



WORKSHOP MANUAL

MTC 22H (CTI)

DRIVEN FRONT AXLES

SECTION 202.

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SECTION 203.

FOREWORD

This production " WORKSHOP MANUAL" was prepared for workshops and contains all the necessary assembly instructions as well as data to be checked and adjusted during repair, with the knowledge of which repair and adjustment of the

MTC 22H (CTI)

type driven front axles can properly be performed.

For technical data on the specific type versions of the Marmon-Herrington MTC22H, RC22H type driven front axles refer to the publication "TECHNICAL DATA", while for the spare parts of that "PARTS CATALOG" grouped according to the Orderers.

The "WORKSHOP MANUAL" contain divided into sections the technical data and the service instructions of the axle. The sections of the service instructions contain the disassembly and reassembly operations of the individual assembly unit, stating the special tools to be used. **The order of the sections is determining the order of the mounting.**

The serial numbers of the figures are started from the beginning in each section. The item numbers of the figures for an assembly unit are referred to in each section dealing with the assembly procedures.

For service operations it is recommended to use the tools shown in the figures in order to assure proper assembly of the individual units. The figures show each essential service operation stating the designation of the tool and its service position. The tools are partly available from commerce and partly can be fabricated in the workshop according to the tool blueprints ordered on basis of tool list supplemented to the "WORKSHOP MANUAL" or can be ordered **from Marmon-Herrington.**

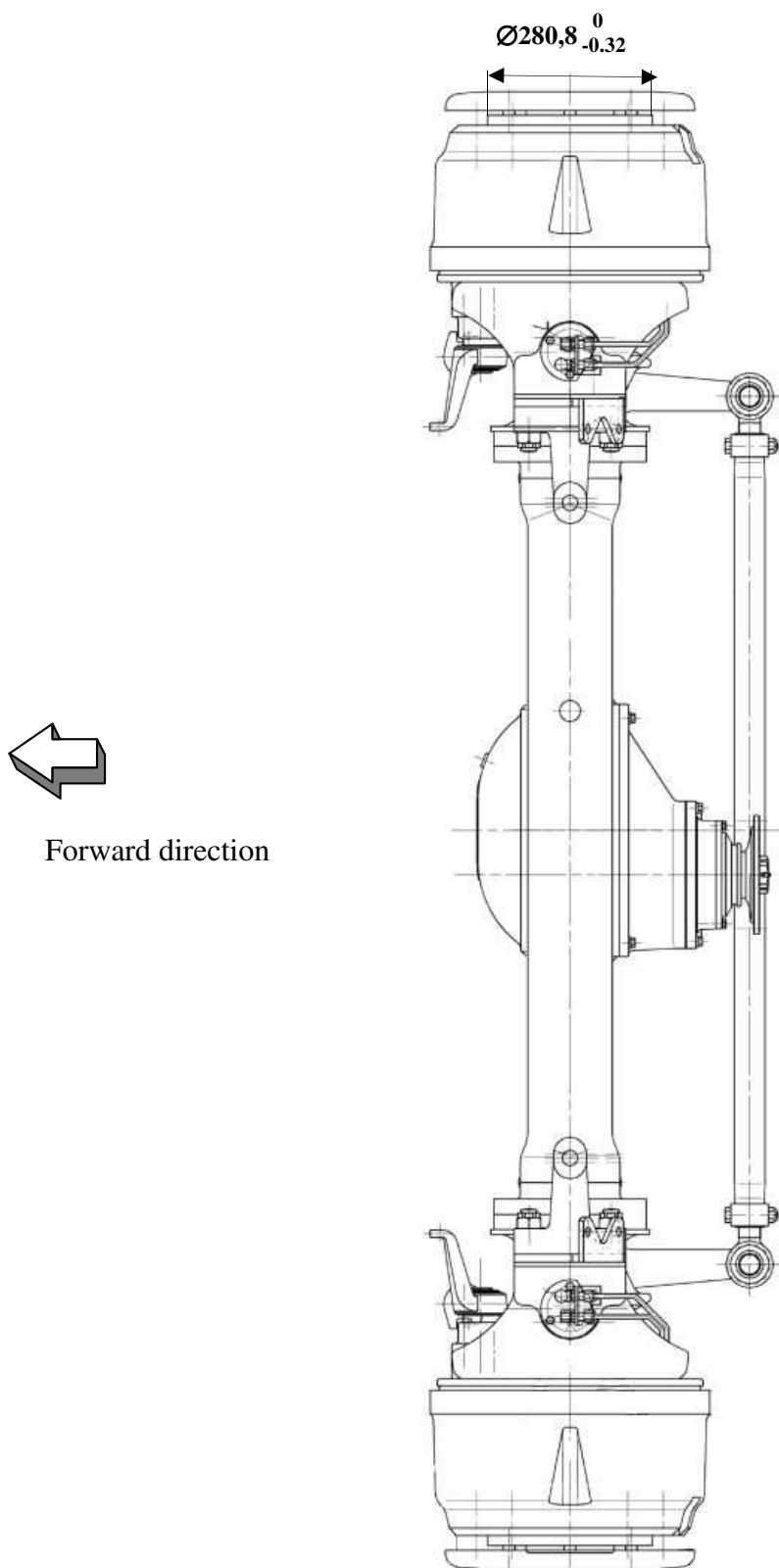
The manufacturer shall not be liable for warranty claims on damages resulting from negligence of the general service practice required for normal service operations but not contained in this Manual.

For replacing assembly units or individual parts use ONLY genuine Marmon-Herrington made products.

SECTION 204.

DRAWINGS OF THE AXLES

Example



SECTION 205.

TECHNICAL DATA

DESIGNATION	UNITS	TYPE	
		MTC22H	MTC22H
<u>SYSTEM OF THE AXLE:</u> The reduction of the driven front axle is of two-stage design. The reduction is accomplished by a pinion and drive gear in the carrier and by spur planetary gearing in the wheel hub.			
DIMENSIONS			
Wheel track	mm	2093	
Applicable wheel discs		13x22,5	
a, Rubber tire		18 x 22,5”	
b, Rolling radius	mm	555	
c, Sinking depth	mm	155,5	
Overall width	mm	2552	
RATIOS			
Drive gear- / drive pinion tooth number		29 / 22	33 / 16
Planetary gear		64 / 26 + 1 = 3,461	
Total ratio		4,563	7,14

TECHNICAL DATA

DESIGNATION	UNITS	TYPE	
		RC22H	MTC22H
GENERAL DATA			
Nominal axle load	kg	10000	
Max. input torque	Nm	6566	4201
Max. output torque	Nm	30000	
Max. input speed r.p.s.	1/min	500	
Knuckle pin angle		5° 30'	
Camber		0° 30'	
Axle mass without oil fill	kg	852	
G.V.W.	kg	20000	
G.C.W. (on highway)	kg	30000	
Max. engine performance	kW	223 (300 HP)	
Parts of ABS		Can be Installed	
Impulse ring		Installed	
WHEEL HUB EXECUTION			
"C"		"C/1"	
Hub centering for installing wheel disc	mm	Flange diameter	$\overset{0}{\underset{-0,32}{\varnothing 280,8}}$

TECHNICAL DATA

DESIGNATION	UNITS	TYPE
		RC22H
WHEEL BRAKE		
System: The wheel brake is of simplex system internally acting drum brake.		
Brake drum diameter	mm	420
Max. trued-up brake drum diameter	mm	424
Brake lining width	mm	180
Brake shoe clearance (at adjustment)	mm	0,3 - 0,6
Max. radial play of camshaft (camshaft bushing wearing)	mm	0,4
Min. brake lining thickness	mm	7
Max. camshaft torque / brake drum torque	Nm	1394 / 13520*
SLACK ADJUSTER		
System: automatic slack adjuster		
Slack adjuster installation radius "C"	mm	165*
"A " Distance of slack adjuster bushing bore center from seating plane of the chamber bracket	mm	312

TECHNICAL DATA

DESIGNATION	UNITS	TYPE RC22H
ROLLING BEARINGS		
In Wheel Hub		
Outer: taper roller bearing inner race outer ring		JM 822049 TIMKEN or NTN. JM 822010 TIMKEN or NTN
Inner: taper roller bearing inner race outer ring		48393 TIMKEN or 48393 A SKF 48320 TIMKEN or 48320 SKF
In wheel hub planetary gear		
Cylindric roller bearing		K 30x42x30 MGM
On drive pinion		
Outer: taper roller bearing		32312 B X7JU MGM
Inner: taper roller bearing		32314 B X7JU MGM
On differential		
On flanged case half: taper roller bearing		32215 A MGM
On half case: taper roller bearing		30215 A MGM

TECHNICAL DATA

DESIGNATION	UNITS	TYPE
		RC22H
ROLLING BEARINGS		
In the steering knuckle carrier		Assortment
Cylindric roller bearing		RNU 310 EC P SKF RNU 310 E TVP2 FAG
In the steering knuckle		Assortment
Cylindric roller bearing		RNU 2208 EC P SKF RNU 2208 E TVP2 FAG RNU 2208 E V TOR
SEALS		
In wheel hub		1HH1 178x205x17 STEFA SYSTEM 500
In differential		A 75x95x10 NB SIMMERWERKE AS 75x95x10 NB SIMMERWERKE
In camsaft bushing bracket		42x55x8 NB
In the steering knuckle		TPYA 721752T 401N OR 76x3 Mat. Pat. 169 Ø 50x65x6-KV 3440 SIMMERWERKE MSZ 18716 10x14-Cu 583.30-3110-038
In the steering knuckle carrier		
"O" ring		OR 85x3 Mat. Pa 169 OR 65x3 Mat. Pa 169
Oil seal		11 CCI 65x85x10 NB STEFA
Gasket		Ø65x80x8 KV3826 012.0-3340-018
In the double joint		TPC 100140-T-401N

TORQUE RATINGS

The serial numbers are the item numbers of the figures in the " GENERAL WORKSHOP MANUAL ".

DESIGNATION	SECTION / FIG. ITEM No.	TYPE
		RC22H
WHEEL HUB	210 / 1	Nm
Wheel nuts	---	As specified by the orderer.
Wheel hub cover bolts	12	12 - 15
Planetary carrier mounting bolts	33	40 - 50
Distance plate	54	12 - 15
Hex. nuts clamping the protection disk	11	25 - 30
Spindle nut (outer)	34	560 - 640
Spindle nut (inner) Per section 223	36	196
Brake drum mounting bolts	39	40 - 50
AXLE HOUSING	240 / 1	Nm
Knuckle pin cover mounting bolts	52	30 - 35
Steering arms and tie-rod arms mounting bolts castle nut	61	540 - 590

TORQUE RATINGS

DESIGNATION	SECTION / FIG. ITEM No.	TYPE
		RC22H
Steering arms and tie-rod arms stud bolts cast	63	40 - 50 Mounted with thread adhesive
Tie-rod clamp self lock nuts	---	70 - 80 FAD 160 - 180 LEMFÖRDER
Tie-rod ball stud castle nuts	---	300 - 400
Draw key flanged nut	69	50 - 70
Steering knuckle carrier mounting bolts	70	360 - 380 Mounted with thread locker
Oil seal support mounting bolts	85	6 - 8
Holder mounting bolts	97	39 - 49
Low nut fixing the elbow to the support	99, 112	30 - 40
Stop bolts jamnut	242/3/2	120 - 160
Extensich	111	50 - 60 Mounted with thread locker
Hose	110	50 - 60
Plug nut	115	10 - 15
Oil filling and level plug		55 - 83

TORQUE RATINGS

DESIGNATION	SECTION /	TYPE
		RC22H
WHEEL BRAKE	260 / 1	Nm
Brake camshaft bracket mounting hex. flanged bolts	25	130 - 140 Mounted with thread locker
Dust shield mounting bolts	21	12 - 16
Brake support to steering knuckle mounting hex. bolts	24	350 - 400 Mounted with thread adhesive
Hex. bolts mounting stop of the automatic slack adjuster	29	20 - 25
DIFFERENTIAL CARRIER HEAD	310/1 310/2	Nm
Differential carrier housing to axle housing mounting bolts	---	100 - 110 Mounted with thread locker
Drive pinion castle nut	1	650 - 700
Differential carrier cover mounting bolts	6	20 - 30
Bearing cage mounting bolts	14	88 - 98 Mounted with thread locker
Adjuster lock plate mounting bolts	22	15 - 20
Differential case halves clamp bolts	25	49 - 59
Ring gear mounting self-lock flanged bolts	39	120 - 135

ADJUSTMENT DATA

DESIGNATION	UNITS	TYPE
		RC22H
WHEEL HUB		
Axial play of wheel hub bearings (adjustment by shims)	mm	0,01 - 0,04
Axial play of the double joint	mm	0,4 – 0,9
Thickness of shims	mm	0,25; 0,5; 2,0
STEERING KNUCKLE		
Axial play of the steering knuckle	mm	0,0 - 0,3
Thickness of shims	mm	0,4; 0,6; 1,0; 1,2; 1,4
Toe-in (measured on brake drum flange)	mm	0 ± 1,5
Max. inner wheel turn angle		35°

ADJUSTMENT DATA

DESIGNATION	UNITS	TYPE
		RC22H
WHEEL BRAKE		
Shoe clearance (during adjustment)	mm	0,3 - 0,6
Axial play of camshaft	mm	0,1 - 0,5
DIFFERENTIAL CARRIER HEAD		
Drive pinion to drive gear backlash GLEASON - toothing	mm	0,2 - 0,28
Drive pinion rolling torque, after preloading the bearings (the seal is not installed, adjustment by the distance rings)	Nm	2,2 - 2,7
Size of distance rings	mm	- 34 distance rings from 33,400 to 34,225 mm in 0.025 mm steps.
Theoretical distance between the drive pinion face and the drive gear centerline ("AXIS DISTANCE")	mm	88
Shim thicknesses	mm	0,2; 0,25; 0,3; 0,5; 1,0

SECTION 209.

GENERAL SERVICE INSTRUCTIONS

This section summarizes the service operations and adjustment data considered by us to be most important and which should thoroughly be observed and followed during assembling the axle.

WHEEL HUB AND AXLE HOUSING

Assure 0.01 - 0.03 mm axial play for the wheel hub bearings after securing the spindle nut. For adjustment refer to Section 223.

Install ONLY identical code, same tolerance class bearings supplied in one package to one wheel hub planetary gear.

Adjust the axial play of the twin-swivels to 0,4-0,9 mm as measured between the bull gear and the friction disk. For adjustment shims of 0.25; 0.5 and 2.0 mm thickness are available. The adjustment is described in the Section 220.

WHEEL BRAKE

If the brake linings are worn to the permitted limit (as indicated by wear indicating washer) replace the brake linings as specified.

Check the brake shoe surface being in contact with the shoe anchor pin and the brake spanner rollers.

Adjust the specified shoe clearance (0.3 - 0.6 mm) by the brake lever.

After adjustment the brake lining may not interfere with the brake drum.

From among the sealing rings of the brake spanners that at the brake spanner head may not pass the surplus lubricant during greasing. The sealing ring at the brake spanner head protects the brake drum against the grease. Make sure to check if the sealing rings are pressed in proper position.

True up the brake drum ONLY to the permitted max. 424 mm diameter.

DIFFERENTIAL CARRIER HEAD

Install the taper roller bearings of the drive pinion with preload. Assure such a preload the bearings shall roll on torque of 2.2 - 2.7 Nm. During check the sealing rings (4 in Fig. 1 of section 310) with the cover (5) are not equipped. For adjustment refer to Section 317.

The differential gears should be rotatable without jamming.

Install the taper roller bearings supporting the differential without clearance.

For proper contact pattern and specified in case of GLEASON toothing 0.2 - 0.28 mm backlash refer to Section 314.

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 clean and sound parts 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 taper 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 Omni FIT 1550 HENKEL
---------------	-------------------------------------

Thread locker:

Medium-strength	LOCTITE 243 Omni FIT 230 M HENKEL
-----------------	--------------------------------------

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 air-curing oil-resistant surface sealant. Apply a continuous strip of min. 3 mm diameter to the specified surface. The time between applying the sealant and assembling the parts together may not exceed 10 min.

Instead of the above cementing, fixing and sealing material other equivalent grade ones may also be used.

APPLICATION OF "LOCTITE" BOLT LOCKING MATERIALS

The LOCTITE 277 thread adhesive material needs min. 3-4 hrs on 22°C temperature, the LOCTITE 243 thread locking needs 1-2 hrs in the same conditions - to 75% solidification - based on the LOCTITE catalogue. The proper bonding strength does not develop 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 locking materials and after the bolts are driven in, within the curing time.

REPAIR OF THE PARTS ASSEMBLED WITH LOCTITE THREAD ADHESIVE AND THREAD LOCKING MATERIALS:

In case of a defect during the operation and during a general overhaul, after the assembly unit had been previously washed, the first thing to do is to dismount the bonded 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 the adhesive shall be removed both by mechanical cleaning and with LOCTITE 806 solvent. The threaded bores and bolts can be considered to be cleaned, when the bolts can easily be driven upto the total thread length.

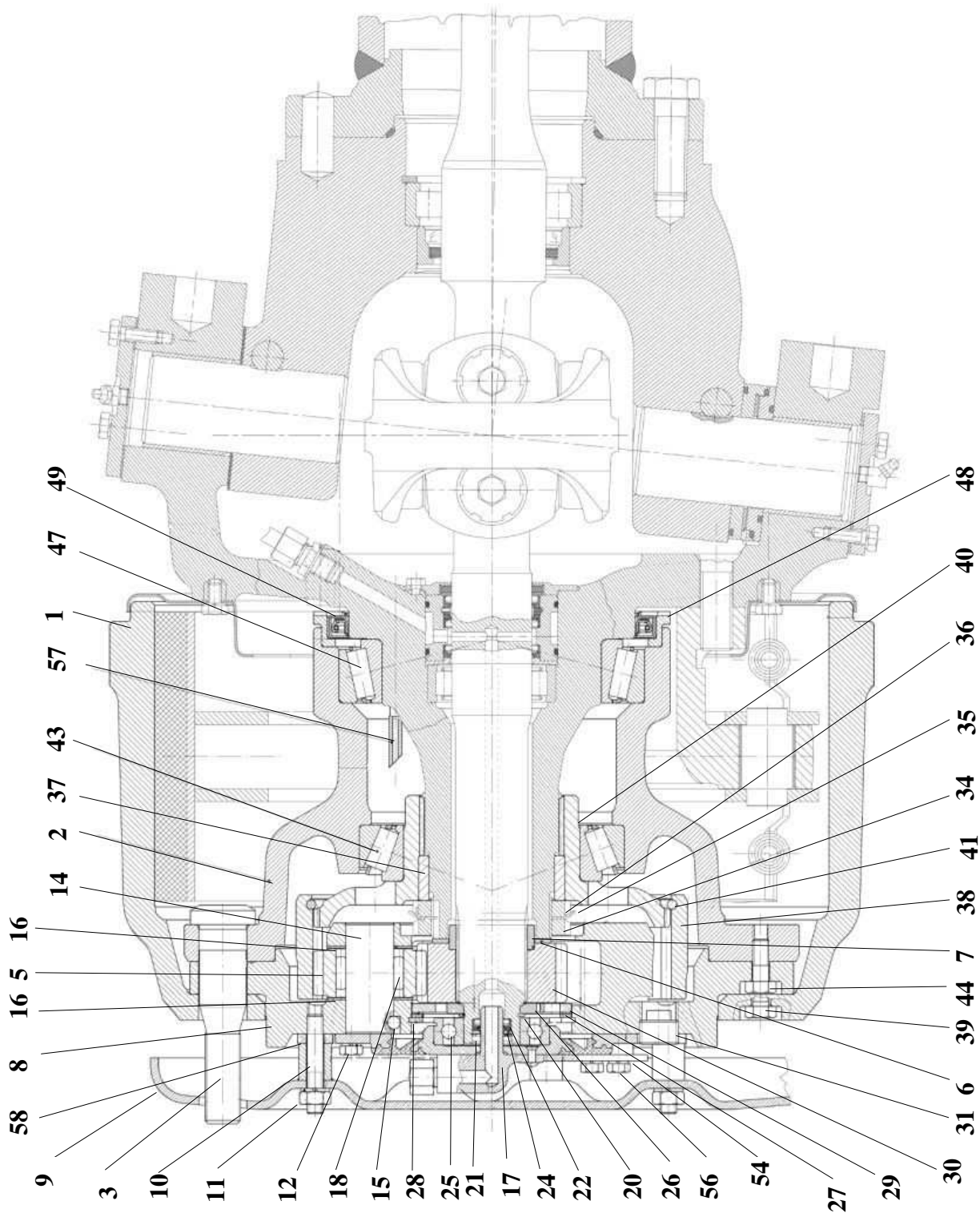
Prior to assembly, degrease carefully the bores of the parts to be assembled and the bolts. If oil/dirt is detected in the bores of the washed parts, drop the oil from bores then spray with LOCTITE 7061 cleaning spray then dry it in free air. (*Blowing is permitted only with oil-free compressed air!*) 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 the bolts around 4-5 threads from the end of the shank. (If steel is to be bonded to steel, the curing time is 1-3 hrs for achieving 50-80% strength which provides the loadability).

WHEEL DRIVE, WHEEL HUB

210. SECTION

SECTIONAL VIEW OF THE WHEEL DRIVE AND WHEEL HUB



683-80-6

Fig. 1.: WHEEL DRIVE, WHEEL HUB
SECTIONAL VIEW

SECTION 211.

PARTS OF THE WHEEL DRIVE AND WHEEL HUB

- 1 - Brake drum
- 2 - Wheel hub
- 3 - Wheel bolt
-
- 5 - Idler pinion
- 6 - Friction disk
- 7 - Distance ring
- 8 - Pinion carrier
- 9 - Protection disc
- 10 - Stud bolt
- 11 - Hex. nut and lock washer
- 12 - c
-
- 14 - Pinion pin
- 15 - Steel ball
- 16 - Distance plate
- 17 - End-cover
- 18 - Needle rollern
-
- 20 - Snap ring
- 21 - Snap ring
- 22 - Sealing ring
-
- 24 - Distance plate
- 25 - Deep-groove ball bearing
- 26 - Distance ring
- 27 - Shims
- 28 - Snap ring
- 29 - Friction disk
- 30 - Bull gear
- 31 - Oil drain bore screw plug with magnetic insert
-
- 34 - Outer shaft-end nut
- 35 - Lock plate
- 36 - Inner shaft-end nut
- 37 - Centering ring
- 38 - Gear rim
- 39 - Hex. bolt
- 40 - Rim hub
- 41 - Circlip
-
- 43 - Taper roller bearing
- 44 - Hex. bolt
- 47 - Taper roller bearing
- 48 - Impulsering
- 49 - Sealing ring
-
- 54 - Distance plate
-
- 56 -
- 57 - Wheel hub connecting pipe
- 58 - Distance

SECTION 212.

REMOVING AND REINSTALLING THE PROTECTION DISC THE WHEEL DISK

Drive out the hexagon nuts (11) that lock the protective disc and remove the spring washers then the protective disc (9).

The wheel disc can be removed after removing the protection disc (9).

REMOVING THE WHEEL DISK

With wheels in loaded condition loosen the wheel nuts, then jack up the axle, back out the wheel nuts and remove and the wheels.

REINSTALLING THE WHEEL DISKS

Thoroughly clean the mating surfaces of the wheel disk and the wheel hub.

After positioning the wheel disk diagonally tighten the hex. distance wheel nuts with the wheel nut wrench to the specified torque.

Mount the stud bolts (10) that clamp the protective disc (9) after being coated with thread locking material LOCTITE 243 and tightened to 25-30Nm torque.

Reinstalling the protection disc (9) screw hex. nuts (11) onto the stud bolts (10) and tighten to 30 - 40 Nm.

SECTION 213.

REMOVING AND REINSTALLING THE BRAKE DRUM

REMOVING THE BRAKE DRUM

After removing the wheel disk back out the 2 off hex. bolts attaching the brake drum to the wheel hub, then by 2 off M12 bolts of at least 40 mm thread length driven into the threaded bores prepared for this purpose in the brake drum flange pull off and remove the brake drum.

REINSTALLING THE BRAKE DRUM

Position the brake drum on the wheel hub. Install the hex. bolts attaching the brake drum and tighten to the specified 40 - 50 Nm torque.

Check the runout of brake drum's brake area.
Max. permissible runout: 0,2 mm.

SECTION 214.

REMOVING AND REINSTALLING THE END-COVER

REMOVING THE END-COVER

Drain the oil.

Drive out the hexagon nuts (11) that lock the protective disc and remove the spring washers then the protective disc (9).

Remove the hex. bolts (12) attaching the end-cover (17) to the planetary carrier (8) and separate the end-cover together the deep-groove ball bearing (25).

REMOVING AND REINSTALLING THE SEALS IN THE OUTER AXLE-SHAFT

After removing, the end-cover (17) first remove the snap ring (21), the distance plate (24) and finally the sealing ring (22).

By means of tool show in Fig. 1. drive in the new sealing ring (21), then insert the distance plate (24)

Following this secure by snap ring (21).

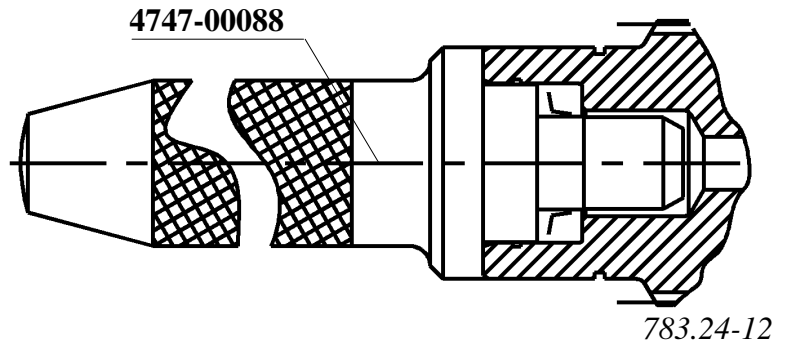
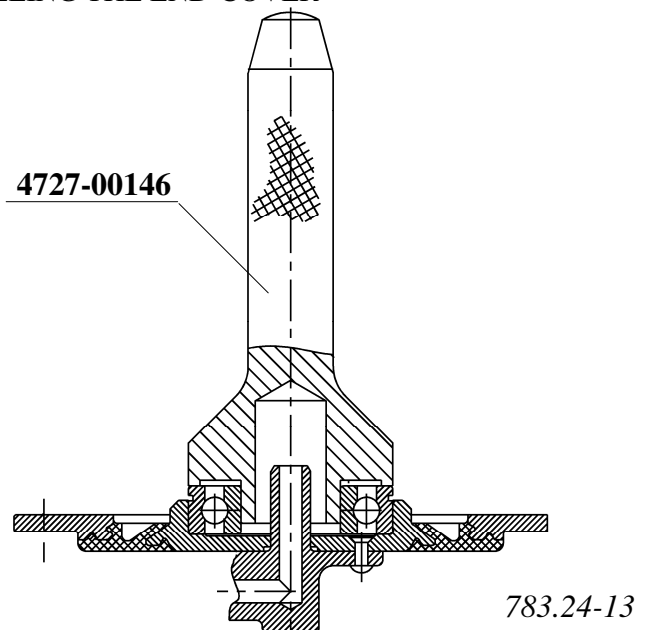


FIG. 1.: PRESSING IN THE SEALING RING

REINSTALLING THE END-COVER

In replacement of the deep-groove ball bearing is required, first press the bearing into the end cover by means of the tool shown (See Fig.2.)

Fig. 2.: PRESSING THE DEEP-GROOVE BALL BEARING INTO



As a described in the "GENERAL SERVICE INSTRUCTIONS" apply oil-proof surface sealant to the seating flange of the end-cover (avoiding the bores from inside).

Then apply thin coat of oil to the bearing journal of the axle-shaft.

Push the deep-groove roller bearing mounted in the end cover onto the axle shaft end, while taking care of the cuts on the cover align with the oil drain plugs

By means of the hex. bolts (12) and lock washers attach the end cover (17) to the pinion carrier (8). Tighten the bolts to 12- 15 Nm torque.

SECTION 220.

REMOVING AND REINSTALLING THE PLANET CARRIER, ADJUSTING THE AXLE SHAFT CLEARANCE

REMOVING THE PLANET CARRIER

After removing the end-cover (17) and distance plate (54) by means of snap ring pliers remove the snap ring (28), then the shims (27) and the friction disk (29) from the pinion carrier.

Remove the hex. flanged bolts (33) from flange of the pinion carrier (8). Following this for pulling the pinion carrier out of the wheel hub drive 2 off M8 bolts of at least 25 mm thread length into the threaded bore prepared for this purpose in the pinion carrier flange and pull the carrier out of the planetary carrier wheel hub.

REINSTALLING THE PLANET CARRIER

According to the "GENERAL SERVICE INSTRUCTIONS" apply oil-proof surface sealant to seating flange of the pinion carrier avoiding the bore from inside.

Aligning the bores and the gear teeth insert the planetary gear into the wheel hub, making sure the match-marks on the wheel hub and the pinion carrier align (oil drain).

Secure the pinion carrier by means of hex. flanged bolts coated with thread locker and tightened to 39 - 49 Nm torque.

ADJUSTING THE AXLE SHAFT CLEARANCE

Insert the friction disk (29) into the installed planetary gear, then insert the snap ring (28). Pressing the friction disk to bottom out against the bull gear (30) by means of feeler gage measure the distance between the friction disk and the snap ring.

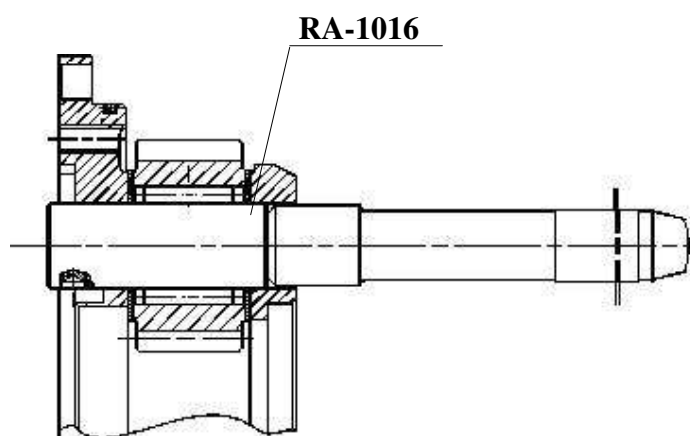
From among the shims (27) select an amount of thickness less by 0,4-0,9 mm than the measured value.

By means of snap ring pliers remove the snap ring (28) again, then insert the selected shim pack and finally install the snap ring.

SECTION 221.

DISASSEMBLING AND REASSEMBLING THE PLANETARY GEAR

By means of the mandrel shows in the figure drive out the pinion pin toward direction of the detent ball (15) (see Fig. 1.).



583.10-8

Fig. 1.: DRIVING OUT THE PINION PINS

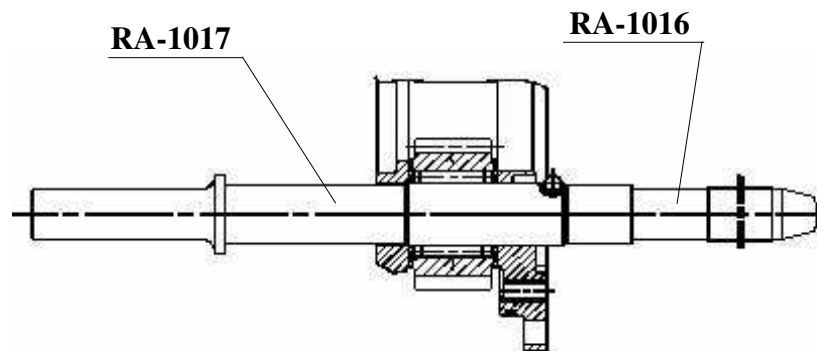
Stack the sound or replaced parts one by one over the guide mandrel positioned thru the pinion carrier bore as shown in Fig. 2.

Insert the distance ring (23) and needle rollers (18) into the bore of the planet gears (5). Insert the planet gears thus pre-assembled and the distance plates (16) into the planetary support. Inserts the fitting sleeve into the bore of the planetary carrier as shown in Fig. 2.

In case of replacing the needle roller (18), 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 driving in the pinion pins (14) make sure the seat machined for the detent ball in the pinion pin and the groove in the pinion carrier (8) align, to be able to insert the detent ball into the seat before completely driving in the pinion pin.

Drive in the pinion pins by means of the tools shown (see Fig. 2.).



583.10-9

Fig. 2.: DRIVING IN THE PINION PINS

SECTION 222.

REMOVING AND REINSTALLING THE SUN GEAR

REMOVING THE SUN GEAR

After removing the pinion carrier remove the snap ring (20) and the distance ring (26).

Following this pull the sun gear (30) from the axle-shaft together with the distance ring (7) and remove the friction disk (6).

REINSTALLING THE SUN GEAR

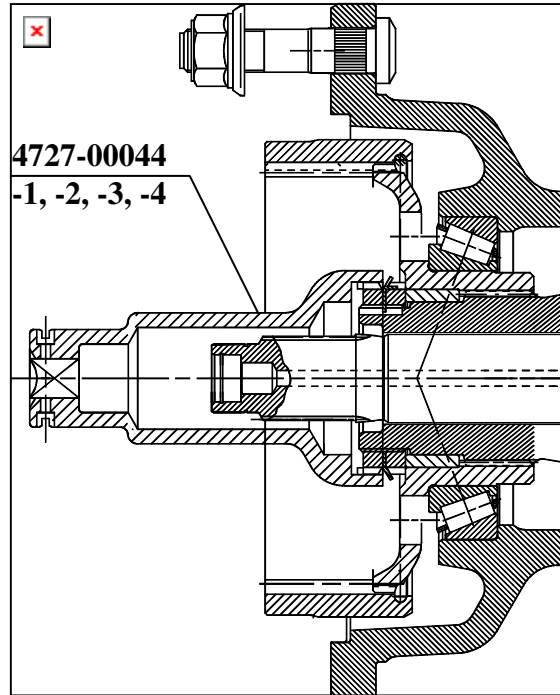
Reinstalling the sun gear in reverse order of removal. Make sure to check if the friction disk (6) is on the distance ring (7), as well as the chamfered side of outer distance ring (26) faces inward.

SECTION 223.

REMOVING AND REINSTALLING THE WHEEL HUB

REMOVING THE WHEEL HUB

After removing the pinion carrier, planetary carrier connection element and the sun gear unsecure the shaft-end nuts (34 and 36).



783.24-16

Fig.1.: ASSEMBLING THE SHAFT-END NUTS

Slightly pull the safely suspended wheel hub forward, so the planetary ring gear support hub (40) equipped with planetary ring gear and the outer taper roller bearing inner race (43) can be removed.

Pull the wheel hub off steering knuckle. The oil seal (49) will pull the inner taper roller bearing (47) off the steering knuckle (due to loose-fit).

INSTALLING THE WHEEL HUB

Safety suspended to hoist position the wheel hub subassembled with impulse ring (48), sealing ring (49) and cups of the taper roller bearings (43 and 47) and the cone of the inner taper roller bearing to the steering knuckle and push on to bottom out making sure not to damage the sealing lips of the sealing rings.

Position the rim hub (40) subassembled with the outer taper roller bearing (43) cone and with gear rim (38) into the wheel hub and aligning the splines drive on to bottom out, making sure the taper roller bearing seats properly.

Adjust axial play of the wheel hub to 0.01 - 0.03 mm:

Tighten the inner wheel end nut (36) with 196 Nm torque and then release. While keeping the wheel hub rotating and moving in axial direction, re-tighten the nut so that the wheel hub has axial endplay.

Position the lock plate (35) and one of the slots of the shaft-end nut adjust to any tab of the lock plate, **but do not secure** yet. Install the outer shaft-end nut (34) up while rotating the wheel hub tighten to 560 - 640 Nm torque.

By means of dial indicator check if the specified 0.01-0.03 mm axial play is obtained.

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

If the 0.01 - 0.03 mm axial play is adjusted secure the shaft-end nuts by the lock plate (35).

SECTION 224.

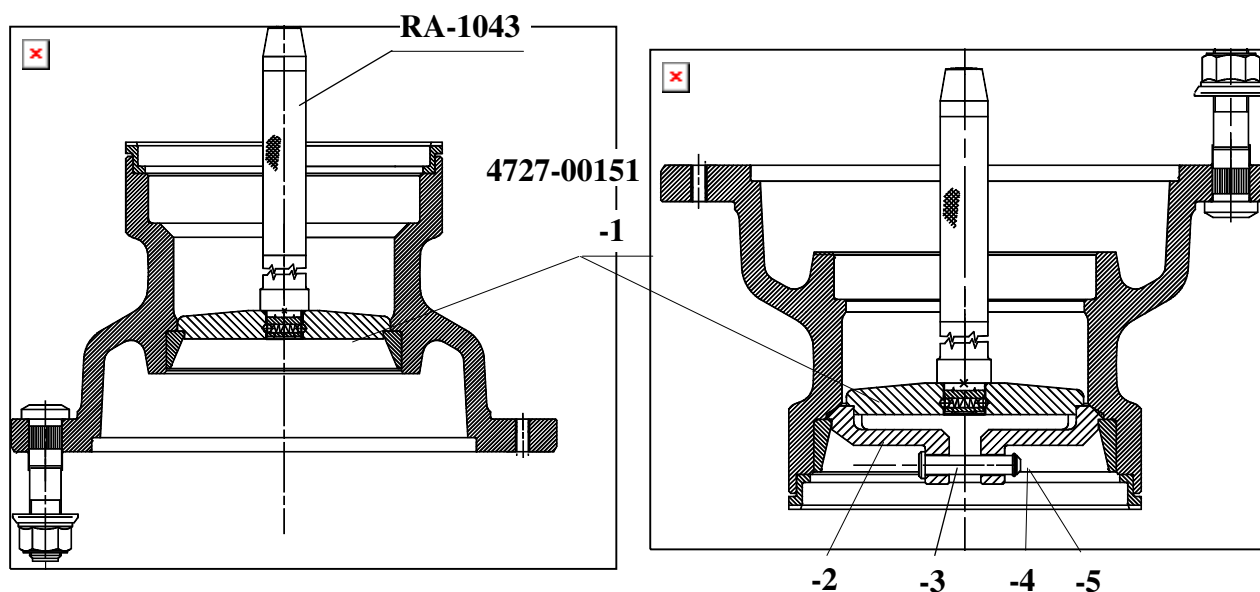
DISASSEMBLING AND REASSEMBLING THE WHEEL HUB

WARNING!

At mounting of wheel hub the undamaged energizer ring is not replaced. At replacement of bearings and sealing rings take care to preserve the toothing of energizer ring in good state to a greater extent!

By means of a simple pry remove the sealing ring (49) from the removed wheel hub and remove the inner taper roller bearing cone.

By means of the tools shown drive out the cups of the taper roller bearings (see Fig. 1.).

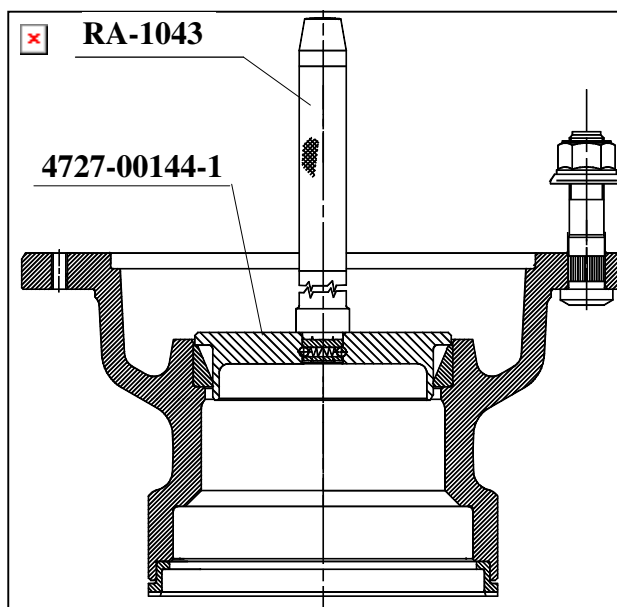


783.24-17

Fig.1.: DRIVING OUT THE BEARING CUPS

REASSEMBLING THE WHEEL HUB

First drive in the cups of the outer taper roller bearings by means of the tool shown (Fig.2.).



783.24-18

Fig. 2.: DRIVING IN THE OUTER TAPER ROLLER BEARING CUP

Turn the wheel hub over and also drive in the cup of the inner taper roller bearing (see Fig. 3).

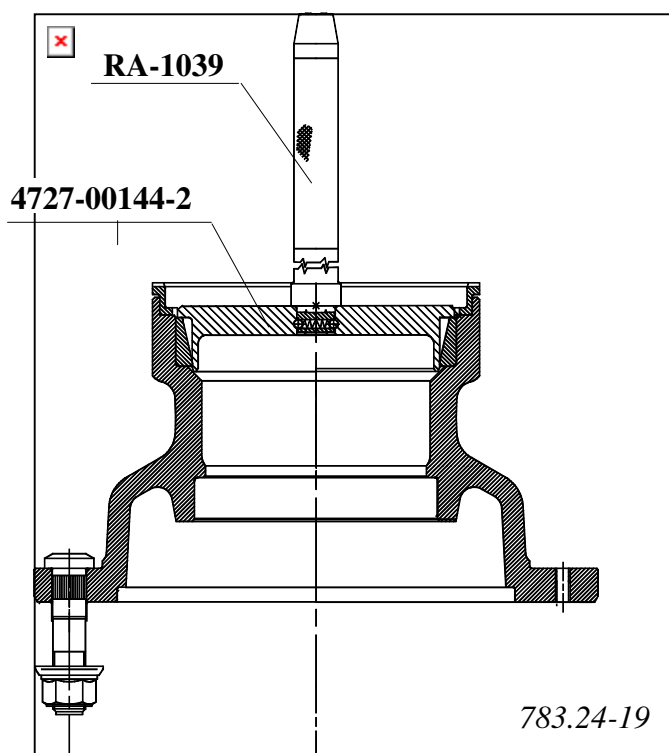


Fig. 3.: DRIVING IN THE INNER TAPER ROLLER BEARING CUP

WARNING!

On the axles mountable with ABS toothed surfaces of the impulse ring shall be protected from shocking during installation of seal support and seal ring!

According to "GENERAL SERVICE INSTRUCTIONS" apply oil-proof sealant to the impulse ring seat (LOCTITE 515).

If the impulse ring is changed, before pressing the new impulse ring is to be cooled uniformly in dry ice and pushed in to stop on the wheel hub.

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

TOOTHING CAN GET DAMAGED!

Put the inner taper roller bearing (47) cone into the wheel hub.

Seating of seal ring is to be lubricated with oil-proof surface sealing material per "GENERAL SERVICE INSTRUCTIONS" and the seal ring .

Drive the sealing ring into the seat until the tool bottoms out (see Fig. 4.).

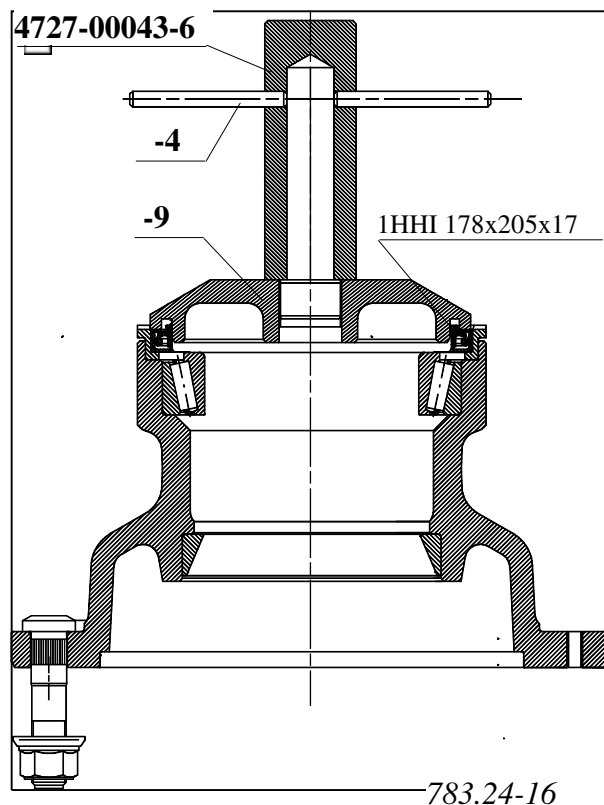


Fig. 4.: DRIVING IN THE SEALING RING

SECTION 225.

DISASSEMBLING AND REASSEMBLING THE RIM HUB

DISASSEMBLING THE RIM HUB

After removing the circlip (41) pull the gear rim (38) off the rim hub (40).

Do not remove the centering ring (37) from the rim hub, these may be replaced only together.

By soft mandrel positioned thru the rim hub bores drive the taper roller bearing cone (43) off the rim hub.

REASSEMBLING THE RIM HUB

As shown in the figure drive the cone of the taper roller bearing (43) to the rim hub supplied together with centering ring (37) (see Fig. 1.).

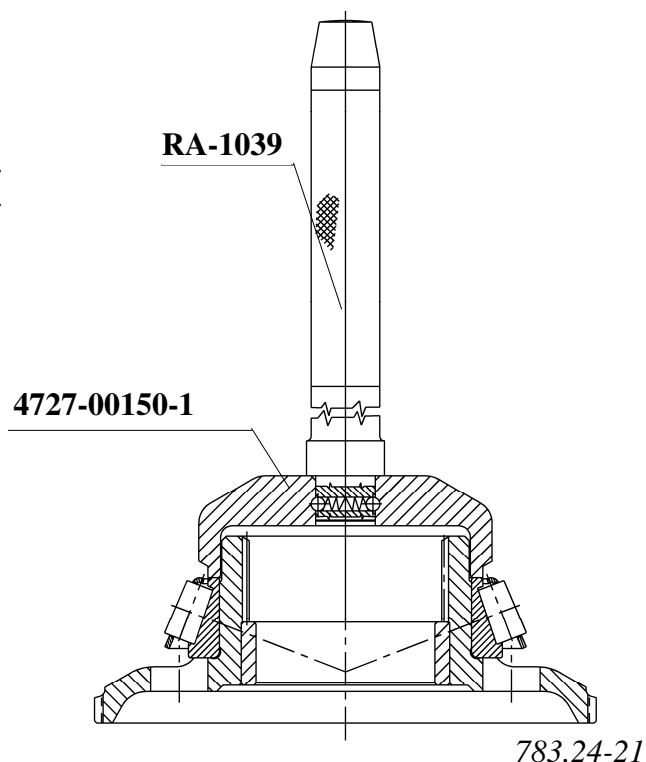


Fig. 1.: DRIVING THE TAPER ROLLER BEARING
CONE TO THE RIM HUB

By aligning the toothing (38) push the ring gear support (40) onto the ring gear. Push the ring gear support back up to bottoming on the ring gear and mount the locking ring (41) into its groove then adjust the ring gear support to its place.

SECTION 229.

INSTALLATION INSTRUCTIONS FOR MOUNTING THE PARTS OF ANTI-LOCK SYSTEM

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

1. ALTERNATIVE MOUNTING ITEMS FOR ABS AND ASR

1.1 Speed sensor:

Robert Bosch GmbH A 335 545 231 or
KNORR-BREMSE ZB 9010-I/83315 or
WABCO 441 032 001 0 or
WABCO 441 032 578 0 or
WABCO 441 032 808

1.2 Spring bushing:

Robert Bosch GmbH C 335 002 431 A or
KNORR-BREMSE 4B 69698 or
WABCO 899 760 510 4 or
WABCO 899 759 815 4

NOTE: Install speed sensor with the same type of springed bush only.

A - Toothed pulse generating ring

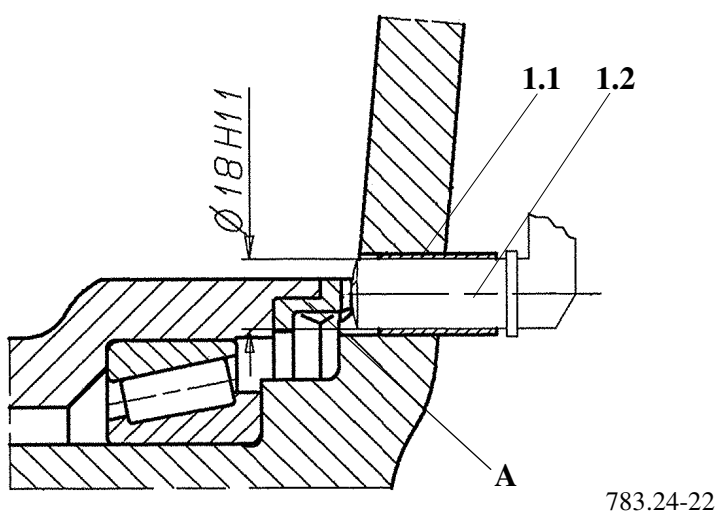


Figure 1.: MOUNTING THE ANTIBLOCKING SYSTEM

2. MOUNTING INSTRUCTIONS

Apply copper paste or silicon grease (e.g. Molykote FP 186, NBU 30 PTM Univew N3) to the $\text{Ø}18\text{H}11$ bore of the speed sensor holder before installation of the springed bush, to prevent corrosion.

Push the springed bush into the $\text{Ø}18\text{H}11$ bore from the middle of axle to mate (12).

Insert speed sensor (1.1) into the spring bush, and push towards the generating ring on the wheel hub. After dismantling wheel hub this adjustment must be made every time.

During operation the distance between the speed sensor and the generating ring should be 0,8 mm max.

Lead the wire of speed sensor from the axle brake system in such a way that the radius of the blended wire never less than a minimum of R50 mm and fix the wire at 50 mm intervals while inside the hot brake system .

Check the runout of toothed impulse generating ring. Allowable runout of the ring teeth in the direction of the speed sensor is 0,2 mm max.

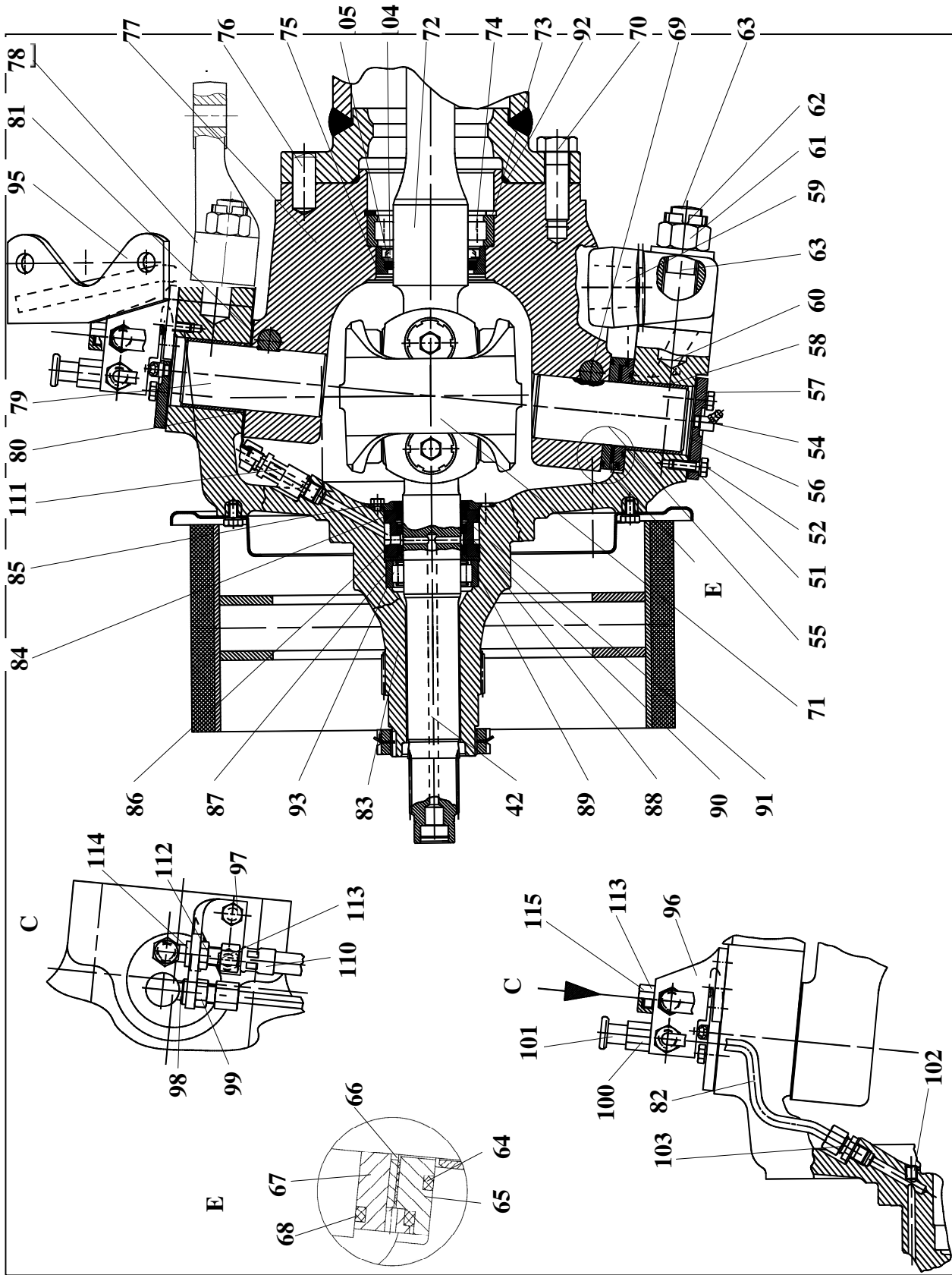
*NOTE: Tachometer to be built in only with spring bushing of the same manufacturing. Besides BOSCH, KNORR and WABCO tachometer, a tachometer of other production, interchangeable with the above is allowed to be built in. If the impulse ring is changed, before pressing the **new impulse ring is to be cooled uniformly in dry ice** and pushed upto stop in the wheel hub.*

THE TEETH MUST NOT BE DAMAGED!

AXLE HOUSING

SECTION 240.

SECTIONAL VIEW OF THE AXLE HOUSING



783.30-22

Fig. 1.: SECTIONAL VIEW OF THE AXLE HOUSING

SECTION 241.
PARTS OF THE AXLE HOUSING

42 - Outer axle-shaft

51 - Lock washer

52 - Hex. Bolt

54 - Ball lube fitting

55 - Knuckle pin, lower

56 - Gasket

57 - Cover

58 - Knuckle pin, bush

59 - Tie- rod arm

60 - Dowel pin

61 - Castle nut

62 - Securing wire

63 - Stud bolt

64 - O-ring

65 - Bearing case, lower

66 - Thrust disk with plastic coating

67 - Bearing case, upper

68 - O-ring

69 - Lock wedge with hex. flanged nut

70 - Hex. bolt

71 - Double joint head

72 - Inner axle shaft

73 - Snap ring

74 - Cylindric roller bearing

75 - Seal retainer

76 - Dowel pin

77 - Knuckle carrier

78 - Steering arm

79 - Knuckle pin, upper

80 - Sealing ring

81 - Shims

82 - Wheel hub connecting pipe

83 - Steering knuckle

84 - Dust protection plate with gasket

85 - Hex. bolt with lock washer

86 - Oil seal support

87 - Sealing ring

88 - O-ring

89 - Spacer

90 - Spacer plate

92 - Sealing ring

91 - V - ring

93 - Cylindric roller bearing

95 - Chamber holder

96 - Holder

97 - Hex. bolt with lock washer

98 - Elbow

99 - Low nut

100 - Reducing fitting

101 - Vent valve

102 - Grub screw

103 - Pipe fitting

104 - Sealing ring

105 - Dust protection gasket

- 110 - Hose
- 111 - Extension
- 112 - Hex. nut
- 113 - Oil seal
- 114 - Crandet adapter
- 115 - Plug nut

SECTION 242.

REMOVING AND REINSTALLING THE TIE-ROD, ADJUSTING THE TOE-IN AND THE WHEEL TURN ANGLES, ASSEMBLING THE TIE-ROD

REMOVING THE TIE-ROD

Remove the cotters and back out the castle nuts, then remove the linkages from the taper bore of the tie-rod arms by pressing out the ball stud with the tool shown (Fig.1).

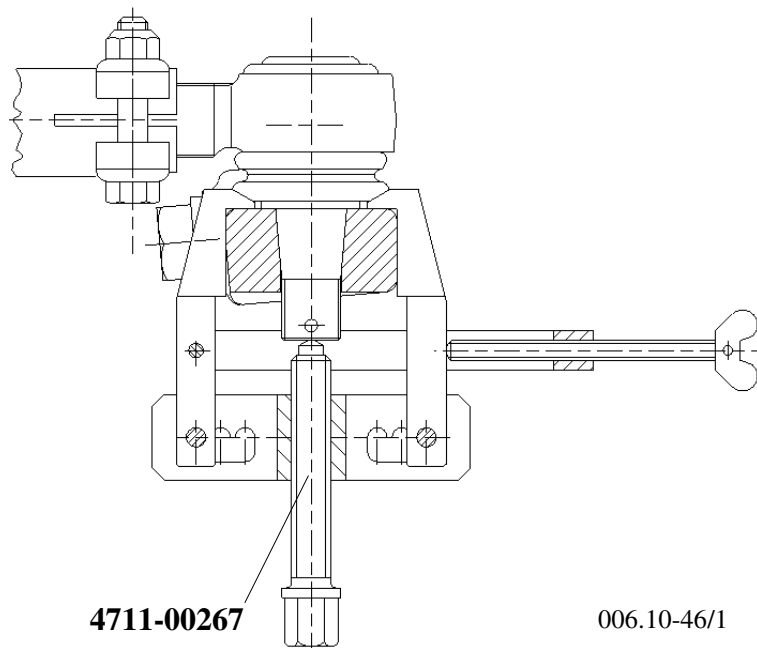


Fig. 1.: PRESSING OUT THE BALL STUDS

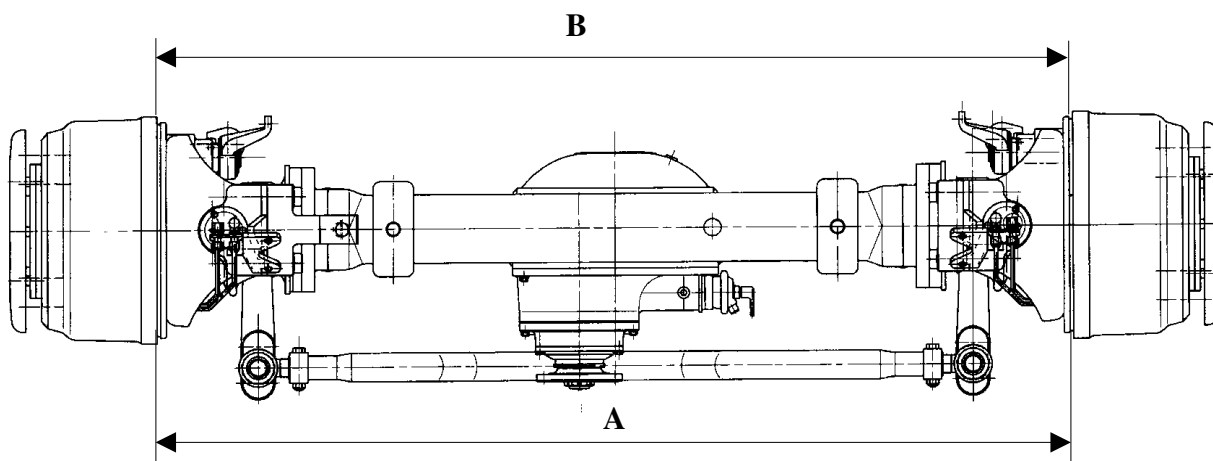
REINSTALLING THE TIE-ROD

Reinstall the tie-rod in reverse order of removal.

After reinstalling the tie-rod adjust the steering geometry of the axle.

1. ADJUSTING TOE-IN

Toe-in (Fig. 2) means the difference between the dimensions "A" and "B" as measured at the height of the wheel center in front and rear on the brake drum flange.



783.24-23

Fig.2.: CHECKING TOE-IN

$$\text{TOE-IN} = A - B = 0 \dots 1,5 \text{ mm.}$$

Warning!

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

After loosening the tie-rod clamp self lock nuts adjust the toe-in by turning the tie-rod to required direction.

After proper adjustment tighten the castle nuts of the ball studs to 300 - 400 Nm and the tie-rod clamps in case of FAD tie-rod to 70 - 80 Nm in case of LEMFÖRDER tie-rod to 160 - 180 Nm torque then cotter secure the self lock nut.

In the cotter pin hole does not align with the groove, retighten the nut until you can secure the nut by cotter pin. *No loosening is allowed (47)!*

After this check the toe-in again.

2. ADJUSTING MAX. INNER WHEEL TURN ANGLE

Upon reaching the max. inner wheel turn angle ($\alpha=35^\circ$) specified in, adjust the stop bolt (1) to bottom out against the axle body (Fig. 3.).

- 1 - Stop bolt
 2 - Hex. nut
 α - Wheel turn angle
 $\alpha=35^\circ$

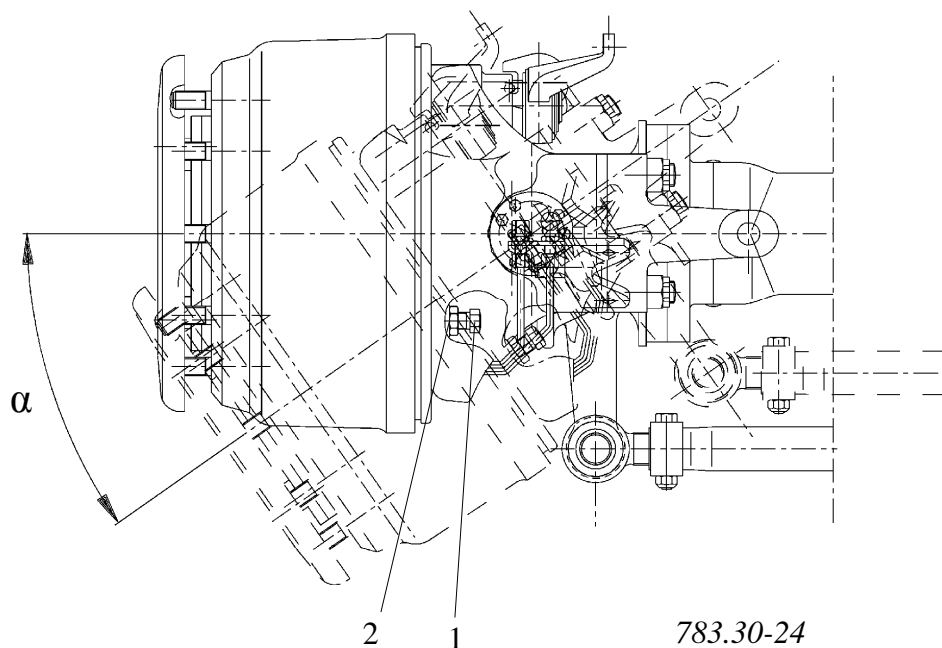


Fig. 3.: ADJUSTING THE INNER MAX. WHEEL TURN ANGLE

Warning!

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

After the adjusting tighten the hex. nut to 120 - 160 Nm torque

Perform adjustment of the max. inner wheel turn angle on the 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.

DISASSEMBLING AND REASSEMBLING THE TIE-ROD

DISASSEMBLING THE TIE-ROD

Back out the flanged self-lock nuts, then remove the clamp bolts.

Unscrew the ball joint head from the tie-rod ends.

The ball joint head can be replaced as a unit, only.

RE ASSEMBLING THE TIE-ROD

Screw the ball joint head into the tie-rod so, after adjusting the proper length the ball joint head at the both ends of the linkage shall be screwed in nearly to identical length.

Install the clamp bolts to the shackles and screw on the flanged self-lock nuts.

After installing the tie-rod to the tie-rod arms and adjusting the specified toe-in tighten the flanged self-lock nuts of the shackles on case of FAD tie-rod to 70 - 80 Nm, in case of LEMFÖRDER tie-rod to 160 - 180 Nm torque.

SECTION 243.

REMOVING AND REINSTALLING THE STEERING KNUCKLES, REMOVING AND REINSTALLING THE DOUBLE JOINTS

REMOVING THE STEERING KNUCKLES

After removing the wheel hub detach the pipeline connection, then remove the cover (57) of the knuckles pins (55 and 79).

Remove the hex. flanged nuts (69) from the lock wedges and drive out the wedges.

Properly backing up the steering knuckle pull the knuckle pins by the tool shown (Fig. 1.).

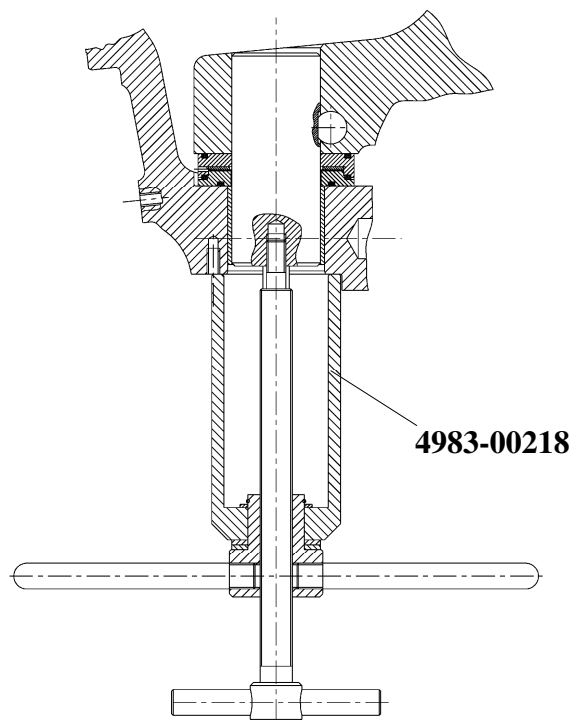


Fig. 1.: PULLING OUT THE KNUCKLE PINS

Following this catching safely pull the steering knuckle (83) off the knuckle carrier (77) and the outer axle-shaft, then remove the shims (81).

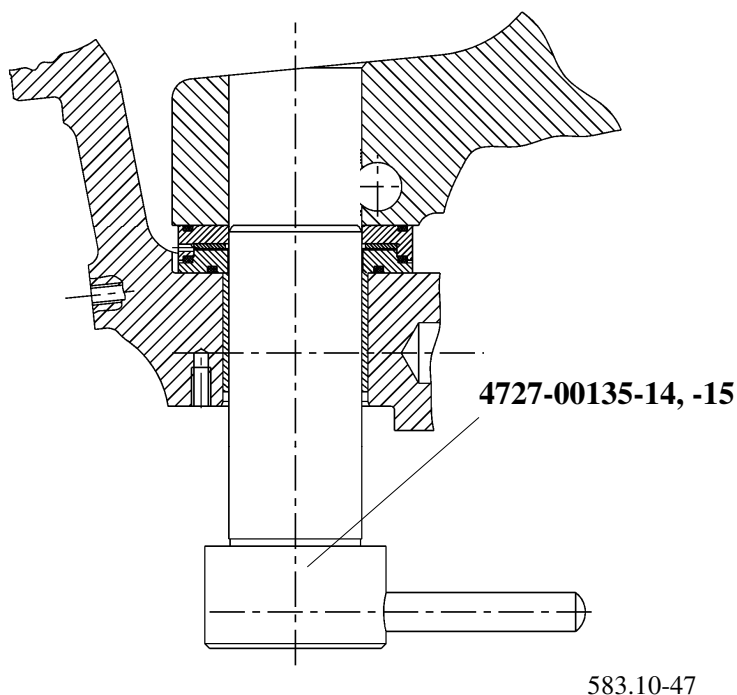


Fig. 2.: ASSEMBLING THE AXIAL BEARING OF THE LOWER KNUCKLE PIN

REMOVING AND REINSTALLING THE DOUBLE JOINT AND THE STEERING KNUCKLE

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

Carefully push the inner longer axle-shaft (72) of the double joint thru the sealing ring of the knuckle carrier (77) and the bore of its cylindric roller bearing (74), then aligning the splines with those of the differential gear push the axle-shaft further bottom out against the differential.

When the outer axle shaft is mounted, use the set of protecting sleeves P/N **8987-00010** for protecting the gasket (105) and the sealing ring (104).

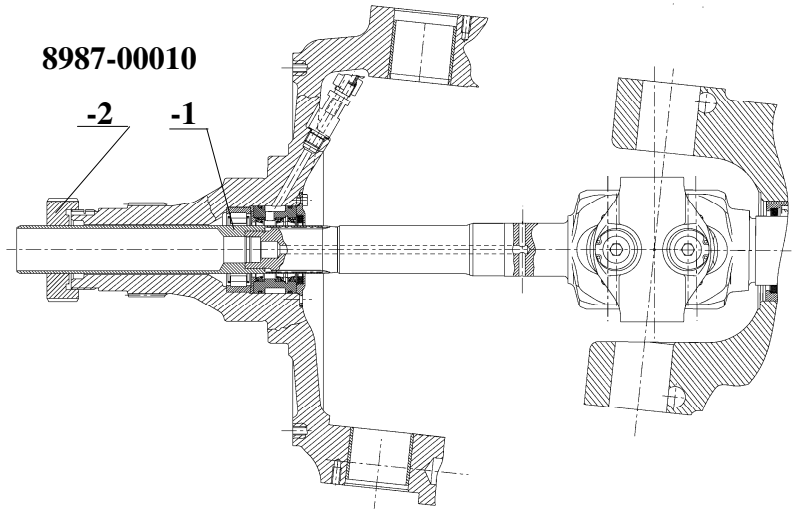
Screw the mounting nut (2) onto the knuckle end and push the protecting sleeve (1) into the knuckle thru the nut (Fig. 3).

8987-00010

-2

-1

Thru the protecting sleeve push carefully the knuckle pre-mounted with bearing, seal retainer and protecting sleeve onto the outer axle shaft (Fig. 3).

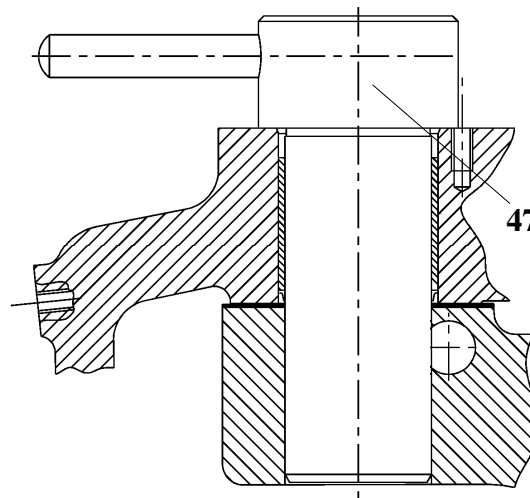


783.24-12

Fig. 3.: REINSTALLING THE STEERING KNUCKLE

Remove the mounting sleeve only after the axial play of the knuckle is adjusted in order to preserve undamaged condition of the seal rings.

Align the bore in the upper knuckle pin of the steering knuckle with that in the lock wedge of the knuckle carrier. Pilot the bores by means of the service mandrel shown (see Fig. 4.).



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583.10-18/1

Fig. 4.: PILOTING THE BORE IN THE UPPER KNUCKLE PIN

By means of the lower service mandrel fit the thrust bearing, the "O"-rings (64 and 68), the bearing case lower (65), the thrust disk (66), the bearing case upper (67) to place shown in Fig. 2., then push the service mandrel in to bottom out.

Apply LZS-2-EP grease on plastic surface of the thrust disc (66) prior to assembly
Make sure the plastic coating on the thrust disk (66) shall face downward.

Mount in the knuckle pin lower. Push up the steering knuckle by means of tool shown in Fig. 1. to bottom out so, the "O"-rings (64 and 68) of the 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:

By means of feeler gage measure the distance between the plane of the knuckle carrier (77) and the steering knuckle (83) then from the shims (81) select a pack of thickness 0.0 - 0.3 mm less than the measured value.

Pull out the upper service mandrel so, to be able to insert the selected shim pack, then aligning the bores push back the service mandrel.

Lower the steering knuckle to normal 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 (55 and 79) in place the service mandrels and secure by lock wedge (69). Screw the hex. flanged nuts to the lock wedges and tighten to 50 - 70 Nm.

Install the covers (57) together with gasket (56) over the knuckle pins . Tighten the hex. bolts with lock washers to 30 - 35 Nm torque.

Screw one ball grease fitting (54) into each cover and fill up the knuckle pin bearing with grease.

As required, the grease seems at the oil seal of the knuckle pin and the axial roller bearing.

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

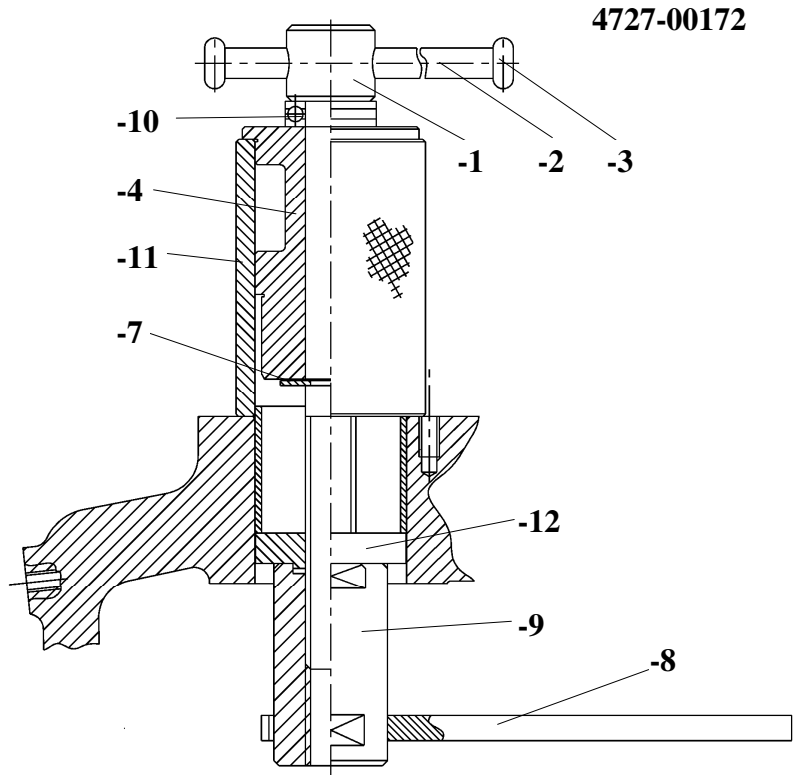
SECTION 244.

ASSEMBLING THE KNUCKLE PIN BEARING BUSHES AND THE SEALING RINGS ON THE STEERING KNUCKLE

REMOVING THE KNUCKLE PIN BUSHES

Remove the sealing ring (80) by means of a simple pry.

By means of the device arranged from the parts shown pull out the swivel pin bushes (58) on both sides. (Fig.1).



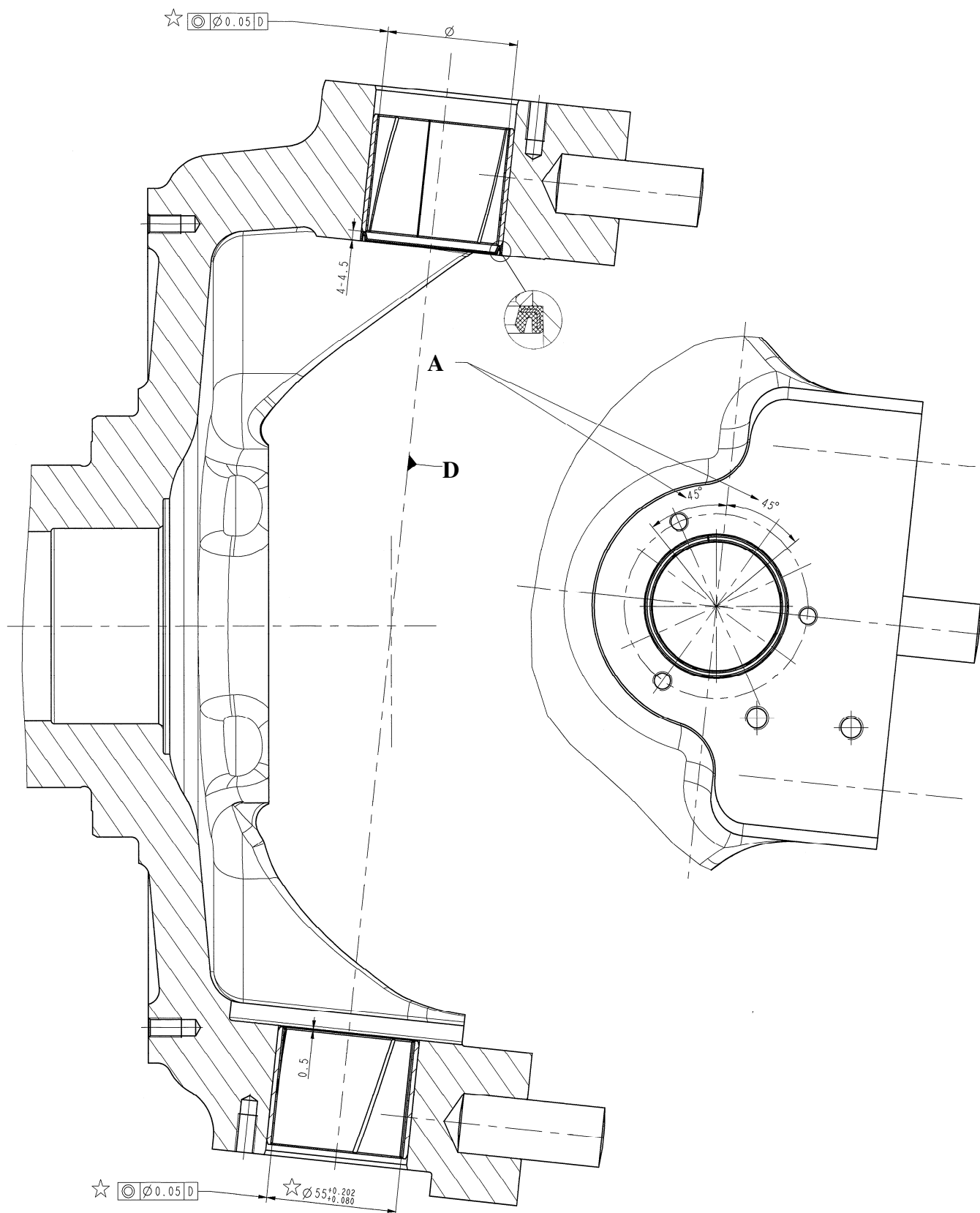
583.10-48

Fig. 1.: PULLING OUT THE KNUCKLE PIN BUSH

INSTALLING THE KNUCKLE PIN BUSHES AND THE SEALING RINGS

When pressing in the knuckle pin bushes make sure to check if the slot of the bushes faces toward the area indicated in Fig. 2., 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 (Fig. 2).



583.10-49

Fig. 2.: POSITION OF THE KNUCKLE PIN BUSHES AND THE SEALING RINGS

By means of the device arranged from the parts shown press in the bushes to the upper and lower side, as well (Fig. 3).

When installing the lower knuckle pin bush, before completely pressing in, remove the insert ring item 12 of the device so, to be able to press the bush into depth shown in Fig.2.

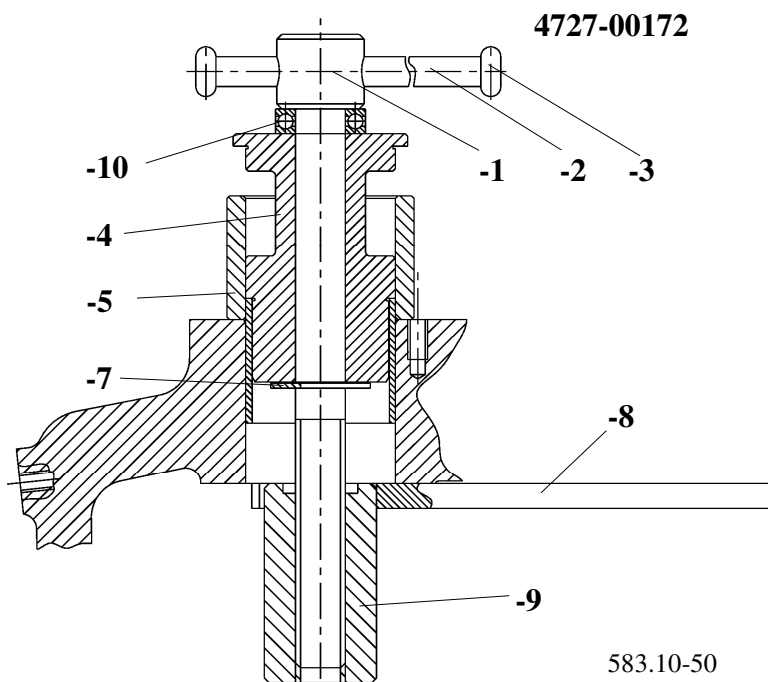


Fig. 3.: PRESSING IN THE KNUCKLE PIN BUSHES

Drive in the specified sealing ring beside the upper bush by means at the tools shown in Fig. 4. Make sure to install the sealing ring as shown in detail drawing of Fig. 2.

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

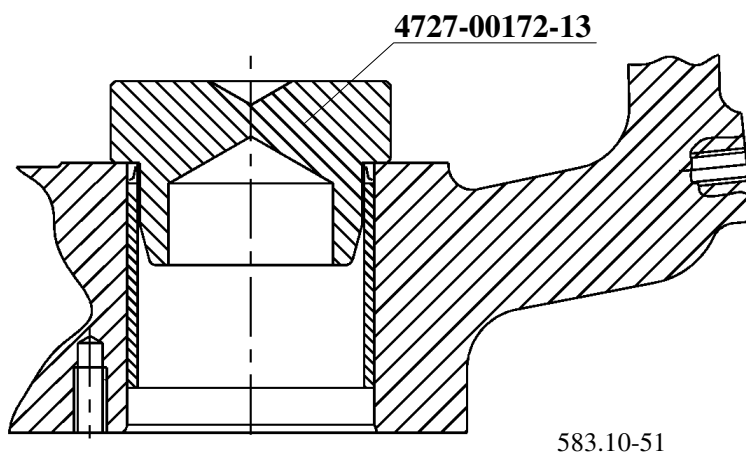


Fig.4.: DRIVING IN THE SEALING RINGS

SECTION 245.

REMOVING AND REINSTALLING THE PILOT ARM, THE CHAMBER HOLDER AND THE TIE-ROD ARMS

For removing the castle nuts cut their securing wire (62) and back out the castle nuts (61).

Following this remove the arms from the steering knuckle. (The dowel pins (60) remain in the steering knuckle.)

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

Using stud bolt driver install the new stud bolt - after apply thread adhesive to 4 - 5 threads - and tighten to 40 - 50 Nm torque.

Install the relevant chamber holder, pilot arm and tie-rod arm to the steering knuckle and secure by the castle nut.

Tighten the castle nuts to 540 - 590 Nm.

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

SECTION 247.**REMOVING AND REINSTALLING THE
INNER BEARING AND SEALS OF THE
STEERING KNUCKLE****REMOVAL**

Remove the dust protection plate (84).

Pull out the cylindrical roller bearing (93) together with seal retaining ring (see. Fig. 1.)

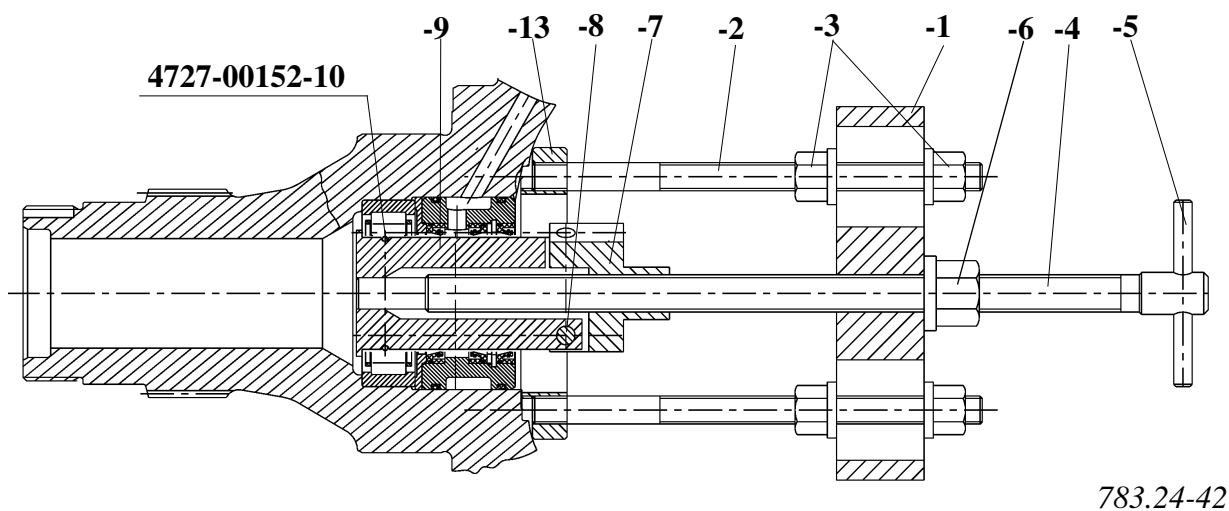


Fig. 1.: PULLING OUT THE CYLINDRIC ROLLER BEARING

**REINSTALLING THE INNER BEARING AND THE
SEALS TO THE STEERING KNUCKLE**

First drive the cylindric roller bearing into its seat to bottom out (see Fig. 2.).

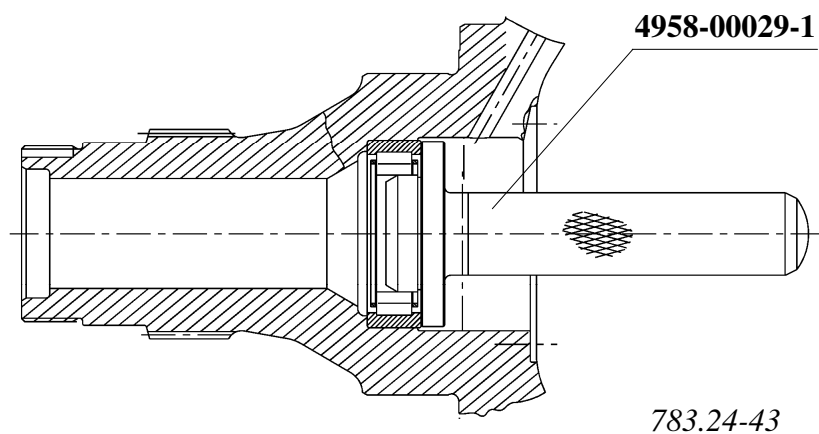


Fig. 2.: DRIVING IN THE CYLINDRIC ROLLER BEARING

Replace the sealing rings (87) also in the seal retainer (86). For this first remove the outer seal ring (87), then by snap ring pliers remove the V- ring (91) and the distance (90), then by means of pry remove the sealing rings (87).

Mount new seal rings into the seal retainer (86) as follows: push the seal ring (87). Reverse the seal retainer and first, push the inner seal ring (91) up to bottoming, insert the spacer plate (90), V-ring (87) and finally, push the outer seal ring up to bottoming

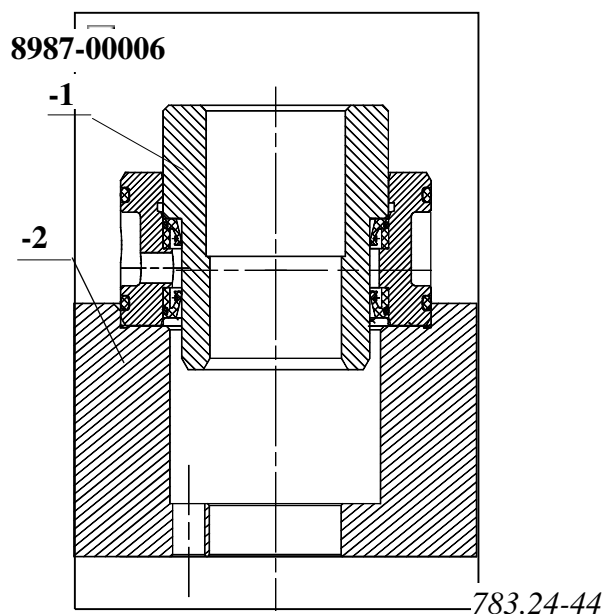


Fig. 3: INSTALLING THE SEALING RINGS

Fill BP Energrease LC2 grease in the space between the seal rings.

Replace 2 O-rings (88) on the seal retainer surface. Fit the O-rings to the outer wall of seats. Make sure that surfaces are free of edges and burrs when the O-rings are mounted.

Apply a thin oil film onto the seal retainer surface.

Insert the spacer (89) into the knuckle (83) and then push the pre-assembled seal retainer (86) up to bottoming (figure 4).

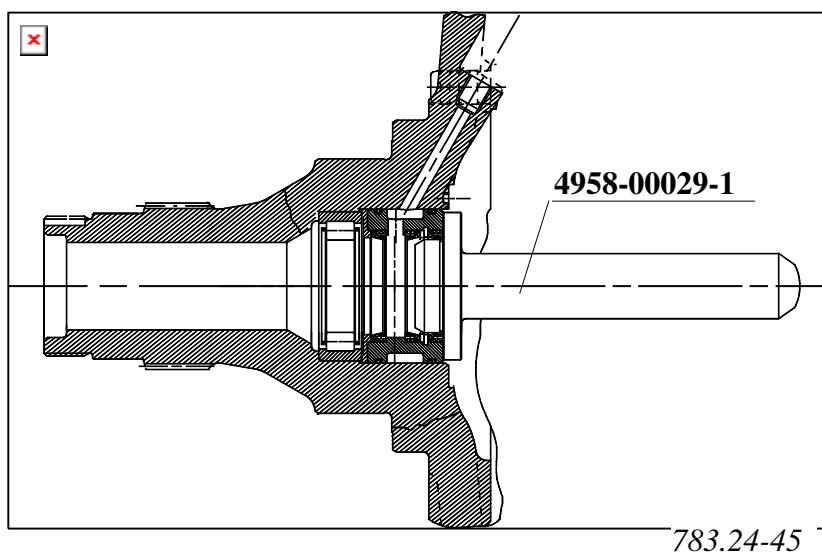


Fig. 4: PRESSING IN THE OIL SEAL SUPPORT

By means of lock washer and hex. bolts (85) install the dust protection plate (84) supplied with pressed in sealing ring and tighten the bolts to 6 - 8 Nm torque.

Fill up the space between the dust protection plate (84) and the sealing ring, as well as and the lips of the sealing rings with grease LZS-2EP.

SECTION 248.

REMOVING AND REINSTALLING THE BEARING AND SEALS OF THE KNUCKLE CARRIER

REMOVAL

After removing the double-joint remove the hex. bolts (70) from the axle housing flange, the separate the knuckle carrier (77) from the axle housing, by 2 off M12 bolts of at least 40 mm thread length driven into the axle housing flange.

By means of snap ring plier remove the snap ring (73).

Drive out the cylindric roller bearing (74) and the seal retainer (75) (Fig. 1.).

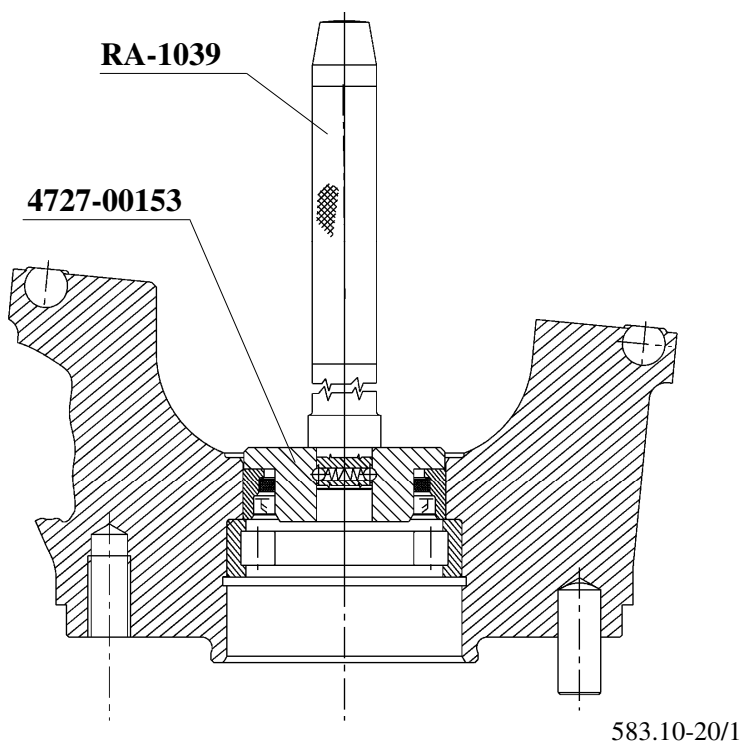


Fig. 1.: REMOVING THE SEAL RETAINER AND THE CYLINDRIC ROLLER BEARING

INSTALLING THE CYLINDRIC ROLLER BEARING AND THE SEALS INTO THE KNUCKLE CARRIER

By means of the tool shown drive the dust protection seal (105) into the seal retainer Fig. 2.).

Fill up the space between the dust protection (105) and the sealing ring (104) with grease LZS-2EP.

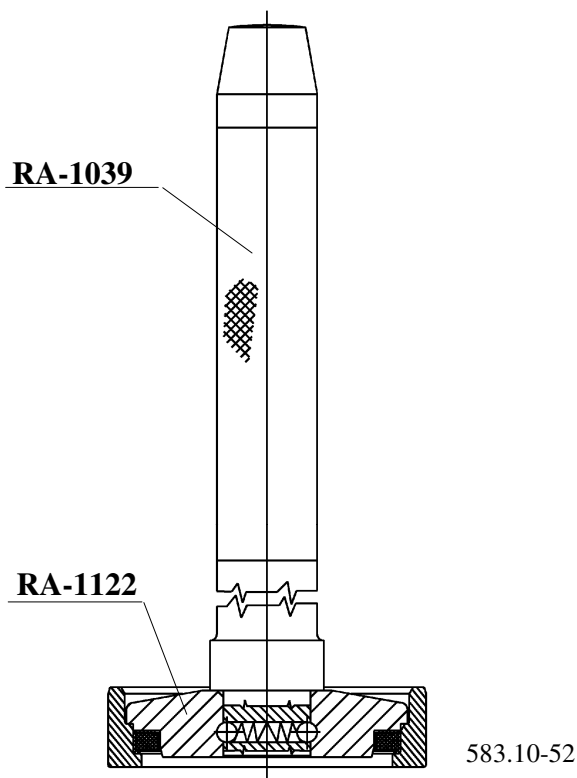


Fig. 2.: INSTALLING THE METAL CLAD SEALING RING INTO THE SEAL RETAINER

By means of the tool shown drive the new sealing ring (104) into the seal retainer (Fig. 3.)

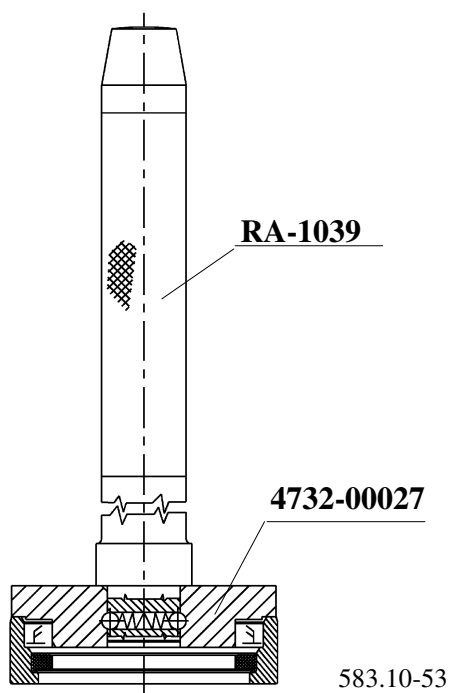


Fig. 3.: DRIVING THE NEW SEALING RING INTO THE SEAL RETAINER

Apply oil-proof surface sealant to mantle of the seal retainer.

For installation turn the knuckle carrier over and first drive in the seal retainer subassembled with sealing ring until the tool bottoms out (Fig. 4.).

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

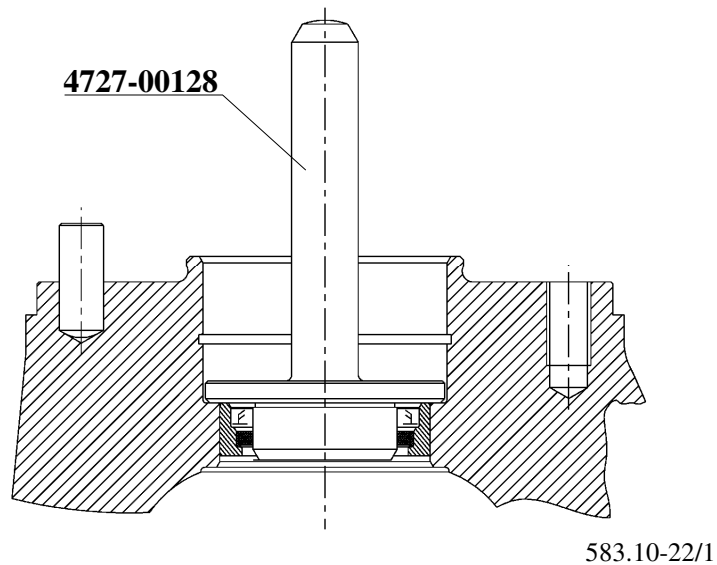


Fig. 4.: DRIVING IN THE SEAL RETAINER

Drive in the cylindric roller bearing by means of the tool shown (Fig. 5.).

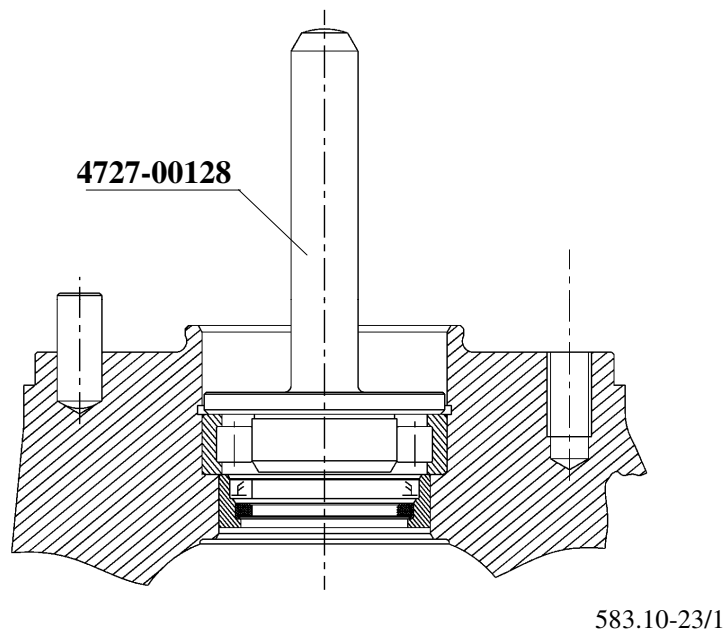


Fig. 5.: DRIVING IN THE CYLINDRIC ROLLER BEARING

Secure oil-proof cylindric roller bearing by means of snap ring (73).

Install the sealing ring (92) then connect the knuckle carrier to the axle housing and attach by means of hex. bolts (70) coated with thread locker and tighten to 360 - 380 Nm torque.

SECTION 249.

ASSEMBLING THE VENTILATION LINE

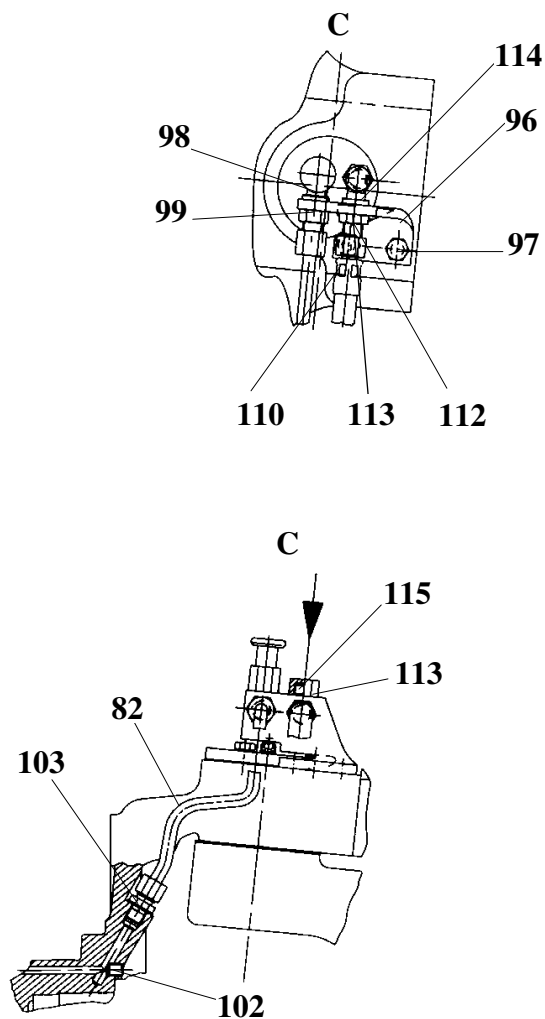
REMOVING THE VENTILATION LINE

Detach the ventilation line at the pipe fitting (103) of the steering knuckle and the elbow (98) on the holder (96) mounted to the steering knuckle. Remove the pipes and unscrew the fitting from the steering knuckles as well as the elbow (98) from the holder (96) after removing the low nut (99).

Release the hose (110) connection at the extension (111) mounted into the knuckle and at the elbow (114).

Unscrew the end nut (115), release the low nut (112) and remove the elbow (114).

REINSTALLING THE PIPES



783.24-53

Fig. 1.: THE VENTILATION LINE

Attach the holder (96) on the steering knuckle by means of 2 hex. bolts (97) and lock washers. Tightening torque of the hex. bolts is 39 - 49 Nm.

Screw the elbow (98) into the threaded bores of the holder and secure by low nut (99) tightened to 30 - 40 Nm torque after the vent valve is installed.

Install the pipe fitting coated (103) with thread locker into the threaded bores of the steering swivel.

Close the bore of the steering knuckle by means of grub screw (102) coated with thread locker.

Connect the relevant (RH - LH) pipelines (82) by the union nut to the pipe fitting (103) and the elbow, then tighten to be leak-tight. Screw the reducing fitting (100) with thread locker (LOCTITE 243) and the vent valve (101) to the elbow (98) so, the vent valve shall be vertical.

Screw the elbow (114) into the threaded bore of the bracket (96) and fix it with the low nut (112), by tightening to 30 - 40 Nm torque.

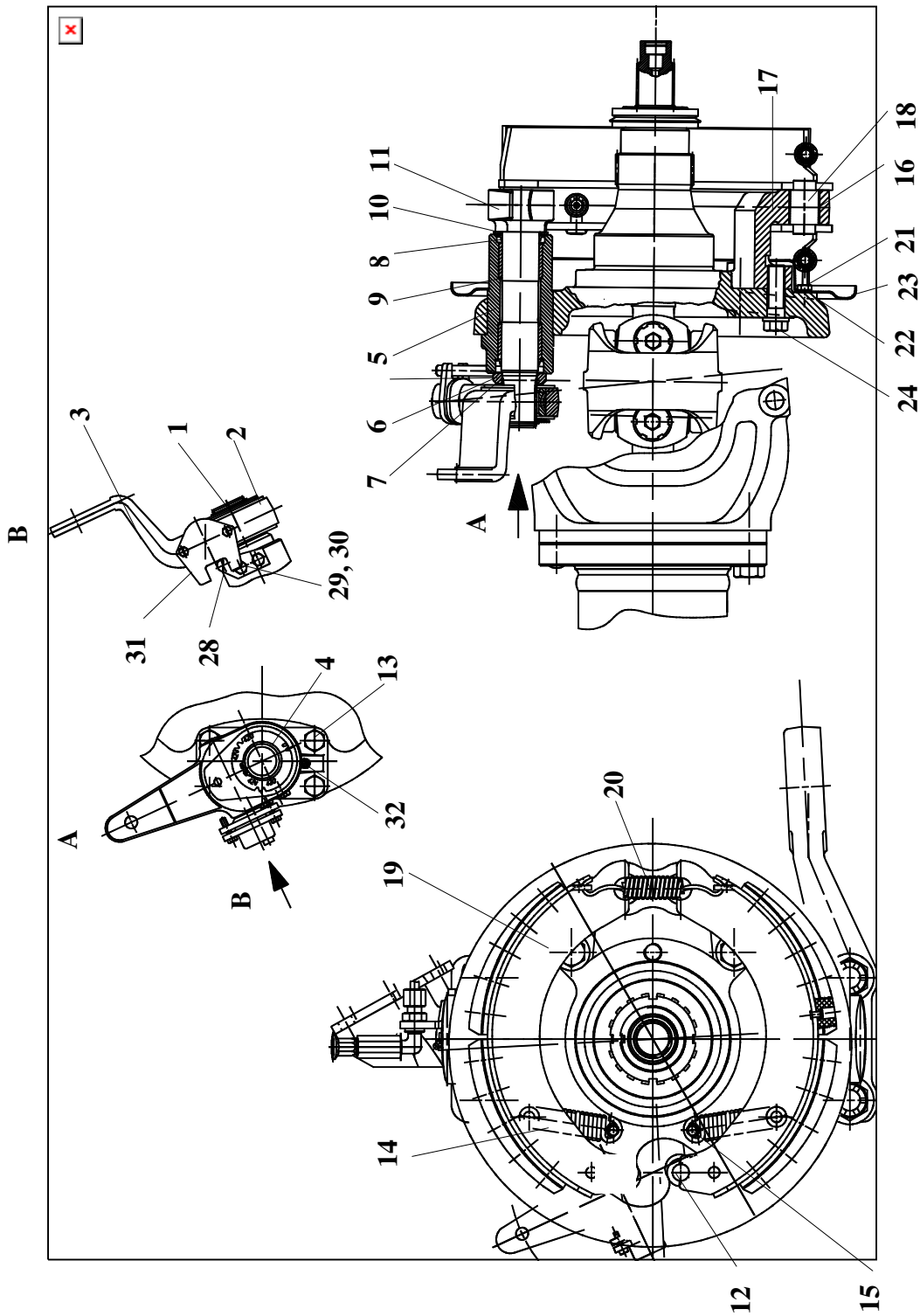
Insert the seal ring (113) between the hose connection (110) and the elbow (114) as well as between the extension (111) and the hose (110) and tighten the hose connection to 50-60 Nm torque. Mount the extension into the knuckle with LOCTITE 243 (thread retaining material), tightening torque is 50 - 60 Nm.

Insert the seal ring (113) between the end nut (115) and the elbow (114) and tighten the end nut to 10-15 Nm torque.

Install the threaded extension with thread locker (LOCTITE 243) of the vent valve shall be vertical.

FRONT WHEEL BRAKE

DRAWING OF THE FRONT WHEEL HUB



783.24-6

Fig. 1.: DRAWING OF THE FRONT WHEEL BRAKE

SECTION 261.

PARTS OF THE FRONT WHEEL BRAKE

- 1- Snap ring
- 2 - Spacer
- 3 - Brake lever
- 4 - Wear indicator disk
- 5 - Camshaft support
- 6 - Shims
- 7 - Spacer
- 8 - Sealing ring
- 9 - Bearing bush
- 10 - Distance washer
- 11 - Brake spanner
- 12 - Roller (with roller pin)
- 13 - Hex. bolt
- 14 - Brake shoe return spring, long
- 15 - Spring support pin
- 16 - Bushing
- 17 - Brake support
- 18 - Brake shoe anchor pin
- 19 - Brake shoes
- 20 - Brake shoe return spring, short
- 21 - Hex. bolt
- 22 - Lock washer
- 23 - Brake cover plate
- 24 - Hex. bolt
-
- 28 - Stop
- 29 - Hex. bolt
- 30 - Lock washer
- 30 - Adjusting plate
- 32 - Ball presse fitting

SECTION 262.

REMOVING AND REINSTALLING THE BRAKE

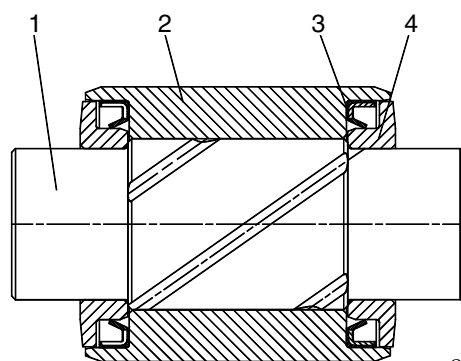
REMOVING THE BRAKE SHOES

Remove the brake drum (1 in Fig.1 of Section 210). Pry the brake shoes (19) away. Remove the rollers (12).

Unhook the shoe return springs by means of the spring hooking device **4957-00489**, then remove the brake shoes.

BRAKE SHOE ROLLER AND ITS ASSEMBLING

- 1 - Roller pin
- 2 - Brake shoe roller
- 3 - Oil seal
- 4 - Spacer



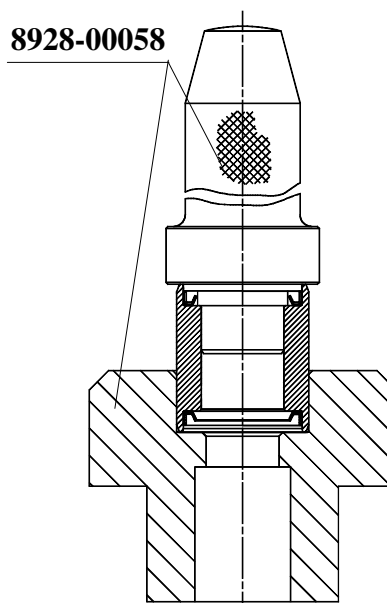
860.00-50

Fig. 1.: THE BRAKE SHOE ROLLER

At specified intervals described in the OPERATING AND MAINTENANCE INSTRUCTIONS drive out the brake shoe roller. Apply thin coat of the operating surface of the brake shoe roller and refill the groove with AGIP AUTOL TOP 2000 grease.

When the oil seal is to be replaced, after driving out the roller pin remove the worn oil seal. By means of the tool shown drive in the new oil seal to bottom out (Fig. 2.).

Fill up the hole between the sealing lip of the oil seal and the spacer with the above mentioned grease, too.



860.00-51

Fig. 2.: DRIVING IN THE OIL SEAL

Drive on the spacer with the spacer driver mandrel of the No. **8928-00058** set.

REINSTALLING THE BRAKE SHOES

Position the brake shoes to be placed in shoe anchor pin (18) on the brake camshaft head. Hook the return springs (14 and 20) to the brake shoes. For hooking use the springs hooking device Drw. No. **4957-00489**.

Coat the connecting surface with AGIP AUTOL TOP 2000 grease

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

Pry the brake shoes away, then insert the rollers (12) so, they shall seat both in the brake shoe rib and in the brake spanner involute profile

SECTION 263.

REPAIRING THE BRAKE SHOES AND THE BRAKE DRUM

Operate the axle with brake drum trued-up ONLY to the permitted max. diameter and brake linings worn to the permitted limit. Exceeding the above limits the brake spanner may turn over making the brake application impossible.

The permitted minimum thickness of the brake linings is indicated by upper edge of the recess in side of the linings. (As measured at the center of the brake shoe $V_{min.} = 7.0 \text{ mm}$).

Replace the brake linings if damaged or worn below the permitted limit. Replace the all of brake linings in the axle. True up the brake shoes only in pairs.

The working off is implemented with equipment drawing number **8860-00135**. The device shall be mounted on the wheel hub. The fitting of the device on the guiding flange ($\varnothing 282E8$) after the clamping shall be checked then the device shall be tightened by the wheel bolts.

The brake shoes equipped with new linings should be in compliance with the dimension specifications and technical requirements shown in Fig. 1.

The depth of cut can be adjusted base on the scale on the bolt of tool adjuster (1 pitch: 0.05 mm in radial direction). Every time, the device is permitted to be operated only by the crank rod. **It is prohibited to turn on the drive!**

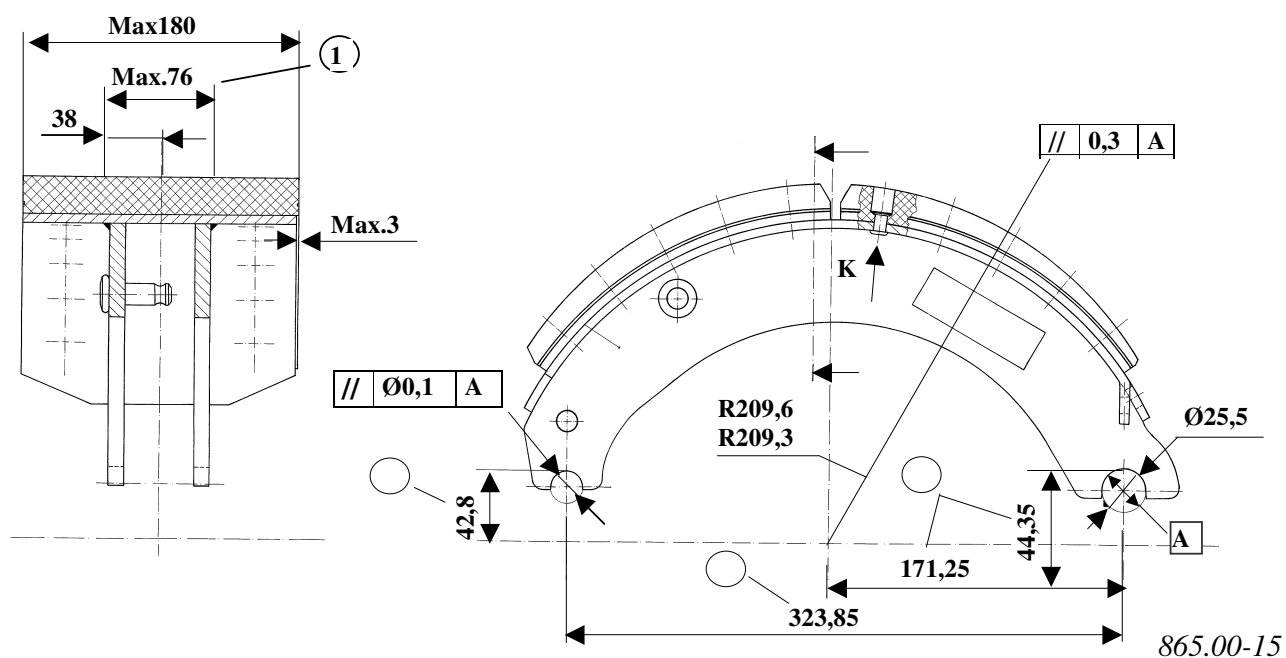


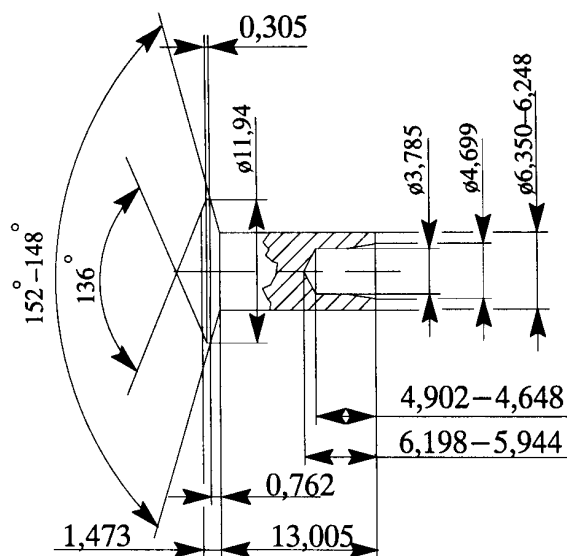
Fig. 1.: DATA FOR TRUEING UP THE BRAKE SHOES EQUIPPED WITH NEW LININGS

- 1 - Max. "Z" - area
- 3 - Basis
- 4 - Controlling - dimension

For riveting use ONLY the rivets corresponding to Fig.2.

TECHNICAL REQUIREMENTS:

- 1 - Material: C10 Z MSZ 6251
- 2 - Copper plated
- 3 - Tolerance of the untolerated dimensions is ± 0.254
- 4 - Tolerance of the untolerated angles is $\pm 1^\circ$

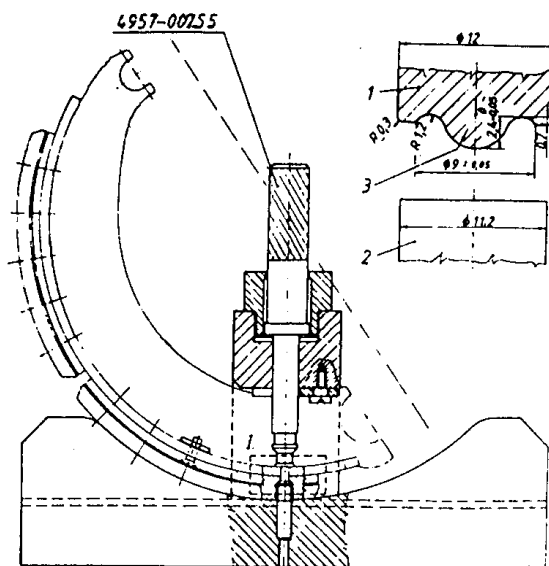


832.81-17/4

Fig.2.: DIMENSIONS OF THE RIVETS

For riveting use the device No. **4957-00755** equipped with tool developed according to Fig. 3.

- 1 - Rivet set, upper
- 2 - Rivet set, lower
- 3 - Globe R 2.4 mm

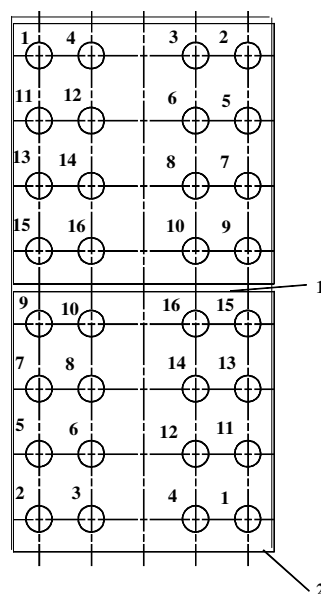


832.81-16/4

Fig. 3.: RIVETING TOOLS

Perform riveting in sequence shown in Fig 4.

- 1 -
Center of the brake shoe
- 2 -
Brake spanner end of the brake shoe



470.00-17

Fig. 4.: RIVETING SEQUENCE

The brake linings should seat so, the feeler gage of 0.15 mm could not be inserted along the lining to between the lining and the brake shoe, except the Zed-area (Fig. 1.).

Check the surface of both linings for parallel to the datum "A" so, to adjust the datum "A" by means of $\varnothing 25,5$ mm pin into position shown (Fig. 1.).

Upset rivet must withstand 1200 LBS proof load in direction of arrow - K - at rivet base.

On each lining 2 off rivet flanges may crack in Vee-shape, provided the test load was endured.

CHECKING THE BRAKE DRUM

Check the inside surface of the brake drum.

If depth of the hair-cracks experienced on the brake drum surface does not exceed 1 mm the brake drum can be repaired by true-up.

The maximal brake drum diameter after true-up may be $\varnothing 423$ mm. Out of this diameter the brake drum should be replaced.

WARNING!

When trueing up the brake drum the brake shoes should be trued-up taking the brake drum diameter into account.

Eg.: If diameter of the trued-up brake drum is 422 mm, true-up the brake shoe to R 210.6 - R 210.3 mm as shown in Fig. 1.

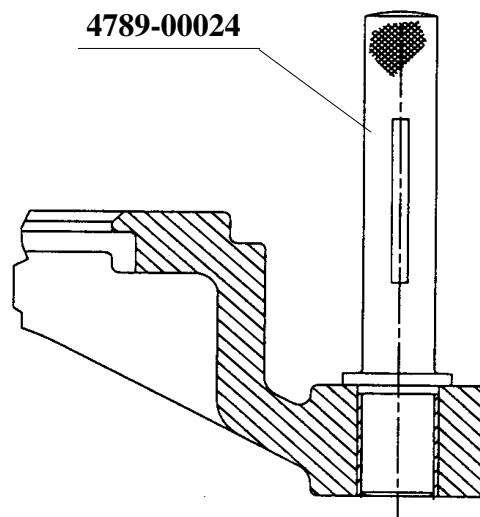
SECTION 264.

REMOVING AND REINSTALLING THE BRAKE SUPPORT AND THE CAMSHAFT SUPPORT, ASSEMBLING THE SPRING SUPPORT PIN

REMOVING THE BRAKE SUPPORT

In case of damage to the brake support the steering swivel assembly machined together with the brake support should be replaced as described in the Section 243.

If the anchor pin bushing (16) are to be replaced, drive out by means of No. **8839-00371** driver and drive in the tool shown (Figure 1.).



470.00-16/1

Fig. 1.: PRESSING THE BUSHING IN AND OUT

ASSEMBLING THE SPRING SUPPORTING PINS

Install the spring support pins (15) with thread adhesive.

REMOVING AND REINSTALLING THE CAMSHAFT SUPPORT

After removing the hex. flanged bolts (13) pull the camshaft support (5) out of the steering swivel.

The relevant (RH-LH) camshaft support should be positioned into bore of the steering swivel and secure by hex. flanged bolts (13) coated with thread locker (LOCTITE 243). Tighten the bolts to 130 - 140 Nm torque.

SECTION 265.

REMOVING AND REINSTALLING THE BRAKE LEVER AND THE BRAKE SPANNER

REMOVING THE BRAKE SPANNER

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

Remove the snap ring (1), the spacer (2) and the wear indicator disk (4).

Pull the brake lever (3), the shims (6) and the spacer (7) off the brake spanner (11) end.

Pull the brake spanner out of the brake spanner support (5) and remove the distance washer (10) below the brake spanner head.

REINSTALLING THE BRAKE SPANNER

Position the distance washer (10) to the relevant brake spanner (RH - LH) to bottom out against the brake spanner head.

Apply grease to the brake spanner bushes and push the brake spanner subassembled with distance washer into the bushes (9) of the brake spanner support.

REINSTALLING AND ADJUSTING THE BRAKE LEVER

Stack the spacer (7), the required number shims (6) and the relevant brake lever (RH-LH) to the brake spanner.

Install the brake lever to the brake spanner so, the bore centre of the brake lever bush shall be in distance $A=312$ mm from the sealing plane of the chamber holder.

Position the wear indicator disk (4) to the end of the brake spanner.

After adjusting the above $A=312$ mm dimension and the 0.3 - 0.6 mm shoe clearance adjust the wear indicator disk so, the cut-out marked "0" on the disk and the recess on the lever shall be in the nearest position to each other.

Position the spacer (2) and the snap ring (1) to the end of the brake spanner.

Check the axial clearance of the camshaft to be between 0.5 - 1.5 mm. If required perform readjustment by means of shims (6).

WARNING!

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

In case of new lining the brake lever recess and "0" mark of the wear indicator disk will nearly align (max. deviation is 9°).

With wear of the brake lining the brake chamber stroke length increase, which is automatically readjusted before exceeding the limit permitted by the chamber.

In case of new brake drum of Ø420 mm the mark "420" while at brake drum true-up to Ø424 mm the mark "424" of the disk may reach the recess on the brake lever. This indicates that the brake lining is worn to the permitted limit. In such a case replace the brake linings.

Attach the relevant brake lever stop (28) (RH-LH) to the chamber holder by 2 off hex. bolts (29) with lock washer (30) for each. Tighten the hex. bolts to 20 - 25 Nm torque.

SECTION 266.

REPAIRING THE BRAKE SPANNER BEARING SUPPORT

REMOVING THE BEARING BUSHES AND THE SEALING RINGS

By means of the tool shown pull the bearing bushes (9) out of the camshaft support (5) See Fig. 1.

The bushes will push out the sealing rings (8) ahead.

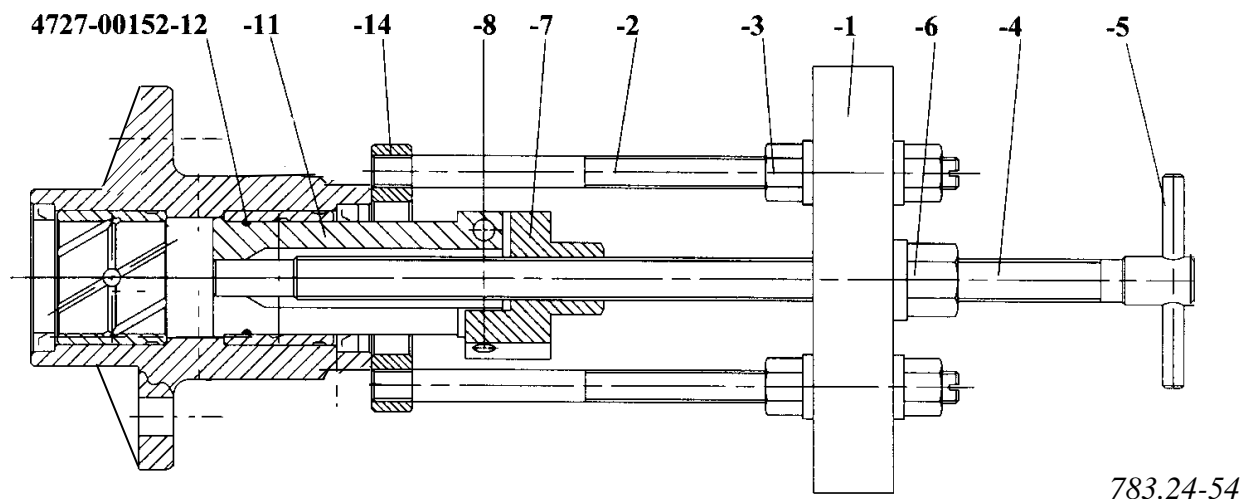
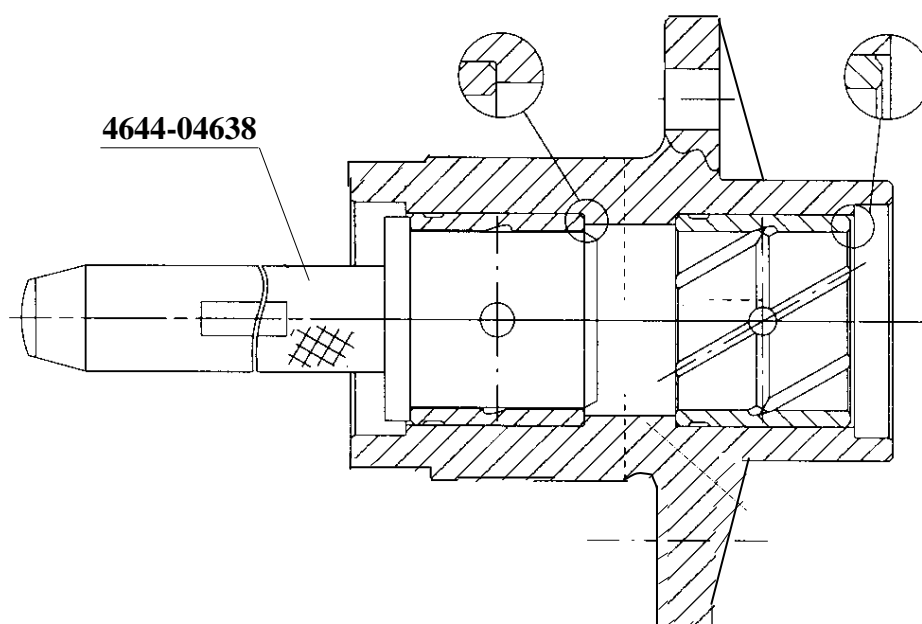


Fig. 1.: PULLING OUT THE BEARING BUSHES

REINSTALLING THE BEARING BUSHES

By means of the tools shown drive in the new bearing bushes until the tool bottoms out (Fig.2.).



783.24-55

Fig. 2.: DRIVING IN THE BEARING BUSHES

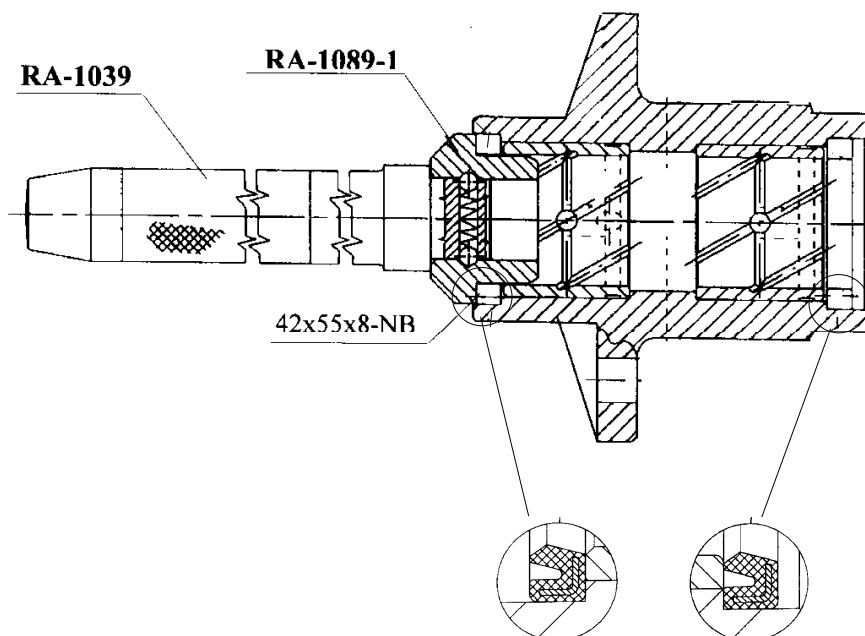
REINSTALLING THE BEARING BUSHES

When reinstalling the sealing rings make sure to check if the sealing lips of the rings both near the brake spanner head and on the brake lever side face toward the axle housing and the brake lever.

By this means leak-tightness at the brake spanner head is assured.

During lubrication with grease the sealing ring near the brake lever should pass the surplus lubricant toward the brake lever.

By means of the tools shown press the sealing rings before the bushes (Fig.3.).



783.24-56

Fig. 3.: DRIVING IN THE SEALING RING

SECTION 268.

AUTOMATIC SLACK ADJUSTER

In case of installing the brake chamber, replacing the brake linings or after repairing the axle perform adjustment of the shoe clearance and the automatic slack adjuster as follows:

Items:

- 1 - Adjusting plate
- 2 - Setscrew (Hex. distance 13)
- 3 - Setscrew (Hex. distance 10)
- 4 - Protection cap
- 5 - Hex. adjusting ring (Hex. distance 32)
- 6 - Stop pin
- 7 - Plastic thread protector
- 8 - Indicator disk

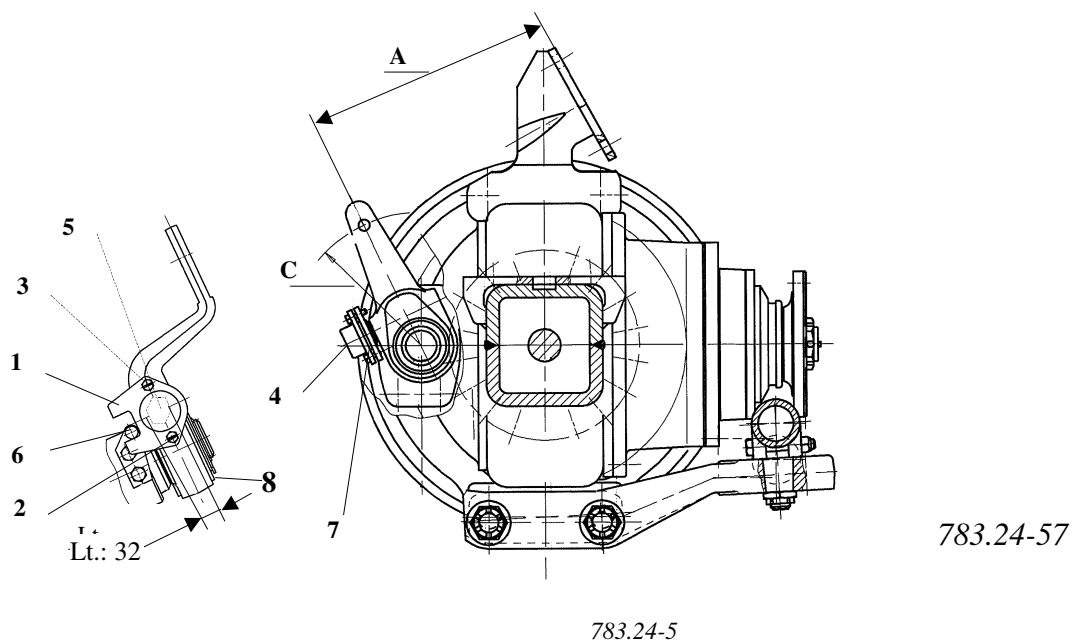
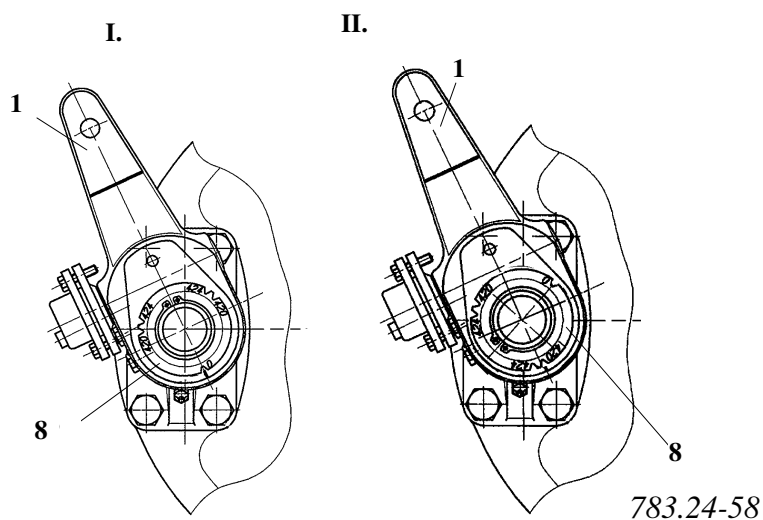


Fig. 1.: AUTOMATIC SLACK ADJUSTER



I. Position of wear indicator disk a new brake lining.

II. Position of wear indicator disk at worn brake lining. Brake drum diameter: 420 mm.

Fig. 2: POSITION OF WEAR INDICATOR DISK

Adjustment data:

A = Distance between the chamber holder plane and the brake lever bore

C = Brake lever installation radius

A = 312 mm

B = 165 mm

Adjusting position of the brake lever and the shoe clearance:

- Remove setscrew (2, 3).
- Take care of the plastic thread protector (7).
- Remove the adjusting plate (1) and the plastic protection cap (4).
- By turning the hex. adjusting ring (5) to proper direction adjust the specified distance between the seating surface and the brake lever bore. (Start adjustment from a distance higher than specified. If required, also adjust the push rod clevis.)
- After the above operation adjust the shoe clearance to 0.3 - 0.6 mm.

Adjusting and fixing the adjusting plate:

Secure the fork "E" of the adjusting plate (1) in bottom position relative to stop pin (6) as shown in Fig. 1.

Complete adjustment by reinstalling the plastic protection cap (4) and the adjusting plate (1) as well as installing and securing the setscrew (2, 3) and screwing on the plastic thread protector.

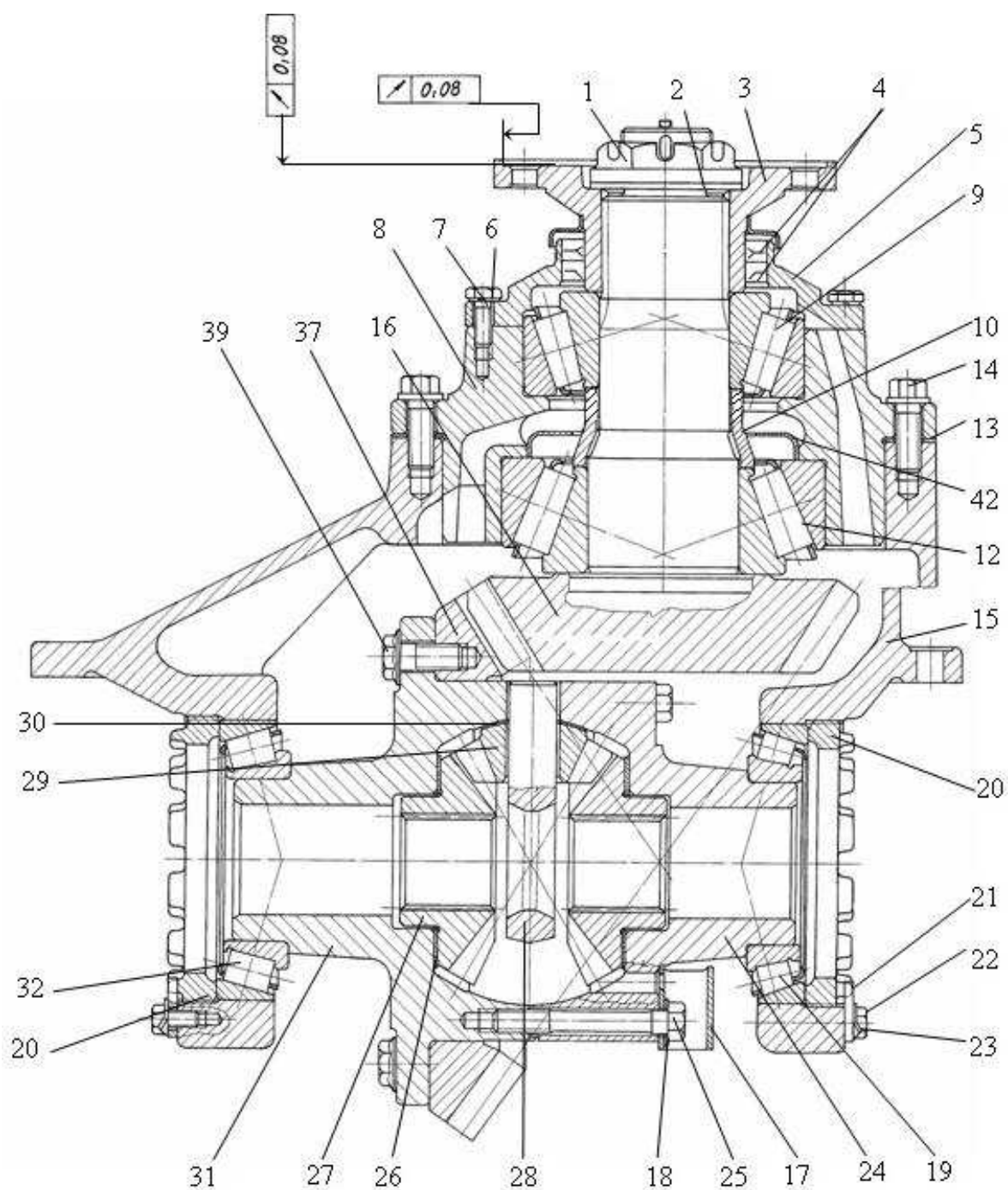
During fixing plane of the adjusting plate should be perpendicular to the stop pin (6).

Before installation apply graphitic grease to serration of the brake lever.

DIFFERENTIAL CARRIER ASSEMBLY

SECTION 310.

DIFFERENTIAL CARRIER ASSEMBLY SECTIONAL VIEW



783.30 -7

Fig. 1.: DIFFERENTIAL CARRIER ASSEMBLY SECTIONAL VIEW

SECTION 311.

PARTS THE DIFFERENTIAL CARRIER ASSEMBLY

- 1 - Flanged castle nut with cotter pin
- 2 - Washer
- 3 - Companion flange
- 4 - Sealing rings
- 5 - Cover
- 6 - Hex. bolt
- 7 - Lock washer
- 8 - Bearing cage
- 9 - Taper roller bearing (32312 B X7 JU MGM)
- 10 - Distance ring
-
- 12 - Taper roller bearing (32314 B X7 JU MGM)
- 13 - Shims
- 14 - Hex. flanged bolts
- 15 - Differential carrier
- 16 - Drive pinion
- 17 - Oil catch plate
- 18 - Washer
- 19 - Taper roller bearing (30215 A MGM)
- 20 - Bearing adjuster
- 21 - Tab lock plate
- 22 - Hex. bolt
- 23 - Lock plate
- 24 - Differential case half
- 25 - Clamp bolt
- 26 - Spacer
- 27 - Differential gear
- 28 - Spider
- 29 - Differential pinion
- 30 - Shim
- 31 - Differential case half (flanged)
- 32 - Taper roller bearing (32215 A MGM)
-
- 37 - Drive gear
-
- 39 - Hex. bolt
-
- 42 - Oil baffle plate

SECTION 312.

REMOVING AND REINSTALLING THE DIFFERENTIAL CARRIER ASSEMBLY

REMOVING THE DIFFERENTIAL CARRIER

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 as described in section 243.

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 as described in section 248.

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

REINSTALLING THE DIFFERENTIAL CARRIER

As described in the “GENERAL SERVICE INSTRUCTIONS” apply (LOCTITE 515) 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 into the axle housing guided by stud bolts and secure by hex. flanged bolts coated with thread locker.

Tighten the bolts coated with thread locker diagonally to 100 - 110 Nm torque.

Reinstall the double joint according to Section 243.

SECTION 313.

REMOVING AND REINSTALLING THE COMPANION FLANGE AND THE COVER, REPLACING THE OIL SEAL

REMOVING THE COMPANION FLANGE

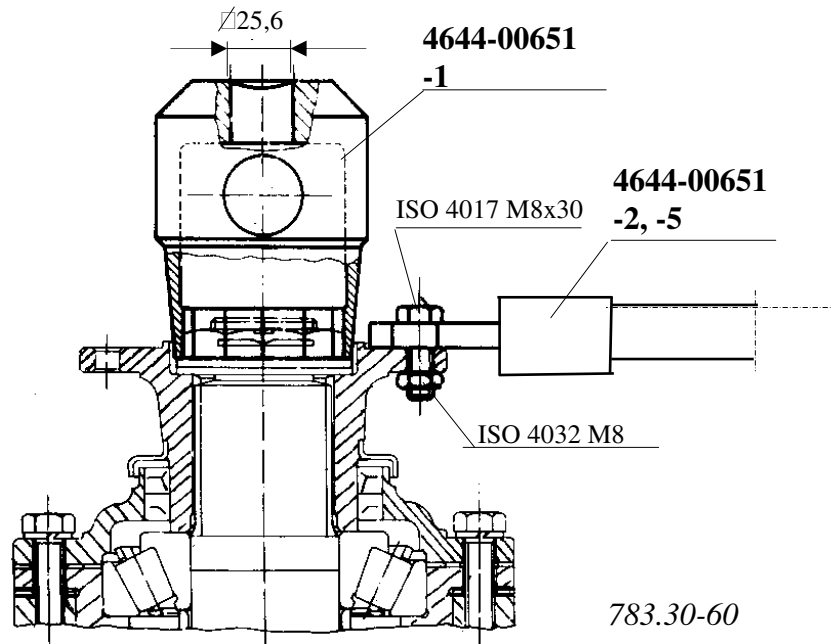


Fig. 1.: MOUNTING THE FLANGED CASTLE NUT

For pulling off the companion flange use the device arranged from the shown parts (Fig. 2.).

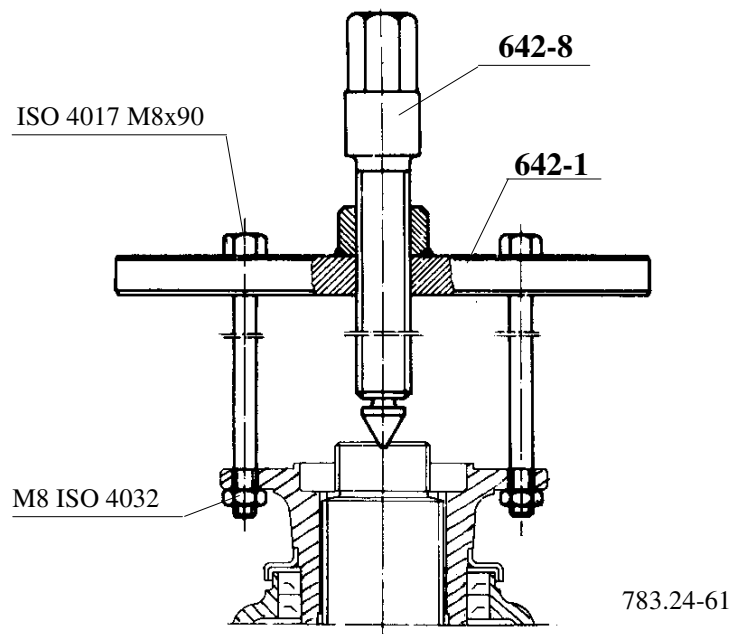


Fig. 2.: PULLING OF THE COMPANION FLANGE

Remove the cover (5).

Drive out the used sealing ring by means of the tools shown (Fig. 3.).

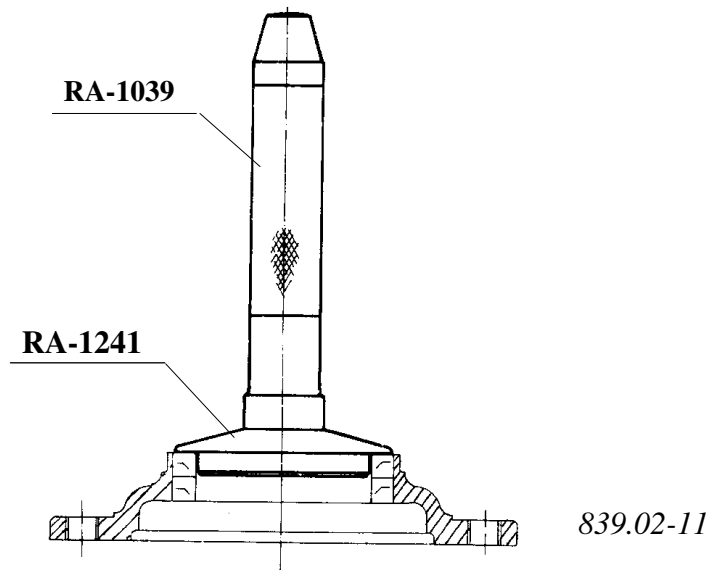


Fig. 3.: DRIVING OUT THE SEALING RINGS

Drive in the inner sealing ring (Fig. 4.)

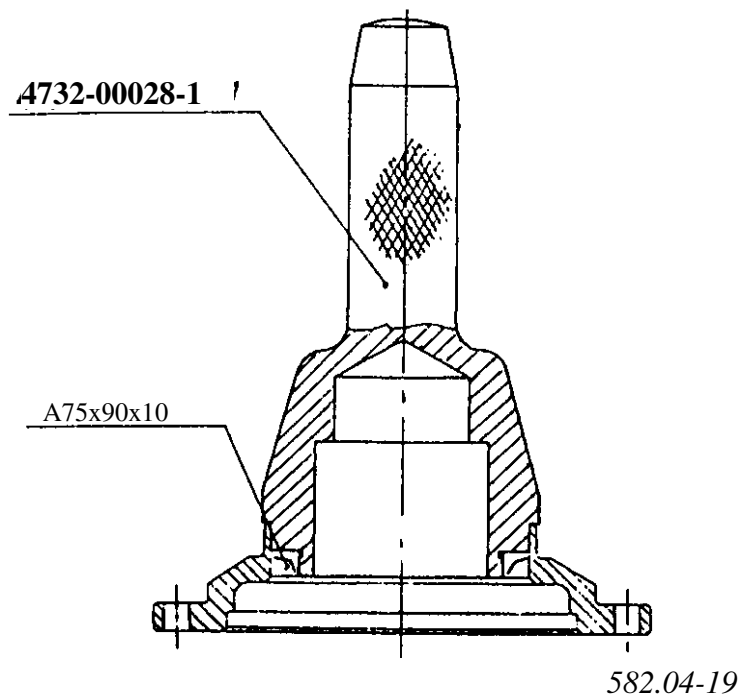


Fig 4.: DRIVING IN THE INNER SEALING RING

Drive in the outer sealing ring, as well,
by means of the tool shown (Fig. 5.)

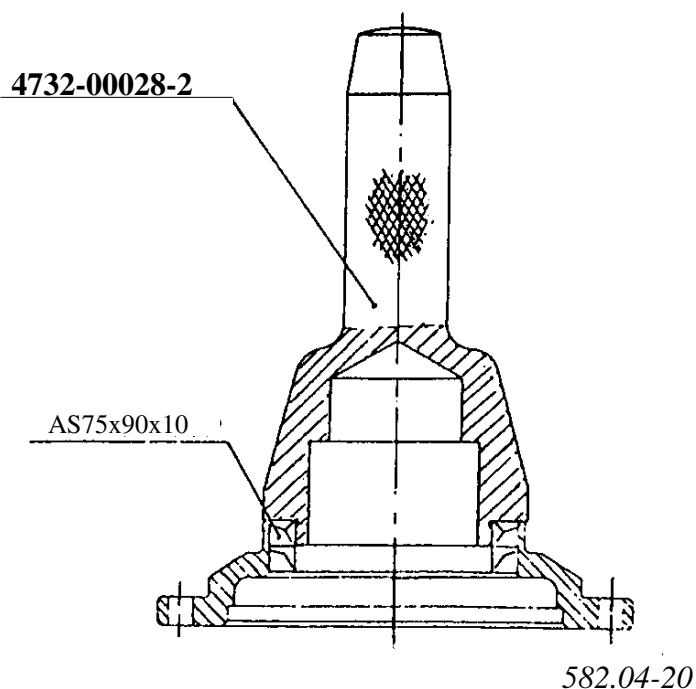


Fig. 5.: DRIVING IN THE OUTER SEALING RING

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

As described in the "GENERAL SERVICE INSTRUCTIONS" apply oil-proof surface sealant to inner flange of the cover (5) subassembled with sealing rings (4), then aligning the bores attach the cover to the bearing cage by means of the lock washer (7) and hex. bolts (6). Diagonally tighten the bolts to 20 - 30 Nm torque.

REINSTALLING THE COMPANION FLANGE

By means of the tool shown press the companion flange (3) to the drive pinon splines to bottom out (Fig. 6.).

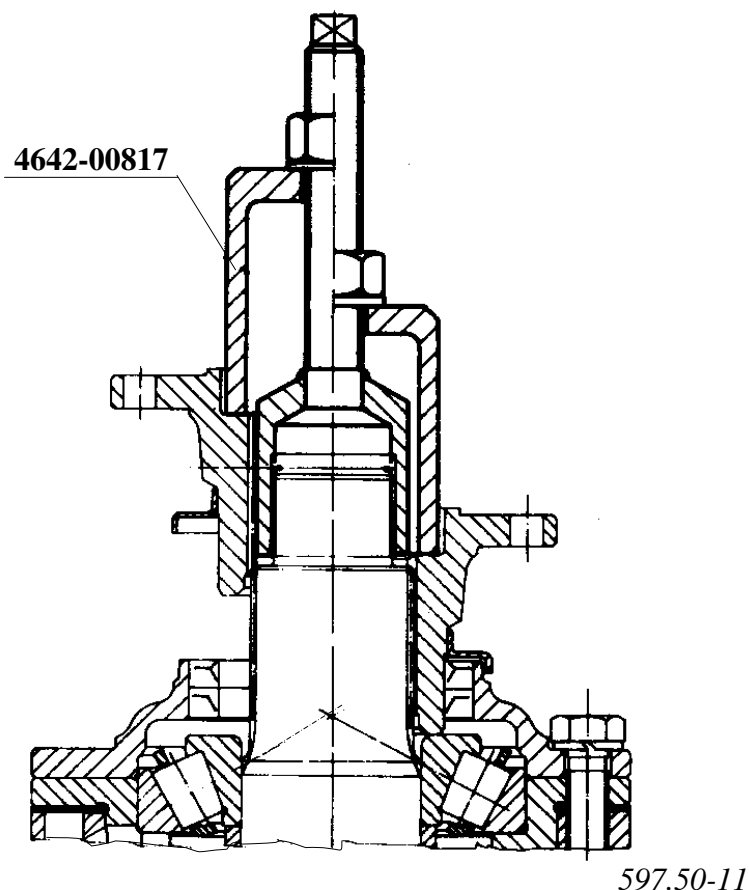


Fig. 6.: PRESSING ON THE COMPANION FLANGE

Check the runout of the companion flange. Allowable runout of the companion flange in radial direction is 0,08 mm (Fig. 1. in section 310). 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 (2), screw on flanged castle nut (1) and tighten to 650 - 700 Nm torque.

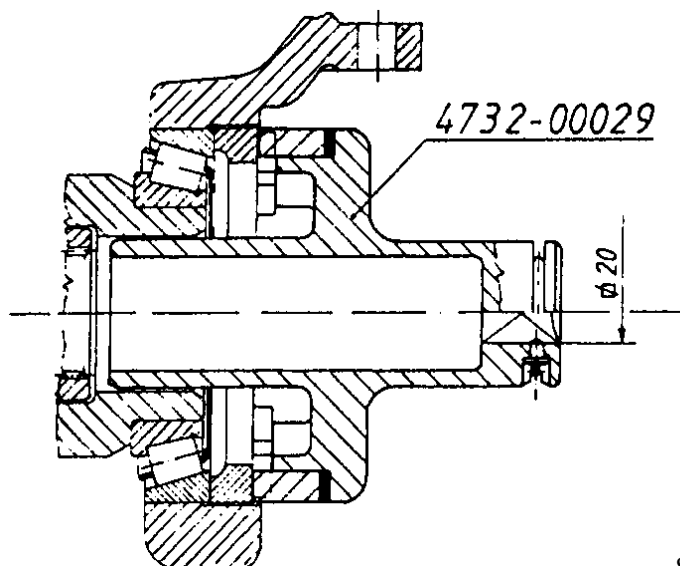
SECTION 314.

REMOVING AND REINSTALLING THE DIFFERENTIAL, ADJUSTING THE BACKLASH AND THE CONTACT PATTERN

REMOVING THE DIFFERENTIAL

Back out the hex. bolts (22) and remove the lock plates (23) and the tap lock plates (21).

By means of the tool shown remove the bearings adjuster (20) (see Fig. 1.).



833.90-11

Fig 1: MOUNTING THE BEARING ADJUSTER

By means of the tool shown in Fig. 3. tap the differential toward the flanged differential case half (31) so, the cup of the taper roller bearing (19) shall fall out.

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

Back out the bolts (25) clamping the differential case halves, then remove the separated case halves and the other parts from the carrier.

Drive the outer race of the other taper roller bearing out of the leg bore in the differential carrier by means of the tool shown in Fig. 3.

REINSTALLING THE DIFFERENTIAL

Reinstall the differential only after installing the bearing cage and adjusting the axis distance (see Section 316.)!

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 (19) to the differential case half (24) and by means of the tool shown drive on to bottom out (see Fig. 2.).

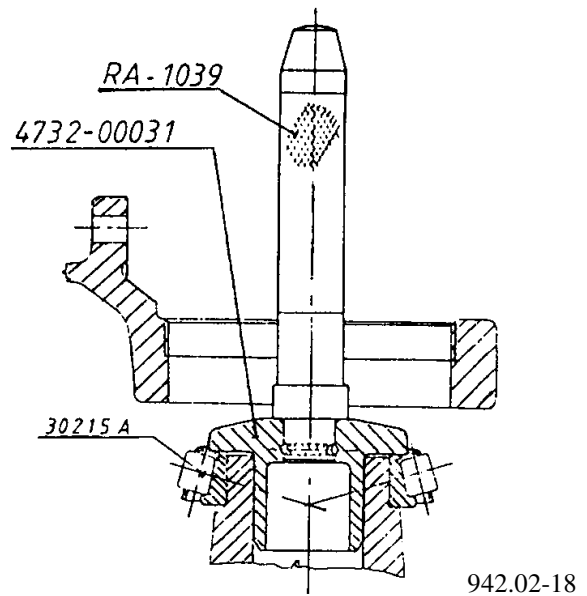


Fig. 2.: DRIVING ON THE TAPER ROLLER BEARING INNER RACE

Position the taper roller bearing cup into the bearing bore in the differential carrier and drive in by means of the tool shown (see Fig. 3.).

Screw in the bearing adjuster (20).

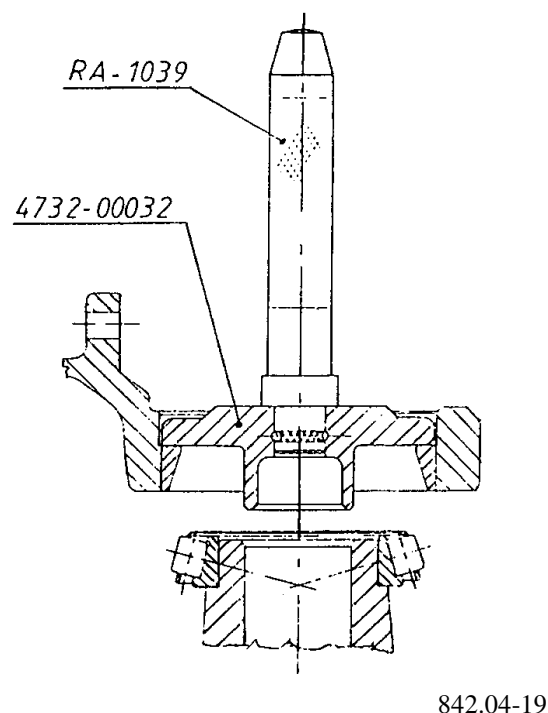


Fig. 3.: DRIVING IN THE TAPER ROLLER BEARING CUP

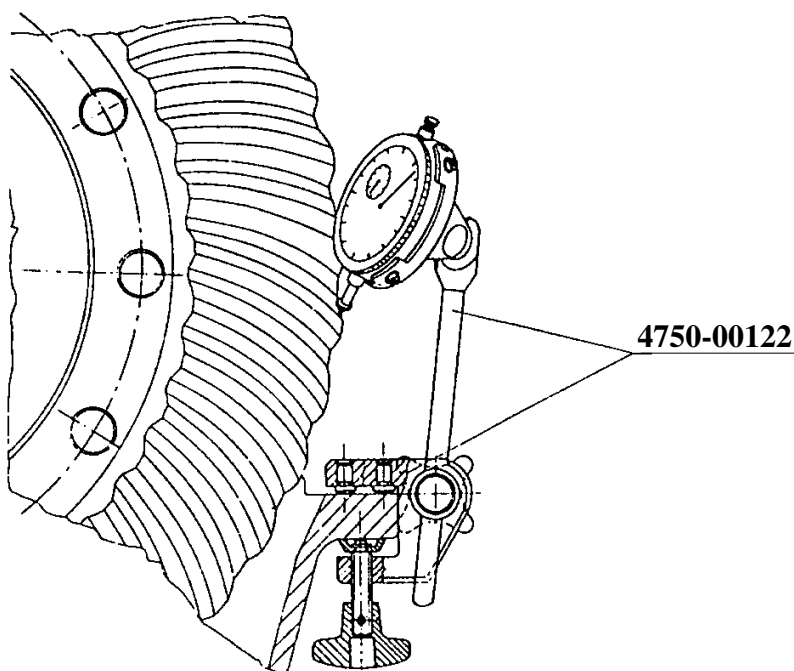
Turn the differential carrier over and drive the taper roller bearing cone and to the flanged case half, then drive on the bearing cup by the same tool. Screw in the bearing adjuster (20).

Install the oil baffle plate (17) and the washer (18) to side the differential case (24) half.

ADJUSTING THE BACKLASH AND THE BEARING PRELOAD

By means of the bearing adjuster adjust the drive pinion to gear backlash at GLEASON toothing to 0.2 - 0.28 mm.

Locking the drive pinion measure the backlash at four places diagonally on the drive gear toothing, perpendiculary to the tooth surface by means of the backlash checking device No. **4750-00122** (Fig. 2.).



009.00-34/1

Fig. 2.: CHECKING THE BACKLASH

Maintaining the backlash install the differential taper roller bearing (19 and 32) with no clearance. Tighten the bearing adjuster (20) 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

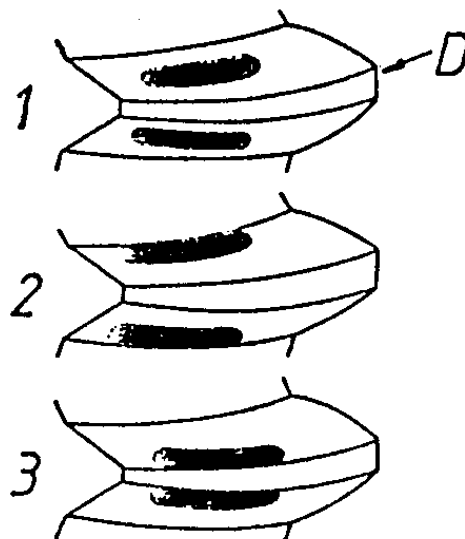
Apply indicator paint to opposite teeth pairs of the drive gear, at 4 places of 90° pitch and one tooth of the drive pinion

Rotate the drive pinion to both directions for approx. 15 sec, while braking the drive gear by a piece of wood.

PROPER CONTACT PATTERN

If a contact pattern shown in detail 1 of Fig. 3. 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.



- D = Large diameter
- 1 = Proper contact pattern
- 2 = Too deep contact
- 3 = Too high contact

118.00-20

Fig. 3.: THE CONTACT PATTERN

In case of GLEASON toothing the contact pattern along the tooth is shifted toward the small diameter of the drive gear.

TOO DEEP CONTACT

If the contact pattern is shifted to the dedendum as shown in detail 2 of Fig. 3. increase the "AXIS DISTANCE" by increasing the thickness of the shim pack (13) and simultaneously reduce the increased backlash by shifting the drive gear so, to obtain the contact pattern shown in detail 1 of Fig. 3.

TOO HIGH CONTACT

If the contact pattern is shifted to the addendum as shown in detail 3 of Fig. 3. reduce the "AXIS DISTANCE" by reducing the thickness of the shim pack (13) and simultaneously increase the reduced backlash by shifting the drive gear so, to obtain the contact pattern shown in detail 1 of Fig. 3.

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

After adjusting the proper contact pattern and bearing clearance tighten further the bearing adjuster on both sides by 0.75 - 1.25 pitch (approx. 7.5° - 15°) to be able to secure them by one of the tab lock plates (21).

Secure the tab lock plates on both sides by means of the hex. bolts (22). Tighten the bolts to 15 - 20 Nm and secure by folding the corners of the lock plates (23) to flats of the bolts.

When the adjustment and the operation is proper, remove the bearing cage assembled with drive pinion and according to the "GENERAL SERVICE INSTRUCTIONS" apply oil-proof surface sealant to the inner flange, then fit back the bearing cage and secure by hex. flanged bolts (14) coated with thread locker. Diagonally tighten the bolts to 88 - 98 Nm torque.

SECTION 315.

DISASSEMBLING AND REASSEMBLING THE DIFFERENTIAL

DISASSEMBLING THE DIFFERENTIAL

Pull the inner of the taper roller bearings (19, 32) from the removed differential (see Fig. 1.).

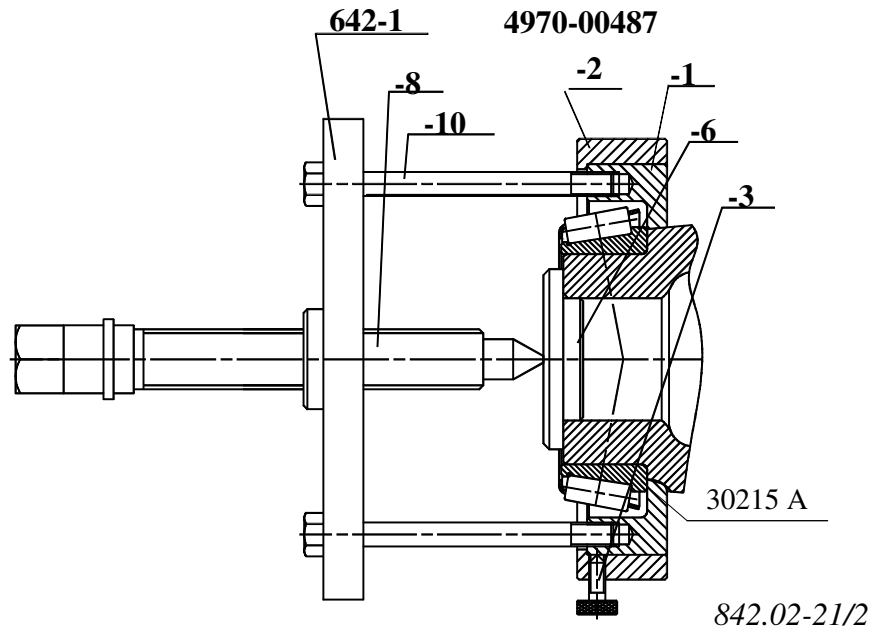


Fig. 1. PULING OFF THE TAPER ROLLER BEARINGS CONE

For disassembling the differential case remove the hex. bolts (25) clamping the case halves (24 and 31) together and separate the case halves.

Remove the spider (28) together with the differential pinions (29) and shims (30) as well as the differential gears (27) and the spacer (26).

REASSEMBLING THE DIFFERENTIAL

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.

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

Place the flanged differential half case (31) preassembled mandrel (Figure 2.). Position the preassembled spacer disc (26) and differential crown-wheel (27) and spacers (30) with differential pinion (29) and traverse shaft (28). Position the other differential crown-wheel and the spacer disc.

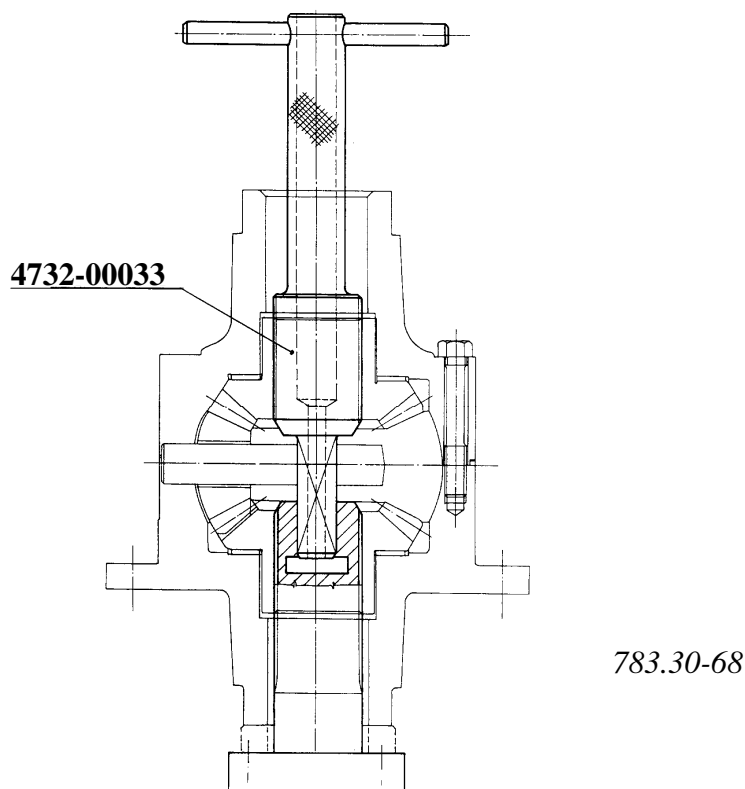


Figure 2.: MOUNTING AND CHECKING THE DIFFERENTIAL BOX

Assemble the differential box half cases checking the bores as match marked at factory and fix with the fastener bolts (25). Close the differential box with the upper assembly mandrel and tighten the fastening bolts with 49 - 59 Nm torque. Remove the upper assembly mandrel and rotate the differential box on the lower assembly mandrel.

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

Apply thin coat of the mating surface of the drive gear. Aligning the bores position the drive gear to the flanged differential case half. 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 bottom out (Fig. 3.).

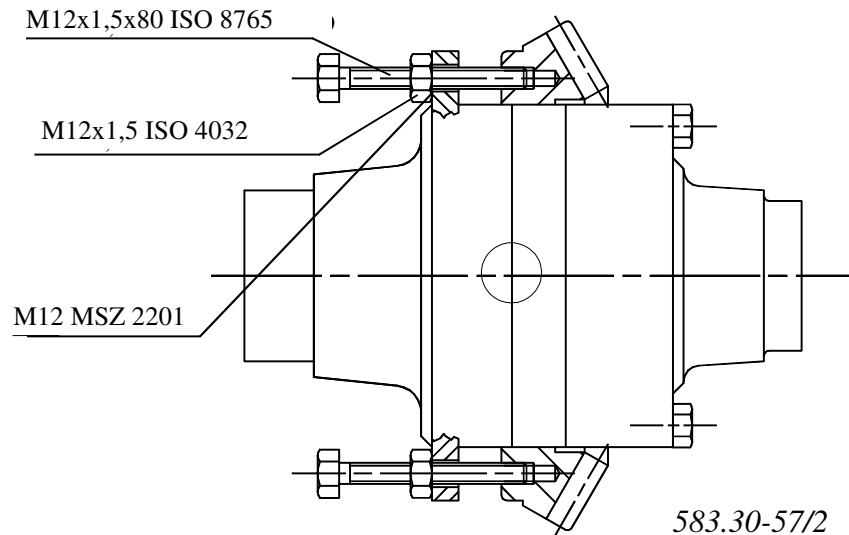


Fig 3.: PULLING ON THE DRIVE GEARS

The drive gear has mounted with flanged self-lock bolts and tighten them to 120 - 135 Nm torque.

SECTION 316.

REMOVING AND REINSTALLING THE BEARING CAGE, ADJUSTING THE AXIS DISTANCE

Remove the hex. flanged bolts (14) attaching the bearing cage to the differential carrier.

By means of M12 bolts of at least 65 mm thread length driven into the two threaded bores in flange of the bearing cage out of the differential carrier and remove the shims from flange of the differential carrier.

REINSTALLING THE BEARING CAGE TO THE DIFFERENTIAL CARRIER

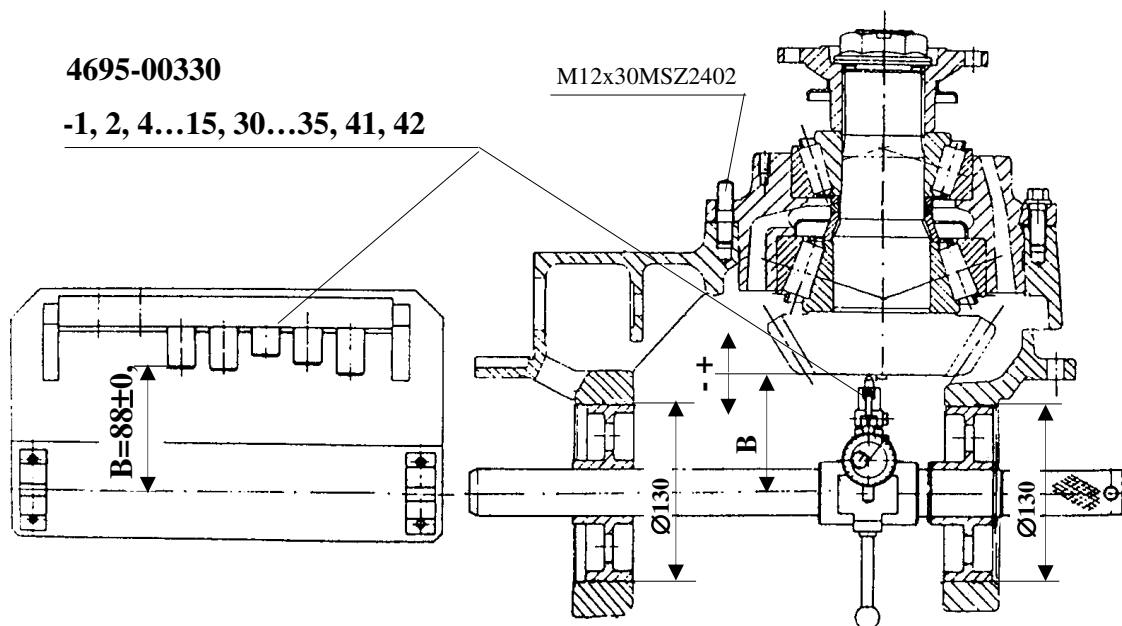
After reassembling the bearing cage and adjusting the specified bearing preload adjust the axis distance (with differential removed from the carrier).

ADJUSTING THE AXIS DISTANCE

For purpose of piloting screw M12 guide stud bolts to two opposite bores in the differential carrier, position the shims (13) necessary for adjusting the drive pinion and gear contact pattern over these studs so, the extreme ones shall be the thicker. Aligning the bores push the bearing cage subassembled with drive pinion into the differential carrier (15) and provisionally secure by hex. flanged bolts (14) driven into two opposite bores and tightened to 88 - 98 Nm torque.

On the relevant measuring pin of the accessory "A" belonging to the measuring device shown in Fig. 1. adjust the theoretical "AXIS DISTANCE" $B=88.00$ mm, by setting the dial indicator to zero.

Insert the measuring device set to $B=88.00$ mm to the differential carrier as shown in Fig. 1. and measure the "AXIS DISTANCE" deviation. Check if the reading is identical to the "AXIS DISTANCE" deviation stated on end of the drive pinion.



839.90-19/1

Fig: 1.: CALIBRATING THE AXIS DISTANCE

In case of identity the adjustment is proper, otherwise obtain the specified value by selecting the proper shim pack (13). The permitted deviation is ± 0.025 mm.

Eg.: If axis distance stated on the drive pinion is $+0.04$, the value "B" to be adjusted is 88.04 ± 0.025 mm.

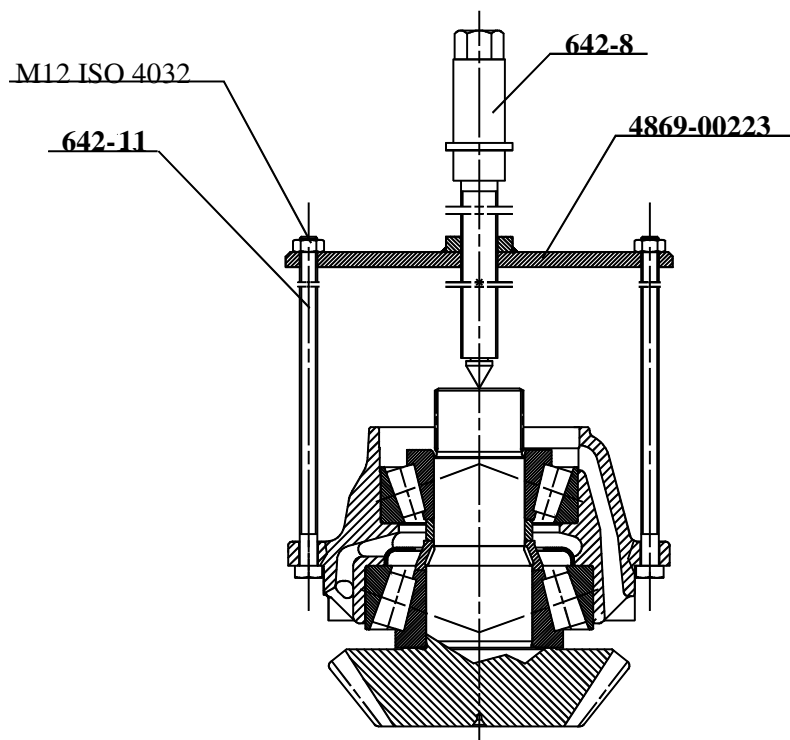
REINSTALLING THE BEARING CAGE

In case of proper contact pattern adjustment and operation remove the bearing cage subassembled with drive pinion and according to the "GENERAL SERVICE INSTRUCTIONS" apply oil-proof surface sealant to the inner flange, then reinstall the bearing cage by means of hex. flanged bolts (14) coated with thread locker. Diagonally tighten the bolts to 88 - 98 Nm torque.

SECTION 317.

DISASSEMBLING AND REASSEMBLING THE BEARING CAGE

By means of the tools shown in the figure
press the drive pinion (16) out of the
bearing cage (8) (Fig. 1.).

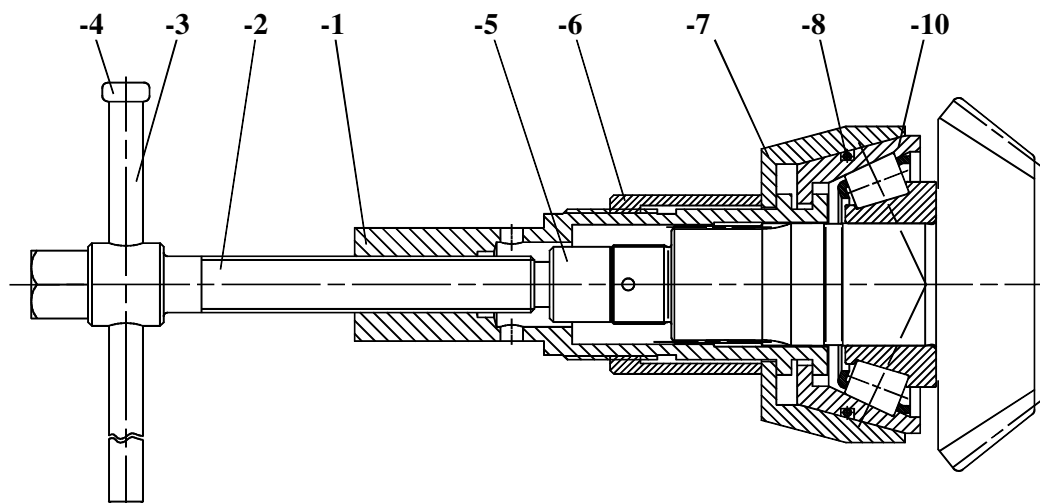


832.02-35/5

Fig. 1.: PRESSING OUT THE DRIVE PINION

By means of the device shown (Fig. 2.) press out the
cone of the inner taper roller bearing (12) remained on
the drive pinion (16).

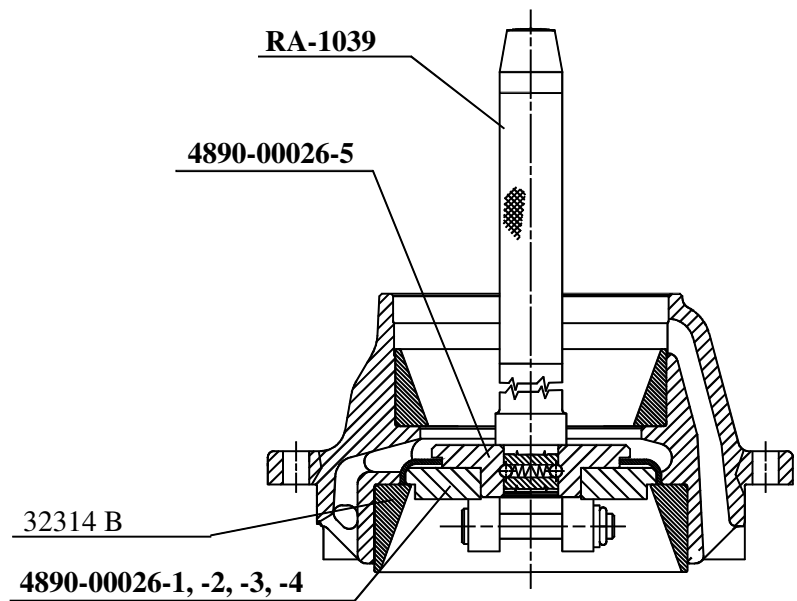
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598.64-20

Fig. 2.: PRESSING OFF THE INNER TAPER ROLLER BEARING CONE

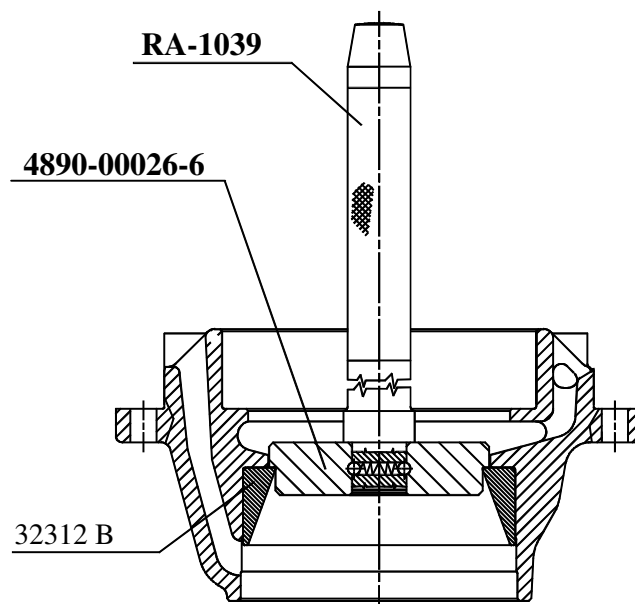
Properly backing the bearing cage drive the cup of the taper roller bearing out of the bearing cage by means of the tools shown (Fig. 3.).



833.02-13

Fig. 3.: DRIVING OUT THE CUP OF THE INNER TAPER ROLLER BEARING

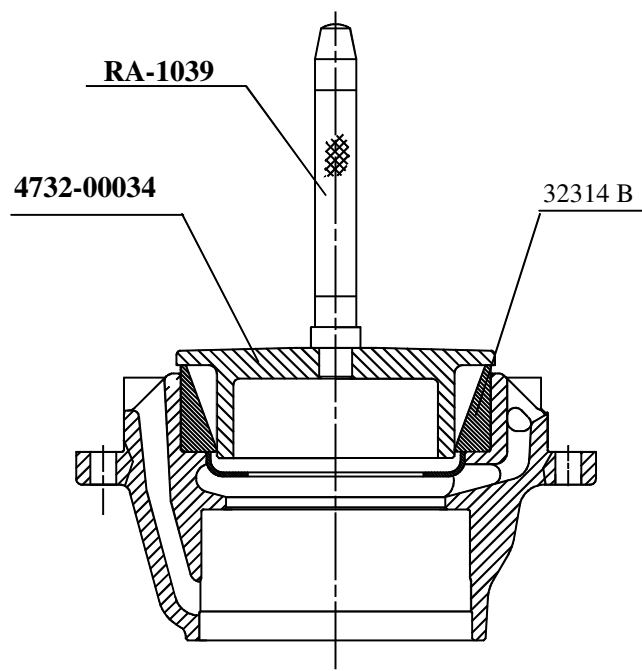
Turn the bearing cage over and by means of tools shown drive out the cup of the outer taper roller bearing (Fig. 4.).



833.02-14

Fig. 4.: DRIVING OUT THE OUTER TAPER ROLLER BEARING CUP

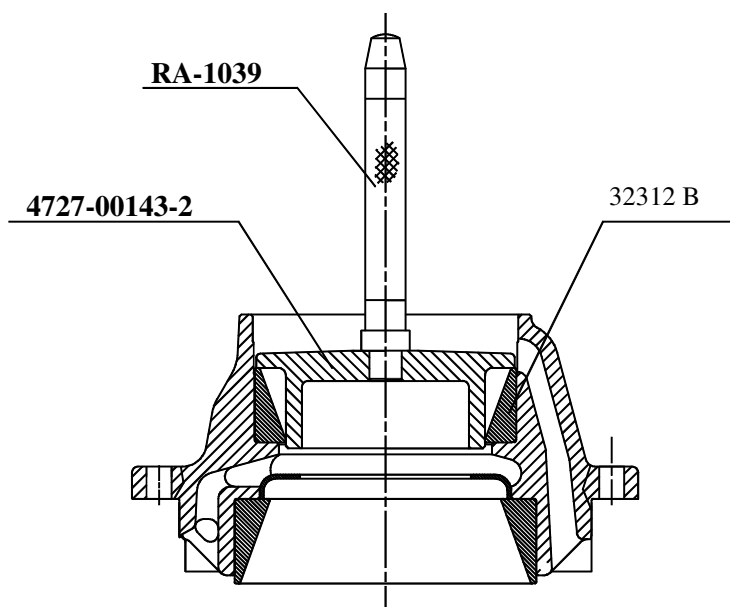
Position the cup of the inner taper roller bearing (12) and by means of the tools shown drive into the bearing cage (Fig. 5).



833.02-15

Fig. 5.: DRIVING IN THE CUP THE INNER TAPER ROLLER BEARING

Turn the bearing cage over and by means of the tools shown drive in the cup of the outer taper roller bearing bottom out (Fig. 6.).



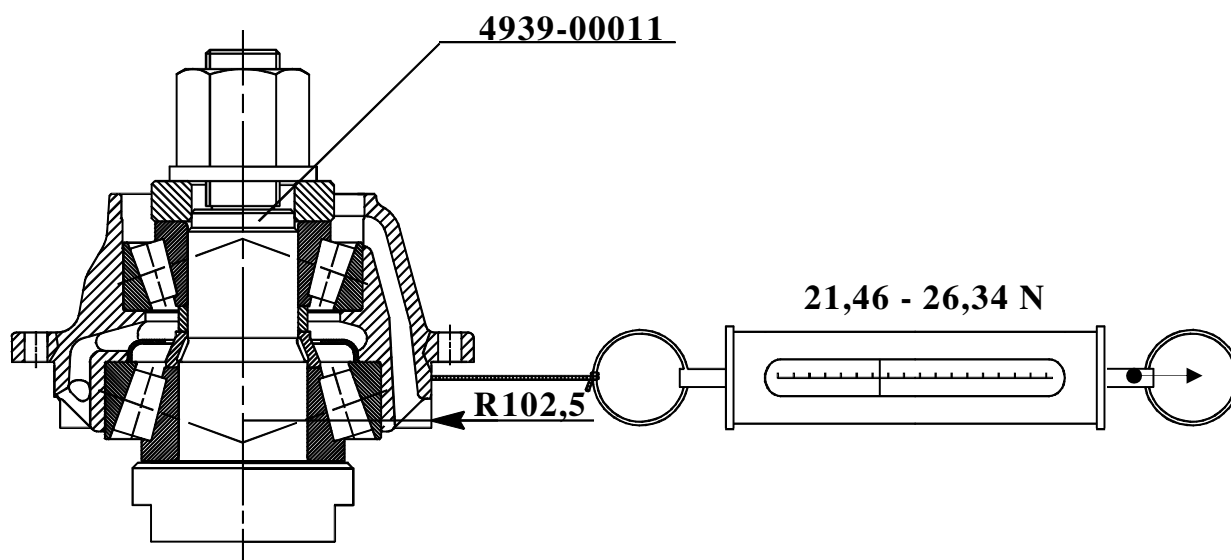
833.02-16

Fig. 6.: DRIVING IN THE CUP OF THE OUTER TAPER ROLLER BEARING

After subassembling the bearing cage with taper roller bearing cups adjust the bearing preload (7. ábra).

The distance between the taper roller bearings (9, 12) cone may vary between 33.400 and 34.225 mm. This distance should be determined by measurement for selecting the proper distance ring (10).

Stack the inner taper roller bearing cone and the distance ring for filling the gap determined by measurement, then the subassembled bearing cage and the outer taper roller bearing cone the shown master shaft



833.02-17

Fig. 7.: ADJUSTING THE BEARING PRELOAD

Position the washer belonging to the master shaft to the bearing inner race, screw on the flanged nut of the device and tighten to 650 - 700 Nm torque.

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

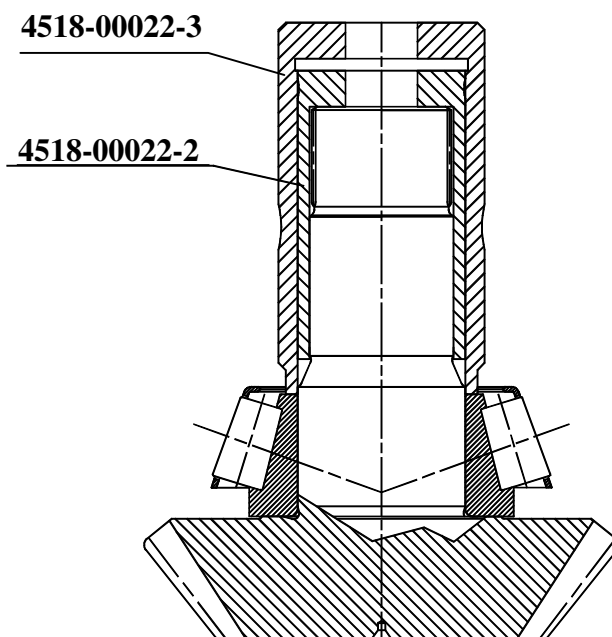
With new bearing installed the force obtained from the fish-scale at approx. 5 rpm should be 21.46 - 26.34 N, which corresponds to 2.2 - 2.7 Nm torque.

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.

In case of proper adjustment relocate the parts from the master shaft to the drive pinion. Make sure to install only the parts used for the previous adjustment.

By means of the tools shown drive the cone of the inner taper roller bearing (12) onto the drive pinion (Fig. 8.).



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Fig: 8.: DRIVING ON THE INNER TAPER ROLLER BEARING CONE

Position the previously selected distance ring (10) and the bearing cage subassembled with bearing cups to the drive pinion stem, then by means of press sleeve **4518-00022-4** drive on the outer taper roller bearing cone to bottom out while assuring proper connection of the bearings.

By means of tool according to Fig. 6. of Section 313. press the companion flange (3) to the drive pinion. Screw on the flanged castle nut (1) and tighten to 650 - 700 Nm torque.

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

The oil seals (4) with the cover (5) are not installed during check.

SECTION 395.

OIL FILL-UP, RUN, CHECK

According to the Operator's Manual fill up the finish assembled axle with oil to lower edge of the filler bores in the end-cover of the wheel hubs, in the axle housing and the differentials.

Fill only completely clean oil fill-up into the axle.

After oil fill-up install the screw plugs and tighten to be leak-tight. Following this it is recommended to run the axle to both directions at varying.

DURING RUNNING CHECK THE FOLLOWING:

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 one freely without unusual noise.

THE BRAKE FOR OPERATION:

In normal position no friction may occur between the brake shoes and the brake drum, during brake application the brake spanner may not jam in the spanner bearing and upon releasing the brake the spanner should return to initial position.

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 section approx. 80 C°.