

BEML - TATRA 815

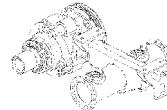
26RR36 22 255 6x6.1R/50T, 51T

Workshop manual

**Part 6 – BACK BONE TUBES, CONNECTING PARTS
DIFFERENTIALS**

Publication numer: 03-0254-ENG/00

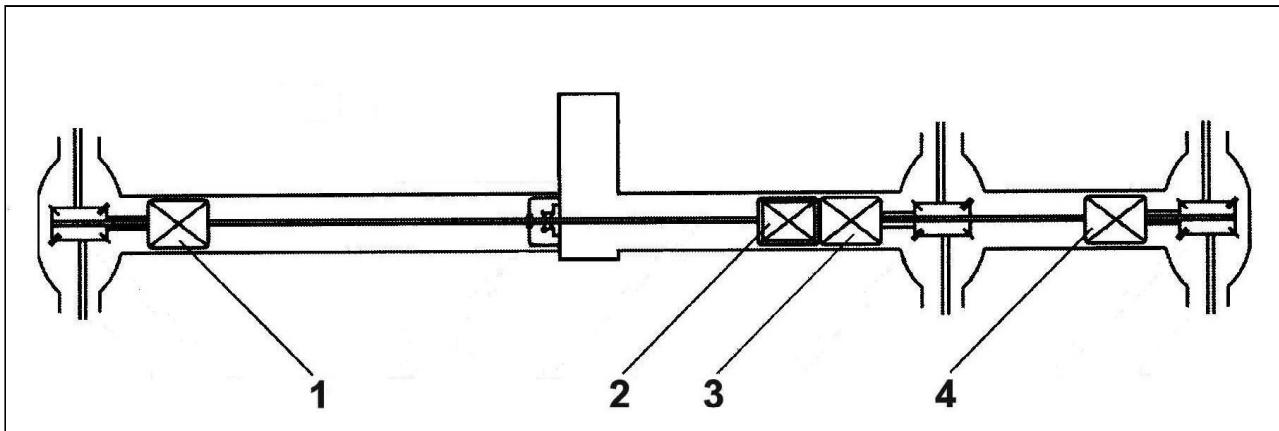




6 BACK-BONE TUBES, CONNECTING PARTS AND DIFFERENTIALS

6.1 Description and Main Technical Specifications

The vehicles BEML - TATRA T 815 - 26RR36 22 255 6x6.1R/50T and BEML - TATRA T 815 - 26RR36 22 255 6x6.1R/51T use one inter-axle differential and three axle differentials.



Legend: 1 – front axle differential, 2 – inter-axle differential, 3 – 1st rear axle differential, 4 – 2nd rear axle differential

Fig. 6.1 Block diagram of differentials lay-out on the vehicle central member frame

The design of the inter-axle differential including the lock engagement is illustrated in (See Fig. 6.2).

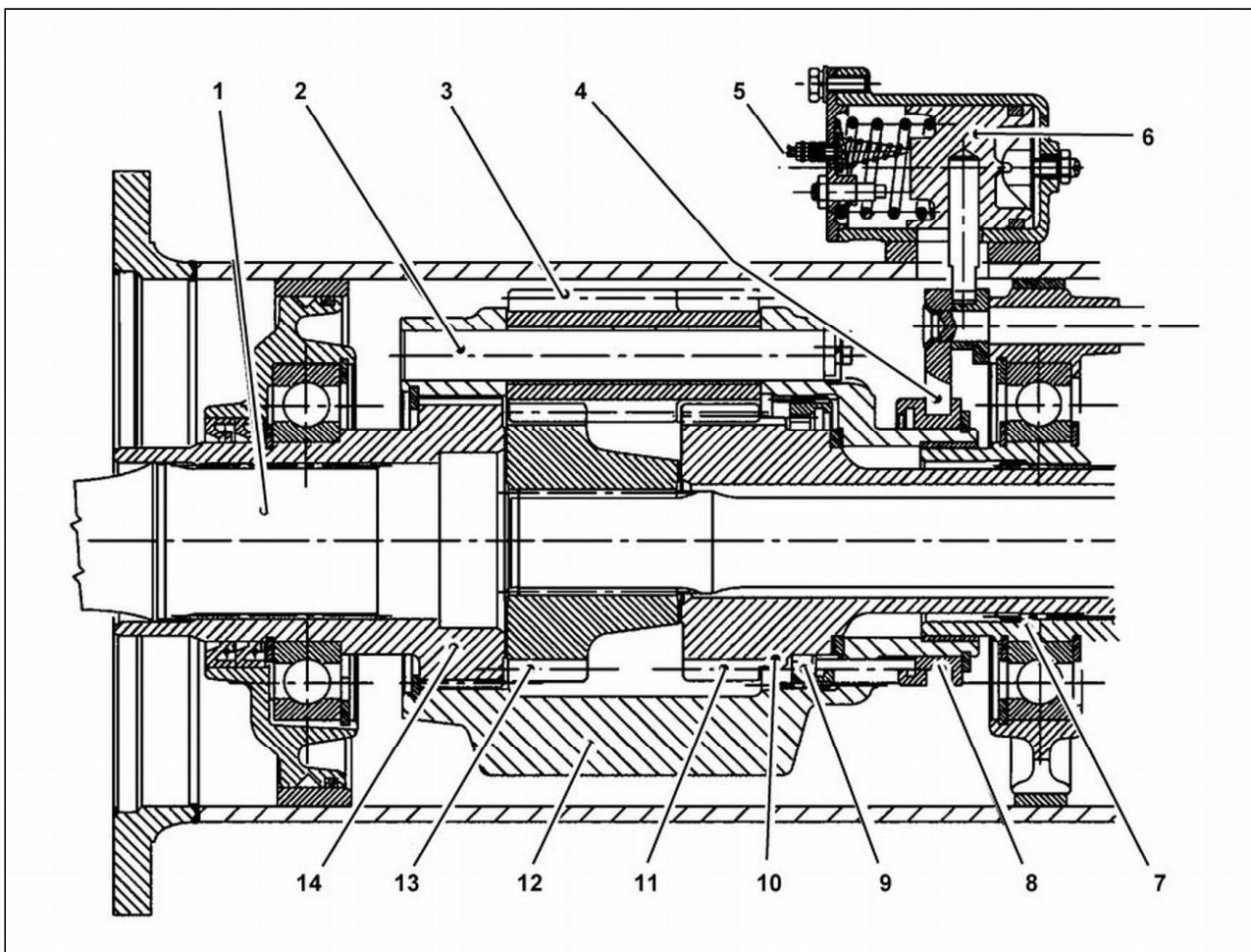
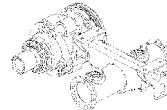
The torque is transmitted by means of the drive shaft 1 through the carrier 14 to the differential housing 12 with three pairs of planetary gears 3. Through planetary gears the torque is transmitted to the central gear 11 and to the sun gear 13. The shaft formed by elongation of the central gear 11 drives the 1st rear axle and the shaft inserted into the sun gear 13 drives the 2nd rear axle. The differential transmission of torque to both axles is allowed by the kinematical coupling realized by three pairs of planetary gears 3. The tooth system of planetary gears 3 is overset to each other so that each planetary gear is in mesh with one central gear and with the other planetary gear and hereby also with the other central gear.

The inter-axle differential lock is engaged by the claw clutch.

The lock is engaged after supplying the pressure air from the electro-valve into the pneumatic single-acting shift cylinder 6; due to the air pressure acting on the piston the shift fork 4, which controls the connecting sleeve 8, will move. Hereby the connecting gearing of the sleeve 9 in the differential housing and the connecting gearing 10 on the central gear 11 will come in mesh.

The signal lamp on the instrument board indicates the differential lock engagement.

On the single-acting shift cylinder 6 there is a switch 5 of engage the lock. After the differential lock disengagement or during the pressure air supply malfunction during the differential lock engagement, the pressure air from the shift cylinder 6 is drawn off through the electro-valve into the open air and the return spring will return the piston c/w pin, shift fork 4 and connecting sleeve 8 into the initial position and hereby the differential lock will be disengaged.



Legend: 1 – complete drive shaft, 2 – planetary gears pins, 3 – planetary gears, 4 – shift fork, 5 – signal lamp switch, 6 – control cylinder, 7 – 1st rear axle differential housing, 8 – connecting sleeve, 9 – sleeve connecting gearing, 10 – central gear connecting gearing, 11 – central gear, 12 – housing, 13 – sun gear, 14 – carrier

Fig. 6.2 Inter-axle differential

The function of all axle differentials (See Fig. 6.3) is identical.

The torque is transmitted through the shaft 1 into the differential housing 6 . Both parts are mutually connected via the involute gearing.

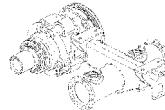
The planetary gears 8 (three pairs) are supported on KU bushes on pins 9 in the housing 6 . Gears are in mesh in one third of the gearing and are mounted into a pair so that the teeth of one gear are on the housing face and teeth of the other gear are on the side of the pins locking which forms the kinematical coupling required when the axle differential lock is engaged. The pins 9 are pressed in the housing 6 and are locked with lock plates in slots and by bolts, which are secured with tab washers 11 against the self-sliding out of their location.

The differential is carried on the ball bearing 16 , which is pressed into the bush 15 . The bush is pressed into a welded annular ring in the tube.

Into the spur teeth of planetary gears the central gear is slided, which is connected via the involute shaft



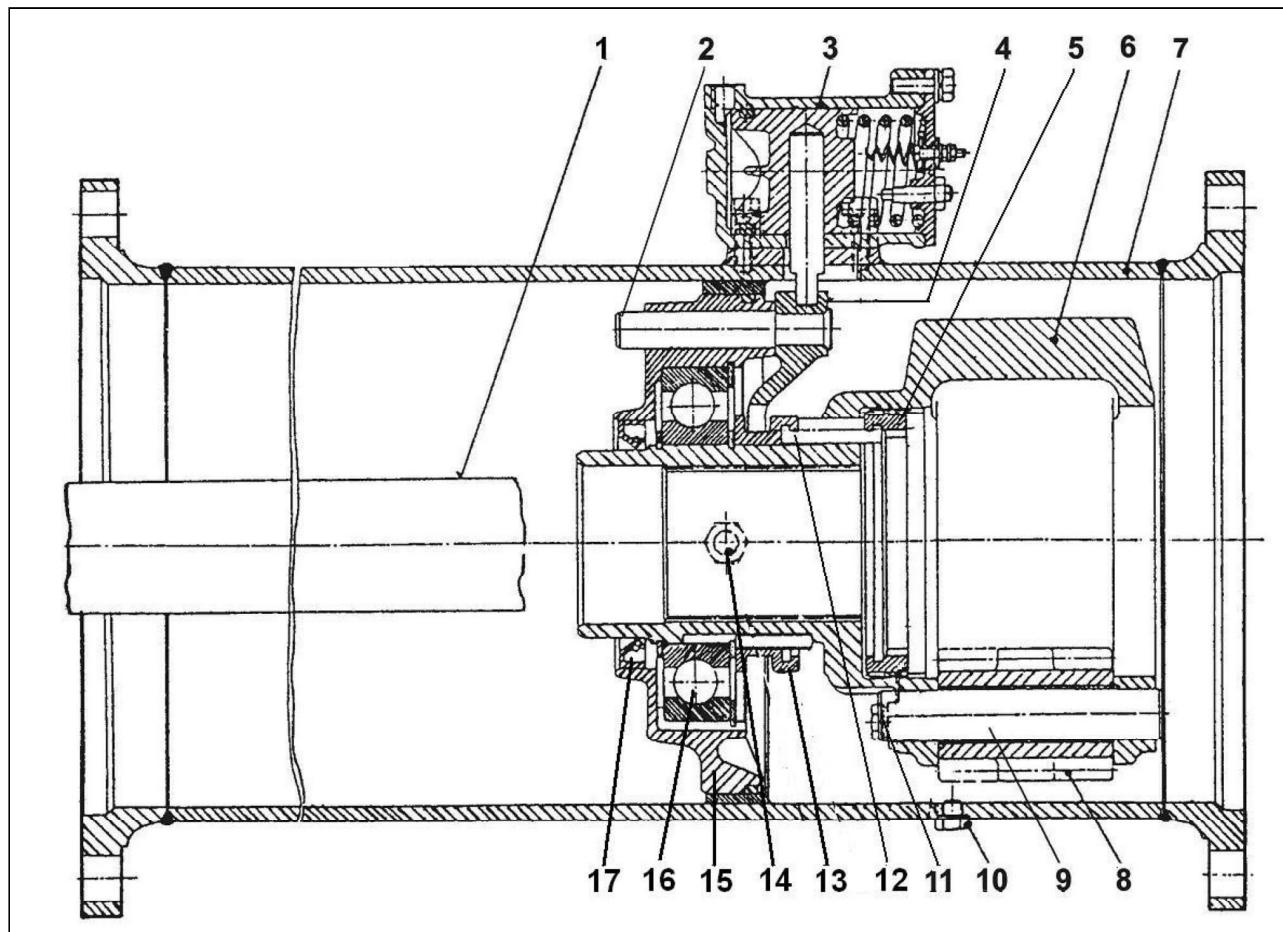
06 Back-bone Tubes, Connecting Parts and Differentials



splining with the rotary pinion (bevel gearing – RH side) and fixed pinion (bevel gearing – LH side).

The axle final drive housings and the axle differentials have the common oil filling. The oil flows from the side of the axle drive housing through a hole in the lower part of the cover location of the couple of bearings. The oil is drained through a threaded hole at the bottom of the backbone tube 7 and is closed by the closing bolt 10.

Two adjusting slotted screws 14 and nuts in a hole of the bearing bush protect it against the axial motion.



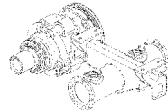
Legend: 1 - propeller shaft, 2 - guide pin, 3 - pneumatic single-acting differential lock control cylinder, 4 - shifter fork, 5 - central member frame sliding sleeve, 6 - differential housing, 7 - backbone tube, 8 - planetary gear, 9 - connecting sleeve pin, 10 - closing bolt, 11 - screw c/w washer, 12 - sliding pin, 13 - sliding sleeve, 14 - lock screw c/w nut, 15 - bush, 16 - ball bearing, 17 - shaft seal

Fig. 6.3 Axle differential

The axle differential lock is engaged when you switch the control cock. This causes that air can pass through a neck in the threaded hole of the shift cylinder 3 into the working space inside. The air pressure moves the piston together with the shift pin, which is pressed in the piston and slides into the shifter fork 4 with its recess. The shifter fork fits on the guide pin 2 and moves in a hole of the bearing bush 15. The fork segment 4 fits in a groove of the sliding sleeve 13. It is connected with the connecting sleeve 5 by means of tabs of three sliding pins 12, which are inserted into recesses of sleeves. During engagement the involute splining of the connecting sleeve 5 engages into internal involute gearing of the housing 6. Hereby the axle differential lock is engaged.



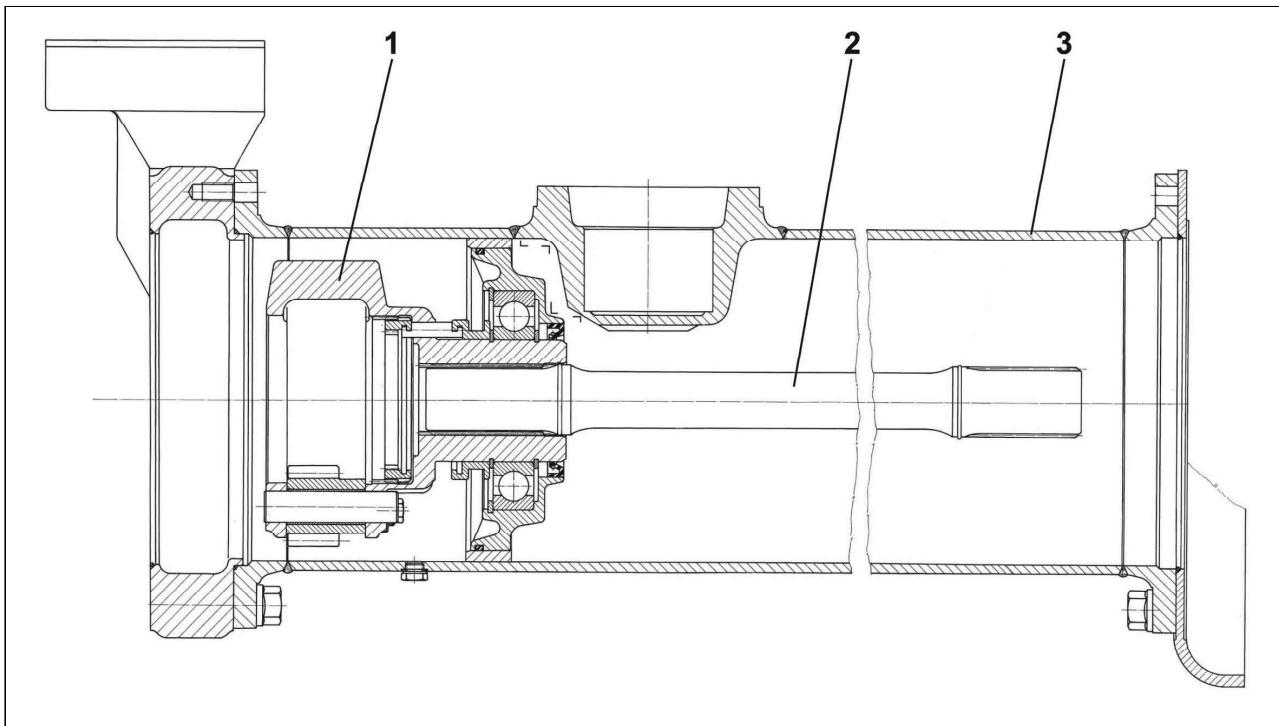
06 Back-bone Tubes, Connecting Parts and Differentials



The signal lamp lights up on the instrument board to indicate that the axle differential lock is engaged.

When you change over the switch into the basic position, the axle differential lock is disengaged – the pressure air blows off into the open air from the shift cylinder and the return spring returns the piston with the shift pin back into the initial position. Simultaneously the differential lock is disengaged too. It happens also at malfunction of the pressure air delivery during the differential lock engagement.

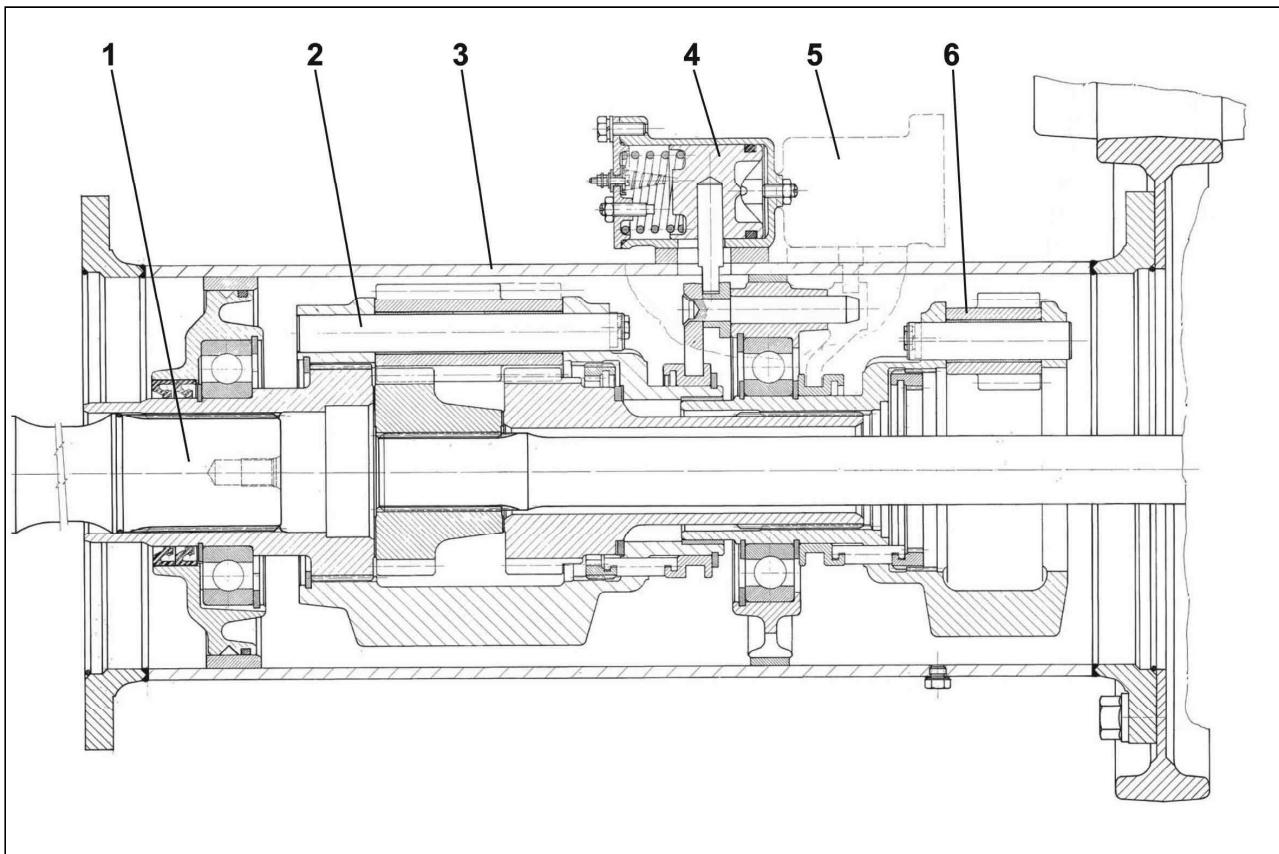
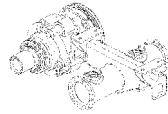
The axle differential **1** (See Fig. **6.4**) of the front axle is situated in the front backbone tube **3**. The propeller shaft **2** drives it from gearbox.



Legend: **1** - axle differential, **2** - propeller shaft, **3** - front backbone tube

Fig. 6.4 Location of the front axle differential

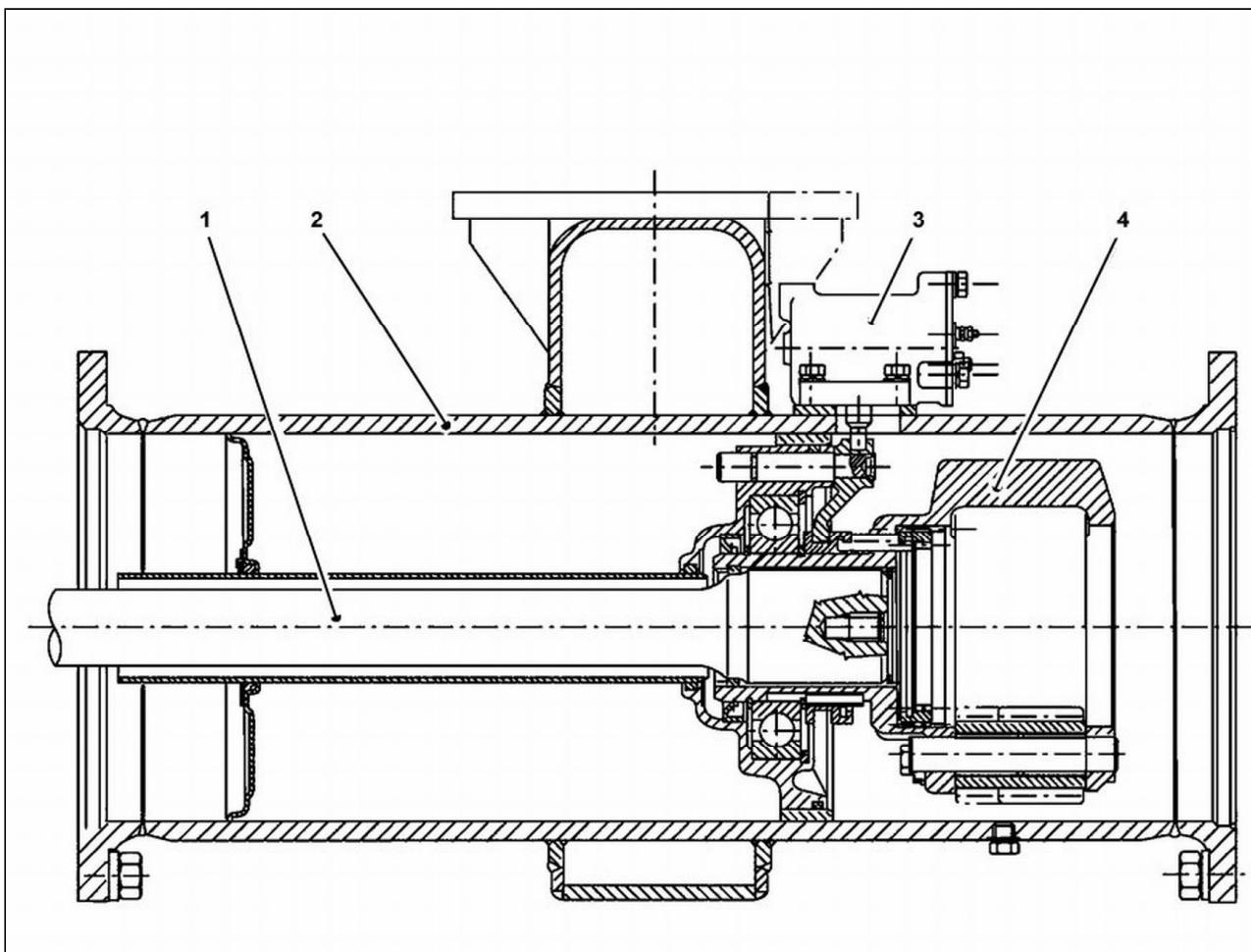
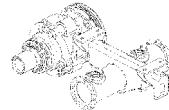
The 1st rear axle differential **6** (See Fig. **6.5**) and the inter-axle differential of the rear couple of axles are located in the rear backbone tube **3**. The torque to the inter-axle differential **2** is transmitted through the propeller shaft **1** from gearbox. To the rear backbone tube **3** the control cylinder **4** of the inter-axle differential lock and the control cylinder **5** of the axle differential lock are attached.

06 Back-bone Tubes, Connecting Parts
and Differentials

Legend: 1 - propeller shaft, 2 - inter-axle differential, 3 - rear backbone tube, 4 - control cylinder of the inter-axle differential lock, 5 - control cylinder of the axle differential lock, 6 - 1st rear axle differential

Fig. 6.5 Location of the inter-axle differential and the 1st rear axle differential

The 2nd rear axle differential 4 (See Fig. 6.6) is situated in the rear connecting part 2. The torque is transmitted to the differential 4 from the inter-axle differential through the shaft 1. To the connecting part the control cylinder 3 of the axle differential lock is attached.



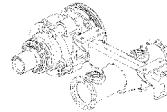
Legend: 1 - propeller shaft, 2 - rear connecting part, 3 - control cylinder of the axle differential lock, 4 - 2nd rear axle differential

Fig. 6.6 Location of the 2nd rear axle differential

Main technical specifications of differentials are mentioned in the next table.

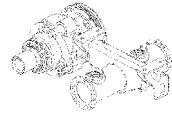
Tab. 6.1 Main specifications of differentials

DATA	UNIT	VALUE
Kind of the central differential – torque converter		Planetary, non-symmetrical with multi-plate locked clutch
Kind of inter-axle differential		with locked spur gears
Kind of axle differentials		with locked spur gears
Central differential – torque converter ratio of division (front axle / rear couple of axles)	(%)	30 / 70
Inter-axle differentials ratio of division	(%)	50 / 50
Axle differentials ratio of division	(%)	50 / 50



6.2 Faults Causes, Symptoms and Troubleshooting

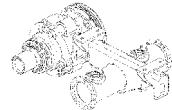
Fault	Cause	Remedy	Mentioned in:
The differential lock cannot be engaged.	Damage to the control cylinder of the differential lock.	Remove the cylinder and replace it.	(See Subchapter 6.5.1)
	Damage to the shift mechanism components in the backbone tube.	Remove the differential and repair the defect.	(See Subchapter 6.5.6), (See Subchapter 6.5.7), (See Subchapter 6.5.8)
	Damaged differential.	Remove the differential and repair the defect.	(See Subchapter 6.5.6), (See Subchapter 6.5.7), (See Subchapter 6.5.8)
The differential lock cannot be disengaged.	Broken return spring of the control cylinder.	Remove the cylinder and replace it.	(See Subchapter 6.5.1)
	Other damage to the control cylinder of the differential lock (seized piston).	Remove the cylinder and replace it.	(See Subchapter 6.5.1)
	Damage to the shift mechanism components in the backbone tube.	Remove the differential and repair the defect.	(See Subchapter 6.5.6), (See Subchapter 6.5.7), (See Subchapter 6.5.8)
	Damaged differential.	Remove the differential and repair the defect.	(See Subchapter 6.5.6), (See Subchapter 6.5.7), (See Subchapter 6.5.8)



6.3 List of Special Tools

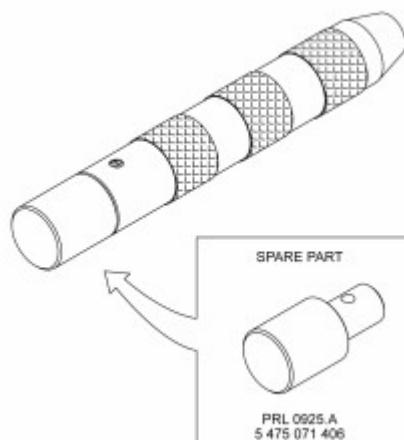
Tab. 6.2 Special tools for the back-bone tube and dofferentials

<p>Name: Lifting tool of differential and inter-axle differential group</p> <p>Tool number: PHV 0992</p>	
<p>Name: Driver of bearings 6219, 6030</p> <p>Tool number: PRL 0831.1</p>	
<p>Name: Driver of bearing 6219</p> <p>Tool number: PRL 0832.1</p>	

**06 Back-bone Tubes, Connecting Parts
and Differentials**

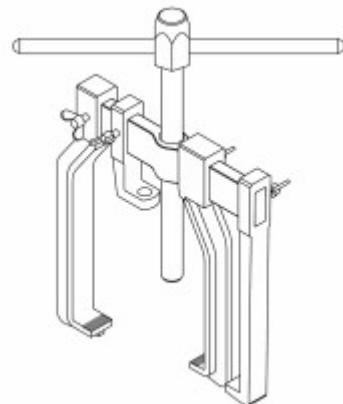
Name: Universal driver

Tool number: PRL 0925



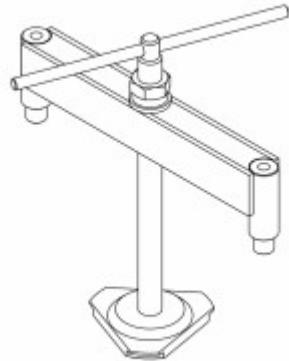
Name: Universal puller

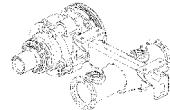
Tool number: PRM 0777



Name: Puller of differential from backbone tube

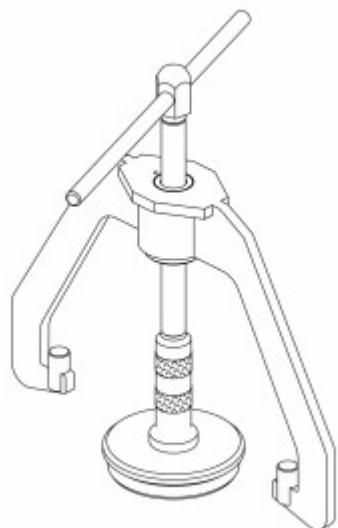
Tool number: PRM 3194



**06 Back-bone Tubes, Connecting Parts
and Differentials**

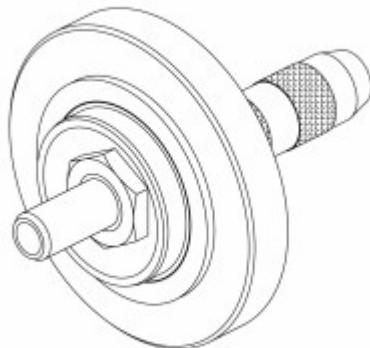
Name: Tool to press differential into backbone tube

Tool number: PRM 3195



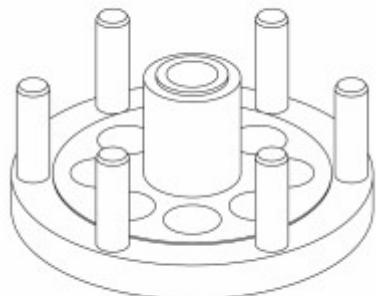
Name: Driver of shaft seals 95x120x13 and 90x120x13

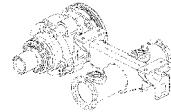
Tool number: PRM 3297.1



Name: Stand for driver PRM-3297.1

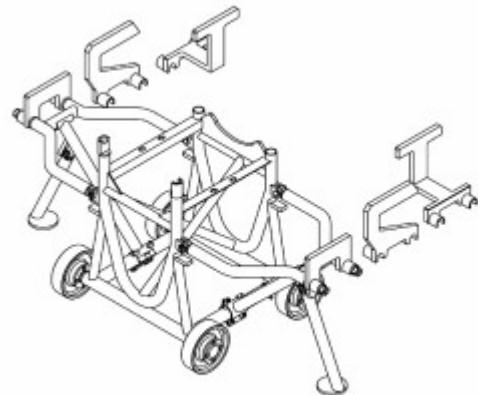
Tool number: PRM 3298



**06 Back-bone Tubes, Connecting Parts
and Differentials**

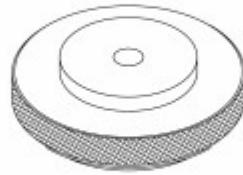
Name: Assembly trolley of axles - axles with reduction gear

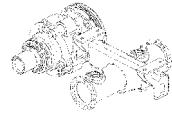
Tool number: PRM 3338.1



Name: Support for disassembly of differentials

Tool number: PRM 3348

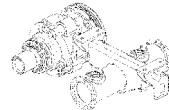




6.4 Survey of Tightening Specifications

Tab. 6.3 Survey of tightening specifications of back-bone tubes, connecting parts and differentials

Data	Unit	Value
Nuts of steering tie-rod ball joints	Nm	280 ± 10 %
Screw connection of central member frame parts		420 ± 10 %
Nuts M4x5.8		1.2 - 1.7
Nuts M8x5.8		9.8 - 14
Nuts M8x8.8		16 - 23
Screws of shift cylinder		32 - 45
Nuts M10x8.8		32 - 46
Cylinder cover bolts		17 ± 4
Screws connecting frame to cross girder		400 ± 40



6.5 Working Procedures

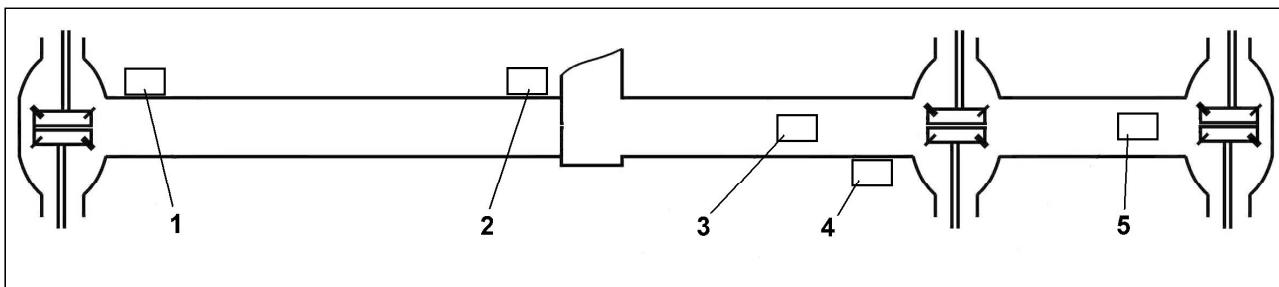
6.5.1 Removal and Installation of the Differential Locks Shift and the Front Drive Shift Control Cylinders

a) Reasons for Removal and Installation

1. The air leaks from the working cylinder.
2. The piston seized in the cylinder.
3. The indication of the axle differential lock or the front drive engagement does not work.

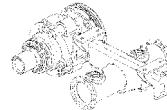
b) Technical Conditions

1. Shaped rings, damaged parts and spring washers must be replaced with new ones.
2. The shift pin must be pressed (it must not be loose) by milled areas perpendicularly to the piston longitudinal axis under the angle of $90^\circ \pm 20'$.
3. The prescribed protrusion of the pin from the shift cylinder for inter-axle and axle differentials: **27.5 - 0.2 mm**.
4. The prescribed protrusion of the pin from the shift cylinder for the front drive shifting: **40.0 - 0.3 mm**.
5. The clearance between the shift pin face and bottom in the fork slot must be **0.8 mm** as a minimum.
6. The shift pins of locks must not be confused with shift pins of the front drive.
7. Clean and degrease the contact and functional surfaces.
8. Smear the functional surfaces with grease.
9. To apply the sealant, let the sealant get dry for **5 minutes** as a minimum.



Legend: 1 – front axle differential lock shift control cylinder, 2 – front axle drive shift control cylinder, 3 – inter-axle differential lock shift control cylinder, 4 – 1st rear axle differential lock shift control cylinder, 5 – 2nd rear axle differential lock shift control cylinder

Fig. 6.7 Lay-out of differential locks shift control cylinders



06 Back-bone Tubes, Connecting Parts and Differentials

c) Removal Procedure

1. Detach the air manifold **2** and disconnect the electric cable **3** signalling the axle differential lock or the front drive engagement from the shift cylinder **1**.
2. Dismount four fastening bolts and withdraw the cylinder from the backbone tube.

Note:

The procedure is the same for all cylinders.

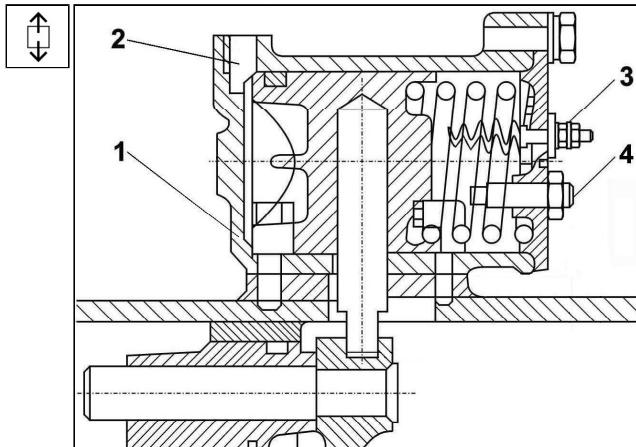


Fig. 6.8 Axle differential lock shift control cylinder

d) Installation Procedure of the Axle Differential Lock Shift Control Cylinders

1. Modify the pressing-in depth of the shift pin so that it meets the dimension of **27.5 - 0.2 mm**. This corresponds to the minimum clearance of **0.8 mm** between the guide pin and the pin of the shift control cylinder.
2. Convey the pressure air and use the soap water to check the cylinder for leaks and make sure that the piston moves properly.
3. Apply the sealant to the perfectly clean bearing surface of the backbone tube.
4. Slide the shift control cylinder **1** with its pin into a recess of the guide pin (shifter fork) and use bolts to attach it to the backbone tube flange (first smear the bolt threads with the sealant) and tighten to **32 - 45 Nm**.
5. Attach the air manifold **2** and connect the signaling electric cable **3**.
6. Convey the compressed air to move the axle differential lock shift fork into the marginal position. Continue to mount the adjusting screw **4** until it touches the piston, disengage the differential lock and tighten the screw by one turn. Lock the screw with nut.
7. Start the engine and make a test run with the vehicle.

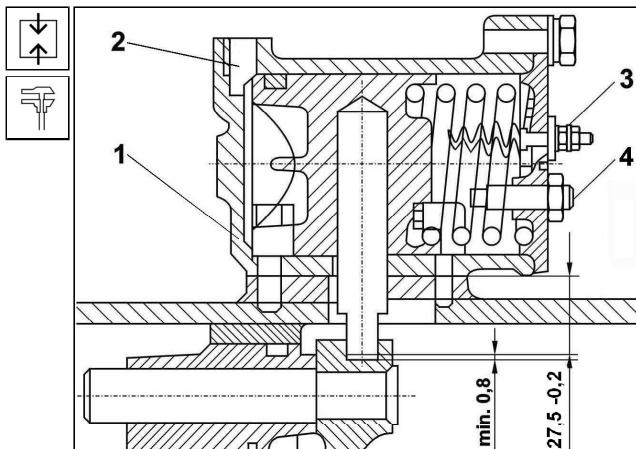
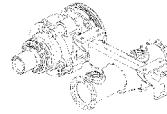


Fig. 6.9 Axle differential lock shift control cylinder - setting



06 Back-bone Tubes, Connecting Parts and Differentials

e) Installation Procedure of the Inter-Axle Differential Lock Shift Control Cylinders

1. Modify the pressing-in depth of the shift pin so that it meets the dimension of **27,5 - 0,2 mm**. This corresponds to the minimum clearance of **0,8 mm** between the guide pin and the pin of the shift control cylinder.
2. Convey the pressure air and use the soap water to check the cylinder for leaks and make sure that the piston moves properly.
3. Apply the sealant to the perfectly clean bearing surface of the backbone tube.
4. Slide the shift control cylinder with its pin into a recess of the guide pin (shifter fork) and use bolts to attach it to the backbone tube flange (first smear the bolt threads with the sealant CURIL K2) and tighten to **32 - 45 Nm**.
5. Attach the air manifold and connect the signaling electric cable.
6. Disengaged the differential lock, tighten the adjusting screw **1** until it touches the piston
7. Engage the differential lock.
8. Tighten the screw **1** by one turns. Lock the screw with nut.
9. Mount the adjusting screw **2** until it touches the piston.
10. Disengage the differential lock and tighten the screw **2** by one turns. Lock the screw with nut.
11. Start the engine and make a test run with the vehicle.

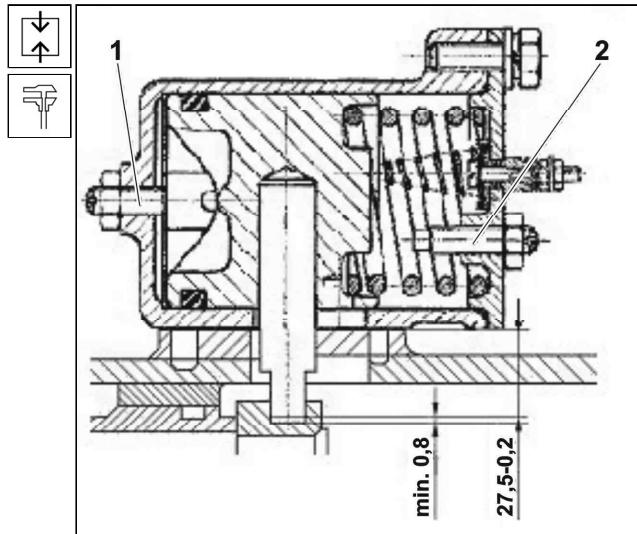
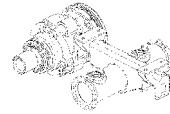


Fig. 6.10 Inter-axle differential lock shift control cylinder - settin



06 Back-bone Tubes, Connecting Parts and Differentials



f) Installation Procedure of the Front Drive Shift Control Cylinder

1. Modify the pressing-in depth of the shift pin so that it meets the dimension of **40 - 0,3 mm**. This corresponds to the minimum clearance of **0.8 mm** between the guide pin and the pin of the shift control cylinder.
2. Convey the pressure air and use the soap water to check the cylinder for leaks and make sure that the piston moves properly.
3. Apply the sealant to the perfectly clean bearing surface of the backbone tube.
4. Slide the shift control cylinder with its pin into a recess of the guide pin (shifter fork) and use bolts to attach it to the backbone tube flange (first smear the bolt threads with the sealant CURIL K2) and tighten to **32 - 45 Nm**.
5. Connect the air manifold **1** and the signaling electric cable **2**.
6. Start the engine, check the shift mechanism for function and make a test run with the vehicle.

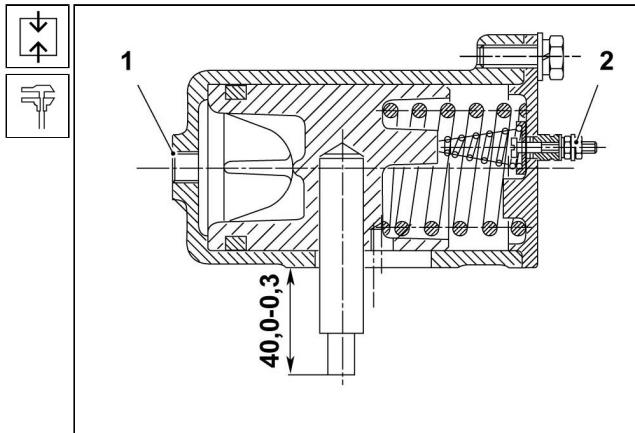
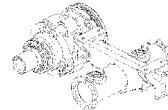


Fig. 6.11 Front drive shift control - setting



6.5.2 Removal and Installation of the Front Backbone Tube

Reasons for Removal and Installation

1. Removal of the front axle differential.
2. Leaky flange connection of the backbone tube at gearbox.

b) Technical Conditions

1. Replace all shaped rings with new ones.
2. Tighten the flange connections of the central member frame to **420 ± 10% Nm**.

c) Removal Procedure

1. Dismount the gearbox according to the procedure (See Part 3).
2. Drain the oil from the power steering circuit into a prepared pan according to the procedure (See Part 10).
3. Dismount the front axle according to the procedure (See Part 7).
4. Finish removal of torsion bars according to the procedure (See Part 8).
5. Detach the air inlet manifolds and disconnect electric cable to signal lamp from the 1st axle differential lock shift cylinder (See Subchapter 6.5.1).
6. Dismount ball joints **6** of both steering rods and remove rods with joints from double steering arm **7** according to the procedure in the Section (See Part 10).
7. Dismount oil manifolds **1**, **2**, **4** and **5** from the front backbone tube **3**.

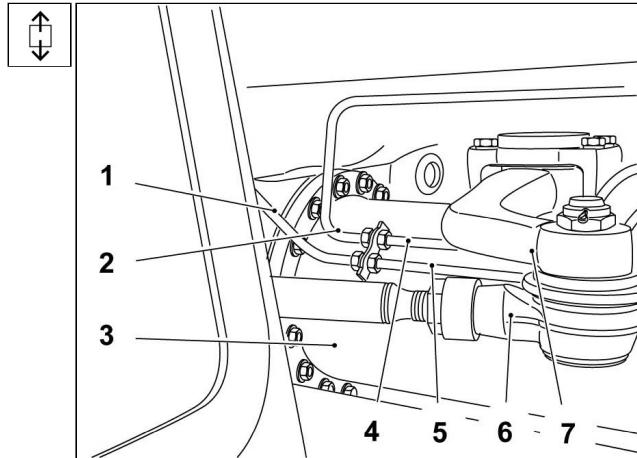
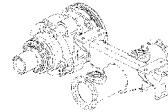


Fig. 6.12 Oil manifolds - removal



06 Back-bone Tubes, Connecting Parts and Differentials



8. Unscrew three auxiliary bolts M 14 **1** and remove cross girder **3** together with shaped ring from the front backbone tube **2**.
9. Partially raise the auxiliary gearbox and support on stand.
10. Support the front backbone tube on height-adjustable assembly truck.

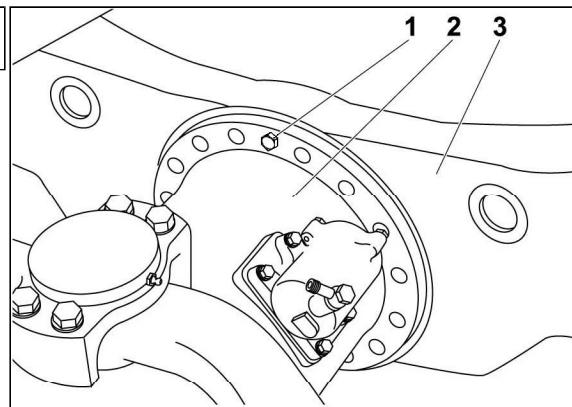


Fig. 6.13 Locking the position of frame cross girder - removal

11. Slacken and unscrew nuts **2** fixing the front backbone tube **1** to the flange of auxiliary gearbox housing **3**.
12. Move the backbone tube **1** being supported on assembly truck forwards ahead of vehicle.
13. Remove shaped ring.

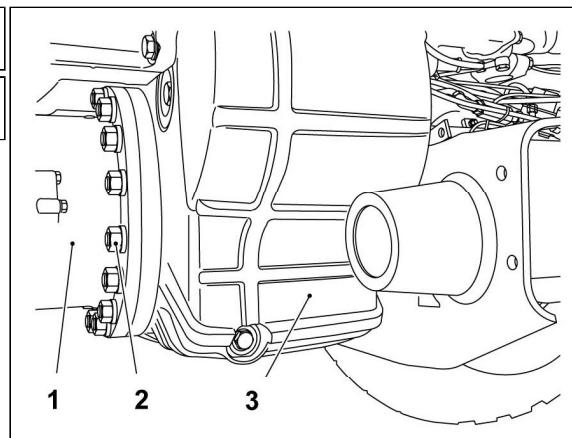


Fig. 6.14 Front backbone tube - removal

14. Slide the propeller shaft out of the axle differential of front backbone tube.
15. Withdraw the shaped ring from the side of auxiliary gearbox.

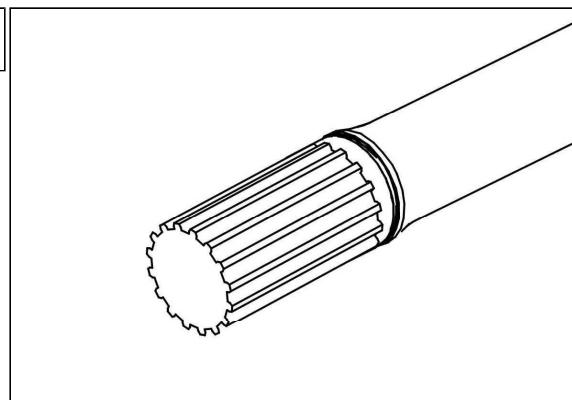
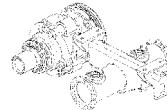


Fig. 6.15 Propeller shaft - removal



06 Back-bone Tubes, Connecting Parts and Differentials



d) Installation Procedure

1. Slide the shaped ring on propeller shaft from the side of auxiliary gearbox.
2. Slightly smear the grooves of propeller shaft with paste **Servo grease 'MP'** and slide the shaft into front backbone tube. Propeller shaft grooves must fit into grooves of front axle differential.

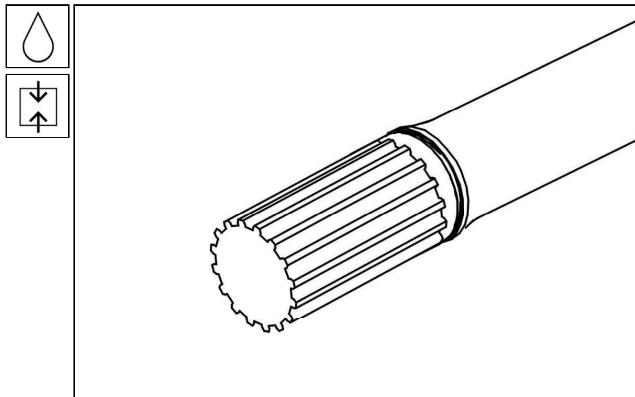


Fig. 6.16 Propeller shaft - installation

3. Fit a new shaped ring on the sealing surface of backbone tube 1.
4. Move the front backbone tube 1 being placed on assembly truck precisely in the vehicle longitudinal centerline to the flange of auxiliary gearbox 3 so that the propeller shaft will slide into carrier of front drive and flange stud bolts of auxiliary gearbox will slide into holes in the flange of front backbone tube 1.
5. Fit nuts 2 on stud bolts and tighten evenly to $420 \pm 10\% \text{ Nm}$.

CAUTION:

The contact surface for nuts 1 of the Ø 32 flange connection must not be painted during installation.

6. Raise the auxiliary gearbox 3, remove assembly truck from beneath the front backbone tube and move the stand, which supported the auxiliary gearbox, beneath the front backbone tube. Lower the jack.

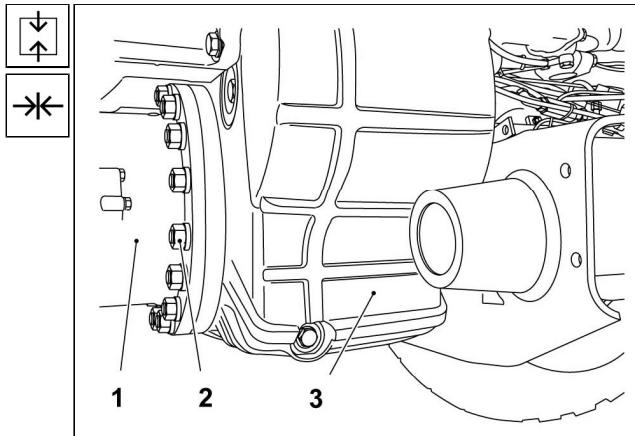
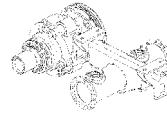


Fig. 6.17 Front backbone tube- installation



06 Back-bone Tubes, Connecting Parts and Differentials



7. Fit a new shaped ring on the sealing surface of cross girder **3** and attach the cross girder **3** to the backbone tube **2** using auxiliary bolts M 14 **1**. Tighten the bolts as far as it goes.
8. Attach the air inlet manifolds to the axle differential lock shift cylinder and connect electric cable to signal lamp (See Subchapter **6.5.1**).
9. Install torsion bars according to the procedure (See Part **8**).
10. Install the front axle according to the procedure (See Part **7**).

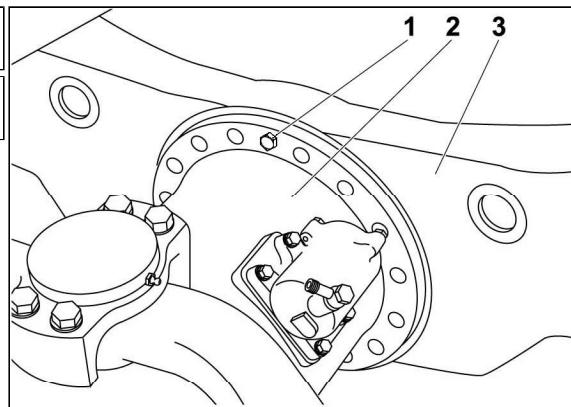


Fig. 6.18 Locking the position of frame cross girder - installation

11. Attach oil manifolds **1**, **2**, **4** and **5** into holder on the front backbone tube **3**.
12. Install ball joints **6** of both steering rods. Mount rods with joints to the double steering arm **7** according to the procedure (See Part **10**).

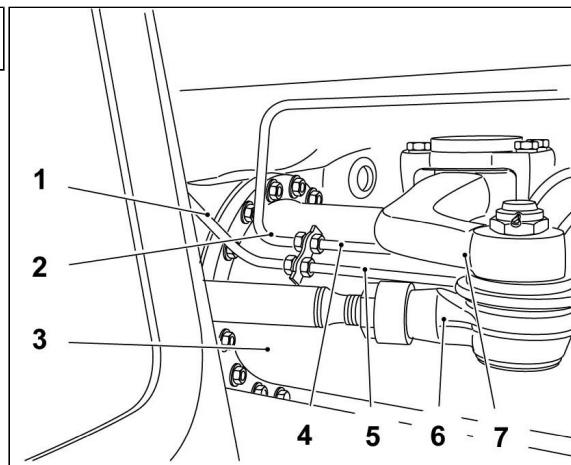
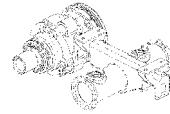


Fig. 6.19 Oil manifolds - installation



6.5.3 Removal and Installation of the Rear Backbone Tube

a) Reasons for Removal and Installation

1. Removal of the 1st rear axle differential.
2. Removal of the inter-axle differential.
3. Leaky gearbox flange connection.

b) Technical Conditions

1. Replace all sealing rings with new ones.

c) Removal Procedure

1. Remove the couple of rear axles according to (See Part 7) (both rear axles must be placed on assembly trucks **PRM 3338** or supported safely).
2. Place the assembly truck under the rear backbone tube or hang it up on a suitable lifting device.
3. Loosen and unscrew nuts **2** connecting the rear backbone tube **1** through the cross girder **3** to the 1st axle final drive housing **4**.
4. Move the backbone tube away from the 1st rear axle final drive housing so that the rear propeller shaft would move out of the inter-axle differential or 2nd rear axle differential.
5. Remove the propeller shaft from the rear backbone tube or from the 2nd rear axle differential.

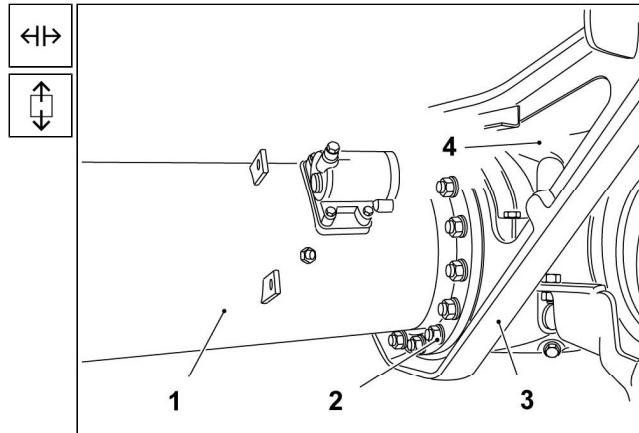
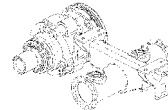


Fig. 6.20 Connection between the rear backbone tube and the 1st rear axle - removal



06 Back-bone Tubes, Connecting Parts and Differentials



6. Remove the shaped ring **1** and cross girder **2** ahead of the 1st rear axle.

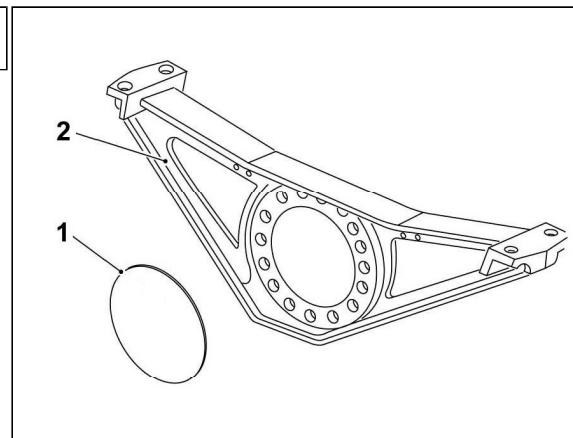


Fig. 6.21 Removal of the cross girder ahead of the 1st rear axle

7. Remove the shaped ring **2** from propeller shaft **1**.

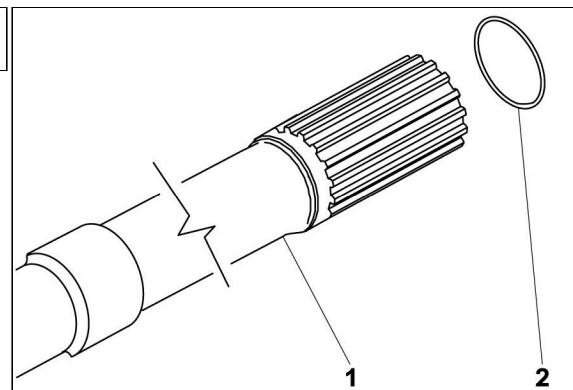


Fig. 6.22 Removal of the shaped ring

d) Installation Procedure

1. Apply the oil to a new shaped ring **2** and slide it onto a propeller shaft **1**.
2. Gently smear the propeller shaft grooves with the paste **Servo grease 'MP'** and slide the shaft into the 2nd rear axle differential with a side fitted with shaped ring.

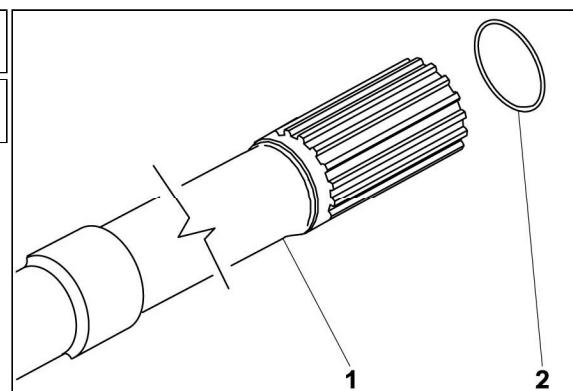
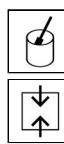
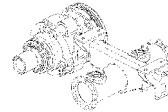


Fig. 6.23 Installation of the shaped ring



06 Back-bone Tubes, Connecting Parts and Differentials



3. Fit the cross girder **2** on stud bolts of the 1st rear axle final drive housing and apply the sealant to a new shaped ring **1**.

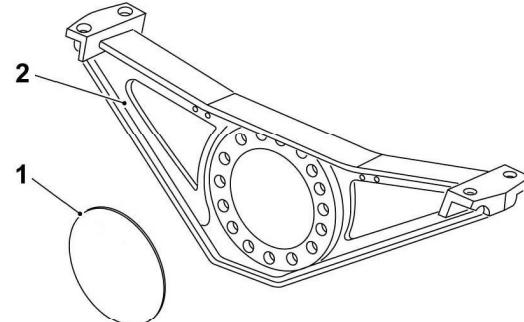
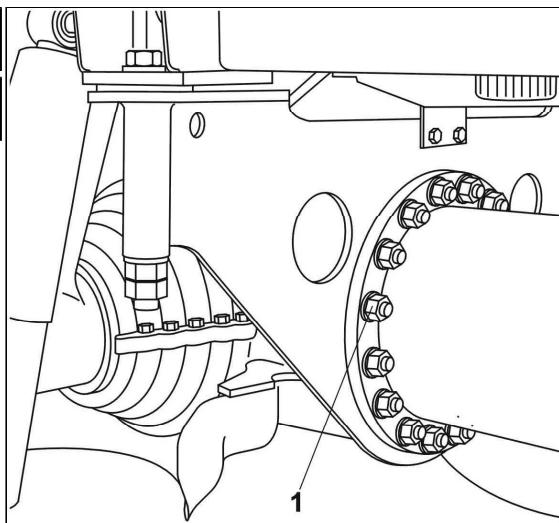
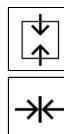


Fig. 6.24 Installation of the cross girder ahead of the 1st rear axle

4. Slide the rear backbone tube **1** with a flange on stud bolts of the axle final drive housing **4** to cross girder **3**. During installation the central gear and the rotary pinion teeth must engage into teeth of axle differential planetary gears and the involute splining of the rear shaft must fit into the splining of the inter-axle differential sun gear.
5. Mount nuts **2** and tighten evenly to the torque of **420 ± 10% Nm**.

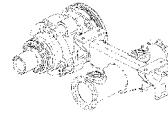


CAUTION:

The contact surface for nuts Ø 32 of the flange connection must be free of paint during assembly.

6. Move the assembly truck or the hanger away from beneath the rear backbone tube.
7. Install the couple of rear axles in accordance with. (See Part 7).

Fig. 6.25 Connection between the rear backbone tube and 1st rear axle – installation



6.5.4 Removal and Installation of the Rear Connecting Part

a) Reasons for Removal

1. Removal of the 2nd rear axle differential.
2. Leaky flange connection with the 1st rear axle.

b) Technical Conditions

1. Replace all shaped rings with new ones.
2. Tighten flange connections of the central member frame to **420 ± 10% Nm**.

c) Removal Procedure

1. Remove the couple of rear axles according to the procedure (See Part 7).
 2. Drain oil from axle final drive housings of rear axles, rear backbone tube and rear connecting part according to the procedure (See Part 7).
 3. Dismount the rear backbone tube according to the procedure (See Subchapter 6.5.3).
 4. Support the rear connecting part on both sides of the cross girder beneath leaf spring shackles and axle final drives of both axles on support stands.
 5. Dismount leaf spring shackles according to the procedure (See Part 8).
 6. Dismount vehicle wheels according to the procedure (See Part 11).
 7. Unscrew nuts **1** fixing the 2nd rear axle final drive housing with the rear connecting part.
 8. Hang the axle on suitable lifting device, move out of the rear connecting part and place on a pallet.
- CAUTION:**
Keep safety precautions valid for work with a hanging load.
9. Remove the shaped ring from the front bush of axle final drive.

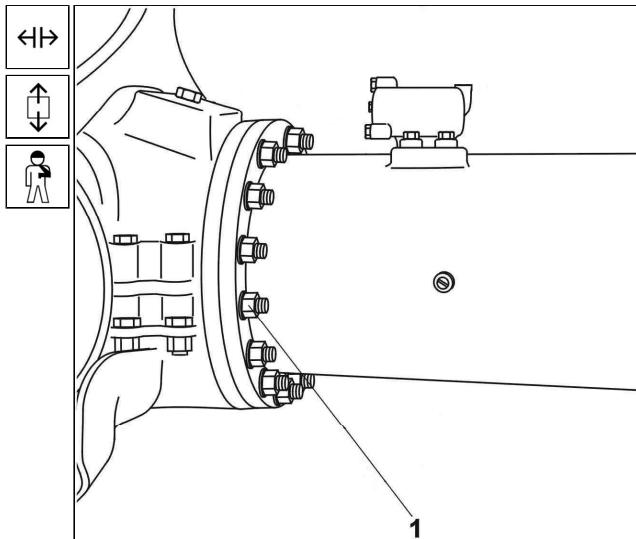
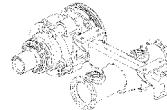


Fig. 6.26 Connection of 2nd rear axle with connecting part - removal



06 Back-bone Tubes, Connecting Parts and Differentials



10. Move the propeller shaft **1** rearwards from grooves of 2nd rear axle differential housing **2**.

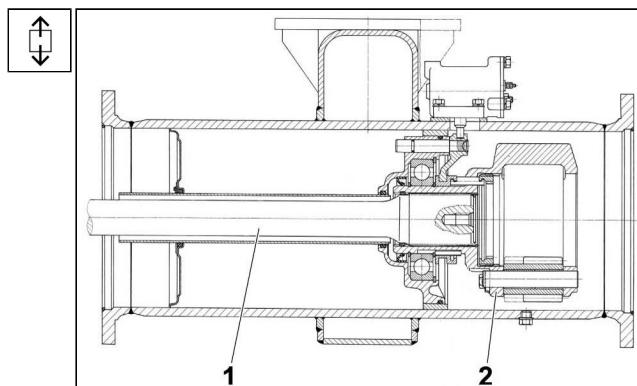


Fig. 6.27 Propeller shaft - removal

11. Unscrew nuts **1** connecting the 1st rear axle final drive housing with the rear connecting part.
12. Hang the axle on suitable lifting device, move out of the rear connecting part and place on a pallet.

CAUTION:
Keep safety precautions valid for work with a hanging load.

13. Remove the shaped ring from the rear bush of axle final drive.

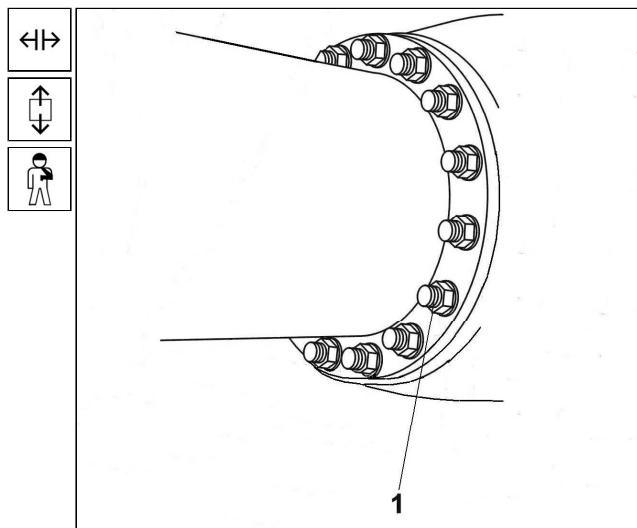
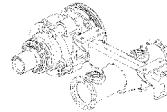


Fig. 6.28 Connection of 1st rear axle with connecting part - removal

14. Dismount leaf springs from the rear connecting part (See Part 8).

d) Installation Procedure

1. Install leaf springs onto rear connecting part (See Part 8).
2. Support the rear connecting part on both sides of the cross girder beneath leaf spring shackles on support stands.



06 Back-bone Tubes, Connecting Parts and Differentials

3. Fit the shaped ring on the cleaned rear bush of the 1st rear axle final drive.
4. Slide the axle being hung on suitable lifting device on the cleaned flange of the rear connecting part.

CAUTION:

Keep safety precautions valid for work with a hanging load.

5. Mount nuts **1** on stud bolts of the axle final drive housing and tighten them evenly to **420 ± 10 % Nm**.

CAUTION:

The contact surface for nuts of the Ø 32 flange connection must not be painted during installation.

6. Support the axle final drive housing on support stand.
7. Slide the propeller shaft **1** of the 2nd rear axle into rear connecting part in direction from 2nd rear axle final drive housing. Slide the grooves at the end of shaft into grooves of the 2nd rear axle differential housing **2**.

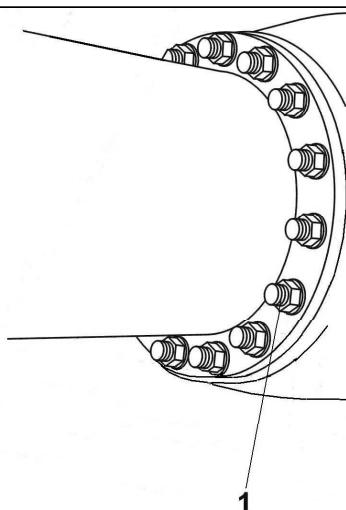
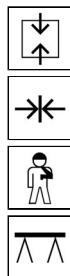


Fig. 6.29 Connection of 1st rear axle with connecting part - installation

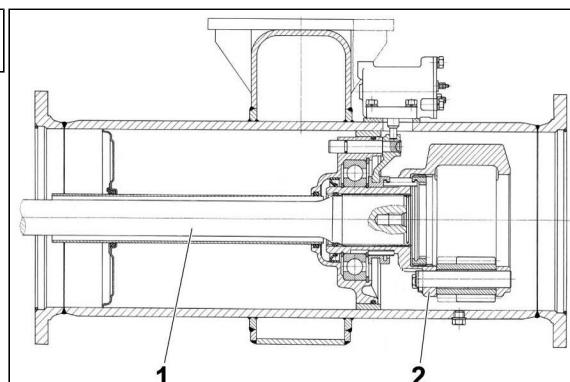
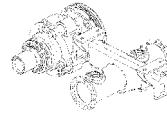


Fig. 6.30 Propeller shaft - installation



06 Back-bone Tubes, Connecting Parts and Differentials

8. Fit the shaped ring on the cleaned front bush of the 2nd rear axle final drive housing.
9. Slide the axle being hung on suitable lifting device into rear connecting part. Gear teeth of the central gear and free pinion of the 2nd rear axle must engage into gear teeth of planet wheels of the axle differential.

CAUTION:

Keep safety precautions valid for work with a hanging load.

9. Mount nuts 1 on stud bolts of the axle final drive housing and tighten them evenly to **420 ± 10 % Nm**.

CAUTION:

The contact surface for nuts of the Ø 32 flange connection must not be painted during installation.

10. Support the axle final drive housing on a support stand.
11. Install vehicle wheels according to the procedure (See Part 11).
12. Install leaf spring shackles according to the procedure (See Part 8).
13. Remove support stands from beneath the rear connecting part and axle final drive housings.
14. Install the rear backbone tube according to the procedure (See Subchapter 6.5.3).
15. Fill the axle final drive housings of both axles with oil according to the procedure (See Part 7).
16. Install the couple of rear axles according to the procedure (See Part 7).

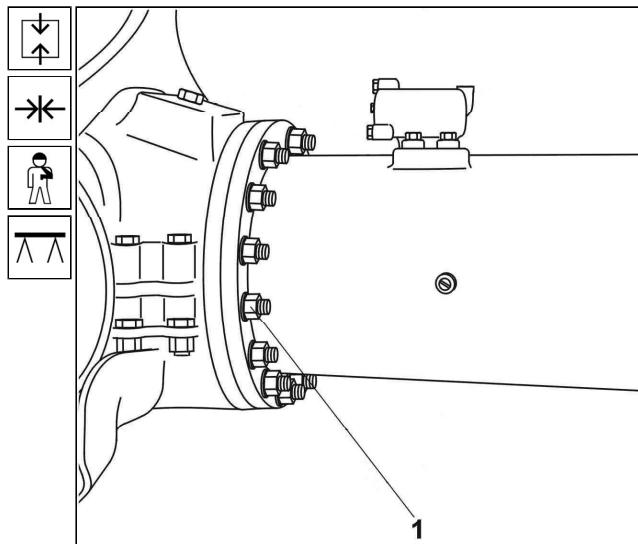
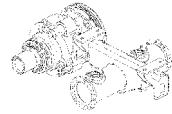


Fig. 6.31 Connection of 2nd rear axle with connecting part - installation



6.5.5 Removal and Installation of the Inter-axle Differential

a) Reasons for Removal

1. Damaged differential.
2. Leaky differential in the backbone tube.

b) Technical Conditions

1. Replace all sealing elements used in the procedure with new ones.
2. Use tools as per (See Chapter 6.3) for removal and installation.

c) Removal Procedure

1. Remove the rear backbone tube according to a procedure (6.5.3).
2. Remove the 1st rear axle differential lock control cylinder according to a procedure (See Subchapter 6.5.1).
3. Remove the inter-axle differential lock control cylinder according to a procedure (See Subchapter 6.5.1).
4. Loosen nuts of adjusting screws 3 and dismount screws from the backbone tube.

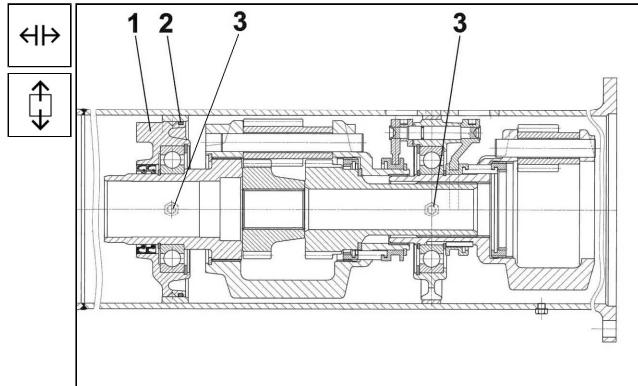
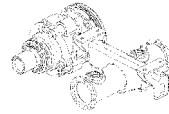


Fig. 6.32 Inter-axle differential - removal



06 Back-bone Tubes, Connecting Parts and Differentials

5. Use the tool **PHV 0992** to hang up the inter-axle differential c/w axle differential on a crane, raise it and withdraw the backbone tube.
6. Move the splined end of the inter-axle differential central gear out of grooves of the axle differential cage to separate the differentials.

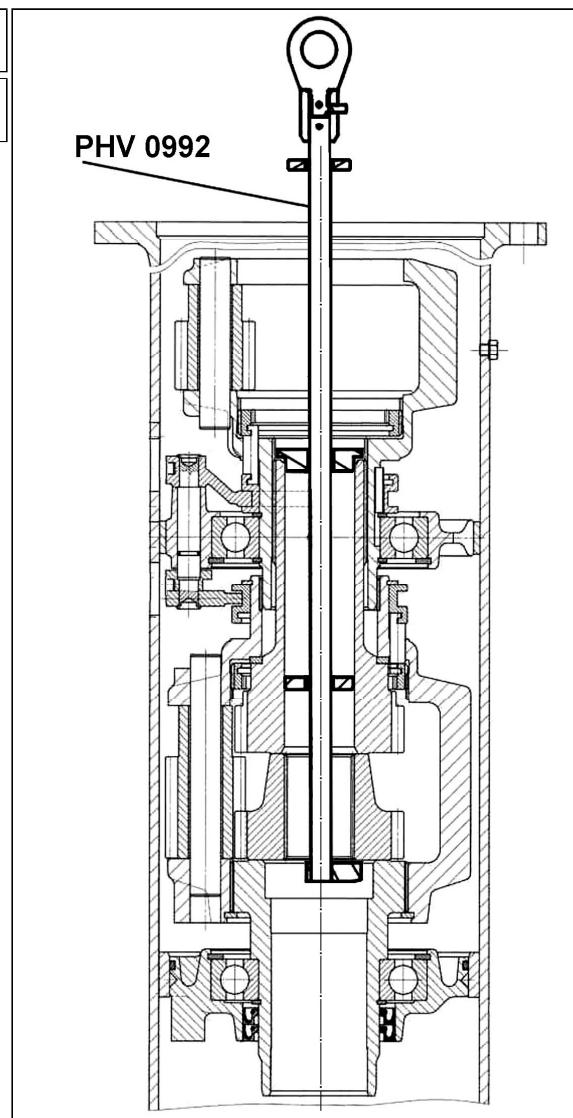
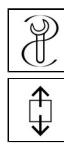
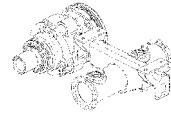


Fig. 6.33 Use of the tool PHV 0992 to pull the differentials out of the backbone tube



06 Back-bone Tubes, Connecting Parts and Differentials



7. Remove the sealing ring 1 from bushing.

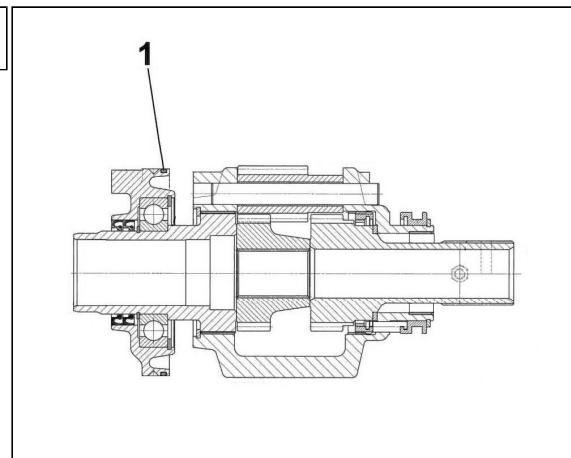


Fig. 6.34 Removal of the sealing ring from the bush

d) Installation Procedure

1. Apply the transmission oil to a new shaped ring 1 and fit on the bearing bushing.

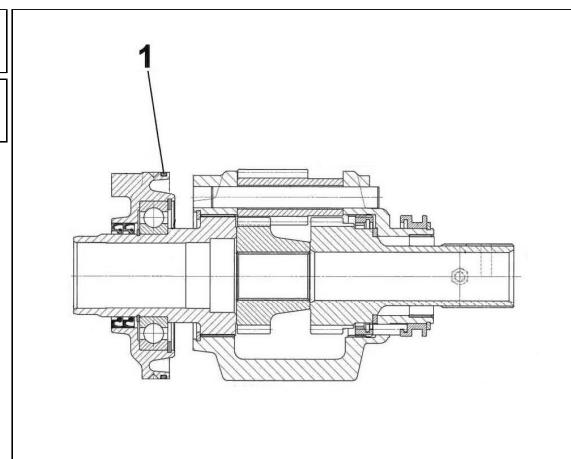
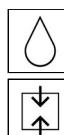
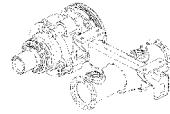


Fig. 6.35 Installation of the sealing ring into the bush



06 Back-bone Tubes, Connecting Parts and Differentials

2. Place the inter-axle differential vertically to the carrier and slide the shift fork 1 into a sliding sleeve 2.
3. Gently apply the paste **Servo grease 'MP'** to connecting grooves of the inter-axle differential central gear.

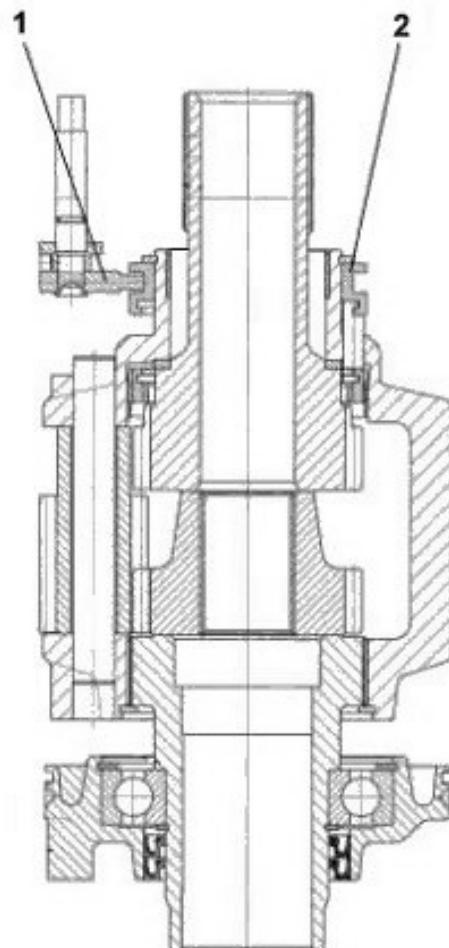
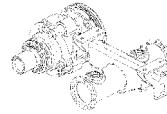


Fig. 6.36 Inter-axle differential – assembly of the sliding sleeve



06 Back-bone Tubes, Connecting Parts and Differentials

4. Slide the complete axle differential on grooves of the inter-axle differential central gear so that the shift fork pin **1** engages into a hole in the bearing **2** cover.

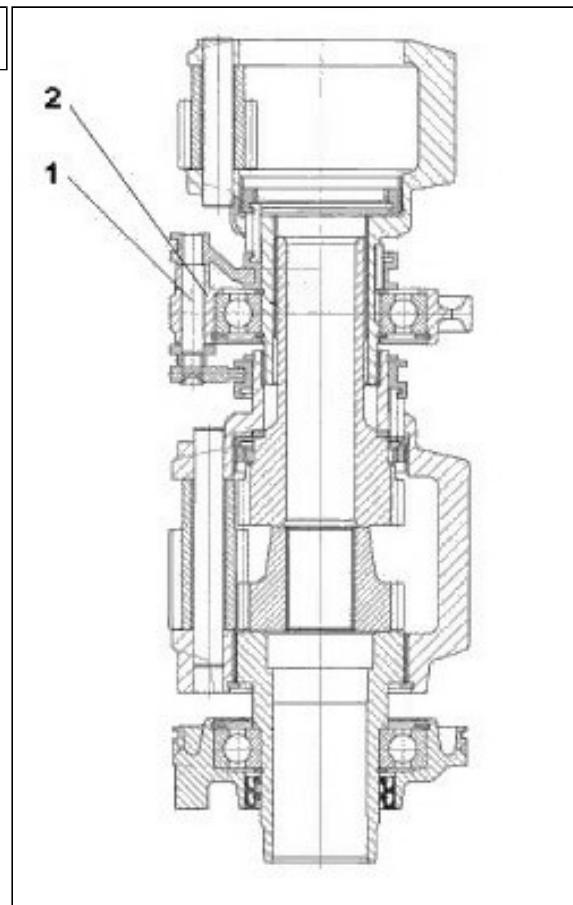
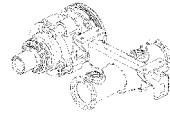


Fig. 6.37 Inter-axle differential – connection of the axle differential



06 Back-bone Tubes, Connecting Parts and Differentials

5. Hang up a couple of differentials on the tool **PHV 0992** and lower into the backbone tube so that holes in the bearing bushing of the axle differential for adjusting screws are aligned with threaded holes in the backbone tube.

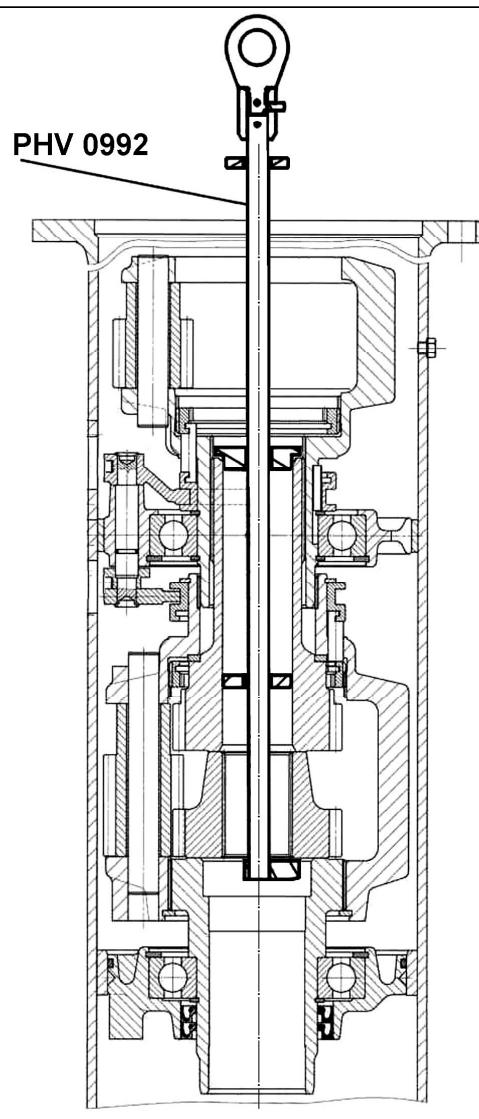
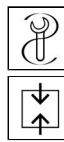
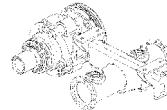


Fig. 6.38 Use of the tool PHV 0992 to slide the differentials into the backbone tube



06 Back-bone Tubes, Connecting Parts and Differentials

6. Use the tool **PRM 3195** to press the couple of differentials into the backbone tube so that holes in the bearing bushing of the axle differential and the groove in the bushing of the inter-axle differential for adjusting screws are aligned with threaded holes in the backbone tube after pressing.
7. Apply the sealant to threads of adjusting screws **3** ((See Fig. 6.32).
8. Screw the adjusting screws to secure the position of the differential and lock the screws with nuts.
9. Check whether both differentials can be shifted.
10. Install the inter-axle differential lock control cylinder in accordance with a procedure mentioned in (See Subchapter **6.5.1**).
11. Install the 1st rear axle differential lock control cylinder in accordance with a procedure mentioned in (See Subchapter **6.5.1**).
12. Install the rear backbone tube in accordance with a procedure mentioned in (See Subchapter **6.5.3**).

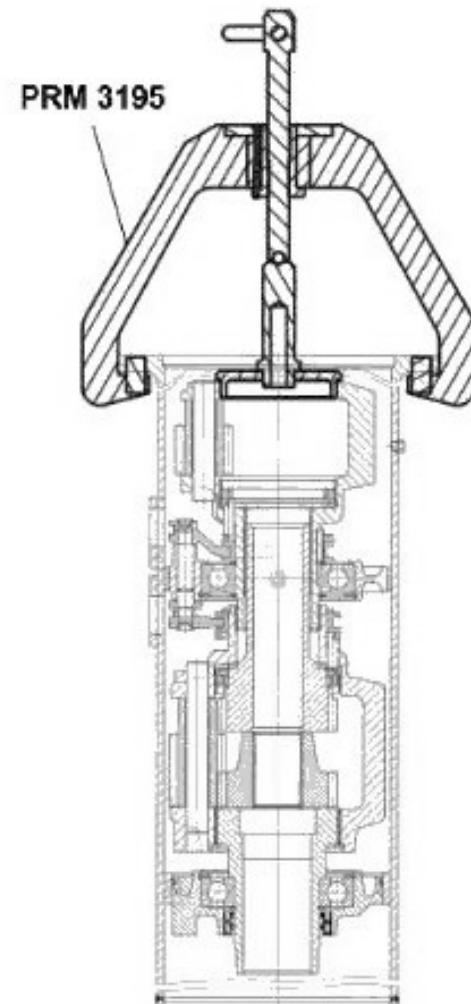
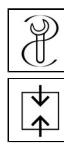
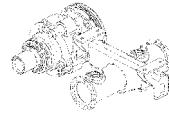


Fig. 6.39 Use of the tool PRM 3195 to press the differentials into the backbone tube



6.5.6 Removal and Installation of the Axle Differential

a) Reasons for Removal

1. Damaged differential.
2. Leakage in the backbone tube.

b) Technical Conditions

1. Replace all sealing elements used in the procedure with new ones.
2. Use tools as per (See Chapter 6.3) for removal and installation.

c) Removal Procedure

1. To dismount the front axle differential, first remove the front backbone tube in accordance with a procedure mentioned in (See Subchapter 6.5.2) and remove the front axle differential lock control cylinder in accordance with a procedure mentioned in (See Subchapter 6.5.1).
2. To dismount the 1st rear axle differential, first remove the rear backbone tube in accordance with a procedure mentioned in (See Subchapter 6.5.3) and remove the 1st rear axle differential lock control cylinder in accordance with a procedure mentioned in (See Subchapter 6.5.1).
3. To dismount the 2nd rear axle differential, first remove the rear connecting part in accordance with a procedure mentioned in (See Subchapter 6.5.4) and remove the 2nd rear axle differential lock control cylinder in accordance with a procedure mentioned in (See Subchapter 6.5.1).
4. Loosen nuts of adjusting screws 3 and dismount screws from the backbone tube (or from the connecting part).

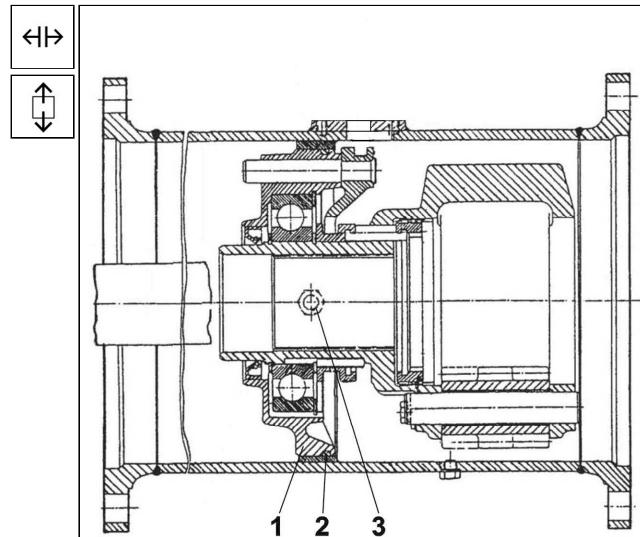
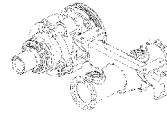


Fig. 6.40 Axle differential – removal



06 Back-bone Tubes, Connecting Parts and Differentials

5. Use the tool **PRM 3194** to pull the differential out of the backbone tube (or out of the connecting part).
6. On the differential c/w sealing ring (on the front axle and 2nd rear axle), remove the sealing ring **2** from bushing **1** (See Fig. **6.40**).

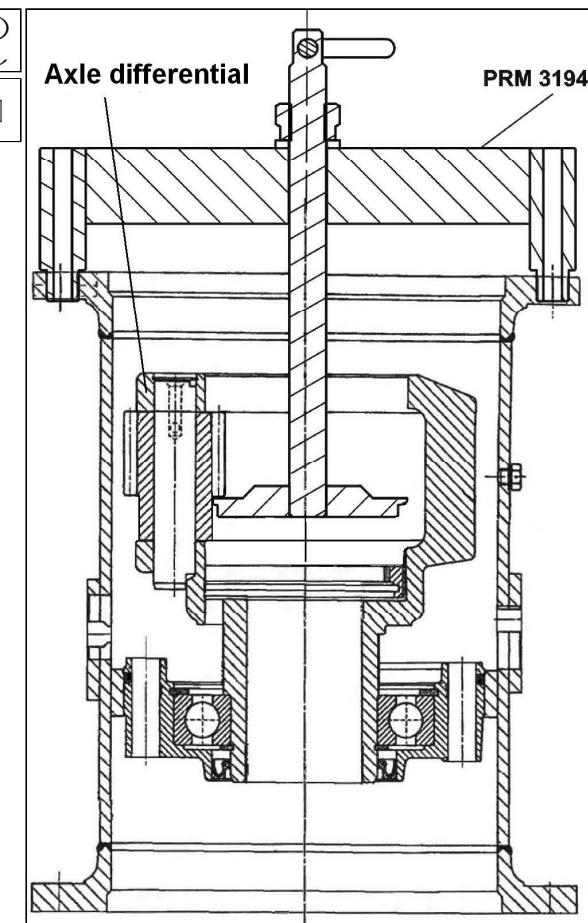
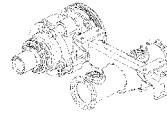


Fig. 6.41 Use of the tool PRM 3194 to pull the differential out of the backbone tube


d) Installation Procedure

1. On the differential c/w sealing ring, apply the transmission oil **2** to a new sealing ring and install it on the bushing **1**.
2. Gently apply the paste **Servo grease 'MP'** to connecting grooves.
3. Slide the differential into a backbone tube (connecting part) so that the holes in the bearing bushing for adjusting screws are aligned with threaded holes in the backbone tube (connecting part).

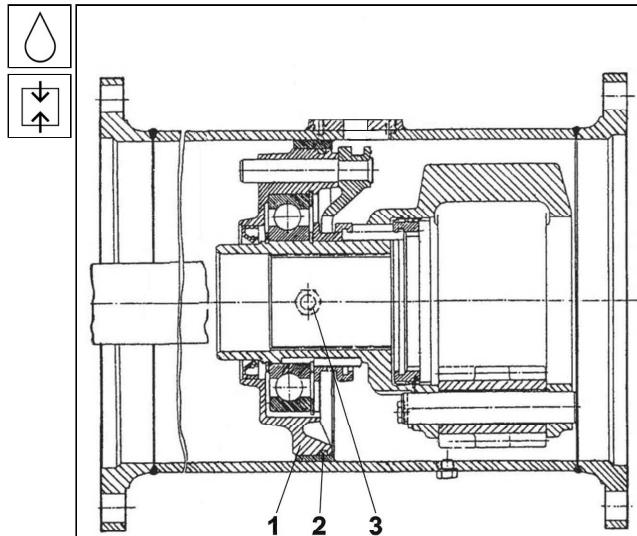


Fig. 6.42 Axle differential – installation

4. Use the tool **PRM 3195** to press the differential into a backbone tube (connecting part) so that the holes in the bearing bushing for adjusting screws are aligned with threaded holes in the backbone tube (connecting part).
5. Apply sealant to threads of adjusting screws **3** (See Fig. 6.42). Screw the adjusting screws to secure the position of differentials and lock the screws with nuts.
6. Check whether the differential lock can be engaged.
7. After installation of the front axle differential, install the front axle differential lock control cylinder in accordance with a procedure mentioned in (See Subchapter 6.5.1) and install the front backbone tube in accordance with a procedure mentioned in (See Subchapter 6.5.2).
8. After installation of the 1st rear axle differential, install the 1st rear axle differential lock control cylinder in accordance with a procedure mentioned in (See Subchapter 6.5.1) and install the rear backbone tube in accordance with a procedure mentioned in (See Subchapter 6.5.3).
9. After installation of the 2nd rear axle differential, install the 2nd rear axle differential lock control cylinder in accordance with a procedure mentioned in (See Subchapter 6.5.1) and install the rear connecting part in accordance with a procedure mentioned in (See Subchapter 6.5.4).

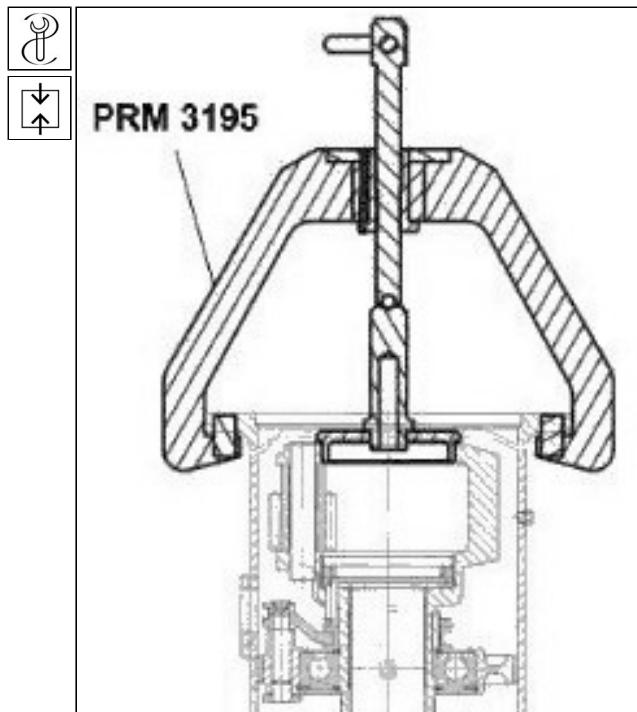
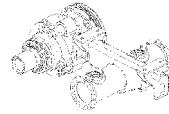


Fig. 6.43 Use of the tool PRM 3195 to press the differential into a backbone tube



6.5.7 Disassembly and Assembly of the Inter-Axle Differential

a) Reasons for Disassembly

1. Damaged differential bearings.
2. Damaged gears.
3. Damaged sliding sleeves of shift forks.
4. Damaged differential housing.
5. The differential lock cannot be engaged or disengaged although the electro-pneumatic control is working properly.

b) Technical Conditions

1. Replace all shaft seals, sealing rings and bearings with new ones.
2. Replace all damaged parts.
3. "Pitting", cementation layer breakout or seizure (transversal scratches on the whole working area) must not appear on planetary and sun gears teeth.
4. The surface of planet wheel pins must not be visibly battered and no marks of seizure are allowed.
5. Use the special tools as per the table (See Chapter 6.3) for removal and installation.

c) Disassembly Procedure

1. Remove the shift fork c/w pin **1** (if not already dismounted) and the retaining ring **2**.

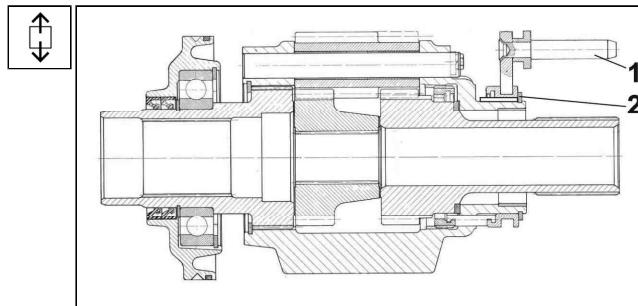


Fig. 6.44 Removal of the shift fork

2. Remove the key **1** from a groove in the differential housing.

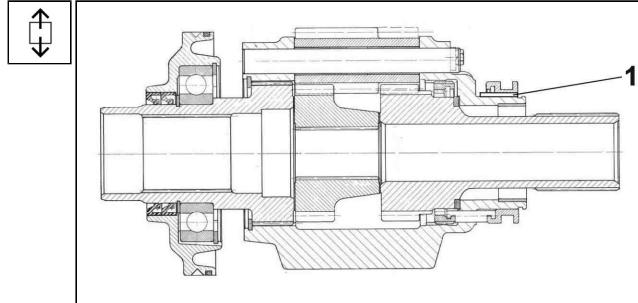
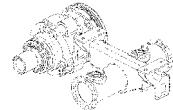


Fig. 6.45 Removal of the key



06 Back-bone Tubes, Connecting Parts and Differentials



3. Turn the sliding sleeve **1** so that the sliding pins **2** are positioned exactly opposite mounting grooves in the sliding sleeve **1** and remove the sleeve.

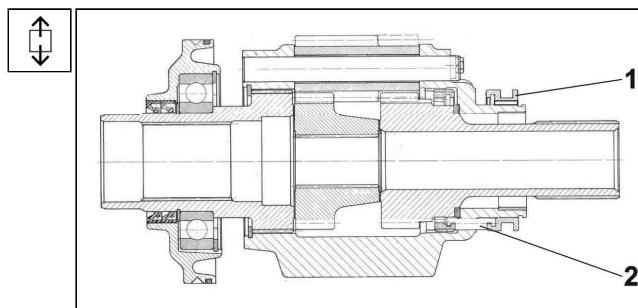


Fig. 6.46 Removal of the sliding sleeve

4. Remove the retaining ring **1**.

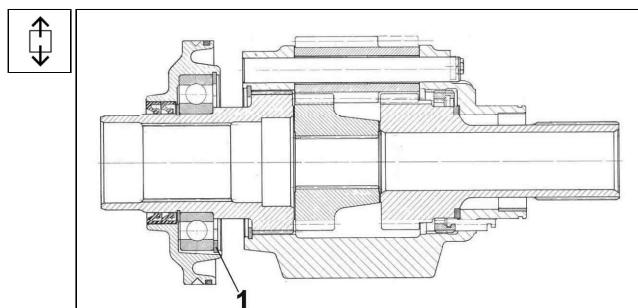
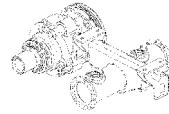


Fig. 6.47 Removal of the inner retaining ring of the bearing bushing



06 Back-bone Tubes, Connecting Parts and Differentials

5. Use the universal puller **PRM 0777** c/w support **PRM 3348** to withdraw the bearing bushing 1.

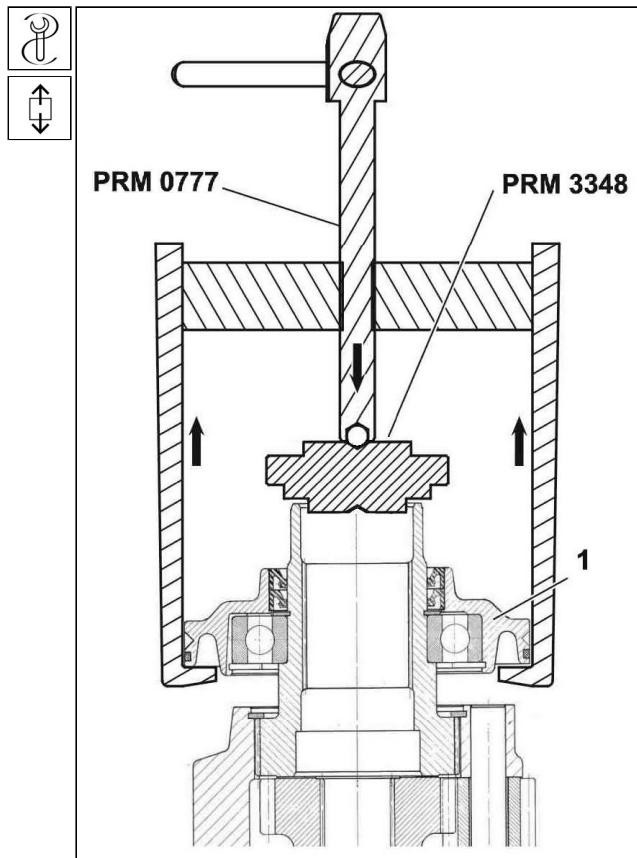


Fig. 6.48 Removal of the bearing bushing

6. Dismount two shaft seals 1 and sealing ring 2 from the bearing bushing 3.

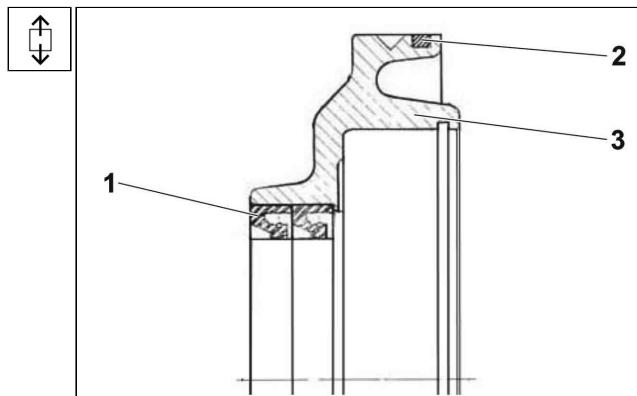
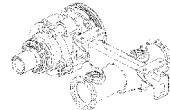


Fig. 6.49 Removal of the shaft seal from bushing



06 Back-bone Tubes, Connecting Parts and Differentials

7. Remove the bearing-retaining ring 1.

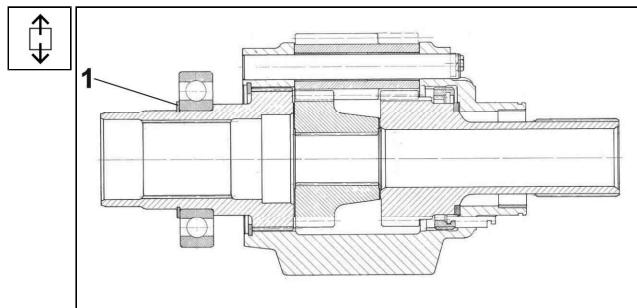


Fig. 6.50 Removal of the bearing retaining ring

8. Use the universal puller **PRM 0777** and support **PRM 3348** to withdraw the ball bearing from the carrier.

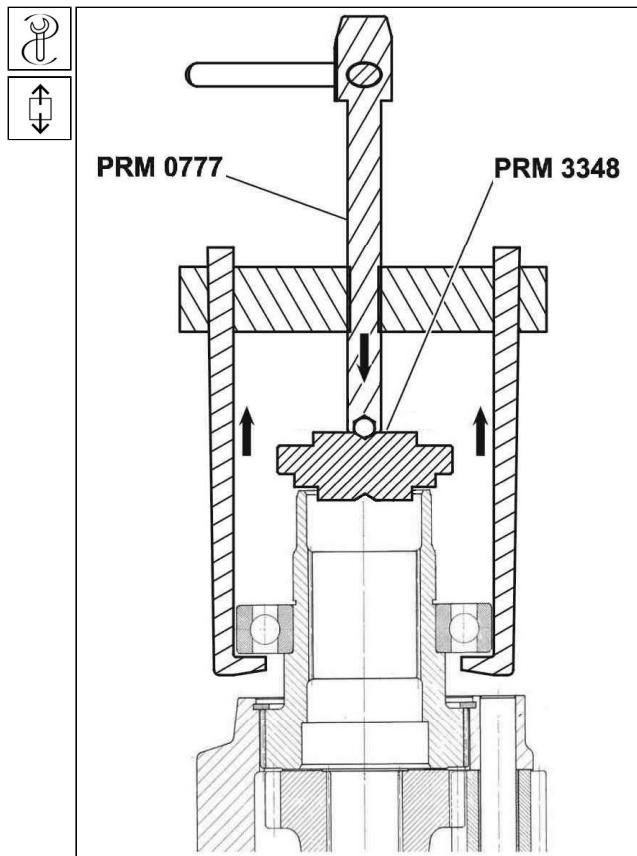
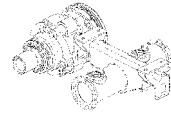


Fig. 6.51 Removal of the bearing from the differential housing



06 Back-bone Tubes, Connecting Parts and Differentials



9. Remove the differential housing retaining ring **1** and remove carrier **2** and sun gear **3**.

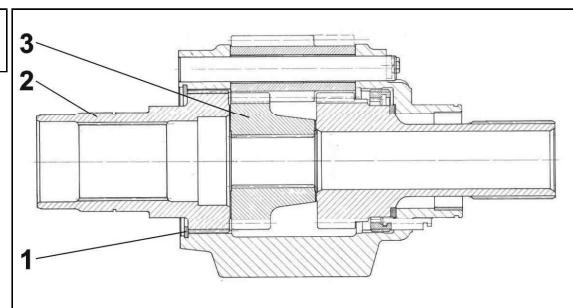


Fig. 6.52 Removal of carrier and sun gear

10. Unlock the lock washers, unscrew fastening bolts **1** and remove lock plates.

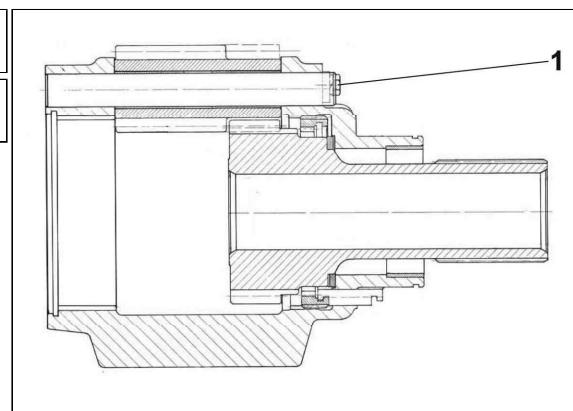
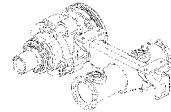


Fig. 6.53 Removal of planetary gear pins locking bolts



06 Back-bone Tubes, Connecting Parts and Differentials



11. Use the tool **PRL 0925** to press out the planetary gear pins.

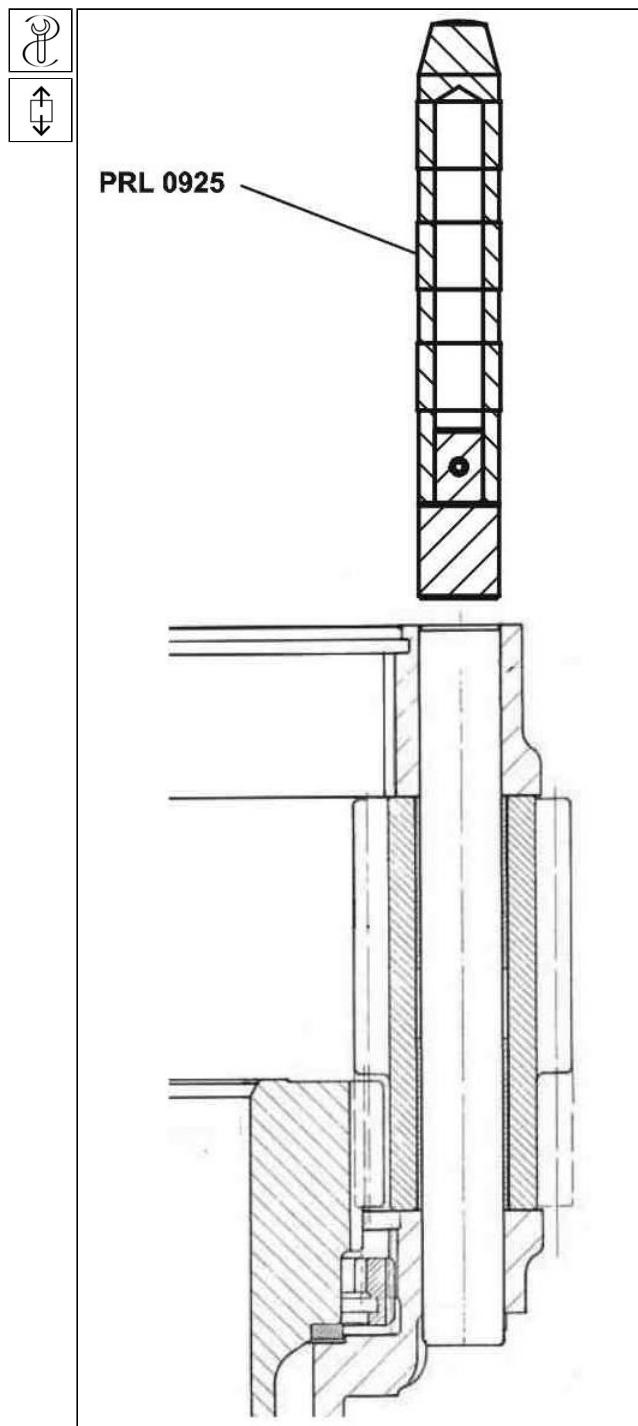
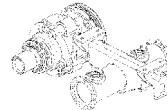


Fig. 6.54 Removal of planetary gear pins



06 Back-bone Tubes, Connecting Parts and Differentials



12. Remove planetary gears **1**, central gear **2**, connecting sleeve **3** c/w sliding pins **4** and shim **5**.

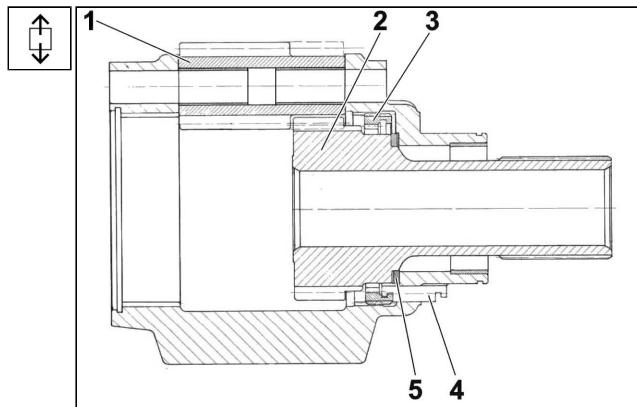


Fig. 6.55 Final disassembly of the differential

d) Assembly Procedure

1. Slide three sliding pins **1** into a groove of the connecting sleeve **2** and fit the sleeve into the inner teeth of the differential housing.

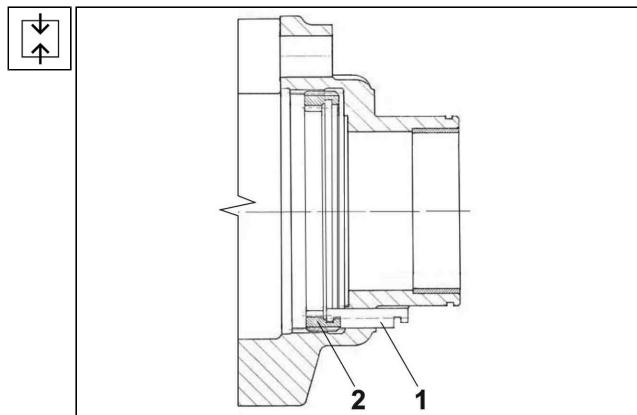


Fig. 6.56 Installation of the connecting sleeve

2. Turn the differential housing upside down (secure the connecting sleeve with pins against shifting-out). Apply the transmission oil to sliding sleeve, differential housing and sliding pins contact surfaces and fit the sliding sleeve **1** with mounting cutouts on sliding pins **2** and move the sleeve so that a key groove is aligned with a groove on the differential housing.

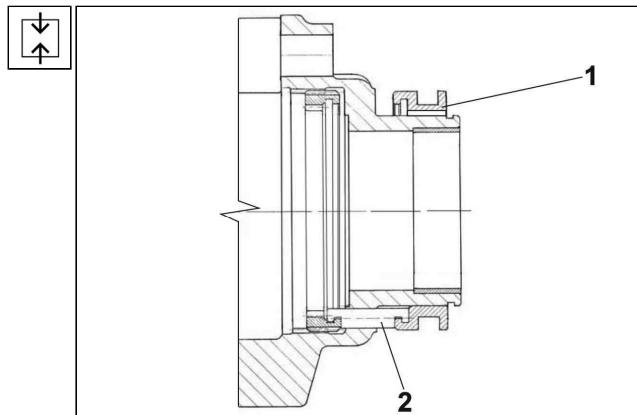
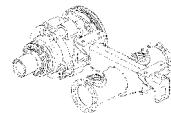


Fig. 6.57 Installation of the sliding sleeve



06 Back-bone Tubes, Connecting Parts and Differentials



3. Press the key **1** into a groove and check whether the sleeve is easy to move.

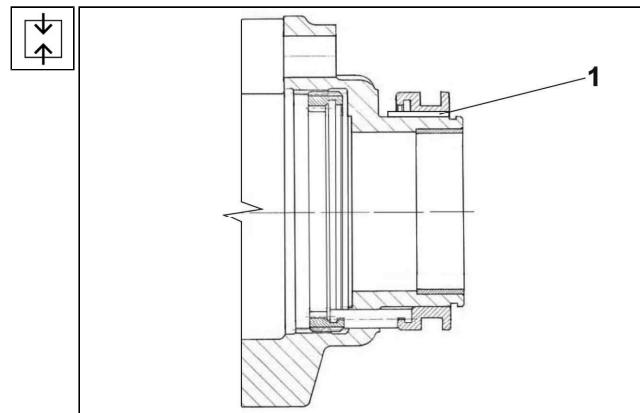


Fig. 6.58 Installation of the key

4. Fit the retaining ring **1**.

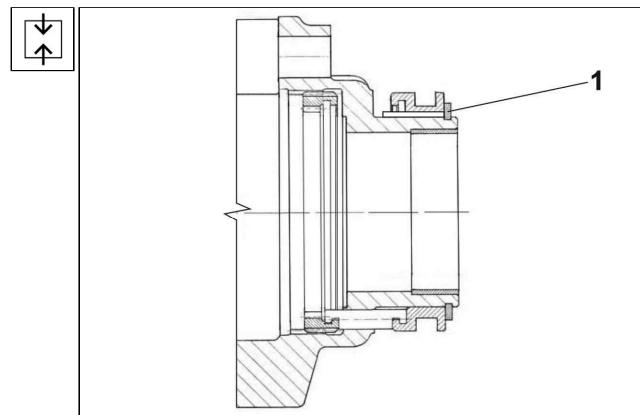


Fig. 6.59 Installation of the retaining ring

5. Apply the transmission oil to contact surfaces and install shim **3** and central gear **2** into the differential housing.
6. Apply the transmission oil to contact surfaces and install planetary gears **1** into the differential housing so that their teeth are mutually overset.

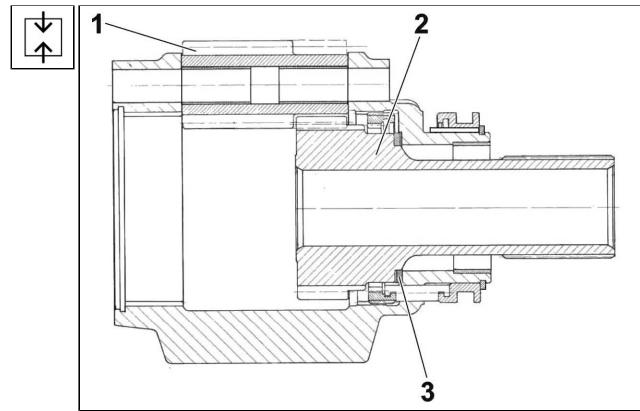
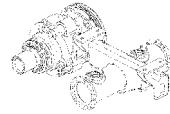


Fig. 6.60 Installation of central and planetary gears



06 Back-bone Tubes, Connecting Parts and Differentials

7. Apply the transmission oil to pins. Use the tool **PRL 0925** to press each pair of pins together with installed locking plate.

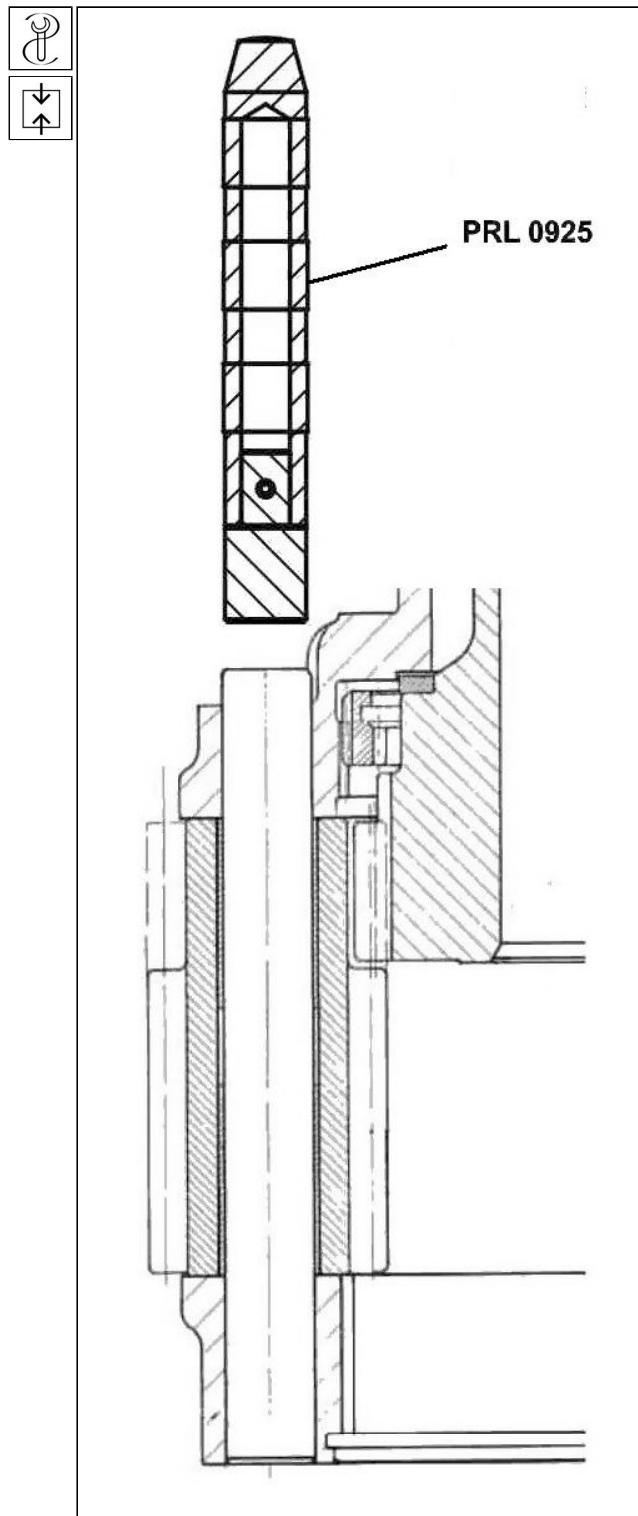
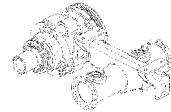


Fig. 6.61 Installation of planetary gear pins



06 Back-bone Tubes, Connecting Parts and Differentials



8. Use the bolt **1** to fix the locking plates in position.

Note:

When you replace the bushings in planet wheels, use the pressing mandrel. The recommended length of the pressing mandrel is ' $L = 3/2"$ ' of the bushing nominal diameter (PRL 0897).

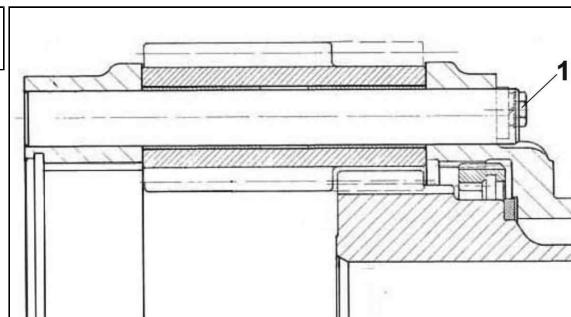


Fig. 6.62 Installation of fastening bolts on planetary gear pins

9. Apply the transmission oil to contact surfaces and install sun gear **3**, carrier **2** and lock it using the retaining ring **1**.

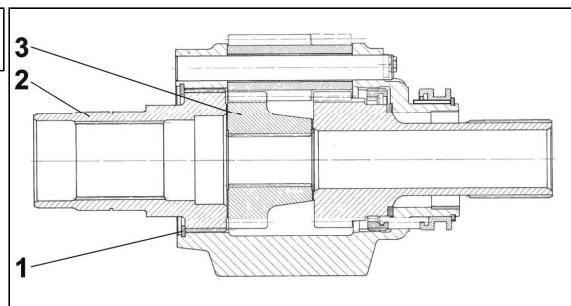
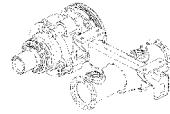


Fig. 6.63 Installation of sun gear and carrier



06 Back-bone Tubes, Connecting Parts and Differentials

10. Slide the bearing inner retaining ring **2** onto carrier (the ring will be later installed into a groove of the bearing bushing) and use the tool **PRL 0832.1** to press the warmed ball bearing **1** onto carrier.

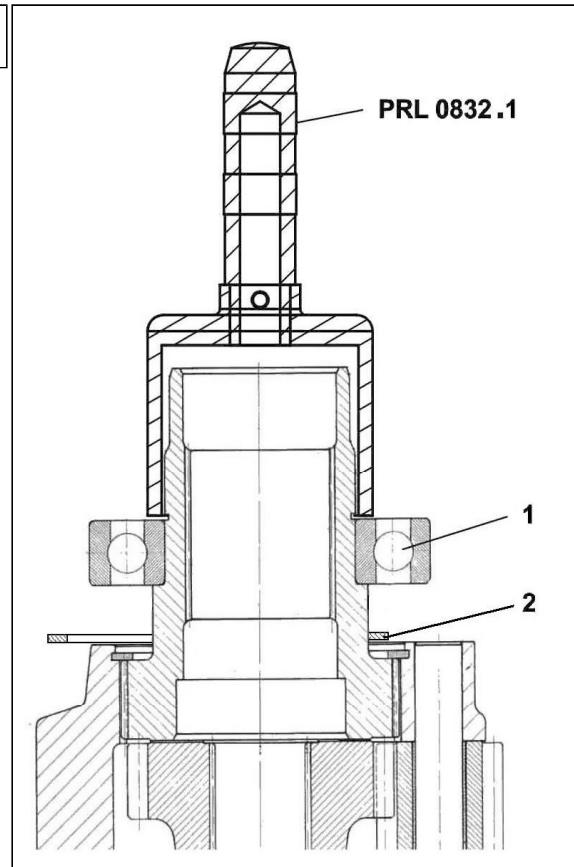


Fig. 6.64 Installation of the bearing onto carrier

11. Use the outer retaining ring **1** to lock the bearing in position.

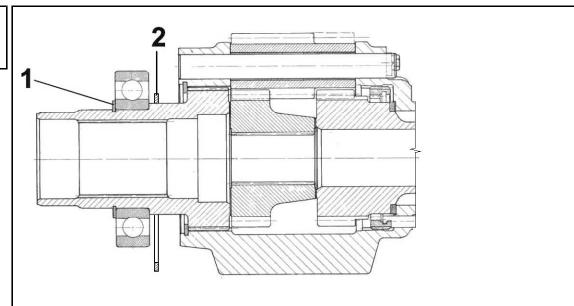
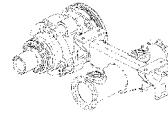


Fig. 6.65 Installation of the bearing retaining ring



06 Back-bone Tubes, Connecting Parts and Differentials



12. Use the tool **PRM 3297.1** c/w stand **PRM 3298** to press new shaft seals 1, which were coated with transmission oil and fit a new shaped ring 2 also smeared with transmission oil into the bearing bushing. Fill the space of shaft seals with grease. The edges of the shafts seals smear with transmissionoil.

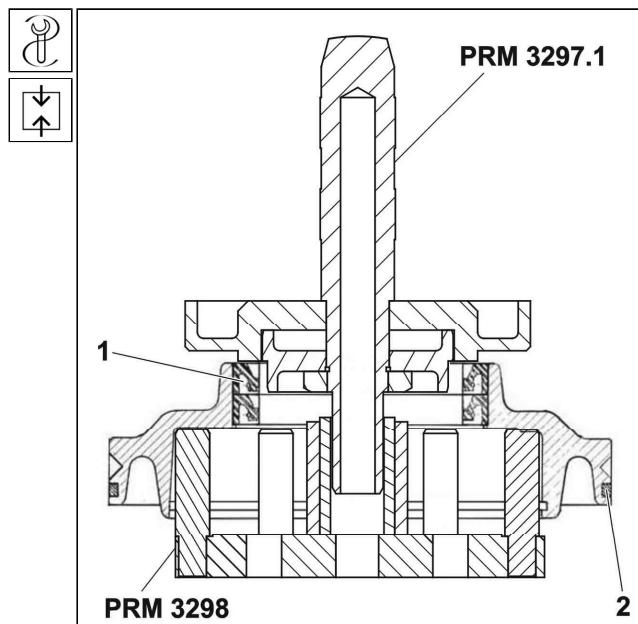


Fig. 6.66 Installation of the shaft seal into bearing bushing

13. Use the tool **PRL 0831.1** to press the bushing 1 onto ball bearing 2 and slide the prepared inner retaining ring 3 into bushing. Take care of the shaft seals edges

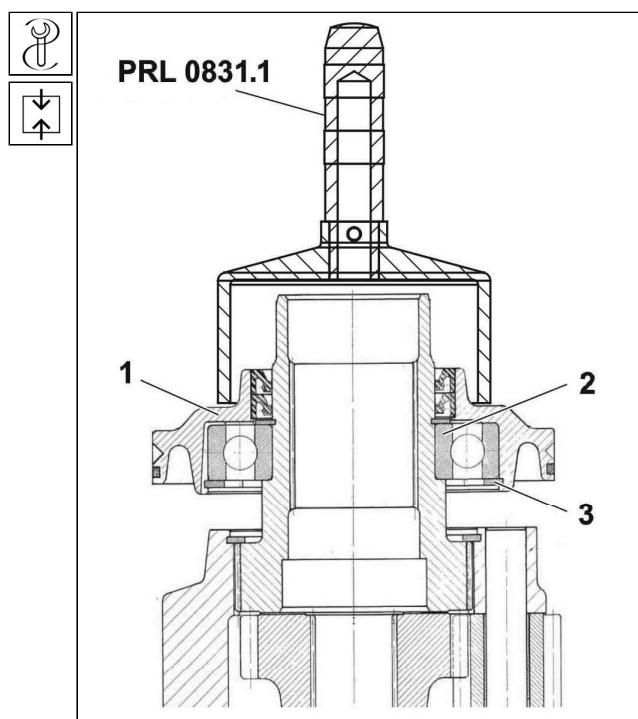
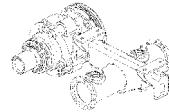


Fig. 6.67 Installation of the bearing bushing



6.5.8 Disassembly and Assembly of Axle Differentials

a) Reasons for Disassembly

1. Damaged differential bearings.
2. Damaged gears.
3. Damaged sliding sleeves of shift forks.
4. Damaged differential housing.
5. The differential lock cannot be engaged or disengaged although the electro-pneumatic control is working properly.

b) Technical Conditions

1. Replace all shaft seals, sealing rings and bearings with new ones.
2. Replace all damaged parts.
3. "Pitting", cementation layer breakout or seizure (transversal scratches on the whole working area) must not appear on planetary and sun gears teeth.
4. The surface of planet wheel pins must not be visibly battered and no marks of seizure are allowed.
5. Use the special tools as per the table (See Chapter 6.3) for removal and installation.

c) Disassembly Procedure for the Front and 1st Rear Axle Differential

Note:

There are no great differences between disassembly and assembly procedures for the front and 1st rear axle differential. The possible differences are mentioned in notes. The text illustrations give the front axle differential.

1. Remove the shaft seal 1.

Note:

This is not valid for the 1st rear axle differential.

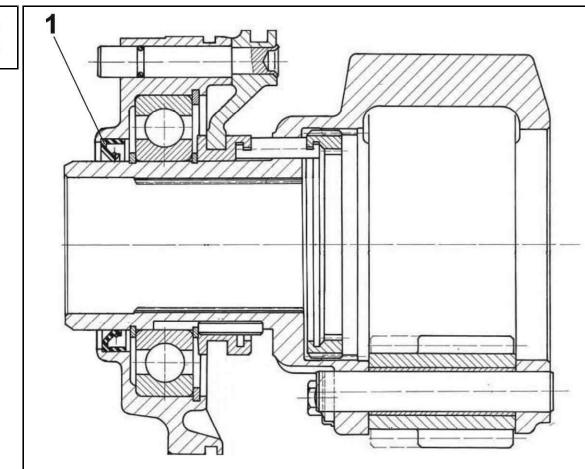
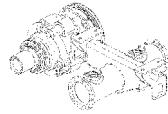


Fig. 6.68 Removal of the shaft seal



06 Back-bone Tubes, Connecting Parts and Differentials

2. Remove the retaining ring 1.

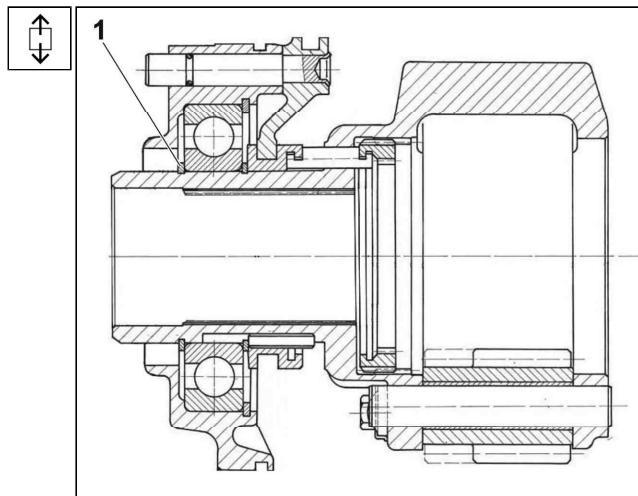


Fig. 6.69 Removal of the retaining ring

3. In the course of the other step (withdrawal of the bearing bushing), remove the shift fork 1 c/w pin.

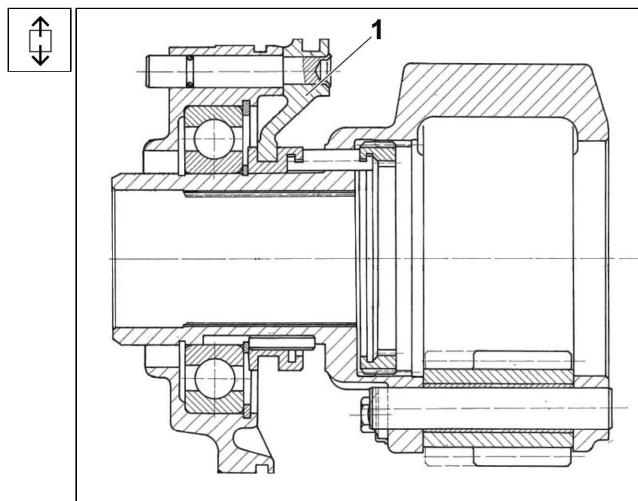
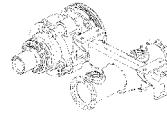


Fig. 6.70 Lock shift fork - removal



06 Back-bone Tubes, Connecting Parts and Differentials

4. Use the universal puller **PRM 0777** c/w support **PRM 3348** to withdraw the bearing bushing c/w ball bearing.

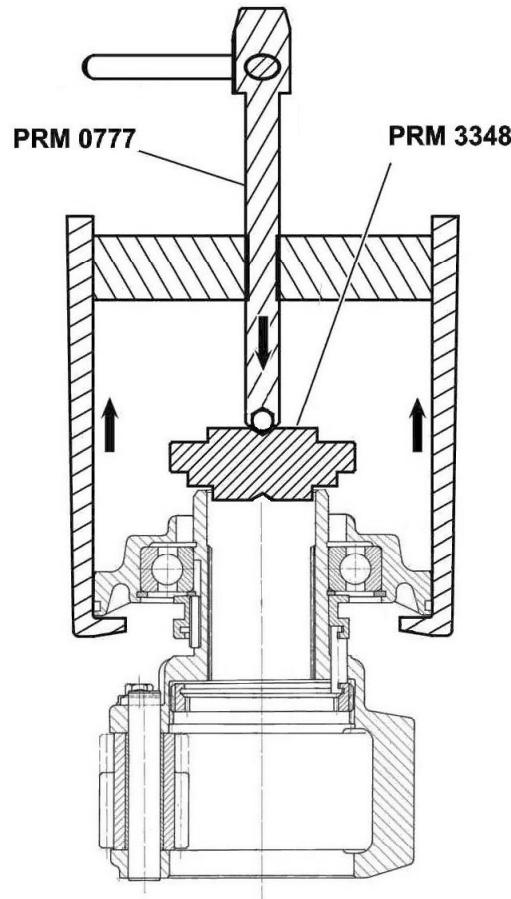
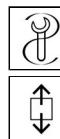


Fig. 6.71 Removal of the bushing with ball bearing

5. Remove the bearing-retaining ring **1**.

Note:

The retaining ring in the bearing bushing is situated on the opposite side on the 1st rear axle differential. It has no decisive influence upon further procedure.

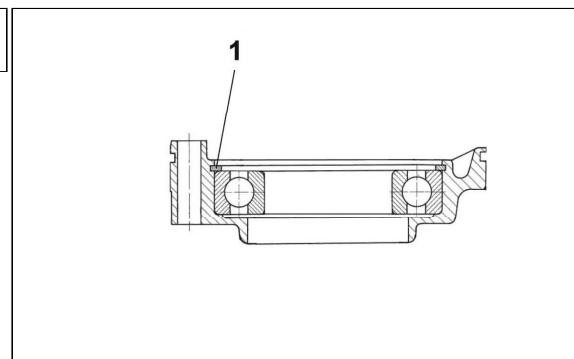
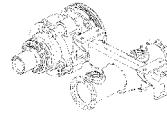


Fig. 6.72 Removal of the bearing inner retaining ring



06 Back-bone Tubes, Connecting Parts and Differentials

6. Use the universal puller **PRM 0777** and support **PRM 3348** to press the ball bearing out of the bushing.
7. Remove the shaped ring from the bearing bushing outer circumference.

Note:

The point 7 is not valid for the 1st rear axle differential

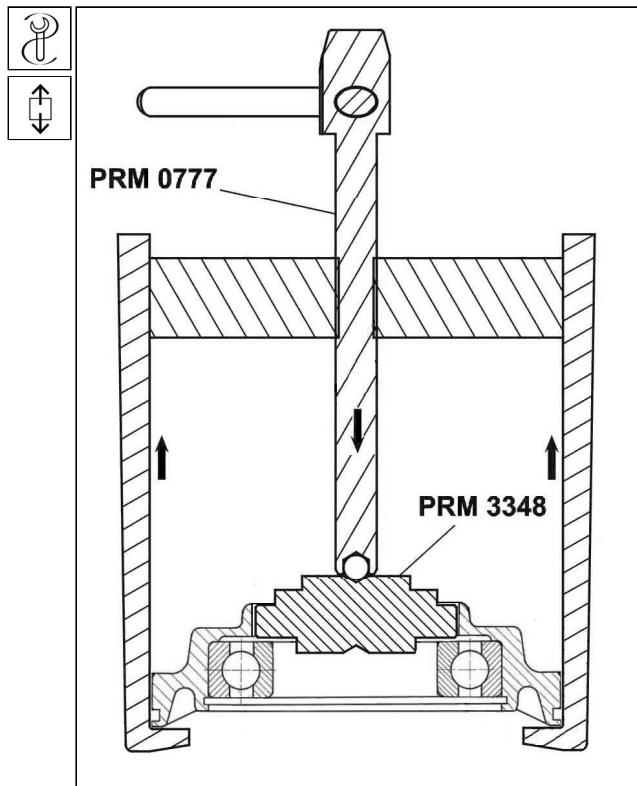


Fig. 6.73 Pressing the bearing out of the bushing

8. Remove the retaining ring **1** from the differential housing.

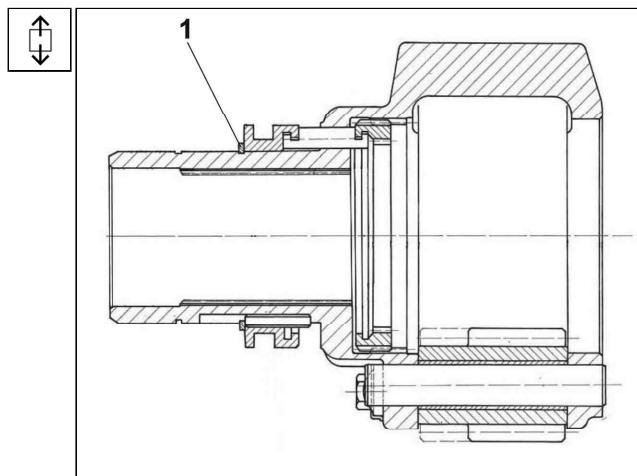
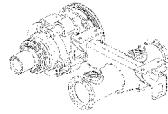


Fig. 6.74 Removal of the differential housing retaining ring



06 Back-bone Tubes, Connecting Parts and Differentials

9. Remove the key **1** from a groove of the differential housing.

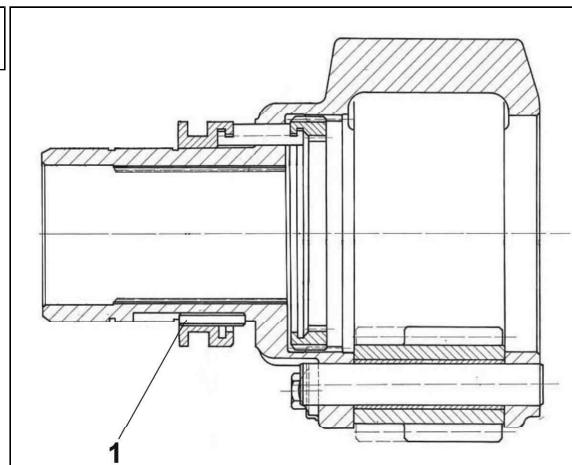


Fig. 6.75 Removal of the key

10. Turn the sliding sleeve **1** so that the sliding pins **2** are situated exactly opposite the mounting grooves in the sliding sleeve **1** and remove the sleeve.

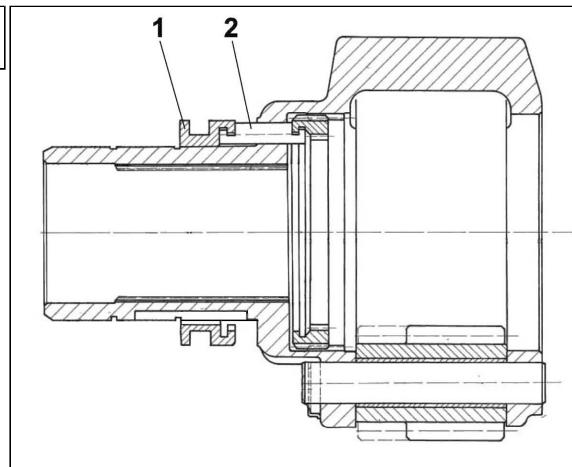
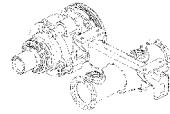


Fig. 6.76 Removal of the sliding sleeve



06 Back-bone Tubes, Connecting Parts and Differentials

d) Disassembly Procedure for the 2nd Rear Axle Differential

1. Remove the retaining ring 1.

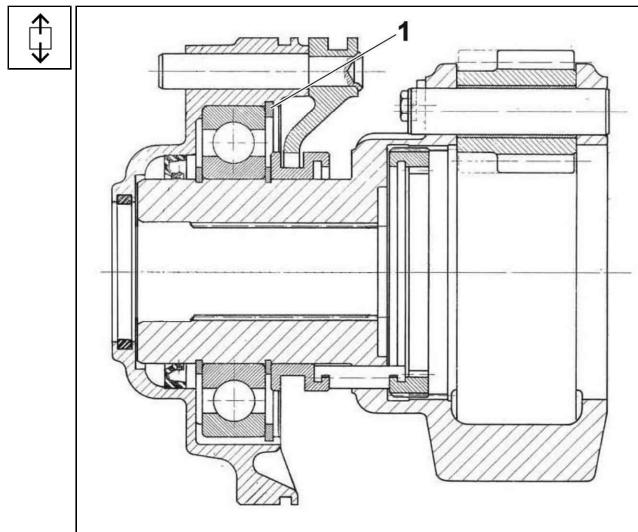


Fig. 6.77 Removal of the bearing inner retaining ring

2. Remove the shaped ring 1.

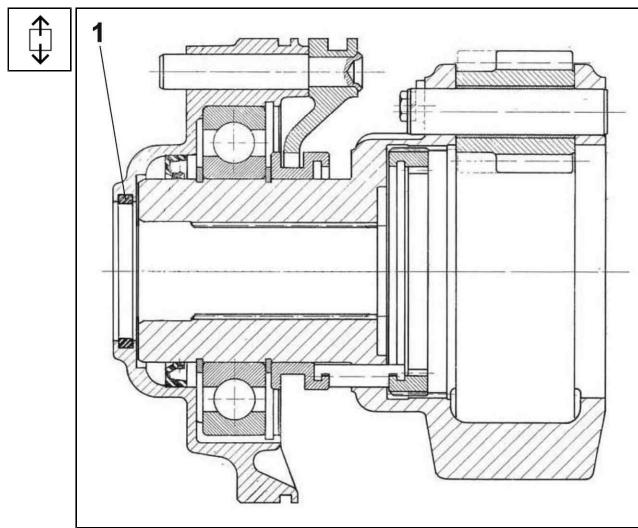
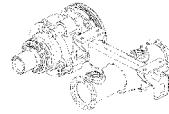


Fig. 6.78 Removal of the shaped ring



06 Back-bone Tubes, Connecting Parts and Differentials

3. Use the universal puller **PRM 0777** c/w suitable support to withdraw the bearing bushing **1** c/w shaft seal **2**. Remove the fork **3** c/w pin during withdrawal. Remove the shaft seal.

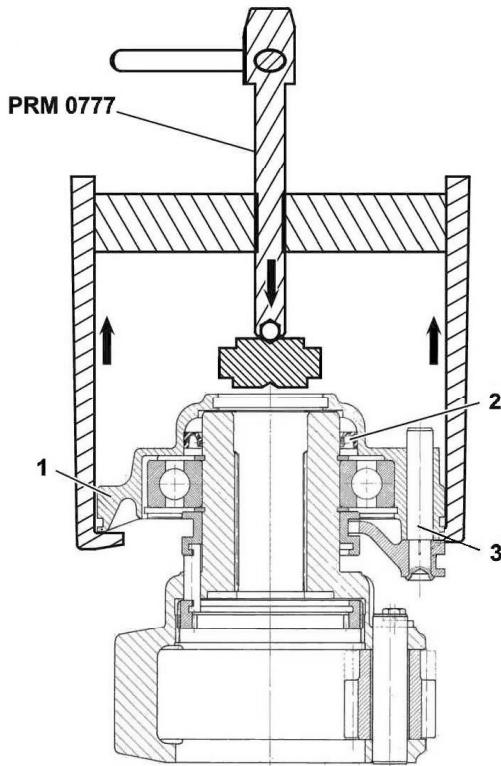
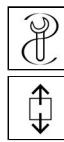
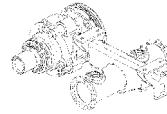


Fig. 6.79 Bearing bushing withdrawal



06 Back-bone Tubes, Connecting Parts and Differentials

4. Remove the retaining ring 1 and use the tool **PRM 0777** c/w support **PRM 3348** to withdraw the bearing 2.
5. Finish the disassembly according to points 7 through 13 of the procedure c)
Disassembly Procedure for the Front and 1st Rear Axle Differential.

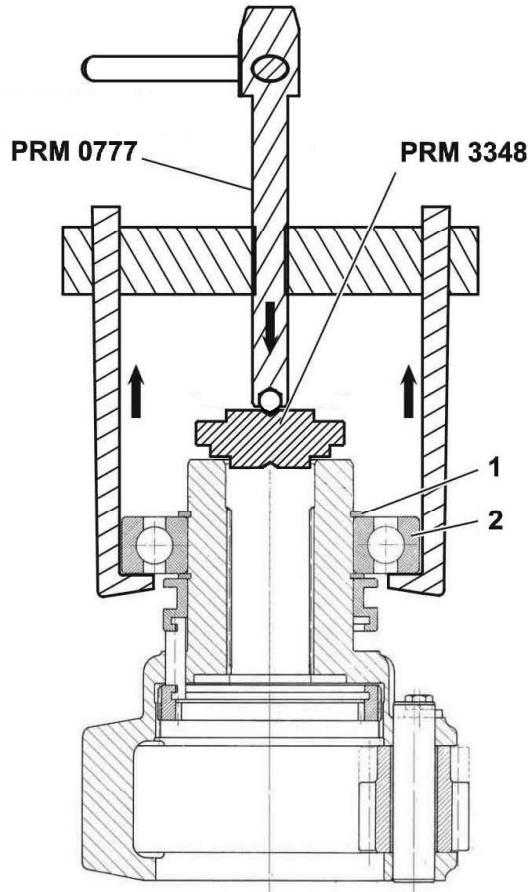
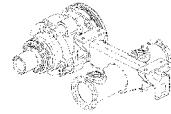


Fig. 6.80 Removal of the bearing from the differential housing



06 Back-bone Tubes, Connecting Parts and Differentials



e) Installation Procedure for the Front Axle Differential

1. Slide three sliding pins 1 into a groove of the connecting sleeve 2 and fit the sleeve into inner gearing of the differential housing.

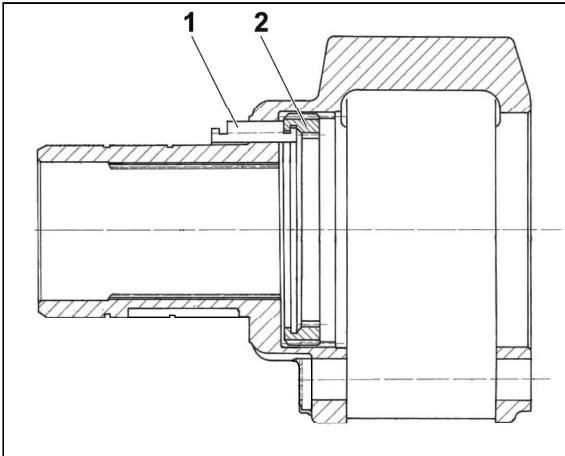


Fig. 6.81 Installation of the connecting sleeve

2. Turn the differential housing upside down (lock the connecting sleeve c/w pins against shifting-out), slide the sliding sleeve 1 with mounting cutouts on sliding pins 2 and turn the sleeve so that a key groove is aligned with a groove on the differential housing.

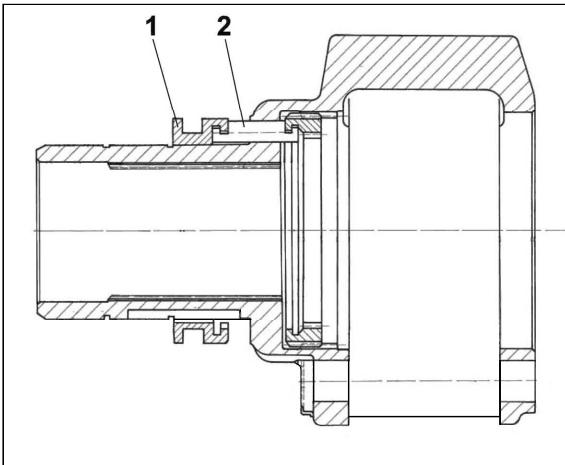


Fig. 6.82 Installation of the sliding sleeve

3. Drive the key 1 into a groove and check whether the sleeve is easy to move.

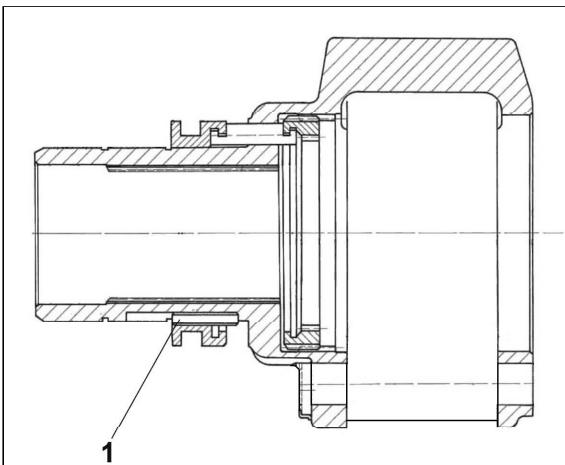
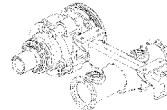


Fig. 6.83 Installation of the key



06 Back-bone Tubes, Connecting Parts and Differentials

- Fit the retaining ring 1.

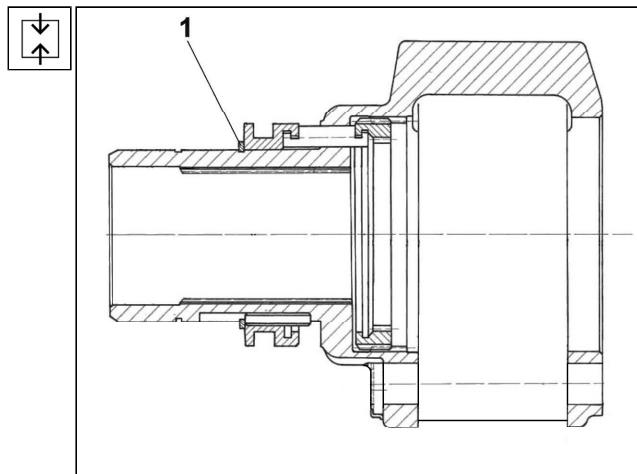


Fig. 6.84 Installation of the differential housing retaining ring

- Use tools **PRM 3297.1** and **PRM 3298** to press a new shaft seal 1 coated with transmission oil and a new shaped ring 2 coated with transmission oil into the bearing bushing.
- Fill the space of the shaft seal with grease.

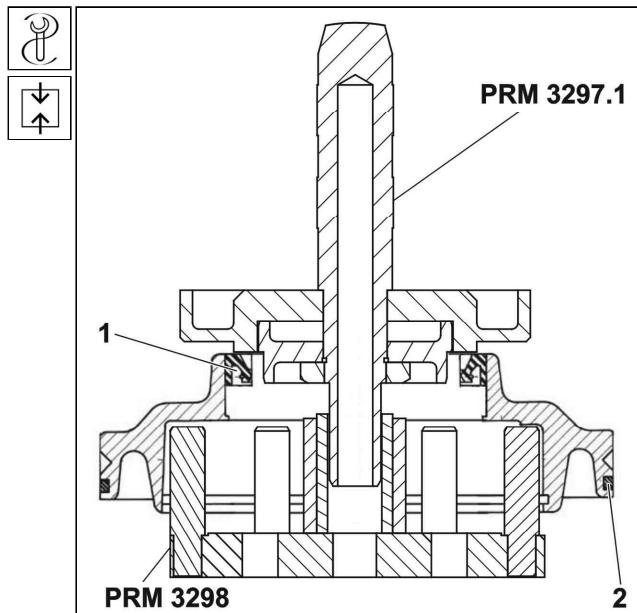
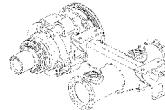


Fig. 6.85 Installation of the shaft seal into bearing bushing



06 Back-bone Tubes, Connecting Parts and Differentials

7. Slide the inner retaining ring of the ball bearing bushing on the differential housing.
8. Use the tool **PRL 0832.1** to press the ball bearing on the differential housing and lock it with retaining ring **1** in position.

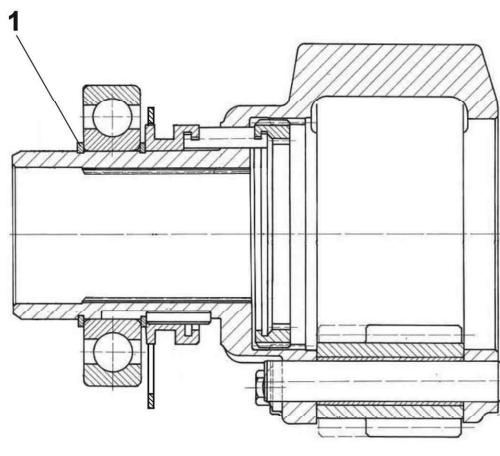


Fig. 6.86 Installation of the bearing on the differential housing

9. Slide the shift fork **1** c/w pin on the sliding sleeve.

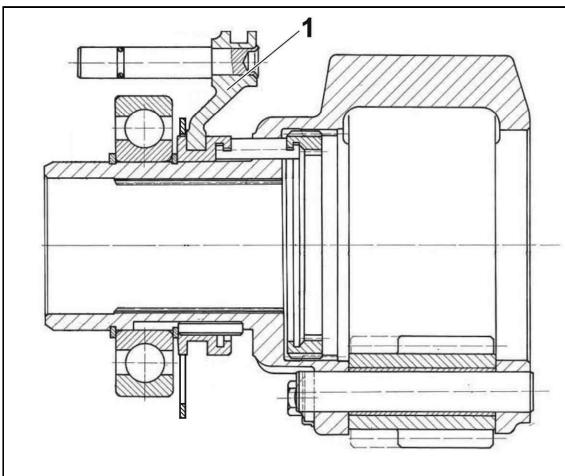
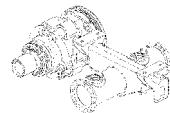


Fig. 6.87 Shift fork - installation



06 Back-bone Tubes, Connecting Parts and Differentials



10. Use the tool **PRL 0831.1** to press the bushing on the ball bearing. Simultaneously check the sliding of the fork guide pin into a hole in the bearing bushing.

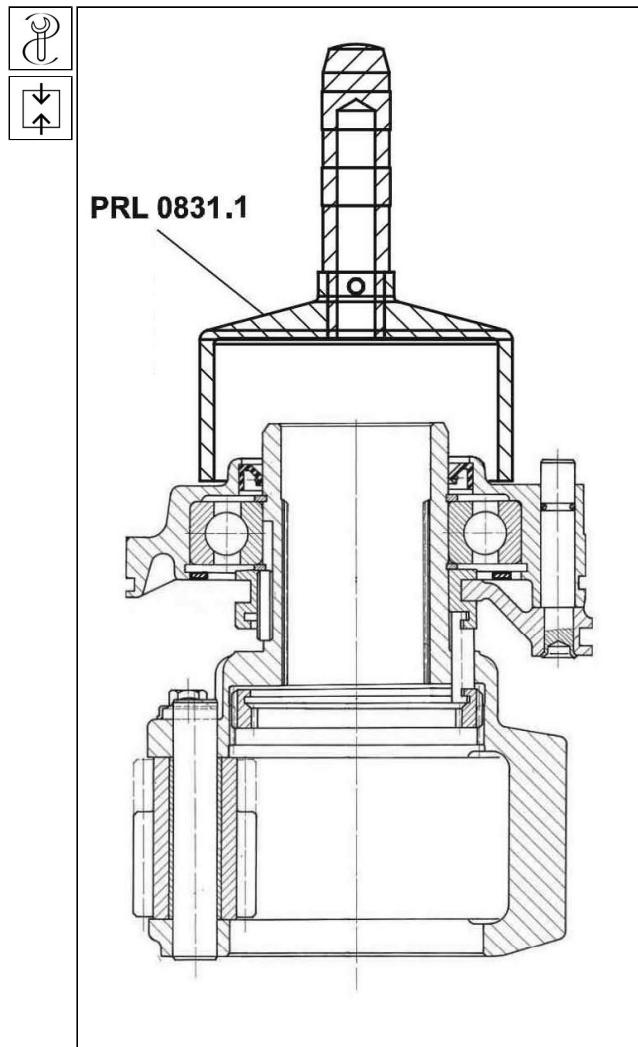


Fig. 6.88 Installation of the bearing bushing

11. Secure the bearing with prepared inner retaining ring **1** in position.

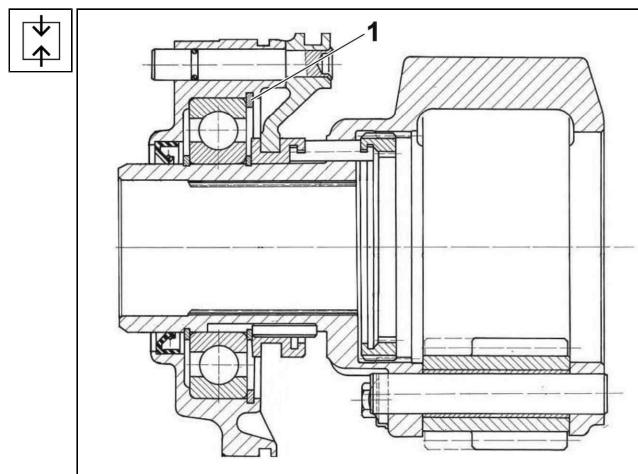
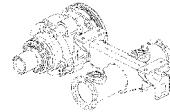


Fig. 6.89 Installation of the bearing inner retaining ring



06 Back-bone Tubes, Connecting Parts and Differentials



f) Assembly Procedure for the 1st Rear Axle Differential

1. Start the assembly according to points 1 through 7 of the procedure **e) Installation Procedure for the Front Axle Differential**.
2. Slide and/or knock the ball bearing **2** into warmed bushing using the tool **PRL 0831** and secure it with inner retaining ring **1** in position.
3. Install the shift fork **1** and use the tool **PRL 0832.1** to press the bushing c/w bearing through the inner bearing ring onto the differential housing. Simultaneously it is necessary to check whether the fork guide pin engages into a hole in the bearing bushing.

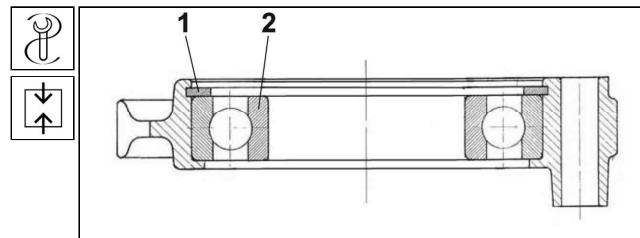


Fig. 6.90 Installation of the bearing into bushing

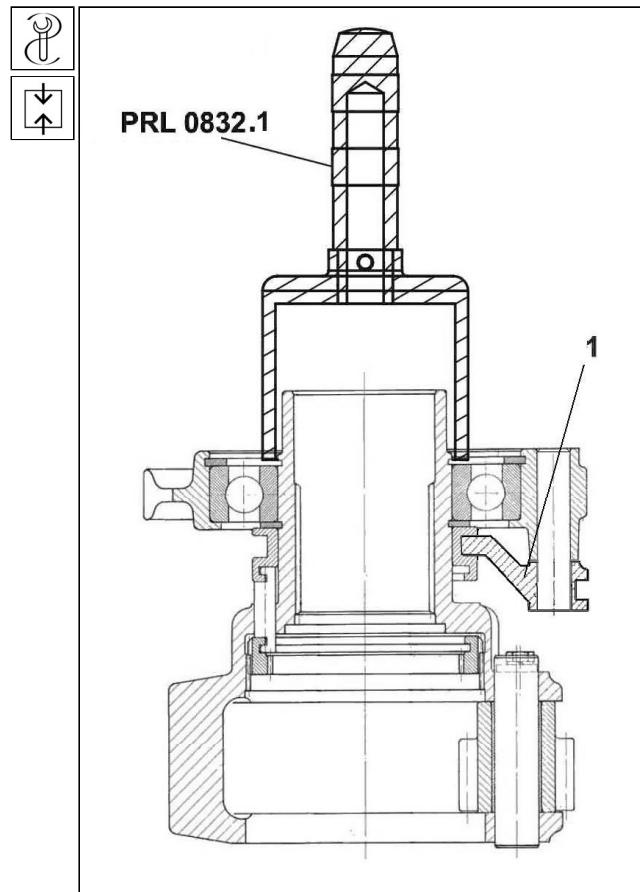
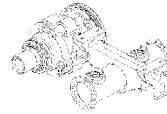


Fig. 6.91 Installation of the bushing c/w bearing on the differential housing



06 Back-bone Tubes, Connecting Parts and Differentials

- Secure the bearing with retaining ring 1 in position.

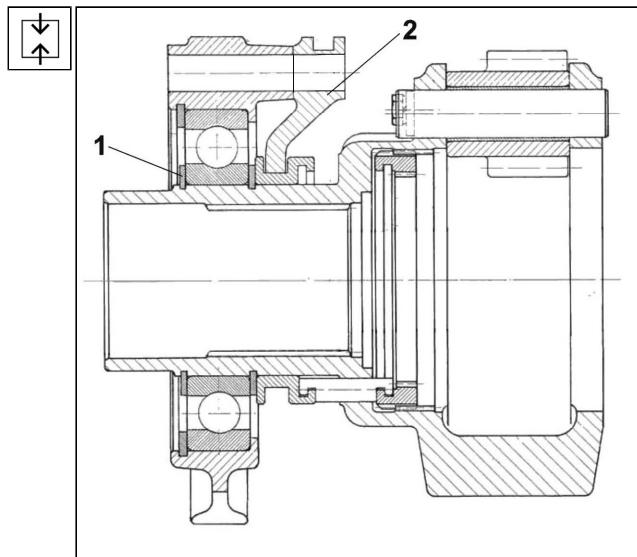


Fig. 6.92 Installation of the retaining ring

g) Assembly Procedure for the 2nd Rear Axle Differential

- Start the assembly according to points 1 through 4 of the procedure **e) Installation Procedure for the Front Axle Differential**.
- Use the tool **PRM 3297.1** to press a new shaft seal 1 coated with transmission oil and a new shaped ring 2 coated with transmission oil into the bearing bushing. Fill the space of the shaft seal with grease.

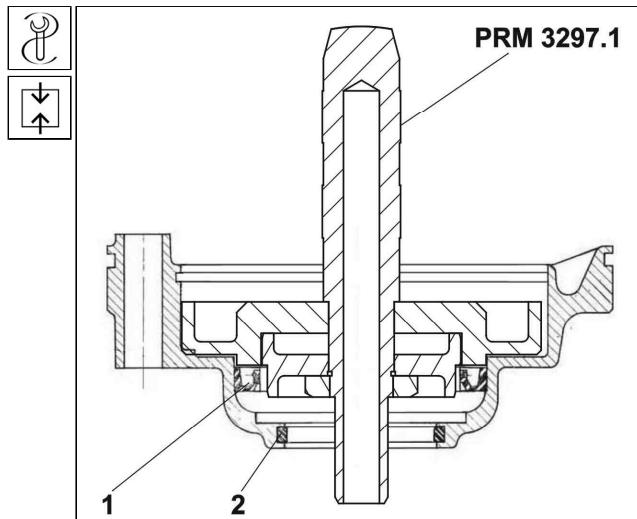
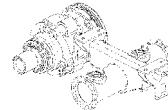


Fig. 6.93 Installation of the shaft seal into the bearing bushing



06 Back-bone Tubes, Connecting Parts and Differentials



3. Slide the inner retaining ring of the ball bearing bushing on the differential housing.
4. Use the tool **PRL 0832.1** to press the ball bearing on the differential housing and use the retaining ring **1** to secure it in position.

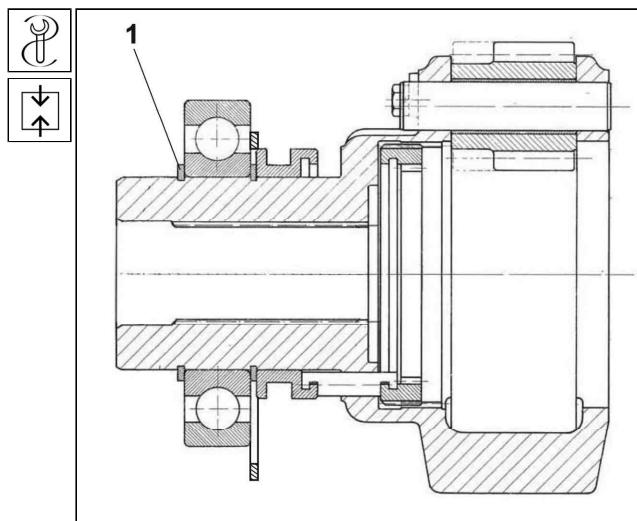


Fig. 6.94 Installation of the bearing on the differential housing

5. Install the shift fork c/w pin **2** and use the tool **PRL 0831.1** to press the bearing bushing **1** on the bearing outer ring fully to stop. In the course of the pressing. Make sure that the fork guide pin **2** engages into a hole in the bearing bushing.

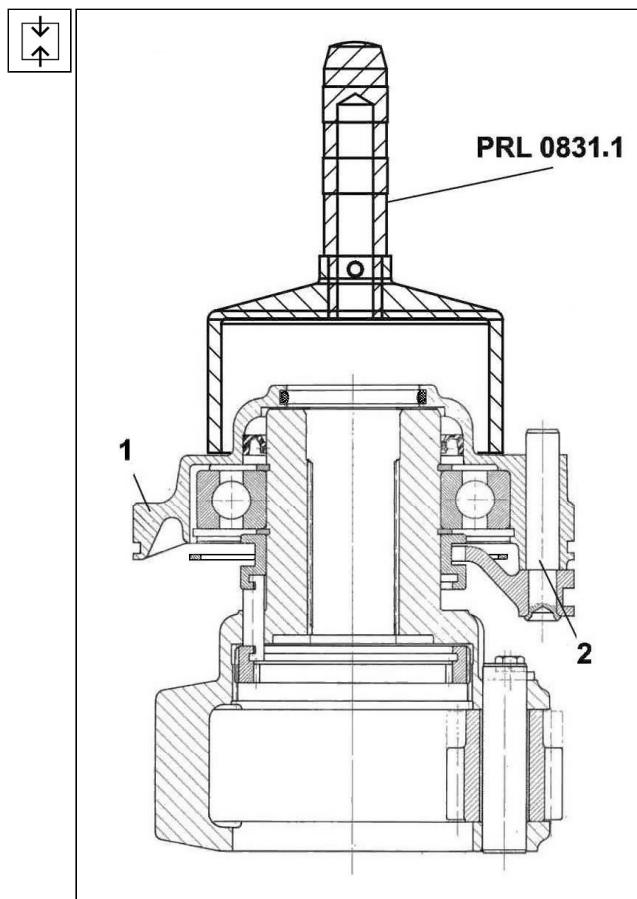
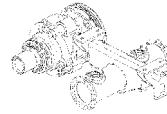


Fig. 6.95 Installation of the bearing bushing



06 Back-bone Tubes, Connecting Parts and Differentials

6. Secure the bearing with prepared inner retaining ring 1 in position.

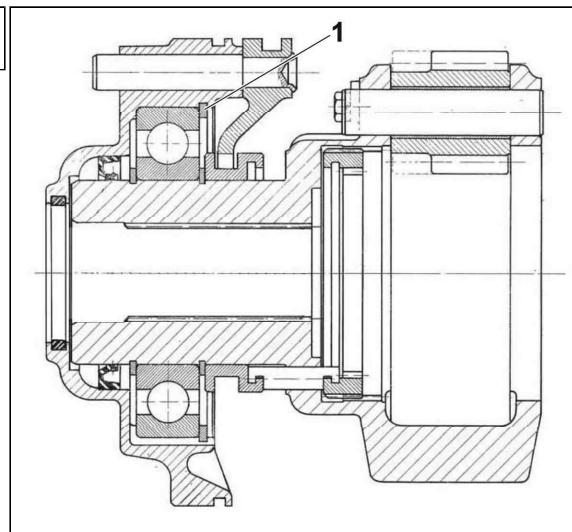


Fig. 6.96 Installation of the bearing inner retaining ring

