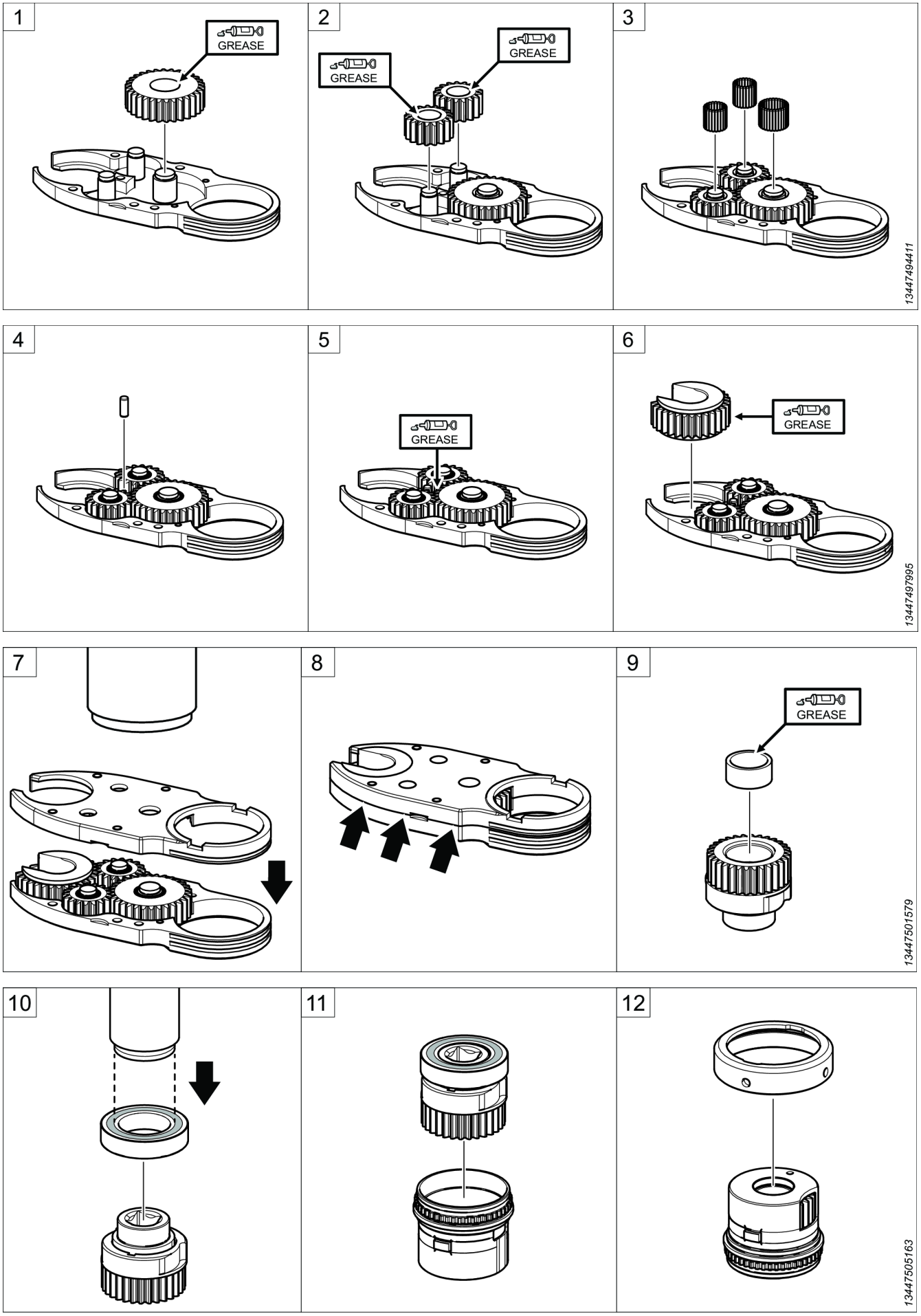
1. Grease the inside of the idler gears and place over the shafts.
2. Repeat for all idler gears. The number of idler gears depend on the configuration of the GFA module.
3. Insert the needle roller bearings. Make sure to insert as many needle roller bearings as there is space for. There should not be any gaps.
4. Make sure that the parallel pin is inserted.
5. Apply grease to the idler gears.
6. Apply grease to the socket gear and place it in the housing. Make sure to place it in the right direction, according to the specification.
7. Place the upper part of the housing on top of the lower part. Use a press tool and press evenly over the housing.
8. Make sure that there is no gap between the upper and lower parts of the housing.
9. Grease the inside of the input gear and the needle carrier. Place the needle carrier in the input gear.
10. Use a press tool to push the ball bearing onto the input gear. Use a cylinder with the correct measurements to make the ball bearing go all the way down.
11. Insert the input gear into the bearing housing.
12. Place the nut over the bearing housing.
13. Place the cover plate on the collar back latch. Grease the pawl and spring and insert into the collar back latch.

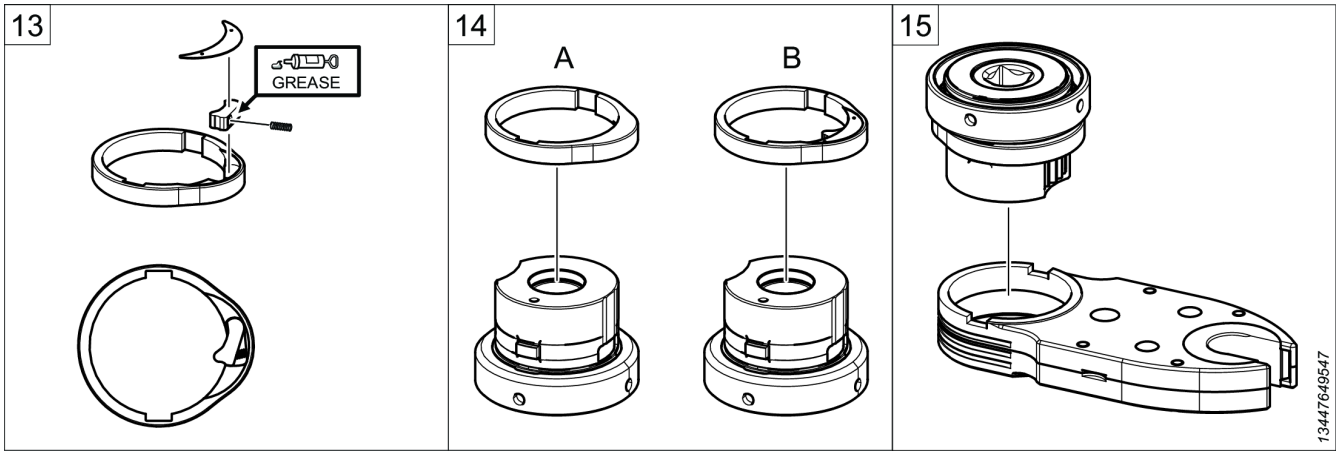
    The collar back latch can include a torque arm flange depending on the configuration.

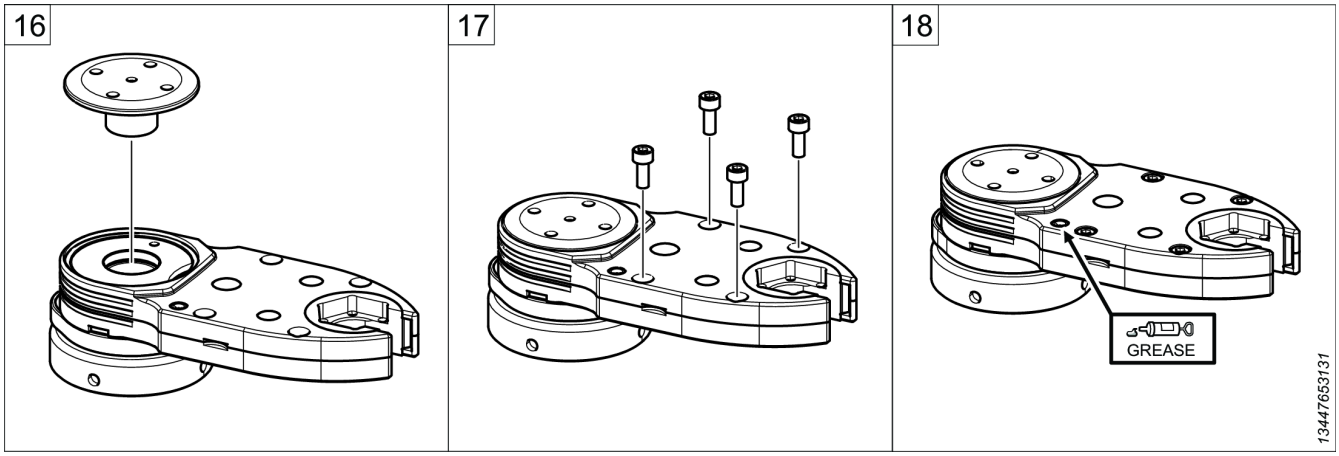
14. Push in the pawl and put the collar back latch over the bearing housing. The pawl should go into one of the two grooves of the input gear. Depending on the gear stage and the desired rotational direction, the collar back latch can be placed either with the cover plate facing downwards **(A)** or upwards **(B)**.

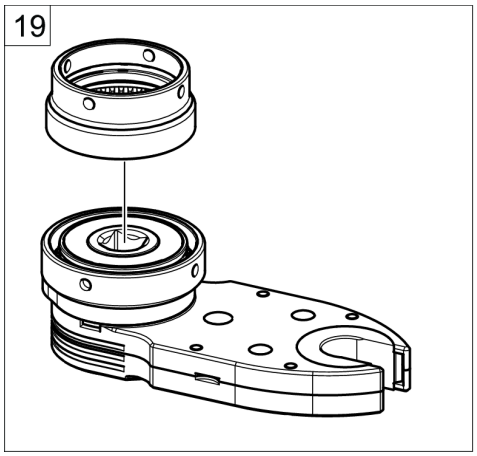
| GFA Gear Model | Tightening Rotational Direction of Output Gear | Mounting Direction of Collar Back Latch |
|---|---|---|
| 2-stage | Clockwise | Cover plate facing downwards, image **A** |
| | Counterclockwise | Cover plate facing upwards, image **B** |
| 3-stage | Clockwise | Cover plate facing upwards, image **B** |
| | Counterclockwise | Cover plate facing downwards, image **A** |

15. Turn the input square all the way to locked position. Make sure that the output gear is in open position and insert the input gear into the housing. The teeth of the gears should mesh. Push the input gear all the way down until the input gear is flush with the housing. Make sure that the output gear is in open position when the input gear is in locked position.
16. Secure the housing in a vice and insert the cover cap into the housing. Push the input gear up from below while tightening the cover cap.
17. Tighten the screws.
18. Use a grease gun to fill the housing with grease through the grease nipple. Note that the GFA module can have a different amount of grease nipples depending on the model.
19. Screw the adapter onto the bearing housing until it stops. Secure the housing in a vice and tighten the nut.





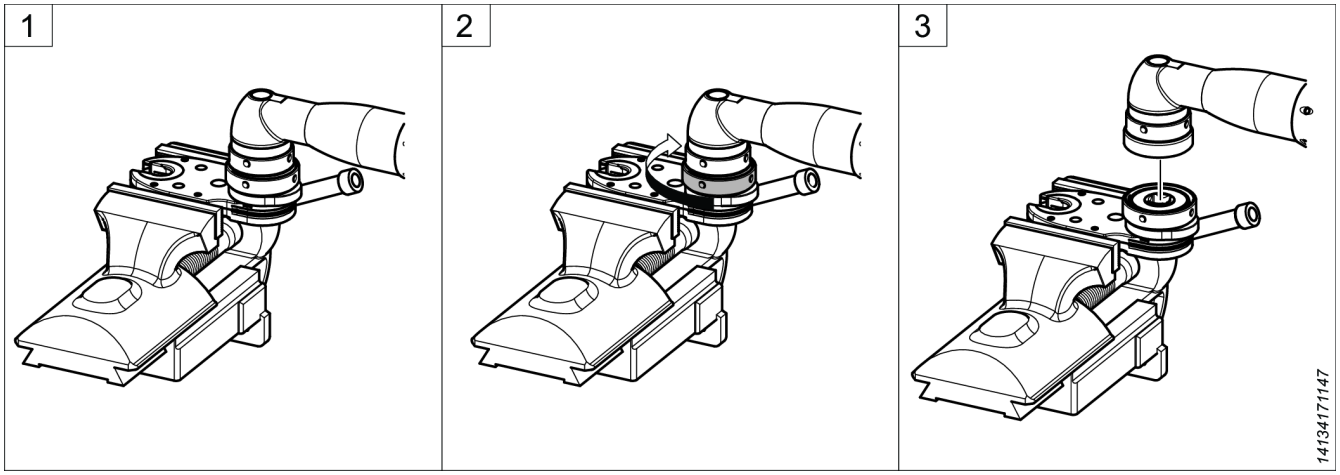



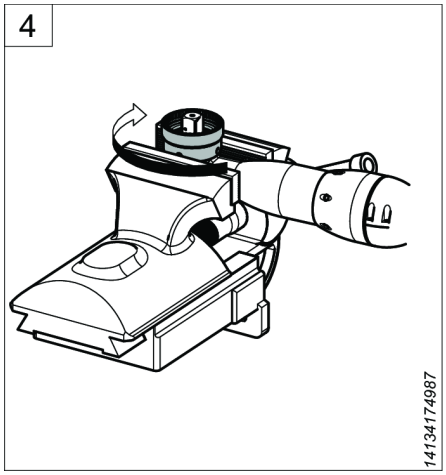




## Removing a Fixed Index Adapter

1. Fasten the GFA system, together with the drive unit, in a vice.
2. Loosen the nut from the adapter. For service tool information, see the spare parts list of the specific GFA model.
3. Remove the adapter, together with the drive unit, from the GFA unit.
4. Fasten the drive unit in a vice. Loosen the adapter clockwise to remove it from the drive unit.

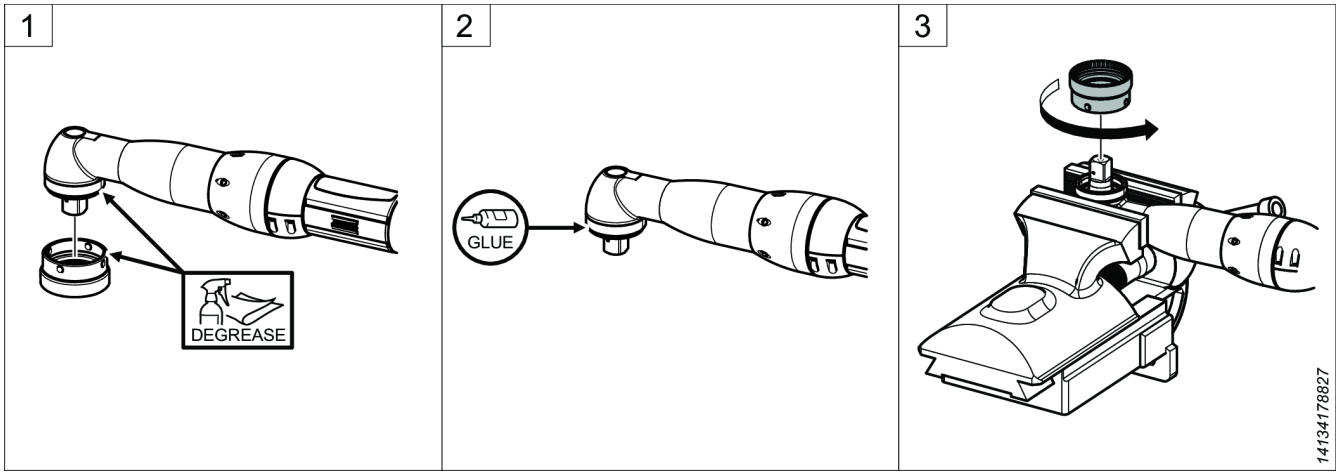
The adapter is fixed to the drive unit with Loctite. Loosening the tool from the adapter requires strong force. It is recommended to use a heat gun to facilitate the loosening.

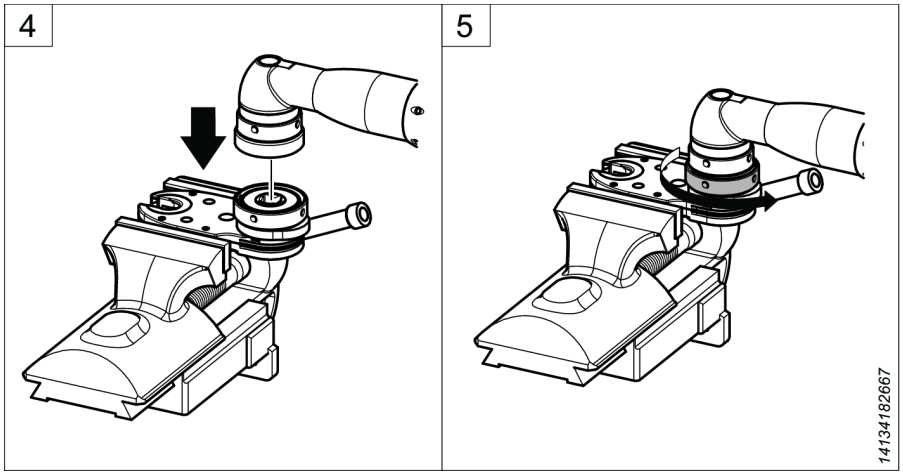



## Attaching a Fixed Index Adapter

1. Clean the threads of the drive unit and the adapter.
2. Apply Loctite 2701, or similar, to the threads of the drive unit.
3. Fasten the drive unit in a vice and tighten the adapter.
4. Fasten the GFA in a vice and attach the adapter to the nut.
5. Tighten the nut. For service tool and tightening torque information, see the spare parts list of the specific GFA model.





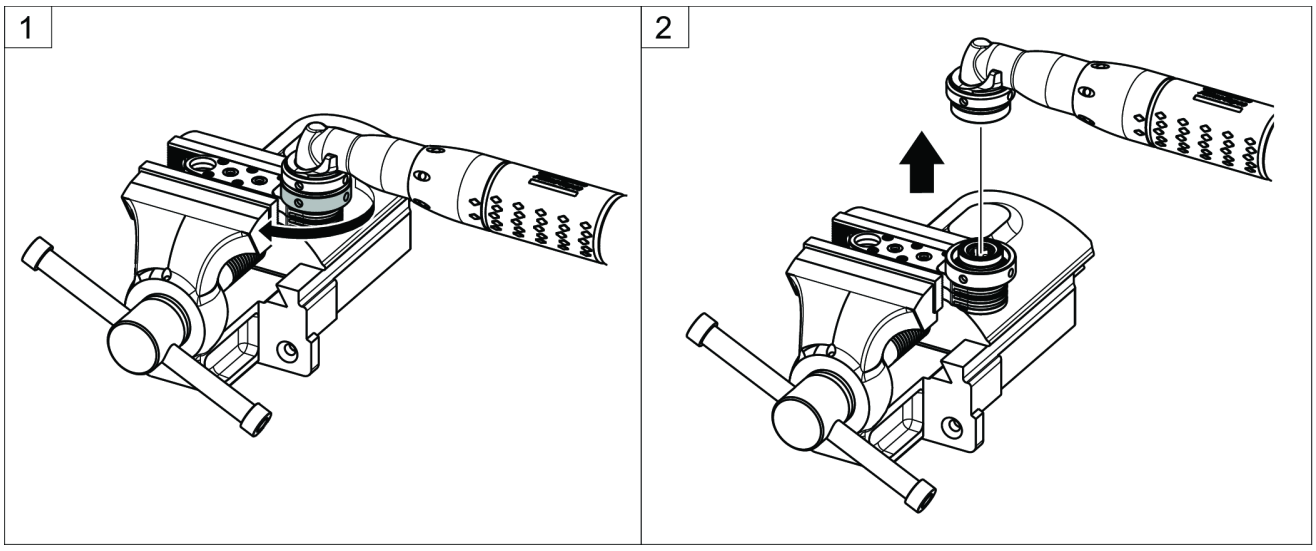

## Removing a Fork Adapter

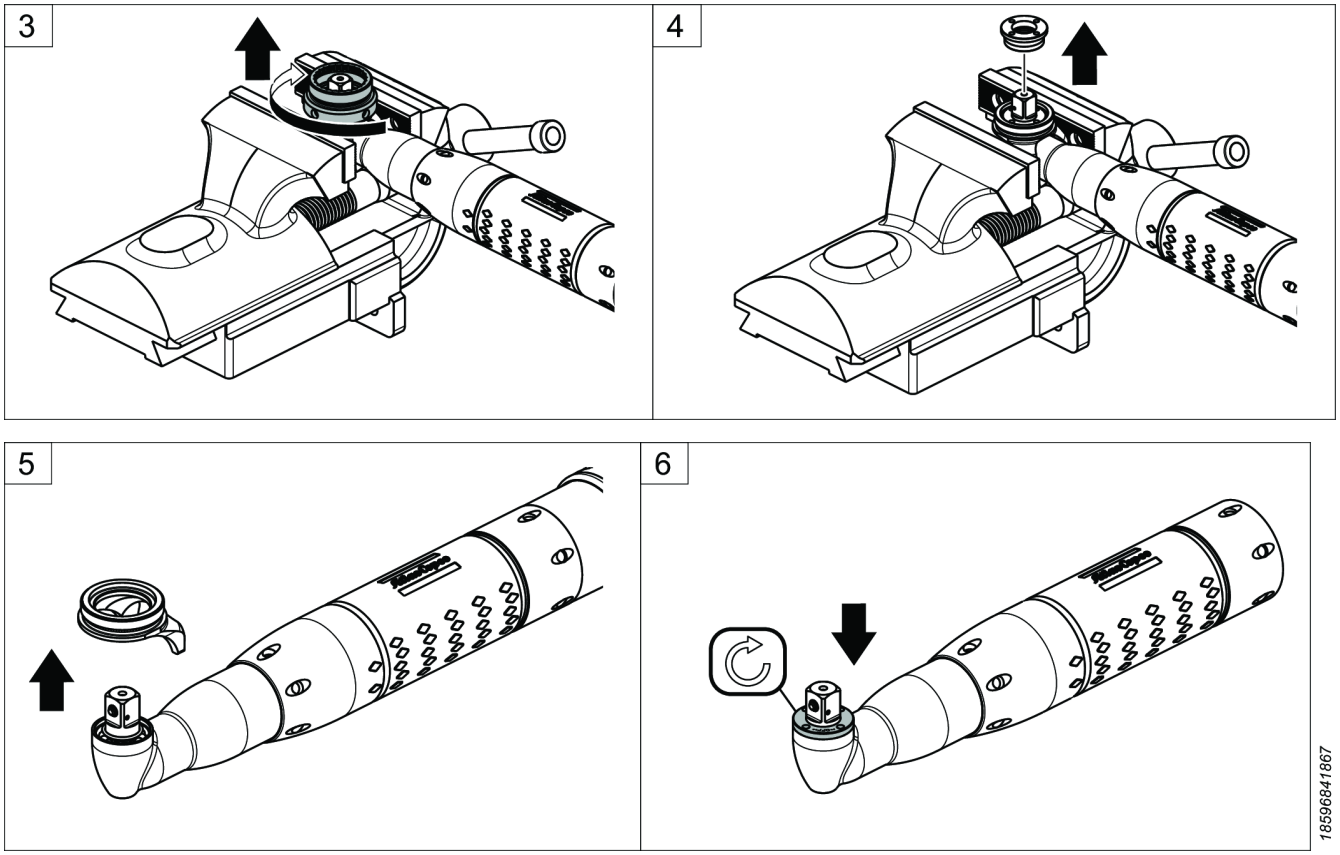
1. Fasten the GFA module in a vice and loosen the nut.
2. Remove the tool, together with the adapter, from the to nut.
3. Fasten the tool in a vice. Loosen and remove the adapter from the fork adapter.

   The adapter is fixed with Loctite. Loosening the adapter requires strong force. It is recommended to use a heat gun to facilitate the loosening.
4. Loosen and remove the bearing shell adapter from the fork adapter.

   The bearing shell is fixed with Loctite. Loosening the bearing shell requires strong force. It is recommended to use a heat gun to facilitate the loosening.
5. Remove the fork adapter from the angle head.
6. If applicable, fasten the tool's bearing shell to the angle head. Note: this is not the same bearing shell as the one for the adapter, in Step 4.

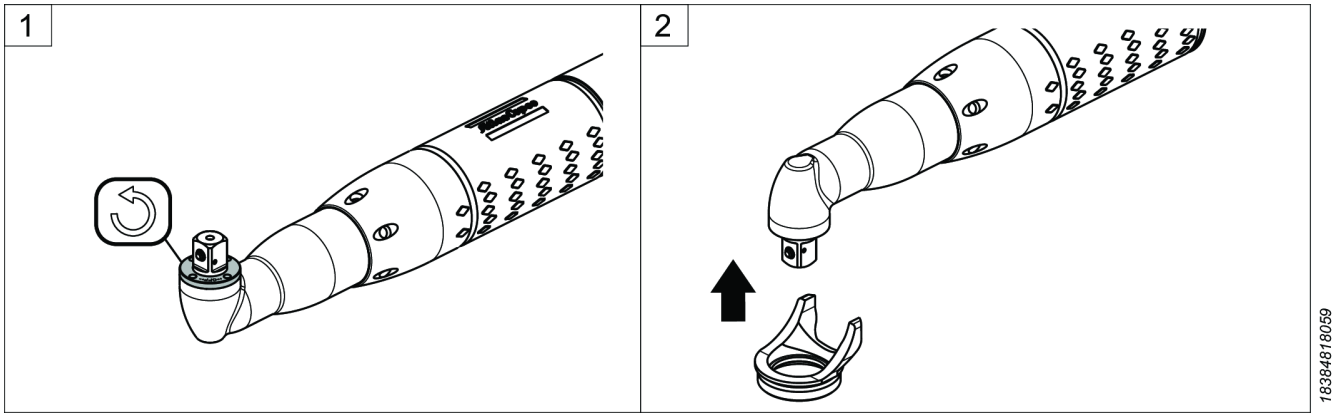
   For service tool, see Spare Parts of the tool in question.

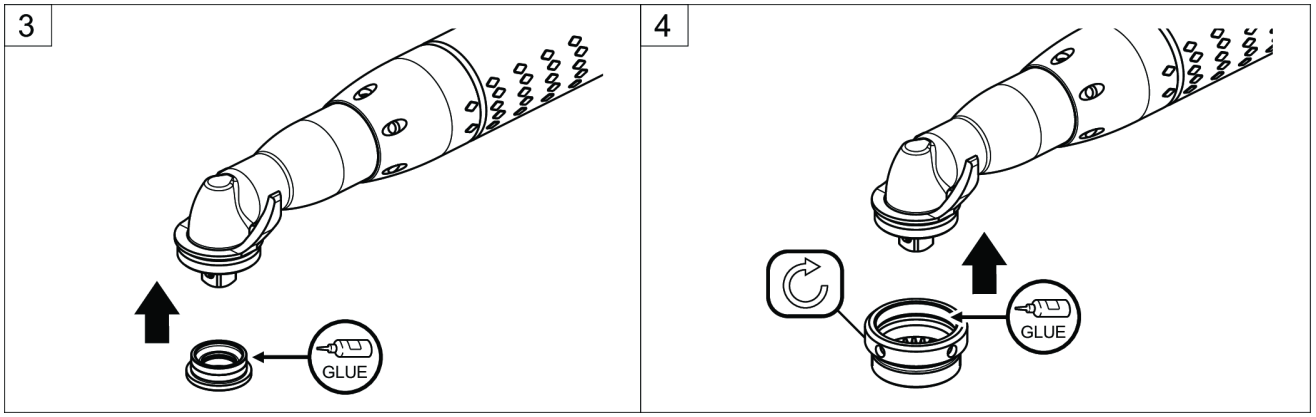


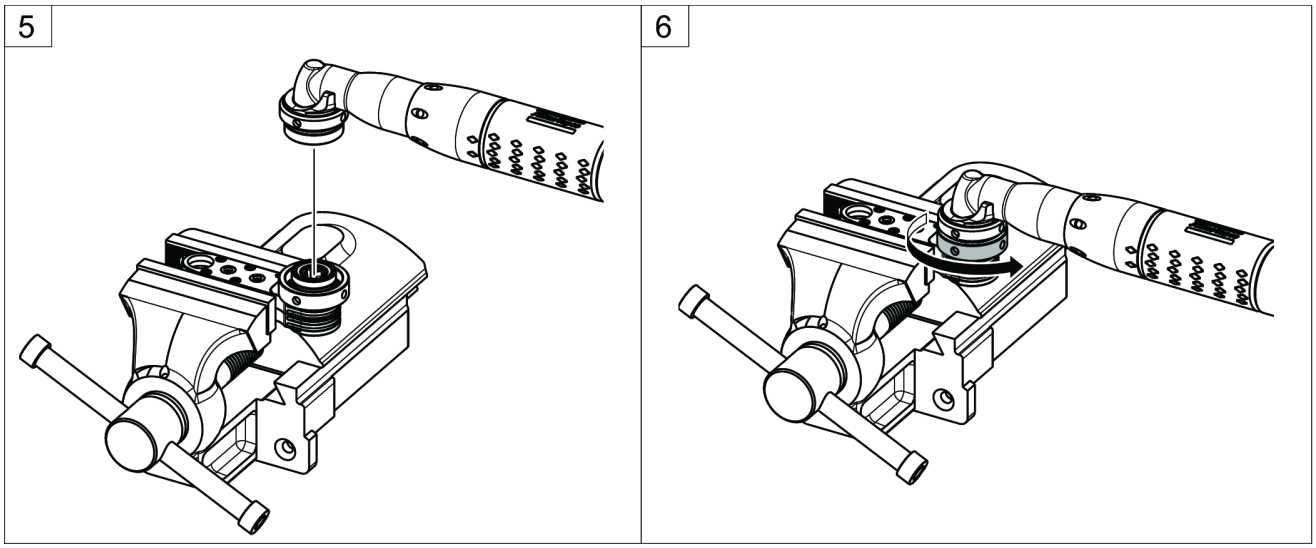



## Attaching a Fork Adapter

1. Remove the bearing shell from the angle head of the tool. For service tool, see Spare Parts of the tool in question.
2. Attach the fork adapter to the angle head.
3. Clean the threads. Apply Loctite 2701, or similar, to the bearing shell adapter, and push it into the fork adapter. Note: this is not the same bearing shell as the one for the angle head, in Step 1.
4. Clean the threads. Apply Loctite 2701, or similar, to the threads of the adapter, and screw it onto the fork adapter.
5. Fasten the GFA module in a vice. Attach the adapter of the tool to the nut of the GFA module.
6. Tighten the nut.





# Recycling

## *Environmental Regulations*

When a product has served its purpose it has to be recycled properly. Dismantle the product and recycle the components in accordance with local legislation.

Batteries shall be taken care of by your national battery recovery organization.

Original instructions

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