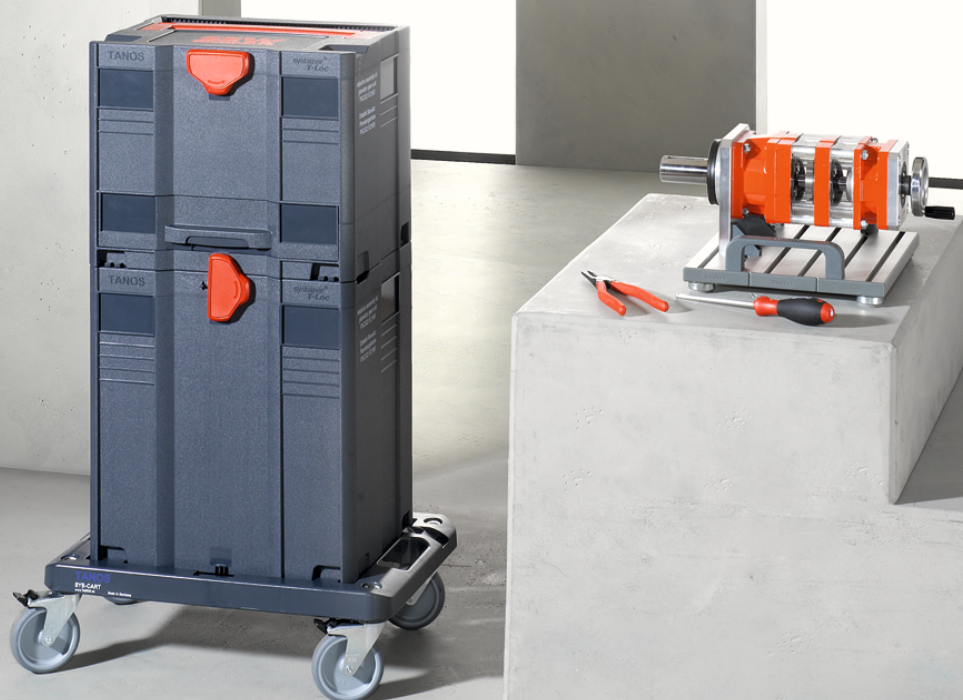




Assembly Instructions



Didactics – Gear Unit Technology

Planetary Gear Unit PSC521 ECH05 / PSC522 ECH05

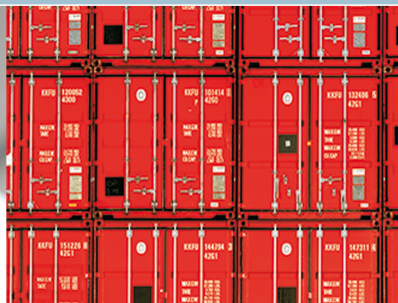


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1 General information

1.1 About this documentation

The current version of the documentation is the original.

This documentation is an integral part of the product. The documentation is intended for all employees who perform work on the product.

Make sure this documentation is accessible and legible. Ensure that persons responsible for the systems and their operation as well as persons who work on the product independently have read through the documentation carefully and understood it. If you are unclear about any of the information in this documentation, or if you require further information, contact SEW-EURODRIVE.

1.2 Important notes

Inspect the shipment for damage as soon as you receive the delivery. Inform the shipping company immediately about any damage. If the product is damaged, it must not be assembled, installed or started up.

Removing covers without authorization, improper use, or incorrect installation and operation may result in severe injuries to persons or damage to machinery.

1.3 Structure of the safety notes

1.3.1 Meaning of signal words

The following table shows the grading and meaning of the signal words for safety notes.

Signal word	Meaning	Consequences if disregarded
▲ DANGER	Imminent hazard	Severe or fatal injuries
▲ WARNING	Possible dangerous situation	Severe or fatal injuries
▲ CAUTION	Possible dangerous situation	Minor injuries
NOTICE	Possible damage to property	Damage to the product or its environment
INFORMATION	Useful information or tip: Simplifies handling of the product.	

1.3.2 Structure of section-related safety notes

Section-related safety notes do not apply to a specific action but to several actions pertaining to one subject. The hazard symbols used either indicate a general hazard or a specific hazard.

This is the formal structure of a safety note for a specific section:



SIGNAL WORD


Type and source of hazard.

Possible consequence(s) if disregarded.

- Measure(s) to prevent the hazard.

Meaning of the hazard symbols

The hazard symbols in the safety notes have the following meaning:

Hazard symbol	Meaning
	General hazard

1.3.3 Structure of embedded safety notes

Embedded safety notes are directly integrated into the instructions just before the description of the dangerous action.

This is the formal structure of an embedded safety note:

▲ SIGNAL WORD Type and source of hazard. Possible consequence(s) if disregarded. Measure(s) to prevent the hazard.

1.4 Designated use

The model is intended for training purposes only. The model serves to explain how gear units are assembled and disassembled and how they operate. Never fill the model with oil and/or operate it on a motor.

1.5 Rights to claim under limited warranty

Read the information in this documentation. This is essential for fault-free operation and fulfillment of any rights to claim under limited warranty. Read the documentation before you start working with the product.

1.6 Product names and trademarks

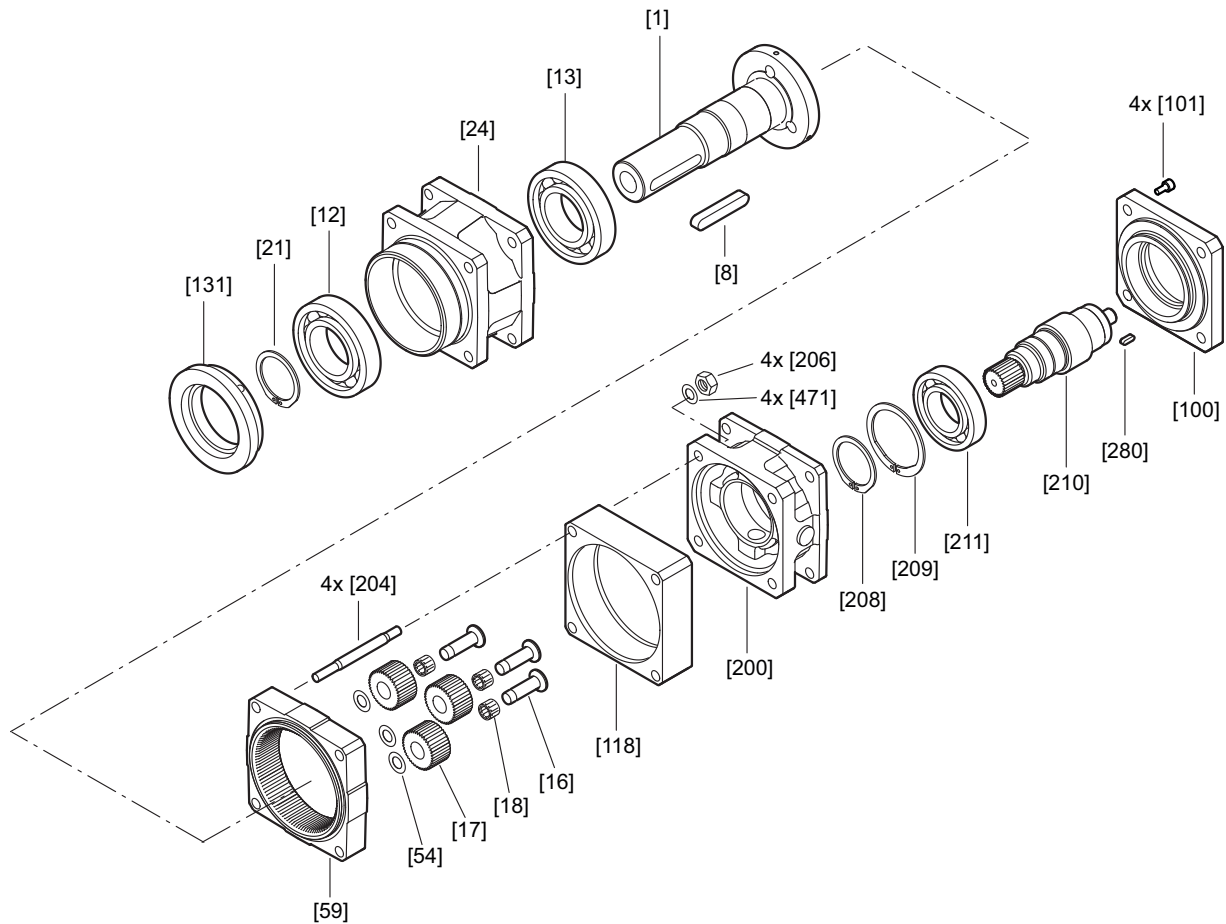
The brands and product names in this documentation are trademarks or registered trademarks of their respective titleholders.

1.7 Copyright notice

© 2018 SEW-EURODRIVE. All rights reserved. Unauthorized reproduction, modification, distribution or any other use of the whole or any part of this documentation is strictly prohibited.

2 Gear unit structure

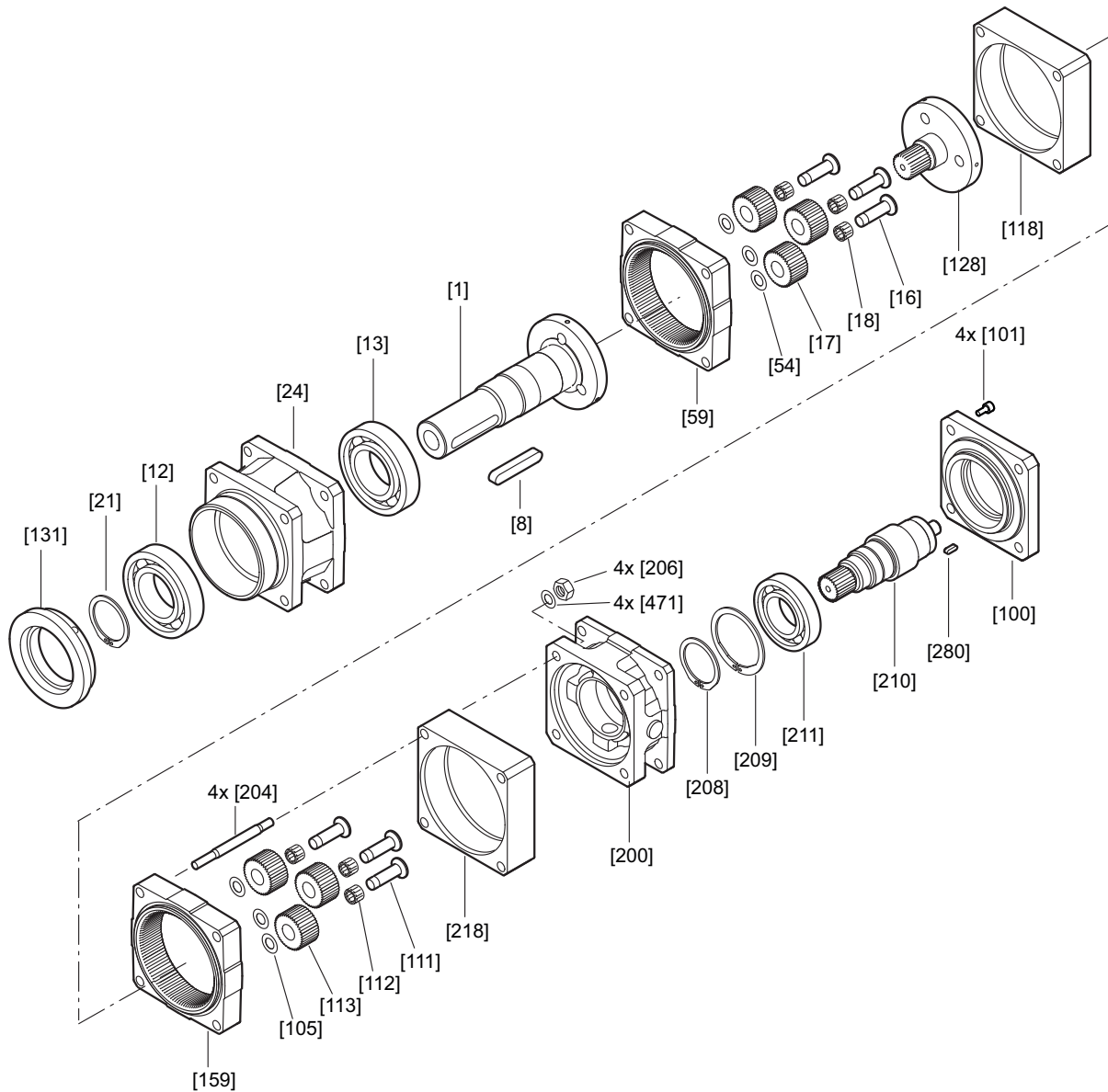
2.1 Basic structure of 1-stage planetary gear units



24239461387

[1]	Planet carrier/output shaft	[24]	Output flange	[204]	Stud
[8]	Key	[54]	Thrust washer	[206]	Hex nut
[12]	Deep groove ball bearing	[59]	Annulus gear	[208]	Retaining ring
[13]	Deep groove ball bearing	[100]	Gear unit cover (complete)	[209]	Retaining ring
[16]	Planetary gear axle	[101]	Cap screw	[210]	Adapter shaft (complete)
[17]	Planet gear	[118]	Built-on housing	[211]	Deep groove ball bearing
[18]	Needle roller and cage assembly	[131]	Closing cap	[280]	Key
[21]	Retaining ring	[200]	Adapter ECH05	[471]	Tooth lock washer

2.2 Basic structure of 2-stage planetary gear units



24245301899

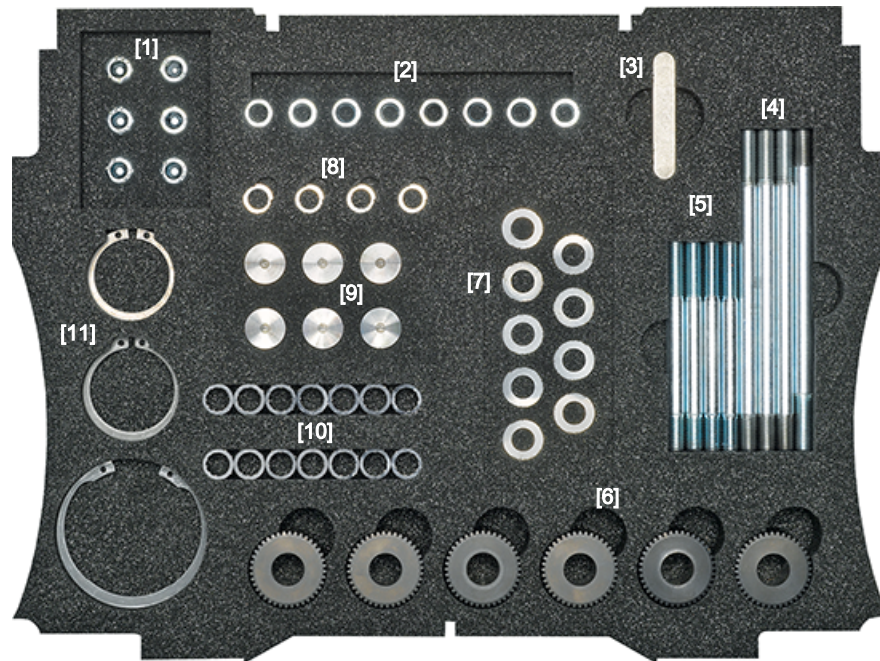
- | | | |
|--------------------------------------|---------------------------------------|--------------------------------|
| [1] Planet carrier/output shaft | [100] Gear unit cover (complete) | [204] Stud |
| [8] Key | [101] Cap screw | [206] Hex nut |
| [12] Deep groove ball bearing | [105] Thrust washer | [208] Retaining ring |
| [13] Deep groove ball bearing | [111] Planetary gear axle | [209] Retaining ring |
| [16] Planetary gear axle | [112] Needle roller and cage assembly | [210] Adapter shaft (complete) |
| [17] Planet gear | [113] Planet gear | [211] Deep groove ball bearing |
| [18] Needle roller and cage assembly | [118] Built-on housing | [218] Built-on housing |
| [21] Retaining ring | [128] 2nd Gear stage | [280] Key |
| [24] Output flange | [131] Closing cap | [471] Tooth lock washer |
| [54] Thrust washer | [159] Annulus gear | |
| [59] Annulus gear | [200] Adapter ECH05 | |

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2.3 Training kit

2.3.1 Content of the parts case

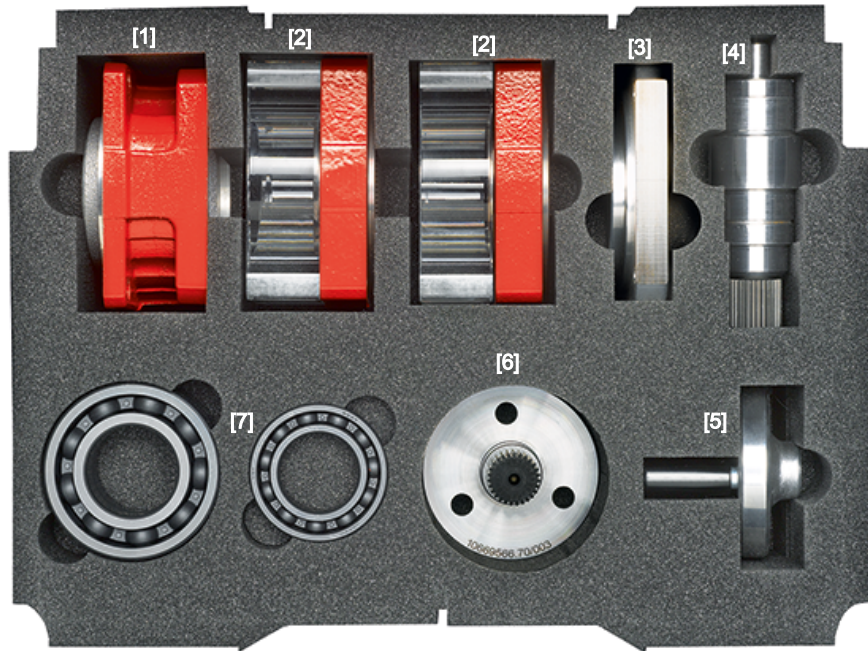
Small gear unit parts



24446292107

- | | | | |
|-----|--------------|------|-----------------------------------|
| [1] | Cap screws | [7] | Thrust washers |
| [2] | Nuts | [8] | Tooth lock washers |
| [3] | Key | [9] | planetary gear axles |
| [4] | Long studs | [10] | Needle roller and cage assemblies |
| [5] | Short studs | [11] | Retaining rings |
| [6] | Planet gears | | |

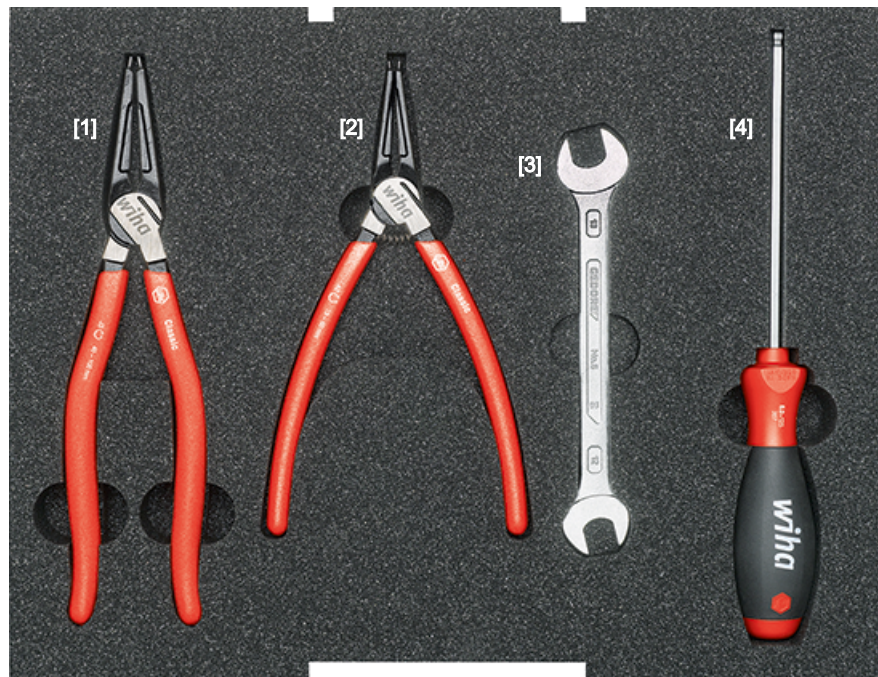
Housing, ball bearing, gear stage, handwheel



24448738699

- | | |
|---|------------------------------|
| [1] Adapter flange | [5] Handwheel |
| [2] Transparent built-on housing and annulus gear | [6] 2nd Gear stage |
| [3] Gear unit cover (complete) | [7] Deep groove ball bearing |
| [4] Adapter shaft (complete) | |

Tools

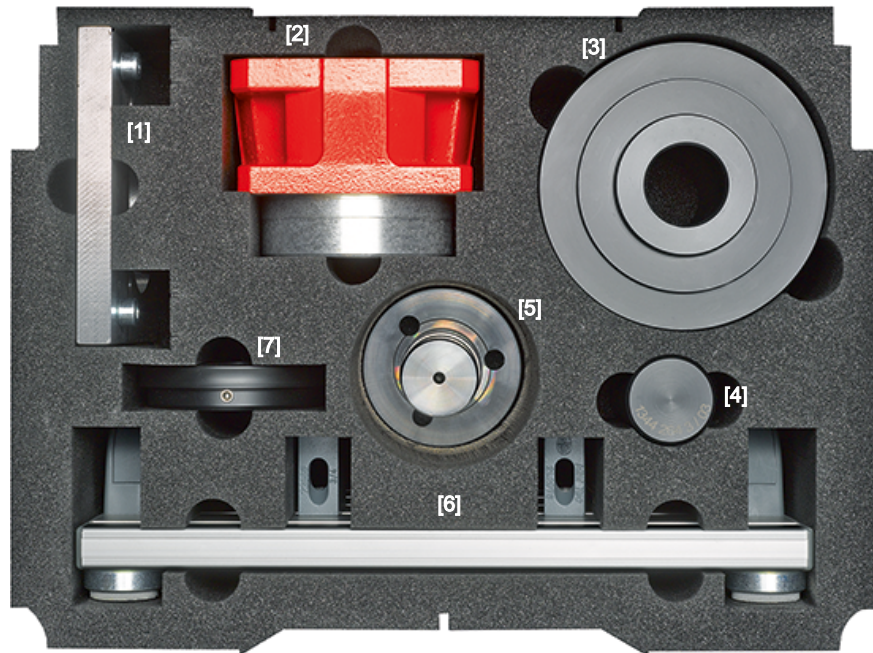


24449604235

- | | |
|------------------------------|--------------------------------|
| [1] Retaining ring pliers J3 | [3] Open-end wrench size 12/13 |
| [2] Retaining ring pliers A2 | [4] Allen wrench size 6 |

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Assembly aid, flange, shaft, base plate



24449172107

- | | | | |
|-----|-----------------|-----|-----------------------------|
| [1] | Flange plate | [5] | Planet carrier/output shaft |
| [2] | Output flange | [6] | Aluminum base plate |
| [3] | Assembly tool | [7] | Oil seal |
| [4] | Assembly sleeve | | |

3 Assembly

3.1 Information about the assembly



⚠ WARNING

Gear units have moving gears and parts.

Severe injuries from crushing.

- Do not place your fingers in the gear unit housing while parts are rotating.
- Remove the crank handle before performing any work on the gear unit housing.



⚠ WARNING

Parts in the gear unit case and the case itself are heavy and may fall or topple over.

Severe injuries from crushing.

- Secure the parts by taking appropriate measures.
- Wear sturdy shoes.



⚠ CAUTION

Parts of the gear unit may have sharp edges, especially at keyways and gearings.

Risk of injury from incised wounds.

- Always wear suitable gloves during assembly and disassembly.



⚠ CAUTION

Clamped retaining rings may loosen and spring out from the pliers.

Risk of injury due to flying parts.

- Wear safety goggles during installation and removal of retaining rings.
- Always insert the pliers into the small bore on the retaining ring first. (The bore of the retaining ring is conical)



NOTICE

Parts of the gear unit may be heavy and sharp-edged.

Damage to the working surface.

- Use the included assembly pad during assembly and disassembly.

3

Assembly

Assembly of the 1-stage gear unit

3.2 Assembly of the 1-stage gear unit

INFORMATION





Numbers in square brackets designate the components from the exploded-view drawing.

3.2.1 Assembly of adapter ECH05

Step	Figure	Procedure
1	 <p style="text-align: right;">24248445451</p>	<ul style="list-style-type: none"> Place the rubber mat included in the assembly kit on your workplace.
2	 <p style="text-align: right;">24248447371</p>	<p>You require the following to assemble the ECH05 adapter:</p> <ul style="list-style-type: none"> Assembly aid (complete) Adapter flange [200] Adapter shaft (complete) [210] Deep groove ball bearing 6007 [211] Retaining ring 35 × 1.5 – FS [208] Retaining ring 62 × 2 – FS [209] Gear unit cover (complete) [100] 4 × cap screw M8 × 16 [101]
3	 <p style="text-align: right;">24248449291</p>	<ul style="list-style-type: none"> Place the assembly aid (upper and lower section) onto the rubber mat.


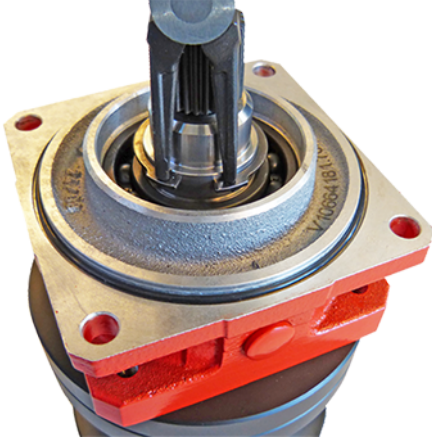

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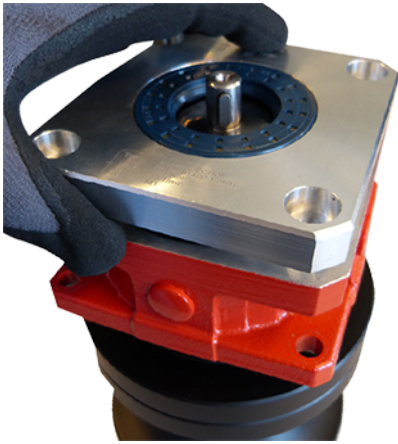


Step	Figure	Procedure
4	 <p style="text-align: center;">24248451211</p>	<ul style="list-style-type: none"> • Place the adapter flange [200] in the assembly aid with the shoulder facing up.
5	 <p style="text-align: center;">24248453131</p>	<ul style="list-style-type: none"> • Insert the adapter shaft (complete) [210] into the flange with the key at the bottom. • The sun gear is pointing up. • The shaft is held in place by the assembly aid.

3

Assembly

Assembly of the 1-stage gear unit

Step	Figure	Procedure
6	 <p style="text-align: right;">24248455051</p>	<ul style="list-style-type: none"> Place the deep groove ball bearing 6007 [211] onto the shaft.
7	 <p style="text-align: right;">24248456971</p>	<ul style="list-style-type: none"> Secure the adapter shaft using retaining ring 35 × 1.5 – FS [208]. Use the retaining ring pliers A2 for the outer rings. INFORMATION: The retaining ring must sit firmly in the groove.
8	 <p style="text-align: right;">24507919371</p>	<ul style="list-style-type: none"> Secure the deep groove ball bearing 6007 using retaining ring 62 × 2 – FS [209]. Use the retaining ring pliers J3 for inner rings. INFORMATION: The retaining ring must sit firmly in the groove.

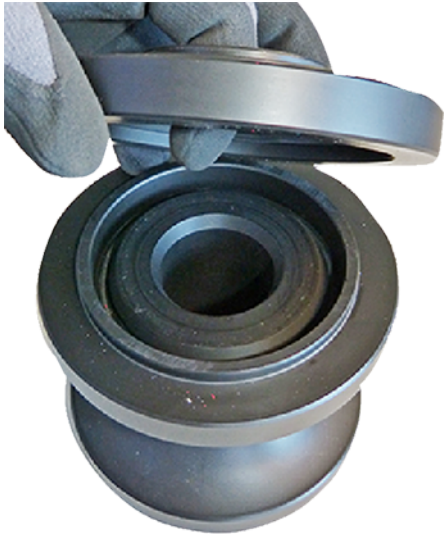
Step	Figure	Procedure
9	 <p style="text-align: center;">24507925003</p>	<ul style="list-style-type: none"> • Take the adapter off the assembly aid. • Turn over the adapter by 180° and place it onto the assembly aid with the sun gear facing down.
10	 <p style="text-align: center;">24248473611</p>	<ul style="list-style-type: none"> • Attach the gear unit cover (complete) [100] to the adapter.
11		<ul style="list-style-type: none"> • Fasten the gear unit cover using the 4 M8 × 16 [101] cap screws. Use the Allen wrench size 6. • Tighten the cap screws in diametrically opposite sequence. <p>Optionally, you can tighten the screws with a torque wrench. The M8 screws consist of corrosion-resistant steel with a strength class of 70. This results in a tightening torque of 19 Nm.</p>
12	 <p style="text-align: center;">24248475531</p>	<ul style="list-style-type: none"> • The preassembly of the ECH05 adapter is complete. • Take the assembled flange off the assembly aid.

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3



Assembly

Assembly of the 1-stage gear unit

Step	Figure	Procedure
13	 <p style="text-align: right;">24248661003</p>	<ul style="list-style-type: none"> For the next assembly steps, remove the upper part of the assembly aid.

3.2.2 Assembly of the output head (1-stage gear unit)



Step	Figure	Procedure
1	 <p style="text-align: right;">25405544715</p>	<p>You require the following for the assembly:</p> <ul style="list-style-type: none"> Planet carrier/output shaft [1] 2 × deep groove ball bearing 6208 [12], [13] Output flange [24] Retaining ring 40 × 1.75 [21]

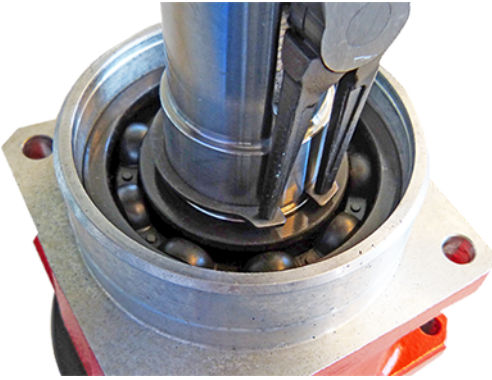

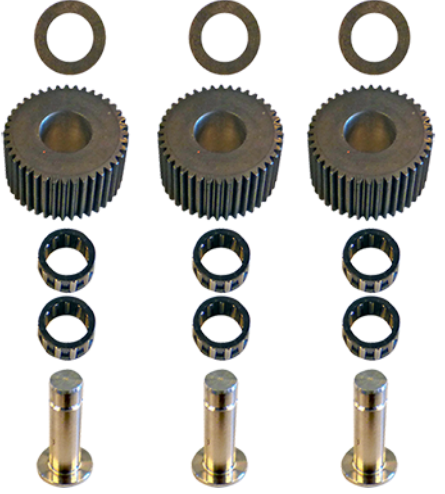
Step	Figure	Procedure
2	 <p style="text-align: right;">24300096395</p>	<ul style="list-style-type: none"> Place the output shaft with planet carrier [1] centrally onto the assembly aid with the planet carrier at the bottom.
3	 <p style="text-align: right;">24300098315</p>	<ul style="list-style-type: none"> Place the deep groove ball bearing 6208 [13] onto the output shaft. The bearing must be pushed all the way to the planet carrier.

3

Assembly

Assembly of the 1-stage gear unit

Step	Figure	Procedure
4	 <p style="text-align: right;">24300100235</p>	<ul style="list-style-type: none"> Place the output flange [24] onto the output shaft. <p>INFORMATION: Insert the bearing [13] into the flange without tilting.</p> <ul style="list-style-type: none"> The flange must be centered and flush with the assembly aid.
5	 <p style="text-align: right;">24300102155</p>	<ul style="list-style-type: none"> Insert the 2nd deep groove ball bearing [12] into the flange via the output shaft.


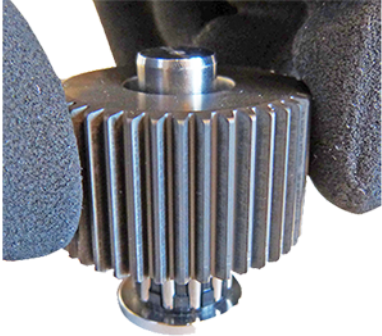
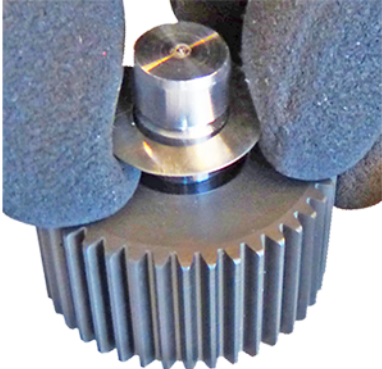
Step	Figure	Procedure
6	 <p style="text-align: right;">24300104075</p>	<ul style="list-style-type: none"> Secure the output shaft using retaining ring 40 × 1.75 [21]. Use the retaining ring pliers A2 for the outer rings. The retaining ring must sit firmly in the groove.
7	 <p style="text-align: right;">24300656395</p>	<ul style="list-style-type: none"> Take the output flange off the assembly aid. Turn over the output flange by 180° so that the output shaft is facing down into the assembly aid.
8	 <p style="text-align: right;">24300658315</p>	<p>You need the following for the further assembly:</p> <ul style="list-style-type: none"> 3 × planet gear axis [16] 6 × needle roller and cage assembly [18] 3 × planet gear [17] 3 × thrust washer [54]

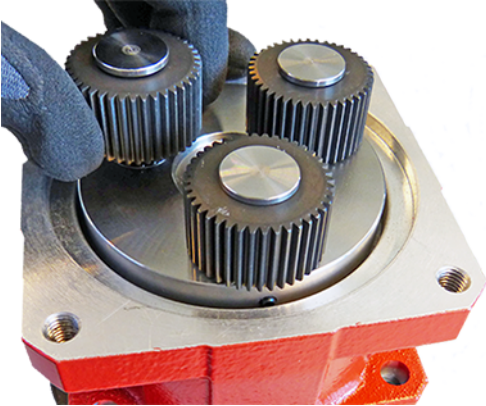


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3

Assembly

Assembly of the 1-stage gear unit

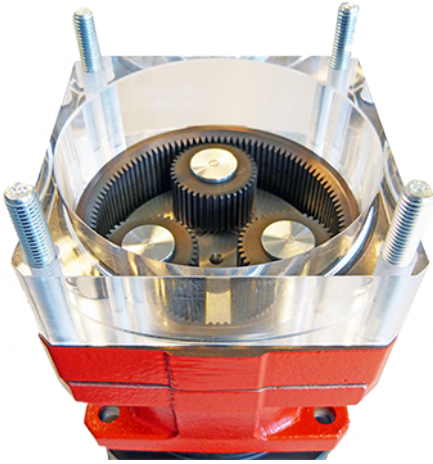
Step	Figure	Procedure
9	 <p style="text-align: right;">24300660235</p>	<ul style="list-style-type: none"> • Push 2 needle roller and cage assemblies [18] onto each planet gear axis [16].
10	 <p style="text-align: right;">24300662155</p>	<ul style="list-style-type: none"> • Push a planet gear [17] onto each planet gear axis.
11	 <p style="text-align: right;">24300664075</p>	<ul style="list-style-type: none"> • Push a thrust washer [54] onto each planet gear via the shafts.

Step	Figure	Procedure
12	 <p style="text-align: right; font-size: 0.8em;">24300839051</p>	<ul style="list-style-type: none"> Insert the complete planet gear axes into the bores at the planet carrier [7] and push them in until they snap into the groove at the planet carrier.
13	 <p style="text-align: right; font-size: 0.8em;">24300840971</p>	<ul style="list-style-type: none"> Screw in the 4 short studs M8 × 75 – 8.8 – A2F [204] into the housing using the stud ends with the short thread.
14	 <p style="text-align: right; font-size: 0.8em;">24300842891</p>	<ul style="list-style-type: none"> Place the annulus gear [59] onto the output flange [24]. <p>INFORMATION: Due to the low circumferential backlash of the gear unit, the gearing must be aligned exactly.</p> <p>Install the annulus gear without tilting and without pressure.</p>



3

Assembly


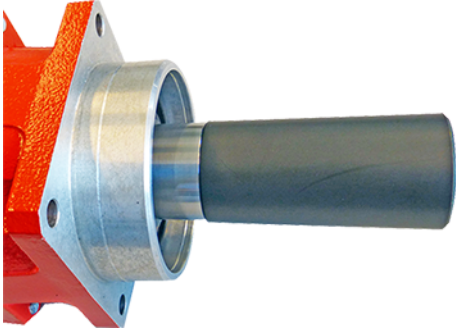
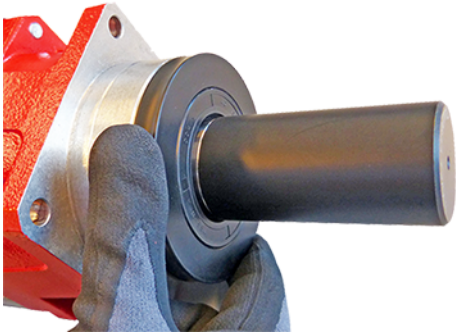
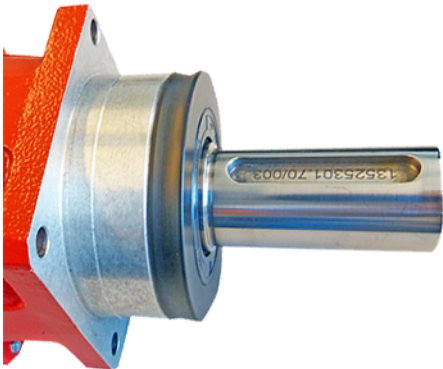
Assembly of the 1-stage gear unit

Step	Figure	Procedure
15	 <p style="text-align: right;">24300844811</p>	<ul style="list-style-type: none"> Place the transparent built-on housing [118] onto the installed annulus gear.

3.2.3 Final assembly (1-stage gear unit)

Step	Figure	Procedure
1	 <p style="text-align: right;">24319737867</p>	<ul style="list-style-type: none"> INFORMATION: Risk of crushing and pinching when inserting the adapter into the gearing. Wear gloves. Carefully insert the adapter into the gearing. Place the preassembled adapter ECH05 [200] onto the built-on housing. <p>INFORMATION: You can align the tooth flanks so that they mesh by carefully turning the sun gear and the planet gears.</p>
2	 <p style="text-align: right;">24322124427</p>	<ul style="list-style-type: none"> Place the 4 tooth lock washers [471] on the threads of the studs. Fasten the adapter using the hex nuts [206].


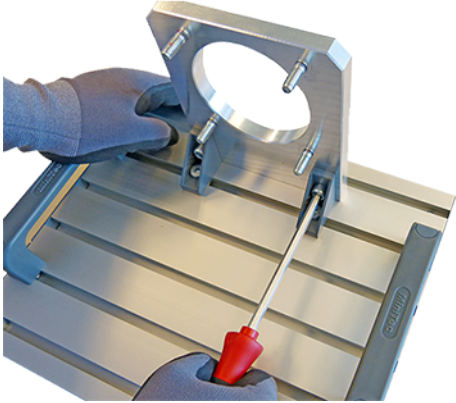
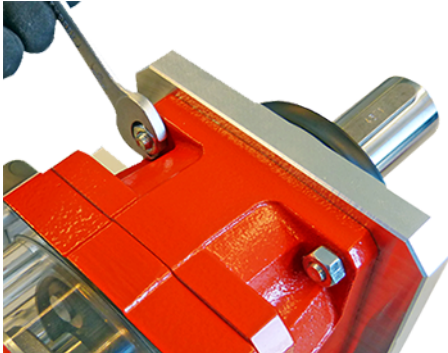
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Step	Figure	Procedure
3	 <p style="text-align: right;">24322126347</p>	<ul style="list-style-type: none"> Tighten the nuts in diametrically opposite sequence. <p>INFORMATION: Damage to the plexiglass parts due to excessive tightening of the nuts. Only fasten the nuts hand-tight.</p>
4	 <p style="text-align: right;">24322128267</p>	<ul style="list-style-type: none"> Take the gear unit off the assembly aid. Place the assembly sleeve onto the output shaft. <p>The assembly sleeve protect the oil seal and facilitates installing the oil seal on the output shaft.</p>
5	 <p style="text-align: right;">24322130187</p>	<ul style="list-style-type: none"> Install the closing cap [131] with the oil seal.
6	 <p style="text-align: right;">24322132107</p>	<ul style="list-style-type: none"> Remove the assembly sleeve.

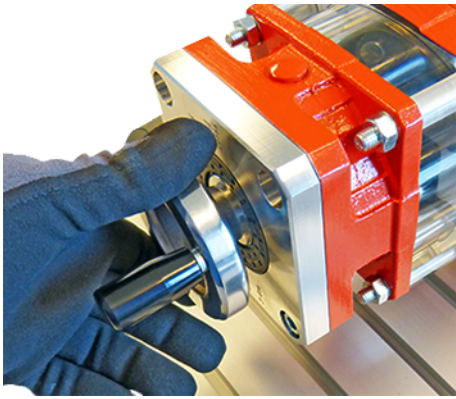
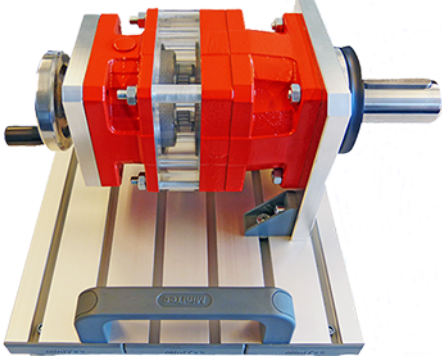
3

Assembly

Assembly of the 1-stage gear unit

Step	Figure	Procedure
7	 <p style="text-align: right;">24322134027</p>	<ul style="list-style-type: none"> Insert the key A10 × 8 × 56 [8] into the keyway of the output shaft.
8	 <p style="text-align: right;">24322135947</p>	<ul style="list-style-type: none"> Attach the flange plate to the aluminum base plate. Screw the 2 plates together using the 2 brackets. Optionally, you can tighten the screws with a torque wrench. The M8 screws consist of corrosion-resistant steel with a strength class of 70. This results in a tightening torque of 19 Nm.
9	 <p style="text-align: right;">24322137867</p>	<ul style="list-style-type: none"> Guide the gear unit through the bore in the flange plate.
10	 <p style="text-align: right;">24322139787</p>	<ul style="list-style-type: none"> Fasten the gear unit to the studs of the flange plate using the nuts. Place a washer [471] underneath each nut [206]. Tighten the nuts in diametrically opposite sequence until hand-tight.

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Step	Figure	Procedure
11	 <p style="text-align: right; font-size: small;">24319739787</p>	<ul style="list-style-type: none"> • Place the handwheel on the input shaft. • Turn the crank and check whether the output shaft turns.
12	 <p style="text-align: right; font-size: small;">24322122507</p>	<ul style="list-style-type: none"> • The assembly of the 1-stage planetary gear unit is complete.

3

Assembly

Assembly of the 2-stage gear unit

3.3 Assembly of the 2-stage gear unit

INFORMATION





Numbers in square brackets designate the components from the exploded-view drawing.

3.3.1 Assembly of adapter ECH05

Step	Figure	Procedure
1	 <p style="text-align: right;">24248445451</p>	<ul style="list-style-type: none"> Place the rubber mat included in the assembly kit on your workplace.
2	 <p style="text-align: right;">24248447371</p>	<p>You require the following to assemble the ECH05 adapter:</p> <ul style="list-style-type: none"> Assembly aid (complete) Adapter flange [200] Adapter shaft (complete) [210] Deep groove ball bearing 6007 [211] Retaining ring 35 × 1.5 – FS [208] Retaining ring 62 × 2 – FS [209] Gear unit cover (complete) [100] 4 × cap screw M8 × 16 [101]
3	 <p style="text-align: right;">24248449291</p>	<ul style="list-style-type: none"> Place the assembly aid (upper and lower section) onto the rubber mat.

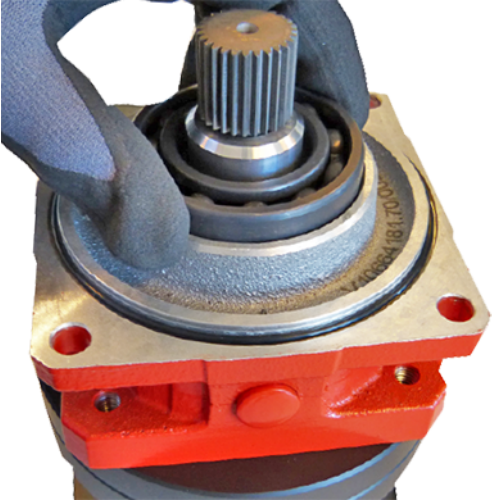
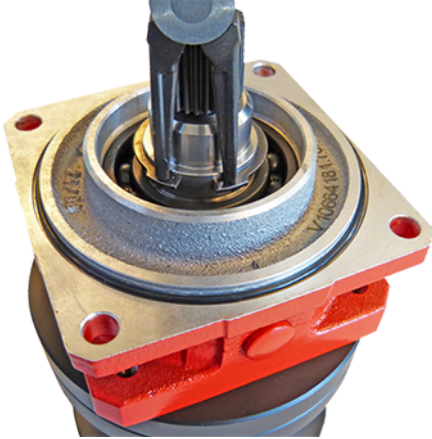

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Step	Figure	Procedure
4	 <p style="text-align: center;">24248451211</p>	<ul style="list-style-type: none"> • Place the adapter flange [200] in the assembly aid with the shoulder facing up.
5	 <p style="text-align: center;">24248453131</p>	<ul style="list-style-type: none"> • Insert the adapter shaft (complete) [210] into the flange with the key at the bottom. • The sun gear is pointing up. • The shaft is held in place by the assembly aid.


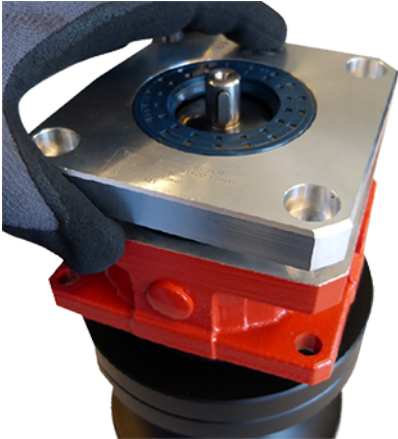


3

Assembly

Assembly of the 2-stage gear unit

Step	Figure	Procedure
6	 <p style="text-align: right;">24248455051</p>	<ul style="list-style-type: none"> Place the deep groove ball bearing 6007 [211] onto the shaft.
7	 <p style="text-align: right;">24248456971</p>	<ul style="list-style-type: none"> Secure the adapter shaft using retaining ring 35 × 1.5 – FS [208]. Use the retaining ring pliers A2 for the outer rings. INFORMATION: The retaining ring must sit firmly in the groove.
8	 <p style="text-align: right;">24507919371</p>	<ul style="list-style-type: none"> Secure the deep groove ball bearing 6007 using retaining ring 62 × 2 – FS [209]. Use the retaining ring pliers J3 for inner rings. INFORMATION: The retaining ring must sit firmly in the groove.

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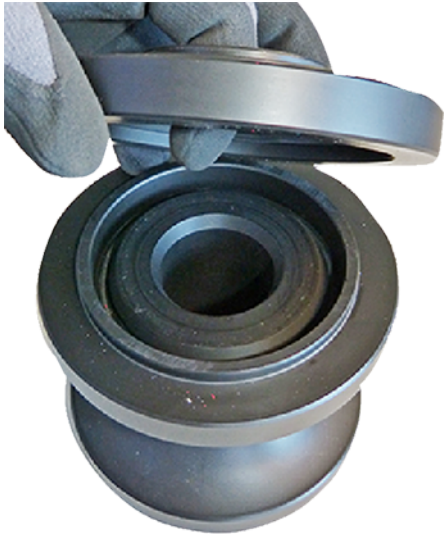
Step	Figure	Procedure
9	 <p style="text-align: center;">24507925003</p>	<ul style="list-style-type: none"> • Take the adapter off the assembly aid. • Turn over the adapter by 180° and place it onto the assembly aid with the sun gear facing down.
10	 <p style="text-align: center;">24248473611</p>	<ul style="list-style-type: none"> • Attach the gear unit cover (complete) [100] to the adapter.
11		<ul style="list-style-type: none"> • Fasten the gear unit cover using the 4 M8 × 16 [101] cap screws. Use the Allen wrench size 6. • Tighten the cap screws in diametrically opposite sequence. <p>Optionally, you can tighten the screws with a torque wrench. The M8 screws consist of corrosion-resistant steel with a strength class of 70. This results in a tightening torque of 19 Nm.</p>
12	 <p style="text-align: center;">24248475531</p>	<ul style="list-style-type: none"> • The preassembly of the ECH05 adapter is complete. • Take the assembled flange off the assembly aid.

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Assembly

Assembly of the 2-stage gear unit

Step	Figure	Procedure
13	 <p style="text-align: right;">24248661003</p>	<ul style="list-style-type: none"> For the next assembly steps, remove the upper part of the assembly aid.

3.3.2 Assembly of the output head (2-stage gear unit)



Step	Figure	Procedure
1	 <p style="text-align: right;">25405544715</p>	<p>You require the following for the assembly:</p> <ul style="list-style-type: none"> Planet carrier/output shaft [1] 2 × deep groove ball bearing 6208 [12], [13] Output flange [24] Retaining ring 40 × 1.75 [21]

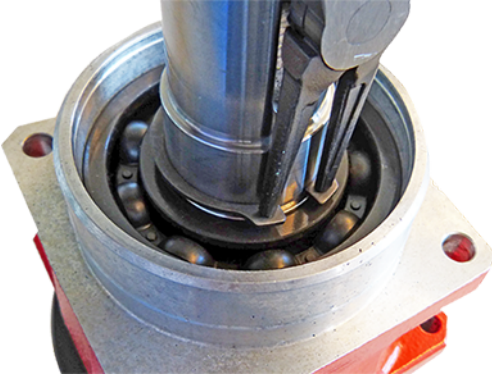

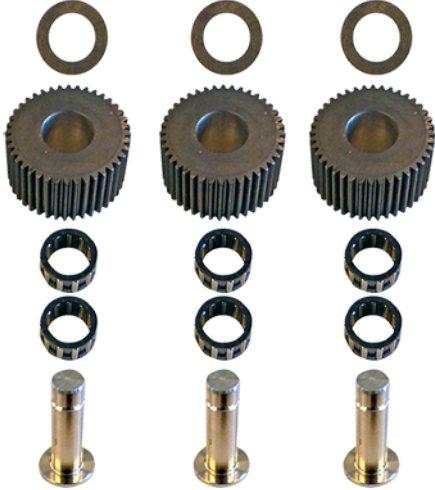
Step	Figure	Procedure
2	 <p style="text-align: center;">24300096395</p>	<ul style="list-style-type: none"> Place the output shaft with planet carrier [1] centrally onto the assembly aid with the planet carrier at the bottom.
3	 <p style="text-align: center;">24300098315</p>	<ul style="list-style-type: none"> Place the deep groove ball bearing 6208 [13] onto the output shaft. The bearing must be pushed all the way to the planet carrier.

3

Assembly

Assembly of the 2-stage gear unit


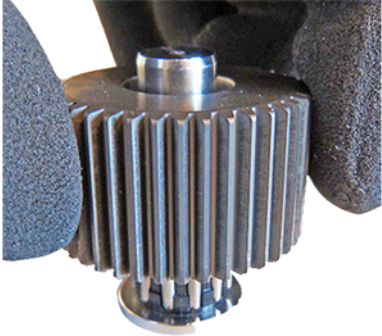
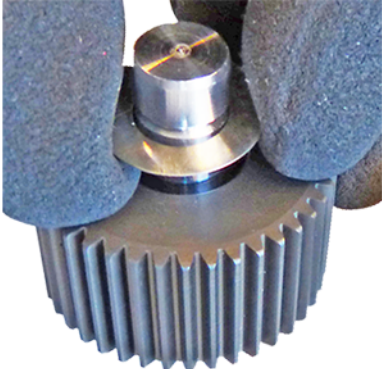
Step	Figure	Procedure
4	 <p>24300100235</p>	<ul style="list-style-type: none">Place the output flange [24] onto the output shaft. <p>INFORMATION: Insert the bearing [13] into the flange without tilting.</p> <ul style="list-style-type: none">The flange must be centered and flush with the assembly aid.
5	 <p>24300102155</p>	<ul style="list-style-type: none">Insert the 2nd deep groove ball bearing [12] into the flange via the output shaft.

Step	Figure	Procedure
6	 <p style="text-align: right;">24300104075</p>	<ul style="list-style-type: none"> Secure the output shaft using retaining ring 40 × 1.75 [21]. Use the retaining ring pliers A2 for the outer rings. The retaining ring must sit firmly in the groove.
7	 <p style="text-align: right;">24300656395</p>	<ul style="list-style-type: none"> Take the output flange off the assembly aid. Turn over the output flange by 180° so that the output shaft is facing down into the assembly aid.
8	 <p style="text-align: right;">24300658315</p>	<p>You need the following for the further assembly:</p> <ul style="list-style-type: none"> 3 × planet gear axis [16] 6 × needle roller and cage assembly [18] 3 × planet gear [17] 3 × thrust washer [54]

3

Assembly

Assembly of the 2-stage gear unit

Step	Figure	Procedure
9	 <p style="text-align: right;">24300660235</p>	<ul style="list-style-type: none"> • Push 2 needle roller and cage assemblies [18] onto each planet gear axis [16].
10	 <p style="text-align: right;">24300662155</p>	<ul style="list-style-type: none"> • Push a planet gear [17] onto each planet gear axis.
11	 <p style="text-align: right;">24300664075</p>	<ul style="list-style-type: none"> • Push a thrust washer [54] onto each planet gear via the shafts.

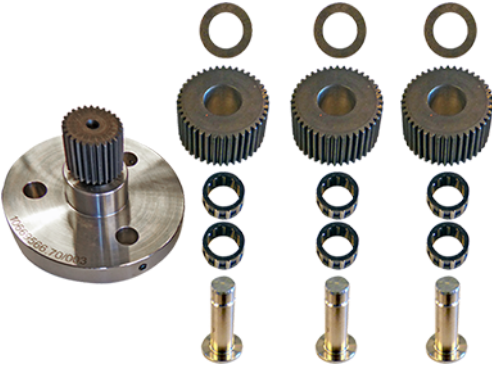

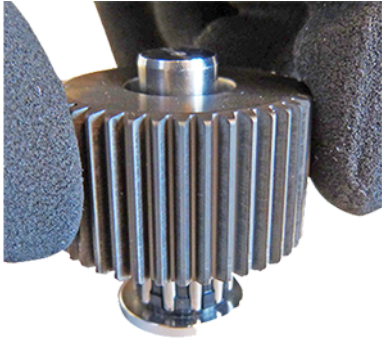
Step	Figure	Procedure
12	 <p style="text-align: right; font-size: small;">24300839051</p>	<ul style="list-style-type: none"> Insert the complete planet gear axes into the bores at the planet carrier [7] and push them in until they snap into the groove at the planet carrier.
13	 <p style="text-align: right; font-size: small;">24357081867</p>	<ul style="list-style-type: none"> Screw in the 4 long studs M8 × 125 – 8.8 – A2F [204] into the housing using the stud ends with the short thread.
14	 <p style="text-align: right; font-size: small;">24512649227</p>	<ul style="list-style-type: none"> Place the annulus gear [59] onto the output flange [24]. <p style="font-size: small;">INFORMATION: Due to the low circumferential backlash of the gear unit, the gearing must be aligned exactly.</p> <p style="font-size: small;">Install the annulus gear without tilting and without pressure.</p>

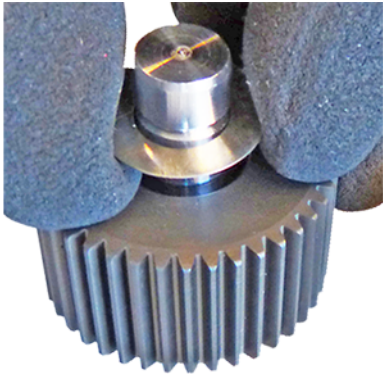

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3

Assembly

Assembly of the 2-stage gear unit


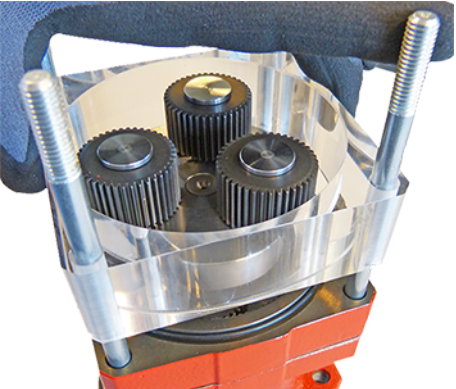
Step	Figure	Procedure
15	 <p style="text-align: right;">24357089547</p>	<p>You need the following for the further assembly:</p> <ul style="list-style-type: none"> • 2nd gear stage [128] • 3 × planet gear axis [111] • 6 × needle roller and cage assembly [112] • 3 × planet gear [113] • 3 × thrust washer [105]
16	 <p style="text-align: right;">24300660235</p>	<ul style="list-style-type: none"> • Push 2 needle roller and cage assemblies [112] onto each planet gear axis [111].
17	 <p style="text-align: right;">24300662155</p>	<ul style="list-style-type: none"> • Push a planet gear [113] onto each planet gear axis.

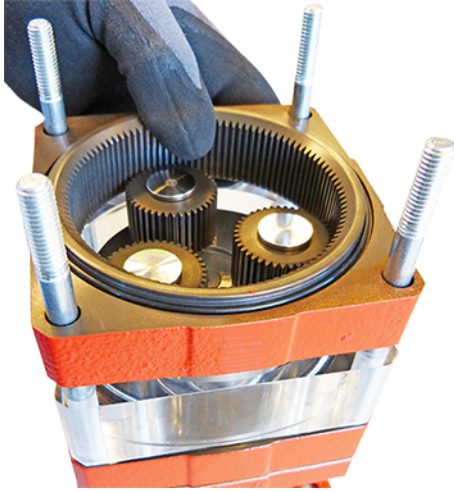
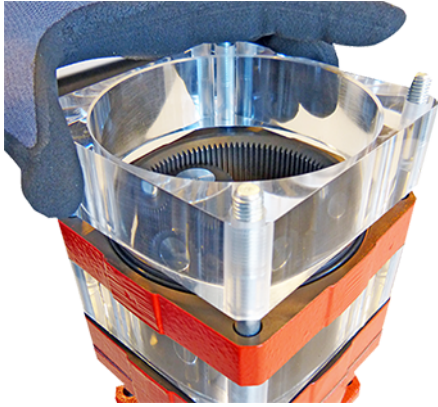
Step	Figure	Procedure
18	 <p style="text-align: right; margin-top: 5px;">24300664075</p>	<ul style="list-style-type: none"> • Push a thrust washer [105] onto each planet gear via the shafts.
19	 <p style="text-align: right; margin-top: 5px;">24357091467</p>	<ul style="list-style-type: none"> • Insert the planet gear axes into the bores at the 2nd gear stage [128] and push them in until they snap into the groove at the planet carrier.

3


Assembly

Assembly of the 2-stage gear unit

Step	Figure	Procedure
20	 <p>24518026123</p> <p>24416702987</p>	<ul style="list-style-type: none"> Insert the completely assembled 2nd gear stage into the 1st stage (preliminary stage), with the 2nd sun gear and the planet gearing of the 1st stage meshing. <p>INFORMATION: You can align the tooth flanks so that they mesh by carefully turning the planet carrier and planet gears.</p>
21	 <p>24416704907</p>	<ul style="list-style-type: none"> Place the transparent built-on housing [118] onto the installed annulus gear.

Step	Figure	Procedure
22	 <p style="text-align: right;">24416706827</p>	<ul style="list-style-type: none"> Place the 2nd annulus gear [159] onto the transparent built-on housing [118]. <p>INFORMATION: Due to the low circumferential backlash of the gear unit, the gearing must be aligned exactly.</p> <p>Install the annulus gear without tilting and without pressure.</p>
23	 <p style="text-align: right;">24416708747</p>	<ul style="list-style-type: none"> Place the 2nd transparent built-on housing [218] onto the installed annulus gear [159].

3.3.3 Final assembly (2-stage gear unit)



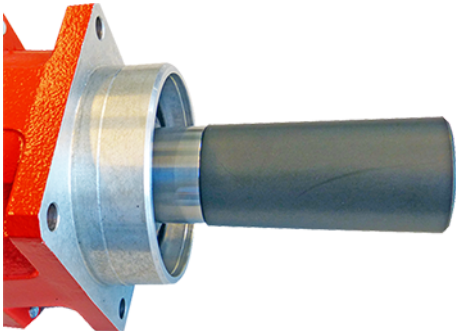
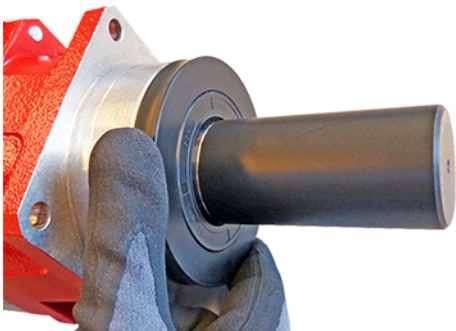
Step	Figure	Procedure
1	 <p style="text-align: right;">24417279499</p>	<ul style="list-style-type: none"> INFORMATION: Risk of crushing and pinching when inserting the adapter into the gearing. Wear gloves. Carefully insert the adapter into the gearing. Place the preassembled adapter ECH05 [200] onto the built-on housing. <p>INFORMATION: You can align the tooth flanks so that they mesh by carefully turning the sun gear and the planet gears.</p>

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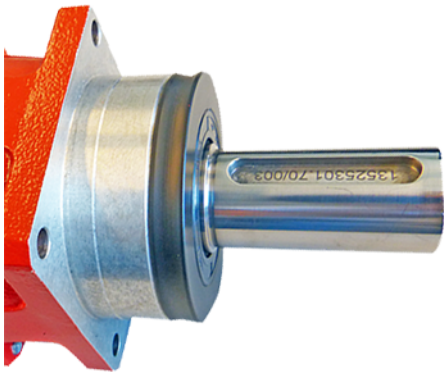

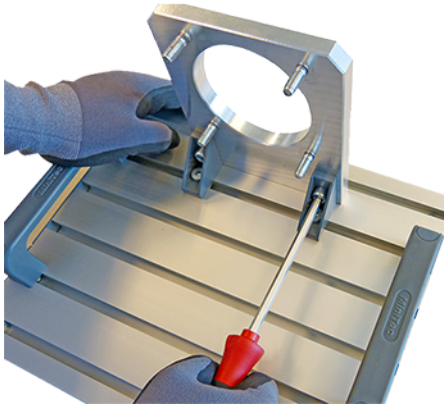
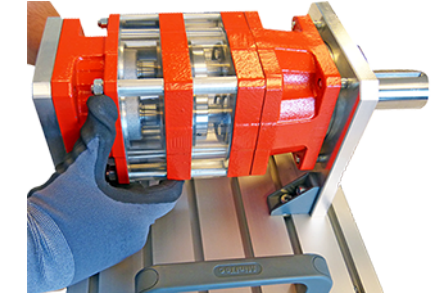
3

Assembly

Assembly of the 2-stage gear unit

Step	Figure	Procedure
2	 <p style="text-align: right;">24322124427</p>	<ul style="list-style-type: none"> Place the 4 tooth lock washers [471] on the threads of the studs. Fasten the adapter using the hex nuts [206].
3	 <p style="text-align: right;">24417281419</p>	<ul style="list-style-type: none"> Tighten the nuts in diametrically opposite sequence. <p>INFORMATION: Damage to the plexiglass parts due to excessive tightening of the nuts. Only fasten the nuts hand-tight.</p>
4	 <p style="text-align: right;">24322128267</p>	<ul style="list-style-type: none"> Take the gear unit off the assembly aid. Place the assembly sleeve onto the output shaft. The assembly sleeve protect the oil seal and facilitates installing the oil seal on the output shaft.
5	 <p style="text-align: right;">24322130187</p>	<ul style="list-style-type: none"> Install the closing cap [131] with the oil seal.

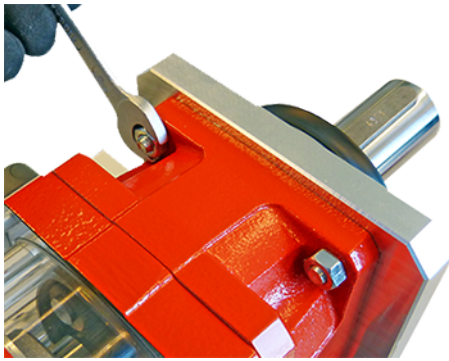
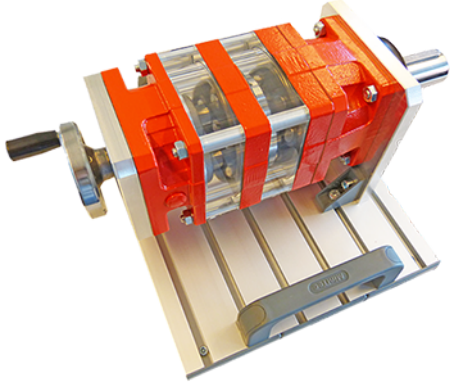
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Step	Figure	Procedure
6	 <p style="text-align: right;">24322132107</p>	<ul style="list-style-type: none"> Remove the assembly sleeve.
7	 <p style="text-align: right;">24322134027</p>	<ul style="list-style-type: none"> Insert the key A10 × 8 × 56 [8] into the keyway of the output shaft.
8	 <p style="text-align: right;">24322135947</p>	<ul style="list-style-type: none"> Attach the flange plate to the aluminum base plate. Screw the 2 plates together using the 2 brackets. Optionally, you can tighten the screws with a torque wrench. The M8 screws consist of corrosion-resistant steel with a strength class of 70. This results in a tightening torque of 19 Nm.
9	 <p style="text-align: right;">24417283339</p>	<ul style="list-style-type: none"> Guide the gear unit through the bore in the flange plate.

3

Assembly

Disassembling the gear unit

Step	Figure	Procedure
10	 24322139787	<ul style="list-style-type: none">• Fasten the gear unit to the studs of the flange plate using the nuts.• Place a washer [471] underneath each nut [206].• Tighten the nuts in diametrically opposite sequence until hand-tight.
11	 24417285259	<ul style="list-style-type: none">• Place the handwheel on the input shaft.• Turn the crank and check whether the output shaft turns.• The assembly of the 2-stage planetary gear unit is complete.

3.4 Disassembling the gear unit

The gear unit is disassembled in the reverse order of the assembly.

The magnet included in the delivery allows for easier removal and disassembly of shims, supporting rings and other small parts.

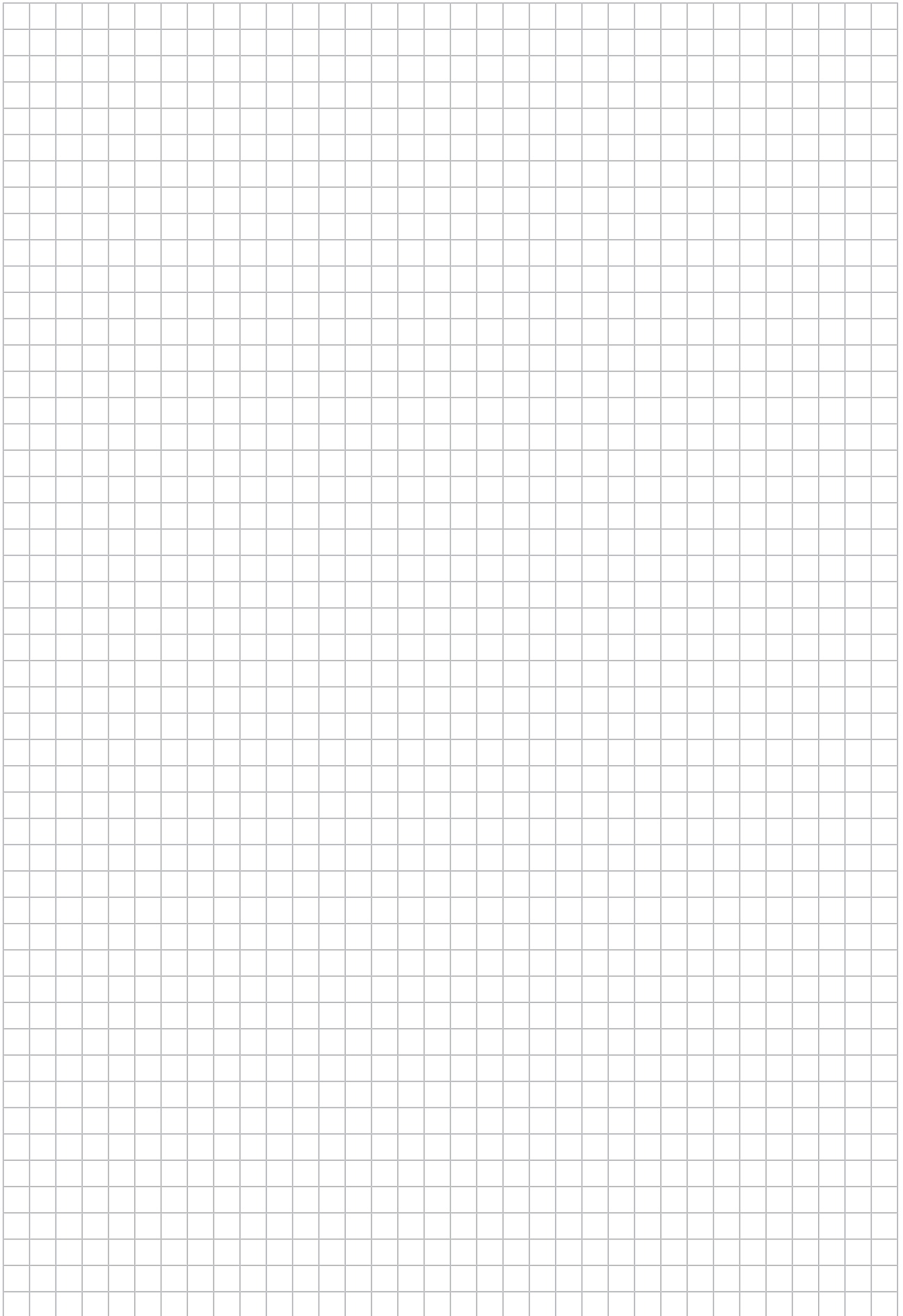
4 Spare part list

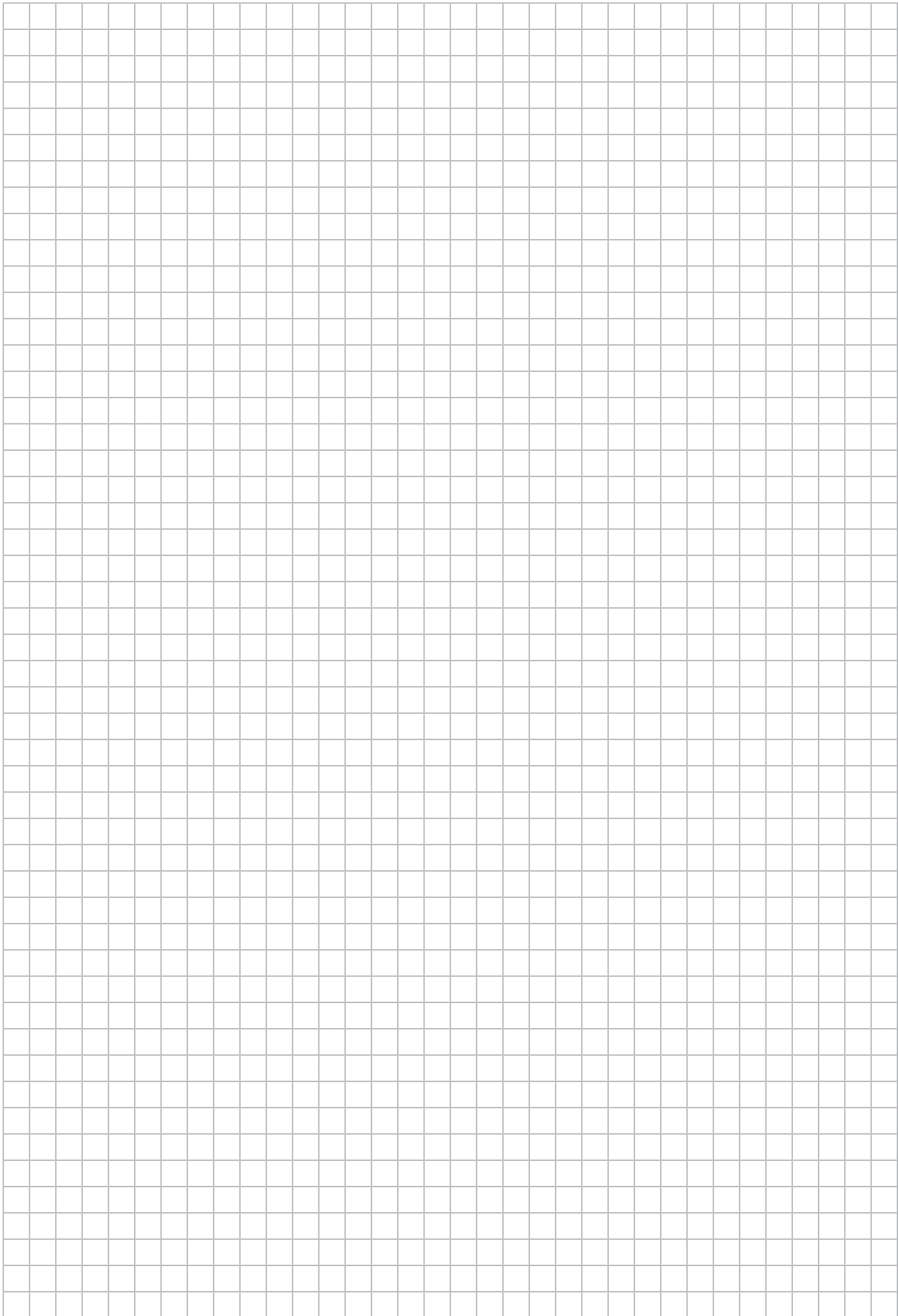
Designation	Item no.	Quantity	Part no.
2nd gear stage	[128]	1	10669566
Output flange (EN AC-AISI8Cu3)	[24]	1	10663991
Adapter shaft (complete)	[210]	1	13534610
Built-on housing (plexiglass)	[118], [218]	1	10664033
Thrust washer	[54], [105]	3	15852938
Adapter ECH05	[200]	1	10664181
Gear unit cover (complete)	[100]	1	13534602
Annulus gear (EN-GJS-600-3)	[59], [159]	1	10664041
Plastic ring (D89 × 10)	[131]	1	13534645
Assembly sleeve	–	1	13442643
Needle roller and cage assembly (DIN 5405 K10 × 14 × 10 – TN – WH)	[18], [112]	6	13256602
Key (DIN 6885-1 A5 × 5 × 12)	[280]	1	10669590
Key (DIN 6885-1 A10 × 8 × 56)	[8]	1	13228218
Planet gear	[17], [113]	3	10663983
Planetary gear axle	[16], [111]	3	10664017
Planet carrier/output shaft	[1]	1	13525301
Deep groove ball bearing	[12], [13]	1	10664068
Deep groove ball bearing	[211]	1	10669620
Hex nut (ISO 4032 M8-8)	[206]	4	00101990
Retaining ring (DIN 471 35 × 1.5 – FS)	[208]	1	00102806
Retaining ring (DIN 471 40 × 1.75 – FS)	[21]	1	00102830
Retaining ring (DIN 472 62 × 2 – FS)	[209]	1	00103217
Tooth lock washer (DIN 6798 – 8.4 – FS)	[471]	4	09439773
Stud (DIN 835 M8 × 75 – 8.8 – A2F for PSC521)	[204]	4	13259733
Stud (DIN 835 M8 × 125 – 8.8 – A2F for PSC522)	[204]	4	13259741
Oil seal	–	1	13534645
Cap screw (ISO 4762 A – M8 × 16 – 8.8 – A2F)	[101]	4	00123153

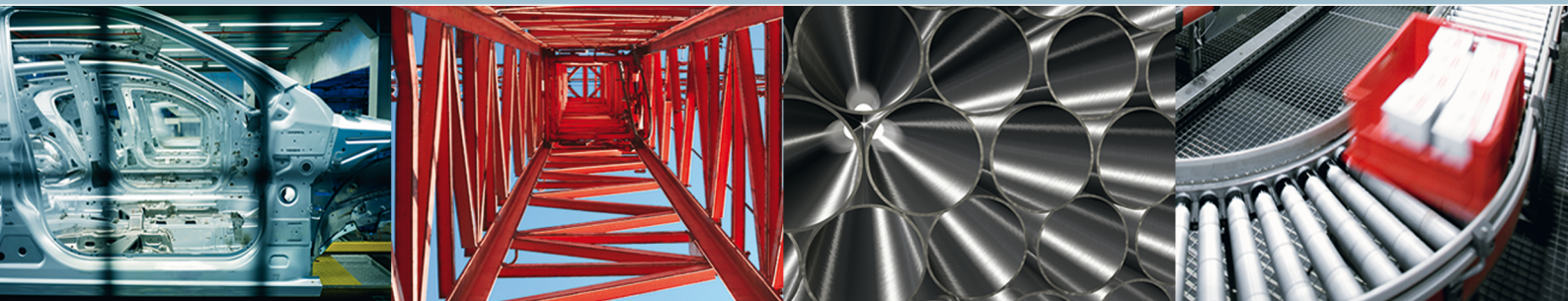
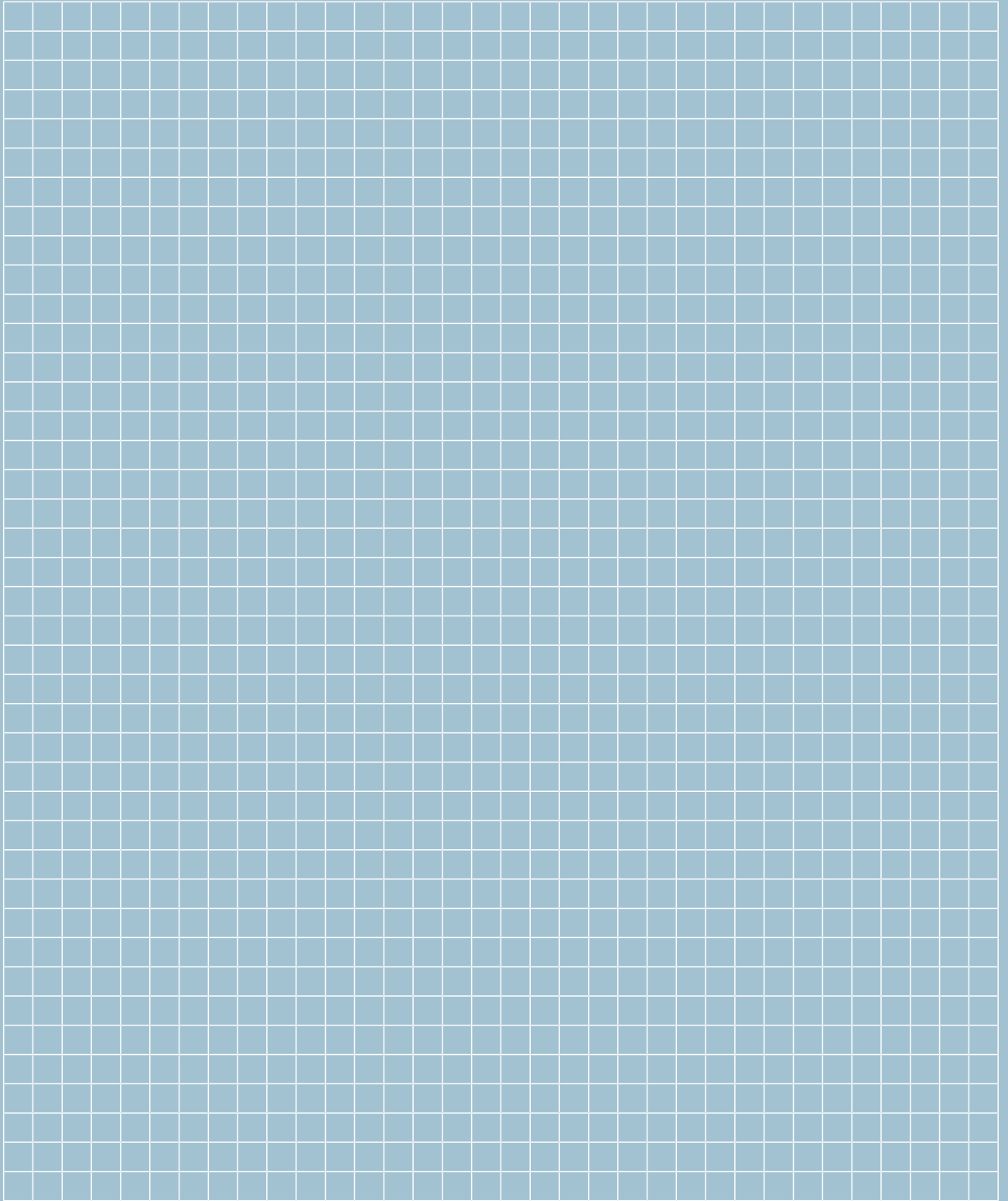
5 Contact persons

For more information about the didactics modules please contact:

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	76646 Bruchsal, Germany	http://www.sew-eurodrive.com
	GERMANY	









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