

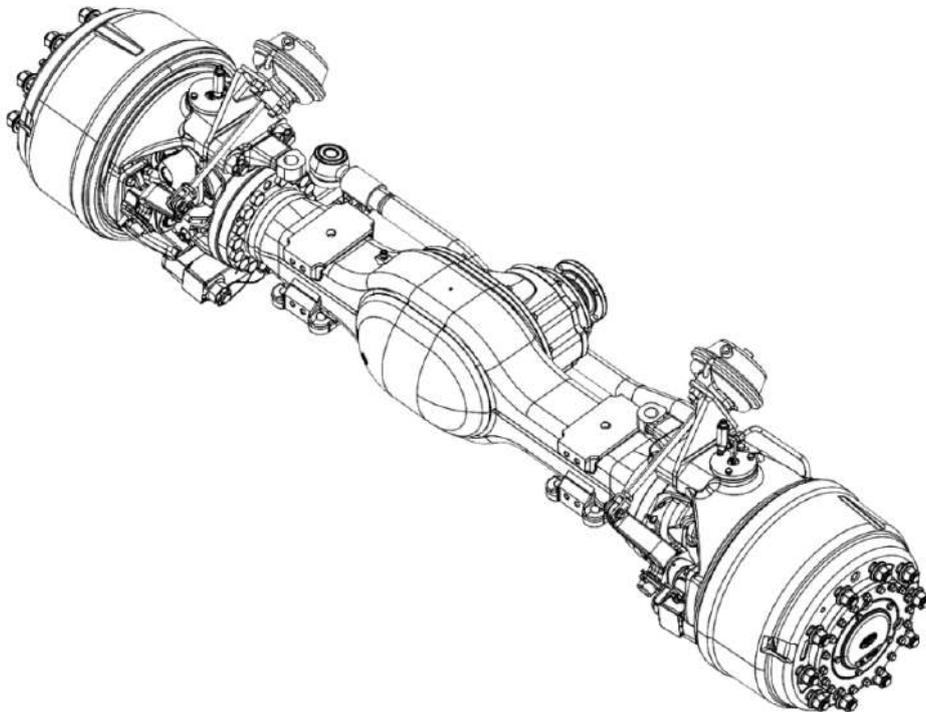


We engineer, you drive

SERVICE DOCUMENTATION

883.39

DRIVEN FRONT AXLE



883_A_SZD_EN_2014_10

RABA AXLE Ltd.
H-9002 GYOR P.O.B.:141

TEL: 36/96/624-900 36/96/624-654

FAX: 36/96/624-900

E-MAIL: futomu@raba.hu

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1 General Information

The service documentation contains the following chapters

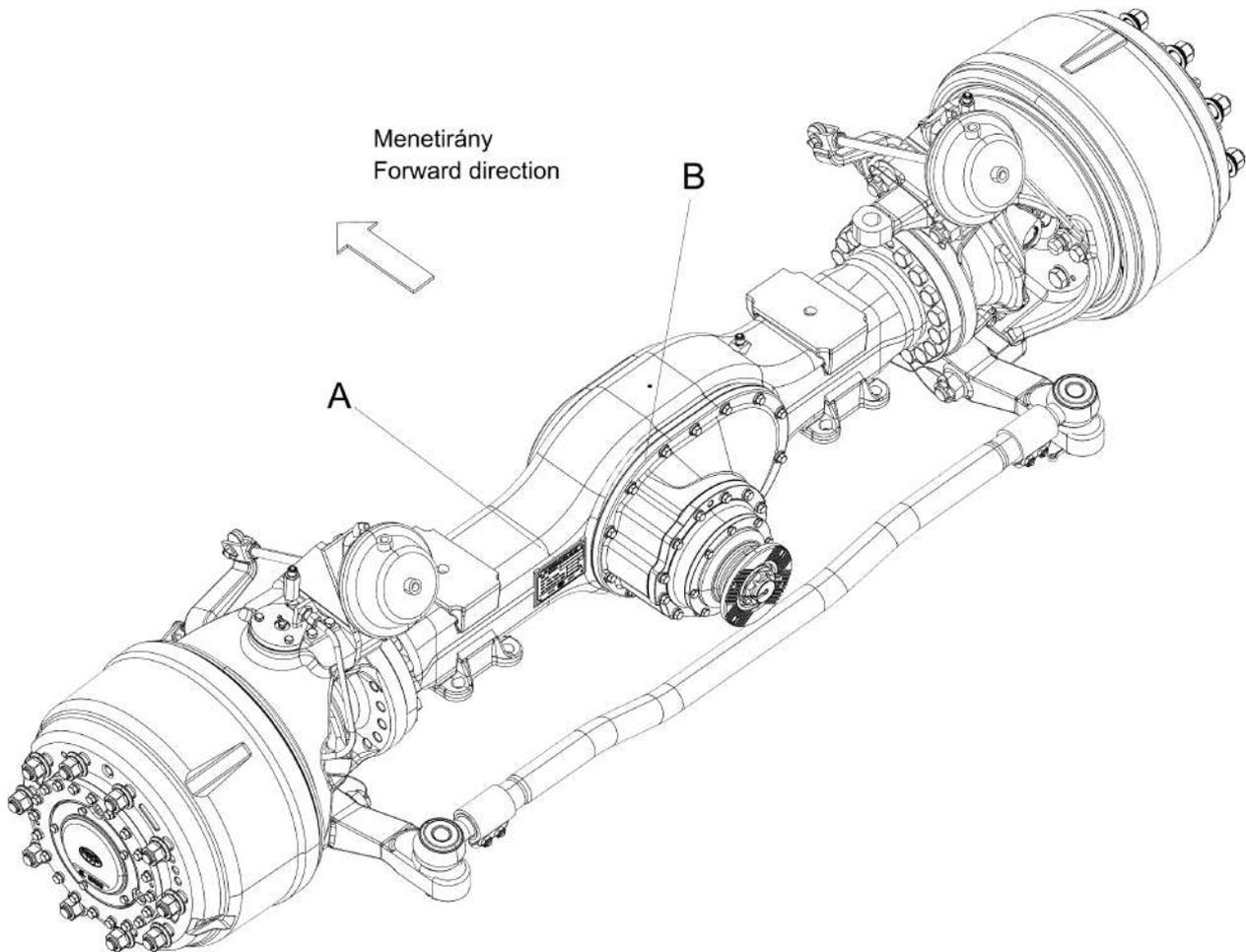
- Parts catalog
- Technical data
- Operating and maintenance instructions
- Workshop manual

If the order is placed on axles with brakes, then this service documentation is supplemented with the description of the specific brakes.

RIGHTS FOR ALTERATIONS RESERVED!

We hope our product will be to your full satisfaction!

1.1 Identification of the axle



A—Axle identification plate on the axle housing

Type version number of the axle:	883.39
Serial number /Production year - month :	0099/14–09
Total ratio of the axle:	5,02
Drive pinion and drive gear pair ratio:	33 / 26
Max. permitted axle load:	10000 kg

B— Differential carrier head assy. identification designation on the differential carrier housing:

Type version number of the differential carrier head assy:	883.39
Serial No. of the differential carrier head assy. / year - month:	0099/14–09

2 Parts catalog

The parts catalog contains the data necessary for ordering spare parts.

In the catalog the main units of the axle are shown in exploded views.

Item numbering starts with 1 in case of each main unit.

The items, which are not shown on the figure are indicated with the sign"-", in the column of item numbering of the tables.

There are some specific parts, which cannot be ordered separately, only as a part of the assembly unit.

Orders can only be placed on parts that have stock and part numbers.

IN THE ORDERS YOU PLACE ON THE SPARE PARTS, PLEASE LET US KNOW THE FOLLOWING:

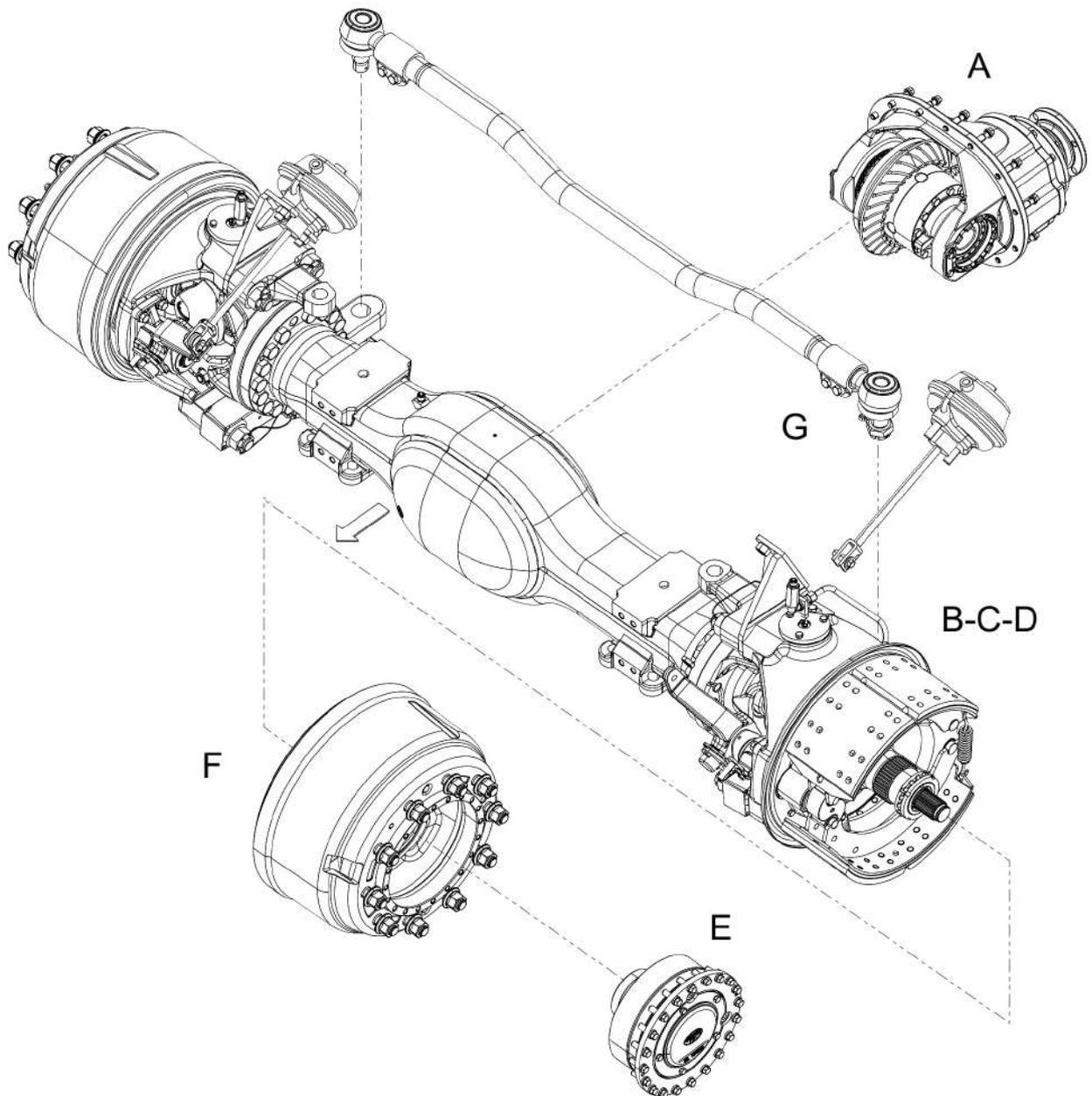
- Type of the axle
- Part number and stock number indicated underneath
- Designation
- Quantity required
- Production serial number of the axle /year-month

If the order is placed on axles with brakes, then this service documentation is supplemented with the description of the specific brakes.

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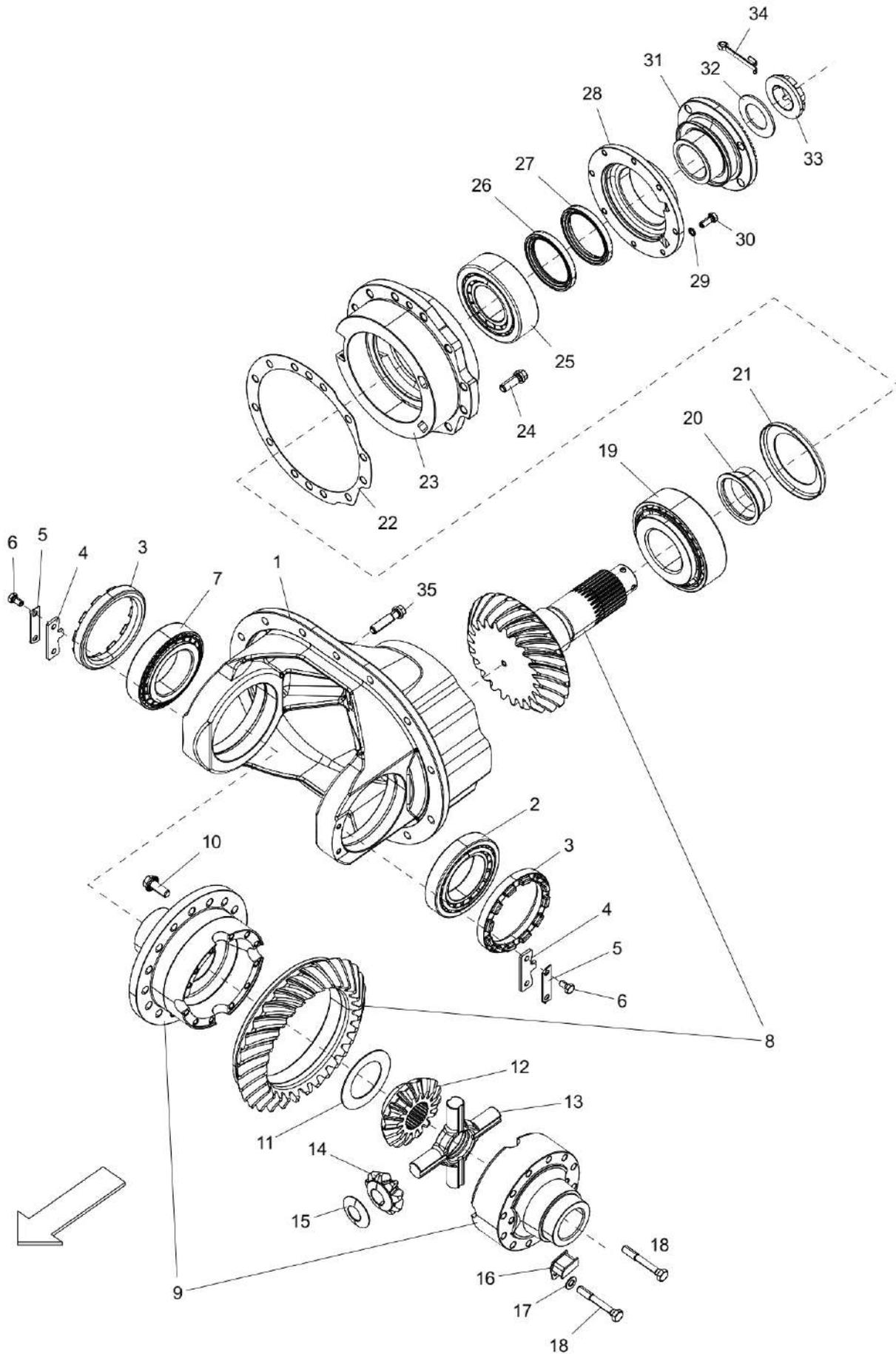
We hope our product will be to your full satisfaction!

2.1 Main units of the axle



ITEM NO.	DRAWING NUMBER PART NUMBER	DESIGNATION	QTY	NOTE
-	883.39-3100-000 169873	Driven front axle	1	
-	883.39-3111-000 169916	Differential carrier head assembly	1	

2.1.1 Detail A — Differential and differential carrier housing



ITEM NO.	DRAWING NUMBER PART NUMBER	DESIGNATION	QTY	NOTE
1	833.52-3311-012 388617	Differential carrier housing assembly	1	
2	MGM 30215 A 827782	Tapered roller bearing	1	ø75/130x27,25
3	833.02-3311-122 380702	Bearing adjuster	2	
4	023.00-3311-123 933961	Adjuster lock plate	2	According to the groove position of the bearing adjuster
-	023.00-3311-125 933717	Adjuster lock plate	X	According to the groove position of the bearing adjuster
-	023.00-3311-126 933718	Adjuster lock plate	X	According to the groove position of the bearing adjuster
5	023.00-3311-124 933962	Lock plate	2	
6	ISO 4017-M8x16-10.9 910182	Hex. bolt	4	
7	MGM 32215 A 604079	Tapered roller bearing	1	ø75/130x33,25
8	883.39-3197-020RN 169923	Meshed pinion and ring gear	1	z = 33 /26 Items 10, 32, 33, 34 included
9	883.39-3197-000 173053	Differential case halves, assembly	1	Items 11,12, 13, 14, 15, 16,17,18 included
10	833.02-3311-080	Self-lock flanged bolt	16	See the item 8
11	833.02-3311-112	Thrust washer diff. side gear	2	See the item 9
12	006.10-3111-111	Differential side gear	2	See the item 9
13	833.02-3311-101	Differential spider	1	See the item 9
14	006.10-3111-104	Differential side pinion	4	See the item 9
15	833.02-3311-107	Thrust washer diff. side pinion	4	See the item 9
16	842.02-3311-131	Oil baffle plate	2	See the item 9

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ITEM NO.	DRAWING NUMBER PART NUMBER	DESIGNATION	QTY	NOTE
17	833.02-3311-139	Washer	2	See the item 9
18	MVGSZ 599-M10x1.25x75-10.9-B	Hex. bolt	12	See the item 9
19	MGM 32314 B X7JU 604127	Tapered roller bearing	1	Ø70/150x54
20	118.24-3311-034 523624	Pinion bearing spacer (as needed)	X	34,225 mm
-	118.24-3311-035 523625	Pinion bearing spacer (as needed)	X	34,200 mm
-	118.24-3311-036 523626	Pinion bearing spacer (as needed)	X	34,175 mm
-	118.24-3311-037 523627	Pinion bearing spacer (as needed)	X	34,150 mm
-	118.24-3311-038 523628	Pinion bearing spacer (as needed)	X	34,125 mm
-	118.24-3311-039 523629	Pinion bearing spacer (as needed)	X	34,100 mm
-	118.24-3311-041 523630	Pinion bearing spacer (as needed)	X	34,075 mm
-	118.24-3311-042 523631	Pinion bearing spacer (as needed)	X	34,050 mm
-	118.24-3311-043 523632	Pinion bearing spacer (as needed)	X	34,025 mm
-	118.24-3311-044 523633	Pinion bearing spacer (as needed)	X	34,000 mm
-	118.24-3311-045 523634	Pinion bearing spacer (as needed)	X	33,975 mm
-	118.24-3311-046 523635	Pinion bearing spacer (as needed)	X	33,950 mm
-	118.24-3311-047 523636	Pinion bearing spacer (as needed)	X	33,925 mm
-	118.24-3311-048 523637	Pinion bearing spacer (as needed)	X	33,900 mm
-	118.24-3311-049 523638	Pinion bearing spacer (as needed)	X	33,875 mm

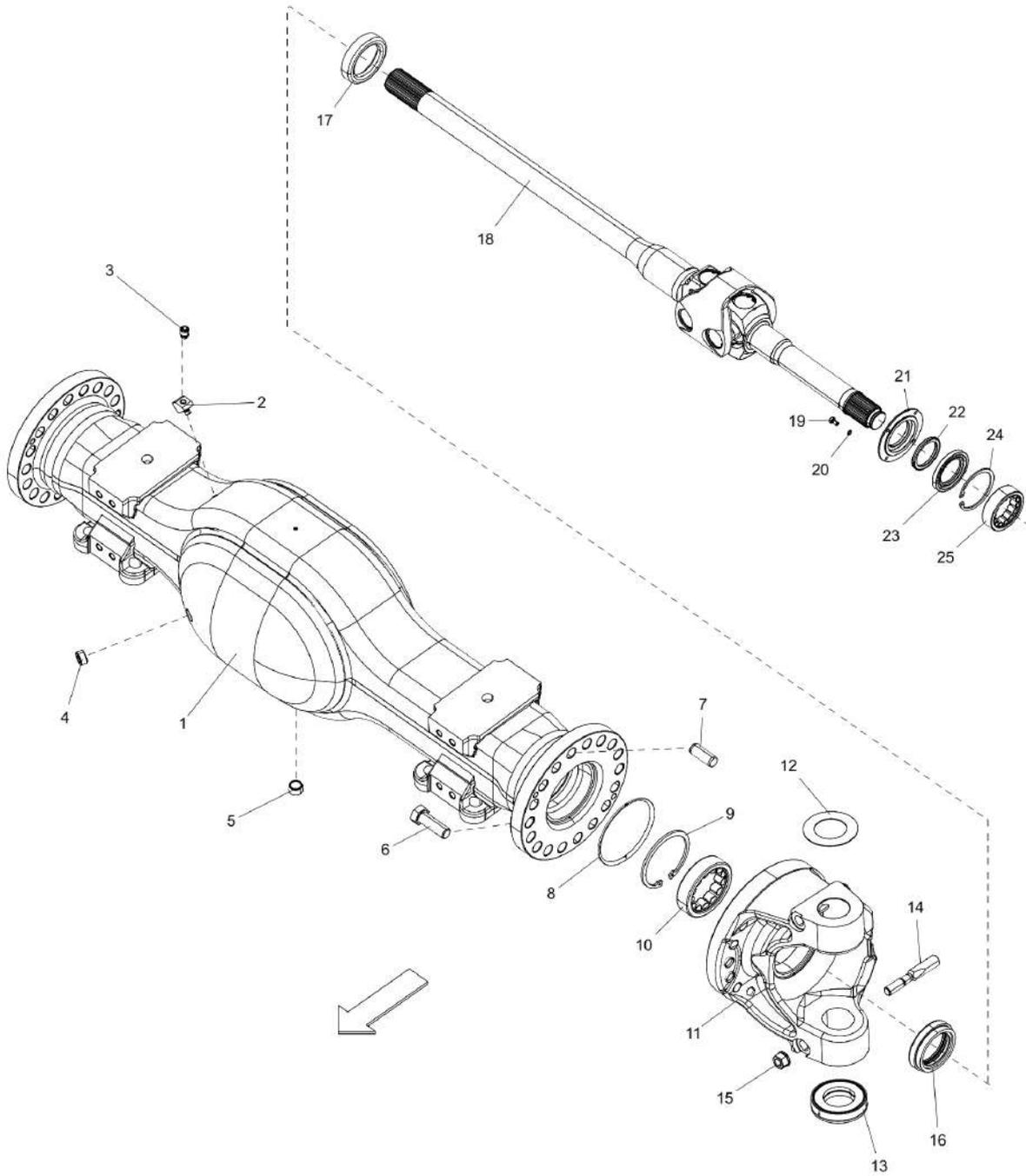
ITEM NO.	DRAWING NUMBER PART NUMBER	DESIGNATION	QTY	NOTE
-	118.24-3311-160 523639	Pinion bearing spacer (as needed)	X	33,850 mm
-	118.24-3311-161 523640	Pinion bearing spacer (as needed)	X	33,825 mm
-	118.24-3311-162 523641	Pinion bearing spacer (as needed)	X	33,800 mm
-	118.24-3311-163 523642	Pinion bearing spacer (as needed)	X	33,775 mm
-	118.24-3311-164 523643	Pinion bearing spacer (as needed)	X	33,750 mm
-	118.24-3311-165 523644	Pinion bearing spacer (as needed)	X	33,725 mm
-	118.24-3311-166 523645	Pinion bearing spacer (as needed)	X	33,700 mm
-	118.24-3311-167 523646	Pinion bearing spacer (as needed)	X	33,675 mm
-	118.24-3311-168 523647	Pinion bearing spacer (as needed)	X	33,650 mm
-	118.24-3311-170 523648	Pinion bearing spacer (as needed)	X	33,625 mm
-	118.24-3311-171 523649	Pinion bearing spacer (as needed)	X	33,600 mm
-	118.24-3311-172 523650	Pinion bearing spacer (as needed)	X	33,575 mm
-	118.24-3311-173 523651	Pinion bearing spacer (as needed)	X	33,550 mm
-	118.24-3311-174 523652	Pinion bearing spacer (as needed)	X	33,525 mm
-	118.24-3311-175 523653	Pinion bearing spacer (as needed)	X	33,500 mm
-	118.24-3311-176 523654	Pinion bearing spacer (as needed)	X	33,475 mm
-	118.24-3311-177 523655	Pinion bearing spacer (as needed)	X	33,450 mm
-	118.24-3311-178 523656	Pinion bearing spacer (as needed)	X	33,425 mm

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ITEM NO.	DRAWING NUMBER PART NUMBER	DESIGNATION	QTY	NOTE
-	118.24-3311-179 523657	Pinion bearing spacer (as needed)	X	33,400 mm
21	581.00-3311-022	Oil baffle plate	1	See the item 23
22	833.02-3311-053 380277	Shim (as needed)	X	1 mm
-	833.02-3311-054 380278	Shim (as needed)	X	0,5 mm
-	833.02-3311-055 380279	Shim (as needed)	X	0,3 mm
-	833.02-3311-056 380280	Shim (as needed)	X	0,25 mm
-	833.02-3311-057 380281	Shim (as needed)	X	0,2 mm
23	833.02-3311-020 380275	Bearing sleeve, assembly	1	Item 21 included
24	581.00-3340-009 983462	Flanged bolt	12	
25	MGM 32312 B X7JU 604126	Tapered roller bearing	1	Ø60/130x48,5
26	SIMMERWERKE AS-75x95x10 NB PA200 318117	Oil seal	1	
27	SIMMERWERKE A-75x95x10 NB PA200 604117	Oil seal	1	
28	833.02-3311-061 380282	Cap	1	
29	MSZ 1612-8K2 070232	Flat lock washer	8	
30	ISO 4017 M8x22-10.9 910185	Hex. bolt	8	
31	008.40-3111-071 575682	Companion flange	1	
32	007.10-3311-067	Washer	1	See the item 8
33	018.01-3311-068	Flange castle nut	1	See the item 8

ITEM NO.	DRAWING NUMBER PART NUMBER	DESIGNATION	QTY	NOTE
34	MSZ 2224-6,3x63	Cotter pin	1	See the item 8
35	581.00.3340-009 983462	Flanged bolt	14	

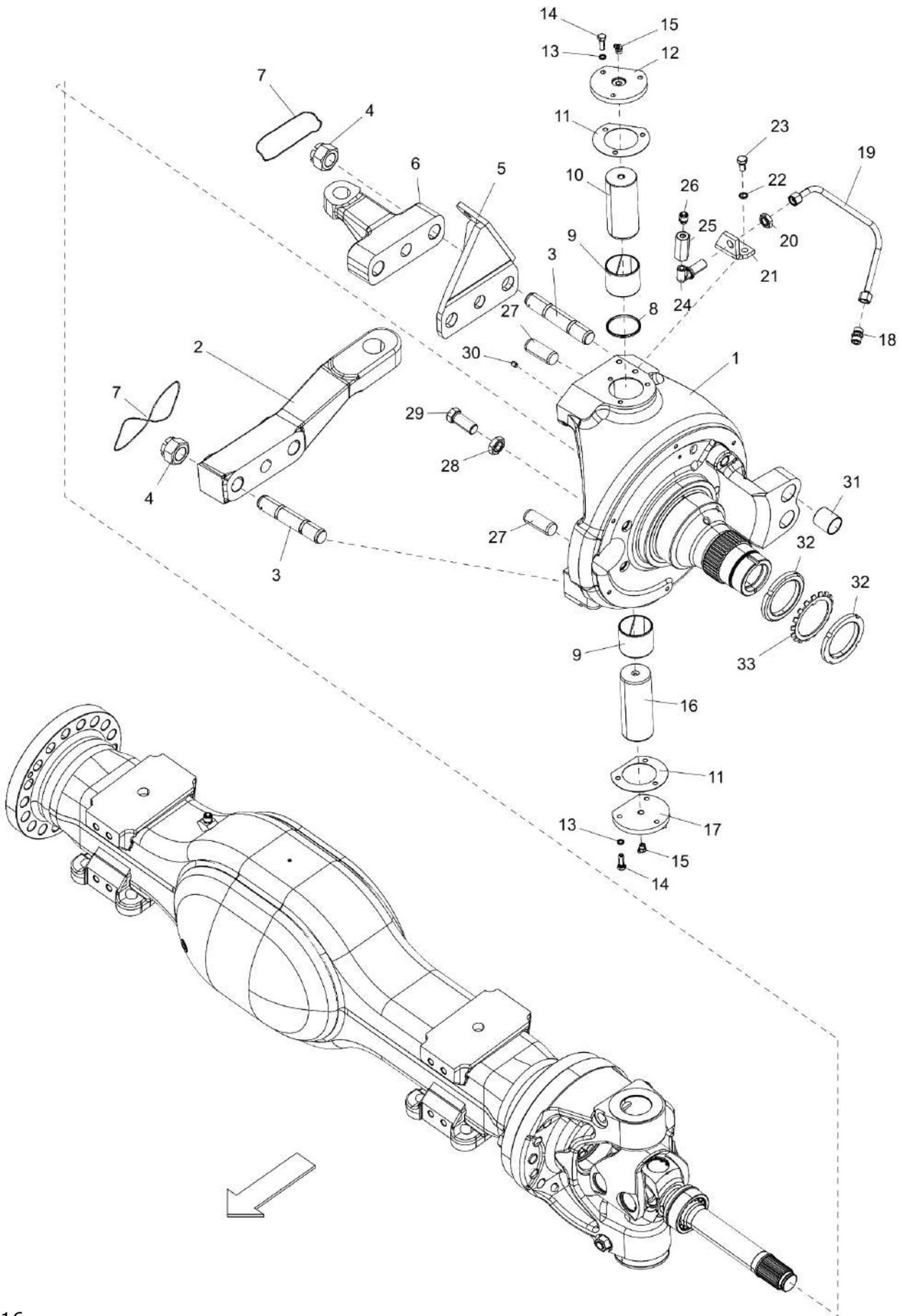
2.1.2 Detail B – Axle housing I. – Axle shaft



ITEM NO.	DRAWING NUMBER PART NUMBER	DESIGNATION	QTY	NOTE
1	883.39-3110-002 169876	Axle housing	1	
2	583.10-3110-015 517549	Threaded extensich	1	
3	0179 842.0 286673	Vent valve	1	
4	DIN 906-M24x1,5-5.8 985079	Taper screw plug	1	
5	831.02-3310-120 356997	Magnetic taper screw plug	1	
6	831.02-3310-105 952363	Hex. bolt	34	
7	ISO 2338-A20x50-St 900522	Dowel pin	2	
8	012.0-3340-018 003371	Oil seal	2	
9	MSZ 231-110 827078	Lock ring to hole	2	
10	FAG RNU 310 ETVP2 314028	Cylindrical roller bearing	2	Ø65x110x27 Depending on the stock also can be installed: - RNU 310E ECP SKF (660906)
11	583.30-3110-017 396998	Knuckle support, left	1	
-	583.30-3110-018 396999	Knuckle support, right	1	
12	583.30-3110-102 503538	Shim	X	1,4 mm
-	583.30-3110-106 313434	Shim	X	1 mm
-	583.30-3110-107 313435	Shim	X	1,2 mm
-	583.30-3110-108 313436	Shim	X	0,4 mm
-	583.30-3110-109 313437	Shim	X	0,6 mm
13	783.28-3110-060 144578	Thrust bearing assy	2	

ITEM NO.	DRAWING NUMBER PART NUMBER	DESIGNATION	QTY	NOTE
14	840.00-3101-004 396241	Draw key	4	
15	MVGSZ 588 M16x1,5-6-B 885455	Hex. flange nut	4	
16	883.39-3110-020 173029	Seal retainer assy	2	
17	883.39-3113-009 169940	Flat lock washer	2	
18	883.39-3113-001 169920	Double joint and axle shafts assy, left	1	
-	883.39-3113-002 169919	Double joint and axle shafts assy, right	1	
19	ISO 4017 M6x12-5.6 070560	Hex. bolt	8	
20	MSZ 1612-6 K2 070231	Flat lock washer	8	
21	Au-12275 173031	Flat lock washer	2	
22	KV 3440 50x65x6 385004	Gasket	2	
23	Beier-Technik A 49,5x80x8-NB 746882	Oil seal	2	
24	MSZ 231-80 827118	Lock ring to hole	2	
25	SKF RNU 2208 ECP 604277	Cylindrical roller bearing	2	Ø49,5x80x23 Depending on the stock also can be installed: -RNU 2208 E.V.TOR (650493) -RNU 2208 TVP2 FAG (656583)

2.1.3 Detail C – Axle housing II. – Steering knuckle



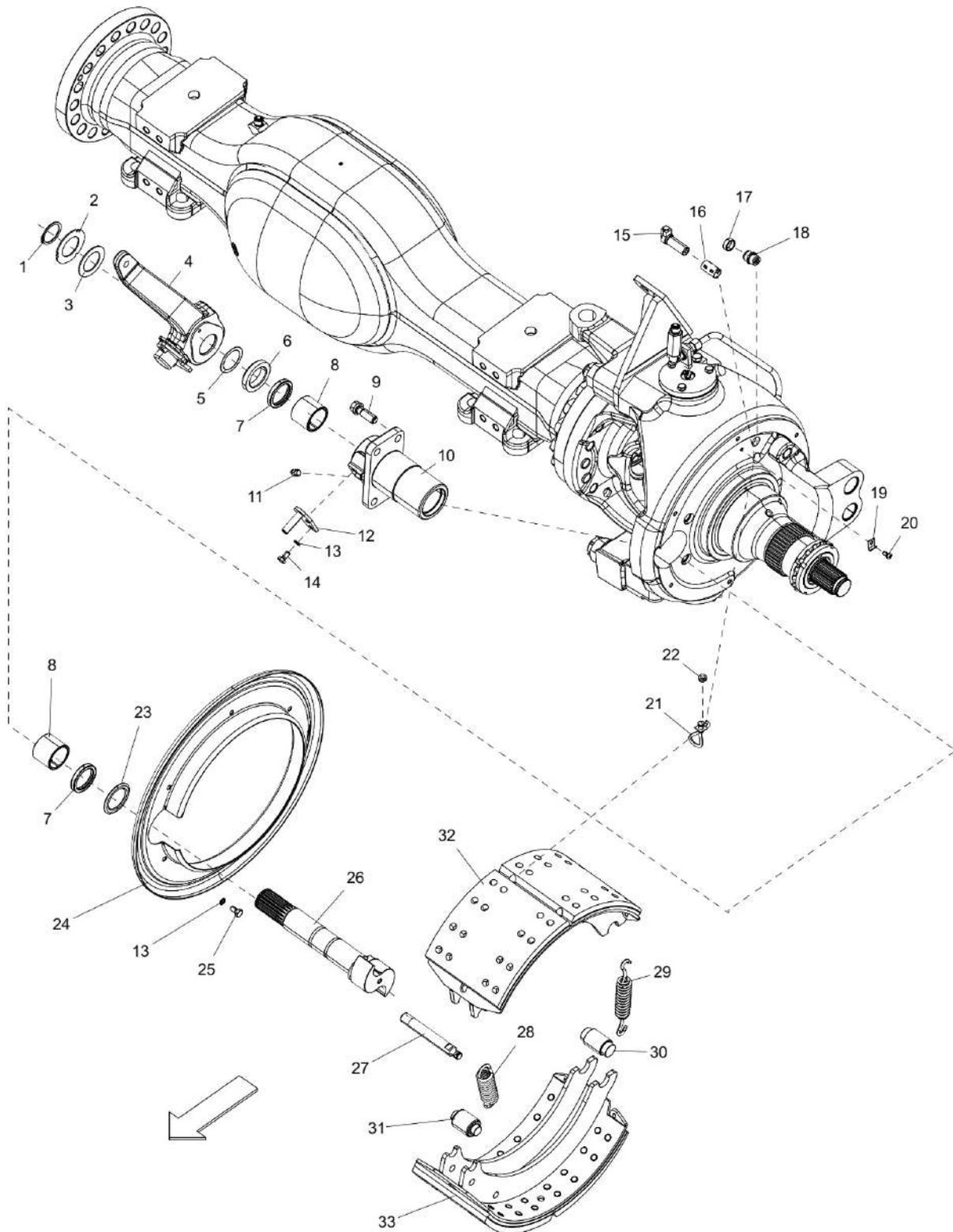
ITEM NO.	DRAWING NUMBER PART NUMBER	DESIGNATION	QTY	NOTE
1	883.39-3110-030 169881	Steering knuckle, left, mounted assembly	1	Items 8, 9, 27, 31 included
-	883.39-3110-040 169884	Steering knuckle, right, mounted assembly	1	Items 8, 9, 27, 31 included
2	783.23-3110-156 086389	Tie-rod arm, left	1	
-	783.23-3110-155 086388	Tie-rod arm, right	1	
3	583.10-3110-092 315770	Stud bolt	8	
4	MSZ 2264 M27x2-8-B 428528	Castle nut	8	
5	683.40-3110-148 560504	Air chamber bracket assembly, left	1	
-	683.40-3110-149 560505	Air chamber bracket assembly, right	1	
6	883.39-3110-091 169890	Steering arm, left	1	
-	883.39-3110-090 169889	Steering arm, right	1	
7	MSZ 4377-1,6 867223	Lock wire	X	
8	783.28-3110-038 144552	Oil seal	2	See items: 883.39-3110-030 and 883.39-3110-040
9	583.10-3110-039 314032	Knuckle pin bushing	4	See items: 883.39-3110-030 and 883.39-3110-040
10	583.30-3110-062 398611	Knuckle pin upper	2	
11	583.10-3110-053 604388	Gasket	4	
12	583.10-3110-052 517747	Cap	2	
13	MSZ 1612-8 K2 070232	Flat lock washer	12	
14	ISO 4017 M8x25-10.9 910186	Hex. bolt	12	

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ITEM NO.	DRAWING NUMBER PART NUMBER	DESIGNATION	QTY	NOTE
15	820015 954003	Greaserfitting 45°	4	
16	583.30-3110-061 398610	Knuckle pin lower	2	
17	583.40-3110-054 144364	Cap	2	
18	583.10-3110-121 319550	Pipe fitting	2	
19	583.30-3110-125 313450	Wheel hub connecting pipe, left	1	
-	583.30-3110-126 313451	Wheel hub connecting pipe, right	1	
20	ISO 8675 M16x1,5-06 901239	Hex.nut	2	
21	583.69-3110-146 513320	Holder plate, left	1	
-	583.69-3110-147 513321	Holder plate, right	1	
22	MSZ 1612-10 K2 070233	Flat lock washer	4	
23	ISO 4017-M10x20-10.9 910196	Hex. bolt	4	
24	583.10-3110-120 503420	Cranked adapter	2	
25	583.10-3110-128 319551	Reducing screw	2	
26	0179 842.0 286673	Vent valve	2	
27	ISO 2338 25 M6x60-St 972757	Dowel pin	4	See items 883.39-3110-030 and 883.39-3110-040
28	ISO 8675-M20x2 -08 901277	Hex.nut	2	
29	583.80-3110-098 313483	Screw stop	2	
30	ISO4766 M8x10-14H 820543	Grub screw	2	

ITEM NO.	DRAWING NUMBER PART NUMBER	DESIGNATION	QTY	NOTE
31	470.10-3310-085 619675	Bushing	4	See items 883.39-3110-030 and 883.39-3110-040
32	583.30-3110-044 398608	Shaft-end nut	4	
33	MB 15 A SKF 828110	Lock plate	2	

2.1.4 Detail D – Axle housing III. – Brake



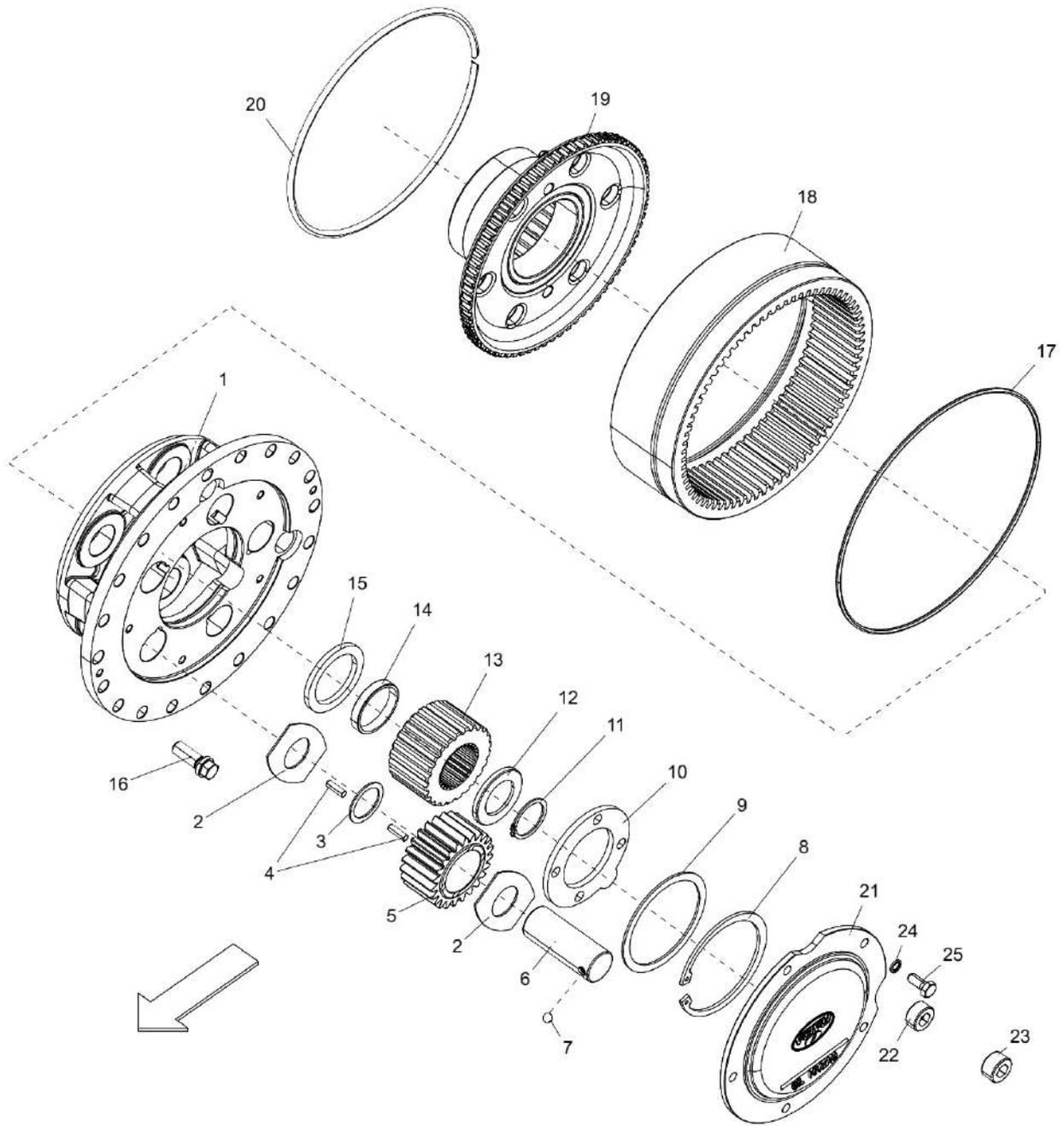
ITEM NO.	DRAWING NUMBER PART NUMBER	DESIGNATION	QTY	NOTE
1	MSZ 232-40 894151	Snap ring to shaft	2	
2	583.10-3141-053 316852	Wear indicating washer	2	
3	583.10-3141-054 316853	Spacer	2	
4	MOM 2398-952 625247	Automatic slack adjuster, left	1	
-	MOM 2398-953 625248	Automatic slack adjuster, right	1	
-	MOM 2393-1031 370130	Adjusting plate	2	E=26 mm
5	831.02-3341-162 365199	Shim	X	
6	831.02-3341-161 365197	Spacer	2	
7	A 42x55x8 NB AFIT 604053	Oil seal	4	
8	018.01-3310-143 005560	Bushing	2	
-	583.10-3141-060 316395	Camshaft support, assy, left	1	Items 9, 10, 11, 12, 13, 14 included
-	583.10-3141-061 315795	Camshaft support, assy, right	1	Items 9, 10, 11, 12, 13, 14 included
9	832.02-3300-002 399017	Hex. head flange bolt	8	
10	583.10-3141-062 315796	Camshaft support, left	1	
-	583.10-3141-063 316396	Camshaft support, right	1	
11	819790 954008	Ball grease fitting	2	
12	832.00-3141-102 318002	Stop, left	1	
-	832.00-3141-106 318005	Stop, right	1	

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ITEM NO.	DRAWING NUMBER PART NUMBER	DESIGNATION	QTY	NOTE
13	MSZ 1612-8 K2 070232	Flat lock washer	16	
14	ISO 4017-M8x16-5.6 070572	Hex. bolt	4	
15	WABCO 441 032 488 0 746866	ABS sensor	2	2.0 m
16	WABCO 899 759 815 4 643831	Collet	2	
17	138.10-3341-015 555702	Ring	2	
18	009.91-3310-008 604580	Slot insert	2	
19	TPI19-55TC-10103 340468	Holder plate	2	
20	MSZ 10112 M6x12-10.9 221886	Hex. bolt	2	
21	13 480 042 PERROT 663783	Brake lining wear indicator	2	
22	TPI19-55TC-41008 340464	Spacer	2	
23	007.10-3341-055 359164	Spacer	2	
24	583.30-3141-071 398637	Brake cover plate	2	
25	ISO 4017-M8x16-10.9 910182	Hex. bolt	12	
26	683.40-3141-051 560506	Camshaft, left	1	
-	683.40-3141-052 560507	Camshaft, right		
27	583.30-3141-046 398632	Spring support pin	4	
28	582.90-3141-045 379261	Brake shoe return spring, long	4	
29	860.00-3341-040 588163	Brake shoe return spring, short	4	

ITEM NO.	DRAWING NUMBER PART NUMBER	DESIGNATION	QTY	NOTE
30	860.00-3341-043 535432	Brake shoe pin	4	
31	860.00-3341-050 300153	Brake shoe roller	4	
-	BEIER NLD24 31 04 HNBR 75 665188	Oil seal	8	See the item 31
32	865.04-3341-010 575225	Brake shoe assembly	2	Rába takes warranty and product responsibility commitments only if brake shoes marked by Rába TM. and brake linings approved by Rába are used.
33	783.50-3341-018 169634	Brake shoe assembly	2	
-	KNORR 190693 088365	Sensor grease	X	

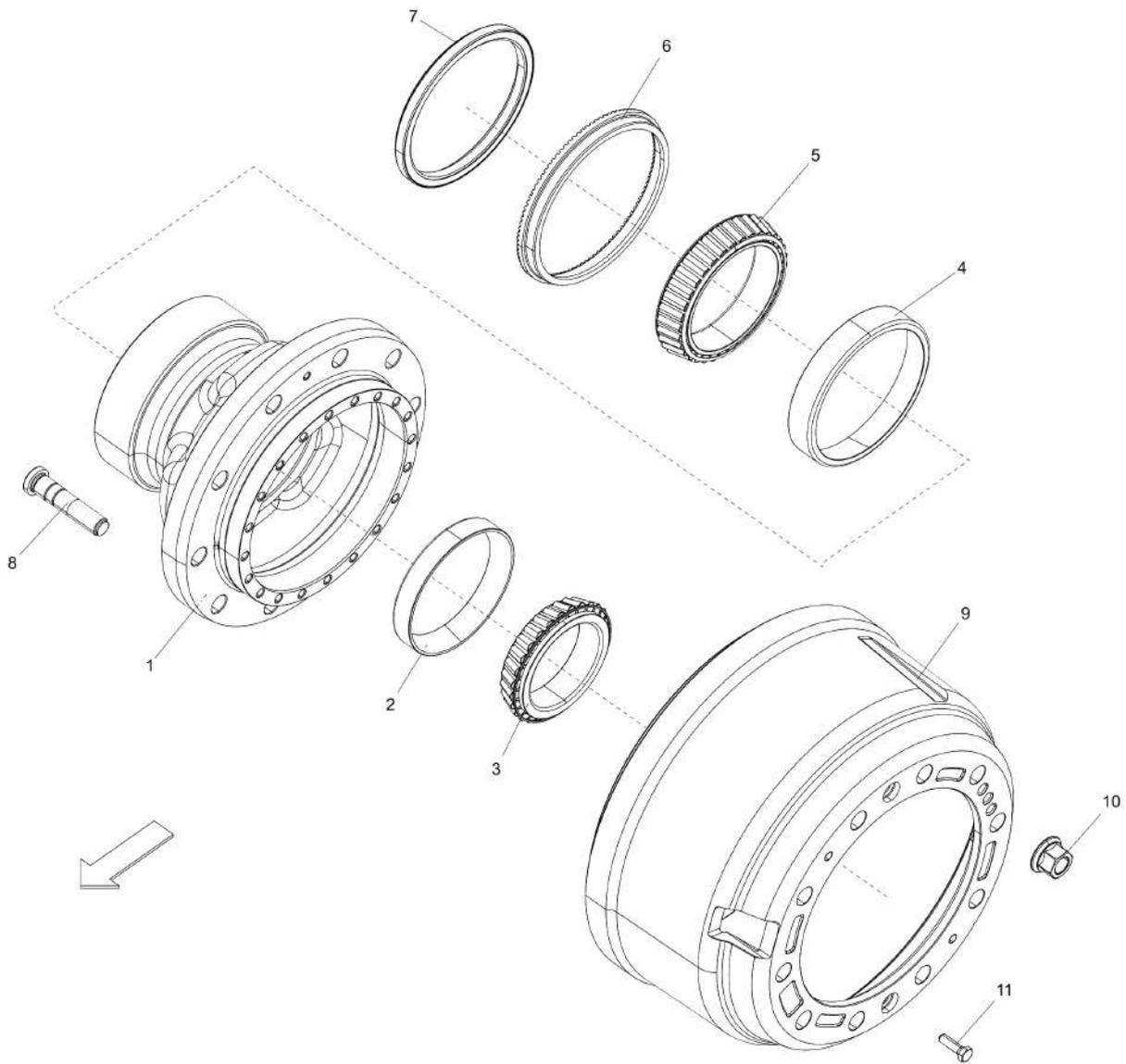
2.1.5 Detail E – Planetary gear



ITEM NO.	DRAWING NUMBER PART NUMBER	DESIGNATION	QTY	NOTE
-	783.24-3197-040 097943	Planet carrier assembly	2	Items 1, 2, 3, 4, 5, 6, 7, 17 included.
1	784.74-3330-012	Planet carrier	2	
2	518.38-3330-024	Spacer	20	
3	128.00-3330-023	Spacer	10	
4	INA NRB 6X18.8	Needle roller	380	
5	518.38-3330-021	Planet gear	10	
6	128.00-3330-025	Planet gear pin	10	
7	MSZ1521-8-200	Steel ball	10	
8	MSZ 231-100 827077	Lock ring to hole	2	
9	582.90-3130-046 503658	Shim (as needed)	2	0,2 mm
-	582.90-3130-043 380768	Shim (as needed)	X	0,25 mm
-	582.90-3130-042 380767	Shim (as needed)	X	0,5 mm
10	582.90-3130-041 380766	Friction disc	2	
11	MSZ 232-35 827159	Snap ring	2	
12	783.30-3113-027 095001	Spacer (as needed)	2	5 mm
-	783.30-3113-028 094942	Spacer (as needed)	X	6 mm
-	783.30-3113-029 094943	Spacer (as needed)	X	6,5 mm
-	783.30-3113-033 081971	Spacer (as needed)	X	5,5 mm

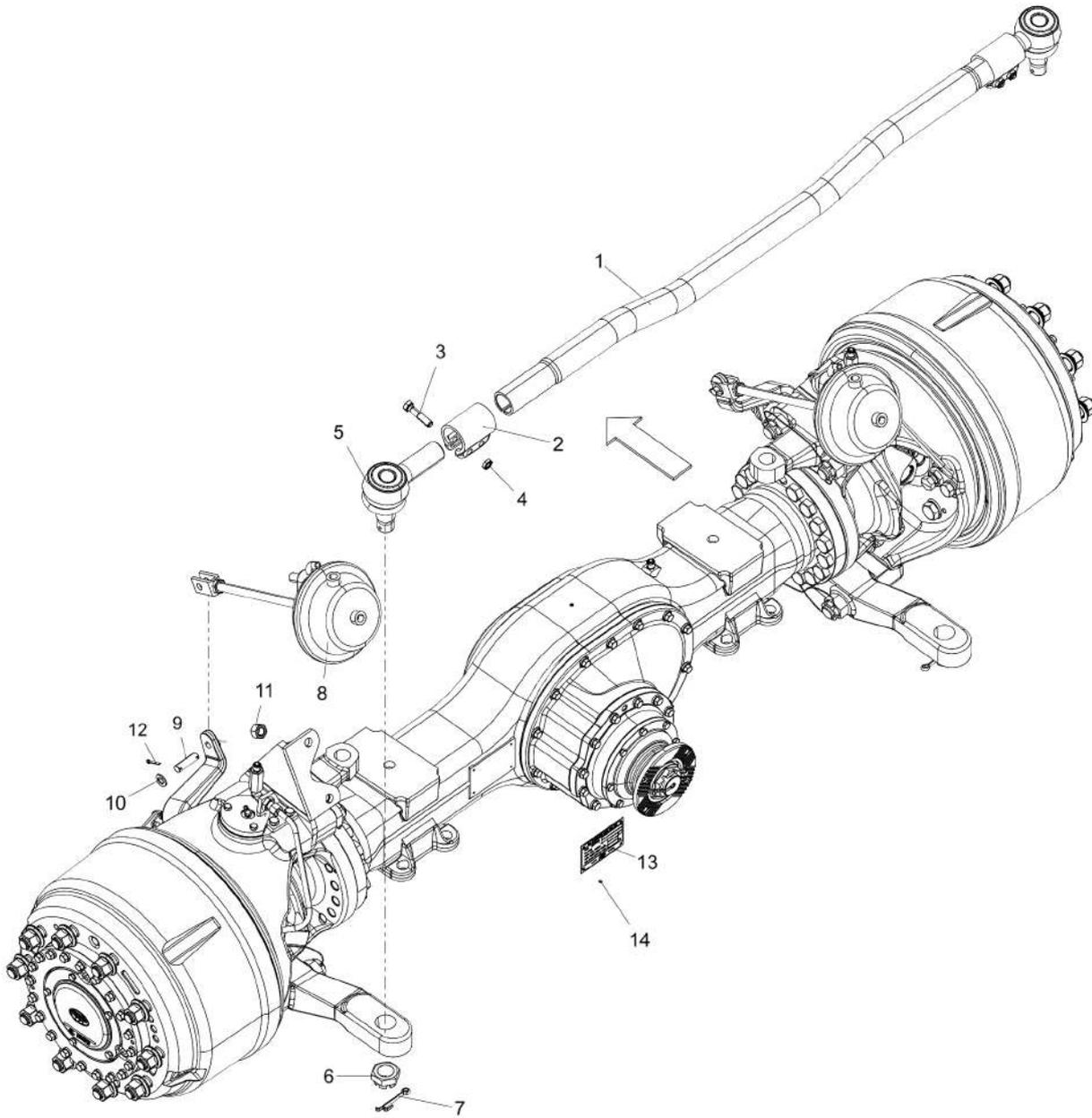
ITEM NO.	DRAWING NUMBER PART NUMBER	DESIGNATION	QTY	NOTE
13	783.30-3113-021 081917	Sun gear	2	
14	783.30-3113-031 081945	Spacer ring	2	
15	783.30-3113-032 081970	Friction disc	2	
16	581.00-3340-009 983462	Hex. bolt	40	
17	581.00-3330-046	O-ring	2	
18	BDI28.51A-3331-011 592856	Planetary ring gear	2	
19	127.20-3331-002 555734	Ring gear support	2	
20	127.20-3331-012 592788	Retaining ring	2	
21	783.50-3130-031 143927	Cover plate	2	
22	DIN 906-M24X1.5-St 985079	Taper screw plug	2	
23	831.02-3310-120 356997	Magnetic taper screw plug	2	
24	MSZ 1612-8-K2 070232	Spring washer	10	
25	ISO 4017-M8x20-10.9 910184	Hex. bolt	10	

2.1.6 Detail F– Wheel hub and brake drum



ITEM NO.	DRAWING NUMBER PART NUMBER	DESIGNATION	QTY	NOTE
-	783.24-3140-002 118384	Wheel hub assembly	2	Items 1, 2, 3, 4, 5, 6, 7, 8 included.
1	783.24-3140-003 118383	Wheel hub	2	
2	TIMKEN JM 822010 660815	Cup, tapered roller bearing	2	Depending on the stock also can be installed: - JM 822010 NTN (604093) - JM 822010 KOYO (144355) Bearing cup and cone need to be replaced at the same time.
3	TIMKEN JM 822049 660813	Cone, tapered roller bearing	2	∅110x165x35 Depending on the stock also can be installed: - JM 822049 NTN (604092) - JM 822049 KOYO (144355) Bearing cup and cone need to be replaced at the same time.
4	TIMKEN 48320 312768	Cup, tapered roller bearing	2	Depending on the stock also can be installed: - 48320 SKF (660875) - 48320 KOYO (142311) Bearing cup and cone need to be replaced at the same time.
5	TIMKEN 48393 312767	Cone, tapered roller bearing	2	∅136,525x190,5x39,688 Depending on the stock also can be installed: - 48993 A SKF (660875) - 48393 KOYO (142311) Bearing cup and cone need to be replaced at the same time.
6	583.40-3140-008 532712	Impulse ring	2	
7	SYSTEM 500 STEFA 1HHI 178x205x17.54-NB 619637	Oil seal	2	
8	118.34-3340-004 355299	Wheel bolt / Wheel stud	20	
9	839.53-3141-031 550679	Brake drum	2	Rába takes warranty and product responsibility commitments only if brake drums marked by Rába TM.
10	DIN 74361-H22-10 752270	Wheel nut	20	
11	ISO 4017-M10x35-10.9 910201	Hex. bolt	4	

2.1.7 Detail G – Tie-rod assembly and brake chamber



ITEM NO.	DRAWING NUMBER PART NUMBER	DESIGNATION	QTY	NOTE
-	FAD 4446.00.00 169926	Tie-rod assembly	1	Items 1, 2, 3, 4, 5, 6, 7 included.
1	FAD 4446.00.08	Tie-rod	1	
2	FAD 3230.00.13	Clamp	2	
3	DIN 960-10-9-A3L M12x1,5x65	Hexagon, fine-threaded bolt	4	
4	DIN 980-10-A3L M12x1,5 V	Flanged self-lock nut	4	
5	FAD 3581.20.00	Ball joint	2	
6	DIN 937-8-A3L M30x1,5	Castle nut	2	
7	DIN 94-St-A4L 6,3x56	Cotter pin	2	
8	P10.01.62.01 ARFESAN 144989	Brake chamber	2	Items 9, 10, 11, 12 included.
9	-	Pin	2	See item 8.
10	-	Washer	4	See item 8.
11	ISO 8673-M16x1.5-10	Hexagon, fine-threaded nut	2	See item 8.
12	4x25 ISO 1234	Cotter pin	2	See item 8.
13	018.52-3310-083 004776	Identification plate	1	
14	MSZ 4254 3x8 821683	Rivet	4	

3 Technical Data

3.1 Brief technical description

The main parts of the double reduction driven front axle are the followings: axle housing, differential carrier assembly, wheel hub with planetary gear and brake mechanism.

The axle housing is a support welded from high strength steel plate, to its centre the differential carrier assembly is bolted. The outer steering knuckle carrier is connected by lower and upper knuckle pins to the knuckle carrier welded to the ends of the axle housing.

The differential carrier assembly is mounted to the cast steel housing.

The bearing cage - where the drive pinion is supported by bearings - is bolted to the differential carrier. The ring gear is bolted to the differential case, which is supported by 2 tapered roller bearings in the differential carrier.

The differential is spiral bevel gear system.

In the differential, ratio is provided by hypoid pinion and ring gear.

The wheel hubs are supported by tapered roller bearings to the spindles, which are bolted to the steering knuckle. Torque transfer between the differential and the wheel hub is assured by inner and outer axle shafts through the double joint.

Brake assembly of the axle: Simplex internally acting drum brake.

The welded brake shoes with the riveted linings are suspended to the knuckle carrier through the shoe anchor pins.

The brake shoes are actuated through shoe rollers by involute profile camshafts.

3.2 General data

Dimensions

DESIGNATION	AXLE TYPE
	883.39
Wheel track	2090 mm
Rubber tyre	14R20"
Applicable wheel discs	10W00-R20"
Rolling radius	580 mm
Depth of sinking	120 mm
Overall width	2439 mm
Spring centre distance	830 mm

Other parameters

DESIGNATION	AXLE TYPE
	883.39
Camber	0°30'
Knuckle pin angle	5°30'
Nominal axle load	10 000 kg
Max. input torque	7968 Nm
Total rolling mass	38 500 kg
G.C.W. on highway	85 000 kg
Engine performance	309 kW
Permissible max output torque	40 000 Nm
Permissible max output revolution	500 RPM
Axle weight without oil filling	845 kg

Ratios

DESIGNATION	AXLE TYPE
	883.39
Ring gear/drive pinion tooth number	33/26
Planetary gear	62/21=3,9583
Ratio	5,02

Wheel hub

DESIGNATION	AXLE TYPE
	883.39
Wheel bolts pitch circle	335 mm
Wheel bolts	10 pieces, M22x1.5
Flange diameter	$\varnothing 280,8^{0}_{-0,32}$ mm Suitable for hub centering wheel disc.
Parts of ABS	Installed
Impulse ring	Installed

Wheel brake

DESIGNATION	AXLE TYPE
	883.39
SYSTEM OF WHEEL BRAKE	
Simplex internally acting drum brake.	
Brake drum diameter	420 mm
Max. trued-up brake drum diameter	423 mm
Width of brake lining	180 mm
Max. radial play of camshaft (Wearing of camshaft bushing)	0,4 mm
Brake shoe clearance (at adjustment)	0,3–0,6 mm
Min. brake lining thickness, measured in brake shoe centre (marked by upper edge of the recess on the side of the brake lining)	7,0 mm
Max. camshaft torque/brake drum torque ($\mu=0,35$)	1794/17400 ^{+30%} _{-20%} Nm
SLACK ADJUSTER	
Automatic slack adjuster	
Slack adjuster installation radius	165 mm
Distance between the bore centre of the slack adjuster bushing and the seating plane of the air chamber bracket	318 mm

Roller bearing

DESIGNATION	AXLE TYPE
	883.39
In wheel hub, outer	Tapered roller bearing bearing cone: JM 822049 TIMKEN or NTN bearing cup: JM 822010 TIMKEN or NTN
In wheel hub, inner	Tapered roller bearing bearing cone: 48393 TIMKEN or 48393 A SKF bearing cone: 48320 TIMKEN or 48320 SKF
In wheel hub planetary gear	Needle rollers NRB 6x18,8 INA
On drive pinion, outer	Tapered roller bearing 32312 B X7JU MGM
On drive pinion, inner	Tapered roller bearing 32314 B X7JU MGM
On flanged case half, in the differential	Tapered roller bearing 32215 MGM
On case half, in the differential	Tapered roller bearing 30215 MGM
In the steering knuckle carrier	Cylindrical roller bearing RNU 310 EC P SKF or RNU 310 E TVP2 FAG
Steering knuckle	Cylindrical roller bearing RNU 2208 EC P SKF or RNU 2208 E TVP2 FAG or RNU 2208 E V TOR

Seals

DESIGNATION	AXLE TYPE
	883.39
In the wheel hub	1HH1 178x205x17 STEFA SYSTEM 500
In the steering knuckle	A 49,5x80x8-NB BEIER-TECHNIK 50x65x6 KV3440 SIMMERWERKE
In the differential	A 75x95x10 NB PA200 SIMMERWERKE AS 75x95x10 NB PA200 SIMMERWERKE
In camshaft bushing	A 42x55x8 NBR K50
O ring in the steering knuckle carrier	OR-65x3 Mat.Pa 169 OR-85x3 Mat.Pa 169
Seal in the steering knuckle	65x85x10-NBR70K55
Gasket in the steering knuckle	65x80x8 KV3826

3.3 Torque ratings

Note:

In the column "Identification number" of the tables, the marking A1 indicates the part of item number 1 of the "detail A" in the parts catalog.

Differential

DESIGNATION	IDENTIFICATION NUMBER	AXLE TYPE
		883.39
Bolts mounting the differential carrier housing to the axle housing	A35	110–120 Nm Mounted with thread locker
Castle nut of the drive pinion	A33	650 - 700 Nm
Bolts mounting the cover of the differential carrier	A30	20–30 Nm
Mounting bolts of the bearing cage	A24	88-98 Nm Mounted with thread locker
Bolts for the mounting of the adjuster lock plate	A6	15-20 Nm
Clamp bolts for the differential case halves	A18	49-59 Nm
Self-lock flanged bolts for mounting the ring gear to the differential case	A10	120-135 Nm

Wheel hub

DESIGNATION	IDENTIFICATION NUMBER	AXLE TYPE
		883.39
Wheel nuts	F10	540–670 Nm
Bolts of the wheel hub cover	E25	10–12 Nm
Mounting bolts of the planetary carrier	E16	90–100 Mounted with thread locker
Shaft-end nut, inner	C32	196 Nm
Shaft-end nut, outer	C32	560 - 640 Nm
Mounting bolts of the brake drum to the wheel hub	F11	40–50 Nm

Axle housing

DESIGNATION	IDENTIFICATION NUMBER	AXLE TYPE
		883.39
Mounting bolts for the knuckle pin cover and the holder of piping	C14	30-35 Nm
Castle nuts mounting the steering and the tie-rod arms	C4	540-590 Nm
Stud bolts fixing the steering and the tie-rod arms	C3	40-50 Nm Mounted with thread adhesive
Self-lock nuts of the tie-rod clamps	G4	70-80 Nm
Castle nuts of the ball joint	G6	300-400 Nm
Flanged nut of the draw key	B15	50-70 Nm
Mounting bolts of the steering knuckle carrier	B6	360-380 Nm Mounted with thread locker
Mounting bolts of the seal carrier	B19	6-8 Nm
Nut fixing the elbow to the support	C23	30-40 Nm
Stop bolts	C29	120-160 Nm
Stud bolts	C3	40-50 Nm Mounted with thread locker

Wheel brake

DESIGNATION	IDENTIFICATION NUMBER	AXLE TYPE
		883.39
Mounting bolts of camshaft bracket	D9	130–140 Nm Mounted with thread locker
Mounting bolts of dust shield	D25	12–16 Nm
Bolts mounting the stop of the automatic slack adjuster	D14	20–25 Nm

4 Operating and maintenance instructions

Compliance with the operating and maintenance instructions assures reliable operation and long service life of our product to your full satisfaction.

Readiness for service and long service life are assured by expert and careful service and maintenance.

The producer shall not accept warranty claims for any damage caused by negligence of knowledge required by general practice of mechanics but not contained in this documentation.

Attention!

Instructions stated in the current section are general for the axle. In other cases, specifications stipulated in the contract are to be considered.

4.1 Regular maintenance

Reliable operation and long service-life of the axle is assured by the regular maintenance consisting of the following operations:

DAILY MAINTENANCE

Visualize the condition of the wheel nuts and the wheel hubs, check the axle for leaks.

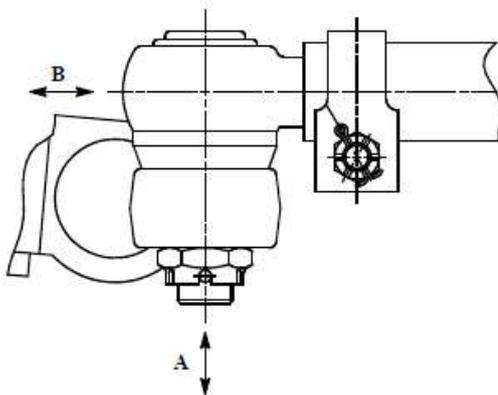
Check the brakes.

Check the braking action by brake test.

MAINTENANCE AT EVERY 5 000 KM

Retighten the wheel nuts. First at 100 km, then at 500 km, further at every 5,000 km.

Clean the vent valve.



Checking the ball joints:

- For heavy operational condition at every 5000 km, for normal operational conditions at every 10000 km.
- Check the rubber boots visually for undamaged condition. If there is some damage, replace the complete tie-rod.
- Play of ball joints

Di- rec- tion	Measuring play	
	Loading power	Play
A	±1050 N	2,00 mm
B	±9000 N	0,80 mm

MAINTENANCE AT EVERY 15 000 KM

Check the brakes - Simplex system internally acting drum brake:

- Brake parts shall always be checked for damage.
- Check the shoe clearance as well as the brake linings for wear at least once in half year.
- Replace the brake linings if worn at the centre to the rivet heads (to thickness of 7 mm) as indicated by the upper edge of the recess on the side of the brake lining.

Attention!

In order to avoid serious failures in the brake, inspections have to be made more frequently when the brake linings are getting thinner.

Brake lining replacement and turning of the brake lining and the brake drum has to be made in a special workshop, according to chapter *Workshop manual*.

MAINTENANCE AT EVERY 30 000 KM

Check the brake shoes and the brake drums and other brake parts for condition.

Check and adjust the tie-rod, the inner wheel turn angle and the toe-in. (In case of new or overhauled axle after the first 5,000 km.)

Check the play of the knuckle pins. (In case of new or overhauled axle after the first 5,000 km.)

Checking the play of the knuckle pin bushings. The permitted play of the knuckle pin bushings in lateral direction (movement resulting from the load) and longitudinal direction (movement resulting from brake torque) is max. 0,4 mm, measured in the median plane of the bushing.

Check and retighten the mounting bolts (see also the table of Torque Ratings in chapter *Technical data*).

MAINTENANCE AT EVERY 60 000 KM

Check the wheel hub bearing clearance. (In case of new or overhauled axle after the first 5,000 km.)

Checking radial play of the camshaft. The permitted radial play of the camshaft is max. 0,4 mm as measured in the centre of the camshaft head.

4.2 Instructions for lubrication

4.2.1 Lubricant grades

HYPOID TRANSMISSION OIL :

Specification : API GL-5 or MIL-L-2105 B and C

Viscosity: Depending on ambient temperature

Tropics zone:	SAE 85W - 140
Temperate climate	SAE 85W - 90; 80W - 90 SAE 80W - 140; SAE 90
Frigid zone	SAE 80W; SAE 75W - 140 SAE 75W - 90
Specially frigid zone	SAE 75W

Oil grades:

(Usage between -26°C and +38°C temperature):

- MOL CARRIER Hykomol-K 80W-90
- OMV GETRIEBEÖL B
- AGIP ROTRA MP
- ARAL GETRIEBEÖL HYP
- BP HYPERGEAR EP
- CASTROL EPX, Dynadrive 80W-90
- ELF TRANSELF TYP B
- ESSO GEAR OIL GX 80W-90
- ESSO GEAR OIL GX-D 85W-90
- MOBIL MOBILUBE HD
- SHELL SPIRAX HD
- TOTAL TRANSMISSION TM 85W-90

LITHIUM BASE LUBRICATION GREASE :

Specification: NLGI-2EP

Grease grades

- MOL LZS - 2 EP
- AGIP GR MU/EP 2
- SHELL Alvania EP2

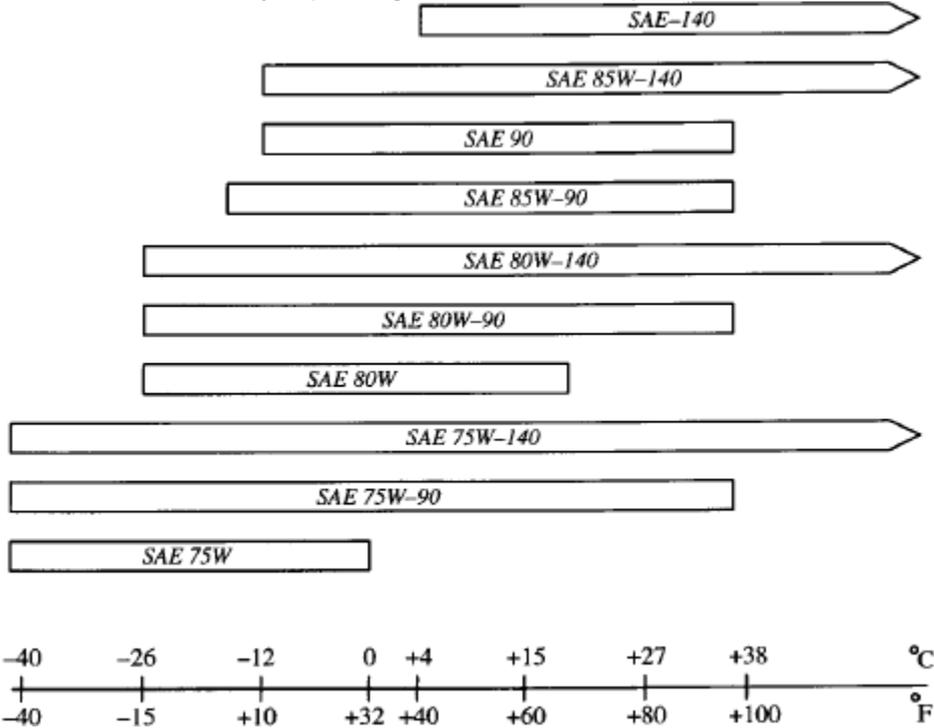
Brake shoe roller:

Agip Autol Top 2000

Seal retainer:

BP Energ grease LC2

Determination of oil viscosity depending on ambient air temperature

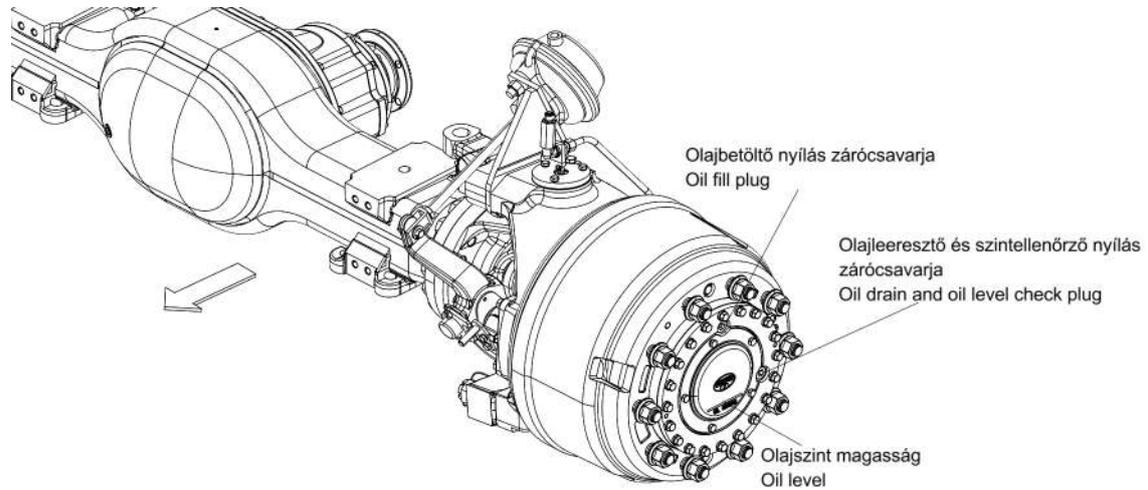


4.2.2 Lubrication guide

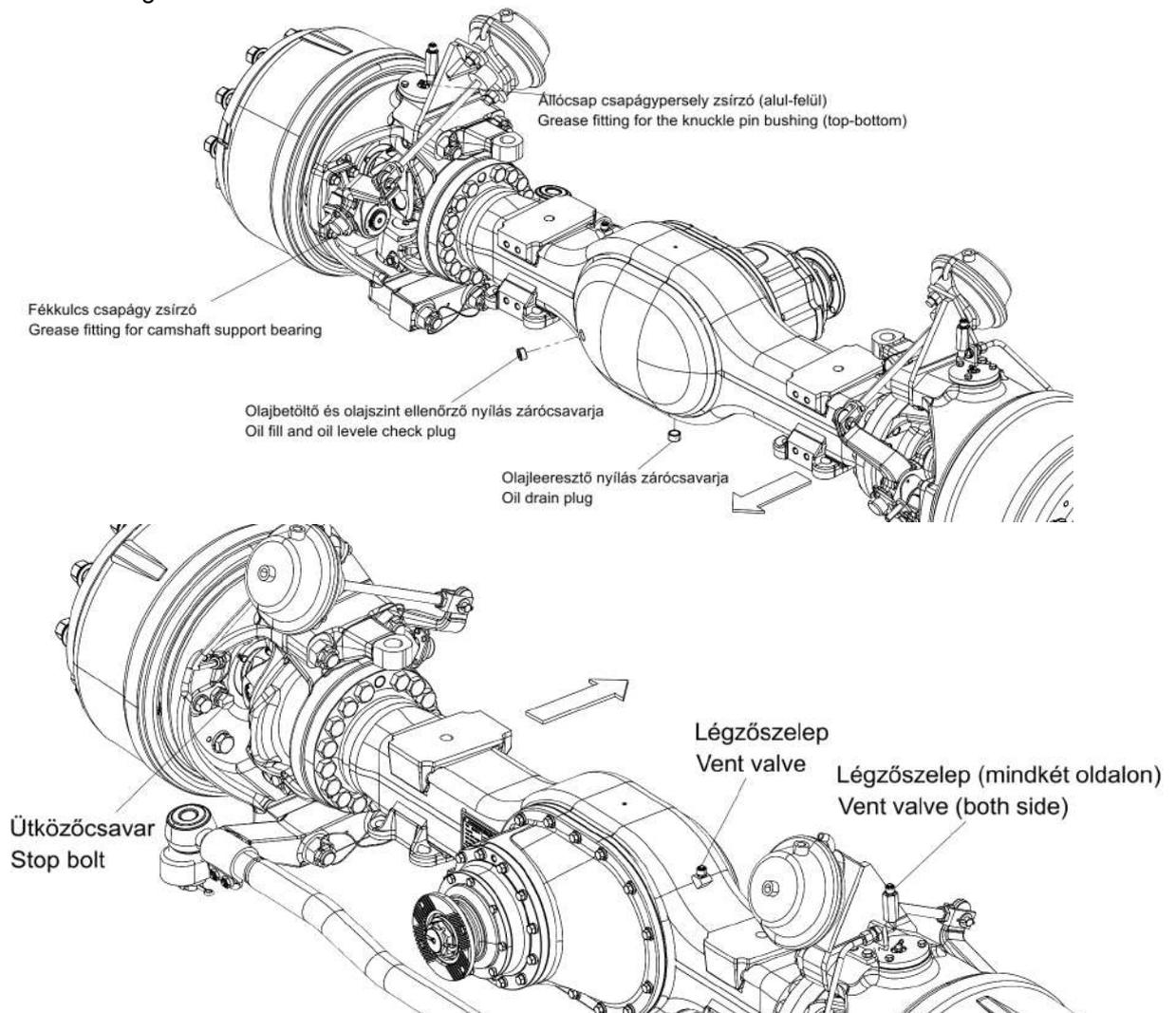
PLACE OF LUBRICATION	FILLING QUANTITY	OPERATION TO BE CARRIED OUT	
Axle housing	approx. 8 litres	Oil level checking: At every 5 000 km	Oil change: Oil changes: in high-way at every 60 000 km. Under heavy-duty conditions at every 30 000 km.
Wheel hubs	approx. 1,0 kg	Grease change: In high-way use at every 60 000 km. Under heavy-duty conditions at every 30.000 km.	
Knuckle pins (bottom-top) Bushings (outer axle shaft)	As required	Greasing at every 15 000 km.	
Camshaft bushing, slack adjusters, ball joints of tie rod	As required	Greasing at every 10 000 km.	
Brake system	As required	Specifications per manufacturer.	

4.2.3 Lubrication and inspection points

1. Wheel hub



2. Axle housing



4.2.4 Oil level check and refill

At the specified intervals check the oil level. Start checking at the wheel hubs. By turning off the wheel adjust the oil level mark on the cover to position shown in the figure below. The oil level should flush with lower edge of the oil level check bore.

In the axle housing the oil level must be at the lower edge of the oil filling bore.

ATTENTION!

Refill only the same grade!

4.2.5 Oil change

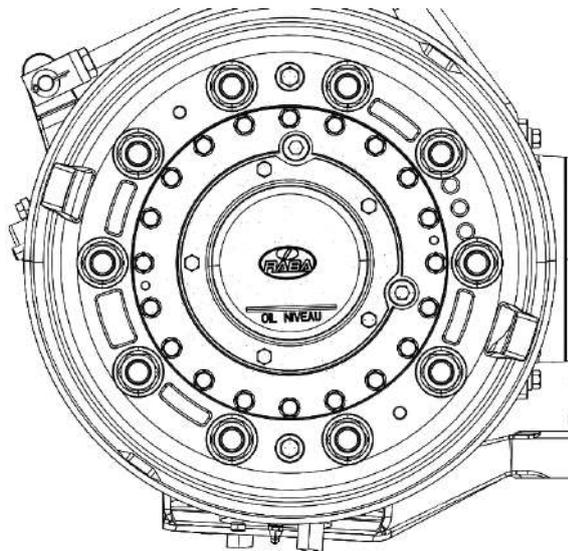
Remove the oil drain bore screw plugs from the wheel hubs and the axle housing and drain the oil.

When draining the oil from the wheel hubs of the axle with wheel installed, use baffle plate against oil splashes.

Clean the magnetic screw plug of the axle housing then reinstall the plugs and tighten to be leak-tight.

Oil fillings should be started in wheel hubs.

For oil fill-up set the wheel hubs so, the oil level mark shall be horizontal under the median line of the axle body. Perform fill-up until the oil level check bore, then carefully close the bores.



Perform fill-up thru the oil filler bore on the axle housing until overflows..

ATTENTION!

For filling-up the axle use only the specified performance grade oil! After the oil was filled in you have to wait till the oil flows through the bores to fill up the entire oilsum. And you supposed to refill it in order to reach the requested level.

4.2.6 Oil leakage on the sealing surface of the axle shafts

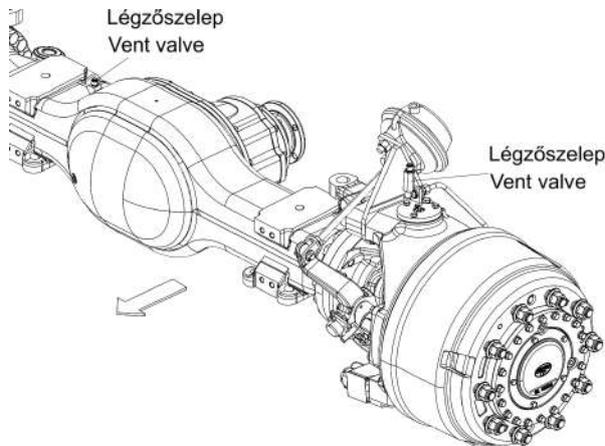
Slight oil leakage from the sealing surface of the inner or outer axle shaft is permitted and normal during the operation of the front driven axles.

This slight oil leakage is from the felt pad saturated by oil, which is located in front of the actual seal ring. This felt pad has to clean the sealing surface of the axle shaft before the surface enters the seal ring during axial displacement. In such a case the oil seal does not have to be replaced.

The oil seal has to be replaced only if oil is dropping from the sealing surface or there are oil marks on the floor.

4.3 Information on maintenance and operation

4.3.1 Vent valve cleaning



Clean the vent valve on the axle housing and the steering knuckle housing at the specified intervals.

In case of dusty or dirty conditions perform checking and cleaning more frequently. Failure to clean the valve may result in oil leakage. This valve is of self-cleaning type, i.e. by turning the cap several times the contamination is removed and the valve operates properly again.

4.3.2 Checking the brake

ATTENTION!

The maintenance and repair work can be completed only by experts! The brake is the first priority the incorrectly made works on brakes can lead operation failure.

Transport safety requirements have to be taken into attention concerning the vehicles that possess vehicle licence.

According to this during the additional brake-review after the brake drum was pulled down the inner tests have to be made in some parts.

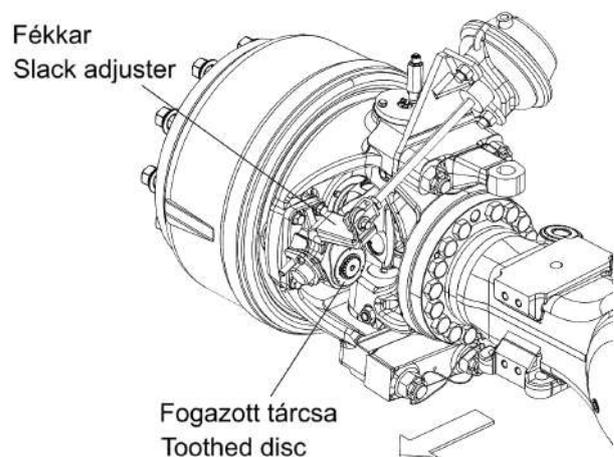
In order to avoid uneven operation every brake shoes and brake lining have to be renewed in one axle.

Since the wear of the brake lining cannot be inspected directly, the grade of wear of the brake lining is indicated by relative position of the toothed disk mounted beside the slack adjuster and the slack adjuster. In case of a new lining the notch of the slack adjuster and division "0" of the toothed disk nearly coincide (max. deviation 9°).

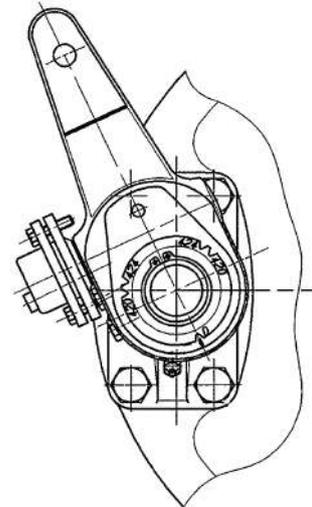
With the wear of the brake lining the shoe clearance and thus it is readjusted by the automatic slack adjuster. After adjustment the brake lining and the brake drum may not interfere.

Inreadjustment the notch marked "420" belonging to the new brake drum gets nearer and nearer to the slack adjuster notch.

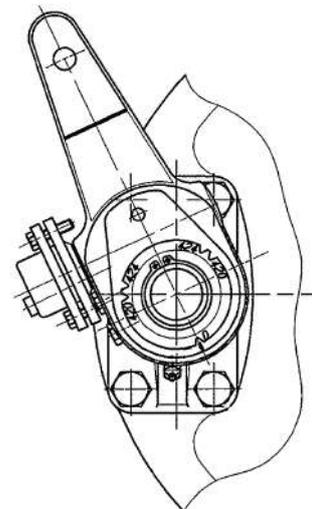
In case of 420 mm new brake drum, mark "420" of the toothed disk, in case of a brake drum trued up to 423 mm, mark "423" of the same max. reach the notch of the slack adjuster. This indicates that the brake lining got worn to the limit. In this case replace the brake linings (since they are worn to the upper edge of the notch on their side).



- Position of wear indicator disk at new brake lining:



- Position of wear indicator disk at worn brake lining
Brake drum diameter = 420 mm.



If removing the brake camshaft and the toothed disk, match-mark the adjuster, the disk and the brake camshaft to assure reinstallation to the original place. In each case check the brakes for operating properly by means of brake test, as well.

ATTENTION!

In each case check the brakes for operating properly by means of brake test, as well.

Grease procedure has to be done per 6 month or at least once per year with dismounted brake drum. So that we can be sure that grease did not occur in the inner brake drum. If we do notice outpressed grease it is a sign of aged seal ring. The worn seal ring has to be replaced according to the service instruction of section *Workshop manual* .

Grease brake shoe roller according to period stated in lubrication table.

In case of brake drum trued up exceeding the permitted diameter and brake lining worn below the minimum thickness (the rivet head reaches the brake drum) the camshaft may turn over!

Camshaft turn-over results in loss of braking action.

5 Workshop manual

After learning this chapter of the manual you can correctly repair and adjust the RÁBA products.

The chapter includes disassembly and reassembly operations of the main units with identification of the special tools.

To perform the correct operations use the tools shown in the figures which can be ordered from RÁBA.

The items in the figures can be found in the parts catalog of this documentation.

Identification of the items shown in the figures of this chapter:

In the workshop manual, the marking A1 indicates the part of item number 1 of the “detail A” 1 in the parts catalog.

The marking of the tools in the figures comes from the table of chapter *Special tools*.

For more information refer to the parts catalog.

The producer shall not accept warranty claims for any damage caused by negligence of knowledge required by general practice of mechanics but not contained in this documentation.

When you replace the main units or some parts use original RABA parts only.

5.1 Special tools

ITEM NO.	DRAWING NUMBER PART NUMBER	DESIGNATION	NOTE
1	4518-00022-2, -3, -4 475268	Pilot and press sleeves	For taper roller bearing inner races
2	4644-00642-1, 22, -25, -26, -27	Backing plate with puller bolt	For pulling off companion flange and the inner taper roller bearing cone and for pressing out the drive pinion
3	4644-00642-13 414864	Bolt	
4	4644-00642-24 475306	Bolt	
5	4644-00651-1, -2, -5 055366	Wrench adapter, counter support	For flanged castle nut
6	4644-04638 225360	Drive mandrel	For camshaft bushing
7	4711-00267 214270	Ball pin driver	For tie-rod
8	4727-00043 -4, -6,-9 475264	Oil seal driver	For wheel hub oil seal
9	4727-00044 -1,...-4 422815	Claw wrench	For spindle nuts
10	4727-00127 594900	Stud bolt driver	For steering knuckle stud bolt
11	4727-00128 410736	Drive mandrel	For oil seal support and cyl. roller bearing
12	4727-00135 -14, -15 475265	Service mandrel	For steering knuckle
13	4727-00143-2 475272	Step plate	For tapered roller bearing cups
14	4727-00144 414676	Drive disk set	For wheel hub, tap. roll bearing cups

ITEM NO.	DRAWING NUMBER PART NUMBER	DESIGNATION	NOTE
15	4727-00150-1 475273	Drive sleeve	For taper roller bearing cone
16	4727-00151 -1....-5 410741	Drive disc set	For wheel hub, tap. roll bearing cups
17	4727-00152 -1....-10, -13 475296	Puller set	For spindle cylindric roller bearing
18	4727-00153 341810	Drive mandrel	For oil seal support and cyl. roller bearing
19	4727-00171 410742	Service cage set	For oil seal protect steering knuckle
20	4727-00172 329273	Mounting device	For knuckle pin bushings and oil seal
21	4732-00028 410777	Drive mandrels	For sealing rings
22	4732-00029 225364	Claw spanner	For bearing adjuster
23	4732-00031 410778	Bearing driver	For taper roller bearing cone
24	4732-00032 410781	Step plate	For the taper roller bearing cup
25	4732-00034 225361	Step plate	For the taper roller bearing cup
26	4789-00024 577658	Drive mandrel	For brake support bushing
27	4869-00223 329688	Backing plate	For drive pinion
28	4939-00008 -1 ...-8, -10 475276	Puller	For taper roller bearing cone off the drive pinion

883.39 DRIVEN FRONT AXLE

ITEM NO.	DRAWING NUMBER PART NUMBER	DESIGNATION	NOTE
29	4957-00487 680443	Wheel nut wrench	For wheel nuts
30	4957-00489 402861	Spring hooking tool	For brake shoe spring
31	4958-00029-1 475266	Drive mandrel	For cyl. roller bearing and oil seal support
32	4970-00487-1, -2, -3, -6 475526	Puller ring set	For inner taper roller bearing cone
33	8928-00006 403294	Drive mandrel	For step plates
34	8928-00008 403296	Drive mandrel	For step plates
35	8928-00014 403302	Drive disc	For camshaft oil seal
36	8928-00030 403318	Step plate	For sealing rings
37	8928-00051 411281	Claw wrench	For the bearing adjuster

5.2 General service instructions

In this section are summarized the service operations and adjustment data considered by us to be most important and which thoroughly should be observed and followed during the service of the axle.

GENERAL INSTRUCTIONS

For purpose of labor safety during service operations performed on the axle removing the individual assembly units make sure to assure safe backing, fixing or suspension.

Install only parts which clean and sound, free of burr and knock-outs. Before installation wipe the mating surfaces of the parts clean and apply thin coat of oil.

For assembly operations use only plastic or copper insert hammer.

Before installing the oil seals make sure to check if the sealing lip is sound and apply specified grease to between the sealing lip and the dust protection edge.

Install the O-rings also with grease.

When installing the tapered roller bearings take care of the pairing according to the original packing or to the manufacturer's specification.

The following thread cementing, locking and surface sealing material are used at the axle, e.g.:

Thread adhesive: (High-strength)	LOCTITE 277
Thread locker: Medium-strength	LOCTITE 243
Surface sealant:	LOCTITE 515

Clean and degrease the surfaces before applying the thread adhesive and thread locker.

Clean and degrease the surfaces before applying the aircuring sealant. Apply a continuous strip of min. 3mm diameter to the specified surface. The time between applying the sealant and assembling the parts together may not exceed 10 minutes.

A fenti ragasztó-, rögzítő- és tömítőanyagok helyett, velük azonos minőségű más anyagok is használhatók.

APPLICATION OF „LOCTITE” BOLT SECURING MATERIALS

The LOCTITE 277 thread bonding material needs min. 3-4 h. time on 22 Celsius temperature, the LOCTITE 243 thread securing (75% solidification) needs in the same circumstances 1-2 hours based on the LOCTITE catalog. The proper bonding strength does not evolve on greasy, oily surfaces even after a longer period.

Oil must not reach the surface even after the application of the LOCTITE 277 and 243 bolt securing materials and after the driving in of the bolts resp. within the duration of the bonding time.

REPAIR OF PARTS ASSEMBLED WITH LOCTITE THREAD BONDING AND THREAD SECURING MATERIALS

In case of defect in the operation and at the general repair, after the previous washing of the assembly the next first thing is to dismount the bounded joints. Clean carefully the matching surfaces and the threaded bores of the dismounted units and the bolts from the dirt and the remains of the adhesive. The remains of bond shall be removed with the joined use of mechanical cleaning and LOCTITE 806 solvent. The threaded bores can be considered as clean when the bolts can be easily driven into the entire thread length.

Degrease carefully the bores and bolts of parts to be assembled before the mounting.

If oil dirt is detected in the bores of the washed parts, drop the oil from bores then spray with LOCTITE 7061 cleaning spray then dry it in free air. (Blowing is permitted only with such compressed air which is free

from oil.) Spray the bores and the bolts with LOCTITE 7649 activator and stand to such a position that the surplus activator could flow down, then let them dry at least for 10 minutes.

Before driving in, apply LOCTITE on bolts circularly on 4-5 threads from the end of the stem. (In case steel is to be bounded to steel, the curing time is 1-3 h. for achieving 50-80% strength which provides the loading ability.)

5.2.1 Oil fill-up, running and checking

According to chapter *Operating and maintenance instructions* fill up the assembled axle with oil to the lower edge of the filler bore at the cover of the wheel hubs, in the axle housing and at the differential.

Attention!

Fill only completely clean oil into the axle.

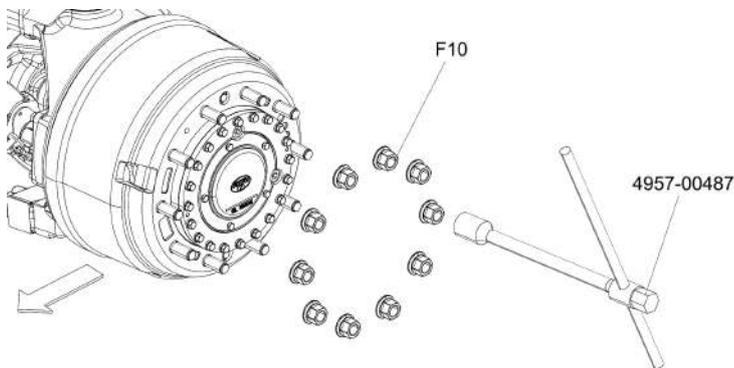
After oil fill-up install the screw plugs and tighten to be leak-proof. Then recommended to run the axle to both direction at different rotation.

During running check the followings:

- THE AXLE FOR LEAKS:
No leaks are permitted.
- THE AXLE FOR OPERATION:
No unusual noise or excessive friction may be experienced at the rotary mechanisms in the differentials and the wheel hubs. The meshing gears should roll on without unusual noise.
- THE AXLE FOR WARMING:
At the end of running the temperature of the wheel hub parts may not exceed approx. 60°C and at the input approx. 80 C°.

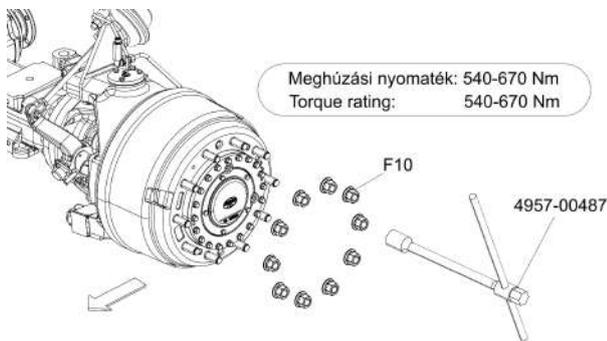
5.3 Wheel hub

5.3.1 Removing and reinstalling the wheel



REMOVING THE WHEEL

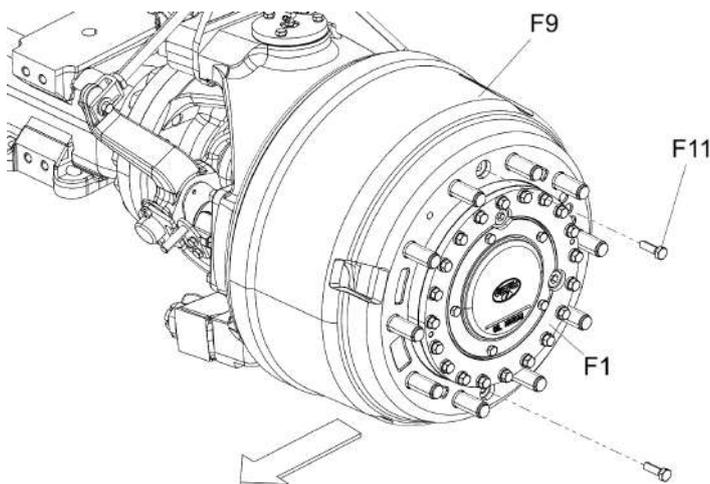
While the wheels are loaded, use the wheel nut wrench to loosen the wheel nuts (F10). Lift the axle, remove the nuts and remove the wheel.



REINSTALLING THE WHEEL

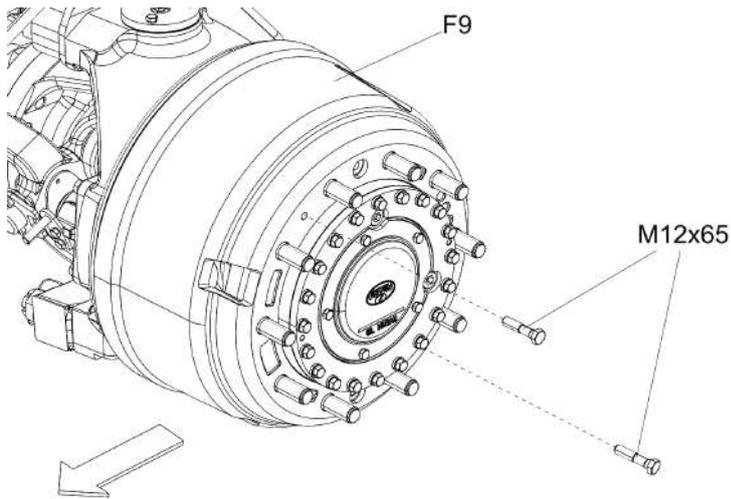
Thoroughly clean the mating surfaces of the wheel disc and the wheel hub. After installing the wheel disc diagonally tighten the wheel nuts (F10).

5.3.2 Removing and reinstalling the brake drum

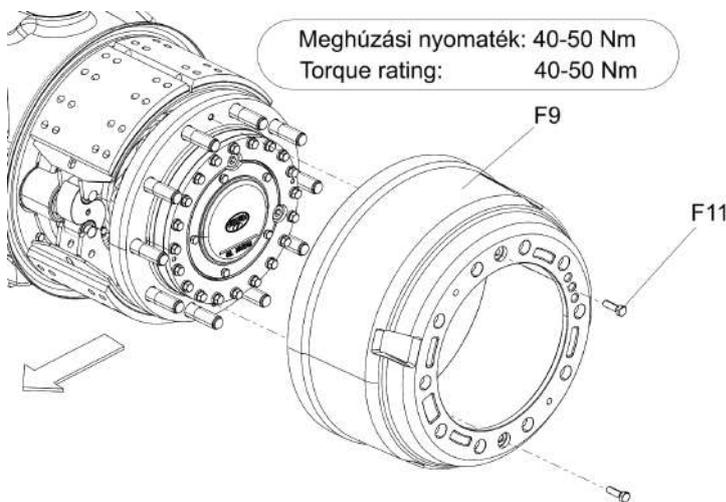


REMOVING THE BRAKE DRUM

After removing the wheel, loosen the 2 hex. bolts (F11) attaching the brake drum (F9) to the wheel hub (F1).



Drive 2 bolts - of at least 40 mm thread length - into the threaded bores on the flange of the brake drum. Pull the brake drum off.

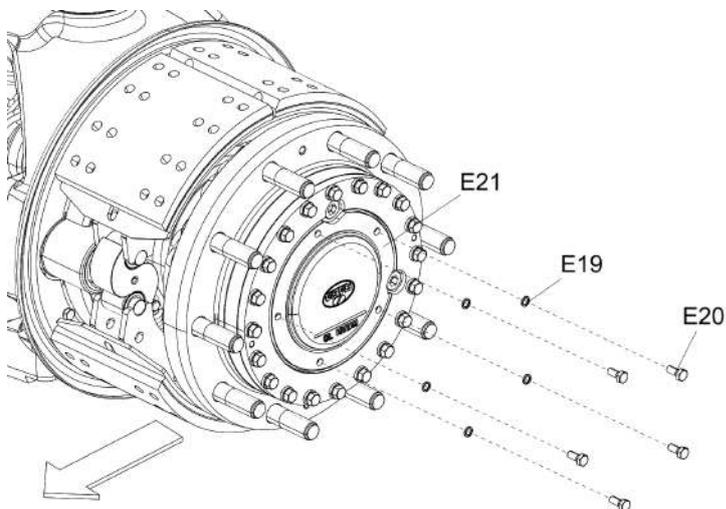


REINSTALLING THE DRUM BRAKE
Position the brake drum (F9) on the wheel hub. Install the 2 hex. bolts (F11) attaching the brake drum and tighten them to the specified torque.

5.3.3 Removing and reinstalling the cover

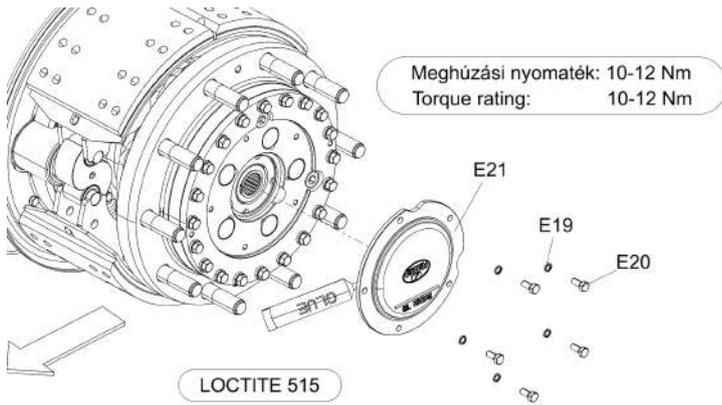
ATTENTION!

Drain the oil before removing the cover!



REMOVING THE COVER

Remove the hex. bolts (E20) attaching the cover (E21) and remove the cover.

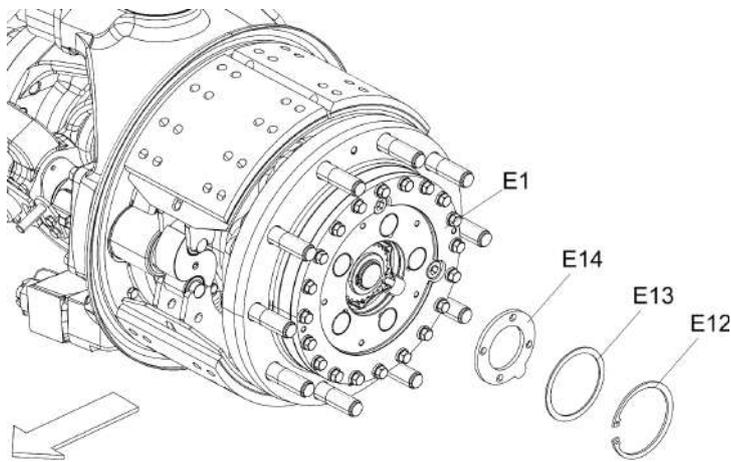


REINSTALLING THE COVER

Apply oil-proof surface sealant to the seating flange of the cover (avoiding the bores from inside).

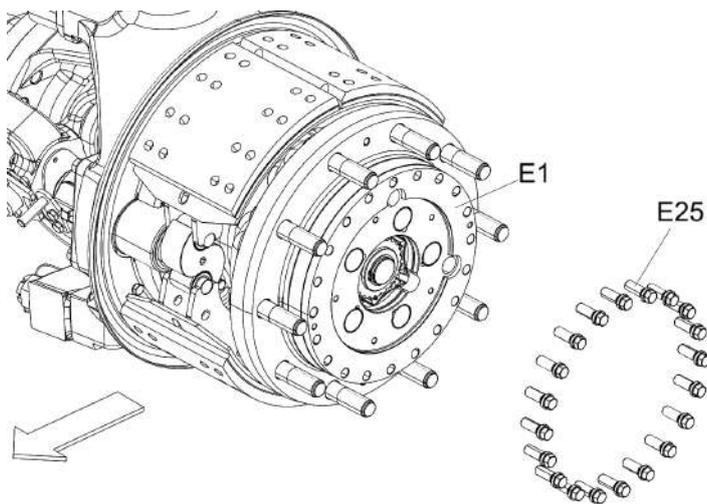
Aligning the bores and the oil drain bore position the cover to the planet carrier and secure the hex. bolts (E20) coated with thread locker and tightened to the specified torque.

5.3.4 Removing and reinstalling the planet carrier

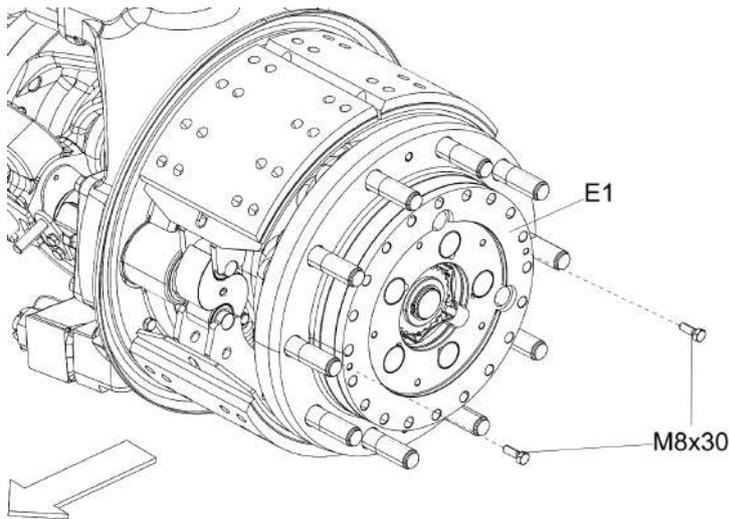


REMOVING THE PLANET CARRIER

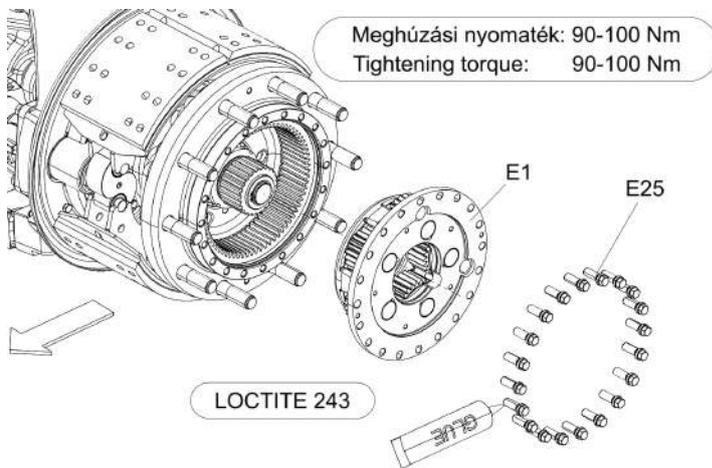
After removing the cover use snap ring pliers for the removal of the snap ring (E12). Then remove the shims (E13) and the friction disc (E14) from the planet carrier (E1)



After that remove the hex. bolts (E25).



For pulling the planet carrier out of the wheel hub drive 2 M8 bolts of at least 25 mm thread length into the threaded bore in the flange of the planet carrier and pull the carrier out of the wheel hub.



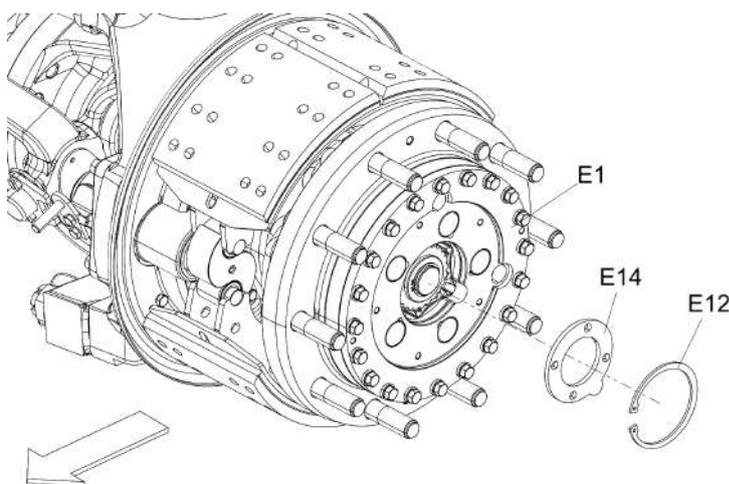
REINSTALLING THE PLANET CARRIER

Apply oil-proof surface sealant to the seating flange of the planet carrier avoiding the bore from inside.

Aligning the bores and the gear teeth insert the planetary gear into the wheel hub, align the oil drain bores on the wheel hub and the planet carrier.

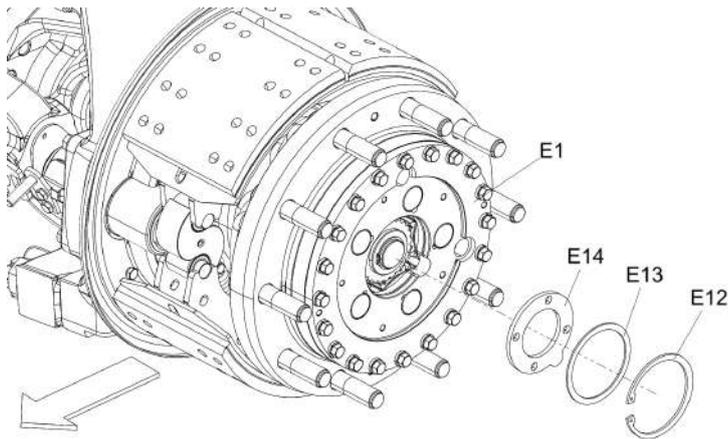
Secure the planet carrier with the hex bolts tightened to the specified torque and coated with thread locker.

5.3.5 Adjusting the axle shaft clearance



Insert the friction disk (E14) into the installed planetary gear (E1), then insert the snap ring (E12). Press the friction disc until bottoming against the sun gear. Use a feeler gauge to measure the distance between the friction disc and the snap ring.

Select shims of the thickness less by 0,4-0,8 mm than the measured value.



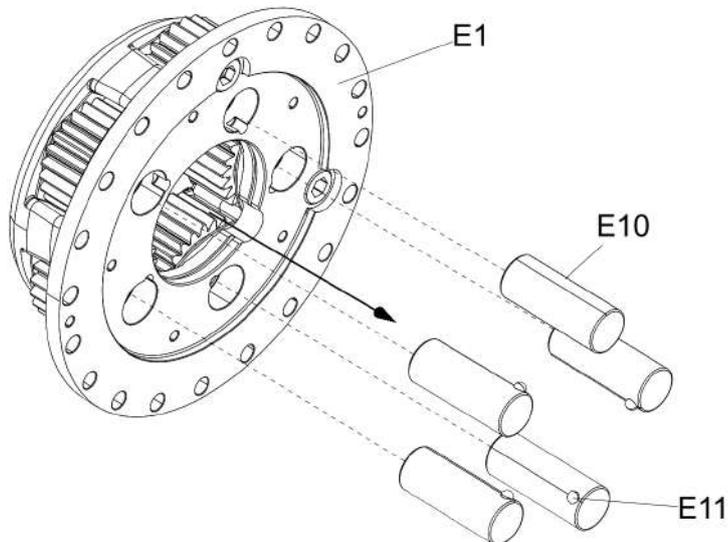
Use snap ring pliers for removing the snap ring (E12) again, then insert the selected shim pack (E13) and finally install the nap ring.

5.3.6 Disassembling and reassembling the planetary gear

ATTENTION

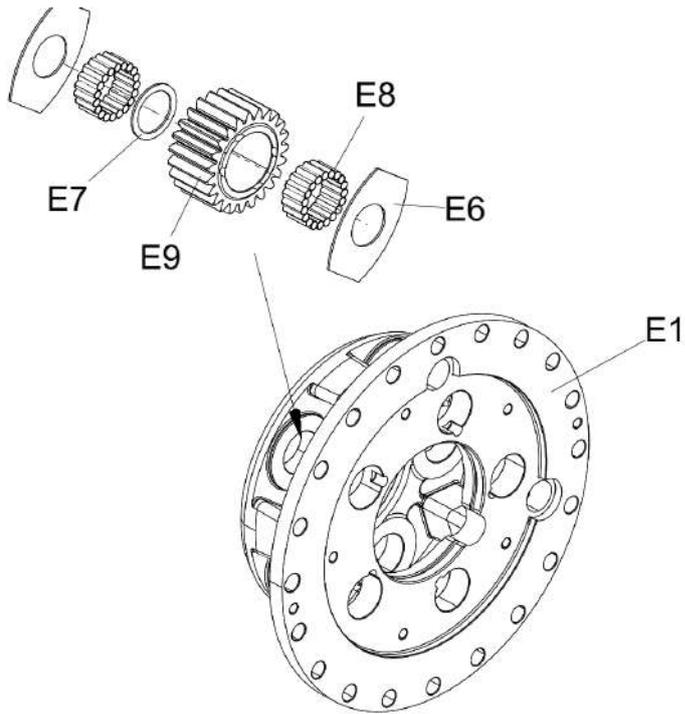
In case of replacing the needle roller, make sure to install only identical tolerance class needle roller supplied in one package and marked by the same color code into one wheel hub planetary.

When mounting the planet gear pins make sure the seat machined for the ball in the planet gear pins and the groove in the planet carrier align, to be able to insert the ball into the seat before completely driving in the pinion pin.



DISASSEMBLING THE PLANETARY GEAR

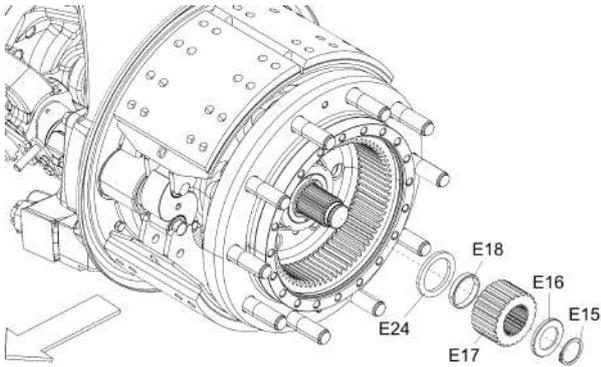
Use the mandrel shown in the figure to drive out the planet gear pins (E10) toward the direction of the balls (E11).



REASSEMBLING THE PLANETARY GEAR

Insert the spacer ring (E7) and needle rollers (E8) into the bore of the planet gear (E9). Insert the pre-assembled planet gear into the planet carrier. Drive in the planet gear pins into the bores of the planet carrier.

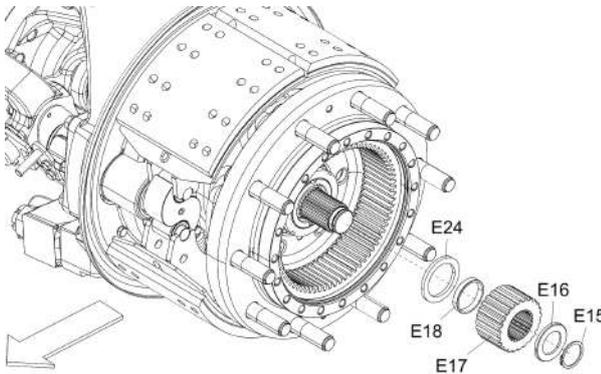
5.3.7 Removing and reinstalling the sun gear



REMOVING THE SUN GEAR

After the removal of the planet carrier, remove the snap (E15) ring and the spacer ring (E16).

Then pull the sun gear off from the axle shaft with the spacer ring (E18) and remove the friction disc (E24).



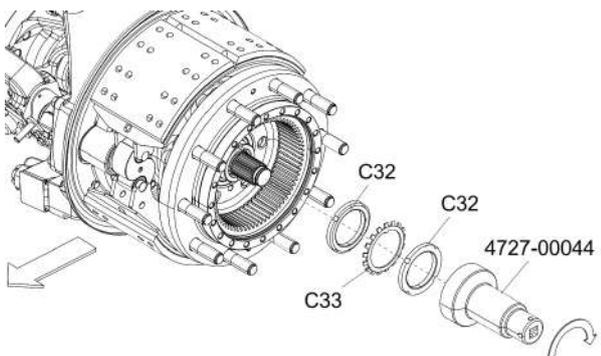
REINSTALLING THE SUN GEAR

Reinstall the sun gear in reverse order of removal. Make sure to check if the friction disc (E24) is on the spacer ring (E18), as well as the chamfered side of outer distance ring (E16) faces inward.

5.3.8 Removing and reinstalling the wheel hub

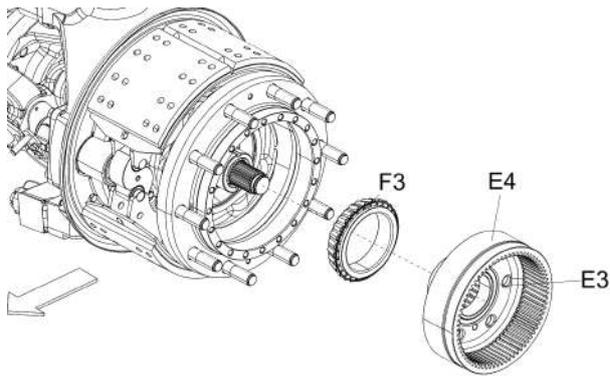
ATTENTION!

When reinstalling the wheel hub the axial play should be 0,01–0,03 mm.



REMOVING THE WHEEL HUB

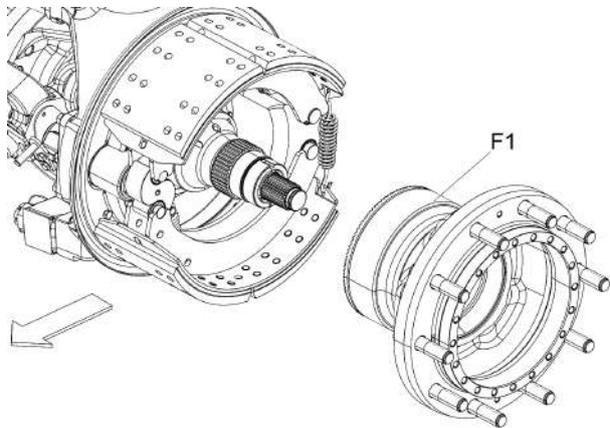
After the removal of the planet carrier and the sun gear unsecure the shaft-end nuts (C32) with the tool shown in the figure.



Slightly pull the safely suspended wheel hub forward, so the ring gear support (E3) equipped with the planetary ring gear (E4) and the outer tapered roller bearing cone (F3) can be removed.

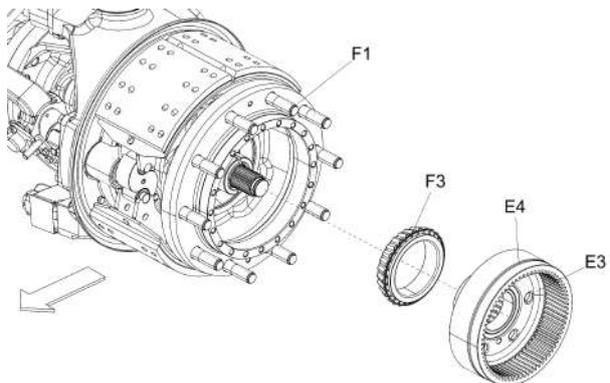
Pull the wheel hub (F1) off the steering knuckle.

The oil seal will pull the inner tapered roller bearing off the steering knuckle (due to loose-fit).

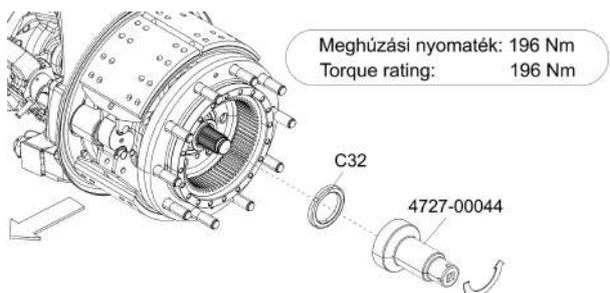


REINSTALLING THE WHEEL HUB

Push the safely suspended and pre-assembled wheel hub (F1) to the steering knuckle until bottoming. Make sure not to damage the sealing lips of the oil seal.

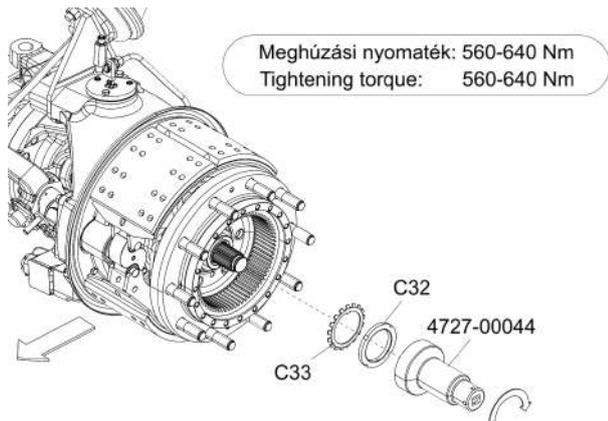


Drive the pre-assembled ring gear support into the wheel hub (F1) aligning the splines until bottoming. Make sure the tapered roller bearing seats properly.



Meghúzási nyomaték: 196 Nm
Torque rating: 196 Nm

Tighten the inner wheel end nut (C32) with the wrench, to the specified torque then release. While keeping the wheel hub rotating and moving in axial direction, re-tighten the nut so that the wheel hub has axial play.



Position any tab of the the lock plate (C33) to one of the slots of the shaft-end nut, **but do not secure** yet. Install the outer shaft-end nut (C32) while rotating the wheel hub and tighten it to the specified torque.

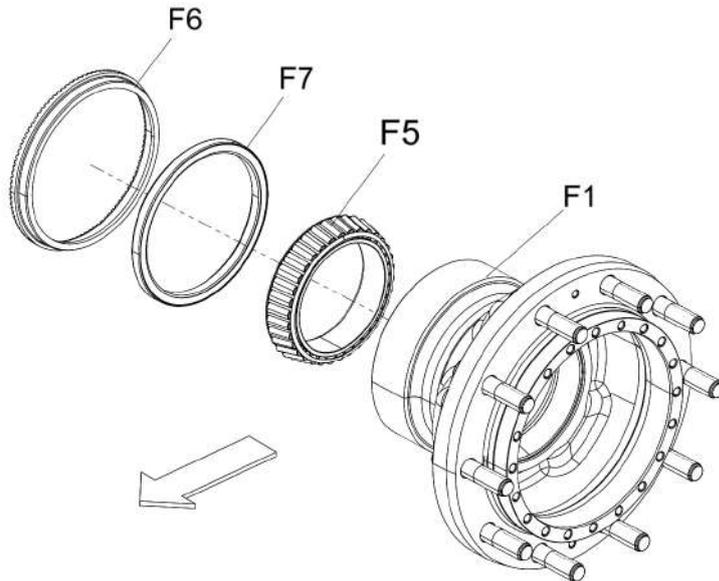
Use a dial indicator to check the axial play. The specified axial play is 0,01 - 0,03 mm.

In case of improper bearing clearance repeat the adjustment by properly turning back the shaft-end nut and repeat the check procedure.

5.3.9 Disassembling and reassembling the wheel hub

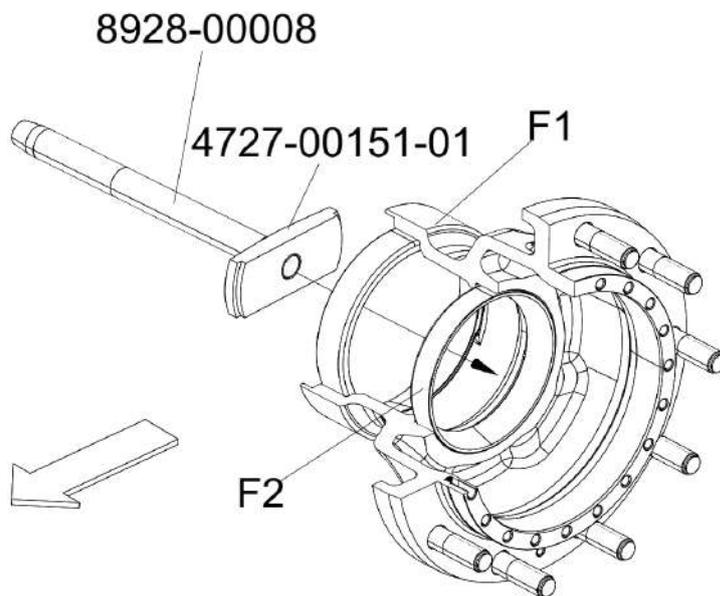
ATTENTION!

When mounting the wheel hub, the undamaged impulse ring should not be replaced. When replacing the bearings and oil seals take care of the safety of tothing of the impulse ring!

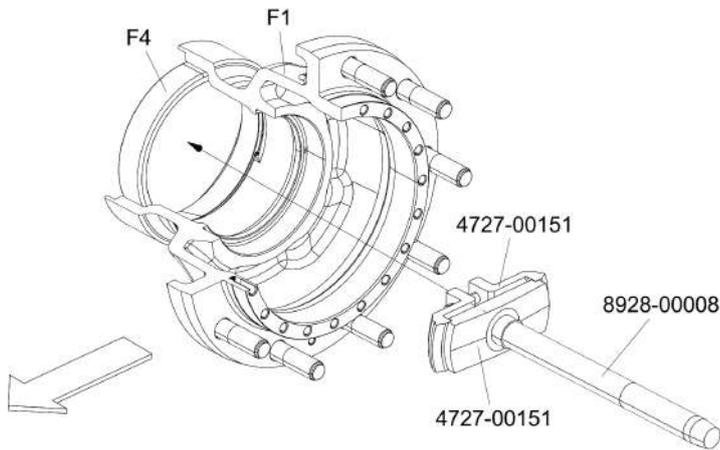


DISASSEMBLING THE WHEEL HUB

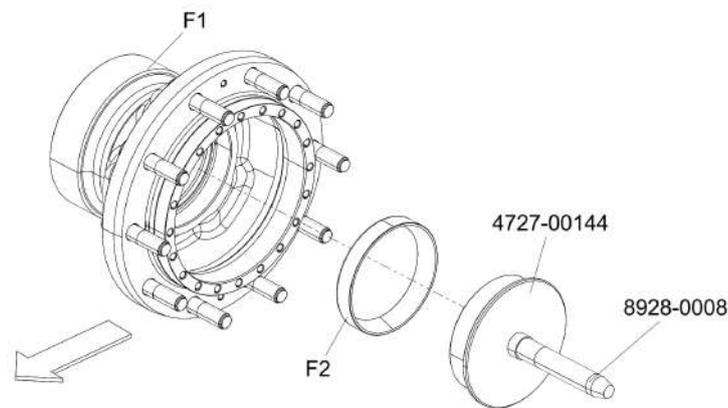
Remove the impulse ring (F6) from the removed wheel hub. With a pry remove the oil seal (F7) from the removed wheel hub and remove the inner tapered roller bearing cone (F5).



First drive out the outer tapered roller bearing cup (F2) with the tool shown.

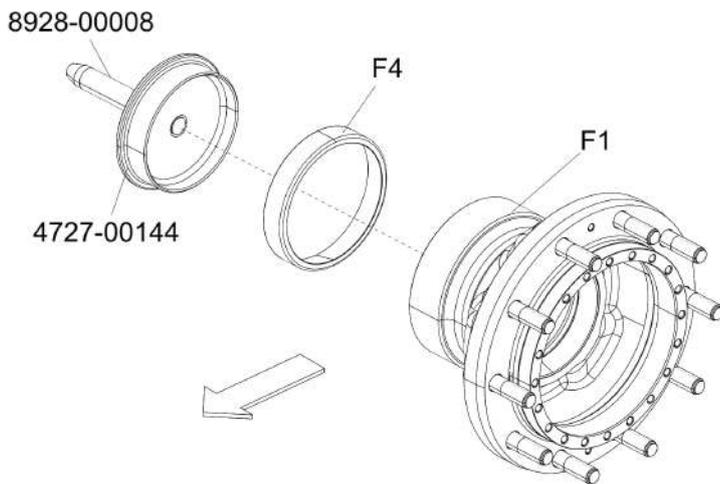


Then drive out the inner tapered roller bearing cup (F4) with the tool shown.

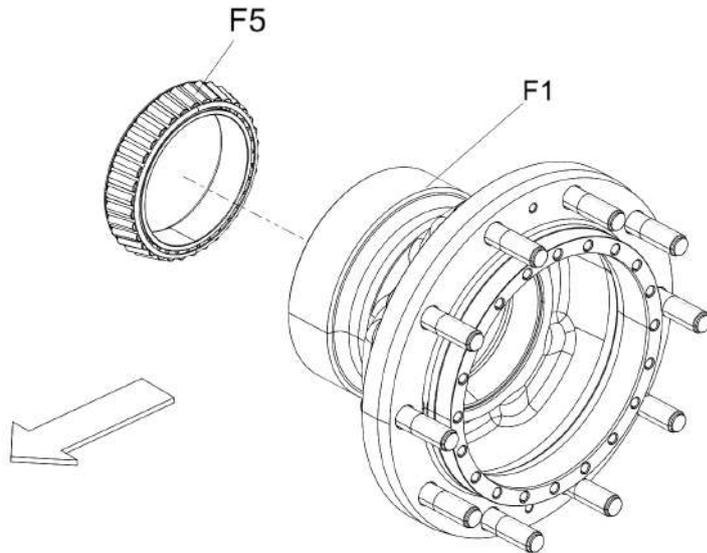


REASSEMBLING THE WHEEL HUB

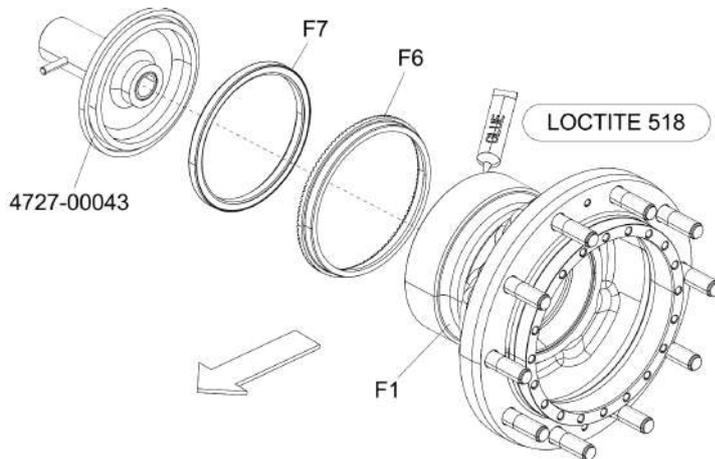
Use the tool shown in the figure to drive in the outer tapered roller bearing cone (F2).



Turn the wheel hub over and also drive the inner tapered roller bearing cup (F4) with the tool shown in the figure.



Insert the inner tapered roller bearing cone into the wheel hub (F5)



Apply oil-proof sealant to the impulse ring (F7) seat.

If the impulse ring is replaced, the new impulse ring has to be cooled uniformly in dry ice before pushed into the wheel hub.

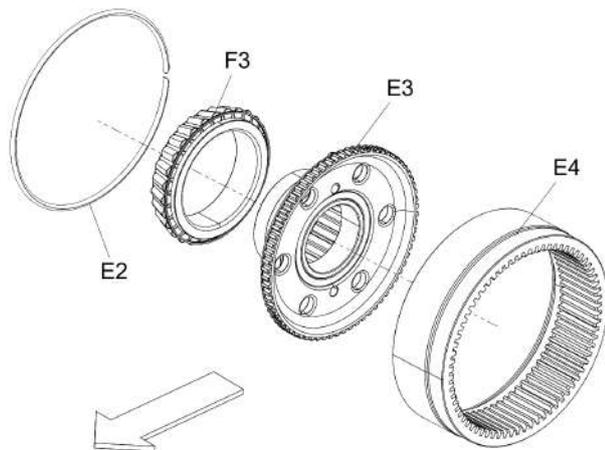
Check the run out of the toothed impulse ring in the wheel hub. Maximum permissible run out of tothing in direction of revolution sensor shaft is 0.2 mm.

Tothing can not get damaged!

Apply oil-proof surface sealing into the seat of the oil seal (F7) then drive the oil seal until the bottoming of the tool.

Apply **AMBLYGON TA 15/2** grease between the sealing lip and the dust protection edge.

5.3.10 Disassembling and reassembling the ring gear support

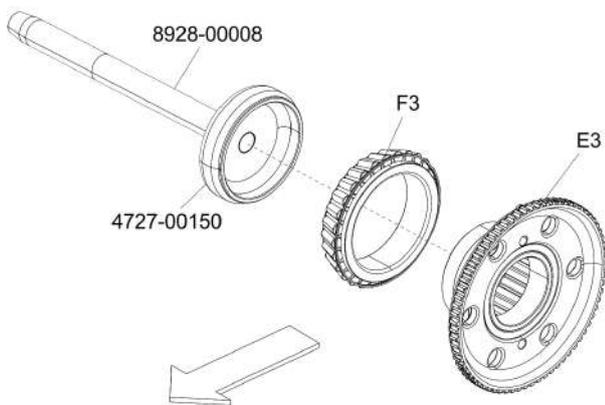


DISASSEMBLING THE RING GEAR SUPPORT

After removing the retaining ring (E2) pull the planetary ring gear (E3) off the ring gear support (E4).

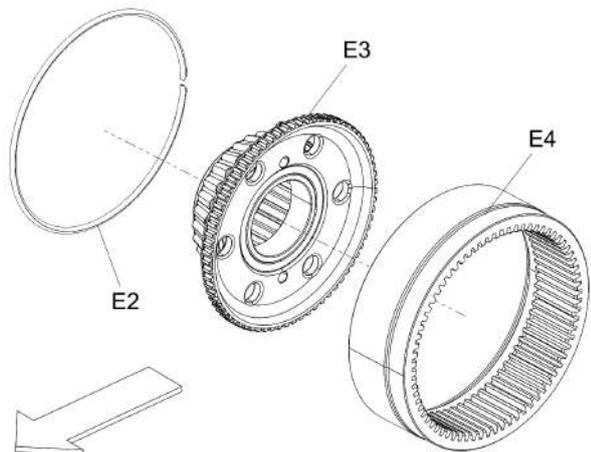
Do not remove the centering ring from the ring gear support, these may be replaced only together.

A soft mandrel positioned thru the rim hub bores drive the tapered roller bearing cone (F3) off planetary ring gear support.



REASSEMBLING THE RING GEAR SUPPORT

As shown in the figure drive the cone of the tapered roller bearing (F3) to the ring gear support supplied the centering ring. Use the tool shown in the figure.



Aligning the ring gear support and the planetary ring gear tothing, and push them completely together and install the retaining ring (E2) into its groove.

5.3.11 Installation instructions for parts of anti-blocking system

This description contains the constructional elements of the anti-blocking and anti-skid systems (ABS and ASR), that can be installed by the customer into the axle according to the installation instructions.

The axle contains the items necessary for the installation of the anti-block and anti-skid systems.

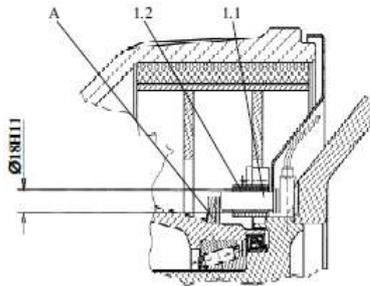
1. Installable elements of the anti-block and anti-skid systems

- Revolution sensor:
 - Robert Bosch GmbH A 335 545 231
 - KNORR-BREMSE ZB 9010-I/83315
 - WABCO 441 032 001 0
 - WABCO 441 032 488 0
 - WABCO 441 032 808 0
 - WABCO 441 032 578 0
- Spring bushing:
 - Robert Bosch GmbH C 335 002 431 A
 - KNORR-BREMSE 4B 69698
 - WABCO 899 760 510 4
 - WABCO 899 759 815 4

Note: The revolution sensor to be built in only with spring bushing of the same manufacturing.

2. Installation instructions

- A — Impulse ring
- 1.1 — Revolution sensor
- 1.2 — Spring bushing



- Before installing the spring bushing coat the bore ($\text{Ø}18\text{H}11$) of the revolution sensor holder with grease (e.g. Molykote FP 186, NBU 30 PTM Univew N3) in order to prevent corrosion.
- Insert the spring bushing from the direction of the axle centre into the bore ($\text{Ø}18\text{H}11$) until bottoming (1.2).
- Put the revolution sensor (1.1) into the spring bushing and push it until bottoming on the impulse ring. This setting has to be performed every time when the wheel hub is disassembled.
- The maximum clearance between the revolution sensor and the impulse ring can be 0,4 mm during the operation.
- When leading the wire of the revolution sensor out of the axle brake mechanism be sure not to bend it with a radius less than R 50 mm. Fasten the wire at distances of 50 mm exposed to heat load inside the brake mechanism.
- Check the run out of the toothed impulse ring on the wheel hub. Maximum permissible run out of toothing in direction of revolution sensor shaft is 0,2 mm.

Note:

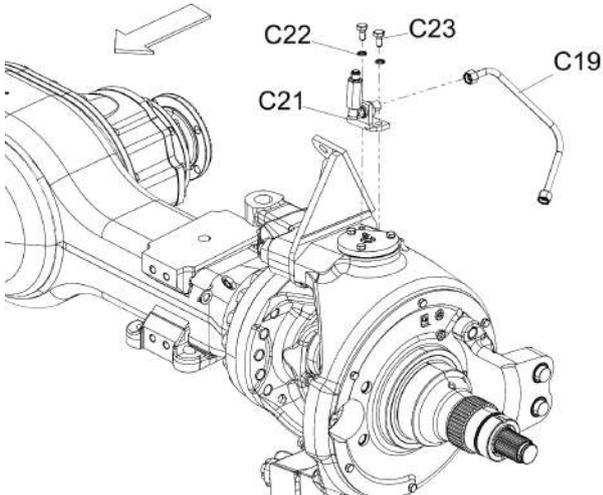
Besides BOSCH, KNORR and WABCO tachometer, a tachometer of other production, interchangeable with the above is allowed to be built in. If the impulse ring is changed, the new impulse ring has to be heated uniformly to 150°C, and pushed up to bottom on the wheel hub. Toothing can not get damaged!

5.4 Axle housing

5.4.1 Removing and reinstalling the steering knuckles, removing and reinstalling the double joints

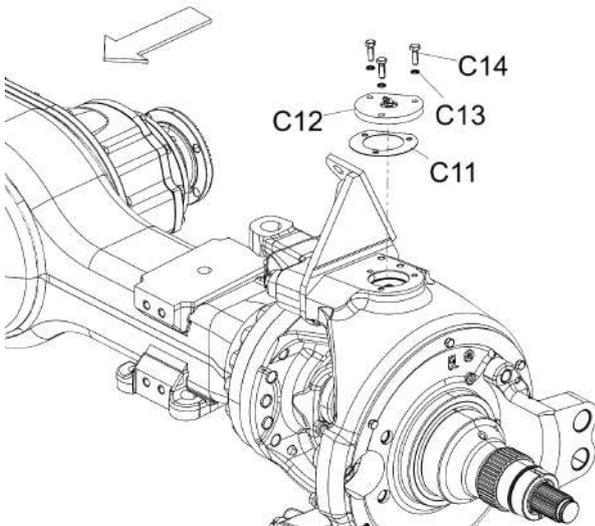
ATTENTION!

It is recommended to remove and reinstall the double joint when the differential is locked.

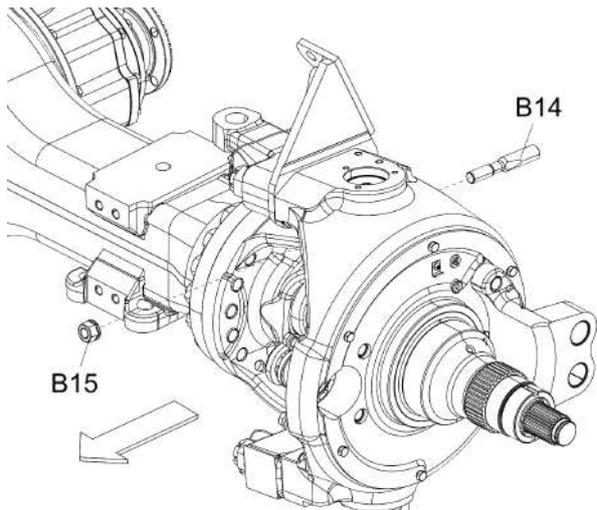


REMOVING THE STEERING KNUCKLE

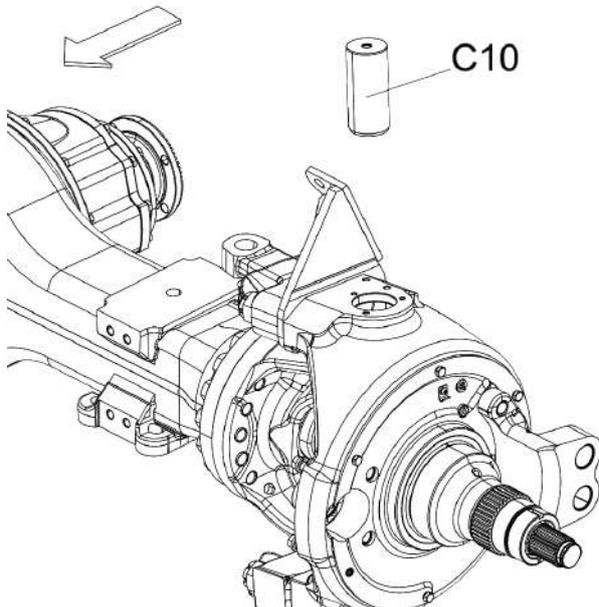
After removing the wheel hub detach the pipeline connection, remove the hex bolts (C23) of the vent valve holder (C21).



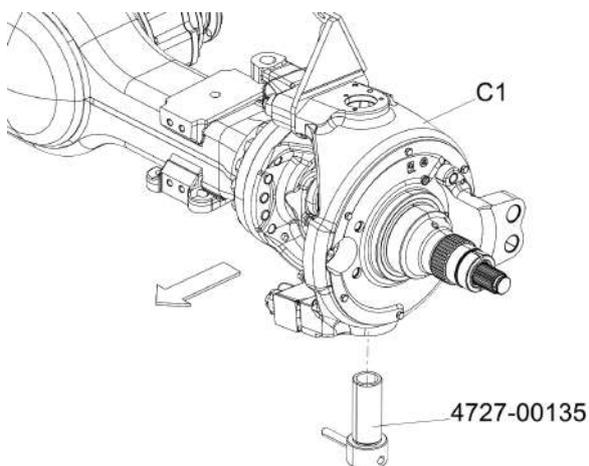
Then remove the cover (C12) of the knuckles pins



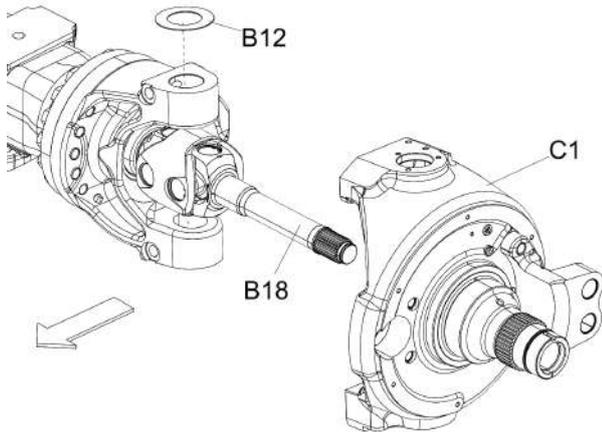
Remove the hex. flanged nuts (B15) from the draw keys (B14) and drive them out.



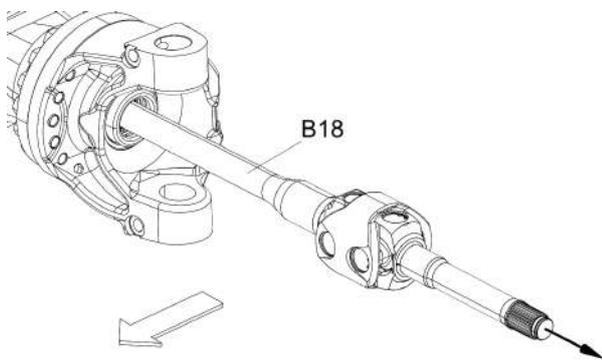
Properly backing up the steering knuckle pull the knuckle pins (C10) out.



Use the mandrel shown to secure the thrust bearing until pulling off the steering knuckle. After removing the steering knuckle remove these parts also from the steering knuckle.

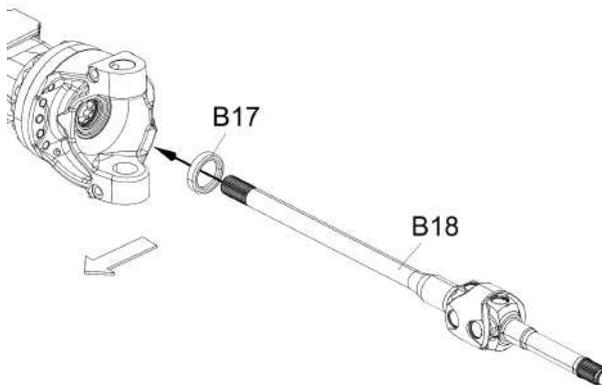


Following this catching safely pull the steering knuckle (C1) off the knuckle carrier and the outer axle-shaft (B18), then remove the shims (B12).



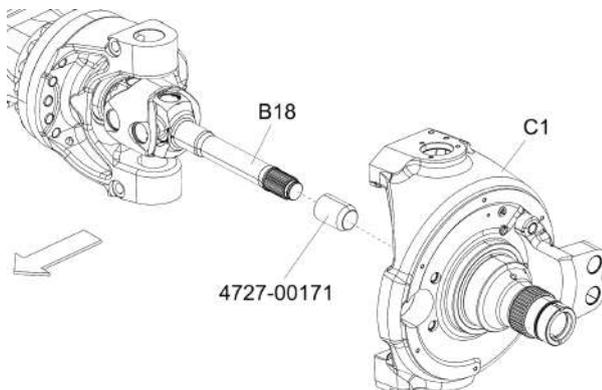
REMOVING THE DOUBLE JOINT

After removing the steering knuckle carefully pull the double joint (B18) out of the differential gear splines and the pinion carrier seals.



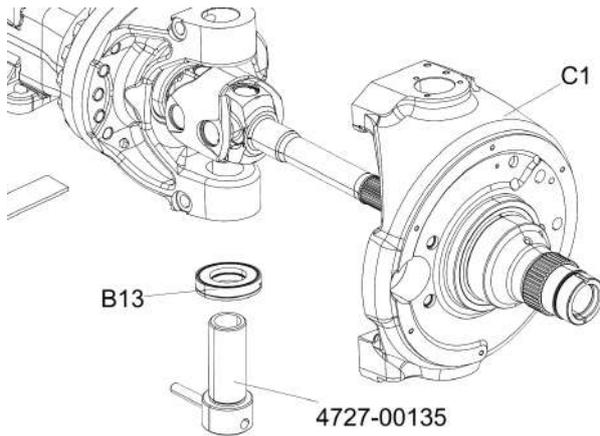
REINSTALLING THE DOUBLE JOINT

Carefully push the inner longer axle-shaft of the double joint (B18) thru the oil seal of the knuckle carrier and the bore of its cylindrical roller bearing, then aligning the splines push the axle-shaft until bottoming the differential, making sure not to damage the oil seal.



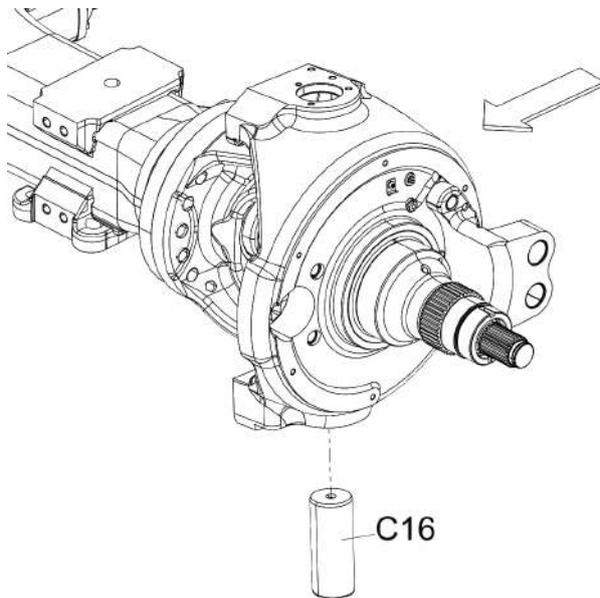
REINSTALLING THE STEERING KNUCKLE

Carefully push the relevant steering knuckle (C1) subassembled with inner seals over the service sleeve (shown in the figure) on the outer axle-shaft, taking care not to damage the oil seals, then pull the service sleeve off the axle-shaft end.

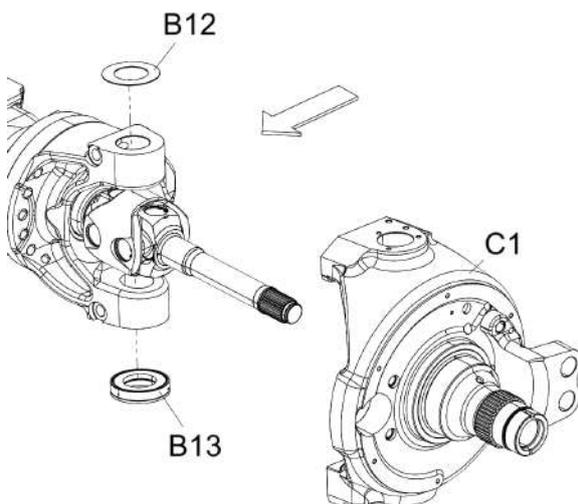


Align the bores of the steering knuckle and the knuckle carrier (for knuckle pin upper and lower).

At the lower bore fit the thrust bearing (B13), then push the mandrel shown in the figure until bottoming.



Mount in the knuckle pin lower (C16). Push up the steering knuckle so, thrust bearing shall be compressed and the thrust bearing parts shall be in metal-to-metal contact. Perform clearance adjustment in this state, as follows.

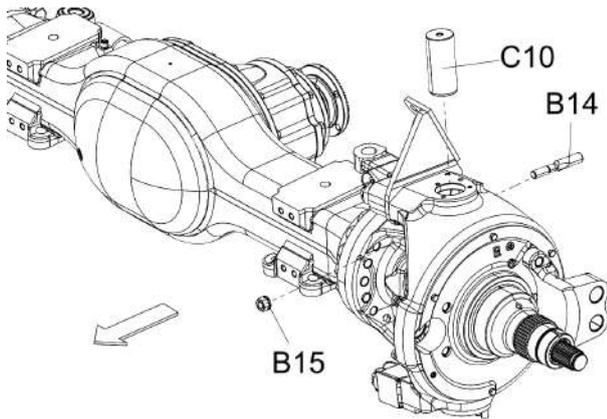


Use a feeler gauge to measure the distance between the plane of the knuckle carrier and the steering knuckle (C1) then from the shims (B12) select a pack of thickness 0.0 - 0.3 mm less than the measured value.

Insert the selected shim pack, then aligning the bores push back the service mandrel.

Position the steering knuckle to lower position and install the magnetic pedestal dial indicator. Moving the steering knuckle up and down check if the clearance is 0.0 - 0.3 mm.

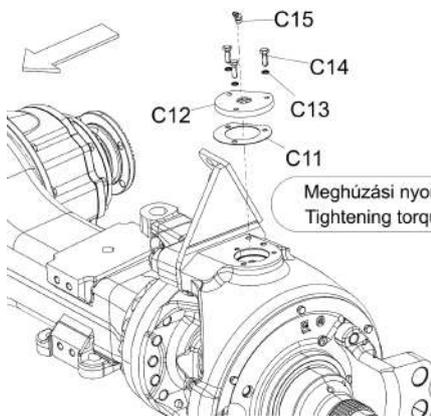
For accuracy perform the measurement several times.



In case of proper clearance install the relevant knuckle pins (C10 and C16) and secure by draw keys (B14). Screw the hex. flanged nuts to the draw keys and tighten to the specified torque.

Apply properly adhering anti-corrosion chassis paint coat to the inner end of the knuckle pins and to mating surface of the steering knuckle!

Meghúzási nyomaték: 50-70 Nm
Tightening torque: 50-70 Nm



Meghúzási nyomaték: 30-40 Nm
Tightening torque: 30-40 Nm

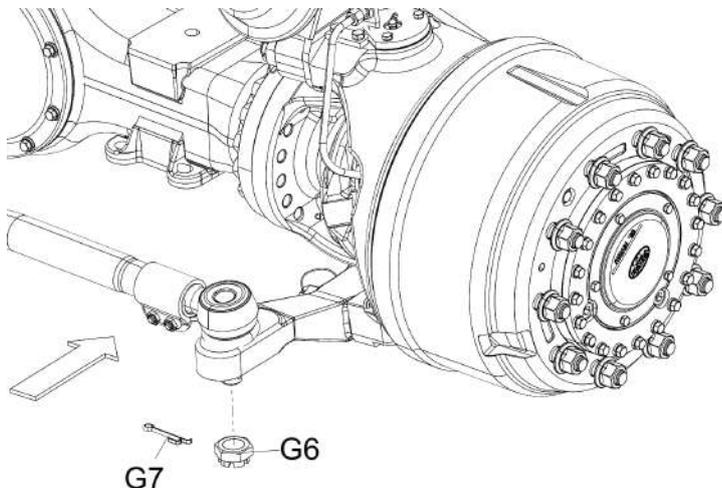
Install the covers (C12) together with gasket (C11) over the knuckle pins. Tighten the hex. bolts with lock washers to the specified torque

Screw one ball grease fitting (C15) into each cover and fill up the knuckle pin bearing with grease.

5.4.2 Removing and reinstalling the tie-rod

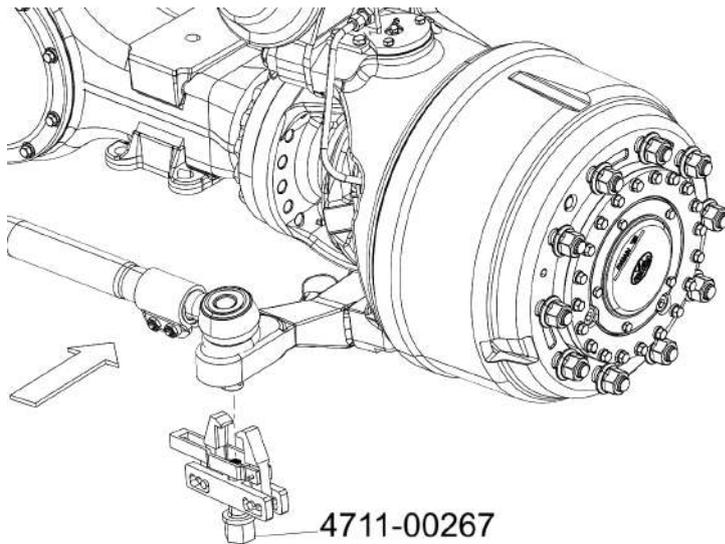
ATTENTION!

After the reinstalling of the tie-rod, adjust the steering geometry!

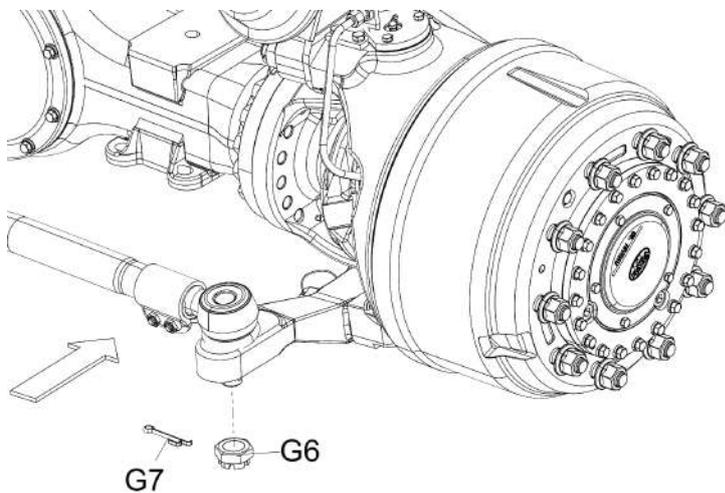


REMOVING THE TIE-ROD

Remove the cotters (G7) and back out the castle (G6) nuts.



Then remove the linkages from the tapered bore of the tie-rod arms by pressing out the ball stud with the tool shown.



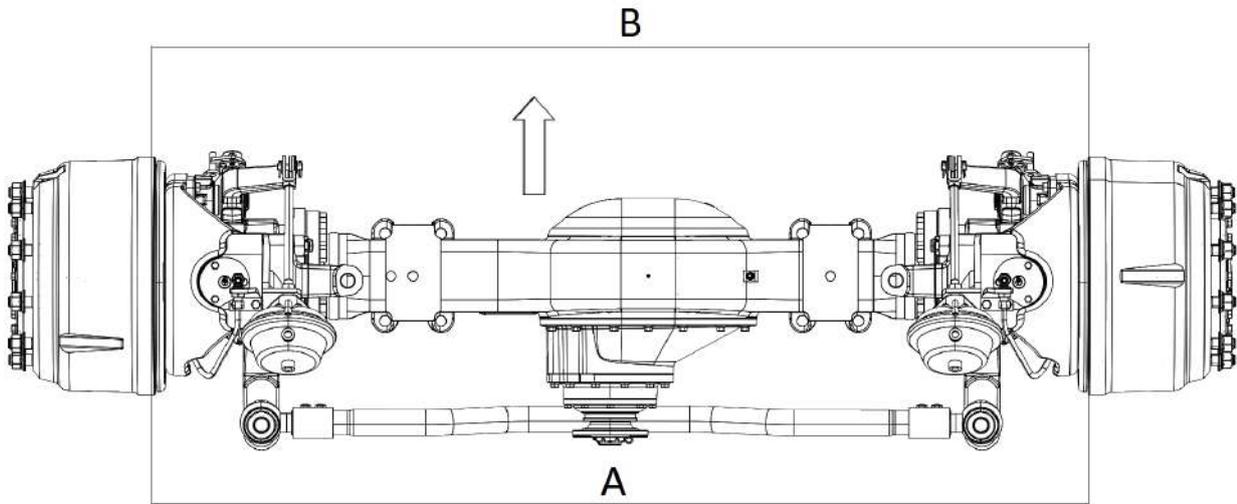
REINSTALLING THE TIE-ROD

Reinstall the tie-rod in reverse order of removal.

5.4.3 Toe-in - measurement and adjustment

Wheel toe-in means the difference between the dimensions "A" and "B" as measured at the height of the wheel centre in front and rear on the wheel hub. Value "B" measured at the front is smaller than value "A".

Measure the dimension "A" and mark the place of measurement, then turn the wheel over by 180° and measure dimension "B" at the marked place.



TOE-IN=A - B

Attention!

Perform toe-in measurement with axle installed to the vehicle and not jacked up.

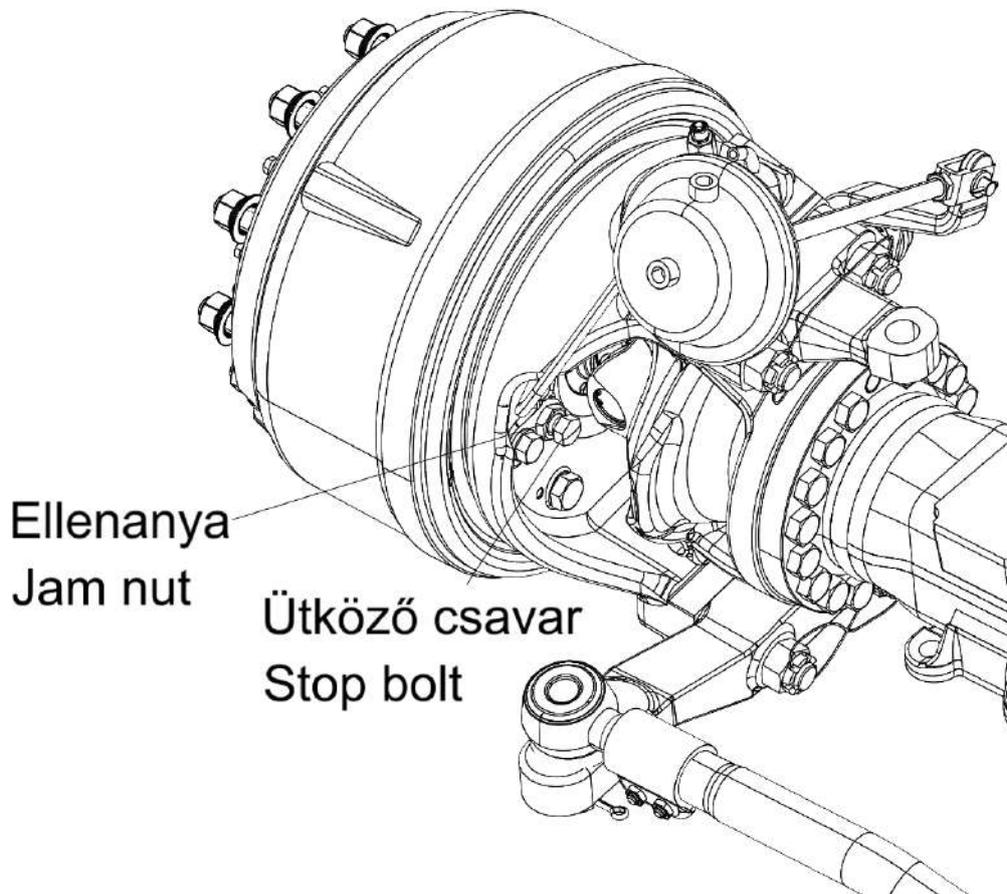
Loosen the tie-rod nuts, and adjust the toe-in by turning the tie-rod to the required direction.

After the adjustment, the tie-rod slit and the stem of the tie-rod clamps should face downward, under angle of $\pm 45^\circ$ from the vertical plane. If required remove a ball joint head, turn off the tie-rod by 180° and turn off the ball joint head by 360° to proper direction to assure the slit shall be in proper position.

After proper adjustment see the reassembly steps in chapter *Workshop manual*

5.4.4 Adjusting the max. inner wheel turn angle

Adjust the stop bolt to bottom on the axle body, when the inner wheel turn angle (α) is the maximum - specified in chapter *Technical data*.



Attention!

With the pressure of the relief valve adjust the steering gear power so, the servo effect shall terminate 2.0-3.0 mm before the stop bolts bottom on the axle body.

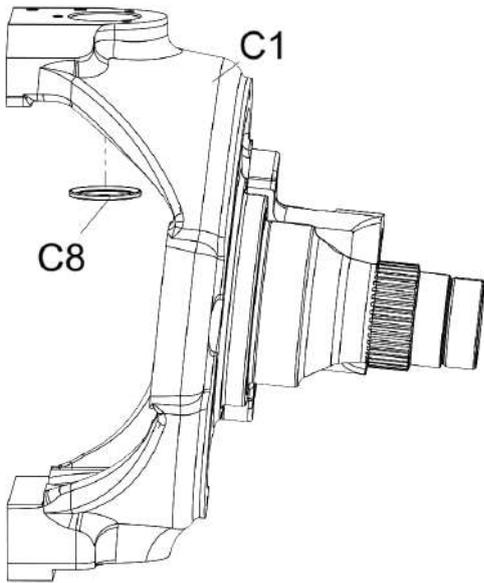
Secure the stop bolts by tightening the jam nut to 60 - 80 Nm torque.

Perform the adjustment of the max. inner wheel turn angle both sides.

When adjusting the inner wheel turn angles, the double joint may not interfere with the knuckle carrier and the steering knuckle.

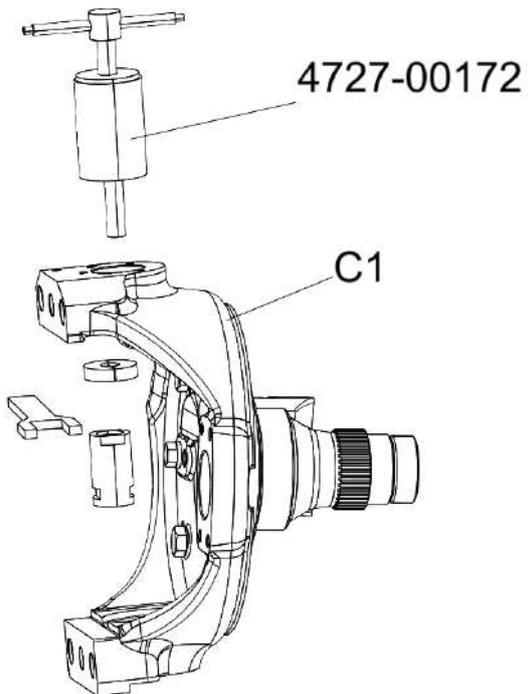
The outer wheel turn angle is a resultant value.

5.4.5 Assembling the knuckle pin bearing bushing and the oil seal



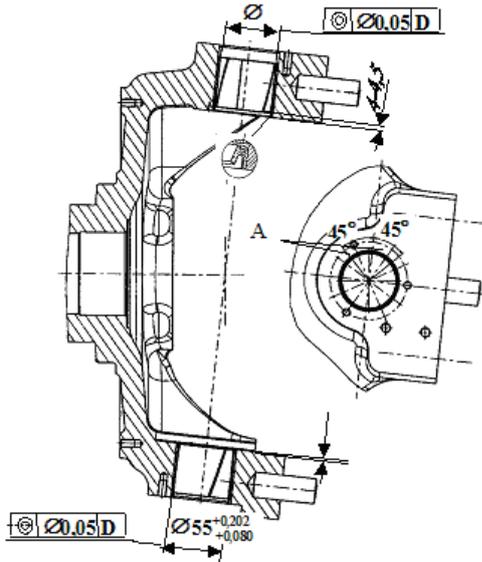
REMOVING THE KNUCKLE PIN BUSHINGS

Remove the oil seal (C8) with a pry.



Use the device arranged from the parts shown for the pulling out the knuckle pin bushing on both sides.

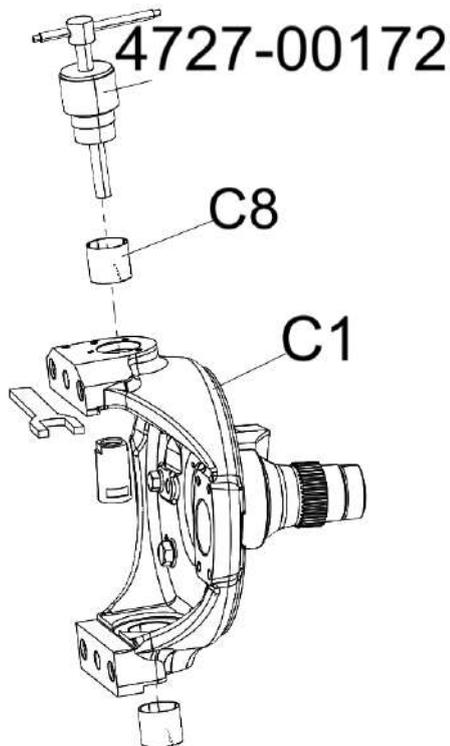
(Parts of the device: 4727-00172 -01, -02, -03, -04, -07, -08, -09, -10, -11, -12)



REINSTALLING THE KNUCKLE PIN BUSHINGS

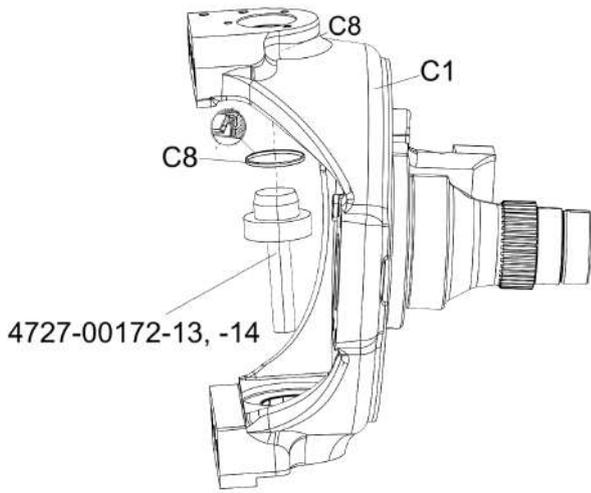
When pressing in the knuckle pin bushes make sure to check if the slot of the bushes faces toward the area indicated in the figure, both at the lower and upper bush. Apply grease to outer surface of the bushes.

A= The slot in the upper and lower bush should face toward the indicated area



Use the device arranged from the parts shown press in the bushings (C8) to the upper and lower side, as well.

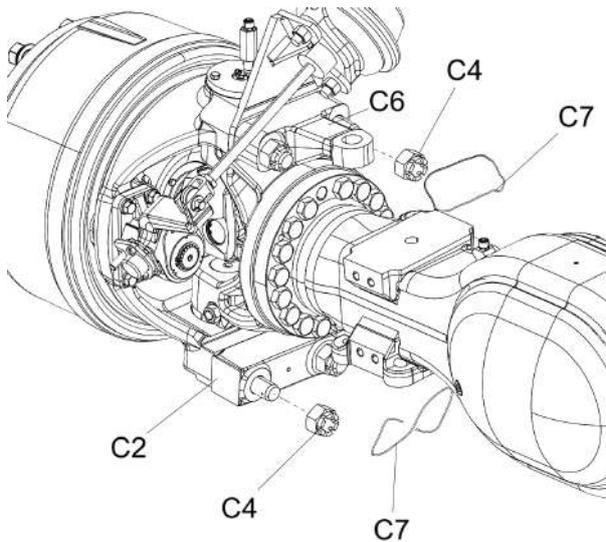
When installing the lower bush, before completely pressing in, remove the insert ring of the device so, to be able to press the bush into depth.



Drive in the specified sealing ring (C8) beside the upper bushing with the tools shown. Make sure to install the oil seal as shown in the drawing

The sealing ring may not extend from plane of the steering knuckle.

5.4.6 Removing and reinstalling the steering arm, the chamber bracket and the tie-rod arms

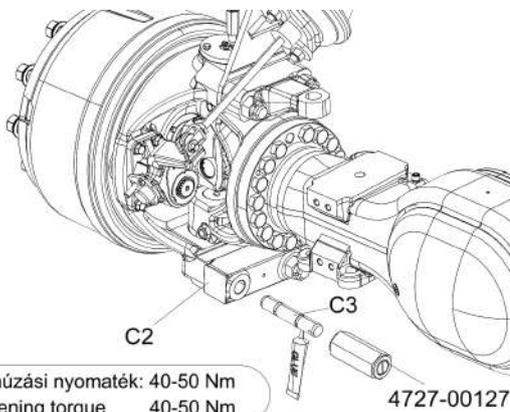


REMOVING THE STEERING ARM, THE CHAMBER BRACKET AND THE TIE-ROD ARMS

Removing the castle nuts (C4) cut their securing wire (C7) and back out the castle nuts.

Following this remove the arms from the steering knuckle. (The dowel pins remain in the steering knuckle.)

After removing the steering arms the diaphragm holder can also be removed from the steering knuckle, that is from the stud bolts.

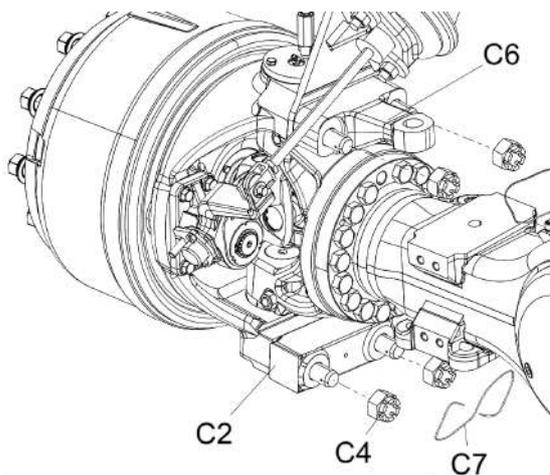


REINSTALLING THE STEERING ARM, THE CHAMBER BRACKET AND THE TIE-ROD ARMS

Using the stud bolt driver install the new stud bolt - after apply thread adhesive to 4 - 5 threads - and tighten to specified torque

Meghúzási nyomaték: 40-50 Nm
Tightening torque 40-50 Nm

4727-00127

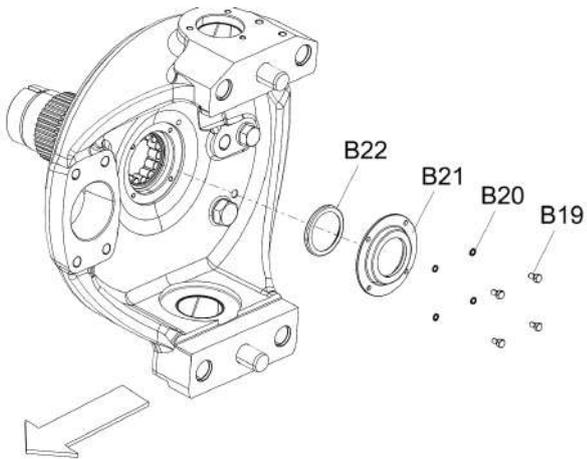


Install the relevant chamber bracket, steering arm (C6), and tie-rod arm (C2) to the steering knuckle and secure by the castle nut (C4).

Secure the castle nuts by securing wire (C7) thru the stud bolt bore.

Meghúzási nyomaték: 540-590 Nm
Tightening torque 540-590 Nm

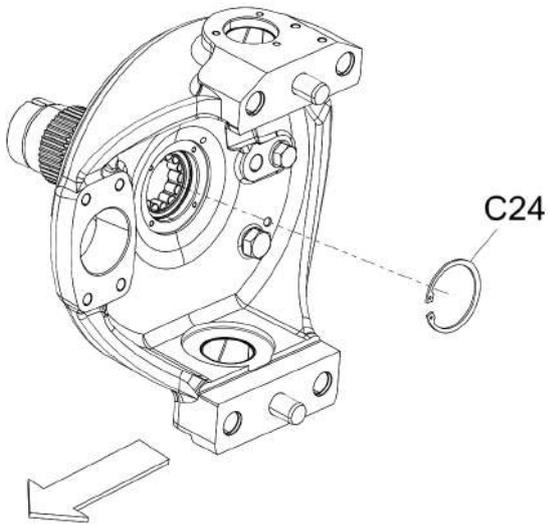
5.4.7 Removing and reinstalling the inner bearing and seals of the steering knuckle



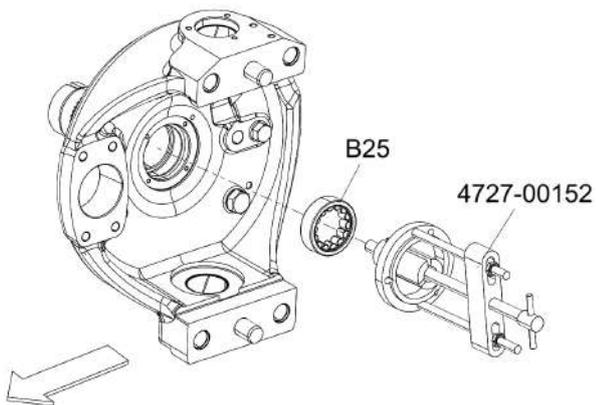
REMOVAL

Unscrew the hex bolts (B19) and remove the dust protection plate (B21).

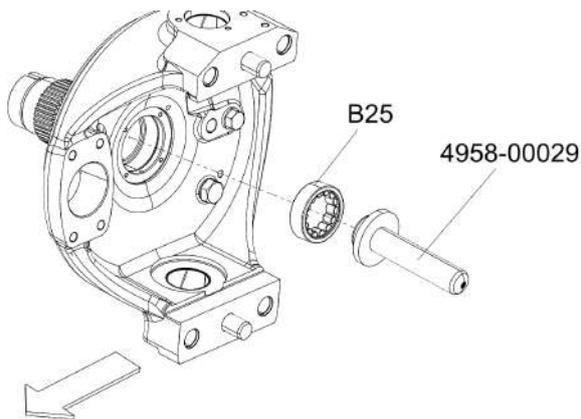
After that remove the oil seal (B22) with a pry.



Remove the snap ring (C24) in front of the cylindrical roller bearing.

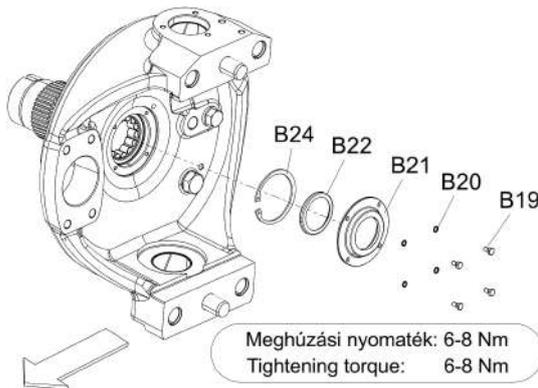


Then using the puller pull out the bearing (B25).



REINSTALLATION

First drive the cylindrical roller bearing (B25) into its seat to bottoming.



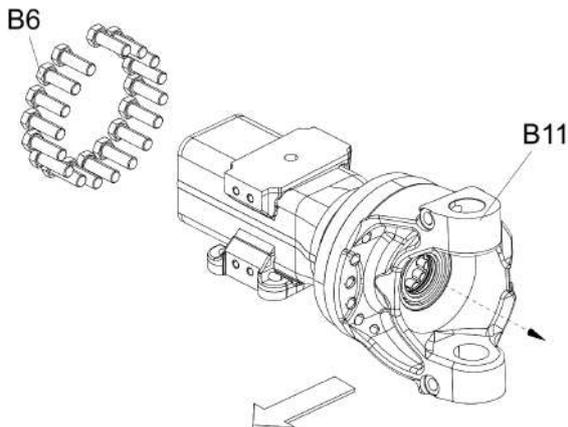
After driving in the bearing install the snap ring (B24) to its seat with a snap ring pliers.

With the tool used for the cylindrical roller bearing drive the sealing ring (B22) ahead of the snap ring.

With lock washers and hex. bolts (B20) install the dust protection plate (B19) supplied with pressed in sealing ring and tighten the bolts.

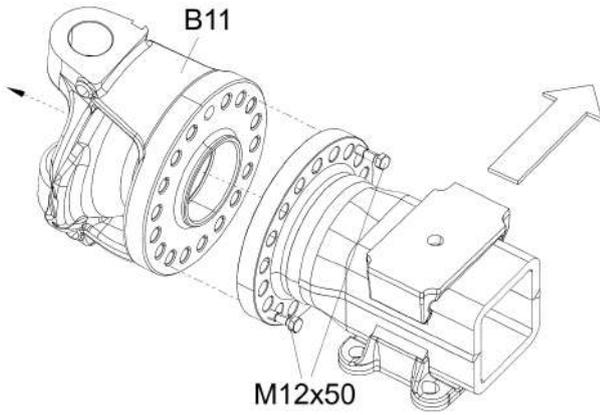
Fill up the space between the dust protection plate and the sealing ring, as well as space between the lips of the sealing rings and the bearing with LZS2 grease

5.4.8 Removing and reinstalling the bearing and seals of the knuckle carrier



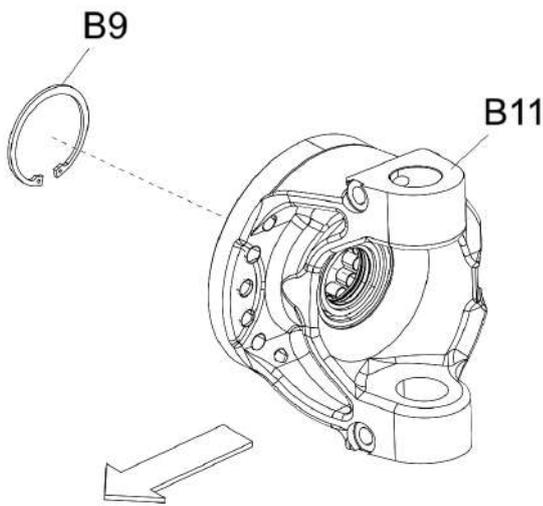
REMOVAL

After removing the double-joint remove the hex. bolts (B6) from the axle housing flange, then separate the knuckle carrier (B11) from the axle housing, with 2 pieces of M12 bolts of at least 40 mm thread length driven into the axle housing flange.

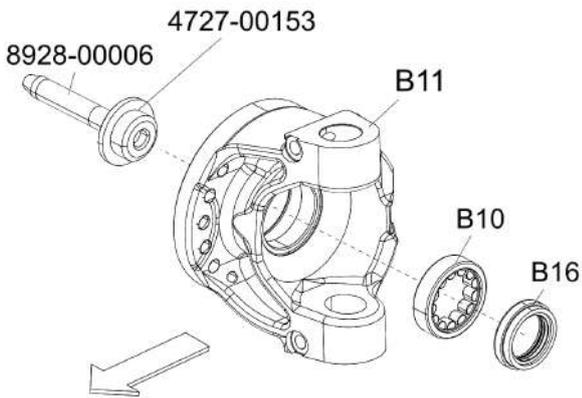


REMOVAL

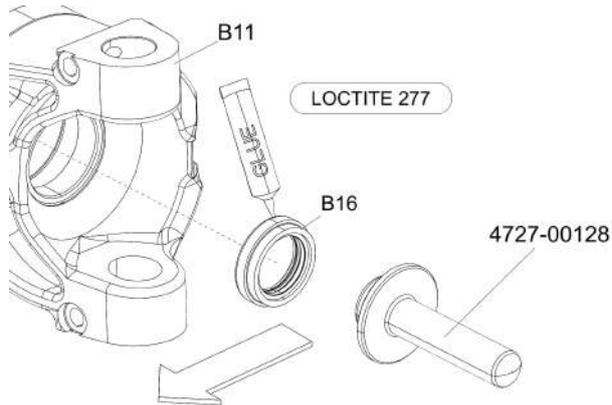
With 2 pieces of M12 bolts of at least 40 mm thread length driven into the axle housing flange.



With snap ring plier remove the snap ring (B9).



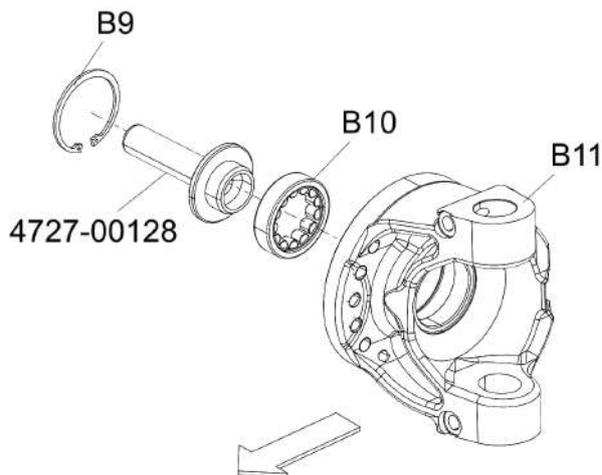
Drive out the cylindric roller bearing (B10) and the seal retainer (B16) using the tool, shown in the figure.



INSTALLATION

For installation turn the knuckle carrier over and first drive in the seal retainer subassembled with sealing ring (B16) until the tool bottoming.

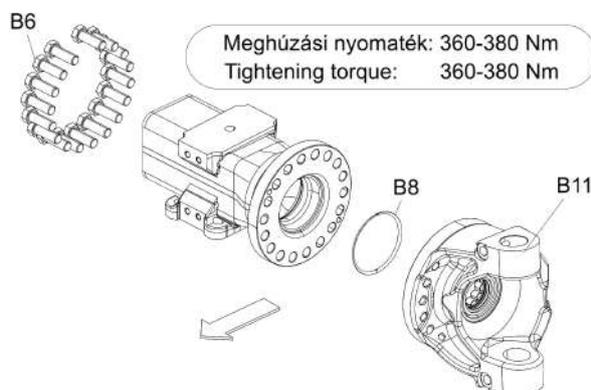
After pressing in fill up the gap between the sealing lip and the dust protection edge of the sealing ring with specified grease.



Drive in the cylindric roller bearing (B10) with the tool shown.

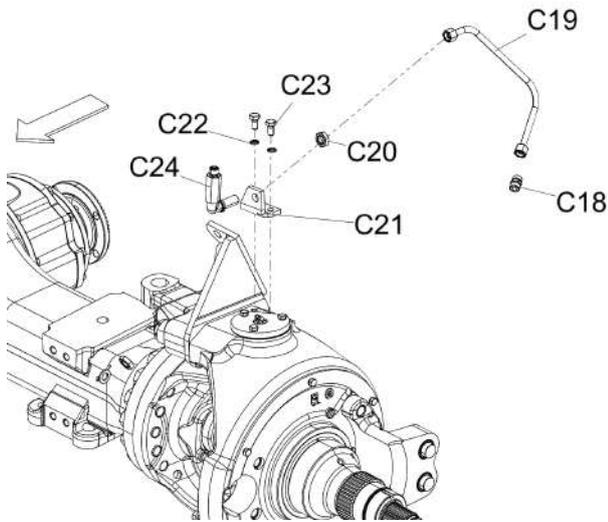
Fill up the space between the lips of the sealing ring and the bearing with LZS-2EP grease.

Secure oil-proof cylindric roller bearing with a snap ring (B9).



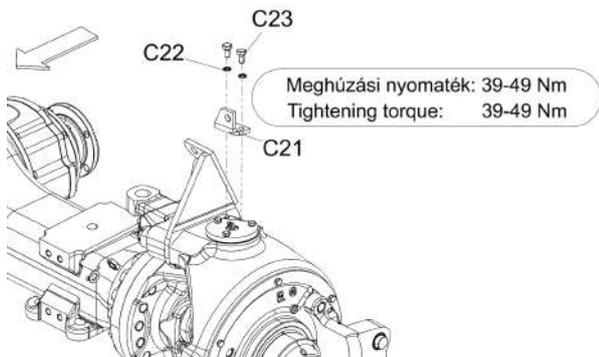
Install the sealing ring (B8) then connect the knuckle carrier (B11) to the axle housing and attach with hex. bolts (B6) coated with thread locker and tighten to the specified torque.

5.4.9 Assembling the ventilation pipe



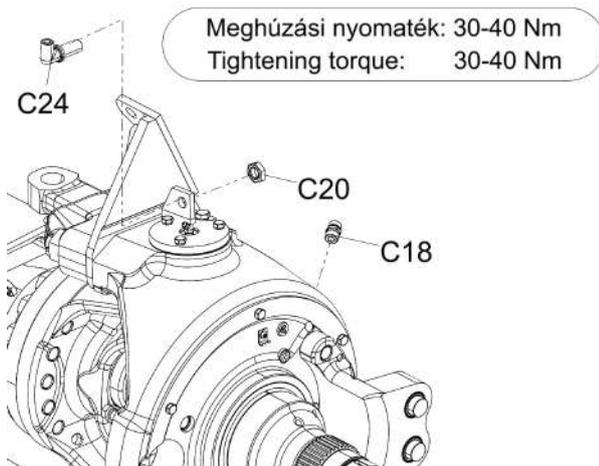
REMOVING THE VENTILATION LINE

Detach the ventilation line at the pipe fitting (B18) of the steering knuckle and the elbow (C24) on the holder (C21) mounted to the steering knuckle. Remove the pipe and unscrew the fitting from the steering knuckles as well as the elbow from the holder after removing the low nut (C20).



REINSTALLING THE PIPE

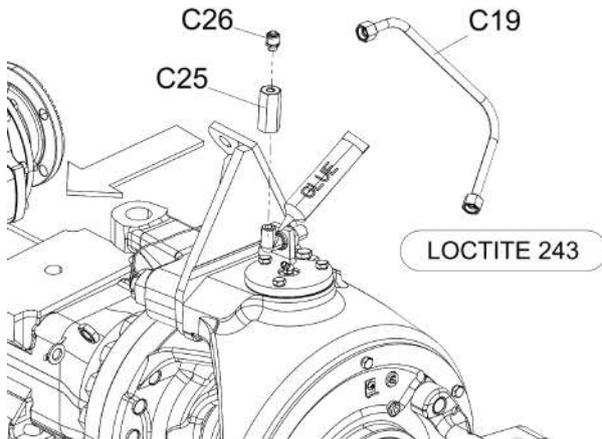
Attach the holder (C21) on the steering knuckle with 2 hex. bolts (C23) and lock washers (C22).



Screw the elbow into the threaded bores of the holder (C24) and secure by low nut (C20) tightened to specified torque after the vent valve is installed.

Install the pipe fitting (C18) coated with thread locker into the threaded bores of the steering knuckle.

Close the bore of the steering knuckle with grub screw coated with thread locker.



Connect the relevant (RH - LH) pipelines (C1) by the union nut to the pipe fitting (C18) and the elbow (C24), then tighten to be leak-tight. Screw the reducing fitting (C25) with thread locker, and screw the vent valve (C26) to the elbow so, the vent valve shall be vertical.

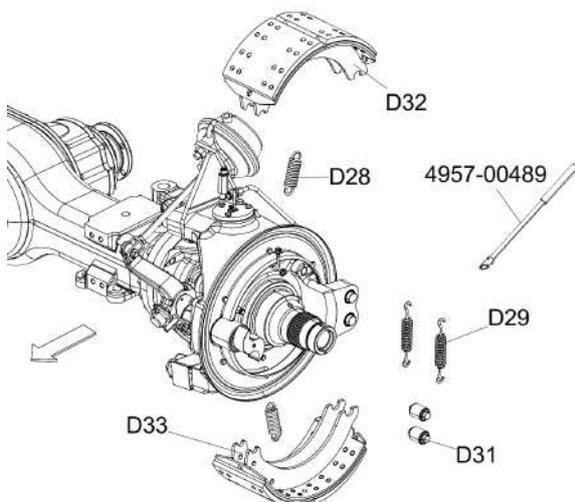
Install the threaded extension of the vent valve to the axle housing so, the vent valve shall be vertical.

5.5 Wheel brake

5.5.1 Removing and reinstalling the brake shoes

ATTENTION!

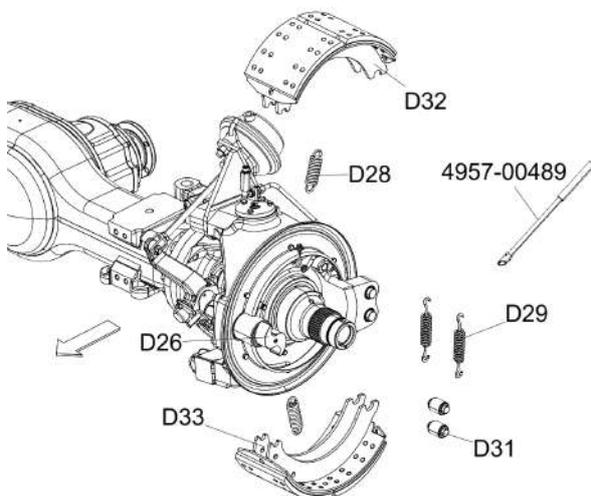
The roller - with grease - has been supplied as an assembled unit



REMOVING THE BRAKE SHOES

After the removal of the brake drum use a pry the brake shoes (D32, D33) away. Remove the rollers (D31)

Unhook the shoe return springs (D28, D29) with the use of the spring hooking device, then remove the brake shoes.



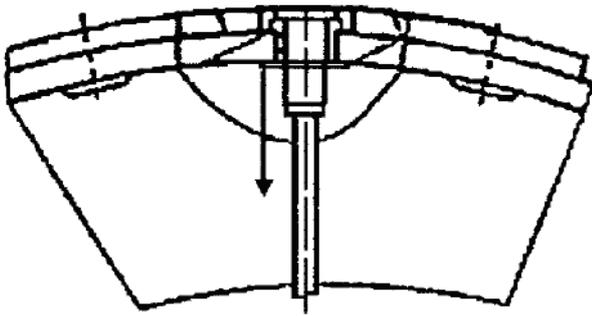
REINSTALLING THE BRAKE SHOES

Position the brake shoes (D32, D33) to be placed in shoe anchor pin (18) on the brake camshaft head.

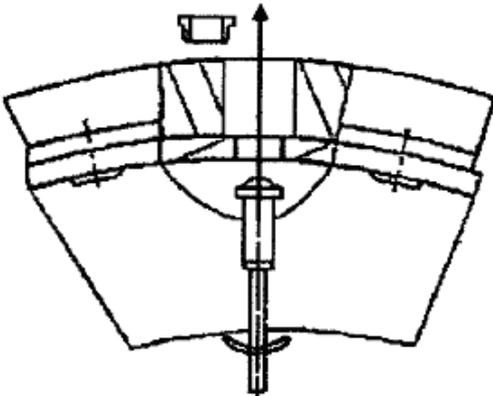
Hook the return springs (D28, F29) to the brake shoes. For hooking use the springs hooking device

Pry the brake shoes away, then insert the rollers (D31) so, they shall seat both in the brake shoe rib and in the brake spanner involute profile

5.5.2 Dismounting and remounting the brake lining wear indicator

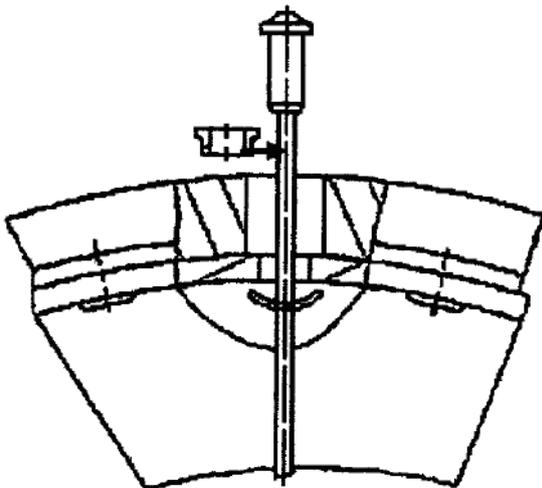


In case of dismounting push out the used wear indicator from the hole. To this push-down the duo-clip from the wear indicator by a screwdriver.



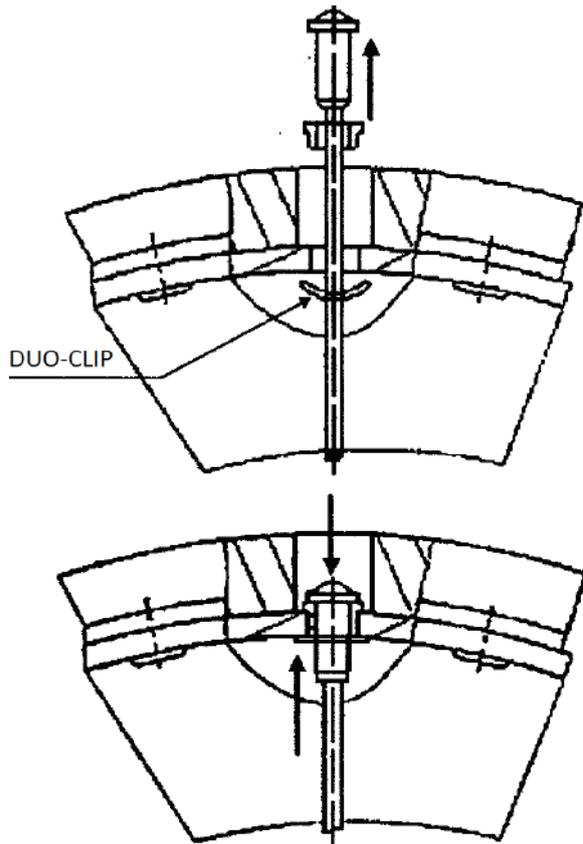
Pull the wear indicator and the wiring through the hole of the slot-hole in the brake support and push them across the liningless side hole of the brake lining holder.

Note: the wear indicator should directed above of he brake lining.



Push the spacer bushing with the axial groove above the electrical conductor, and press it into the sensor head.

Note: The flange on the spacer bushing should directed towards to the wear indicator head.



Push the wear indicator with the spacer bushing into the gap of the brake lining holder, and push the duo-clip into the wear indicator until bottoming to the brake lining holder

ATTENTION!

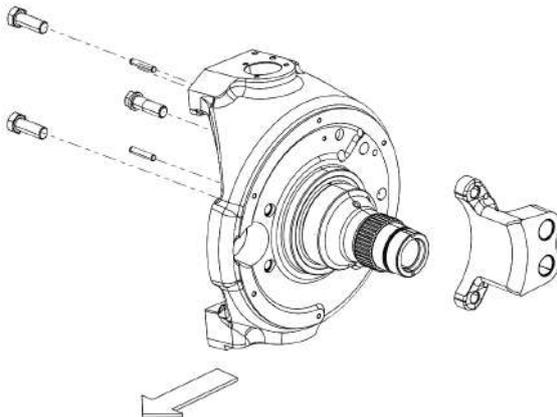
If the duo-clip was not preassembled into the electrical conductor, then take care of the installation position. The arched part should be directed towards the brake lining holder.

Check the mounted wear indicator for fix adaptation, it should not be movable in the axial direction.

After mounting the wear indicator, bend the holder plate to the connecting wire and fix it with a bolt coated with thread locking material LOCTITE 243. Tighten the bolt to 9 - 10 Nm torque.

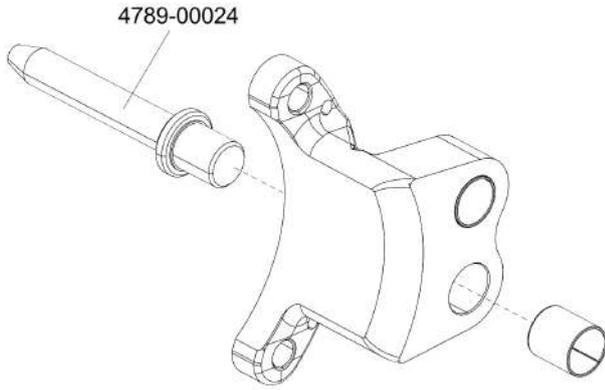
5.5.3 Removing and reinstalling the brake support and the camshaft support, assembling the spring support pin

In case of damage to the brake support the steering knuckle assembly machined together with the brake support should be replaced.

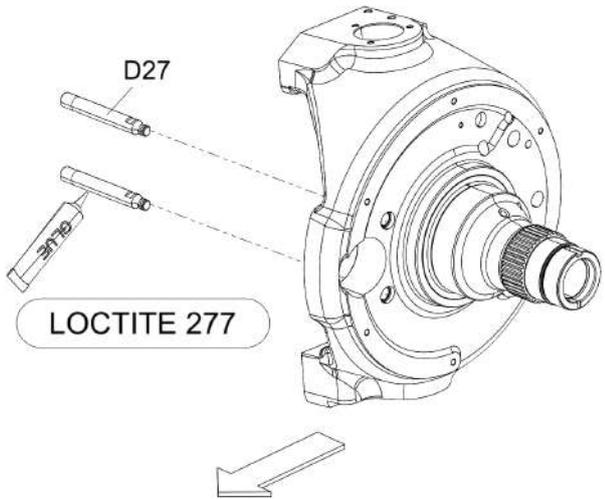


REMOVING THE BRAKE SUPPORT

Remove the brake support from the steering knuckle.

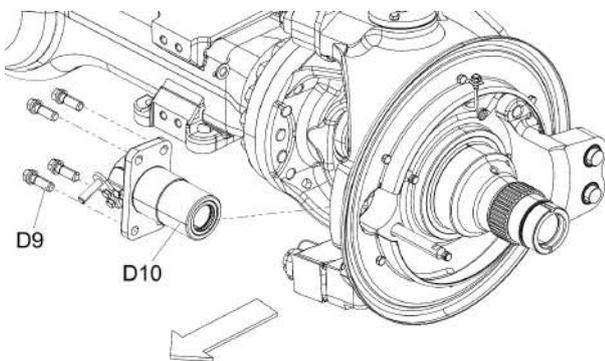


If the anchor pin bushing are to be replaced, drive out the old ones, and drive in the new ones with the tool shown.



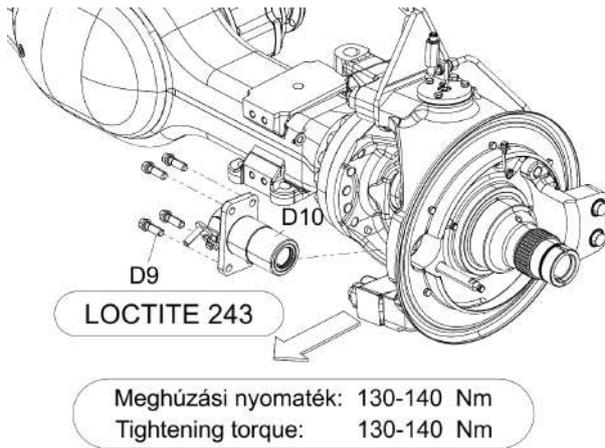
ASSEMBLING THE SPRING SUPPORTING PINS

Install the spring support pins (D27) with thread adhesive.



REMOVING THE CAMSHAFT SUPPORT

After removing the hex. flanged bolts (D9) pull the camshaft support (D10) out of the steering knuckle.



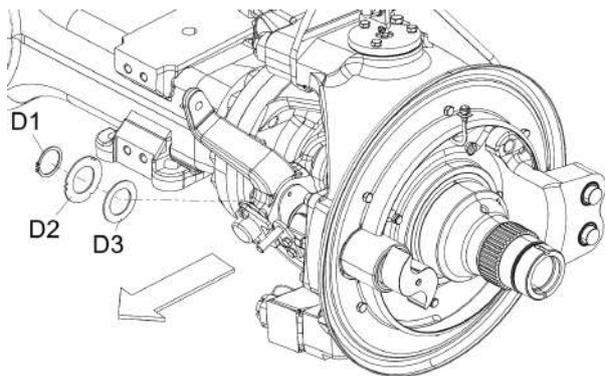
REINSTALLING THE CAMSHAFT SUPPORT

The relevant (RH-LH) camshaft support (D10) should be positioned into bore of the steering knuckle and secure by hex. flanged bolts (D9) coated with thread locker. Tighten the bolts to the specified torque.

5.5.4 Removing and reinstalling the slack adjuster and the camshaft

ATTENTION!

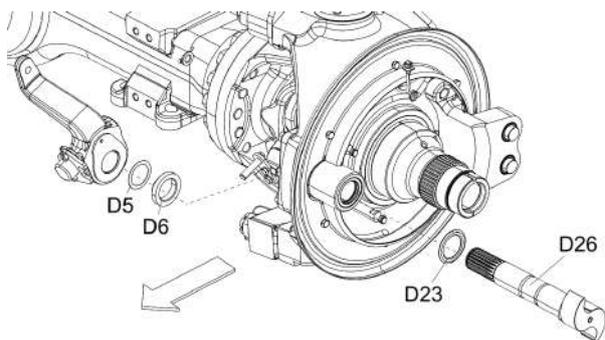
After installing the camshaft make sure it is installed properly (RH, LH). Actuating the slack adjuster brake shoe should open!



REMOVING THE CAMSHAFT

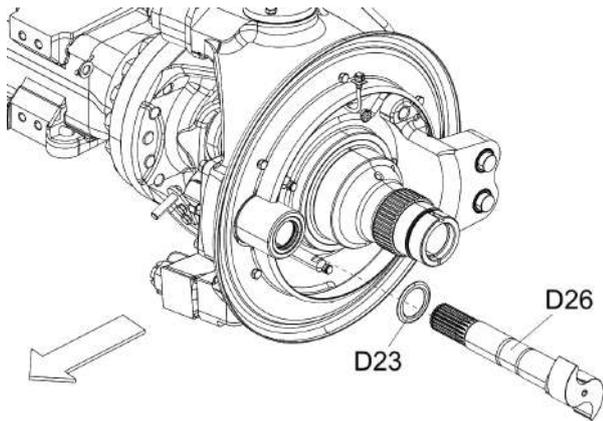
Removal of the camshaft can be performed after the removal of the brake shoes.

Remove the snap ring (D1), the spacer (D3) and the wear indicator disc (D2).



Pull the slack adjuster (D4) and the shims (D5, D6) off the camshaft (D26).

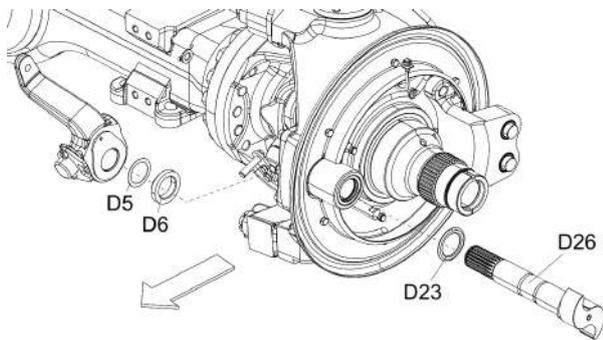
Pull the camshaft (D26) out of the camshaft support and remove the spacer (D23).



REINSTALLING THE CAMSHAFT

Position the spacer (D26) to the relevant camshaft (RH - LH) till bottoming against the camshaft head.

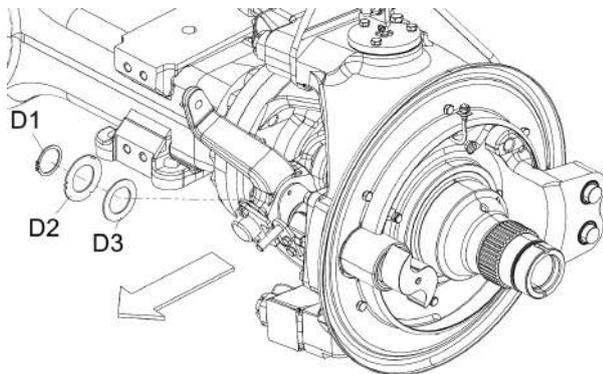
Apply grease to the camshaft bushings and push the camshaft subassembled with spacer into the bushing of the camshaft support.



REINSTALLING AND ADJUSTING THE SLACK ADJUSTER

Install the shim (D6), the required number shims (D5) and the relevant slack adjuster (RH-LH) to the camshaft.

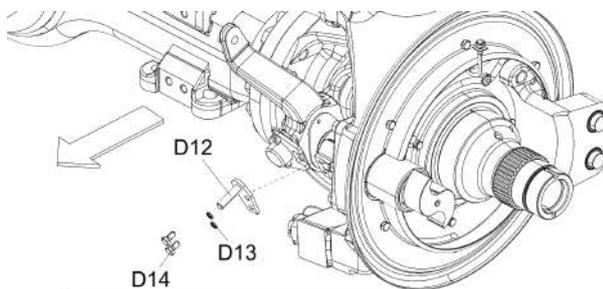
Install the slack adjuster to the camshaft so, the bore centre of the slack adjuster bushing shall be in distance 318 mm from the sealing plane of the chamber holder.



Position the wear indicator disc (D2), the shim (D6) and the lock ring (D1) to the end of the camshaft.

After adjusting the above A=318 mm dimension and the 0.3 - 0.6 mm shoe clearance, adjust the wear indicator disc so, the cut-out marked "0" on the disc and the recess on the lever shall be in the nearest position to each other.

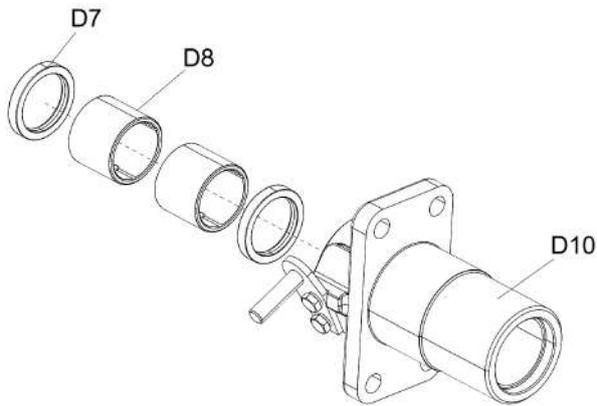
Check the axial clearance of the camshaft to be between 0.5 - 1.5 mm. If required perform readjustment with shims (D6).



Attach the relevant slack adjuster stops (D12) (RH-LH) to the chamber holder with 2 off hex. bolts (D14) mounted with lock washers (D13). Tighten the hex. bolts to the specified torque.

Meghúzási nyomaték: 20-25 Nm
Tightening torque: 20-25 Nm

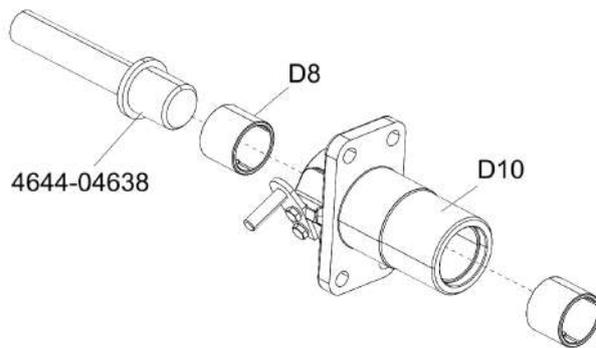
5.5.5 Repairing the slack adjuster bearing support



REMOVING THE BEARING BUSHINGS AND THE SEALS

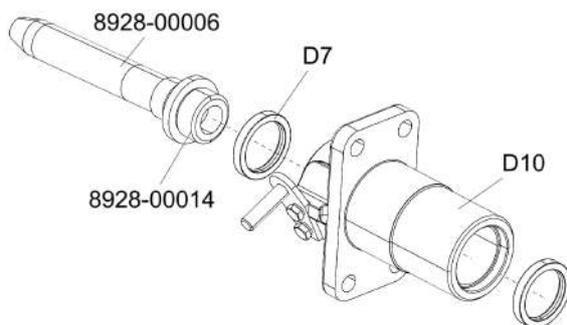
With the tool shown pull the bearing bushings (D8) out of the camshaft support (D10).

The bushings will push out the oil seals (D7) ahead.



REINSTALLING THE BEARING BUSHINGS

With the tools shown drive the new bearing bushings in, until the tool bottoming.



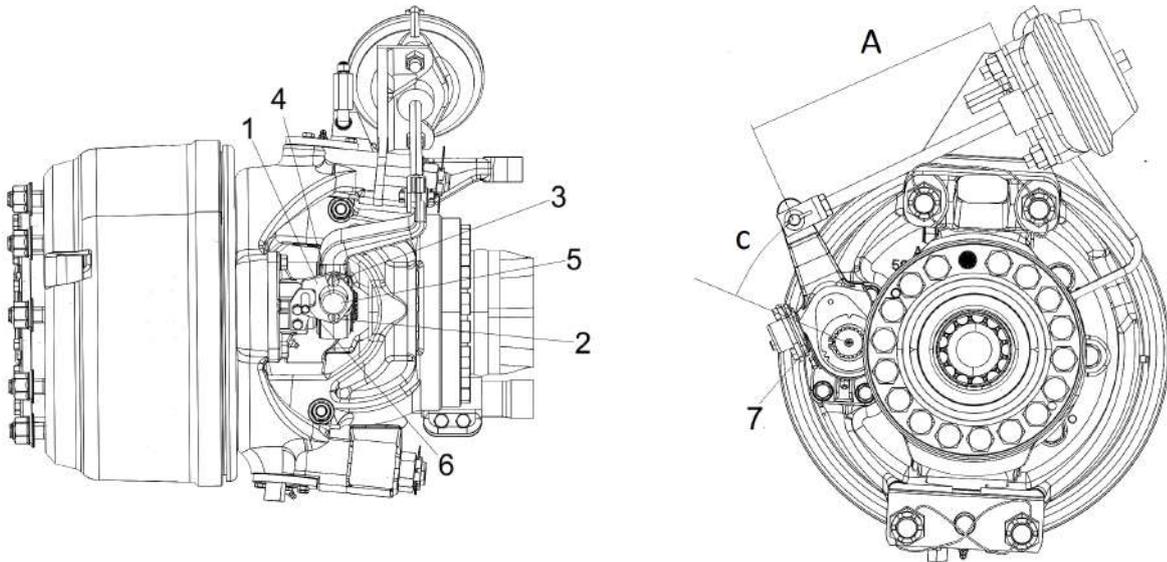
REINSTALLING THE OIL SEALS

When reinstalling the seals make sure to check if the sealing lips of the rings both near the camshaft head and on the slack adjuster side face toward the axle housing and the mid-plane of the axle. This means leak-tightness at the camshaft head is assured.

During lubrication with grease the oil seal near the slack adjuster should pass the surplus lubricant toward the camshaft.

Press the oil seals (D7) to the bushings with the using of the tool shown.

5.5.6 Automatic slack adjuster “MOM” type



Items:

1. Adjuster plate
2. Locking bolt (width across flats: 13)
3. Locking bolt (width across flats: 10)
4. Protecting cap
5. Hexagon adjusting bolt (width across flats: 32)
6. Stop pin
7. Thread protector

The clearance between the brake drum and the brake linings is automatically readjusted by the slack adjuster according to the thickness of the brake linings.

When brake chambers are mounted onto a new axle or the brake linings are replaced or the axle is repaired, the clearance between the brake drum and the brake linings and the automatic slack adjuster shall be adjusted as the followings:

- A —Distance of the chamber bracket plane to the slack adjuster bore centre
- C — Slack adjuster radius

For dimensions A and C refer to chapter *Technical data*.

Adjusting the slack adjuster position and the clearance between the brake drum and the brake linings:

1. Remove the locking bolts (2,3).
2. Take care of the thread protector (7).
3. Remove the adjuster plate (1) and the protecting cap (4).
4. By turning the hexagon adjusting bolt (5) to proper direction, adjust the distance of the brake chamber seating surface to the slack adjuster bore (A) specified on the master print. (Start adjustment from a value higher than the specified.) Adjust the distance of the brake chamber seating surface to the pushrod fork bore centre to the same value (A).
5. Adjust the clearance between the brake drum and the brake linings as followings: by turning the hexagon adjusting bolt (5) press the brake linings against the brake drum and then turn the hexagon

adjusting bolt (5) back in 270° (3/4 turn). Following the above operation, the clearance between the brake linings and the brake drum will be 0.3-0.6mm.

Adjusting and fixing the adjuster plate

1. Fix the stop fork "E" of the adjuster plate (1) relative to the stop pin (6) in the lower position
2. Make the adjustment by remounting the protecting cap (4), the adjuster plate (1) and by driving in and fixing the locking bolts (2, 3), by screwing the thread protector (7) on.
3. When fixing, the plane of the adjuster plate shall be perpendicular to the stop pin (6).

5.6 Differential carrier assembly

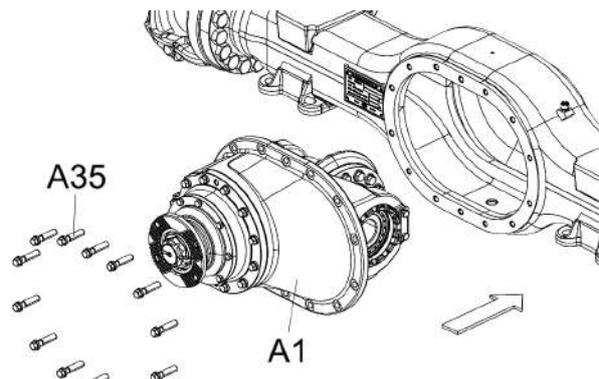
5.6.1 Removing and reinstalling the differential carrier assembly

ATTENTION!

Before removing the differential carrier assembly from the axle drain the oil!

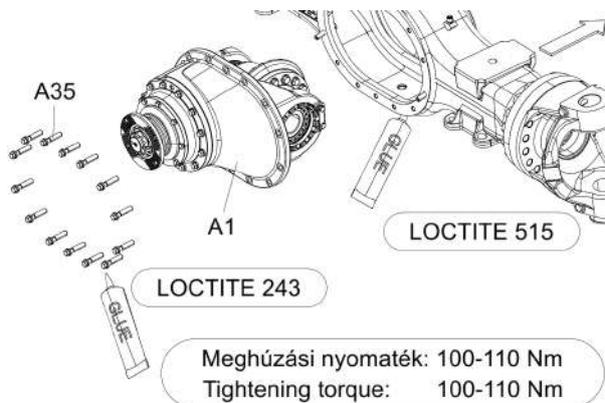
For removing the differential carrier pull the inner axle-shafts of the double-joint out of the differential. This can be performed in two ways:

1. After removing the wheel hub and the steering knuckle, remove the double joints
2. Assembly can be performed in case of removal the knuckle carrier with wheel hub, as well. Perform removal and reinstallation of the knuckle carrier.



REMOVAL

Remove the hex. flanged bolts (A35) attaching the differential carrier assembly (A1) to the axle housing and lift out the carrier

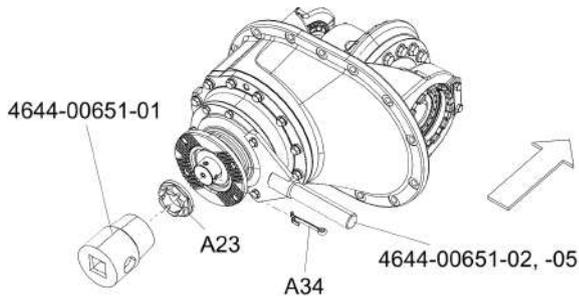


REINSTALLATION

Apply sealant to the thoroughly cleaned axle housing flange.

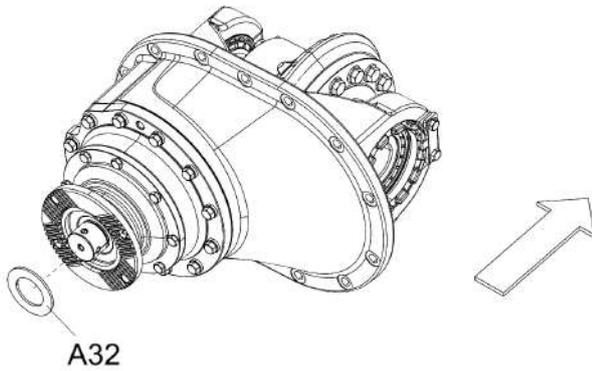
Install one M12 stud bolt to two opposite bores in the axle body, then fit the differential carrier assembly (A1) into the axle housing guided by stud bolts and secure by hex. flanged bolts (A35) coated with thread locker.

5.6.2 Removing and reinstalling the companion flange and the cover, replacing the oil seal

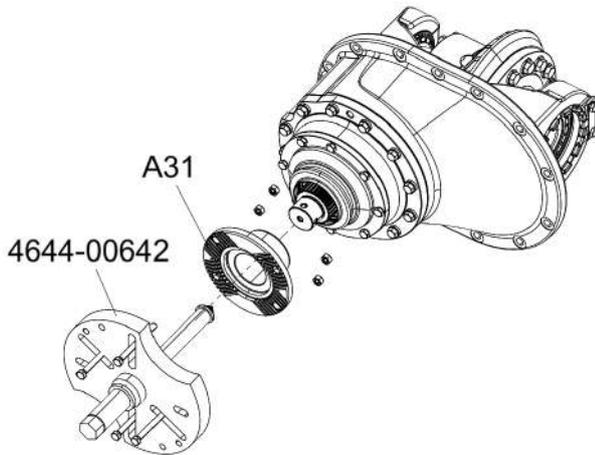


REMOVING THE COMPANION FLANGE

After removing the cotter pin (A34) remove the flanged castle nut (A23) with the tools shown.

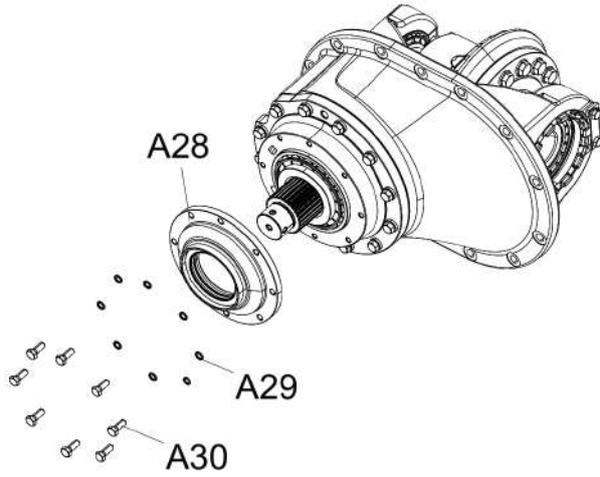


Remove the washer (A32).



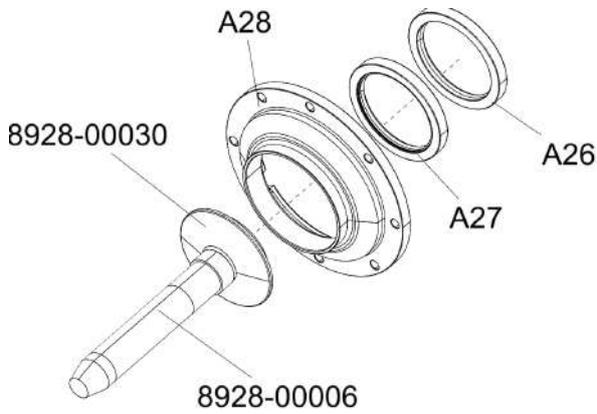
For pulling off the companion flange use the device shown.

Parts of the device: 4644-00642- 01, -22, -25, -26, -27

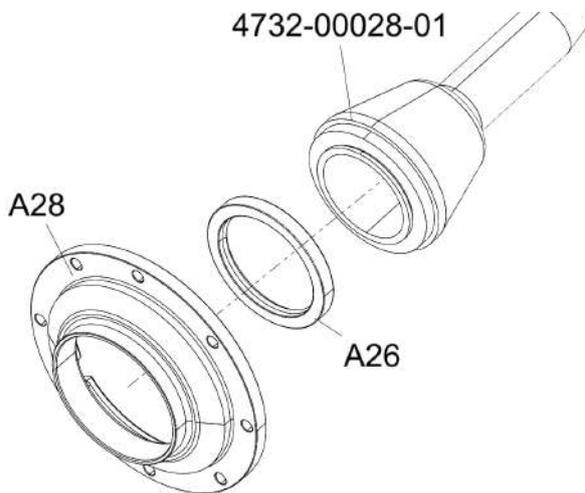


REPLACING THE OIL SEAL IN THE COVER

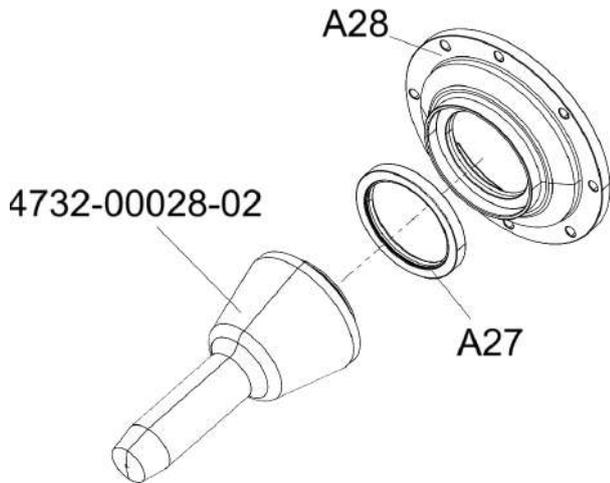
Remove the cover (A28).



Drive out the used seals (A26, A27) with the tools shown.

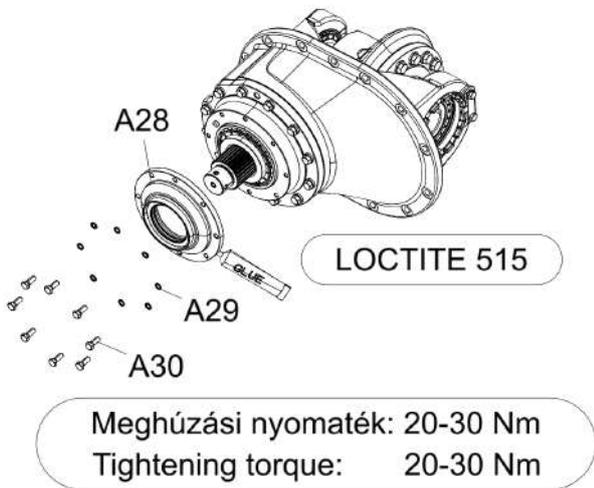


Drive in the inner seal (A26).



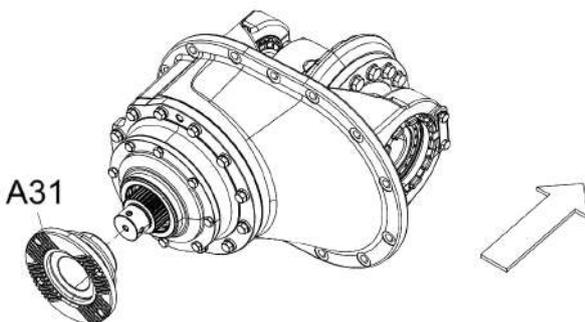
Drive in the outer seal (A27), as well. Use the tool shown in the figure.

Apply specified grease to between the sealing lip and the dust protection edge of the outer sealing ring and apply thin coat grease to the inner one.



REINSTALLING THE COVER

Apply oil-proof surface sealant to inner flange of the cover (A28) subassembled with seals, then aligning the bores attach the cover to the bearing cage with the lock washers (A29) and hex. bolts (A30). Diagonally tighten the bolts to the specified torque.

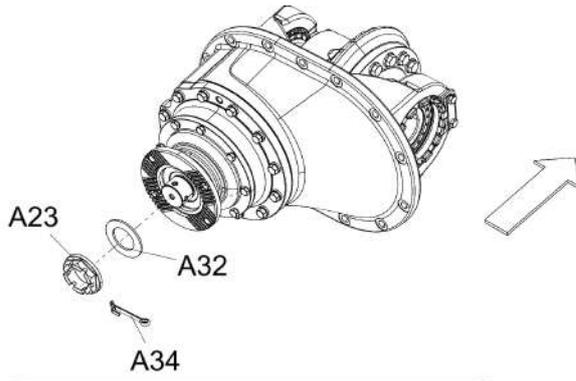


REINSTALLING THE COMPANION FLANGE

Press the companion flange (A31) to the drive pinion splines to bottoming.

Check the runout of the companion flange. Allowable runout of the companion flange in radial direction is 0,08 mm.

When the adjustment is improper, then pull off the companion flange, turn it by 15° and press on and check the runout again. Repeat the adjustment until obtaining the specified value.



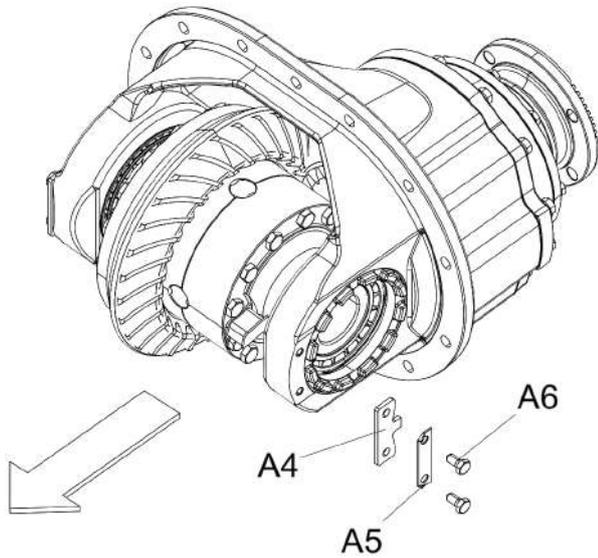
Install the washer (A32), screw on flanged castle nut (A23) and tighten to the specified torque and secure with castle nut (A23) and cotter pin (A34)

Meghúzási nyomaték: 650-700 Nm
Tightening torque: 650-700 Nm

5.6.3 Removing and reinstalling the differential

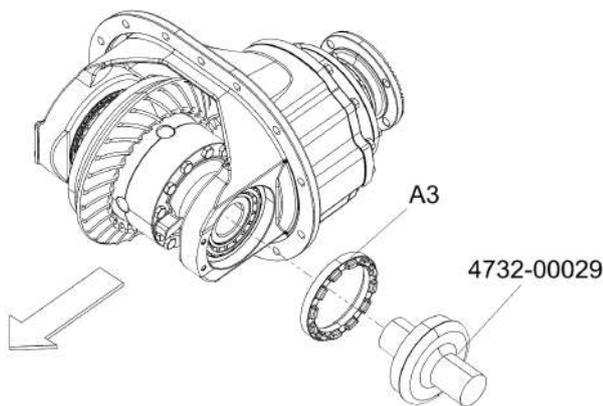
ATTENTION!

Reinstall the differential only after installing the bearing cage and adjusting the axis distance!

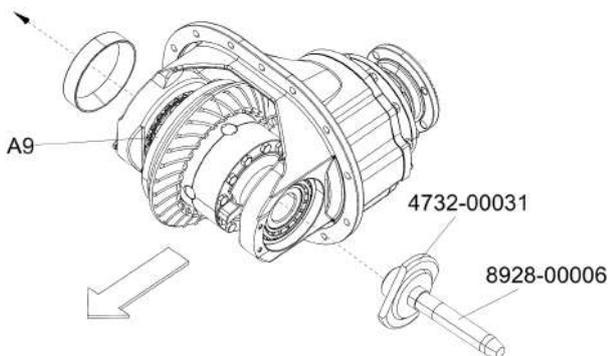


REMOVING THE DIFFERENTIAL

Back out the hex. bolts (A6) and remove the lock plates (A4) and the tap lock plates (A5).

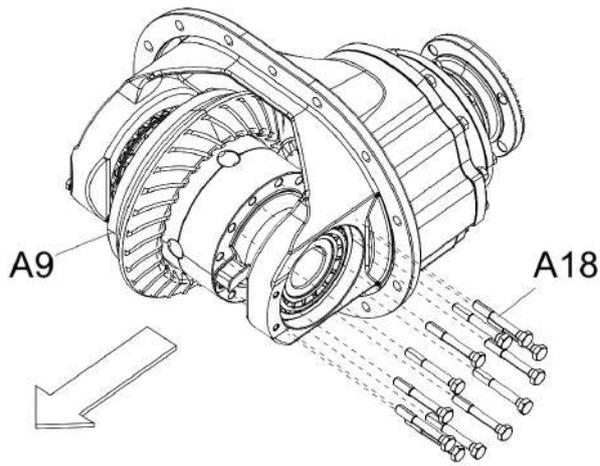


With the tool shown remove the bearings adjuster (A3).

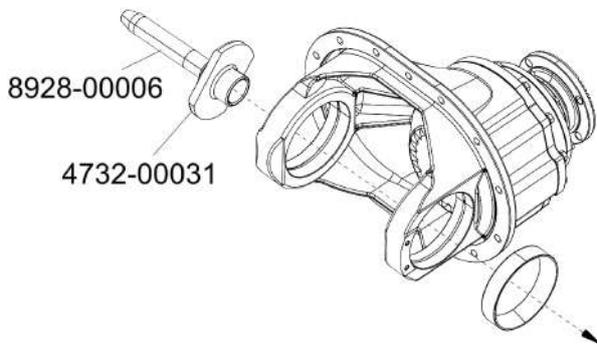


With the tool shown tap the differential toward the flanged differential case half (A9) so, the cup of the tapered roller bearing shall fall out.

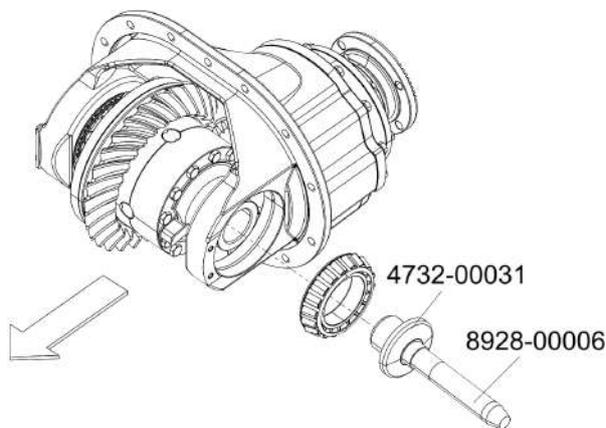
Due to the tapered roller bearing cones the differential can be removed only if disassembled.



Back out the bolts (A18) clamping the differential case halves, then remove the separated case halves and the other parts from the carrier.



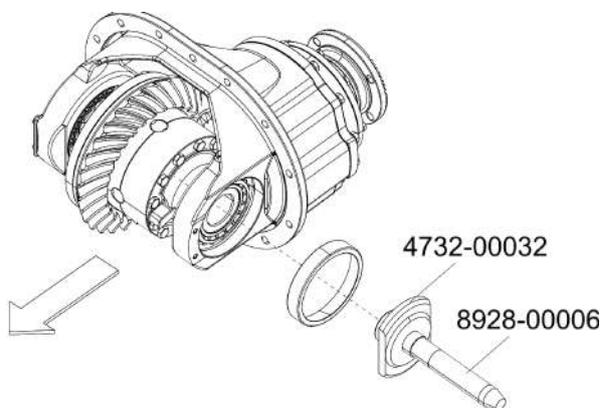
Drive the other bearing cup out of the leg bore of the differential carrier with the tool shown.



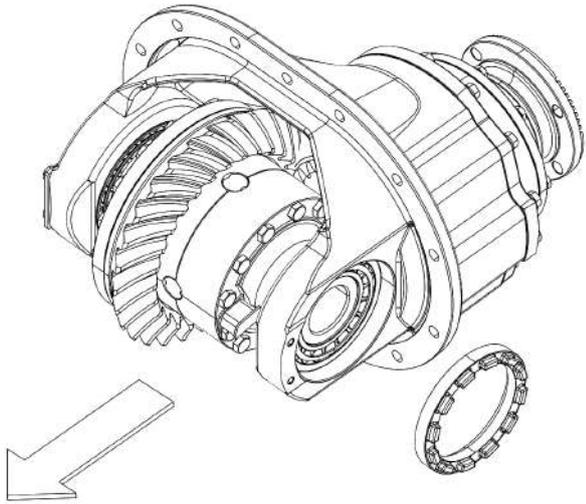
REINSTALLING THE DIFFERENTIAL

Position the assembled differential into the differential carrier. Turn the differential carrier over so, the differential shall be supported by its flanged case half.

Position the cone of the taper roller bearing to the differential case half and drive in until the tool bottoming.



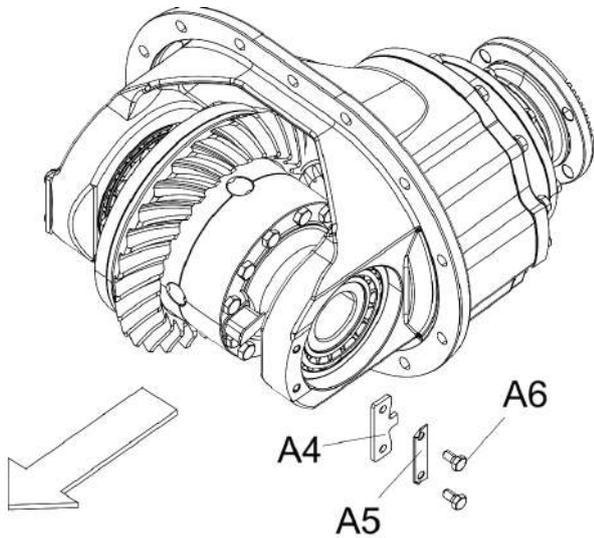
Position the taper roller bearing cup into the bearing bore in the differential carrier and drive in with the tool shown.



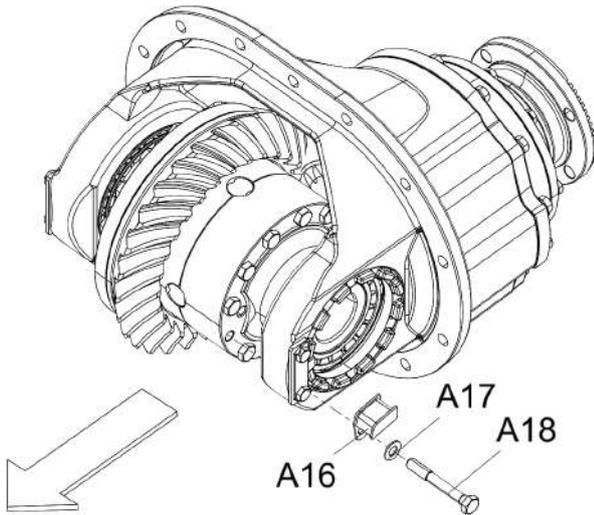
Screw in the bearing adjuster (A3).

Turn the differential carrier over and drive the tapered roller bearing cone to the flanged case half, then drive on the bearing cup by the same tool.

Screw in the bearing adjuster.



Install the adjuster lock plate (A4), the lock plate (A5) and screw the hex bolts (A6).



Install the oil baffle plate (A16) and the washer (A17) to side the differential case half.

5.6.4 Backlash and contact pattern - adjustment

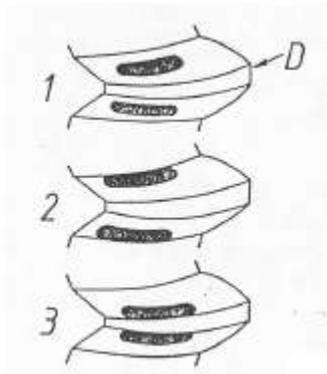
ADJUSTING THE BACKLASH AND THE BEARING PRELOAD

Adjust the drive pinion to gear backlash to 0,2 - 0,28 mm.

- Measure the backlash at the drive gear diagonally at four places with the dial indicator, which stands perpendicularly to the tooth surface, while the drive pinion is locked.
- Maintaining the backlash install the differential taper roller bearing with no clearance. Tighten the bearing adjuster so, to obtain 0.000 mm axial play of the drive gear.
- Important: While setting the backlash of 0.00 mm, rotate the ring gear, hereby you can assure that taper rollers seat in the bearing. In stationary position some of the rollers may slightly diagonally wedge in. A bearing set this way will get loose during rotation.
- After adjusting the backlash and the 0.000 mm bearing clearance check the contact pattern as follows.

ADJUSTING THE CONTACT PATTERN

Apply indicator paint to 2 opposite teeth pairs of the drive gear at four places of 90° pitch and one tooth of the drive pinion. Rotate the drive pinion to both directions for approx. 15 sec, while braking the drive gear by a piece of wood.



D = Large diameter

1 = Proper contact pattern

2 = Too deep contact

3 = Too high contact

PROPER CONTACT PATTERN

If a contact pattern shown in detail 1 of the figure is obtained, the drive gear-pinion pair is installed properly. Practically the perfect contact pattern shown in the figure cannot be obtained, but it is important that the pattern shall nowhere reach the edge of the tooth surface.

In case of GLEASON- toothing the contact pattern moving to the direction of the crown gear small diameter.

TOO DEEP CONTACT

If the contact pattern is shifted to the dedendum as shown in detail 2 of the figure increase the "AXIS DISTANCE" by increasing the thickness of the shim pack and simultaneously reduce the increased backlash by shifting the drive gear so, to obtain the contact pattern shown in detail 1 of the figure.

TOO HIGH CONTACT

If the contact pattern is shifted to the addendum as shown in detail 3 of the figure reduce the "AXIS DISTANCE" by reducing the thickness of the shim pack and simultaneously increase the reduced backlash by shifting the drive gear so, to obtain the contact pattern shown in detail 1 of the figure..

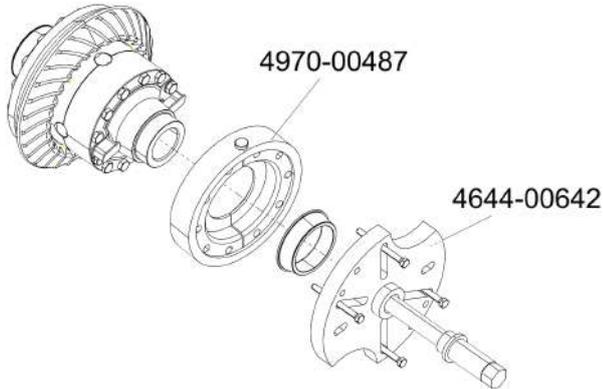
After each contact pattern adjustment measure the backlash and check if the bearing clearance is 0.00 mm.

In case of proper contact pattern, backlash and bearing clearance adjustment install the bearing cage. With the properly selected tab lock plate (one of the 4 different ones) secure the bearing adjusters on both sides. Tighten the lock plate mounting hex. bolts to 15 - 20 Nm torque and secure.

5.6.5 Disassembling and reassembling the differential

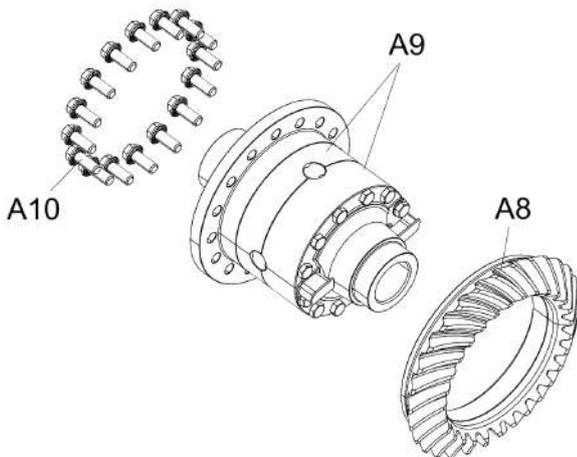
ATTENTION!

Replace the drive gear only together with the matched drive pinion! The match-marks are stamped to one face of the drive pinion and to one tooth end on the outer taper surface of the drive gear. The match-marks indicate the identification number of the matched drive gear-pinion pair and the deviation - true to sense - from the theoretical axis distance measured between the drive pinion face and the drive gear centreline. For example: 1225, +0.04.

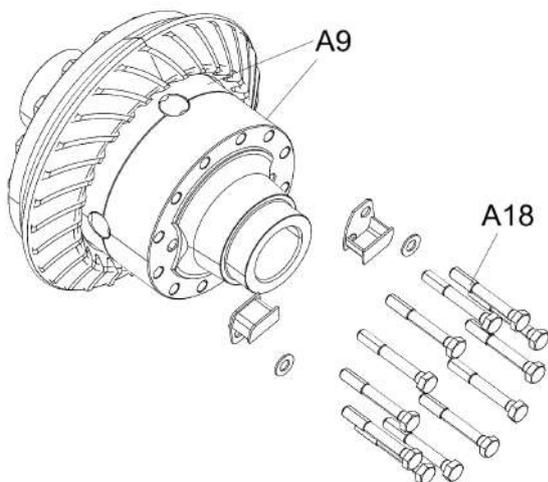


DISASSEMBLING THE DIFFERENTIAL

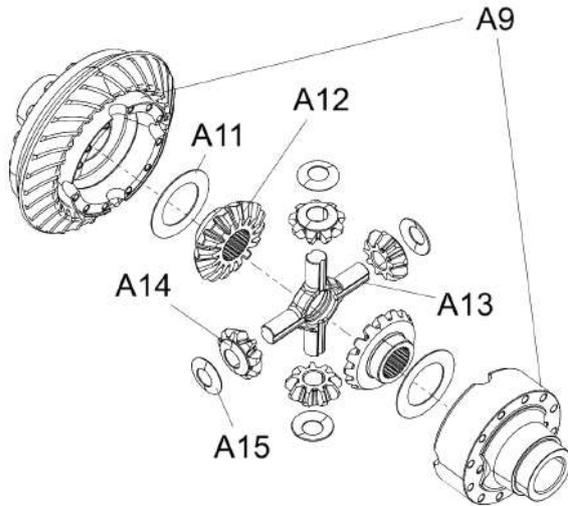
Pull the tapered roller bearings cone from the removed differential with the tool shown in the figure.



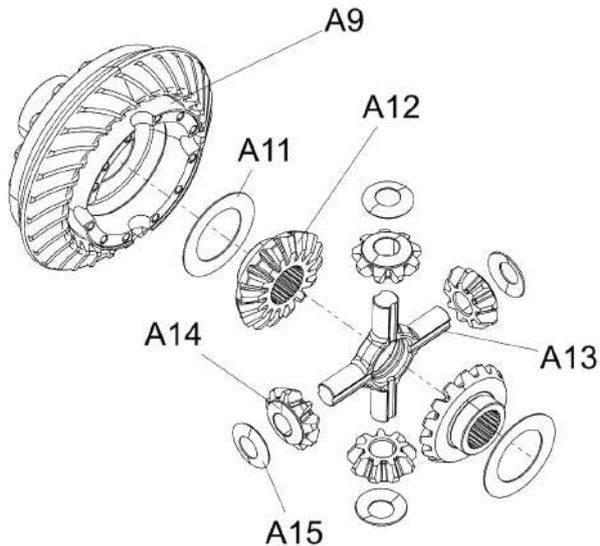
Unscrew the bolts (A10) mounting the drive gear (A8) to the differential case half (A9).



For disassembling the differential case remove the hex. bolts (A18) clamping the case halves (A9) together and separate the case halves.



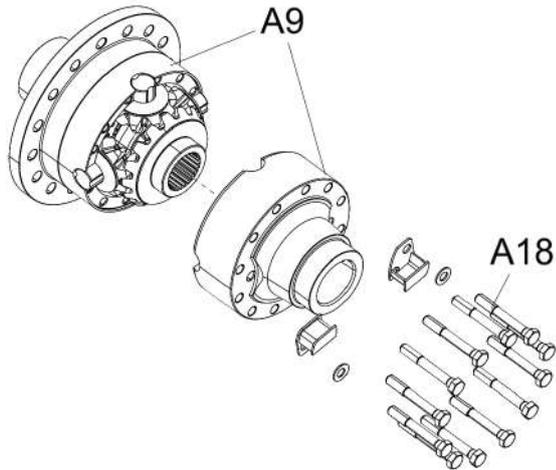
Remove the spider (A13) together with the differential pinions (A14) and shims (A15) as well as the differential gears (A12) and the spacer (A11).



REASSEMBLING THE DIFFERENTIAL

The differential case halves are matched pairs, thus install only match-marked differential case halves, according to the marks!

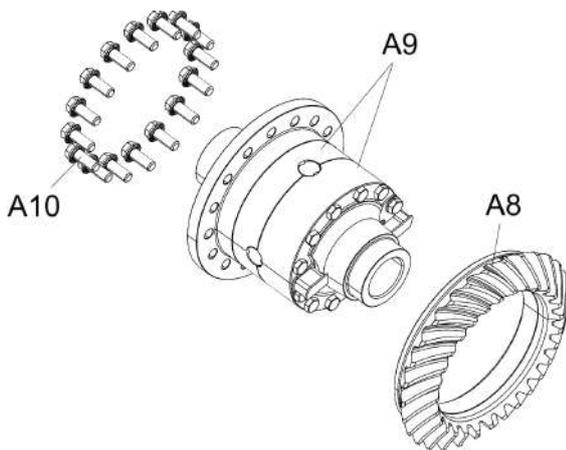
Insert the spacer (A11), differential gears (A12), spider (A13) pre-assembled with shims (A15), differential pinions (A14), the other differential gear and spacer to the differential case half.



Assemble the differential case halves checking the match of the bores and the mark, and fix them with the bolts (A18).

Sticking or tight spots are not permitted, must roll smoothly and without incident.

Meghúzási nyomaték: 49-59 Nm
Tightening torque: 49-59 Nm



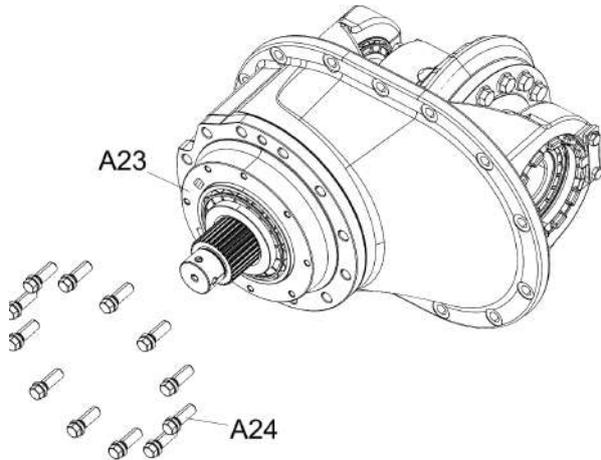
Apply thin coat of the mating surface of the drive gear. Aligning the bores position the drive gear (A8) to the flanged differential case half (A9). Thru the flange bore drive 4 off hex. bolts with completely screwed on nut into the drive gear and gradually screwing the nuts completely pull on the drive gear to bottoming.

Screw the flanged self-lock bolts (A10), and tighten to the specified torque.

Meghúzási nyomaték: 120-135 Nm
Tightening torque: 120-135 Nm

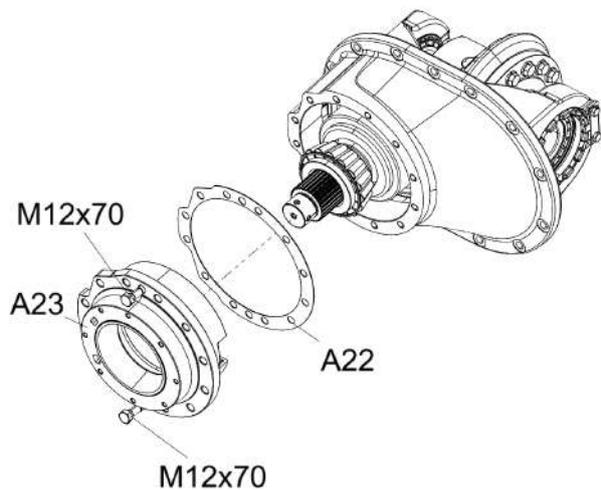
5.6.6 Removing and reinstalling the bearing cage

Before mounting the bearing cage, dismount the companion flange.

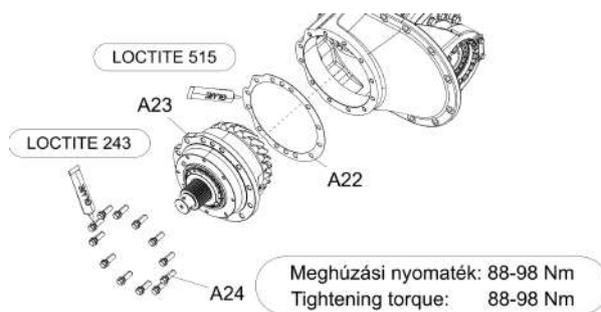


REMOVING THE BEARING CAGE

Remove the hex. flanged bolts (A24) attaching the bearing cage (A23) to the differential carrier.



Pull the bearing cage (A23) out of the differential carrier with two M12 bolts of at least 65 mm thread length driven into the two threaded bores in the flange of the bearing cage, and remove the shims (A22) from the flange of the differential carrier.

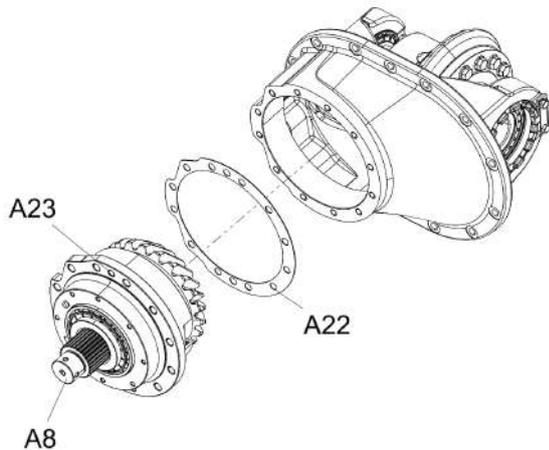


REINSTALLING THE BEARING CAGE TO THE DIFFERENTIAL CARRIER

After reassembling the bearing cage and adjusting the specified bearing preload adjust the axis distance (with differential removed from the carrier).

In case of proper contact pattern adjustment and operation remove the bearing cage subassembled with drive pinion (A23) and apply oil-proof surface sealant to the inner flange, then reinstall the bearing cage by means of hex. flanged bolts (A24) coated with thread locker. Diagonally tighten the bolts to specified torque.

5.6.7 Axis distance - adjustment

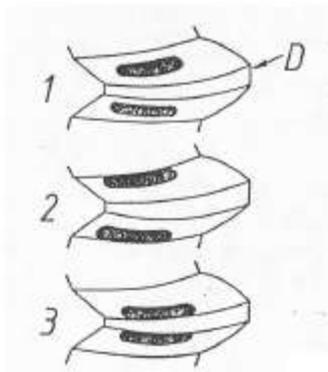


The mark situated at the end of the drive pinion (A8) indicates the deviation from the theoretical axis distance measured between the drive pinion face and the drive gear centreline. The deviation indicated is given in micron with correct sign.

For adjusting the axis distance use shims (A22) of the thickness of the indicated deviation.

Check the contact pattern. In case of proper contact pattern, the axis distance is appropriate.

If the contact pattern differs, then change the thickness of the shims or adjust the drive gear to left or right direction until getting proper contact pattern.



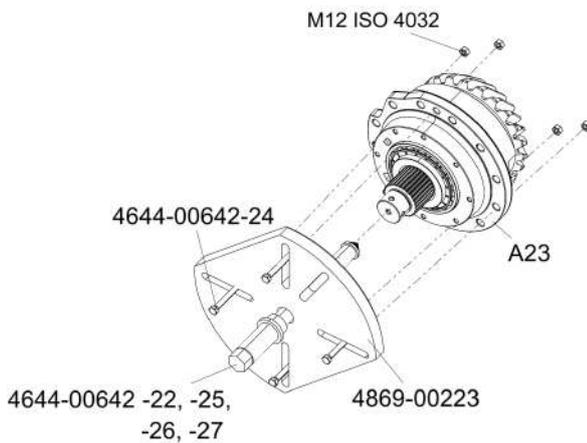
D = Large diameter

1 = Proper contact pattern

2 = Too deep contact

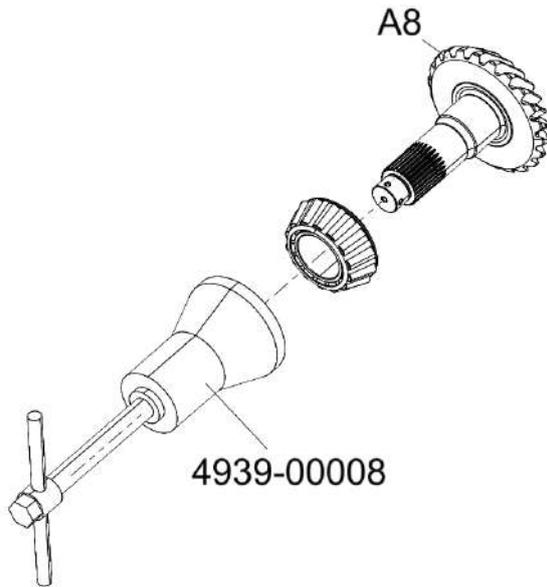
3 = Too high contact

5.6.8 Disassembling and reassembling the bearing cage

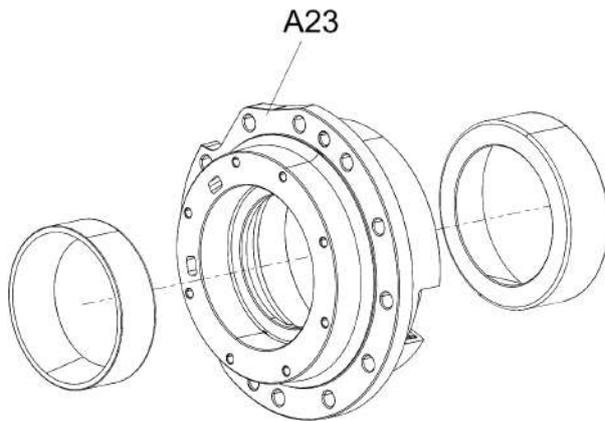


DISASSEMBLING THE BEARING CAGE

With the tools shown in the figure press the drive pinion out of the bearing cage (A23).

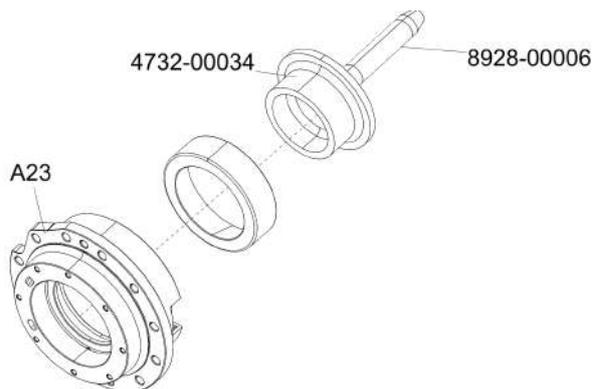


Use the device shown to press out the cone of the inner taper roller bearing remained on the drive pinion (A8).



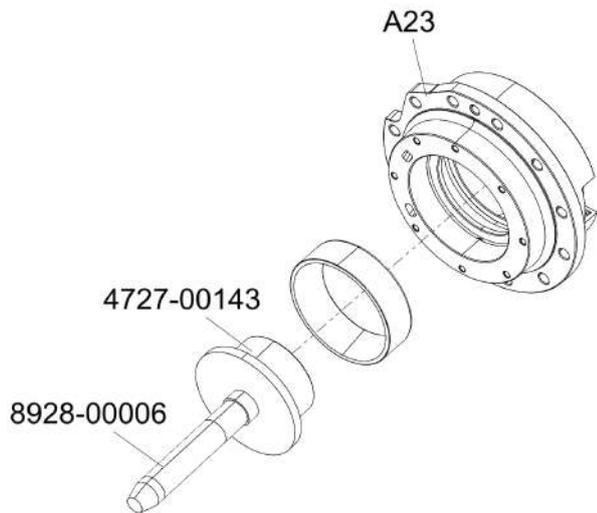
Properly backing the bearing cage drive the cup of the taper roller bearing out of the bearing cage.

Turn the bearing cage over and drive out the cup of the outer taper roller bearing with the tool shown.



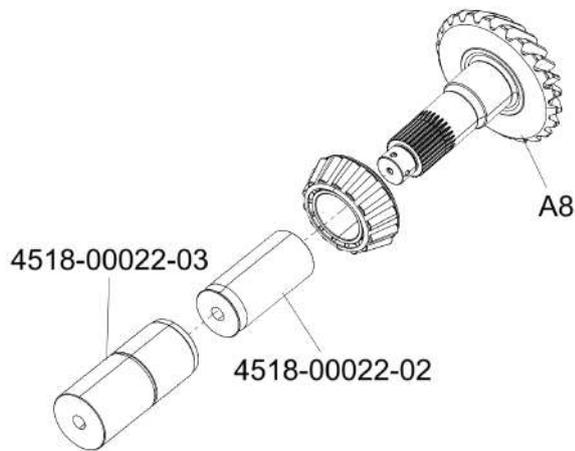
REASSEMBLING THE BEARING CAGE

Position the cup of the inner taper roller bearing and with the tools shown drive into the bearing cage.



Turn the bearing cage over and with the tools shown drive in the cup of the outer taper roller bearing to bottoming.

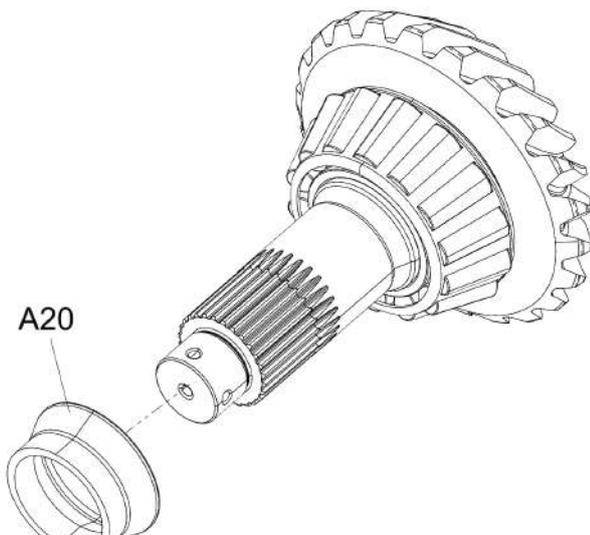
After subassembling the bearing cage with taper roller bearing cups adjust the bearing preload.



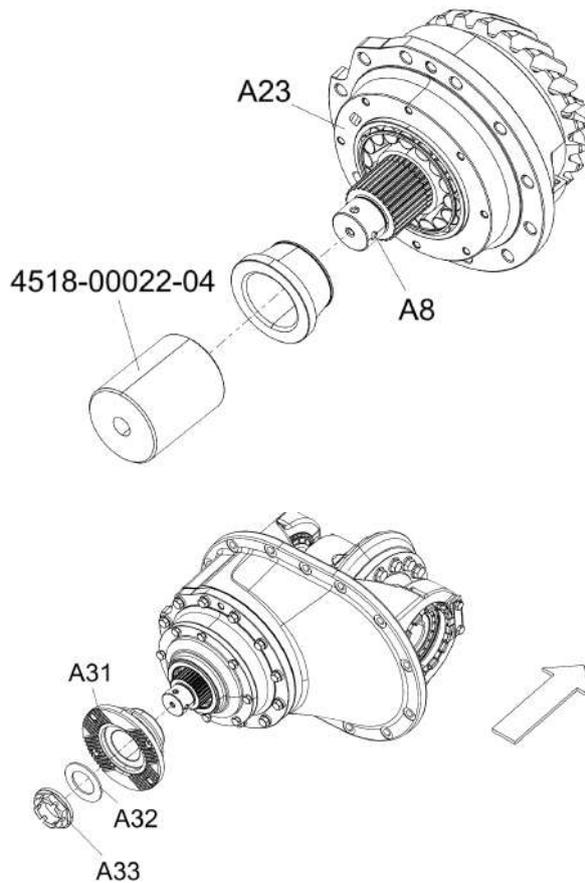
ADJUSTING THE BEARING PRELOAD

The distance between the outer taper roller bearing cone and the distance sleeve may vary between 13.89 and 14.715 mm. This distance should be determined by measurement for selecting the proper spacer rings.

With the tools shown drive the cone of the inner taper roller bearing onto the drive pinion (A8)



Position the proper spacer ring to the measured gap.



Then position the bearing cage (A23) subassembled with bearing cups and the outer tapered roller bearing cone to the drive pinion until the bottoming of the tool shown, while assuring proper connection of the bearings.

Press the companion flange (A31) on. Position the washer (A32), screw on the flanged nut (A31) and tighten to 650 - 700 Nm torque.

The oil seals with the cover are not installed during the check.

Attach approx. 2 mtrs long cord to one bore in the bearing cage flange and wind the cord around the bearing cage. Attach a scale to other end of the cord and measure the rolling torque.

With new bearing installed the force obtained from the scale at approx. 5 rpm should be 21.46 - 26.34 N, which corresponds to 2.2 - 2.7 Nm torque.

Installing reused bearings adjust the rolling torque to 1.1 - 1.35 Nm (approx. half to the new bearing).

In case of deviation perform correction by replacing the distance ring. With higher rolling torque use higher distance ring, while at lower torque use lower one.

Check the rolling torque as described earlier. If deviation is experienced repeat the adjustment until obtaining the specified value.