



Assembly Instructions



Didactics – Gear Unit Technology
Helical Gear Unit R57F AD2



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1 General information

1.1 How to use this documentation

The documentation is part of the product and contains important information for assembly. The documentation is for everyone who assembles this product.

The documentation must be accessible and legible. Make sure that persons who work independently on the unit, have read through the documentation carefully and understood it.

If you are unclear about any of the information in this documentation or require further information, please contact SEW-EURODRIVE.

1.2 General information

Never install or operate damaged products. In the event of damage, submit a complaint to the shipping company immediately.

Removing required covers without authorization, improper use or incorrect installation and operation may result in severe injury to persons, or damage to machinery. Refer to the documentation for additional information.

1.3 Designated use

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

1.4 Rights to claim under limited warranty

A requirement of fault-free operation and fulfillment of any rights to claim under limited warranty is that you adhere to the information in the documentation. Read the documentation before you start working with the unit.

1.5 Product names and trademarks

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

1.6 Copyright

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Unauthorized reproduction, modification, distribution or any other use of the whole or any part of this documentation is strictly prohibited.

2 Structure of the safety notes

2.1 Meaning of signal words

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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 drive system or its environment
INFORMATION	Useful information or tip: Simplifies handling of the drive system.	

2.2 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 hazard.

2.3 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:

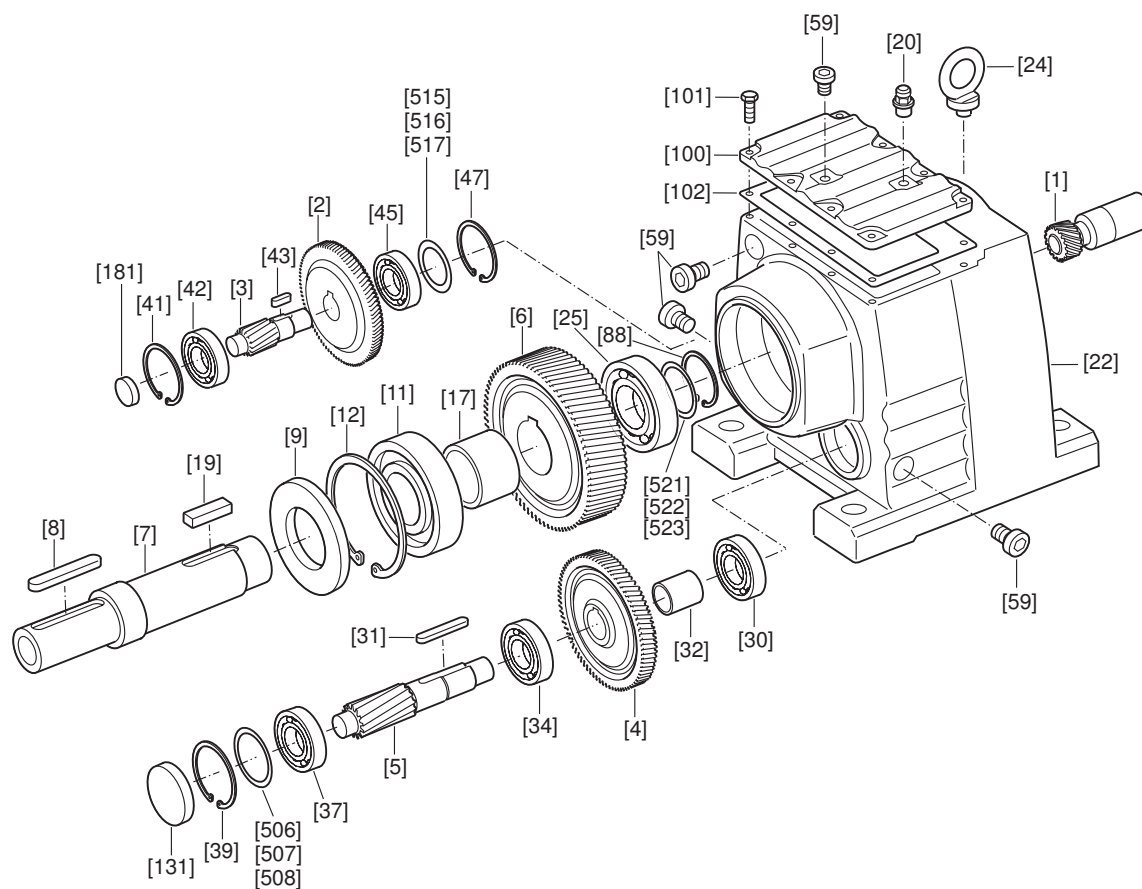
- **▲ SIGNAL WORD** Type and source of hazard.

Possible consequence(s) if disregarded.

- Measure(s) to prevent hazard.

3 Gear unit structure

3.1 Basic structure of helical gear units



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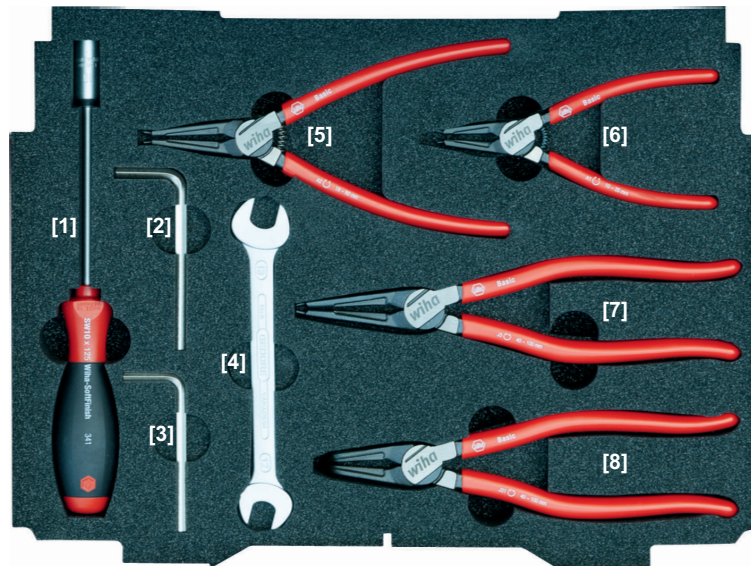
[1] Pinion	[19] Key	[42] Rolling bearing	[507] Shim
[2] Gear	[20] Breather valve	[43] Key	[508] Shim
[3] Pinion shaft	[22] Gear unit housing	[45] Rolling bearing	[515] Shim
[4] Gear	[24] Eyebolt	[47] Retaining ring	[516] Shim
[5] Pinion shaft	[25] Rolling bearing	[59] Screw plug	[517] Shim
[6] Gear	[30] Rolling bearing	[88] Retaining ring	[521] Shim
[7] Output shaft	[31] Key	[100] Inspection cover	[522] Shim
[8] Key	[32] Spacer tube	[101] Hex head screw	[523] Shim
[9] Oil seal	[34] Rolling bearing	[102] Gasket	
[11] Rolling bearing	[37] Rolling bearing	[131] Closing cap	
[12] Retaining ring	[39] Retaining ring	[181] Closing cap	
[17] Spacer tube	[41] Retaining ring	[506] Shim	

3.2 Training kit

3.2.1 Content of the parts case

Tools

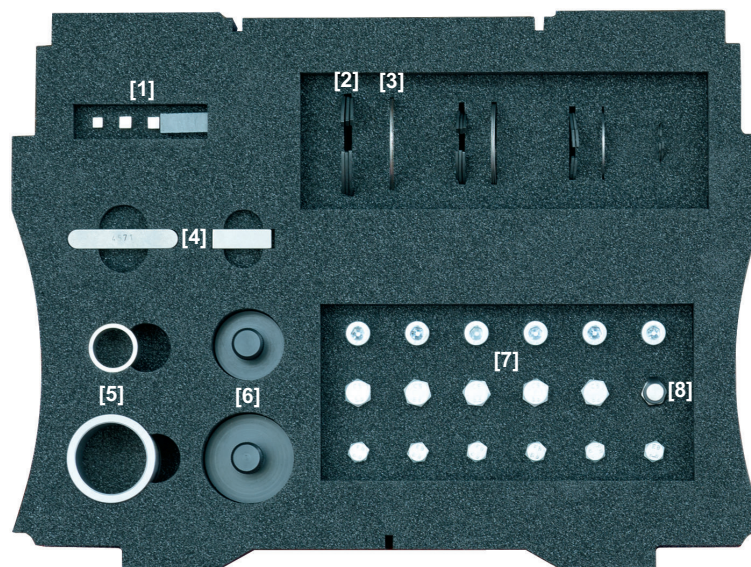
3



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- | | |
|---------------------|--------------------------------|
| [1] Socket wrenches | [5] Retaining ring pliers |
| [2] Allen wrench | [6] Retaining ring pliers |
| [3] Allen wrench | [7] Retaining ring pliers |
| [4] Open-end wrench | [8] Bent retaining ring pliers |

Small gear unit parts



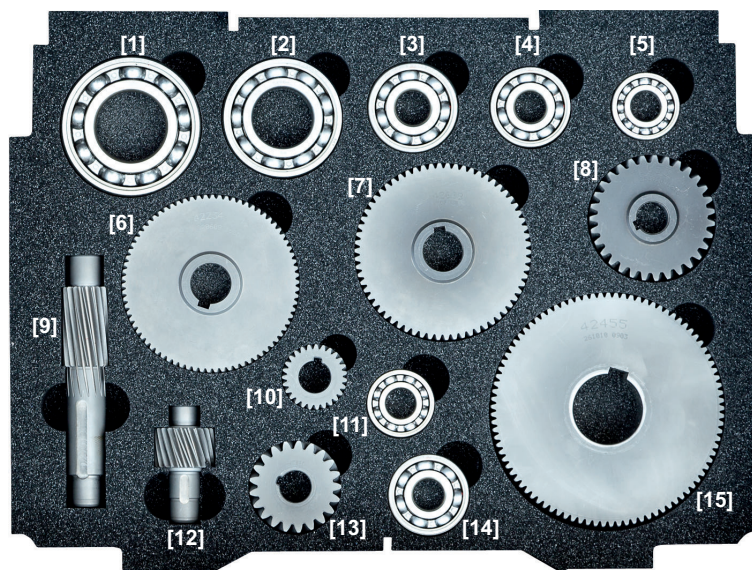
9007208017286155

- | | |
|---------------------|--------------------|
| [1] Keys | [5] Spacer tubes |
| [2] Retaining rings | [6] Closing caps |
| [3] Shims | [7] Bolts |
| [4] Keys | [8] Breather valve |

3 Gear unit structure

Training kit

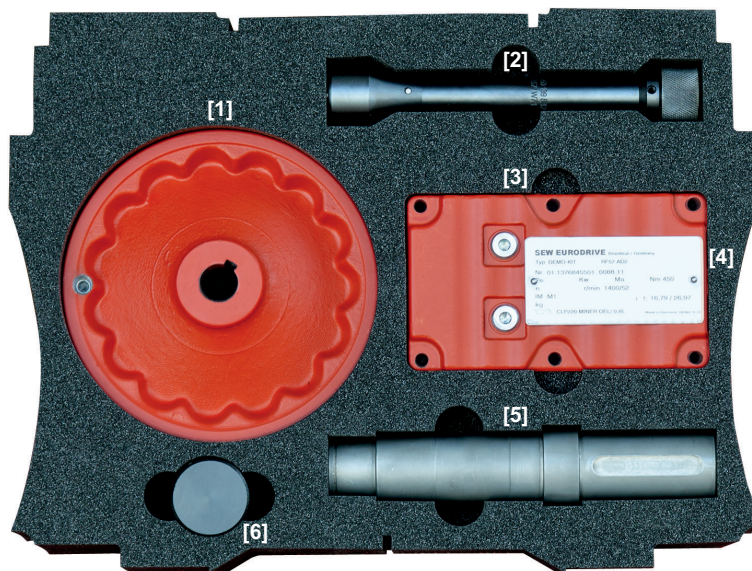
Gearing components, rolling bearings, shaft



- | | |
|--------------------------|---------------------------|
| [1] Rolling bearing 6207 | [9] Pinion shaft 42447 |
| [2] Rolling bearing 6206 | [10] Pinion 41343 |
| [3] Rolling bearing 6303 | [11] Rolling bearing 6202 |
| [4] Rolling bearing 6004 | [12] Pinion shaft 42658 |
| [5] Rolling bearing 6202 | [13] Pinion 41610 |
| [6] Gear 42668 | [14] Rolling bearing 6302 |
| [7] Gear 42234 | [15] Gear 42455 |
| [8] Gear 41653 | |

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Handwheel, cover, shaft

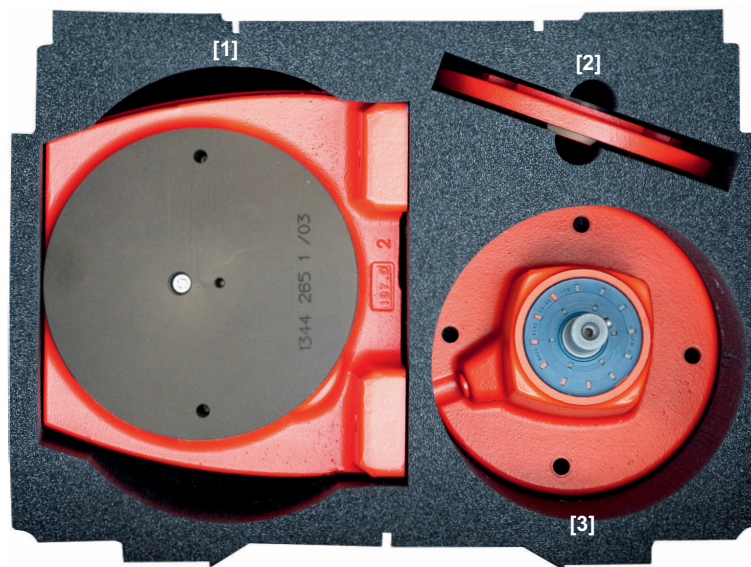


- | | |
|----------------------------------|---------------------|
| [1] Handwheel | [4] Nameplate |
| [2] Joining tool | [5] Output shaft |
| [3] Inspection cover with gasket | [6] Assembly sleeve |

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Housing, adapter, flange



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- [1] Gear unit housing
- [2] Output flange
- [3] Motor adapter AD2

INFORMATION



Spare parts for the training model cannot be ordered in the usual way from the SEW Service Competence Center.

For more information, refer to chapter "Contact details".

4 Assembly

4.1 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 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 assembly pad.




- Use the assembly pad during assembly and disassembly.




4.2 Assembling the 2-stage gear unit




Step	Illustration	Procedure
1	 <p>494975499</p>	<ul style="list-style-type: none"> Insert the rolling bearing (6302) on the input side of the gear unit housing.
2	 <p>494981771</p>	<ul style="list-style-type: none"> Prepare the pinion shaft (42447) with the rolling bearing (6004), spacer tube and key.
3	 <p>495169547</p>	<ul style="list-style-type: none"> Assemble the pinion shaft (42447) with the rolling bearing (6004), spacer tube and key as shown in the figure.

Step	Illustration	Procedure
4	 <p>496765963</p>	<ul style="list-style-type: none"> Insert the pre-assembled pinion shaft on the output side of the gear unit housing. Simultaneously insert the gear (42234) from the input side. <ul style="list-style-type: none"> Important: The part number on the front side of the gear must be legible from the input side.
5	 <p>496774155</p>	<ul style="list-style-type: none"> Insert the pre-assembled pinion shaft through the gear into the rolling bearing.
6	 <p>496974091</p>	<ul style="list-style-type: none"> Insert the assembly aid into the gear unit housing on the input side. Place the gear unit housing onto the assembly aid (with the output end pointing upwards).

Step	Illustration	Procedure
7	 <p>496979339</p>	<ul style="list-style-type: none"> Place the rolling bearing (6303) onto the pinion shaft.
8	 <p>497100811</p>	<ul style="list-style-type: none"> Use 37x14 shims for the rolling bearing (6303) so there is no clearance. <p>Zero clearance: Insert shims until the shaft can no longer be moved in axial direction.</p>

Step	Illustration	Procedure
9	 <p>497106571</p>	<ul style="list-style-type: none"> Insert the retaining ring.
10	 <p>497137419</p>	<ul style="list-style-type: none"> Insert the rolling bearing (6206) into the middle wall of the gear unit housing.
11	 <p>497143435</p>	<ul style="list-style-type: none"> Insert the gear (42455) into the middle wall. Place the gear with the round chamfer on the bore pointing upwards (output side direction). <p>Important: If the input shaft is installed, the round shaft shoulder must be in contact with the round chamfer of the gear wheel.</p>


Step	Illustration	Procedure
12	 <p>497161483</p>	<ul style="list-style-type: none"> Prepare the output shaft with the rolling bearing (6207), spacer tube and key.
13	 <p>497167371</p>	<ul style="list-style-type: none"> Assemble the output shaft with the rolling bearing (6207), spacer tube and key as shown in the figure.
14	 <p>497173131</p>	<ul style="list-style-type: none"> Insert the pre-assembled output shaft into the gear unit housing through the gear and rolling bearing.

Step	Illustration	Procedure
15	 <p>497208459</p>	<ul style="list-style-type: none"> Insert both closing caps into the gear unit housing.
16	 <p>497918475</p>	<ul style="list-style-type: none"> Before mounting the flange, inspect whether the O-ring is fitted. Place the assembly sleeve onto the shaft. Mount the flange to fit the bore pattern.
17	 <p>497926411</p>	<ul style="list-style-type: none"> Tighten the retaining screws and remove the assembly sleeve.




Step	Illustration	Procedure
18	 <p>498047115</p>	<ul style="list-style-type: none"> • Insert the key. • Remove the assembly aid. • Push the input shaft in the direction of the flange and hold it down on the rolling bearing (6206) until the shaft sits on the stop.
19	 <p>498052107</p>	<ul style="list-style-type: none"> • Use 30x42 shims for the shaft so there is no clearance.
20	 <p>498058251</p>	<ul style="list-style-type: none"> • Insert the retaining ring.
21	 <p>498063755</p>	<ul style="list-style-type: none"> • Check that the rubber gasket is seated properly on the inspection cover.

4 Assembly

Assembling the 2-stage gear unit

Step	Illustration	Procedure
22	 <p>498096907</p>	<ul style="list-style-type: none"> Place the inspection cover on the gear unit housing and tighten the bolts by hand. Tighten the inspection cover bolts with the socket wrench, from the inside to the outside.
23	 <p>498102411</p>	<p>Screw in the breather valve at the correct position based on the mounting position.</p>

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Step	Illustration	Procedure
24	 <p style="text-align: right;">498107403</p>	<ul style="list-style-type: none"> Prepare the input side. Important: The round chamfer on the bore of the pinion must lie in the direction of the shaft shoulder.
25	 <p style="text-align: right;">498390539</p>	<ul style="list-style-type: none"> Mount the pinion (41343) onto the shaft.
26	 <p style="text-align: right;">498396299</p>	<ul style="list-style-type: none"> Fit the retaining ring using the pliers.

4





Assembly

Assembling the 2-stage gear unit

Step	Illustration	Procedure
27	 <p>498750219</p>	<ul style="list-style-type: none"> Mount the input flange as shown in the figure. Tilt the flange into the gear unit housing in such a way that the gears fit into one another and the flange is flush with the gear unit housing.
28	 <p>498756491</p>	<ul style="list-style-type: none"> Tighten the bolts of the flange in a diametrically opposite sequence.
29	 <p>498863755</p>	<ul style="list-style-type: none"> Connect the handwheel. Turn the crank and inspect whether the output shaft turns.
30		<ul style="list-style-type: none"> Assembly of the 2-stage helical gear unit training model is now complete.

4.3 Assembling the 3-stage gear unit



Step	Illustration	Procedure
1	 <p style="text-align: right;">494975499</p>	<ul style="list-style-type: none"> Insert the rolling bearing (6302) on the input side of the gear unit housing.
2		<ul style="list-style-type: none"> Prepare the pinion shaft (42447) with the rolling bearing (6004), gear (42668), spacer tube and key.
3	 <p style="text-align: right;">499381259</p>	<ul style="list-style-type: none"> Assemble the pinion shaft (42447) with the rolling bearing (6004), spacer tube and key as shown in the figure.
4	 <p style="text-align: right;">499403275</p>	<ul style="list-style-type: none"> Insert the pre-assembled pinion shaft on the output side of the gear unit housing. Simultaneously insert the gear (42668) from the input side. <ul style="list-style-type: none"> Important: The part number on the front side of the gear must be legible from the input side.



Step	Illustration	Procedure
5	 <p>499427595</p>	<ul style="list-style-type: none"> Insert the pre-assembled pinion shaft through the gear and the spacer tube into the rolling bearing.
6	 <p>499443595</p>	<p>The figure shows the assembled pinion shaft with the gear and spacer tube.</p> <p>In comparison to the 2-stage model, the gear and the spacer tube have swapped positions.</p>
7	 <p>499511563</p>	<ul style="list-style-type: none"> Insert the retaining ring.
8	 <p>499505675</p>	<ul style="list-style-type: none"> Insert the rolling bearing (6202) into the gear unit housing on the input side.

Step	Illustration	Procedure
9	 <p style="text-align: right;">499915147</p>	<ul style="list-style-type: none"> Fit the pinion shaft (42658) with the key, as shown in the figure.
10	 <p style="text-align: right;">499921419</p>	<ul style="list-style-type: none"> Insert the pre-assembled pinion shaft into the jointing tool and clamp the shaft tight into it.
11	 <p style="text-align: right;">500067723</p>	<ul style="list-style-type: none"> Insert the pinion shaft, which is clamped into the jointing tool, on the output side of the gear unit housing. Simultaneously insert the gear (41653) from the input side. <ul style="list-style-type: none"> Important: The part number on the front side of the gear must be legible from the input side.
12	 <p style="text-align: right;">500073995</p>	<ul style="list-style-type: none"> Hold the gear and the pinion shaft firmly and loosen the grip of the jointing tool. Carefully remove the jointing tool from the gear unit housing.

4 Assembly




Assembling the 3-stage gear unit

Step	Illustration	Procedure
13	 <p>500412555</p>	<ul style="list-style-type: none"> Insert the assembly aid into the gear unit housing on the input side. Place the gear unit housing onto the assembly aid (with the output end pointing upwards).
14	 <p>496979339</p>	<ul style="list-style-type: none"> Place the rolling bearing (6303) onto the pinion shaft.





Step	Illustration	Procedure
15	 <p>497100811</p>	<ul style="list-style-type: none"> Use 37x14 shims for the rolling bearing (6303) so there is no clearance. <p>Zero clearance: Insert shims until the shaft can no longer be moved in axial direction.</p>
16	 <p>497106571</p>	<ul style="list-style-type: none"> Insert the retaining ring.




4 Assembly

Assembling the 3-stage gear unit

Step	Illustration	Procedure
17	 <p>504026379</p>	<ul style="list-style-type: none"> Insert the rolling bearing (6202) into the middle wall of the gear unit housing.
18	 <p>504574859</p>	<ul style="list-style-type: none"> Fit the retaining ring using the bent pliers.
19	 <p>497137419</p>	<ul style="list-style-type: none"> Insert the rolling bearing (6206) into the middle wall of the gear unit housing.




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Step	Illustration	Procedure
20	 <p>497143435</p>	<ul style="list-style-type: none"> Insert the gear (42455) into the middle wall. Place the gear with the round chamfer on the bore pointing upwards (output side direction). <p>Important: If the input shaft is installed, the round shaft shoulder must be in contact with the round chamfer of the gear wheel.</p>
21		<ul style="list-style-type: none"> Prepare the output shaft with the rolling bearing (6207), spacer tube and key.
22		<ul style="list-style-type: none"> Assemble the output shaft with the rolling bearing (6207), spacer tube and key as shown in the figure.
23	 <p>505697419</p>	<ul style="list-style-type: none"> Insert the pre-assembled output shaft into the gear unit housing through the gear and rolling bearing.

Step	Illustration	Procedure
24	 <p>497208459</p>	<ul style="list-style-type: none"> Insert both closing caps into the gear unit housing.
25	 <p>497918475</p>	<ul style="list-style-type: none"> Before mounting the flange, inspect whether the O-ring is fitted. Place the assembly sleeve onto the shaft. Mount the flange to fit the bore pattern.
26	 <p>497926411</p>	<ul style="list-style-type: none"> Tighten the retaining screws and remove the assembly sleeve.

Step	Illustration	Procedure
27	 <p>498047115</p>	<ul style="list-style-type: none"> • Insert the key. • Remove the assembly aid. • Push the input shaft in the direction of the flange and hold it down on the rolling bearing (6206) until the shaft sits on the stop.
28	 <p>498052107</p>	<ul style="list-style-type: none"> • Use 30x42 shims for the shaft so there is no clearance.
29	 <p>498058251</p>	<ul style="list-style-type: none"> • Insert the retaining ring.
30	 <p>498063755</p>	<ul style="list-style-type: none"> • Check that the rubber gasket is seated properly on the inspection cover.

Step	Illustration	Procedure
31	 <p>498096907</p>	<ul style="list-style-type: none"> Place the inspection cover on the gear unit housing and tighten the bolts by hand. Tighten the inspection cover bolts with the socket wrench, from the inside to the outside.
32	 <p>498102411</p>	<ul style="list-style-type: none"> Screw in the breather valve at the correct position based on the mounting position.

Step	Illustration	Procedure
33	 <p style="text-align: right;">498107403</p>	<ul style="list-style-type: none"> Prepare the input side. Important: The round chamfer on the bore of the pinion must lie in the direction of the shaft shoulder.
34	 <p style="text-align: right;">498390539</p>	<ul style="list-style-type: none"> Mount the pinion (41610) onto the shaft.
35	 <p style="text-align: right;">498396299</p>	<ul style="list-style-type: none"> Fit the retaining ring using the pliers.

4 Assembly

Dismantling the gear unit

Step	Illustration	Procedure
36	 <p>498750219</p>	<ul style="list-style-type: none"> Mount the input flange as shown in the figure. Tilt the flange into the gear unit housing in such a way that the gears fit into one another and the flange is flush with the gear unit housing.
37	 <p>498756491</p>	<ul style="list-style-type: none"> Tighten the bolts of the flange in a diametrically opposite sequence.
38	 <p>498863755</p>	<ul style="list-style-type: none"> Connect the handwheel. Turn the crank and inspect whether the output shaft turns.
39		<ul style="list-style-type: none"> Assembly of the 3-stage helical gear unit training model is now complete.

4.4 Dismantling the gear unit

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

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5 Contact

For information on the helical gear unit training model or for ordering of spare parts, please contact:

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Didactics

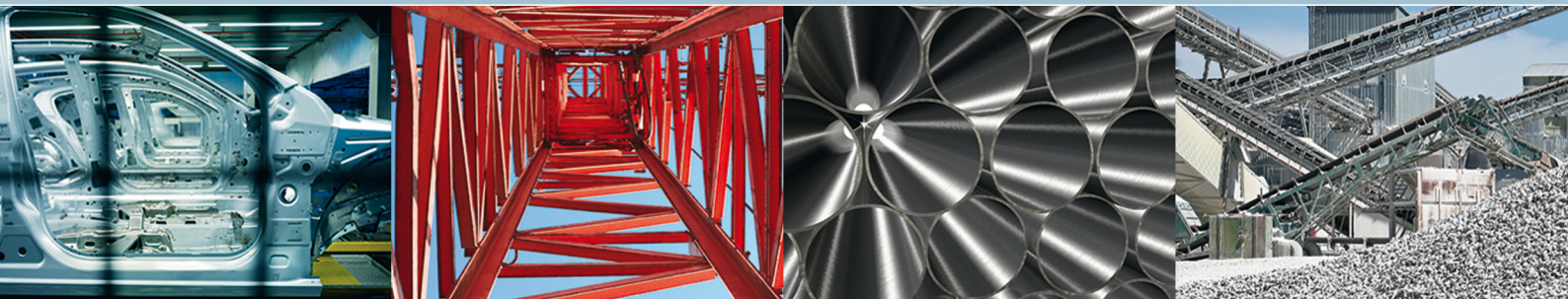
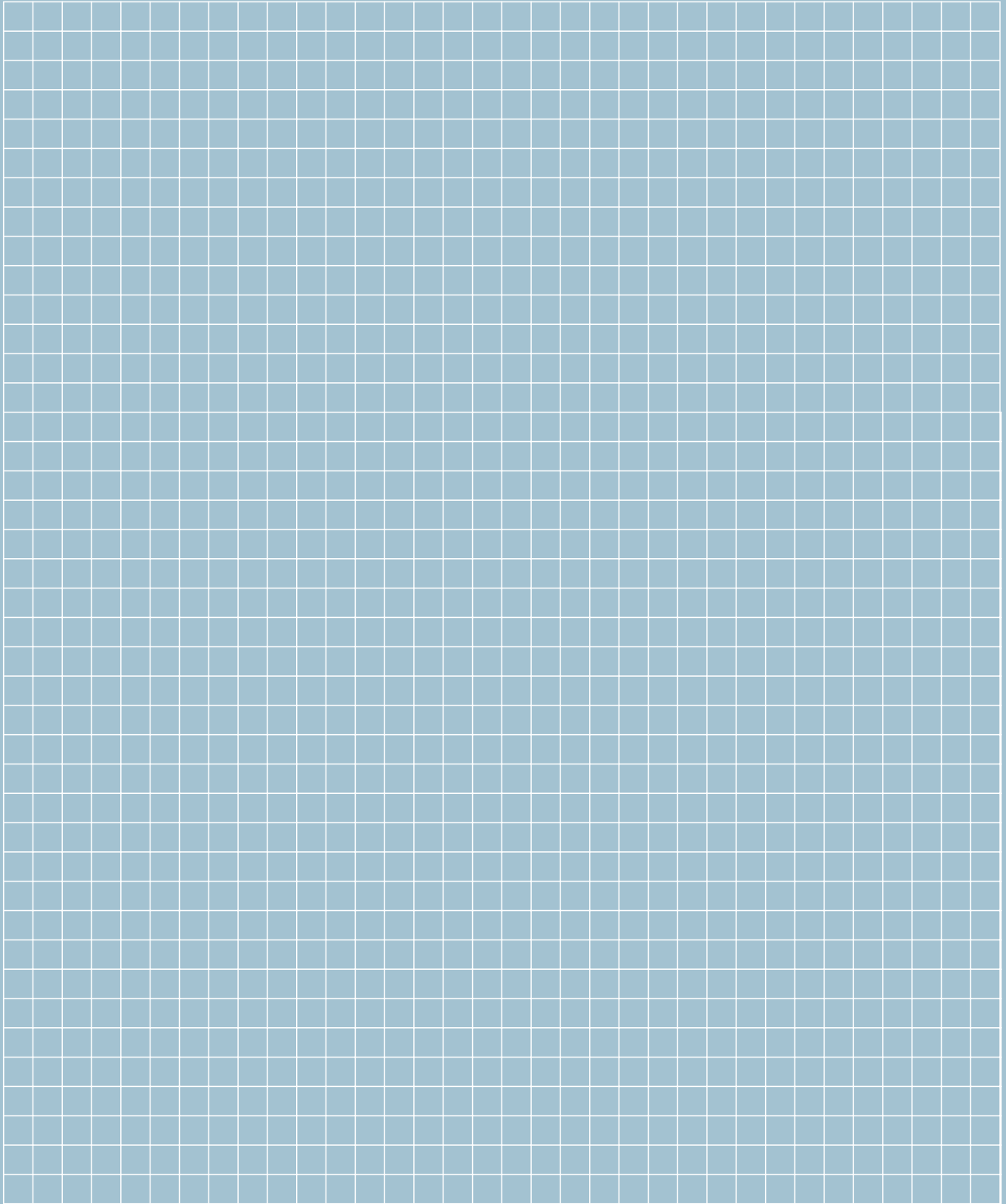
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