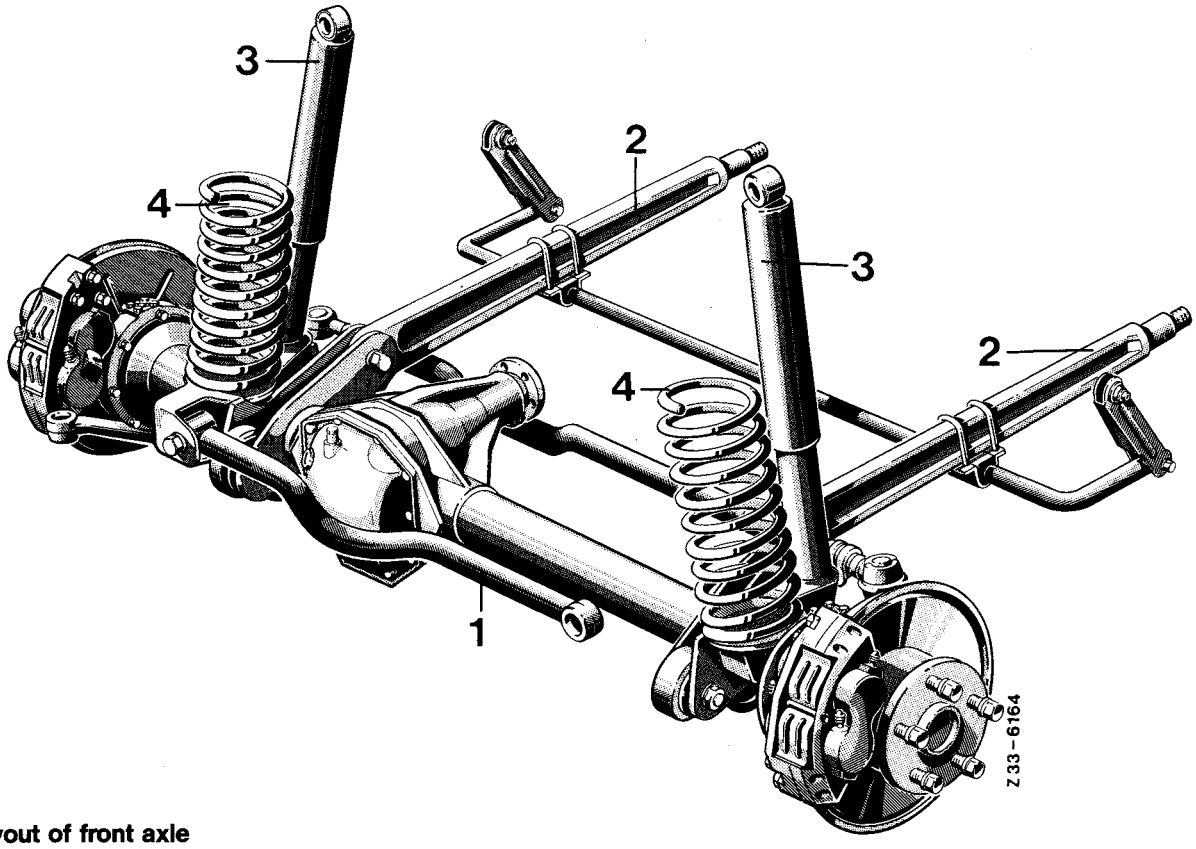
Model 460 Front Axle AL 0/C-1.3 33.61

730.3

730.3

Designation	Unit reduction	Model	Installed in vehicle Sales designation	 Model
AL 0/1 C-1,3	44:9	730.300	300 GD / 4x4	460.312 460.322 460.323 460.332 460.333 460.343
	48:9	730.301	230 G / 4x4	460.210 460.220 460.221 460.230 460.231 460.241
			240 GD / 4x4	460.310 460.320 460.321 460.330 460.331 460.341
	44:9	730.329	280 GE / 4x4	460.212 460.222 460.223 460.232 460.233 460.243

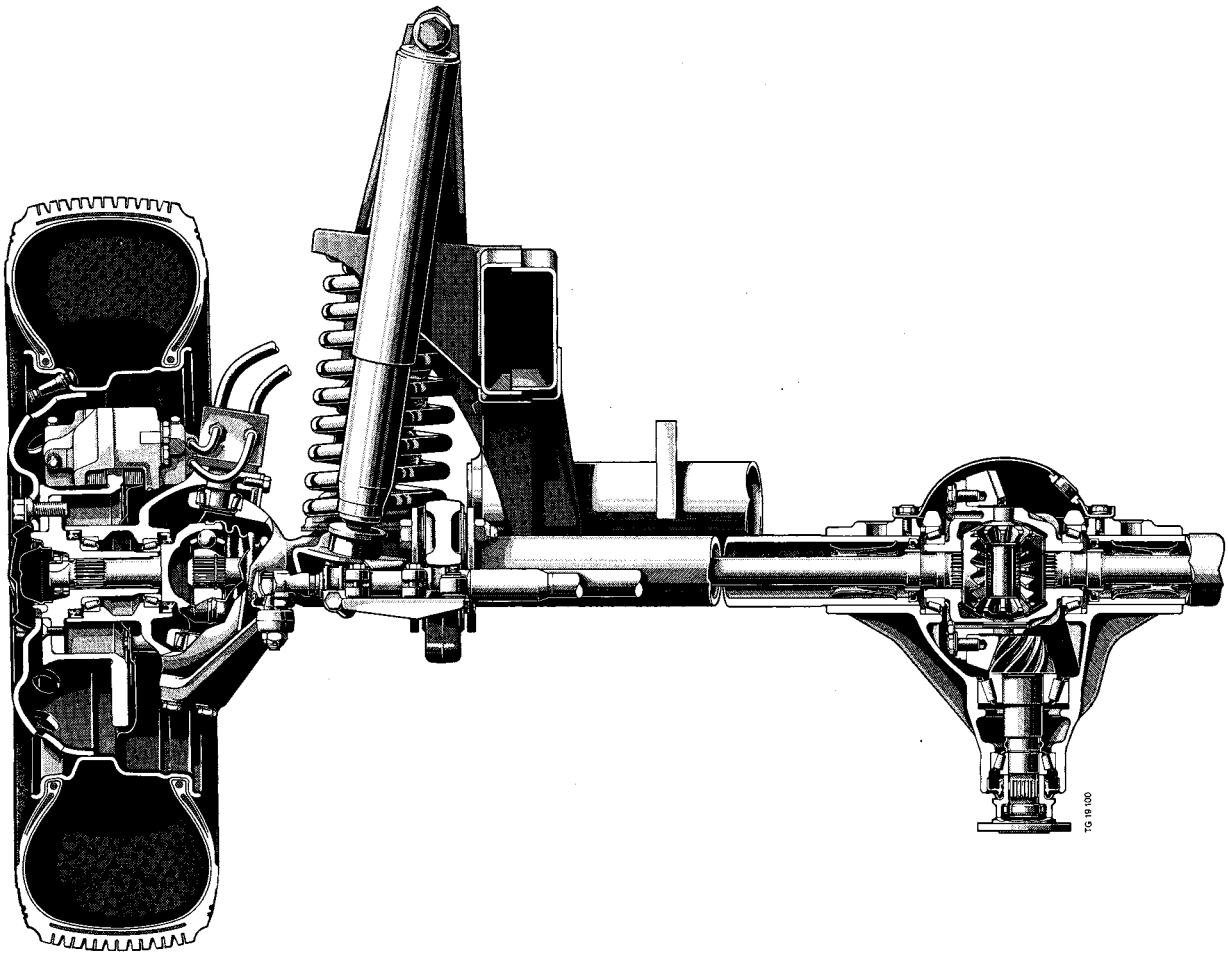
730.3



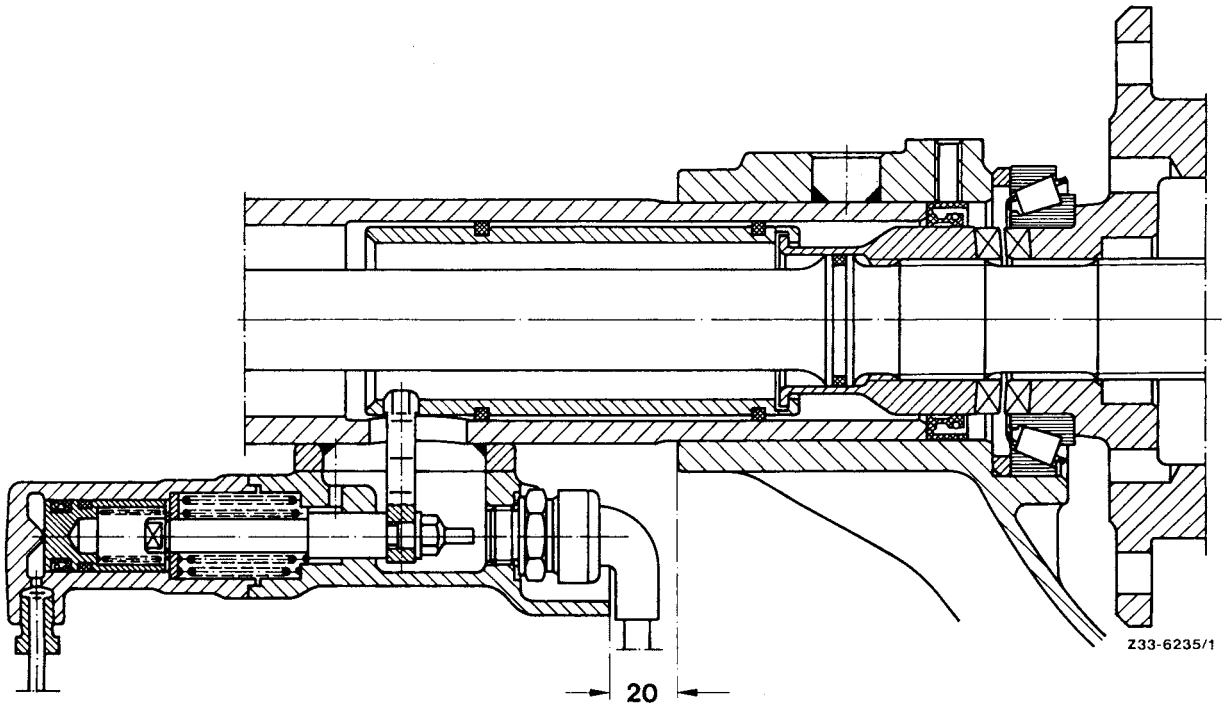
Layout of front axle

1 Control arm
2 Trailing arm
3 Shock absorber
4 Coil spring

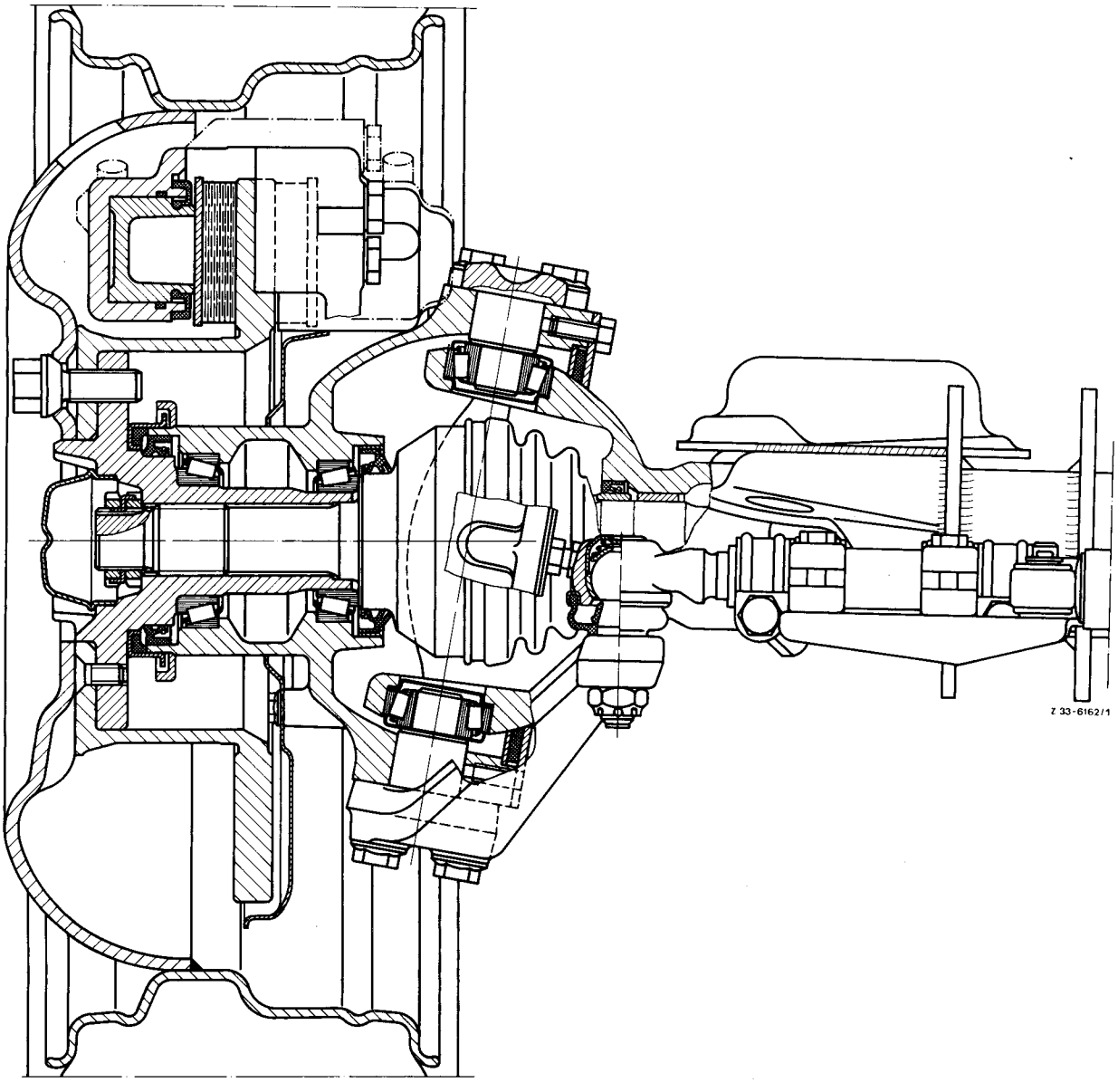
33.61 Sectional Views, Exploded Views



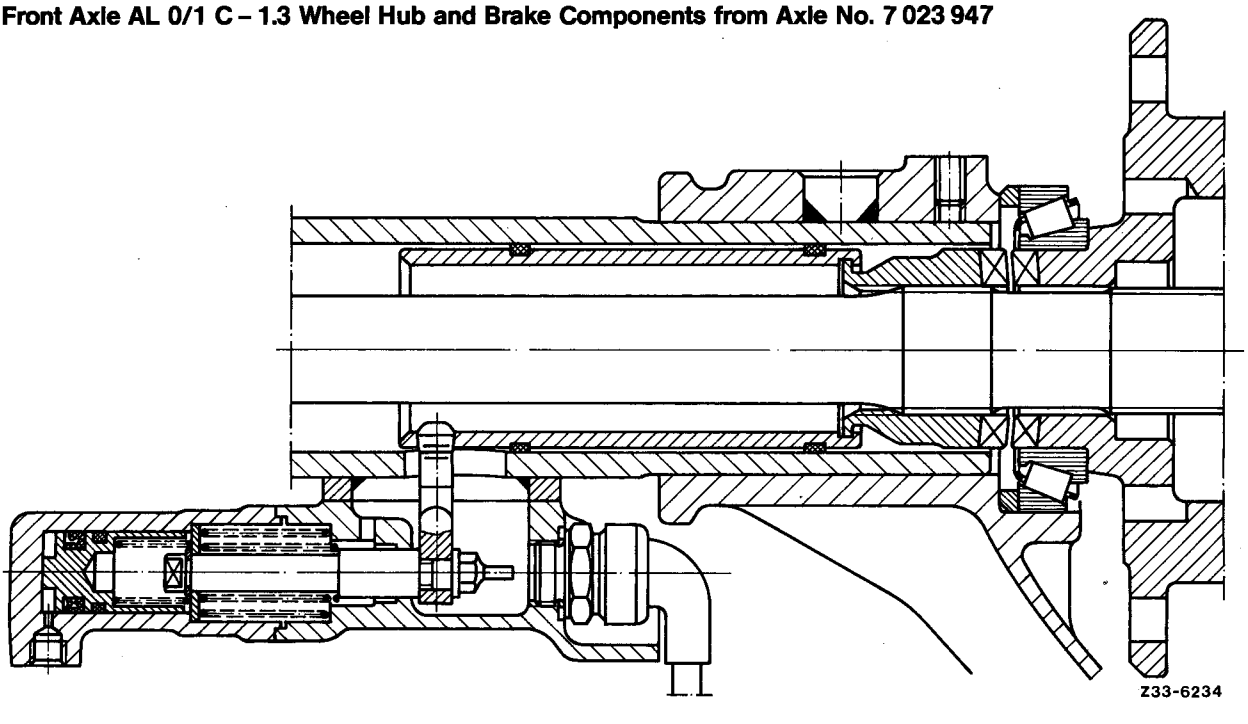
Front Axle up to Axle No. 7 023 946



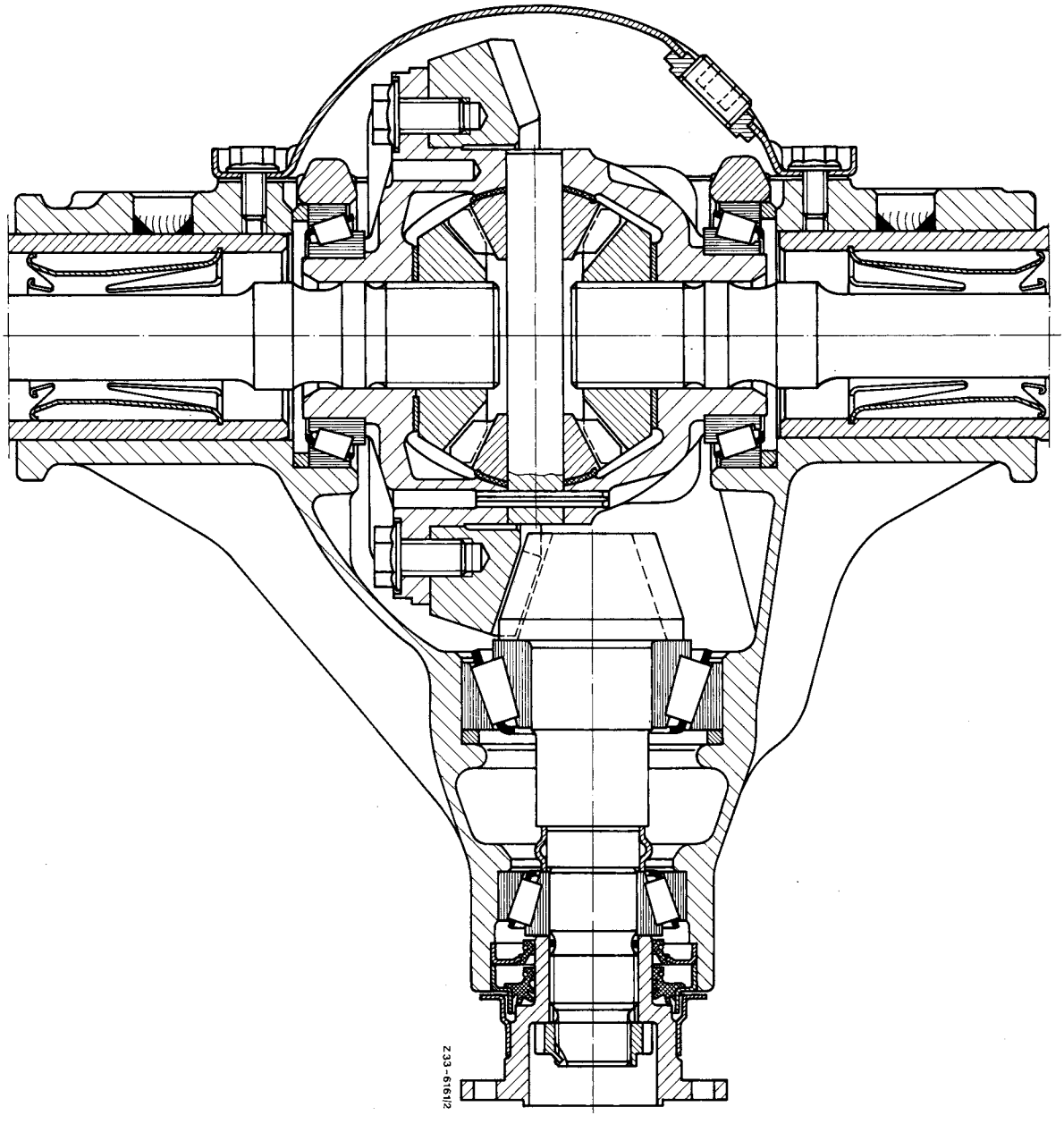
Differential Lock up to Axle No. 7 023 946



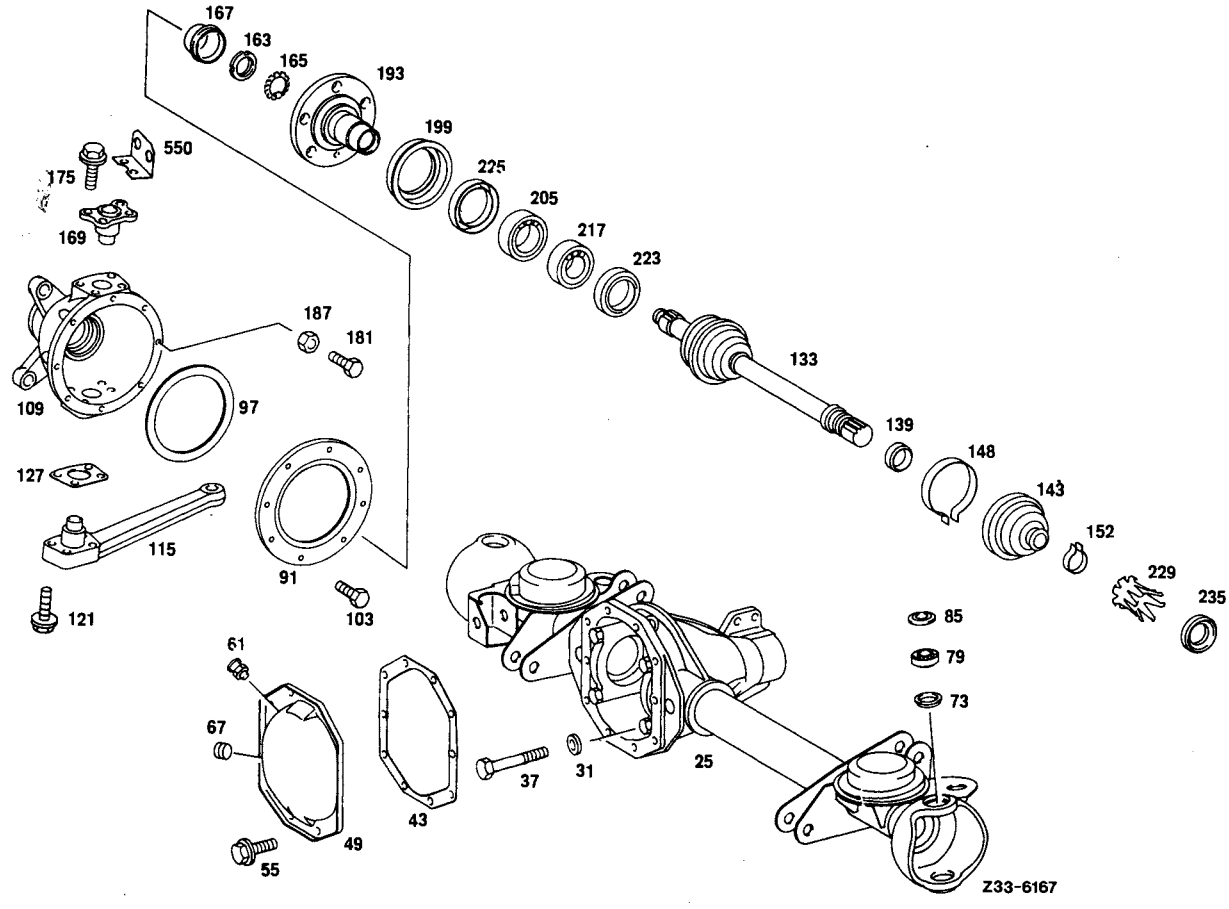
Front Axle AL 0/1 C – 1.3 Wheel Hub and Brake Components from Axle No. 7 023 947



Differential Lock from Axle No. 7 023 947



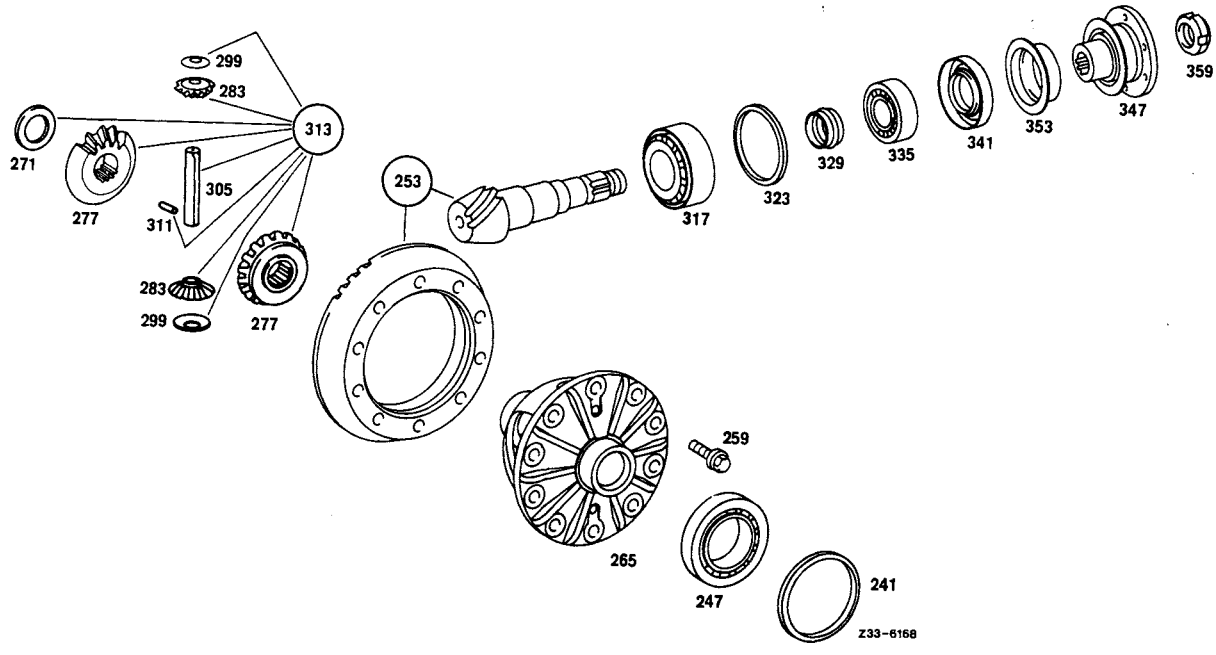
Front Axle AL 0/1 C – 1.3 Drive Bevel Gear and Differential



Axle components

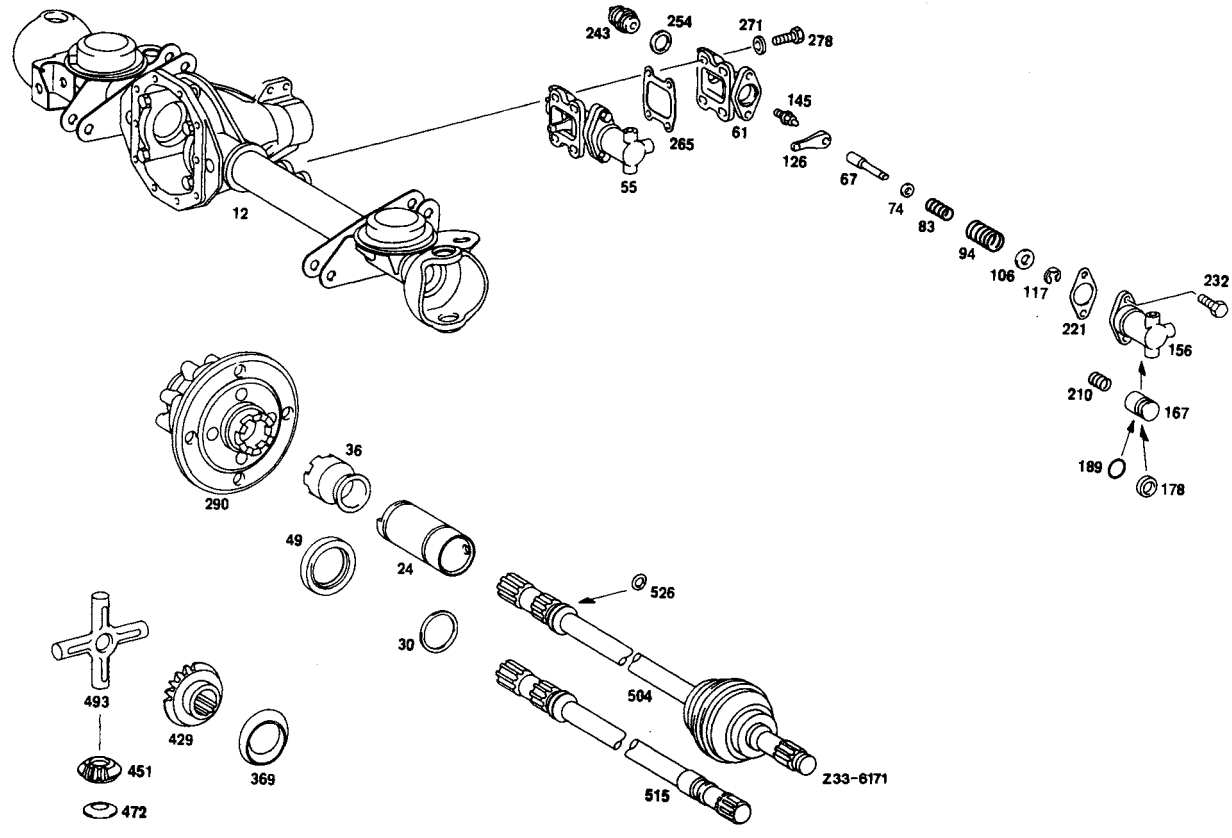
25 Axle housing
31 Washer
37 Bolt
43 Gasket
49 Cover
55 Bolt
61 Breather
67 Screw plug
73 Closing cover
79 Taper roller bearing
85 Sealing ring
91 Sealing ring holder
97 Gasket
103 Bolt
109 Housing
115 Track rod arm
121 Bolt
127 Shim
133 Drive shaft
139 Race
143 Sleeve
148 Compressor
152 Compressor
163 Nut
165 Lock
167 Wheel cap
169 Kingpin
175 Bolt
181 Bolt
187 Nut
193 Front wheel hub
199 Sealing ring
205 Taper roller bearing
217 Taper roller bearing
223 Sealing ring
225 Sealing ring
229 Spacer tube
235 Sealing ring
550 Bracket

33.61 Sectional Views, Exploded Views



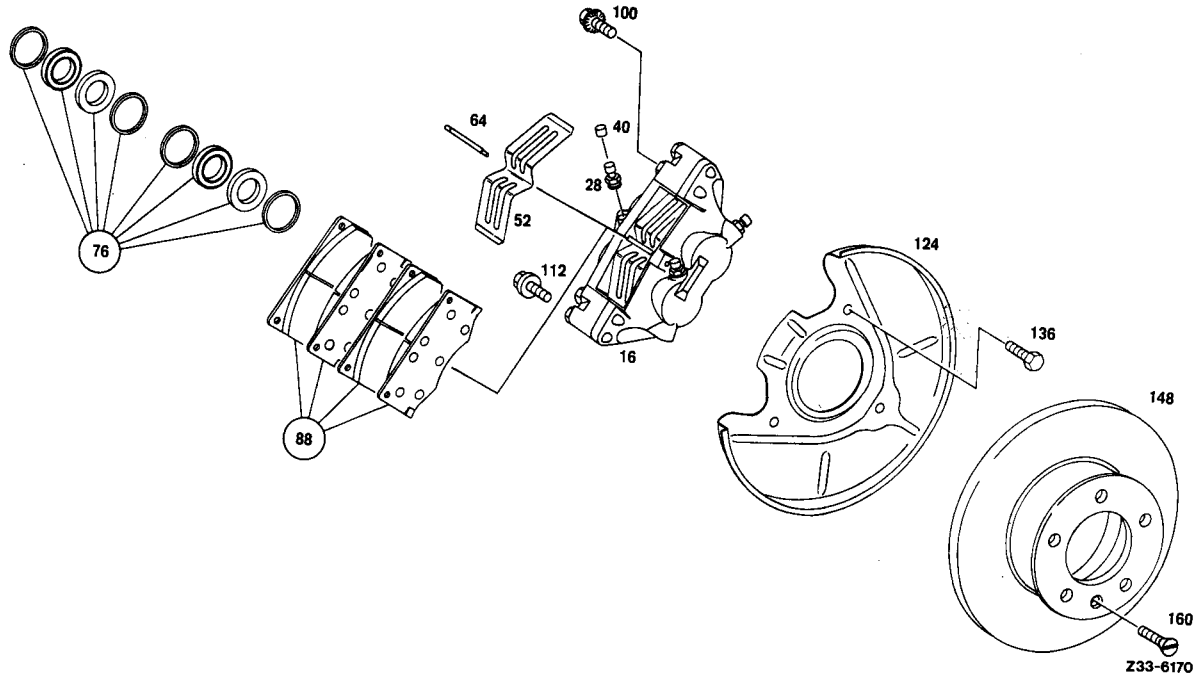
Drive components

241 Shim
247 Taper roller bearing
253 Gear set
259 Bolt
265 Differential
271 Thrust washer
277 Side gear
283 Differential
299 Thrust ring
305 Bolt
311 Clamping sleeve
313 Repair set
317 Taper roller bearing
323 Shim
329 Spacer bushing
335 Taper roller bearing
341 Sealing ring
347 Flange
353 Guard plate
359 Nut



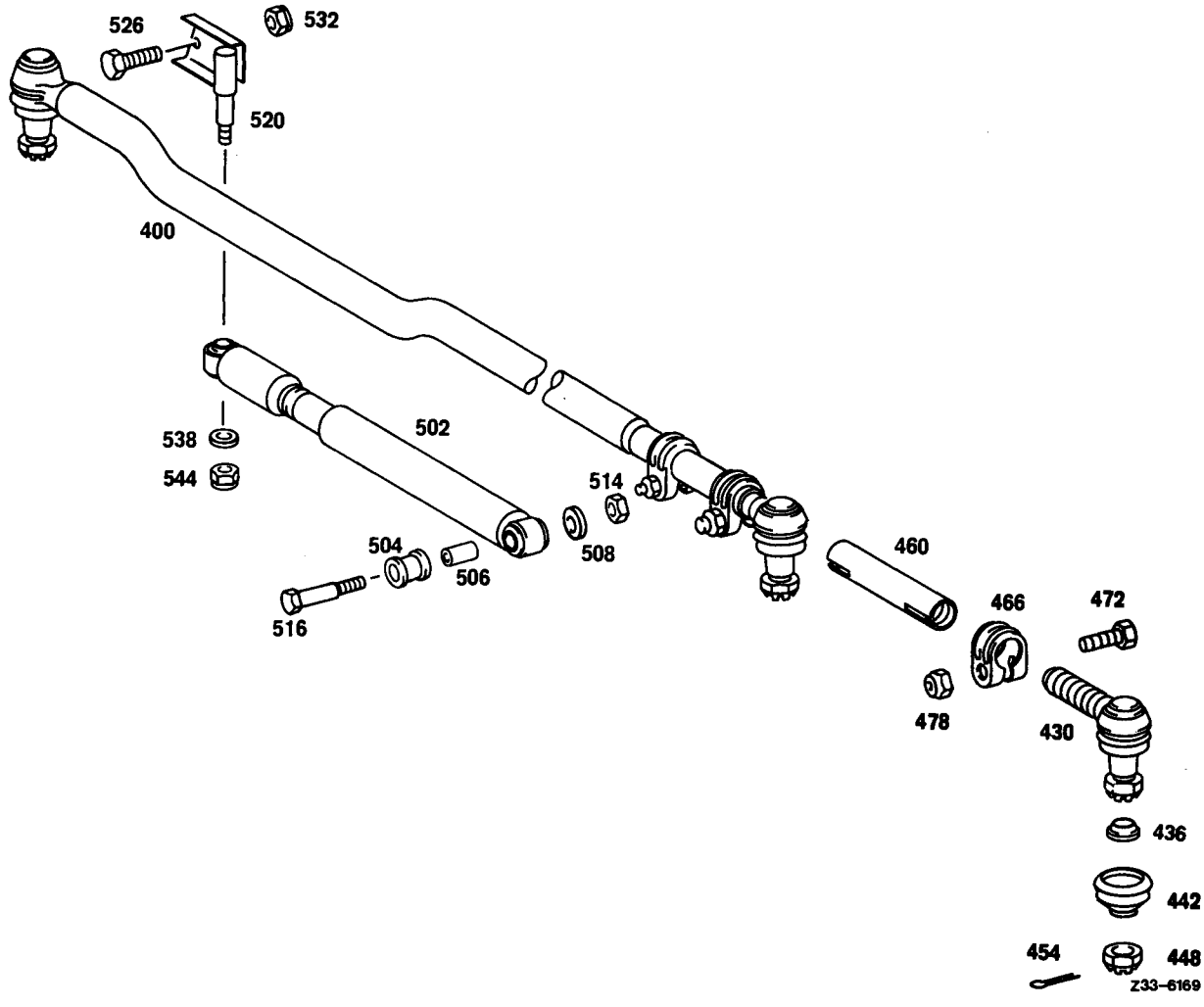
Differential lock components

12 Axle housing
24 Tube
30 Slide piece
36 Driver
49 Sealing ring
55 Cylinder
61 Housing
67 Shaft
74 Shim
83 Spring
94 Spring
106 Washer
117 Circlip
126 Lever
145 Bolt
156 Cylinder
167 Piston
178 Sleeve
189 Sealing ring
210 Spring
221 Gasket
232 Bolt
243 Switch
254 Sealing ring
265 Gasket
271 Washer
278 Bolt
290 Differential
369 Shim
429 Side gear
451 Differential pinion
472 Thrust ring
493 Differential sider
504 Drive shaft
515 Propeller shaft
526 Sealing ring



Brake components

16 Brake caliper
28 Bleeder valve
40 Dust cap
52 Spring
64 Stud
76 Repair set
88 Repair set
100 Bolt
112 Bolt
124 Guard plate
136 Bolt
148 Brake disk
160 Bolt



Track rod components

400 Track
430 Swivel joint
436 Tensioning ring
442 Sleeve
448 Nut
454 Split
460 Clamp
466 Clip
472 Bolt
478 Nut
502 Shock absorber
504 Rubber ring
506 Bush
508 Washer
514 Nut
516 Bolt
520 Bracket
526 Bolt
532 Nut
538 Washer
544 Nut

730.3

Designation	Parts Number
Jaw wrench	460 589 00 07 00
Hexagon socket waf 14	001 589 61 09 10
Mandrel	305 589 00 15 00
Mandrel	312 589 05 15 00
Mandrel	343 589 03 15 00
Mandrel	352 589 04 15 00
Mandrel	360 589 00 15 00
Mandrel	363 589 04 15 00
Mandrel	385 589 03 15 00
Mandrel	387 589 04 15 00
Mandrel	395 589 02 15 00
Mandrel	460 589 11 15 00
Mandrel	460 589 12 15 00
Mandrel	460 589 15 15 00
Torquemeter	001 589 49 21 00
Dial gauge	001 589 53 21 00
Measuring instrument	363 589 02 21 00
Adjusting instrument	601 589 00 21 00
Measuring plate	601 589 00 23 00
Measuring piece	601 589 01 23 00
Retaining wrench	366 589 00 31 00
Spring tensioner	381 589 00 31 00

33.61 Special Tools

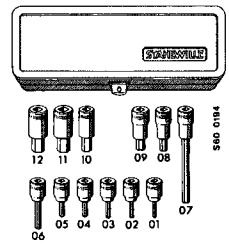
Designation	Parts Number
Retaining wrench	460 589 01 31 00
Spreading device	601 589 00 31 00
Internal extractor	000 589 29 33 00
Puller	000 589 31 33 00
Counter support	000 589 34 33 00
Puller	000 589 89 33 00
Puller	001 589 19 33 00
Puller	001 589 36 33 00
Extractor	001 589 43 33 00
Puller	116 589 22 33 00
Puller	123 589 08 33 00
Puller	186 589 10 33 00
Gripper	000 589 02 34 00
Retaining device	601 589 01 40 00
Piston resetting device	000 589 52 43 00
Plug-in mandrel	116 589 07 61 00
Mandrel	116 589 08 61 00
Split ring	460 589 01 63 00
Insert	601 589 01 63 00
Supporting bridge	601 589 02 63 00
Thrust piece	601 589 10 63 00
Spring balance	000 589 03 65 00

730.3

Oil filling capacity

Hypoid transmission fluid SAE 90 Sheet 235 of POL Specifications	1.6 l

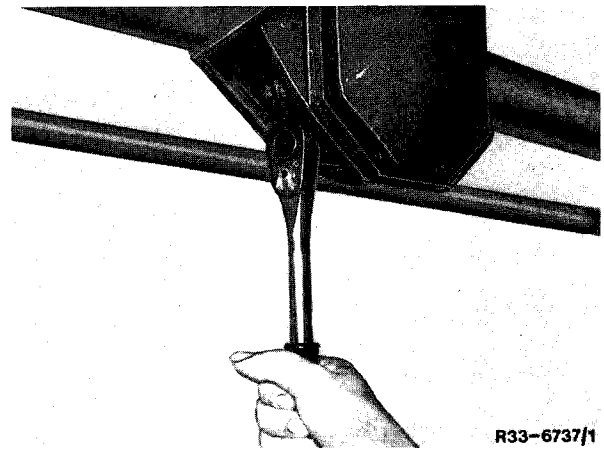
Special tools

Hexagon socket SW 14		001 589 61 09 10

Draining oil

1 Unscrew oil drain plug on bottom of axle housing with hexagon socket (SW 14).

Note: Drain oil when warm if possible.



R33-6737/1

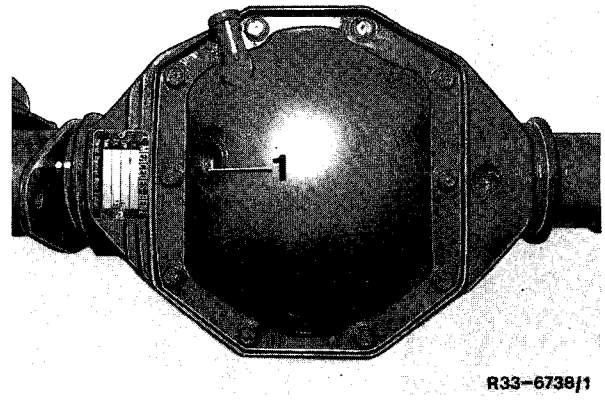
Hexagon socket 001 589 61 09 10

Filling in oil

1 Screw drain plug into axle housing with special tool.

2 Fill oil into oil filler opening on cover.Oil level should be at lower edge of oil filler opening (1).

3 Screw in plug of oil filler opening with special tool.



R33-6738/1

1 oil level

730.3

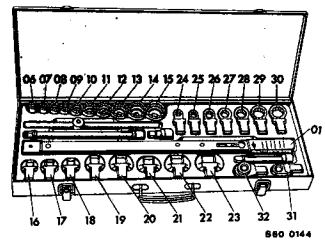
Tightening torques in Nm (kpm)

Wheel mounting bolts	180	(18)
Steering rod on steering arm	65	(6.5)
Stabilizer on frame	70	(7)
Shock absorber at front axle	70	(7)
Transverse link at frame	186	(18.6)
Trailing arm at frame	120	(12)

Filling capacities

Hypoid transmission fluid SAE 90, Sheet 235 of POL Specifications	1.6 l

Special tools

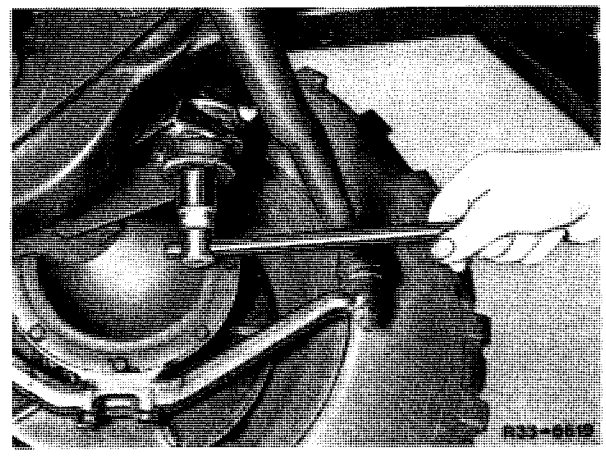
Puller	 880 0088	186 589 10 33 00
Torque wrench 80 – 400 Nm	 880 0144	000 589 10 99 01

Removing front axle

1 Place chocks in front of and behind rear wheels to secure vehicle.

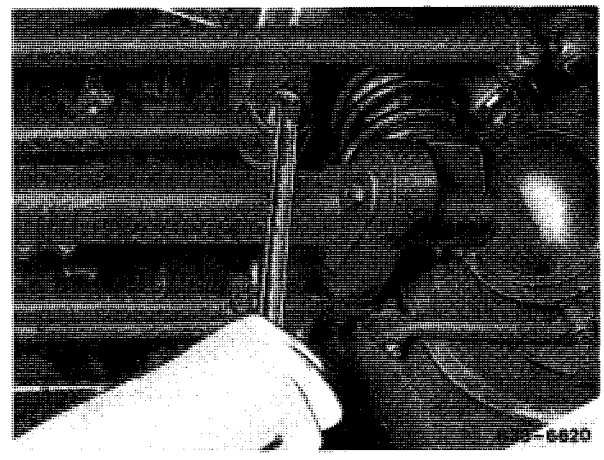
2 Unscrew propeller shaft from clutch flange and secure propeller shaft to vehicle frame.

3 Unscrew both shock absorbers at front axle.

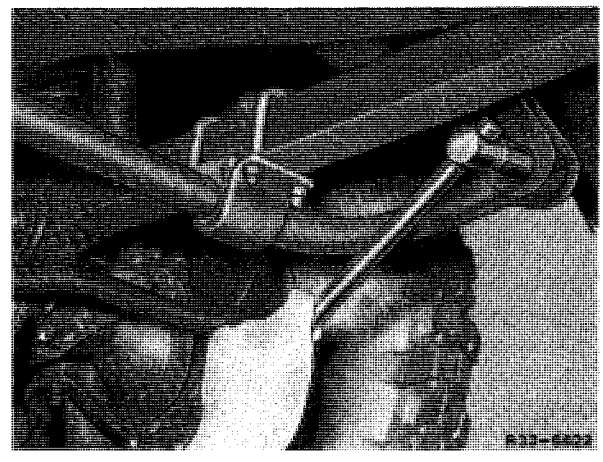


33.61 Removal and installation of front axle

4 Loosen fastening bolt of transverse link from frame.



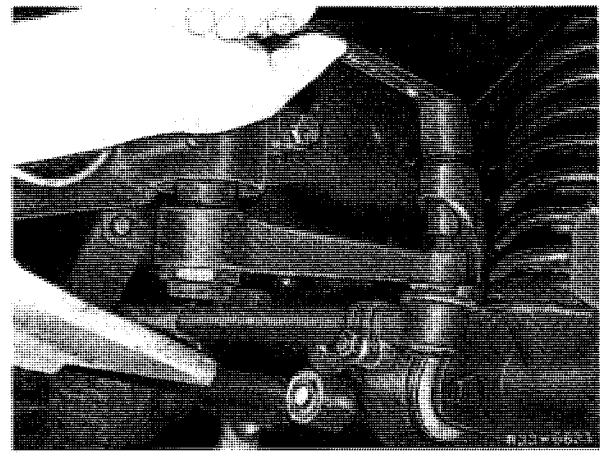
5 Unscrew stabilizer from frame.



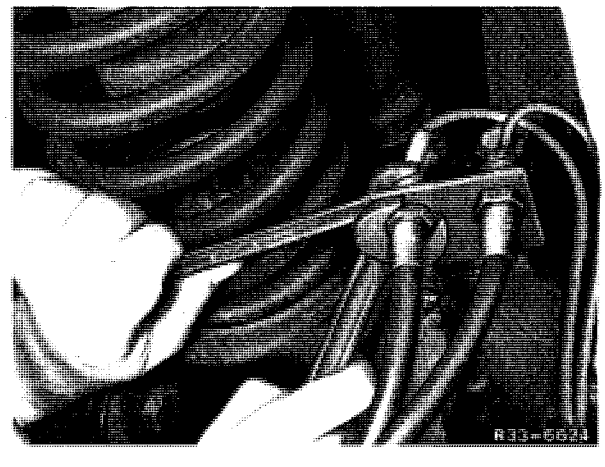
6 Remove split pin of castle nut on steering arm and unscrew.

7 Press steering rod off steering arm with special tool.

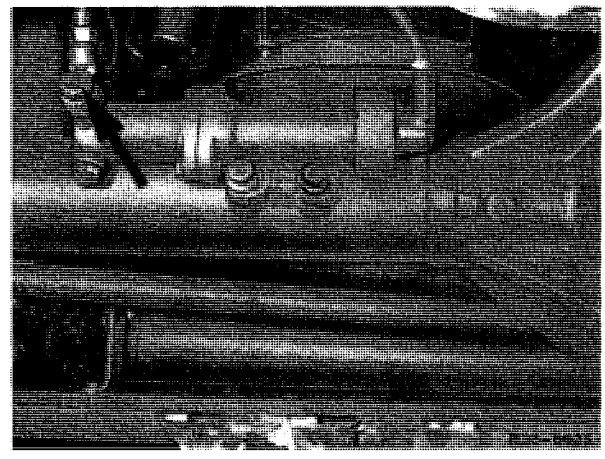
Puller 186 589 10 33 00



8 Unscrew brake lines on left and right and seal with rubber caps.

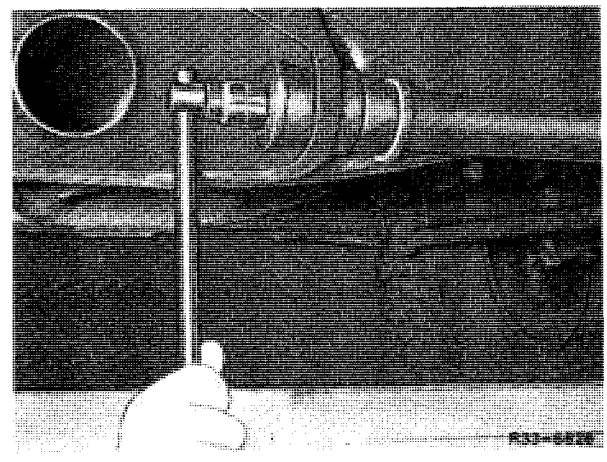


9 Unscrew line for differential lock control. Unscrew line for electric indicator lamp.



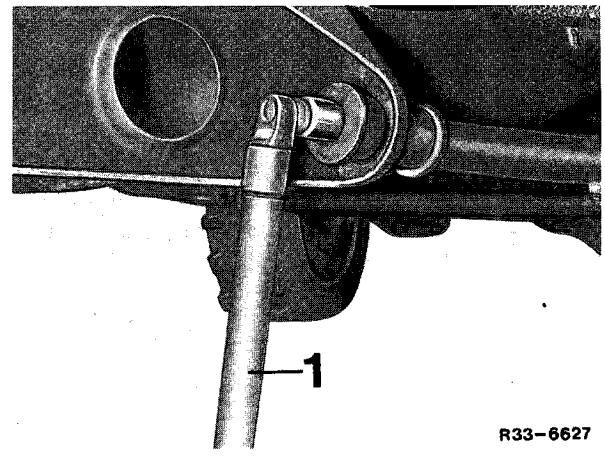
10 Unscrew both trailing arms from frame, remove washers and rubber bearings.

11 Jack up vehicle at front until the spiral springs can be removed, remove fastening bolt of transverse link completely and remove front axle to the front.

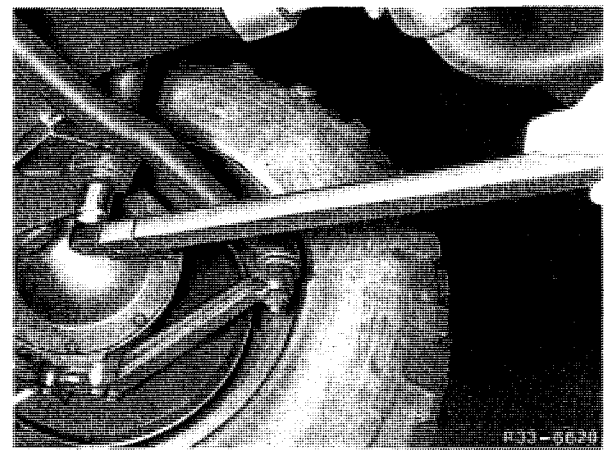


Installing front axle

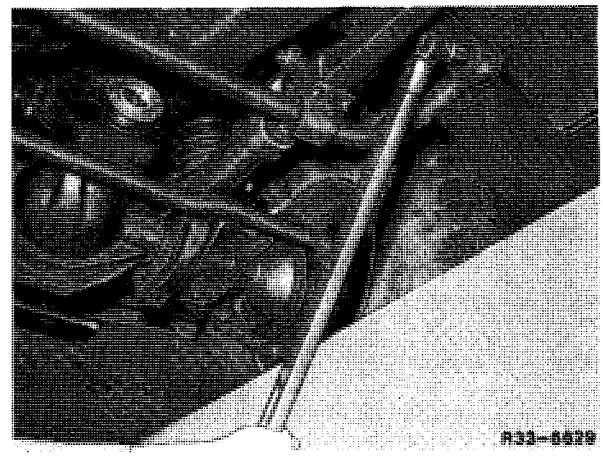
1 Place front axle under vehicle in installation position. Fit spiral springs so that the end of the spring rests on the stop of the spring plate of the axle.
Screw in bolt at transverse link. Lower vehicle until the trailing arms can be inserted into the frame. Fit rubber bearings and washers and tighten nuts with 200 Nm.



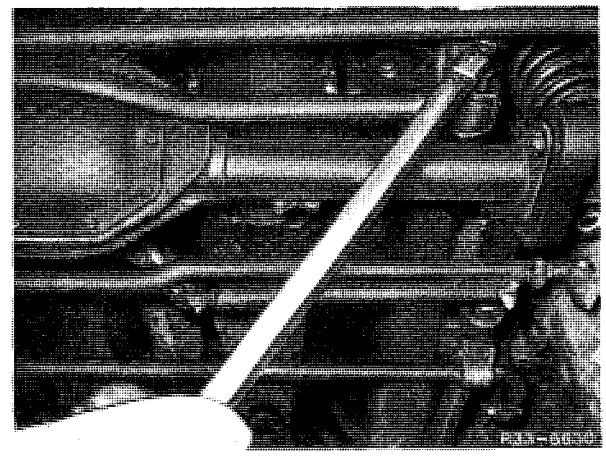
2 Tighten both shock absorbers with 70 Nm.



3 Tighten fastening bolts of stabilizer with 90 Nm.



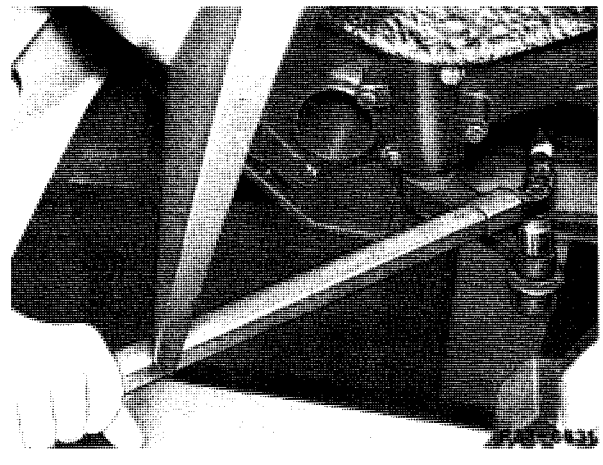
4 Tighten fastening bolt of transverse link with 200 Nm.



5 Bolt steering rod onto steering arm with 90–100 Nm and secure castle nut with split ring.

6 Bolt brake lines onto front axle.

Note: When fitting brake lines, ensure that the minimum distance is maintained between coil spring and brake hose. This minimum distance is 20 mm and must exist in all wheel positions.

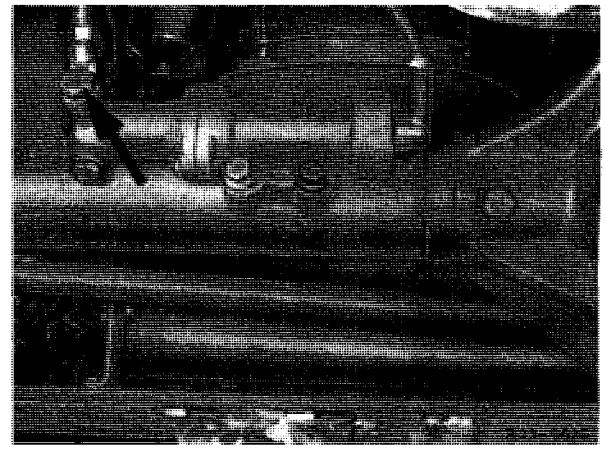


7 Screw on cable for electric indicator lamp then screw on line for differential lock control and bleed until the indicator lamp on the instrument panel lights up to ensure that the lock is fully engaged.

8 Bolt clutch flange to propeller shaft.

9 After installing front axle, bleed brake.

10 Check and adjust oil level of front axle.

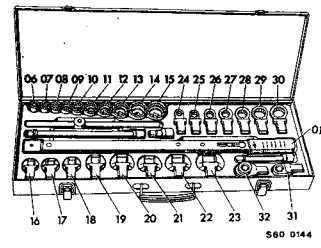


730.3

Tightening torques in Nm (kpm)

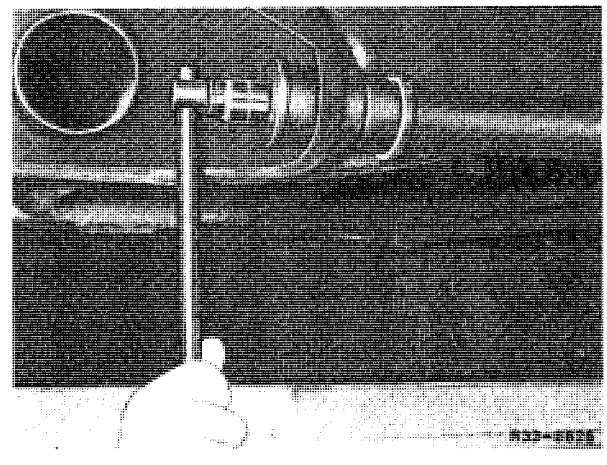
Trailing arm at front axle	186 (18.6)
Trailing arm at frame	120 (12)

Special tools

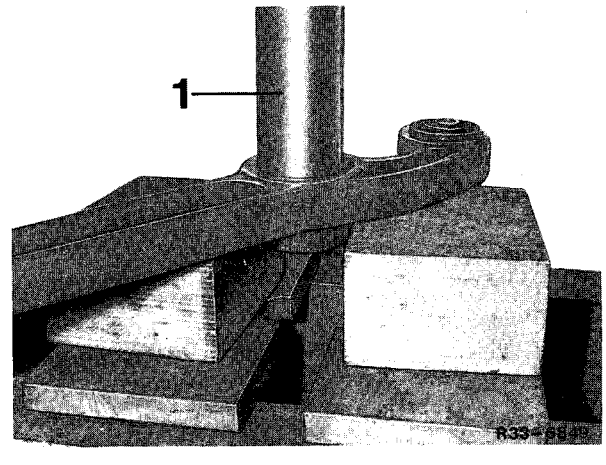
Torque wrench 80 – 400 Nm		000 589 10 99 01

Removing trailing arms

1 Unscrew and remove trailing arms at frame and axle.



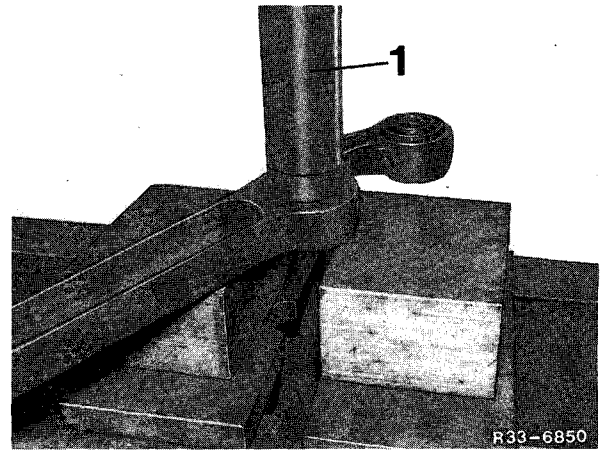
2 Press out bearing in a press using a suitable tube.



33.61 Removal and installation of trailing arms

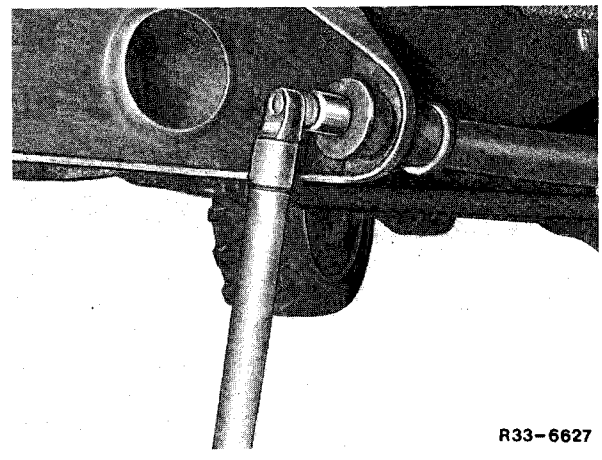
Installing trailing arms

1 Press bearing into trailing arm in a press so that it projects equally on both sides.



2 Insert trailing arm into frame and axle. Torque fastening bolts on frame to 120 Nm.

3 Torque fastening bolts of trailing arm at axle to 186 Nm.



730.3

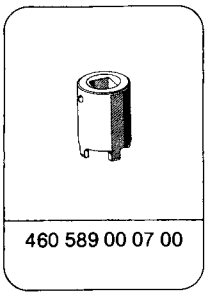
Settings

Wheel bearing play	0.02 – 0.04

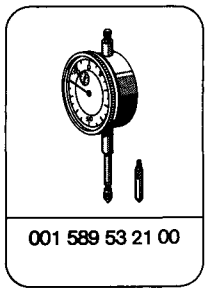
Tightening torques in Nm

Both slotted nuts on wheel hub			200
Fixed caliper on joint housing	M 14 x 1.5 M 16 x 1.5	10.9	190 – 220 250 – 280

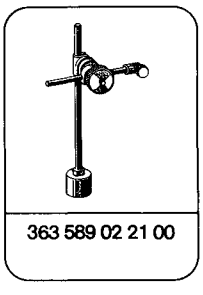
Special tools



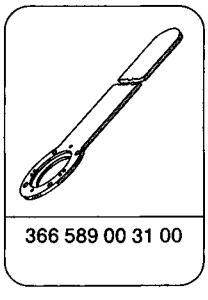
460 589 00 07 00



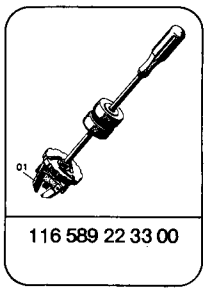
001 589 53 21 00



363 589 02 21 00



366 589 00 31 00

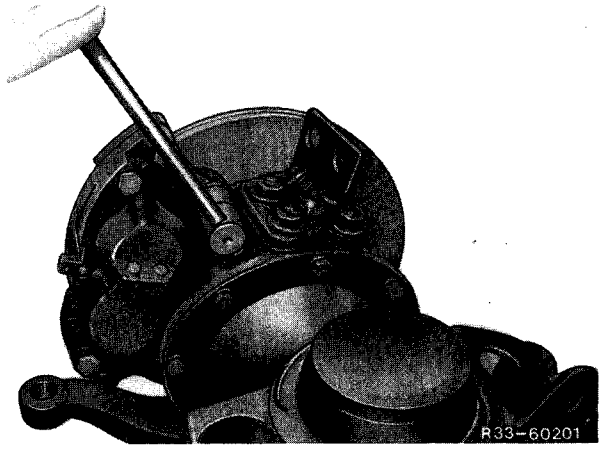


116 589 22 33 00

Removing

1 Unscrew fixed caliper and take off.

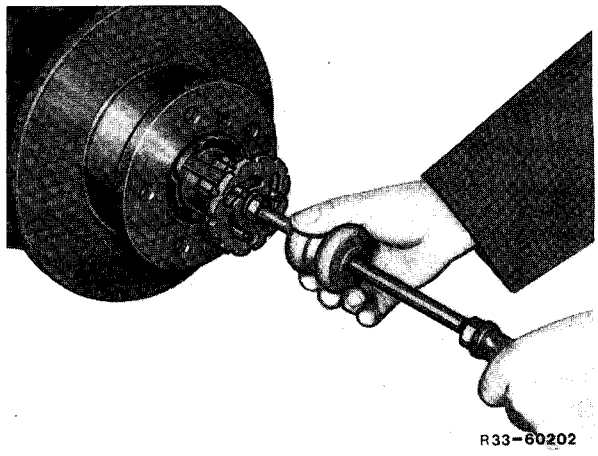
Note: On the righthand side use a (commercial-grade) socket shortened by 5 mm.



33.61 Removing and installing wheel hub

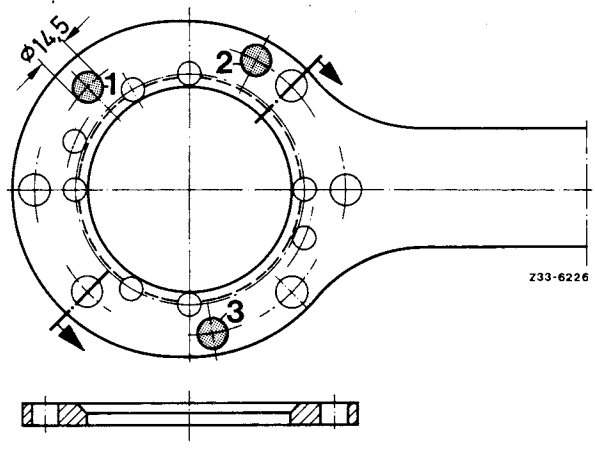
2 Pull wheel cap of the wheel hub using the special tool.

3 Unscrew the brake disc and take off.

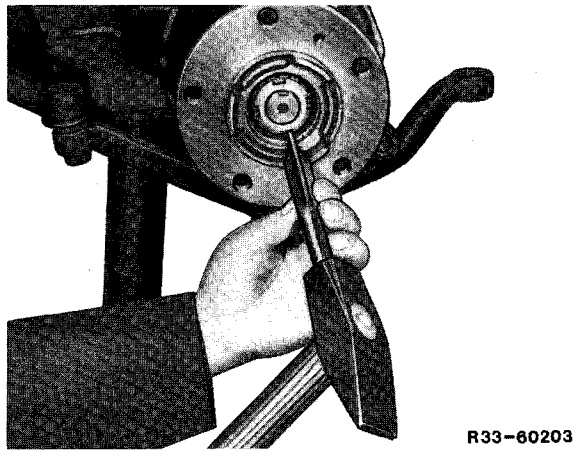


Puller 116 589 22 33 00

Note: Widen hole 1 on retaining wrench 366 589 00 31 00 to 14.5 dia. Place brake disc on retaining wrench, align over hole 1 and bolt tight.
Drill holes 2 and 3 with 14.5 dia. drill.



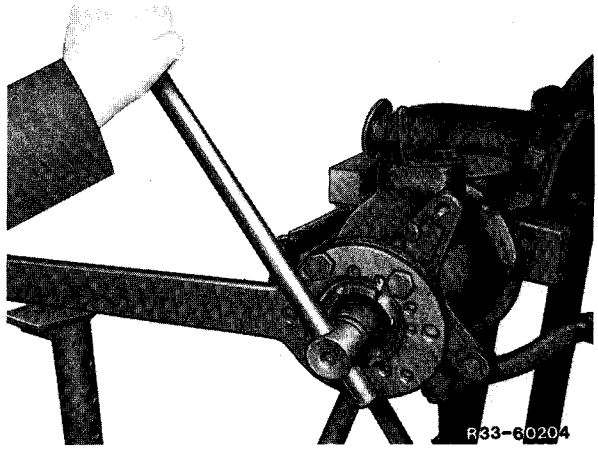
4 Release outer slotted nut.



5 Screw retaining wrench onto wheel hub, unscrew slotted nut with special tool.

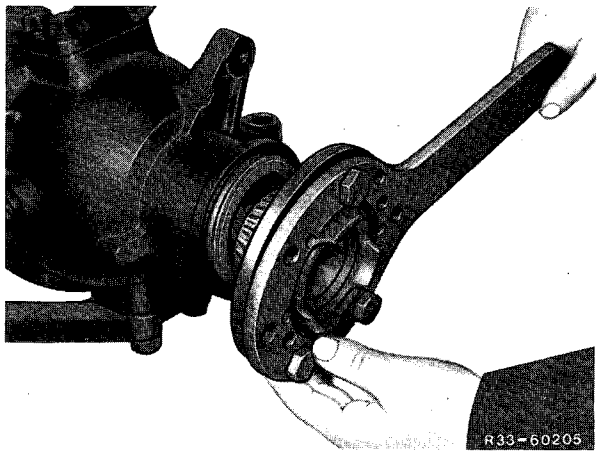
6 Take off tab washer.

7 Unscrew inner slotted nut with special tool.



Retaining wrench 366 589 00 31 00
Jaw wrench 460 589 00 07 00

8 Take wheel hub off the axle, unscrew retaining wrench.

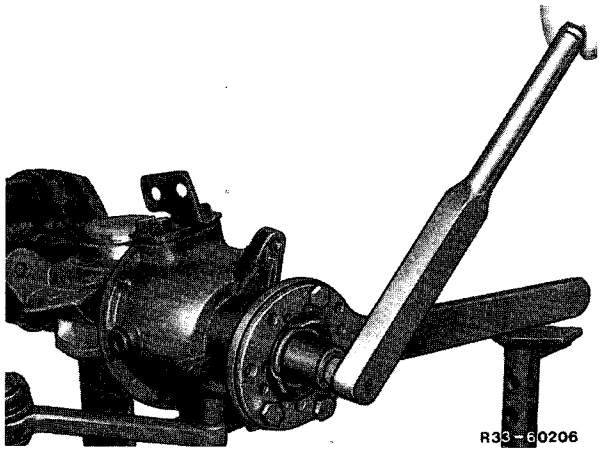


Installing

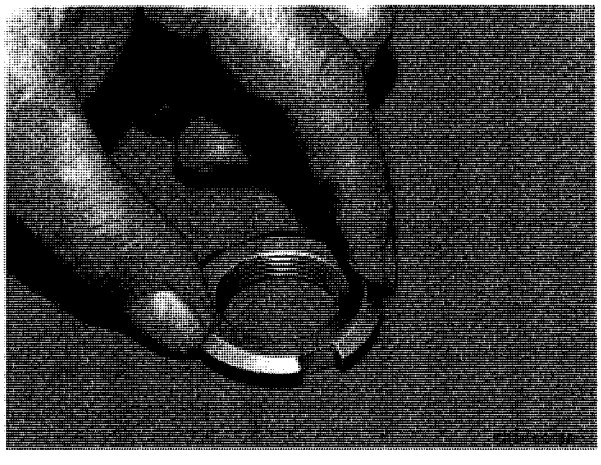
1 Slip on wheel hub and screw on retaining wrench. Grease inner slotted nut on the contact face with hub and tighten with 200 Nm while at the same time turning the wheel hub.
Slacken the inner slotted nut far enough to achieve a clearance of 0.15–0.18 mm. Insert tab washer.

Note: This clearance may increase more if the thread tolerances are unfavourable.

Jaw wrench	460 589 00 07 00
Retaining wrench	366 589 00 31 00



2 Rub the outer slotted nut on the contact face to the tab washer with emery paper. Grease slotted nut and tighten with 200 Nm.

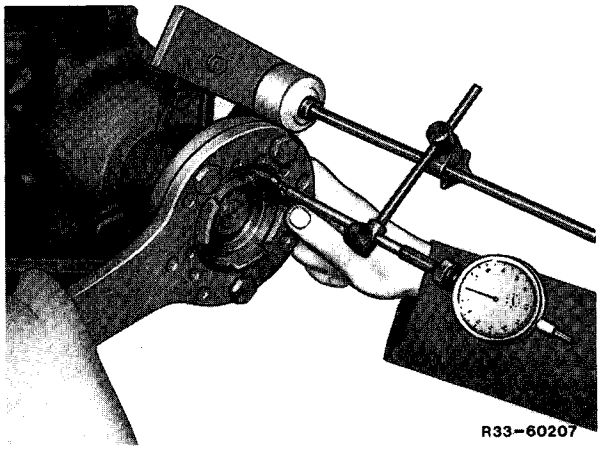


3 Fix shop-made holder (flat iron) to the suspension of the fixed caliper to enable the measuring instrument 363 589 02 21 00 to be safely mounted.

Check wheel bearing play by moving wheel hub back and forth.

Specified wheel bearing play 0.02–0.04 mm.

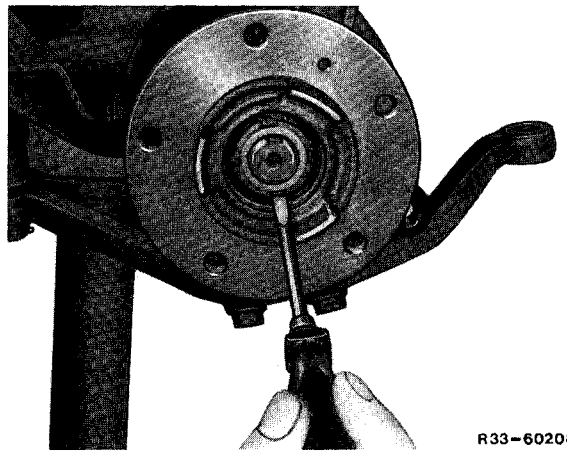
Retaining wrench	366 589 00 31 00
Dial gauge	001 589 53 21 00
Measuring instrument	363 589 02 21 00



33.61 Removing and installing wheel hub

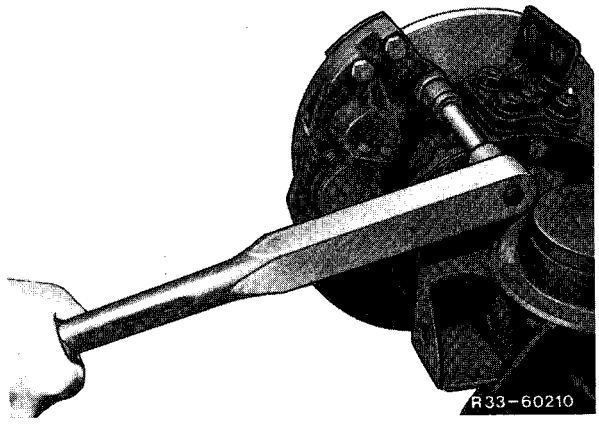
4 After adjusting the wheel bearing play, secure the outer slotted nut by bending over the tab washer.

5 Fit brake disc and bolt tight.

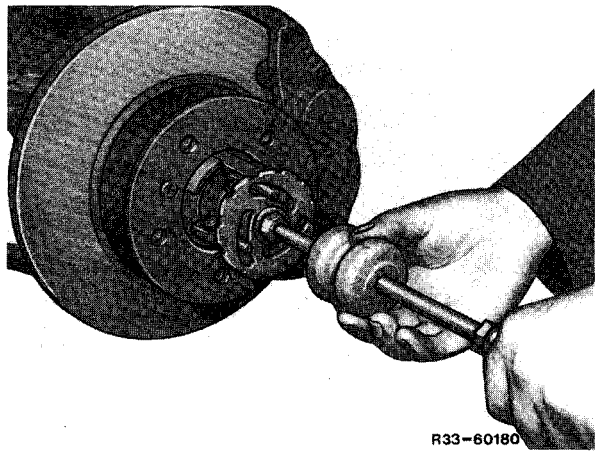


6 Fit fixed caliper to the joint housing and tighten the M 14 x 1.5 fastening bolt with 190–220 Nm and the M 16 x 1.5 bolt with 250–280 Nm.

Note: On the righthand side, use a (commercial-grade) socket shortened by 5 mm.



7 Fit wheel cap using special tool.



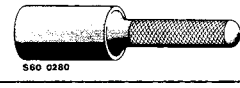
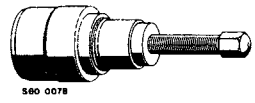
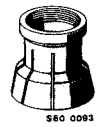
Puller 116 589 22 33 00

730.3

Filling capacities

Universal grease per wheel hub Sheet 267 of POL Specifications	50 g

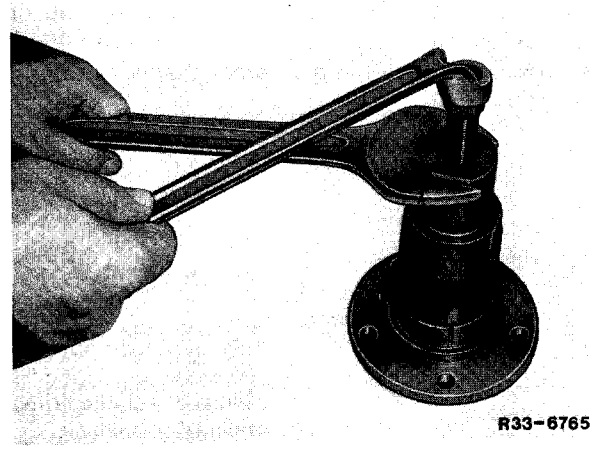
Special tools

Mandrel		343 589 03 15 00
Puller		001 589 36 33 00
Grip		000 589 02 34 00

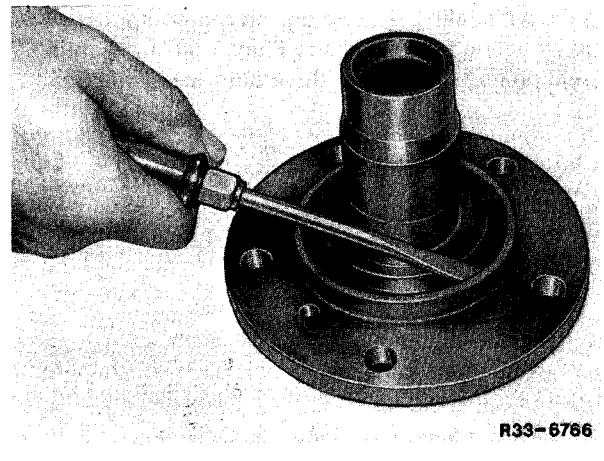
Disassembly

1 Remove outer taper roller bearing from wheel hub with special tool and suitable thrust piece.

Puller 001 589 36 33 00
Grip 000 589 02 34 00


R33-6765

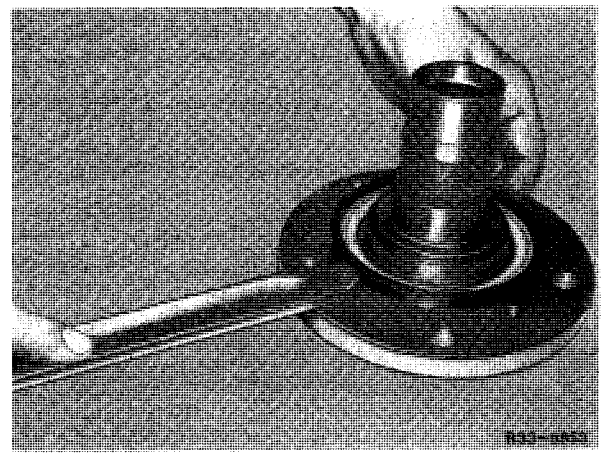
2 Remove sealing ring holder with sealing ring.


R33-6766

33.61 Disassembly and reassembly of wheel hub

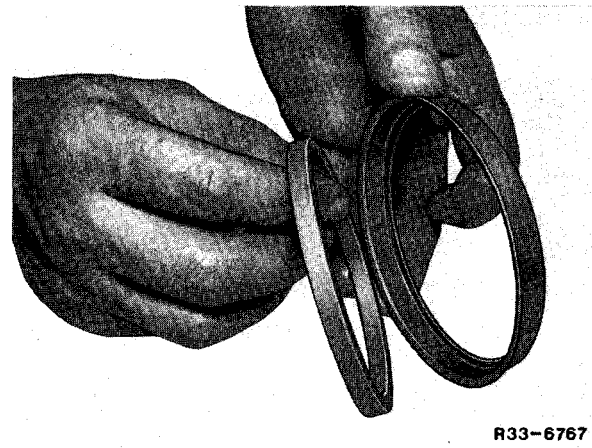
Note: From axle No. 7 000 561 a modified sealing ring holder has been fitted with a cellular polyurethane ring.

3 Clean all parts and check for wear, replacing worn parts.



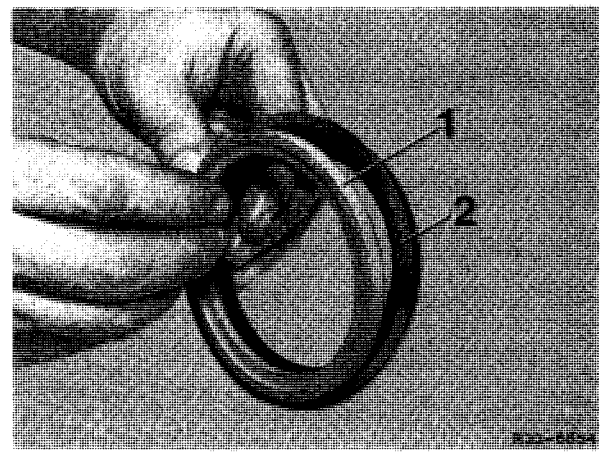
Reassembly

1 Fit gasket into sealing ring holder



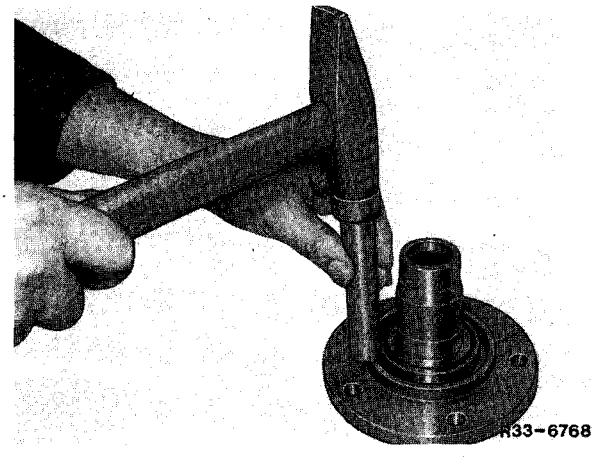
R33-6767

Note: From axle No. 7 000 561 a sealing ring of cellular polyurethane has been installed. The sealing ring holder has a different shape.



1 cellular polyurethane ring
2 sealing ring holder

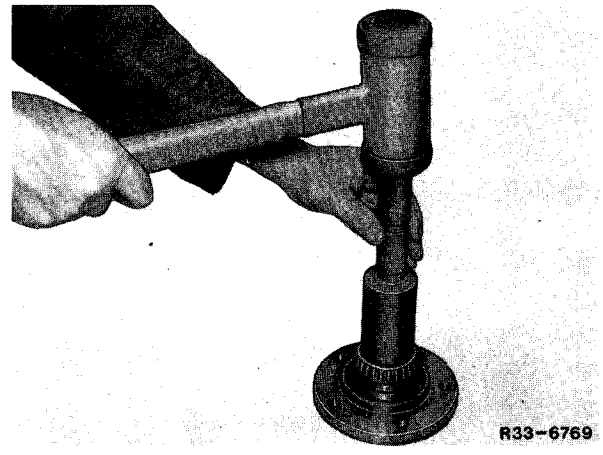
2 Coat sealing ring holder on the contact surface to wheel hub with Teroson Fluid T 307 or Dichtin 51 sealing compound and drive onto wheel hub.



R33-6768

3 Drive outer wheel bearing onto wheel hub with special tool.

4 Pack wheel hub with specified quantity of grease, ensuring that the bearing is well greased.



Mandrel 343 589 03 15 00

730.3

Filling capacities

Universal grease per universal joint housing	800 g

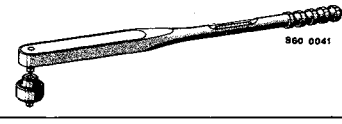
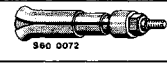
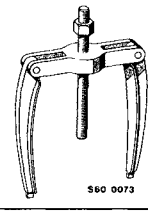
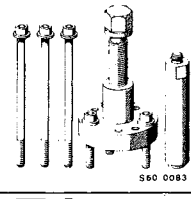
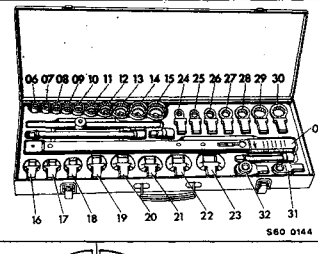
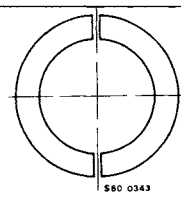
Adjustment values

Preload of steering knuckle bearing	0.3 ± 0.05

Tightening torques in Nm (kpm)

Gasket holder on joint housing	20 – 25	(2 – 2.5)
Stop bolt (check nut)	15 – 20	(1.5 – 2)
Kingpin top on joint housing	110 – 125	(11 – 12.5)
Track or steering arm on joint housing	150 – 170	(15 – 17)
Track rod on track arm	90 – 100	(9 – 10)
Steering shock absorber bracket on axle housing	20 – 25	(2 – 2.5)
Guard plate on joint housing	20 – 25	(2 – 2.5)

Special tools

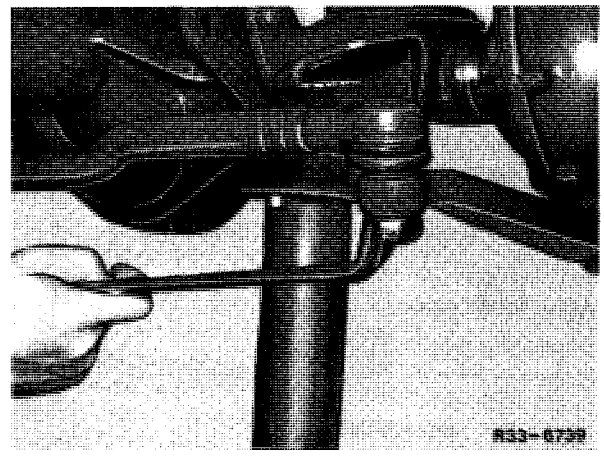
Mandrel		395 589 02 15 00
Torque wrench 20 – 100 Nm	 S60 0041	000 589 64 21 00
Torque wrench		000 589 67 21 00
Internal puller	 S60 0072	000 589 29 33 00
Counter support	 S60 0073	000 589 34 33 00
Puller	 S60 0083	186 589 10 33 00
Torque wrench 80 – 400 Nm	 S60 0144	000 589 10 99 01
Split ring	 S60 0343	460 589 01 63 00

33.61 Removal and installation of universal joint housing and track rod

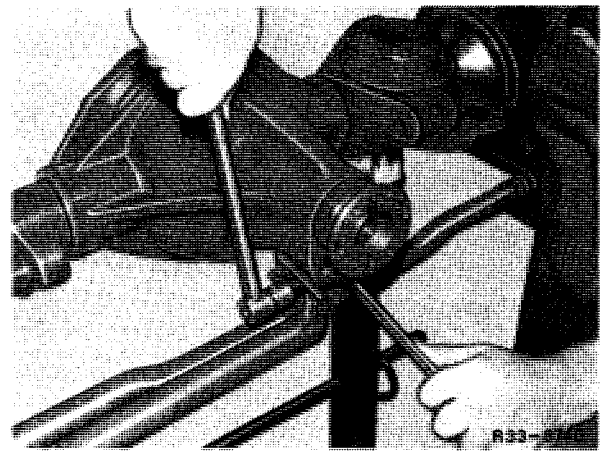
Removal

1 Remove split pins of castle nuts at track rod.

2 Unscrew castle nuts.

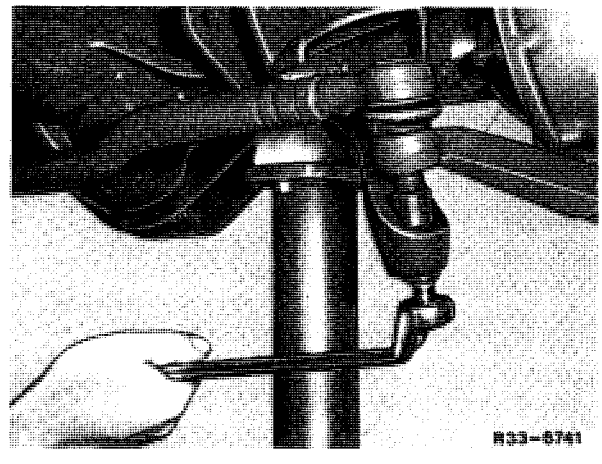


3 Unscrew steering shock absorber from axle.



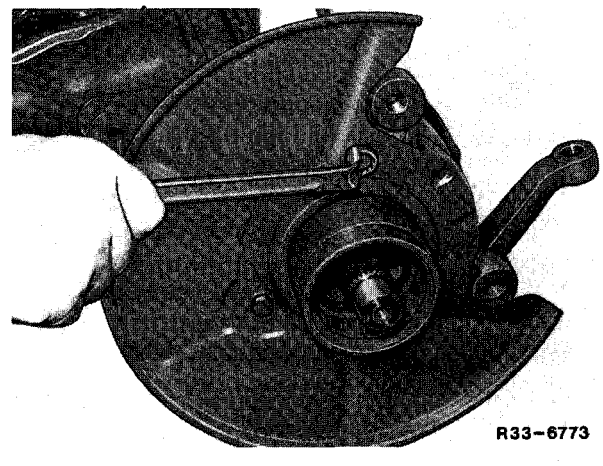
4 Press track rod off with special tool.

Puller 186 589 10 33 00

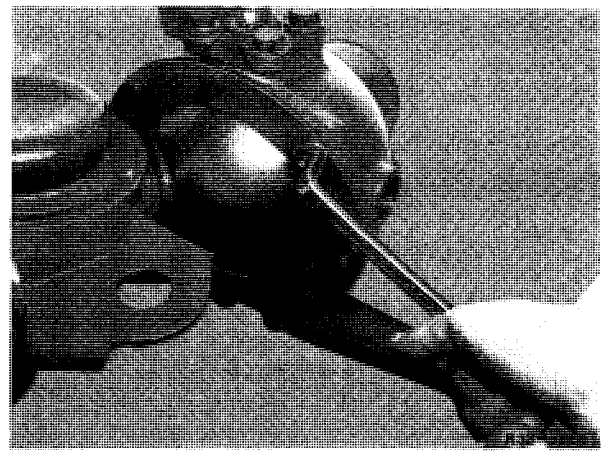


5 Remove wheel hub (33.61–220).

6 Unscrew guard plate from universal joint housing.

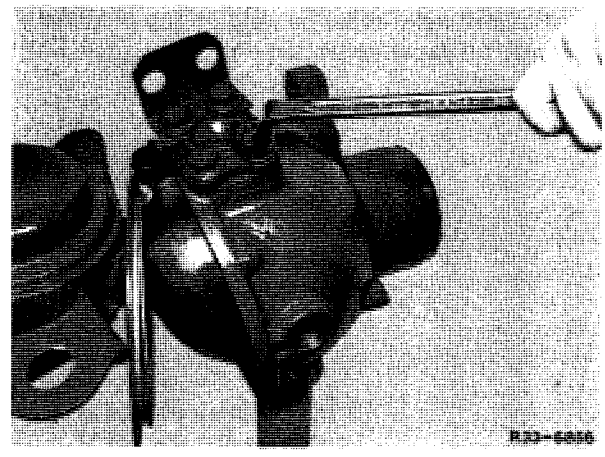


7 Unscrew gasket holder from joint housing.

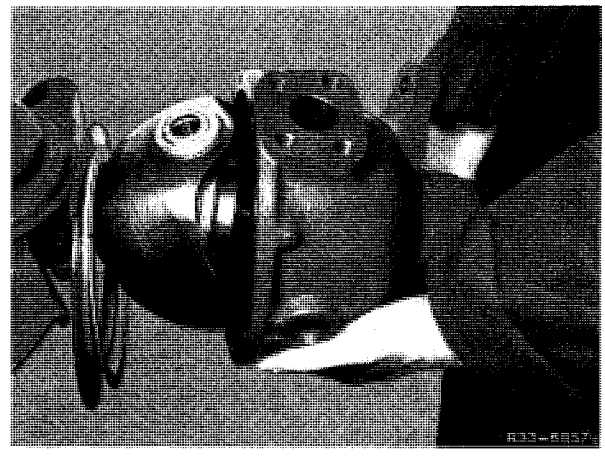


8 Unscrew kingpin at top and track arm or steering arm underneath and remove.

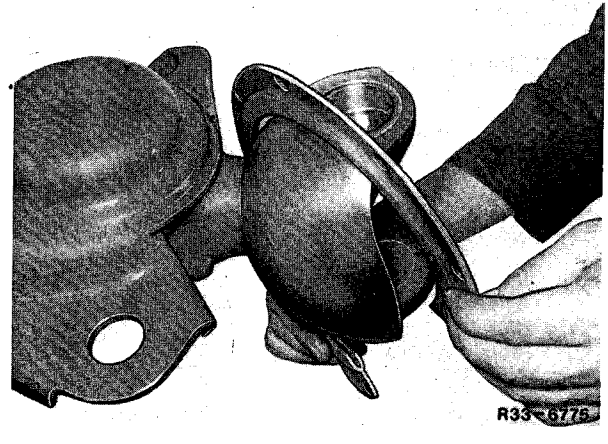
Note: Mark the shims and taper roller bearings on the kingpins so that they can be reinstalled in their original positions.



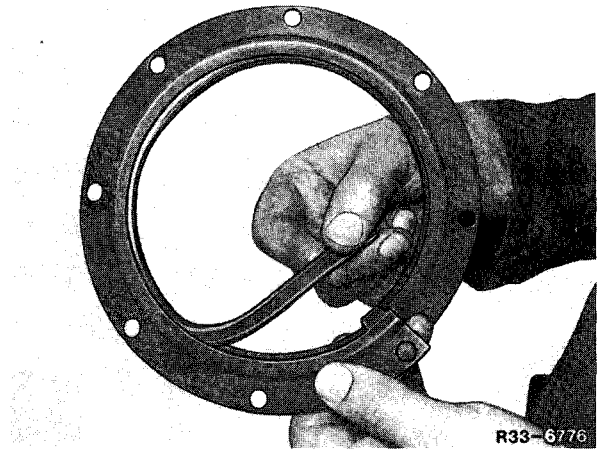
9 Remove joint housing with taper roller bearing at the bottom from the axle.



10 Remove gasket holder with gasket from axle.

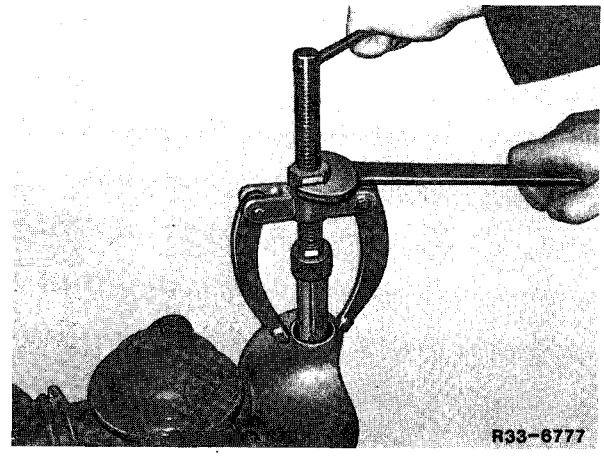


11 Check gasket, renewing if necessary.



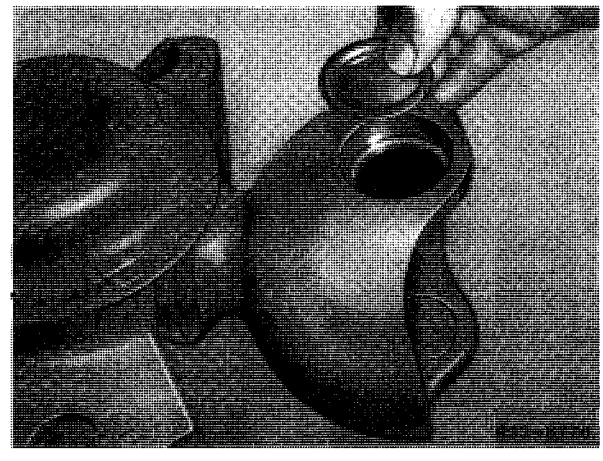
12 Remove taper roller bearing on top of kingpin and pull off taper roller bearing outer race with special tool.

Internal puller 000 589 29 33 00
Counter support 000 589 34 33 00



13 Remove closing cover.

14 Clean all parts or check for wear.

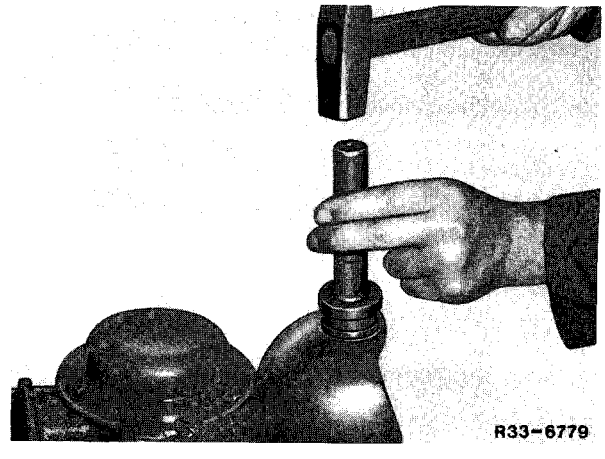


Installation

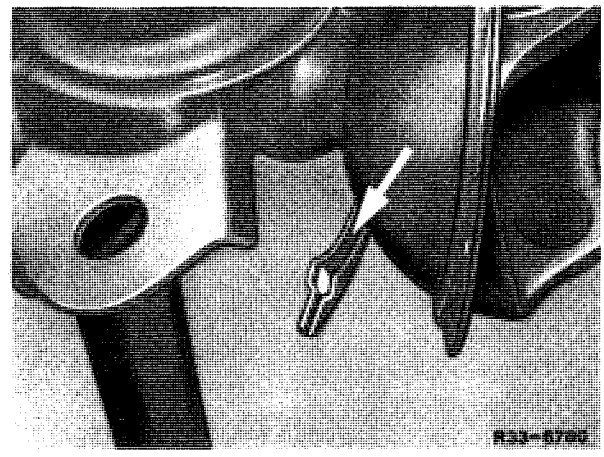
1 Fit closing cover.

2 Drive taper roller bearing outer race into axle with special tool. Insert taper roller bearing.

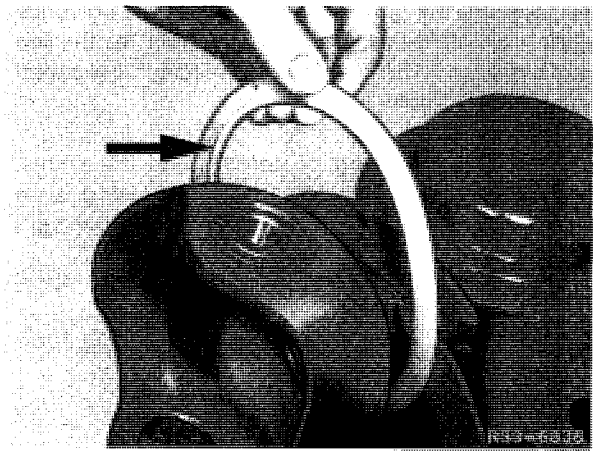
Installer 395 589 02 15 00



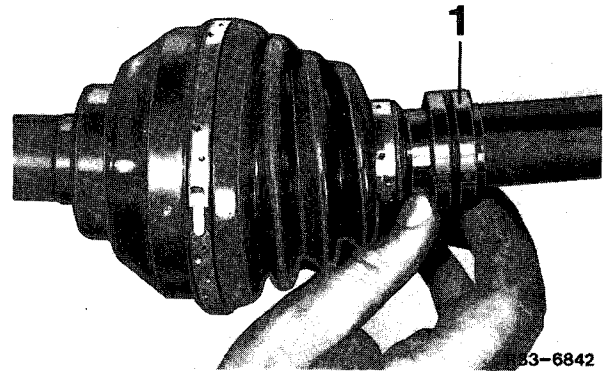
3 Fit gasket holder with gasket to axle so that the chamfer of the gasket agrees with the chamfer of the ball.



Note: A closed ball gasket is fitted from axle number 7 000 561. When installing, ensure that the chamfer points toward the ball.



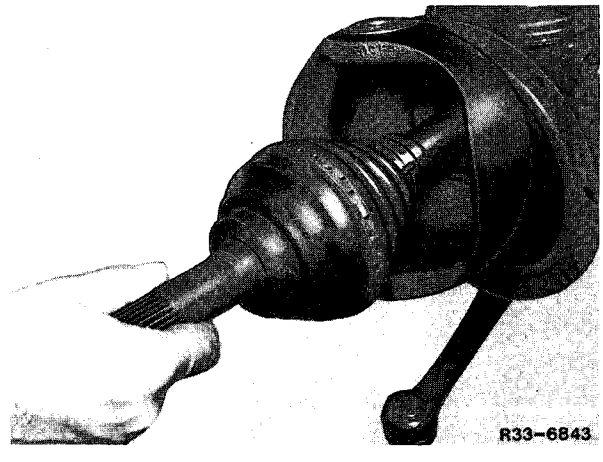
4 If it is necessary to measure the shims at the top and bottom of the universal joint housing because of fitting new parts, mount the special tool on the constant velocity propeller shaft.



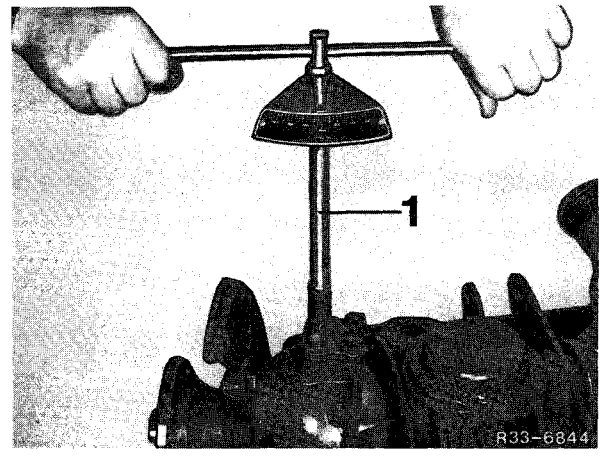
1 Split ring 460 589 01 63 00

5 Insert constant velocity propeller shaft into axle.

6 Install joint housing without shims but with taper roller bearings. Torque slotted nut on wheel hub to 200 Nm. Torque fastening bolts of kingpin top and steering arm or track arm bottom to 10 Nm (100 kpcm).



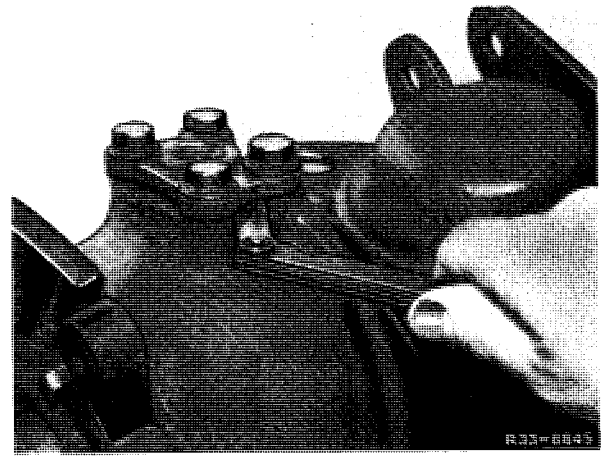
33.61 Removal and installation of universal joint housing and track rod



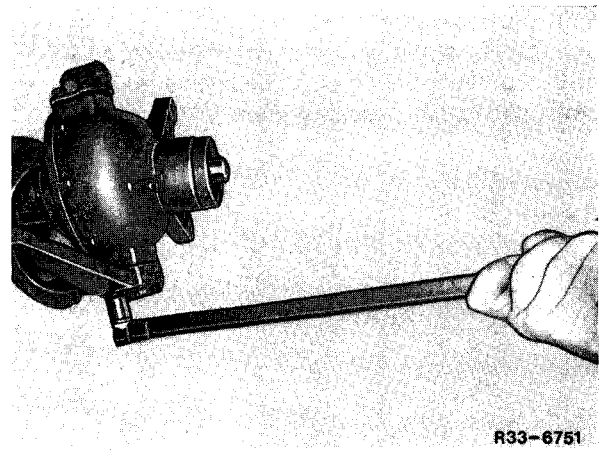
1 Torque wrench 000 589 67 21 00

7 Measure the gap at top and bottom of universal joint housing with feeler gauge. Select for the **top** and **bottom** a 0.15 mm thinner shim to achieve a total preload of 0.3 mm.

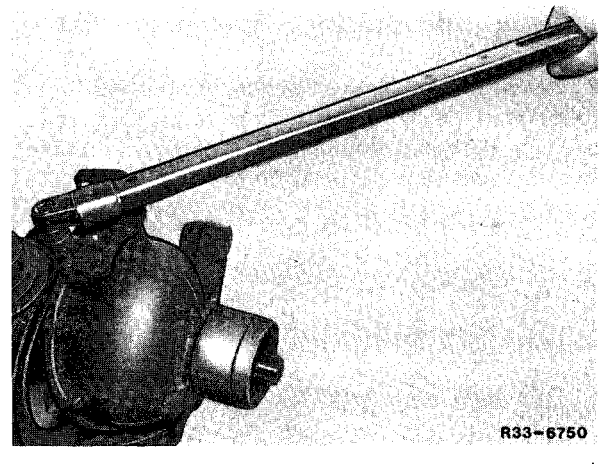
Note: After measuring or determining the shims, remove complete universal joint housing with constant velocity propeller shaft and remove split ring (special tool).



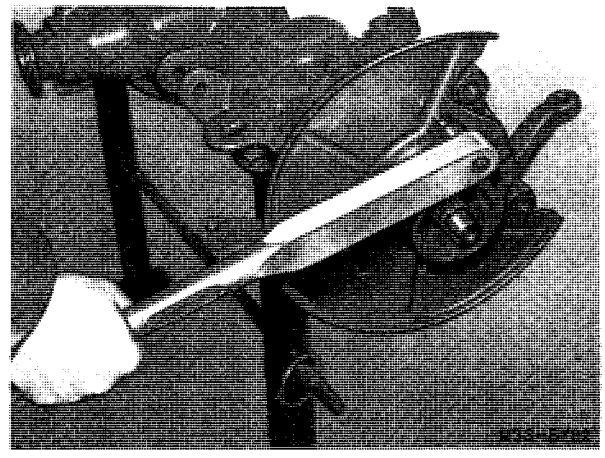
8 Fit universal joint housing with taper roller bearing to bottom of axle and install track or steering arm and torque to 150–170 Nm.
Note 1: Install the shims and taper roller bearings in their original position or, if replacing parts, in the side determined previously.
Note 2: Connex dowel pins are installed in the universal joint housing from axle No. 7004272. When carrying out repairs, check these for damage and wear, renewing if necessary.



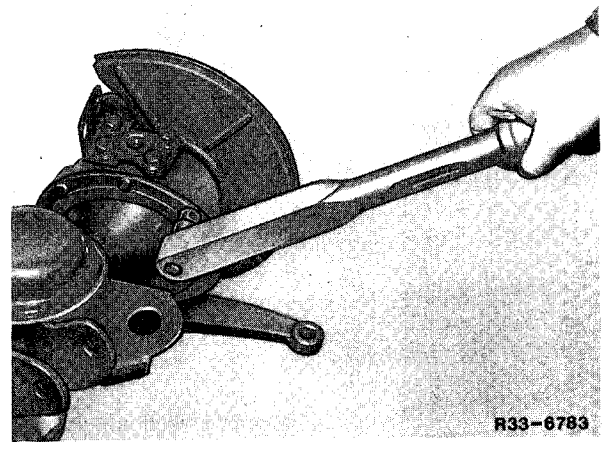
9 Fit kingpin at top and bolt tight with bracket.
Tightening torque of bolts: 110–125 nm.



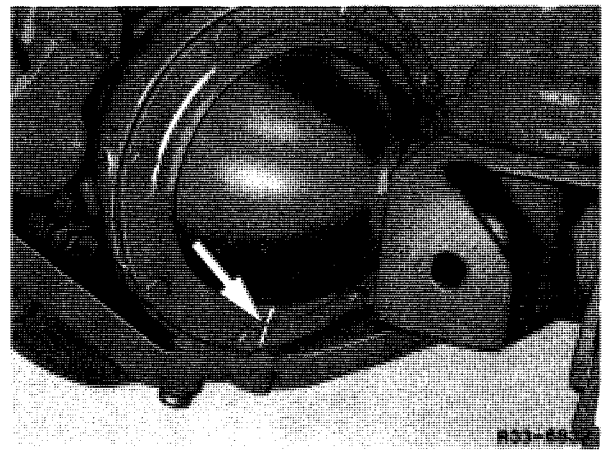
10 Bolt guard plate onto joint housing with 20–25 Nm.



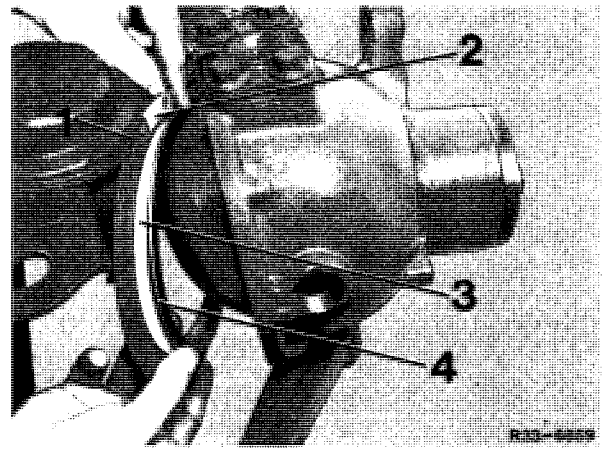
11 Bolt gasket holder onto joint housing with 20–25 Nm.



Note 1: Up to axle No. 7 000 560 bolt on gasket holder so that the parting surface points downward.



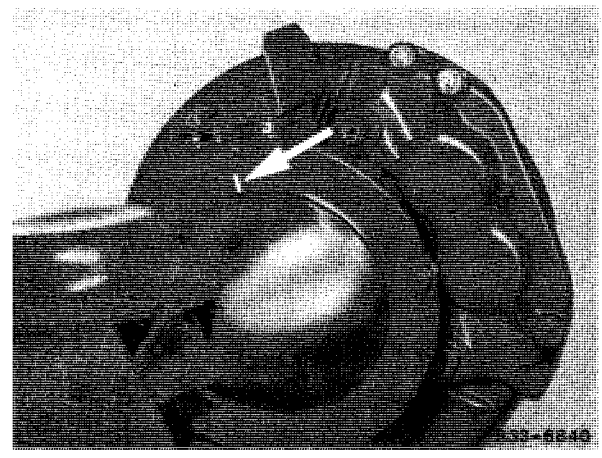
Note 2: From axle No. 7 000 561 a closed ball gasket with an inner and outer gasket holder and a paper gasket is installed. The paper gasket should be fitted between the outer gasket holder and the universal joint housing.



1 Outer gasket holder
2 Paper gasket
3 Ball gasket (closed)
4 Inner gasket holder

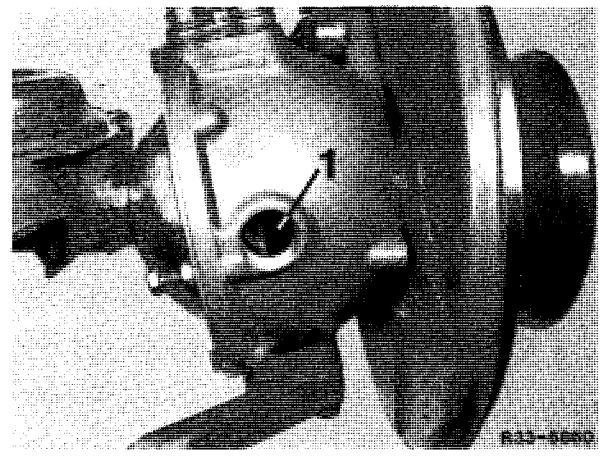
33.61 Removal and installation of universal joint housing and track rod

12 From axle No. 7 000 561 the parting surface of the gasket holder must point upward. Conversion of old axles to the closed ball gasket is only possible if the new universal joint housing is fitted at the same time.



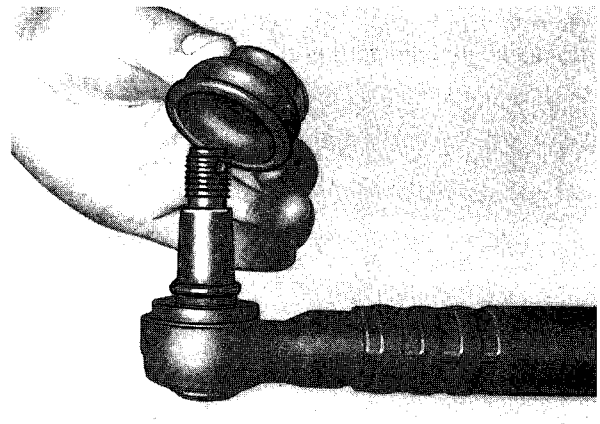
13 Install wheel hub (33.61–220).

Note: From axle no. 7 000 561 the universal joint housing is fitted with a screwplug. When reassembling pack in 800 g universal grease per joint housing.



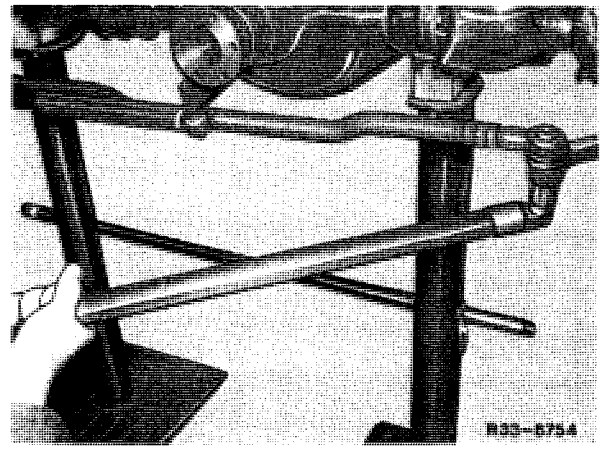
1 Opening for grease packing

14 If a damaged rubber cup seal is detected on a used joint, the joint in question must be completely replaced.
If the rubber capsleeve has been damaged when removing or installing the track rod, it is sufficient to renew the rubber seal.

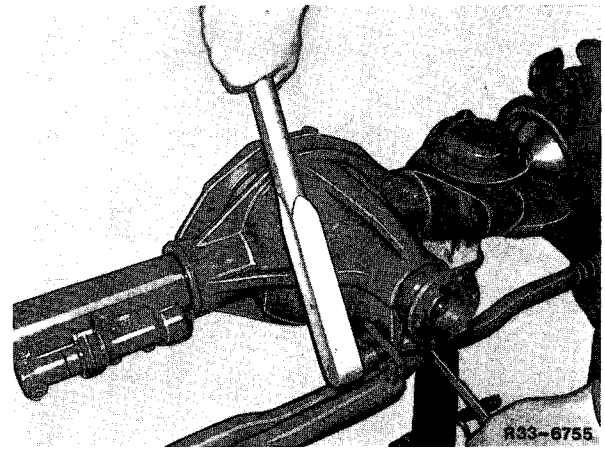


R33-6784

15 Fit track rod and torque castle nuts to 90–100 Nm. Secure castle nuts with split pin.



16 Bolt steering shock absorber to axle to 20–25 Nm.

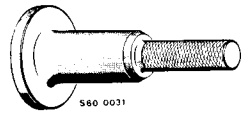
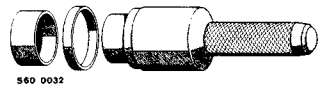
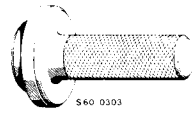
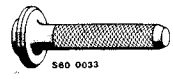
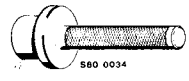
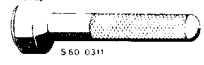
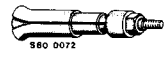
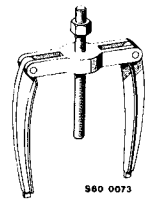


730.3

Filling capacities

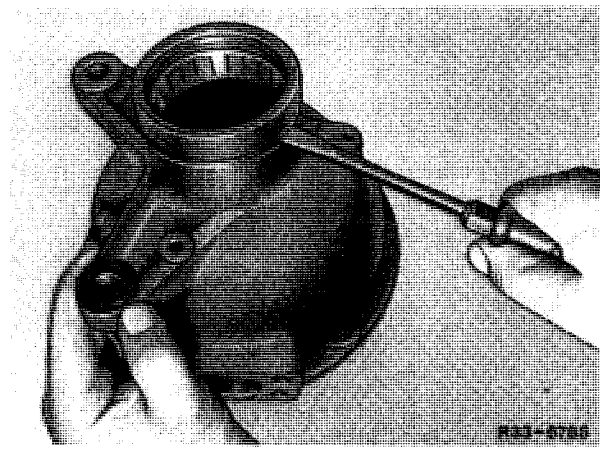
Universal grease per joint housing	800 g

Special tools

Mandrel	 S60 0031	312 589 05 15 00
Mandrel	 S60 0032	352 589 04 15 00
Mandrel	 S60 0303	305 589 00 15 00
Mandrel	 S60 0033	360 589 00 15 00
Mandrel	 S60 0034	363 589 04 15 00
Mandrel	 S60 0311	387 589 04 15 00
Puller	 S60 0072	000 589 31 33 00
Counter support	 S60 0073	000 589 34 33 00

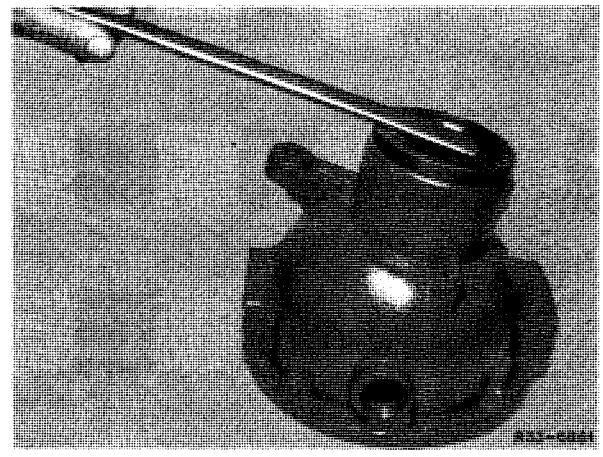
Disassembly

1 Remove outer radial sealing ring from joint housing.

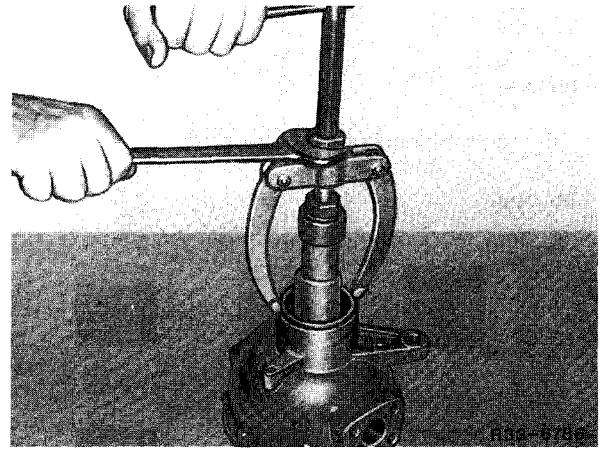


33.61 Disassembly and reassembly of joint housing

Note: From axle No. 7 000 561 the radial sealing ring is seated in the joint housing and should be removed using a mounting iron.



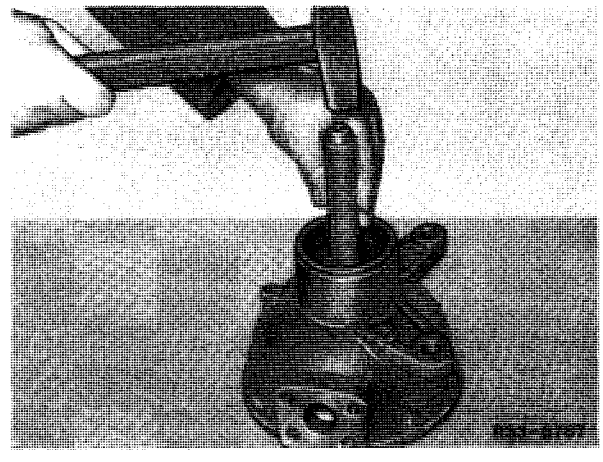
2 Pull outer taper roller bearing outer race out of joint housing with special tool.



Puller	000 589 31 33 00
Counter support	000 589 34 33 00

3 Drive out inner wheel bearing and radial sealing ring using special tool.

Note: Mandrels Part No. 360 589 00 15 00 supplied up to mid-1980 have to be re-turned to an outer diameter of 0.4 mm less to enable them to also be used for the modified joint housing axle no. 7 000 561.

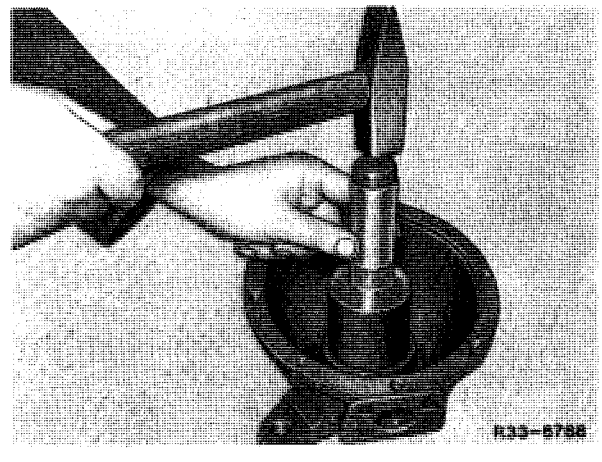


Mandrel 360 589 00 15 00

4 Clean all parts and check for wear. Replace worn parts.

Reassembly

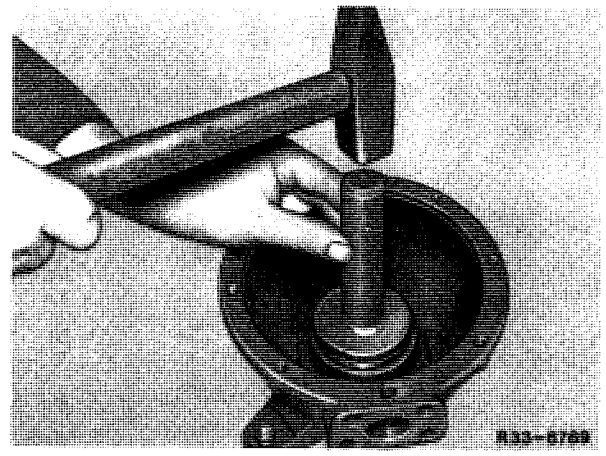
1 Drive in taper roller bearing outer race of inner wheel bearing with special tool.



Mandrel 352 589 04 15 00

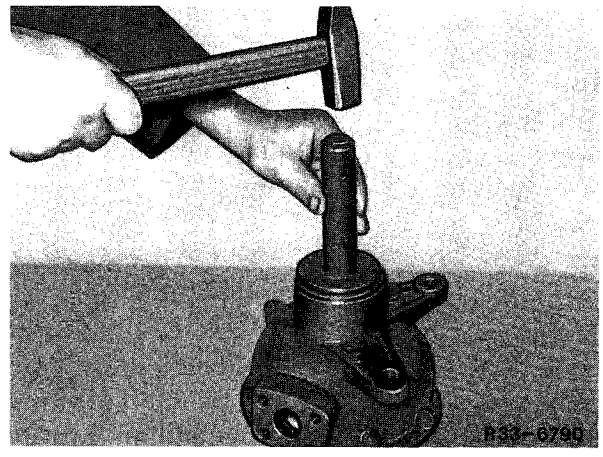
2 Insert well-greased roller cage of inner wheel bearing in joint housing.

3 Drive radial sealing ring into joint housing using special tool.



Mandrel 363 589 04 15 00 up to axle No. 7 000 560
Mandrel 305 589 00 15 00 from axle No. 7 000 561

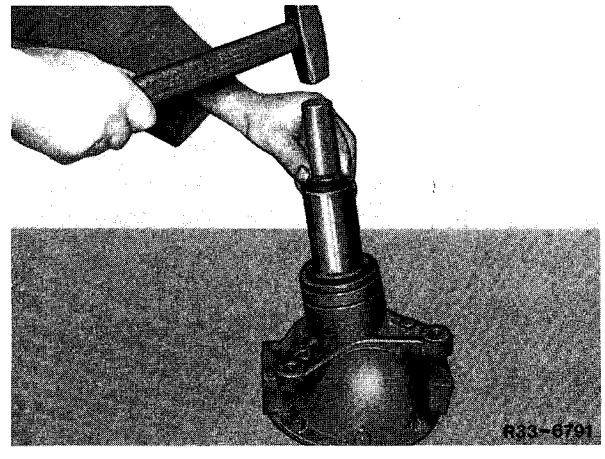
4 Turn joint housing around and drive in taper roller bearing outer race of outer wheel bearing with special tool and insert well-greased taper roller bearing.



Mandrel 363 589 04 15 00

5 Coat contact surface of radial sealing ring pointing toward joint housing with Teroson Fluid T 307 or Dichtin 51 sealing compound and drive in with special tool.

6 Pack joint housing with specified quantity of grease.



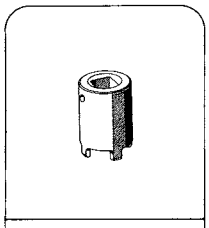
Mandrel 312 589 05 15 00 up to axle No. 7 000 560
Mandrel 387 589 04 15 00 from axle No. 7 000 561

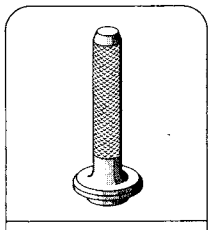
Note: From axle No. 7 0004 272 the steering or track arm is additionally secured at the joint housing with a Connex dowel pin. During repairs, check this pin for damage, renewing if necessary.

Tightening torques in Nm

Seal holder at joint housing			20 – 25
Track rod at track lever	M 16 x 1.5		120 – 140
Kingpin top at joint housing	M 12 x 1.5	10.9	110 – 125
	M 14 x 1.5	12.9	170 – 190
Track lever or steering arm at joint housing	M 12 x 1.5	12.9	150 – 170
	M 14 x 1.5	12.9	250 – 280

Special tools


460 589 00 07 00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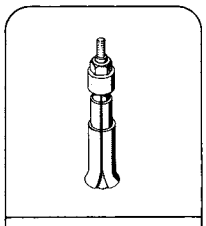
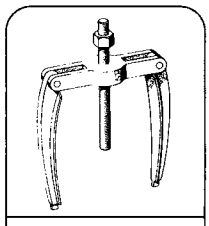
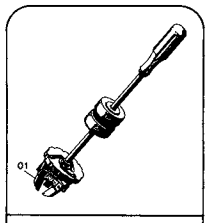
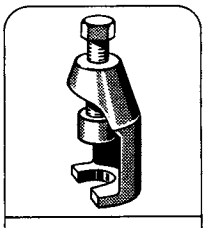

000 589 29 33 00


000 589 34 33 00



116 589 22 33 00

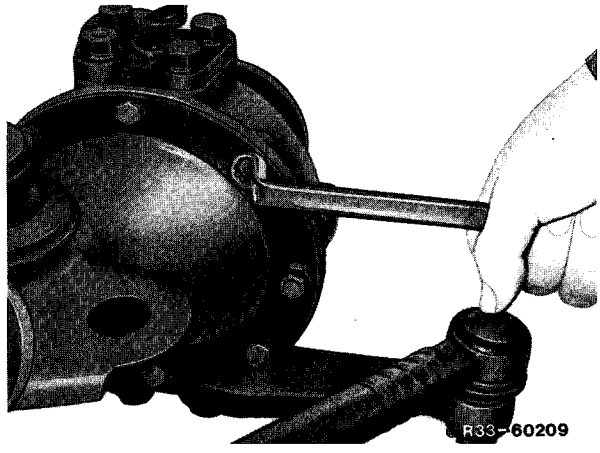

186 589 10 33 00

Removing

Note: The constant velocity joint shaft may also be removed complete with wheel hub and joint housing, e. g. for changing the gear set.

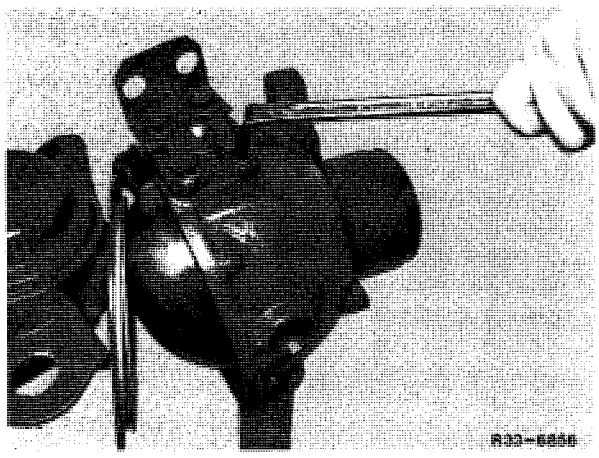
1 Remove wheel hub (33.61–220/1).

2 Unscrew seal holder with ball seal.

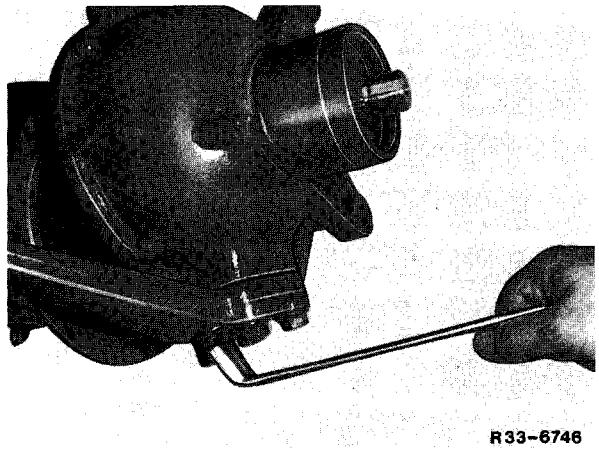


33.61 Removing and installing constant velocity joint shaft

3 Unscrew fastening bolts for kingpin at top and take off brake hose holder.



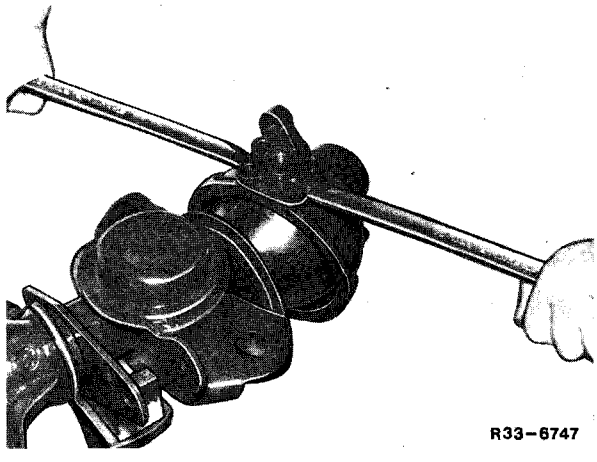
4 Unscrew steering arm or track lever at bottom and remove.



R33-6746

5 Remove kingpin at top.

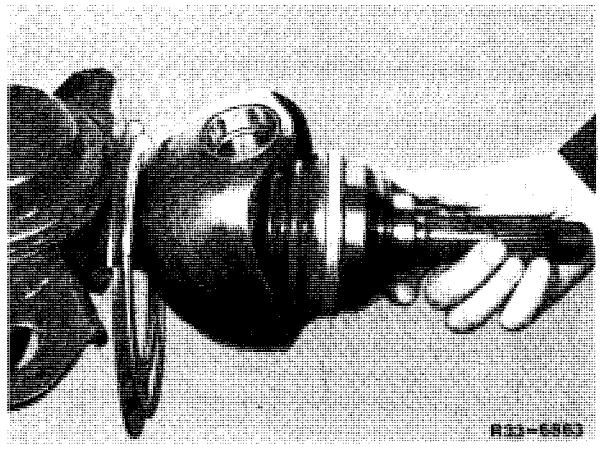
Note: Mark the shims of the kingpin and the steering arm or track lever and the taper roller bearings so that the original installation conditions exist when re-assembling.



R33-6747

6 Take off joint housing.

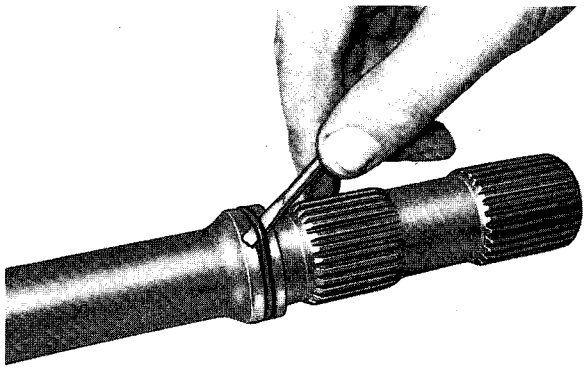
7 Pull out constant velocity joint shaft.



Up to Axle No. 7 023 946 refer to Notes 1 and 2.

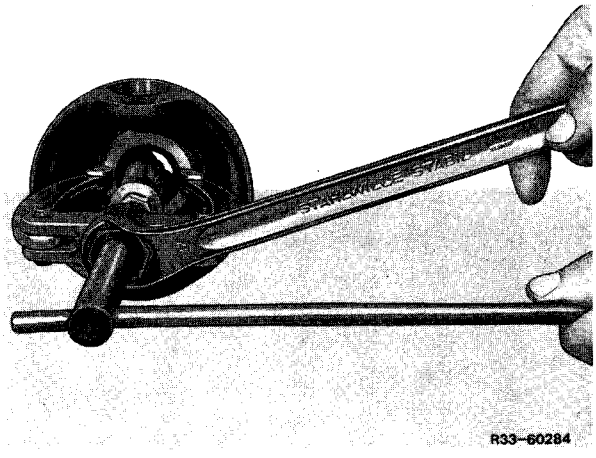
Note 1: Constant velocity joint shaft with differential lock gearing: check O ring and cup seal and replace if necessary.

Note 2: Constant velocity joint shaft without differential gearing: check bearing race for scoring from running-in and remove from shaft if damaged. If a new bearing race has to be fitted to the shaft, it should be heated to 100–110 °C and shrink-fitted. The shaft seat must be free of oil and grease. The bearing race chamfer must be pointing to the short end of the shaft.



R33-6758

From Axle No. 7 023 947 the seal was repositioned into the supporting tube to the outside. Remove the bush and radial seal using special tool.

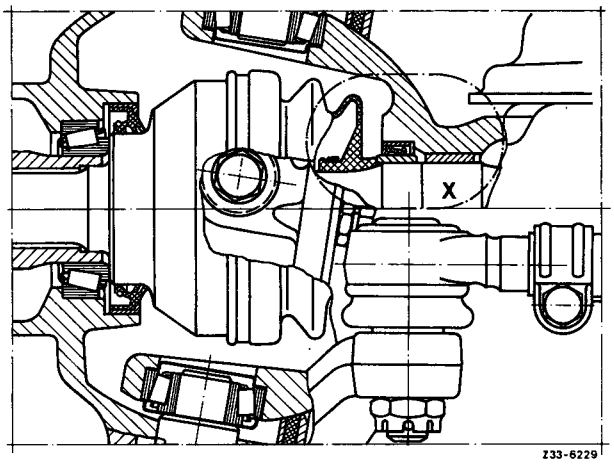


R33-60284

Puller	000 589 29 33 00
Counter support	000 589 34 33 00

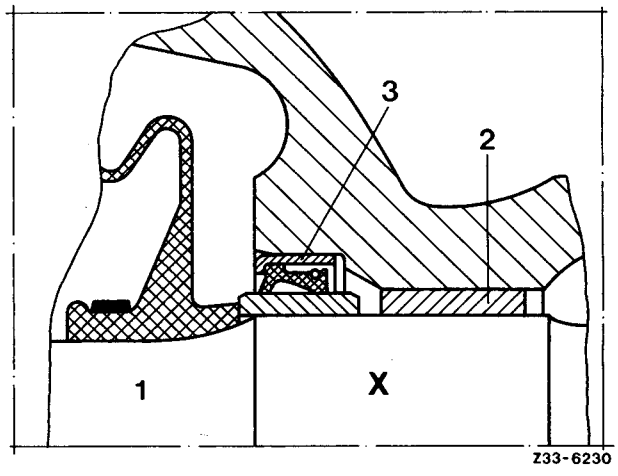
Installing

Note: From Axle No. 7 023 947 the seal is in the outer part of the supporting tube, see detail X.



Z33-6229

Location of seal on outside, detail X.

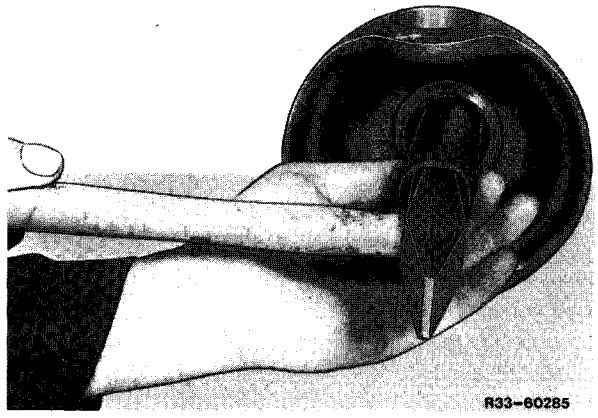


Z33-6230

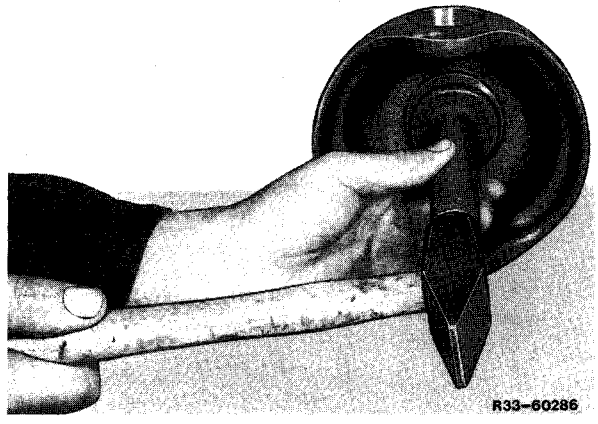
1 Drive shaft
2 Bush
3 Radial seal

33.61 Removing and installing constant velocity joint shaft

1 Install bush using suitable mandrel.



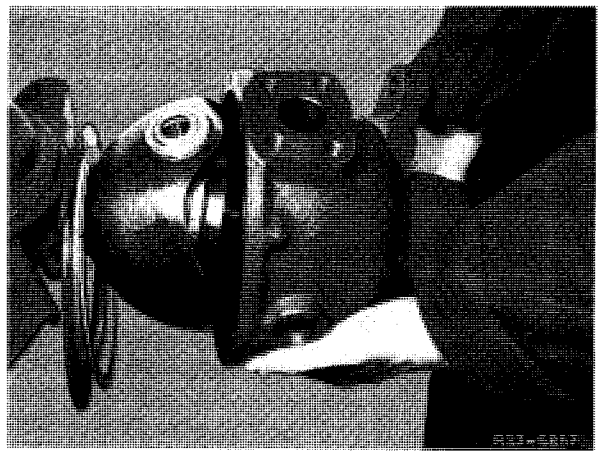
2 Knock in radial seal using special tool.



Mandrel 360 589 00 15 00

3 Introduce constant velocity joint shaft into the axle.

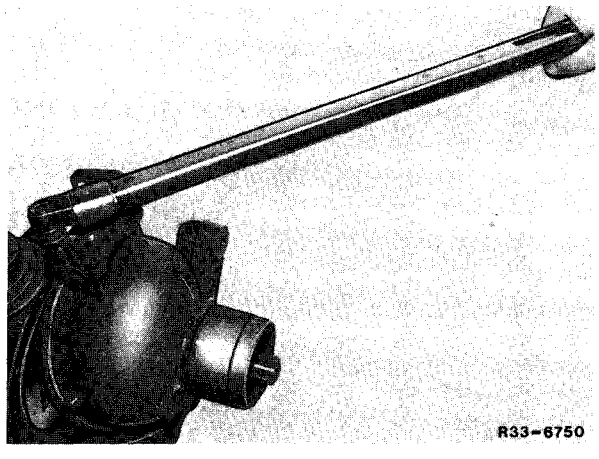
4 Mount joint housing.



5 Insert kingpin at top with shims and brake hose holder and tighten the fastening bolts with the specified tightening torque.

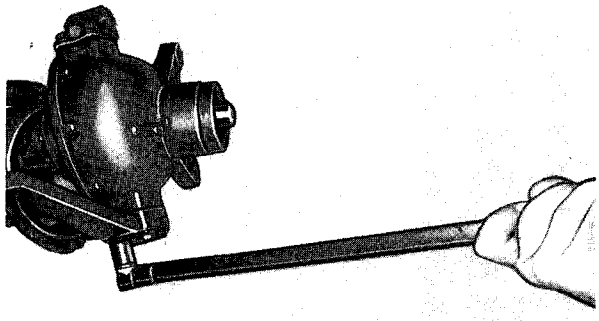
Thread	Strength	Tightening Torque (Nm)
M 12 x 1.5	10.9	110–125
M 14 x 1.5	12.9	170–190

Note: Install the shims as they were originally.



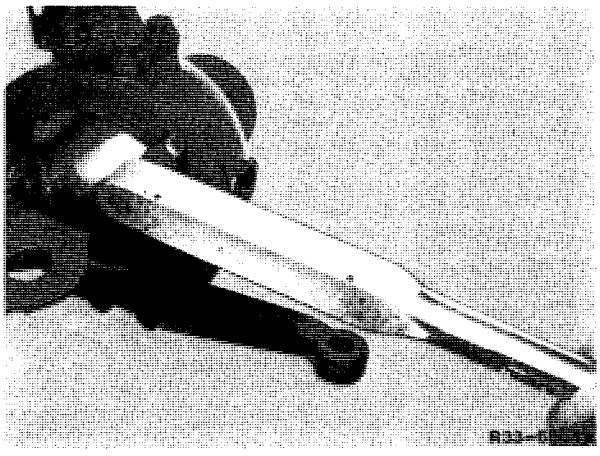
6 Insert track lever or steering arm at bottom with shim and tighten the fastening bolts with the specified tightening torque.

Thread	Strength	Tightening Torque (Nm)
M 12 x 1.5	12.9	150–170
M 14 x 1.5	12.9	250–280



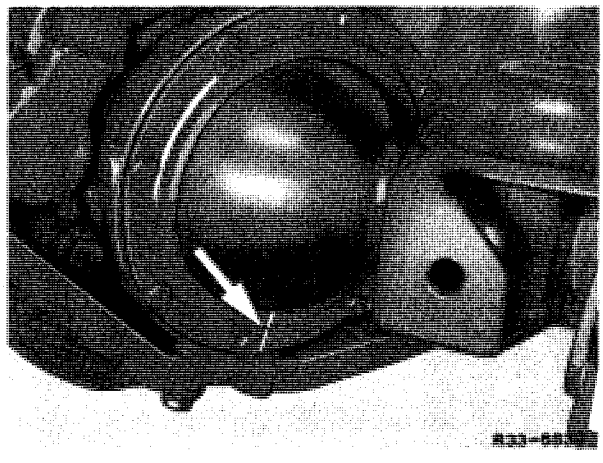
R33–6751

7 Bolt the seal holder onto the joint housing with 20–25 Nm.

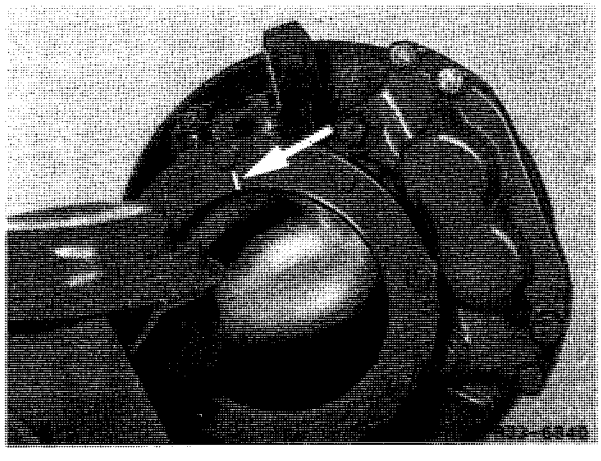


Note 1: Up to Axle No. 7 000 560 the seal holder is bolted on so that the parting face is pointing down.

Note 2: From Axle No. 7 000 561 a closed spherical seal with an inner and outer seal holder and a paper gasket is installed. The paper gasket is fitted between the outer seal holder and the joint housing. The parting face of the seal holder must now point up. It is not possible to convert older axles to the closed spherical seal unless the new joint housing is fitted at the same time.

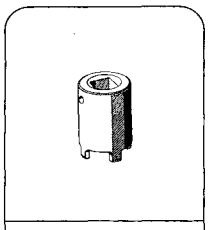


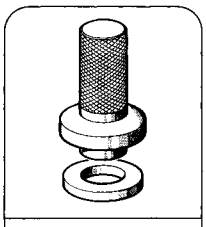
8 Install wheel and fixed caliper (33.61–220/3).

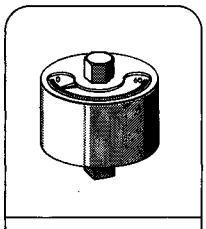


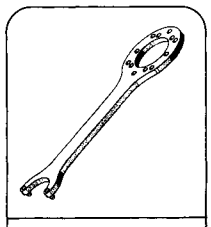
730.3

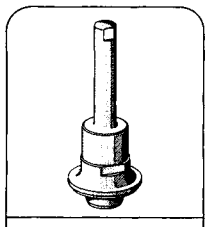
Special tools


460 589 00 07 00


460 589 15 15 00


001 589 49 21 00

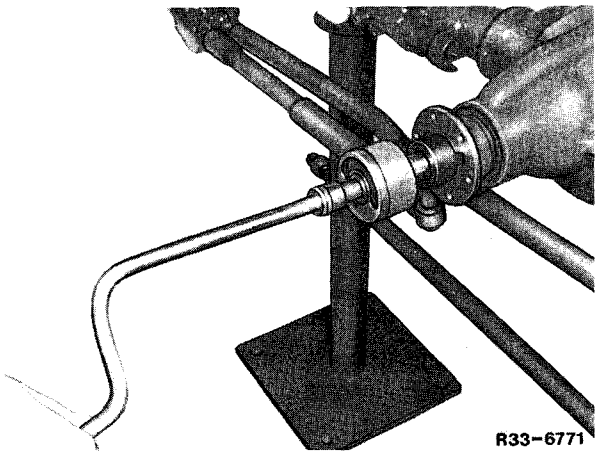

460 589 01 31 00


601 589 10 63 00

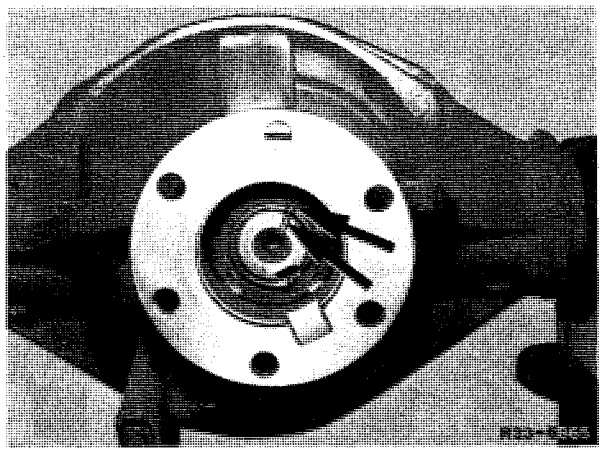
Replacing radial seal

1 It is essential to measure the friction torque of the entire axle using the special tool at the coupling flange (without wheels) before removing the coupling flange and seal.
Note the friction torque determined.

Jaw wrench 460 589 00 07 00
Torquemeter 001 589 49 21 00

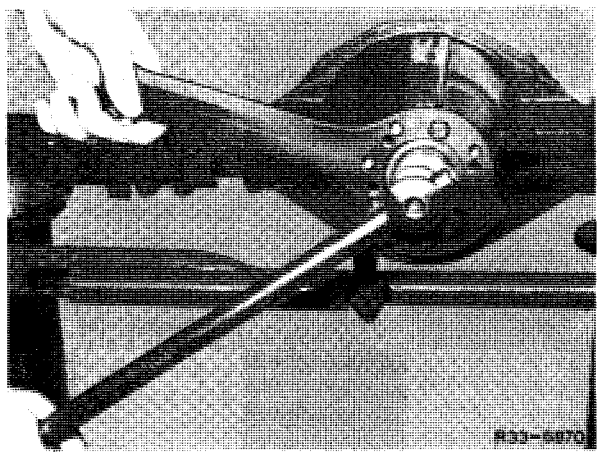

R33-6771

2 Mark the slotted nut and drive bevel gear with scoring tool to indicate their position relative to each other.



33.61 Replacing radial seal on drive bevel gear

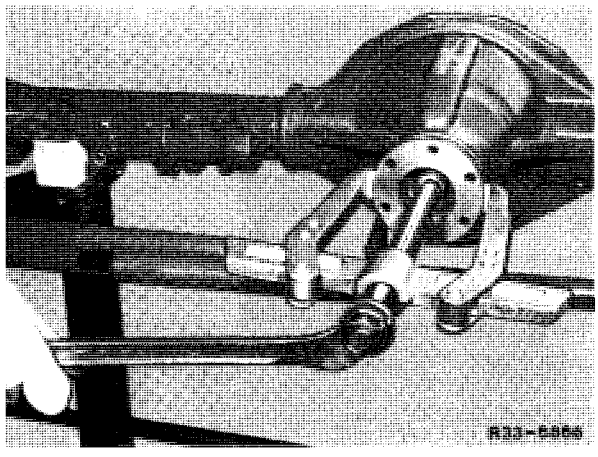
3 Bolt special tool onto the clutch flange and unscrew the slotted nut with special tool.



Jaw wrench 460 589 00 07 00
Retaining wrench 460 589 01 31 00

4 Pull off clutch flange with special tool and check for signs of damage and scoring from running-in, replace coupling flange if necessary.

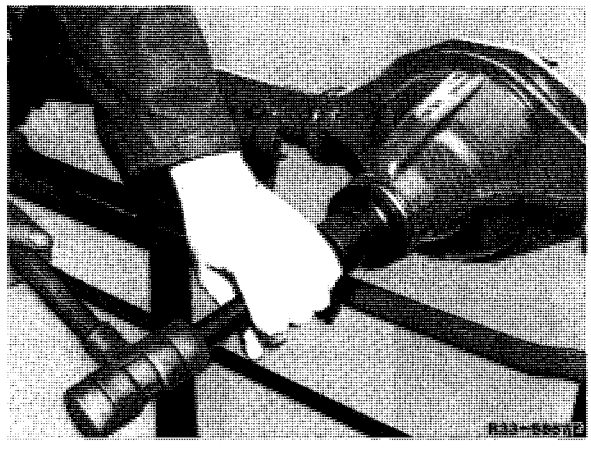
Note: On no account may the coupling flange be removed by hard blows from a hammer since this will result in damage to the bearings.



Puller 000 589 89 33 00

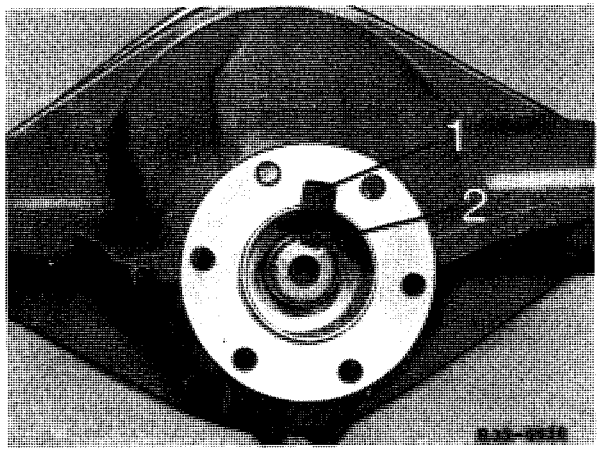
5 Remove damaged radial seals and knock in new seal far enough with plastic hammer and special tool until the insert is resting against the axle housing.

Note: Before installing radial seals, pack space between dust and sealing lips with grease, lightly oil lips. Coat the outer circumference of the radial seals with Teroson Fluid T 307 or Dichtin 51 sealing compound. Only 1 radial seal is fitted up to Axle No. 7 001 890. It is not possible to convert older axles to 2 seals.



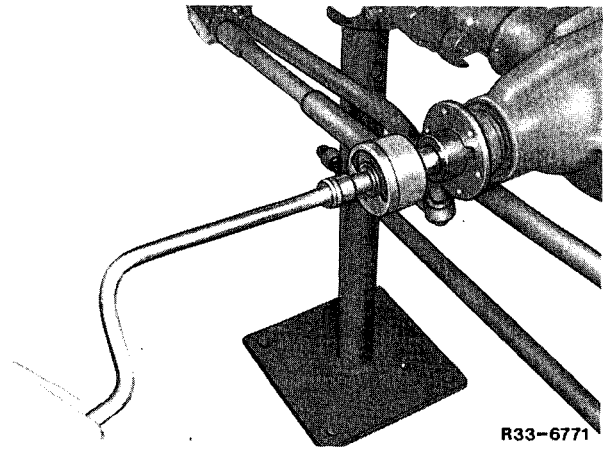
Mandrel 601 589 10 63 00 up to Axle No. 7 001 889
Mandrel 460 589 15 15 00 from Axle No. 7 001 890

6 Mount coupling flange on the drive bevel gear so that the notch on drive bevel gear is aligned with the notch of the coupling flange.



1 Notch on coupling flange
2 Notch on drive bevel gear

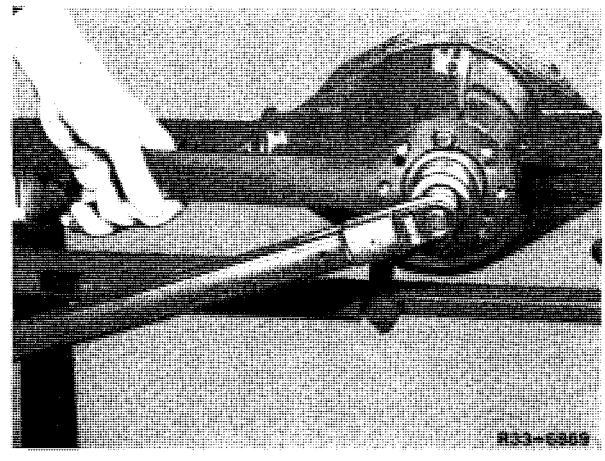
7 Screw on old slotted nut as far as the mark and measure the friction moment with special tool.



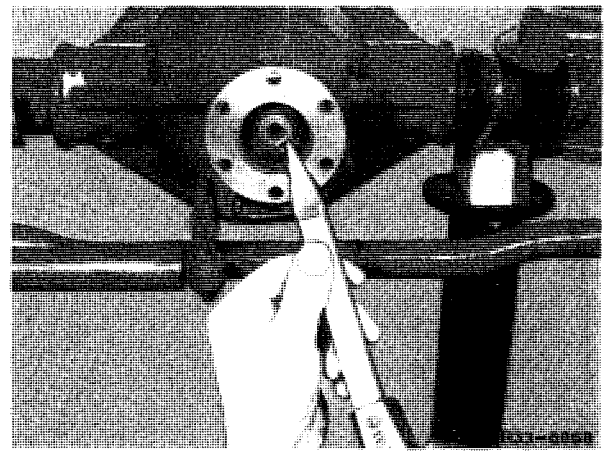
Claw wrench 460 589 00 07 00
Torquemeter 001 589 49 21 00

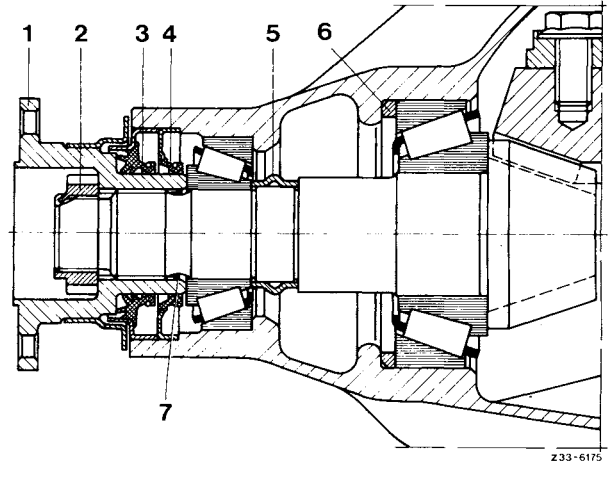
8 Remove old slotted nut. Fit new slotted nut, then slowly achieve specified friction moment by alternate tightening and measuring (rotating drive with torquemeter). The friction moment should exceed the value measured in Fig. 7 by 50 Ncm (5 kpcm).

Note: Check vertical and lateral runout of clutch flange with dial gauge at pilot for propeller shaft.
Permissible vertical runout: 0.1 mm
Permissible lateral runout: 0.1 mm



9 Secure slotted nut.
Note: If the slotted nut is inadvertently overtightened and the friction moment increased beyond the permitted tolerance, the gear set must be completely disassembled in this case since the compression ring has been compressed during incorrect installation and has lost its effect and cannot be removed without disassembling the axle. In addition, it is not permitted to reinstall for the repair a slotted nut which has been previously used since this would also cause the drive bearing to fail prematurely.





1 Clutch flange
2 Slotted nut
3 Radial sealing ring
4 Radial sealing ring
5 Compression ring
6 Shim
7 O-ring

730.3

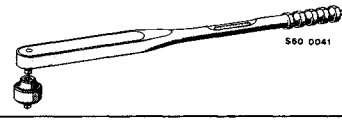
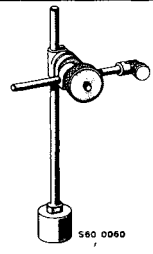
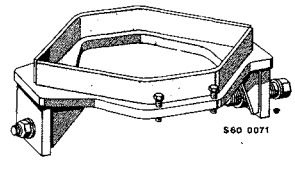
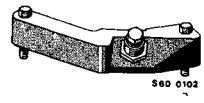
Ajustment values

Backlash	0.1 – 0.15

Tightening torques Nm (kpm)

Bearing bracket on axle housing M 10	65 – 75 (6.5 – 7.5)
Cover on axle housing M 8 10.9	40 – 50 (4 – 5)

Specials tools

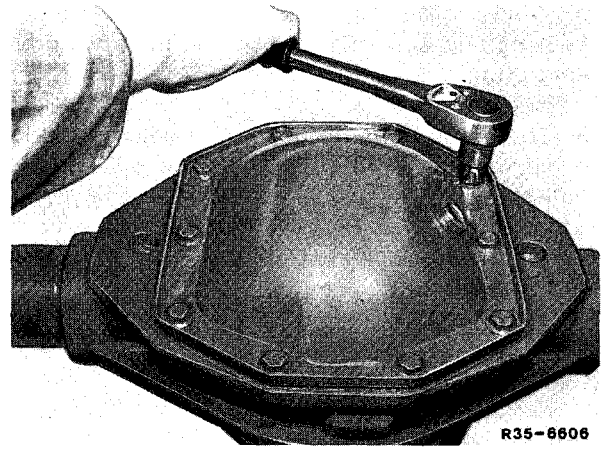
Torque wrench 20 – 100 Nm	 S60 0041	000 589 64 21 00
Dial gauge	 S60 0048	001 589 53 21 00
Measuring instrument	 S60 0060	363 589 02 21 00
Expander	 S60 0071	601 589 00 31 00
Retaining device	 S60 0102	601 589 01 40 00
Spring balance	 S60 0139	000 589 03 65 00

Removal

1 Drain oil (33.61 – 013).

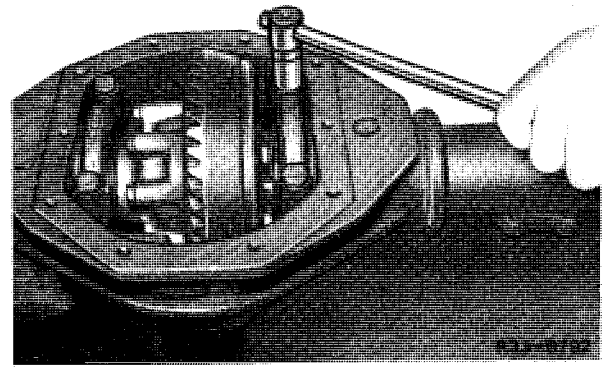
2 Unscrew cover and remove with gasket.

3 Remove constant velocity propeller shafts (33.61 – 250).


R35-6606

4 Unscrew and remove bearing brackets.

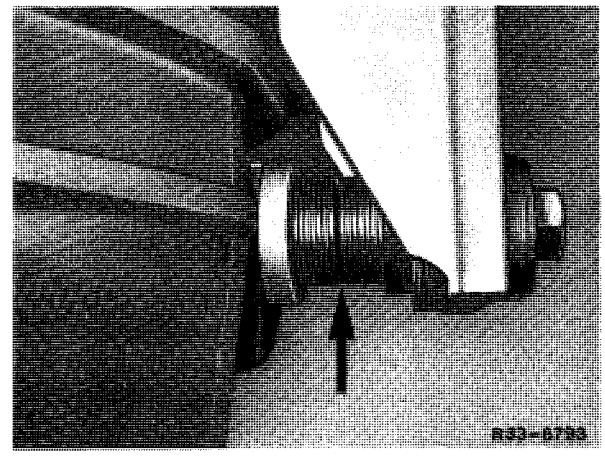
Note: Mark the bearing brackets, shims and taper roller bearing outer races to enable them to be re-installed in their original positions.



5 Mount special tool on axle housing and tighten so that the differential can be removed.

Note: The clamping bolt of the expander must only be tightened to the point where the Belleville springs make full contact (refer to arrow).

Expander 601 589 00 31 00

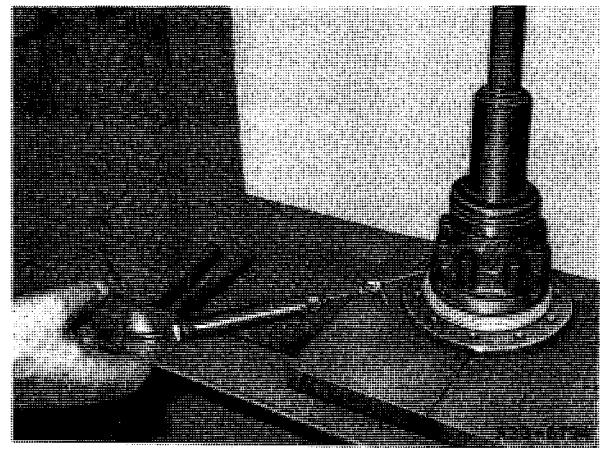


Installation

Note: If a new differential housing or different taper roller bearings are fitted, the preload of the differential housing bearings must be determined afresh.

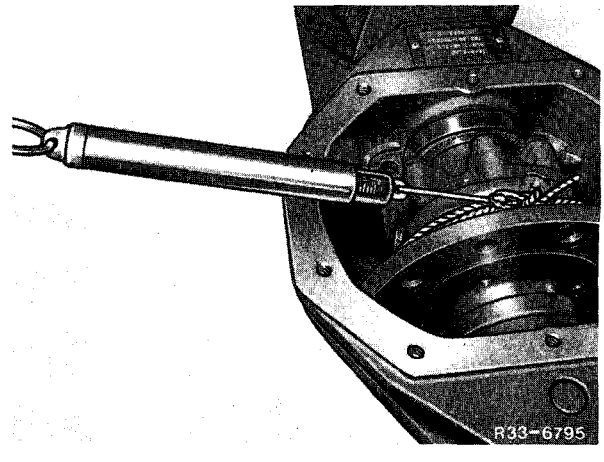
1 Load differential housing with taper roller bearings and taper roller bearing outer races in a press to 700 ± 50 kp.

Spring balance 000 589 03 65 00

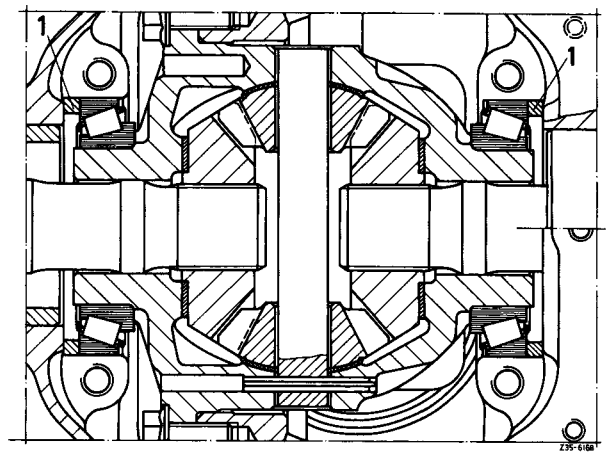


2 Wind a cord several times around the differential housing and determine the tensile force with the special tool.

3 The tensile force at the spring balance determined in the press must also be reached in the axle housing. It can be modified by installing shims. Shims are available in sizes from 4.90 to 6.08 mm in steps of 0.02 mm.

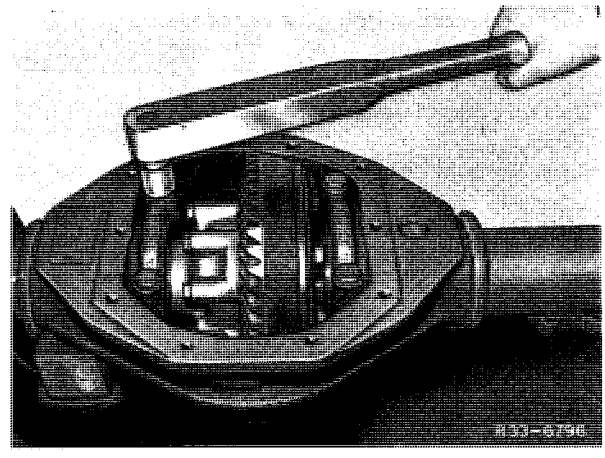


Note: The expander must not be tightened when determining the friction moment in the axle housing.



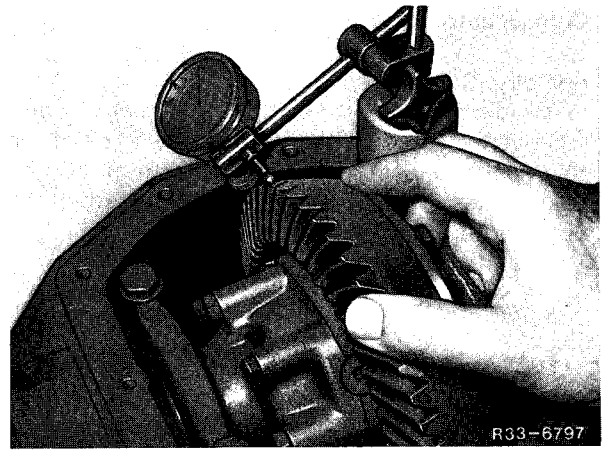
1 Shims

4 If no parts in the differential housing are replaced, preload the axle housing with expander 601 589 00 31 00, re-install the differential housing with shims, taper roller bearing outer races and bearing brackets in their original position.



5 Torque the fastening bolts of the bearing brackets to 65–75 Nm.

6 Fit special tool with dial gauge to axle housing so that feeler pin of the dial gauge is at right angles to the tooth face. Check backlash by moving the ring gear back and forward. Repeat this operation at at least four points around the circumference of the ring gear.



Measuring instrument	363 589 02 21 00
Dial gauge	001 589 53 21 00

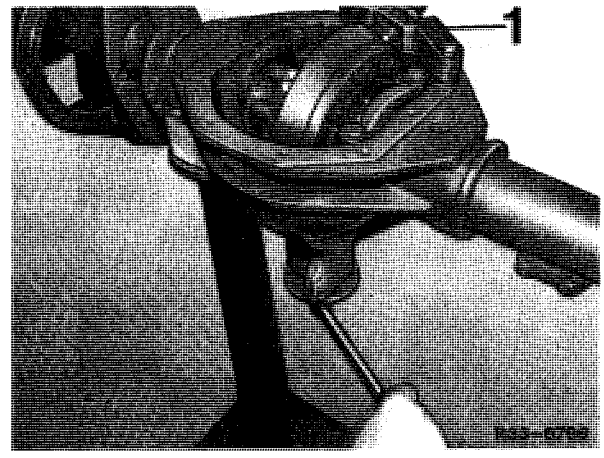
Note: The backlash is altered by fitting shims. If a thinner shim is fitted on one side, a shim thicker by the same amount must be installed on the opposite side of the differential housing to maintain the preload on the differential housing bearings.

33.61 Removal and Installation of Ring Gear with Differential

Checking contact pattern

The manufacturing tolerances of the ring gear and drive pinion are such as to provide adequate adjustment of basic dimension and backlash for installation.

It is good practice, however, to check the contact pattern of the gear set. For this purpose, coat three ring gear teeth offset by 180° with India ink. Fit the special tool to the axle housing and press against ring gear, then turn forward and backward at drive pinion.

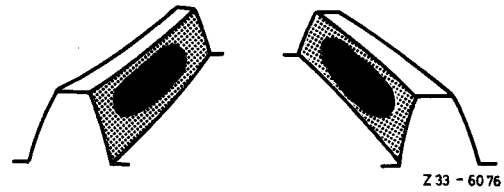


1 Retaining device 601 589 01 40 00

Contact pattern at ring gear under load (ring gear braked)

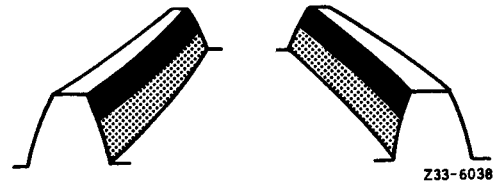
Correct contact pattern

Such an ideal contact pattern can generally not be achieved in practice. The important aspect is, however, that the contact pattern does not at any point touch the outer edge of the tooth face.



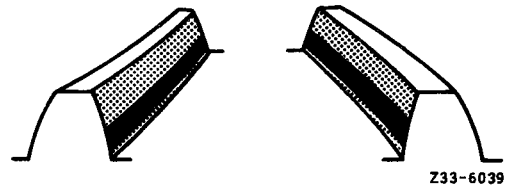
Contact at tooth tip (incorrect)

Remedy: Slightly reduce the installation distance (basic dimension) of the drive pinion and simultaneously increase the installation distance of the ring gear slightly, i.e., so that the teeth of the ring gear do not engage so deeply into the teeth of the drive pinion to maintain the correct backlash.



Contact at base of tooth (incorrect)

Remedy: Slightly increase the installation distance (basic dimension) of the drive pinion and simultaneously reduce the installation distance of the ring gear slightly, i.e., so that the teeth of the ring gear engage more deeply into the teeth of the drive pinion to maintain the correct backlash.

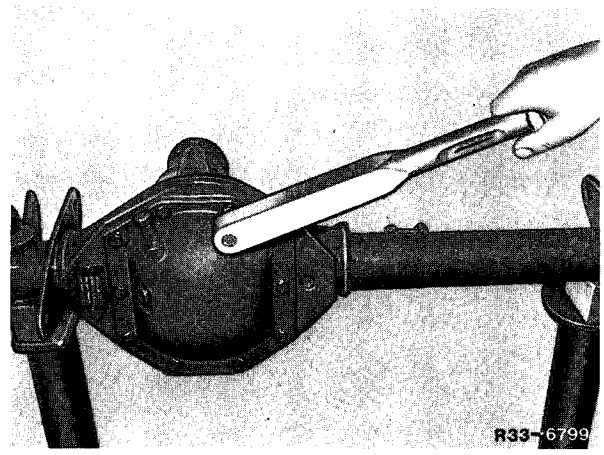


7 Coat both sides of gasket (Part No. 601 351 50 80) on cover with Terolan 2105 or Curilin sealing compound and bolt to axle housing with cover. Torque fastening bolts to 40–50 Nm.

Note: From axle No. 6 597 807 a second gasket with the Part No. 601 351 51 80 was approved.
This gasket, make Reinzoflex, must not be fitted with sealing compound.

8 Install constant velocity propeller shaft or complete assembly with joint housing and wheel hub (33.61–250).

9 Fill in oil (33.61–013)

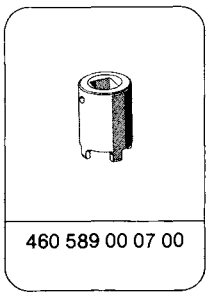


730.3

Settings

Friction value of drive bevel gear with radial seal	2.5 – 3 Nm

Special tools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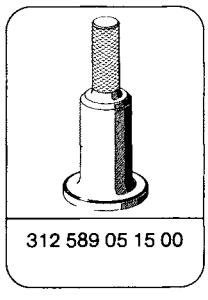
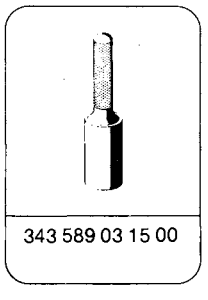
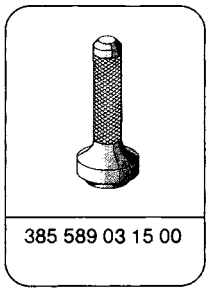
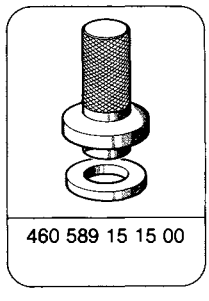
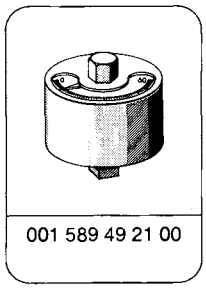
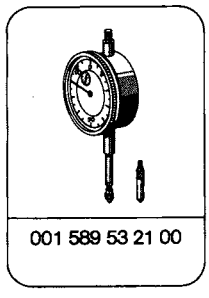

312 589 05 15 00

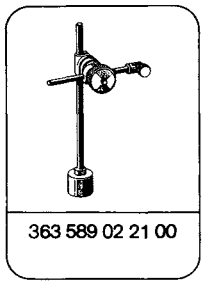

343 589 03 15 00

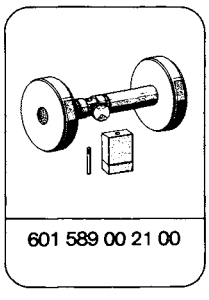

385 589 03 15 00

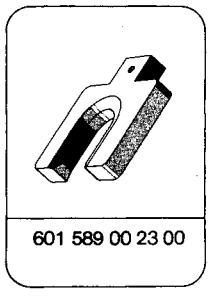

460 589 15 15 00


001 589 49 21 00


001 589 53 21 00


363 589 02 21 00


601 589 00 21 00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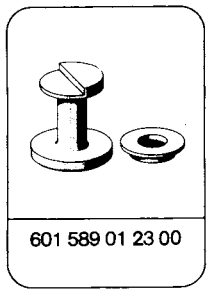
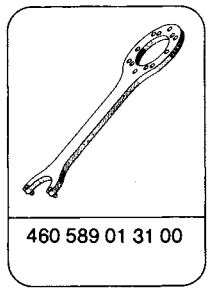
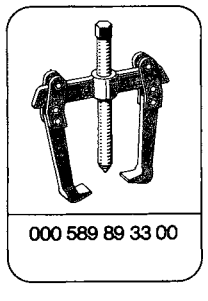
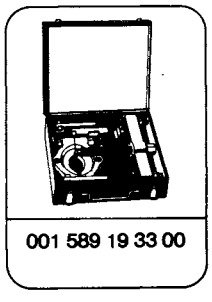
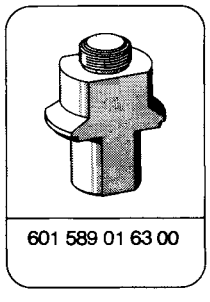
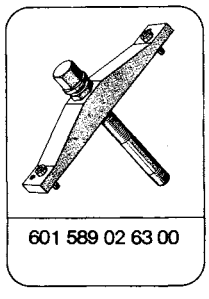

601 589 01 23 00

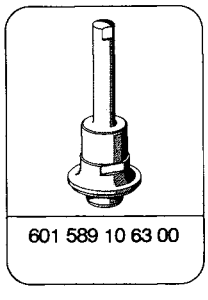

460 589 01 31 00


000 589 89 33 00


001 589 19 33 00


601 589 01 63 00


601 589 02 63 00

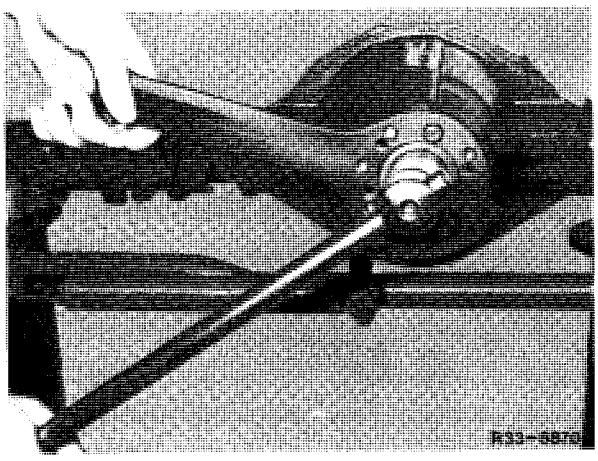

601 589 10 63 00

33.61 Removing, disassembling, reassembling and installing drive bevel gear

Removing and disassembling

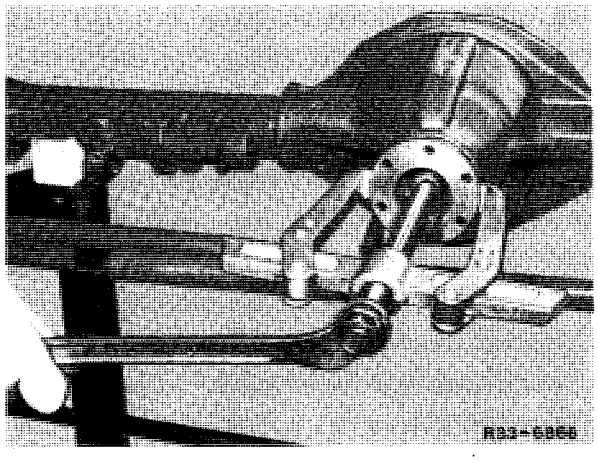
1 Remove differential (33.61–300).

2 Bolt special tool onto the coupling flange and unscrew the slotted nut with special tool.



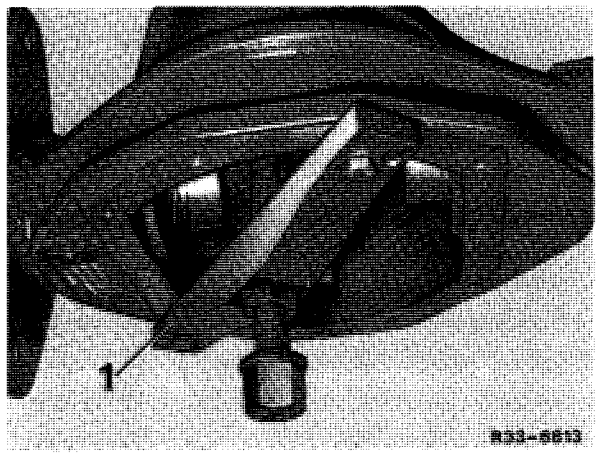
Retaining wrench 460 589 01 31 00
Jaw wrench 460 589 00 07 00

3 Pull coupling flange off drive bevel gear using special tool.



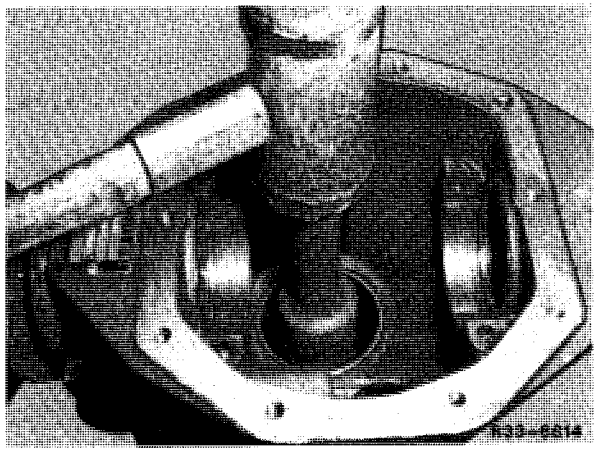
Puller 000 589 89 33 00

4 Bolt special tool onto axle housing, knock out the drive bevel gear and take off together with compression ring.



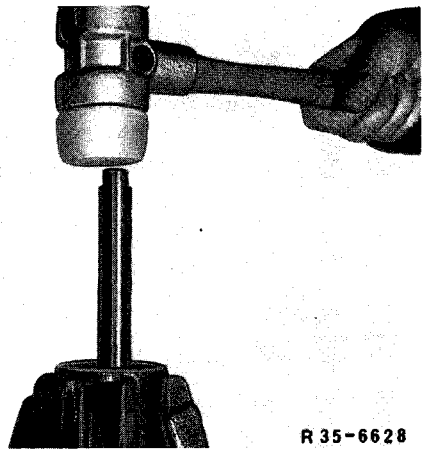
1 Supporting bridge 601 589 02 63 00

5 Knock the taper roller bearing and the radial seal at the flange end out of the axle housing using the special tool.



Mandrel 343 589 03 15 00

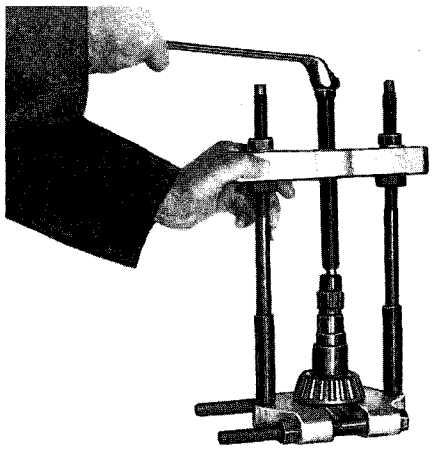
6 Knock the bearing outer race of the taper roller bearing at the pinion end out of the axle housing with special tool and take off the spacer ring.


R 35-6628

Mandrel 460 589 15 15 00
Insert 601 589 01 63 00

7 Pull the taper roller bearing off the drive bevel gear using special tool.

8 Clean all parts and check for signs of wear.

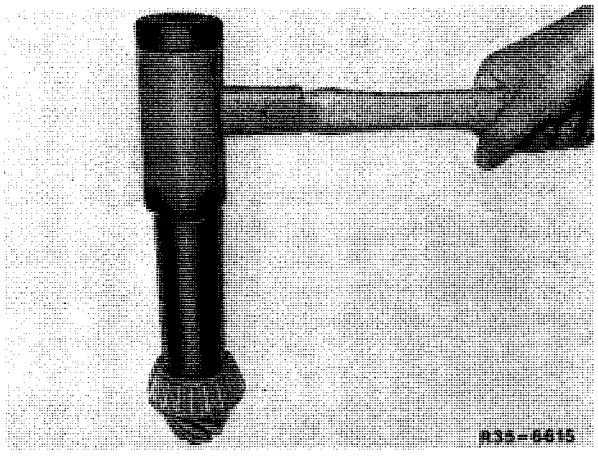

R35-6629

Puller 001 589 19 33 00

Reassembling and installing

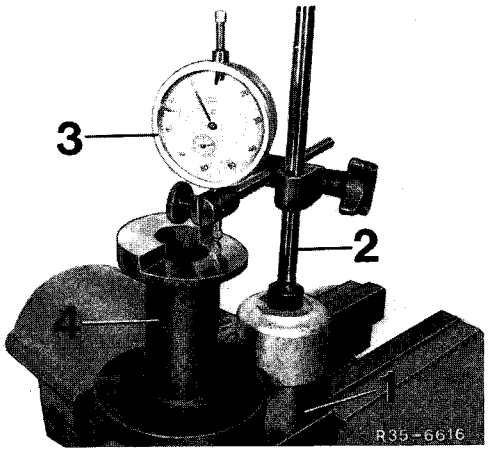
1 Knock the taper roller bearing onto the drive bevel gear with a suitable sleeve.

Note: If installing a different gear set or replacing the taper roller bearing at the pinion end, operations 2 to 6 below must be performed.


R35-6615

2 Clamp measuring plate (1) into the vice and mount measuring instrument (2) with dial gauge (3) inserted. Mount measuring piece (4) onto measuring plate, create pretension of 8 mm at dial gauge and set to zero.

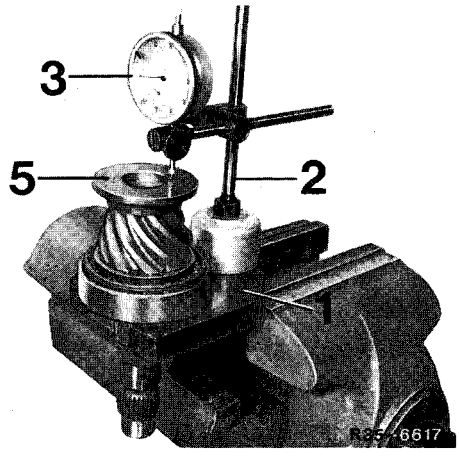
Note: Use the lower end of the measuring piece for setting.



1	Measuring plate	601 589 00 23 00
2	Measuring instrument	363 589 02 21 00
3	Dial gauge	001 589 53 21 00
4	Measuring piece	601 589 01 23 00

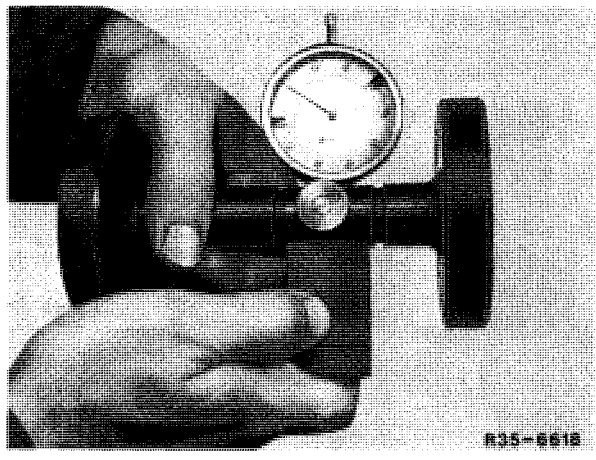
33.61 Removing, disassembling, reassembling and installing drive bevel gear

3 Mount the drive bevel gear on the measuring plate together with taper roller bearing and magnetic plate (5) (from special tool 601 589 01 23 00) and rotate several times. The difference of drive bevel gear with taper roller bearing to the measuring piece can then be noted.



1	Measuring plate	601 589 00 23 00
2	Measuring instrument	363 589 02 21 00
3	Dial gauge	001 589 53 21 00
5	Magnetic plate	601 589 01 23 00

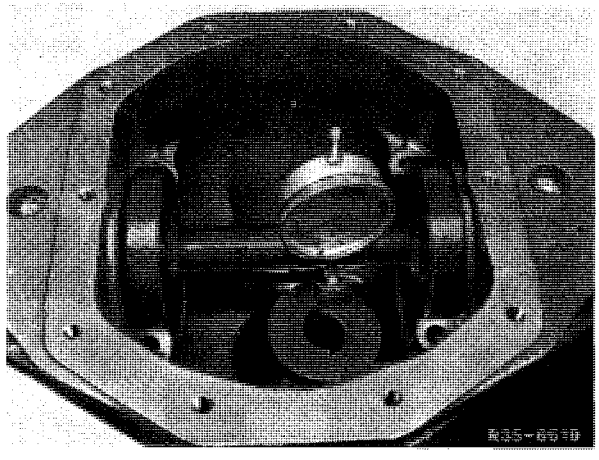
4 Set the adjusting instrument to the specified setting of 66 mm for checking. This is done by screwing the measuring pin (on circumference of adj. instrument) into the dial gauge, pressing the spacer firmly against the adjusting instrument. Create a pretension of 2 mm at the dial gauge and set the gauge to zero.



	Adjusting instrument	601 589 00 21 00

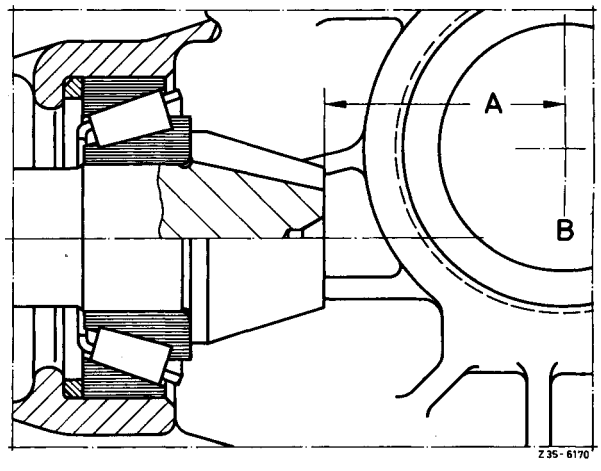
5 Insert the measuring piece (1) into the axle housing, then introduce the adjusting instrument (2) and measure the production difference of the axle housing to the specified basic size of 66 mm.

Note: If there is a difference toward the centre of the crown gear (gauge indicates more than 2 mm), deduct this difference from the difference noted in step 3. If there is a difference toward the drive bevel gear, (gauge indicates less than 2 mm), add this difference to the difference noted in step 3.



1	Measuring piece	601 589 01 23 00
2	Adjusting instrument	601 589 00 21 00

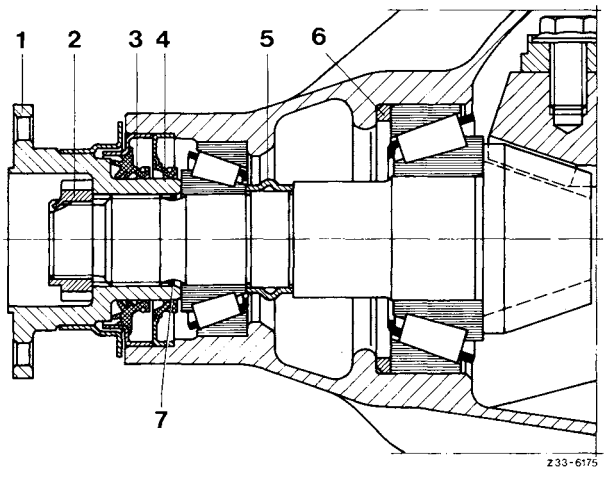
6 Determine the difference of the specified basic size of 66 mm to the basic size for the gear set being fitted (inscribed electrically on drive bevel gear).



A Basic size to be set
B Centre of crown gear

Note: If the difference is toward the crown gear (size less than 66 mm), again add the difference to the difference noted in step 3. If the difference is toward the drive bevel gear (size greater than 66 mm), deduct the difference from the difference noted in step 3. The size determined in this way is the thickness of the spacer ring. Spacer rings are available in sizes from 5.0 to 5.68 mm in 0.02 mm graduations.

Example: The difference measured from measuring piece to drive bevel gear with taper roller bearing and magnetic plate is 5.30 mm.
The production difference measured for the axle housing to the specified basic size of 66 mm is 0.12 mm toward the centre of crown gear. The inscribed basic size is 65.84 mm.
5.30 − 0.12 + 0.16 = 5.34 mm.
In this case the spacer ring fitted is 5.34 mm thick.

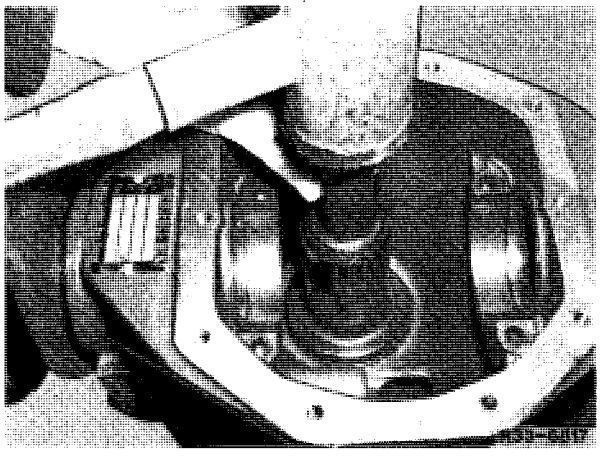


1 Coupling flange
2 Slotted nut
3 Radial seal
4 Radial seal
5 Compression ring
6 Spacer ring
7 O ring

7 Insert the calculated spacer ring in the axle housing so that the chamfer is pointing toward the coupling flange.

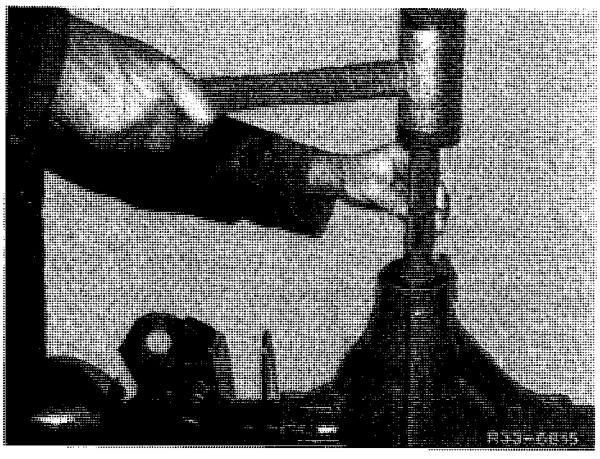
8 Knock in the taper roller bearing outer race of the pinion end bearing with special tool.

Note: Since the housing is not machined flat, the bearing outer race must be driven in with a suitable copper or brass mandrel far enough for it to centre itself, then knocked in fully with mandrel 312 589 05 15 00.



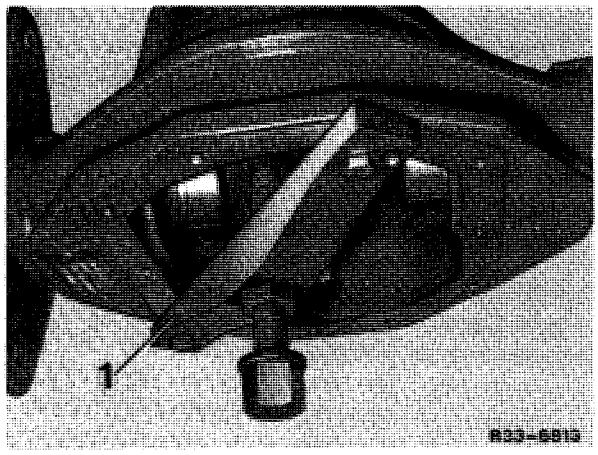
Mandrel 312 589 05 15 00

9 Knock in the taper roller bearing outer race of the flange end bearing with special tool.



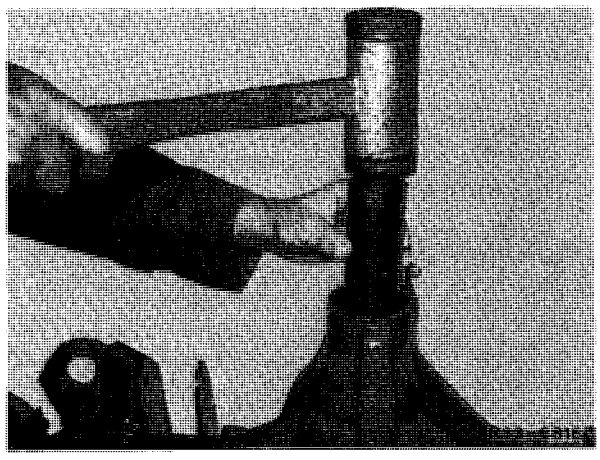
Mandrel 385 589 03 15 00

10 Insert drive bevel gear, bolt on special tool and position the spindle against drive bevel gear.



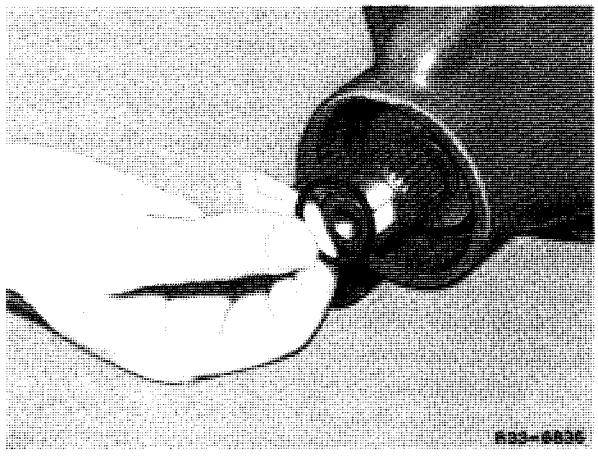
1 Supporting bridge 601 589 02 63 00

11 Fit new compression ring onto drive bevel gear and knock in the outer taper roller bearing with a suitable sleeve.



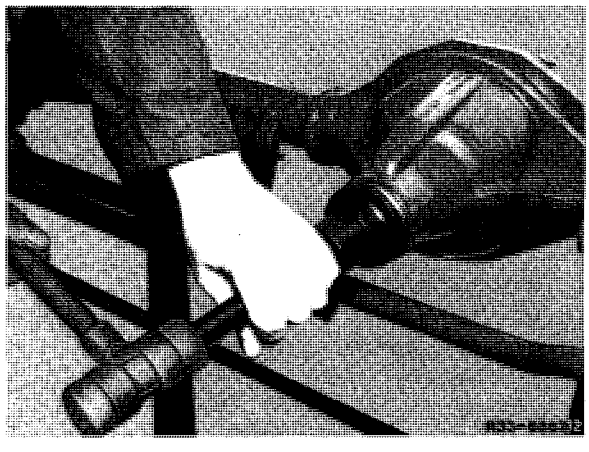
12 Fit O ring onto the drive bevel gear and push on until it rests against taper roller bearing.

Note: The O ring is fitted as standard only from Axle No. 7 001 890.



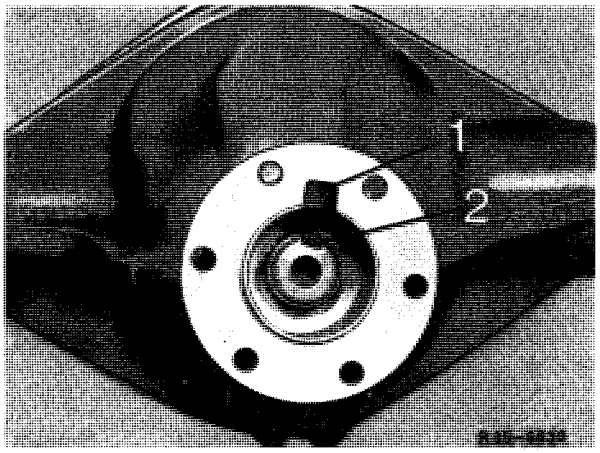
13 Knock in both radial seals with plastic hammer and special tool far enough for the insert of the thrust piece to rest against the axle housing.

Note: Apply a thin coat of Teroson Fluid T 307 sealing compound to outer circumference of radial seals before fitting. Pack gap between dust and sealing lips with grease, lightly oil lips.
Up to Axle No. 7 001 890 only 1 radial seal is fitted. It is not possible to convert older axles to 2 radial seals.



Mandrel 601 589 10 63 00 up to Axle No. 7 001 889
Mandrel 460 589 15 15 00 from Axle No. 7 001 890

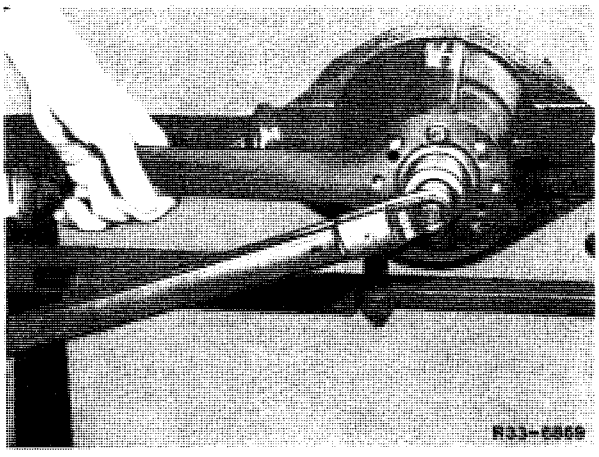
14 Mount coupling flange on the drive bevel gear so that the notch on the bevel gear is aligned with the notch on the coupling flange.



1 Notch on coupling flange
2 Notch on drive bevel gear

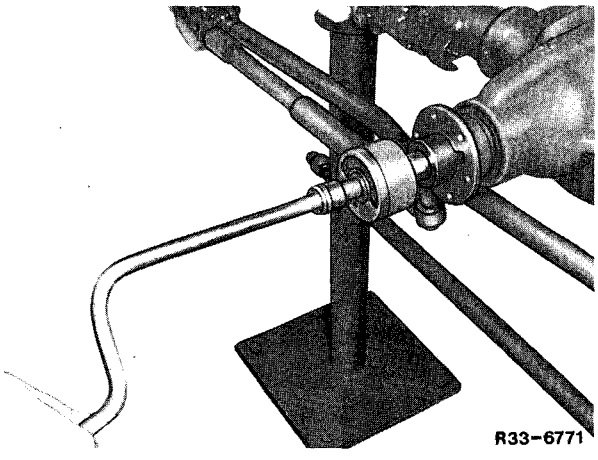
15 Bolt special tool onto coupling flange, screw on slotted nut and tighten firmly enough with special tool to reach the specified friction value.

Note 1: Check vertical and lateral runout of coupling flange with dial gauge at the pilot for universal shaft.
Permissible vertical runout: 0.1 mm
Permissible lateral runout: 0.1 mm



Retaining wrench	460 589 01 31 00
Jaw wrench	460 589 00 07 00

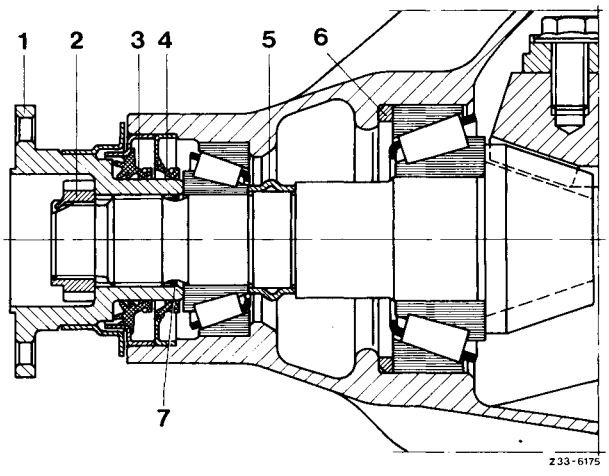
Note 2: Check the friction value of the drive bevel gear with special tool. The friction value of the bevel gear must never be achieved by turning back the slotted nut. If the slotted nut has been over-tightened, a new compression ring must then always be fitted.



Torquemeter 001 589 49 21 00

16 As a check, we recommend re-checking the basic size inscribed on the drive bevel gear, as described in steps 4 and 5. This requires the magnetic plate being mounted on the drive bevel gear.

17 Secure the slotted nut by caulking the collar in the slot provided.



1 Coupling flange
2 Slotted nut
3 Radial seal
4 Radial seal
5 Compression ring
6 Spacer ring
7 O ring

730.3

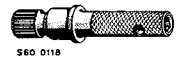
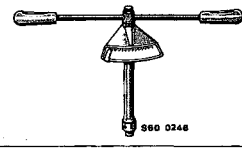
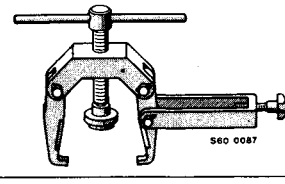
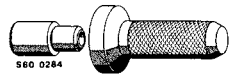
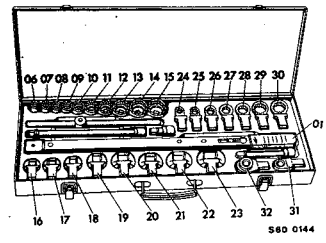
Adjustment values in Nm (kpm)

Friction moment when turning the complete differential			20 – 40	(2 – 4)

Tightening torques in Nm (kpm)

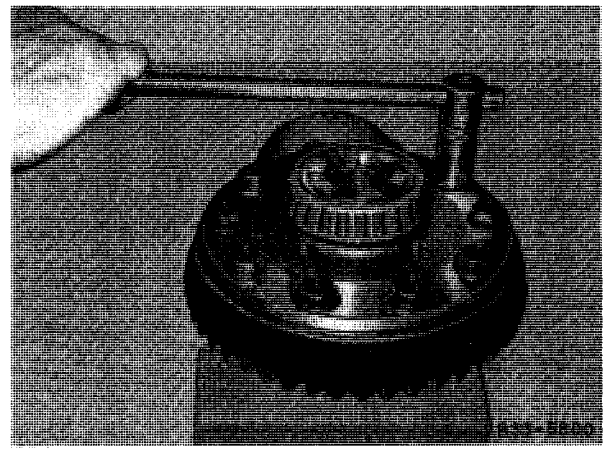
Ring gear at differential housing	M 12 x 1	10.9	130 – 145	(13 – 14.5)
Cover at differential housing	M 8		30 – 35	(3 – 3.5)

Special tools

Mandrel	 S60 0118	460 589 11 15 00
Torque wrench	 S60 0246	000 589 27 21 00
Torque wrench 20 – 100 Nm	 S60 0041	000 589 64 21 00
Puller	 S60 0087	123 589 08 33 00
Mandrel	 S60 0284	116 589 08 61 00
Torque wrench 80 – 400 Nm	 S60 0144	000 589 10 99 01

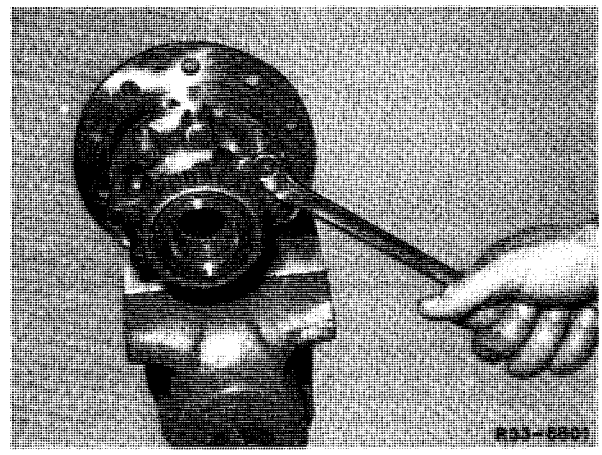
Disassembly

1 Unscrew ring gear fastening bolts and remove ring gear by knocking downward around circumference with a soft mandrel.

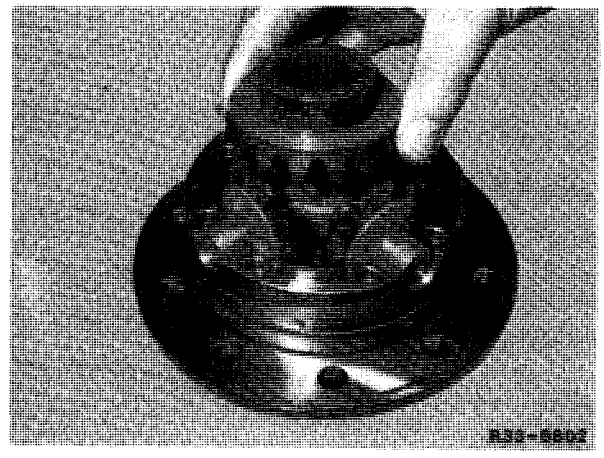


33.61 Disassembly and Reassembly of Differential (with Differential Lock)

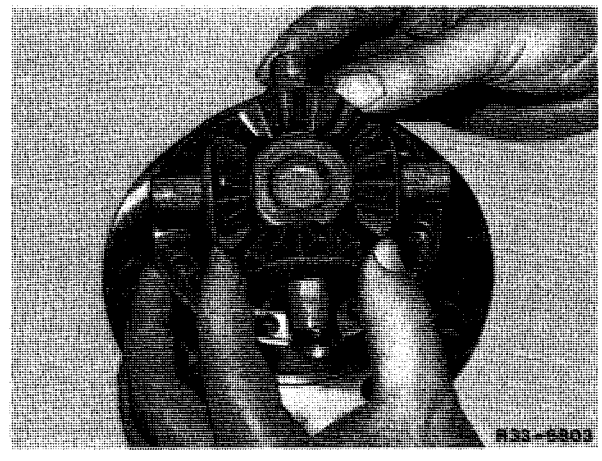
2 Unscrew fastening bolts of cover and remove cover.



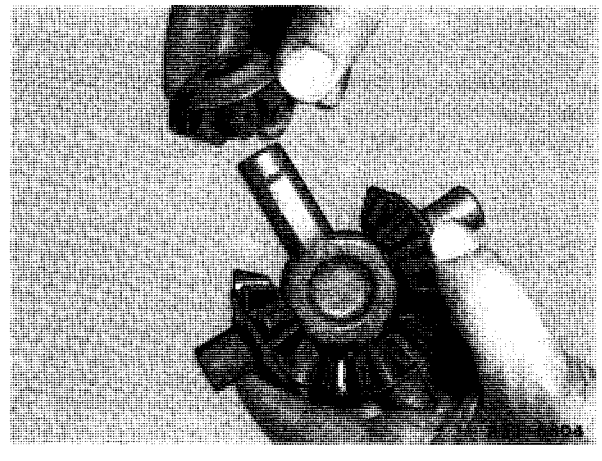
3 Remove side gear with shim from cover.



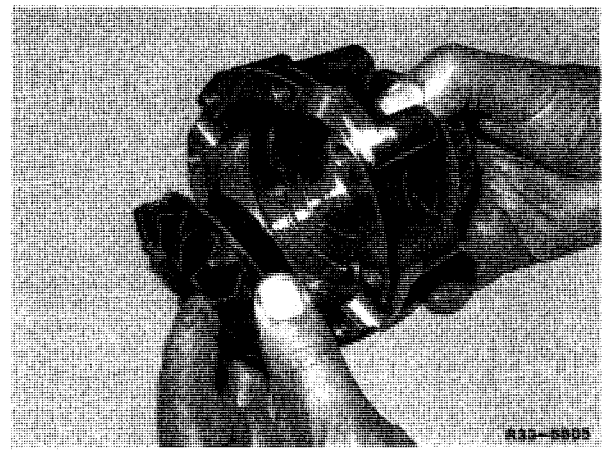
4 Remove differential spider with differential pinions.



5 Remove differential pinions with spherical washers from spider.

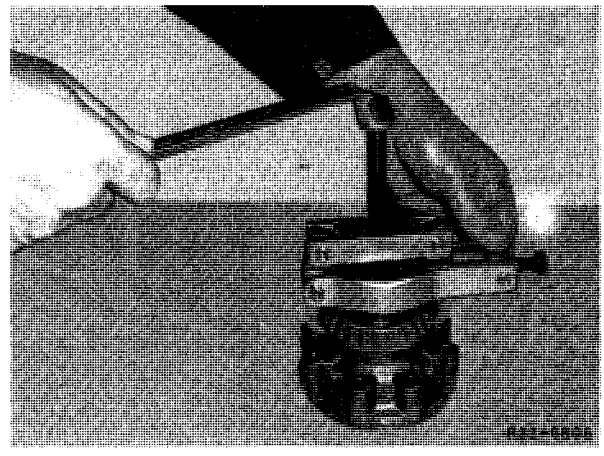


6 Remove side gear with washer from differential housing.



7 Pull both taper roller bearings of differential housing or cover with special tool.

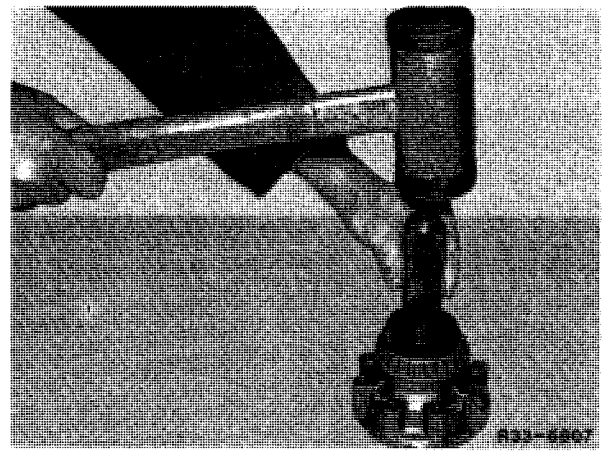
8 Clean all parts and check for wear.



Puller 123 589 08 33 00

Reassembly

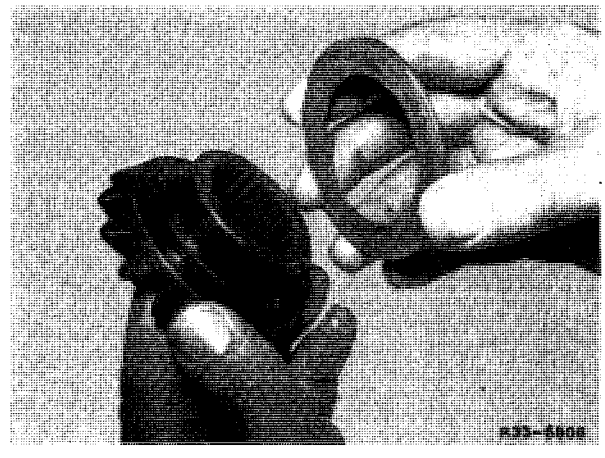
1 Drive both taper roller bearings onto differential housing or cover with special tool.



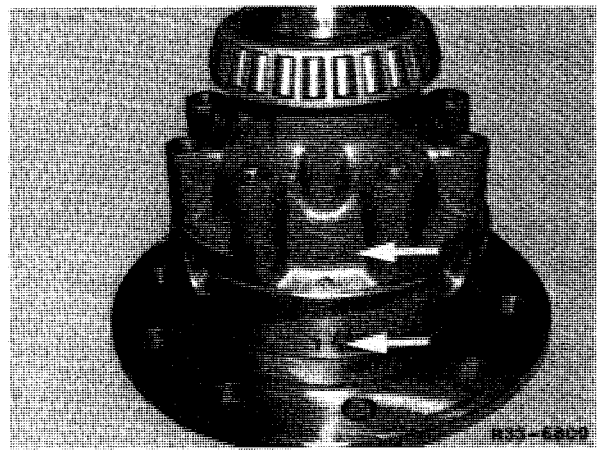
Mandrel 116 589 08 61 00

2 Fit shims to both side gears so that the groove is pointing toward the side gear and insert the side gears in the differential housing or cover.

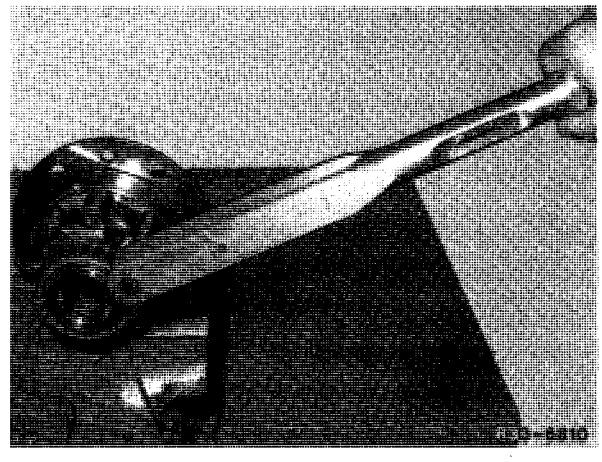
3 Fit differential pinions with spherical washers to the differential spider and install this on the differential housing.



4 Fit cover to differential housing so that the marks agree (same numbers).



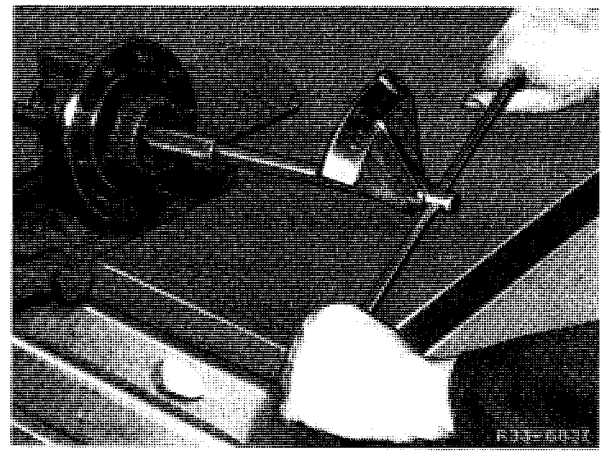
5 Torque fastening bolts of cover to 30–35 Nm.



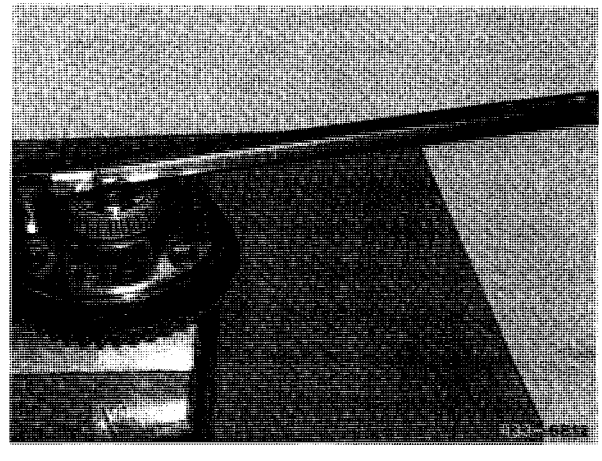
6 Check friction moment with special tool. Specified friction moment; 20–40 Nm.

Note: The friction moment can be altered by fitting different sizes of thrust washers. Thrust washers are available in sizes from 1.3–1.8 mm in steps of 0.1 mm.

Torque wrench	000 589 27 21 00
Mandrel	460 589 11 15 00



7 Fit ring gear to differential housing and torque fastening bolts to 130–145 Nm.



730.3

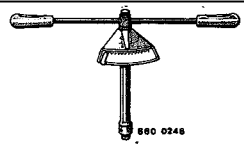
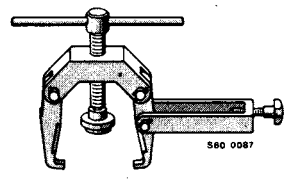
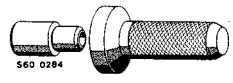
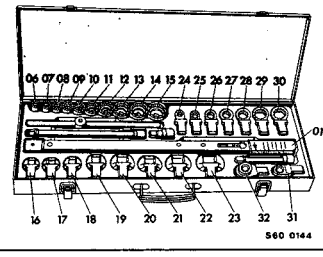
Adjustment values in Nm (kpm)

Friction moment when turning complete differential	20 – 40 (2 – 4)

Tightening torque in Nm (kpm)

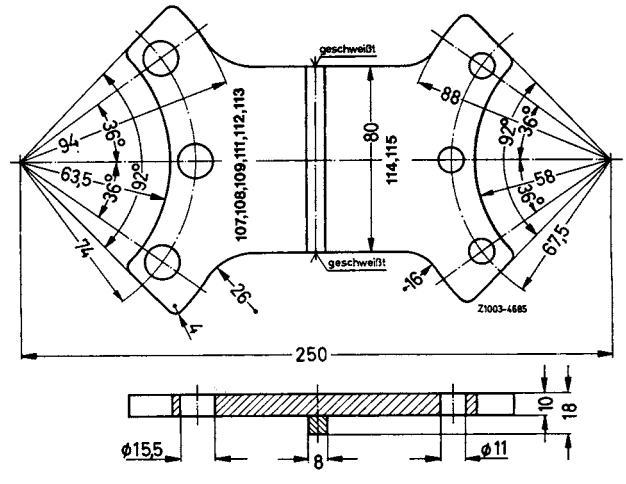
Ring gear at differential housing	130 – 145 (13 – 14,5)

Special tools

Mandrel	 S60 0118	460 589 11 15 00
Torque wrench	 S60 0246	000 589 27 21 00
Puller	 S60 0087	123 589 08 33 00
Installer	 S60 0117	116 589 07 61 00
Mandrel	 S60 0284	116 589 08 61 00
Torque wrench 80 – 400 Nm	 S60 0144	000 589 10 99 01

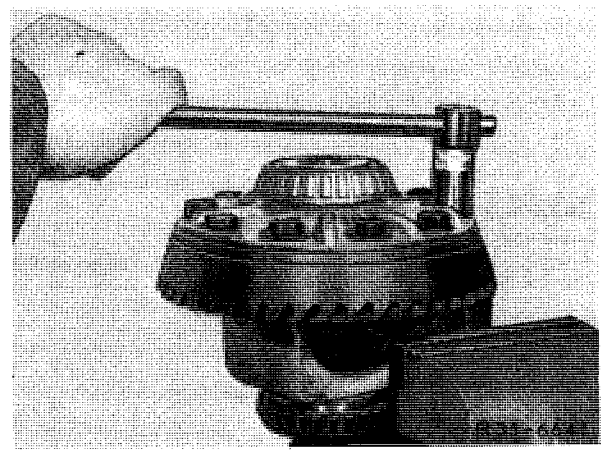
Disassembly

To aid installation, we recommend fabricating a clamping device in the shop in accordance with the adjacent sketch.



33.61 Disassembly and Reassembly of Differential (without Differential Lock)

1 Unscrew the ring gear fastening bolts and remove ring gear by knocking down around the circumference with a soft hammer.

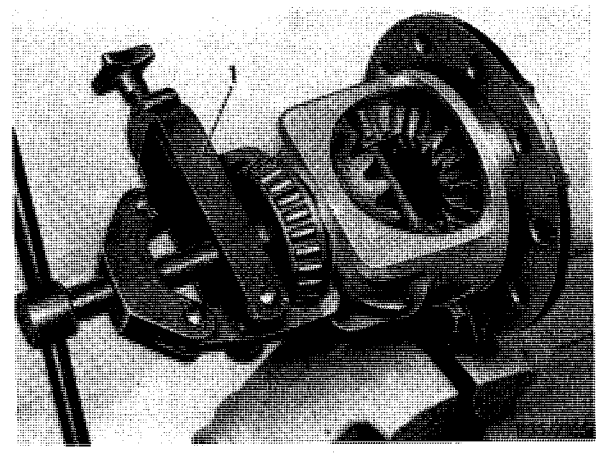


2 Clamp the differential housing with clamping device (self-made) in a vice.

3 Pull off both taper roller bearings with special tool.

4 Knock clamping sleeve for differential pin out of differential housing with a puller.

5 Press out differential pin and remove differential pinions, side gears, thrust washers and spherical washers.



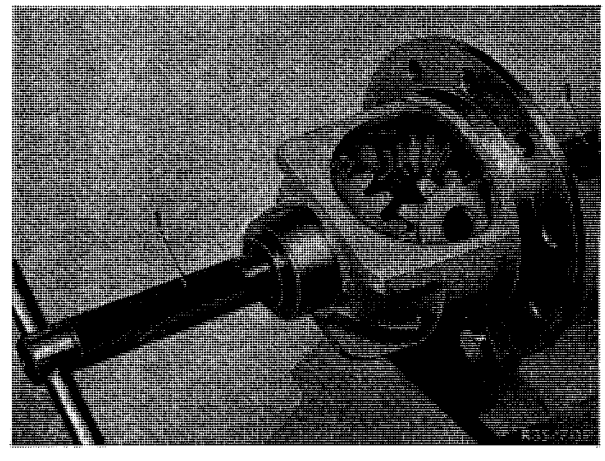
1 Puller 123 589 08 33 00

Note: When removing the differential pinions, center the side gears with suitable mandrels. The differential pinions can be removed by turning the side gears.

6 Check components to determine whether they can be reused. Always replace differential pinions, thrust washers and spherical washers which have overheated or have score marks.

Reassembly

Note: Coat all sliding parts of the diffential with special lubricant Molykote paste HTP or WHS LN 776 paste before installing.

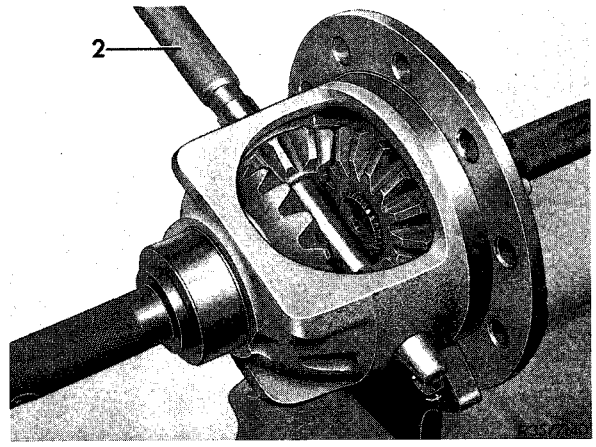


1 Fit thrust washers to side gears and insert in differential housing.

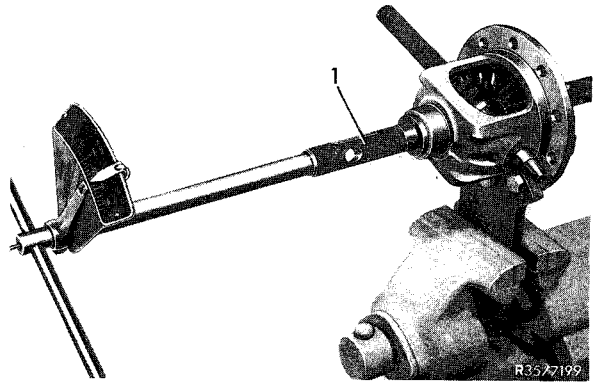
2 Insert special tool (1) in side gears and fit both differential pinions with spherical washers on both sides and position in the correct installation position by turning the mandrels.

1 Installer 460 589 11 15 00

3 Insert special tools in differential housing instead of differential pin for locating differential pinions and spherical washers.



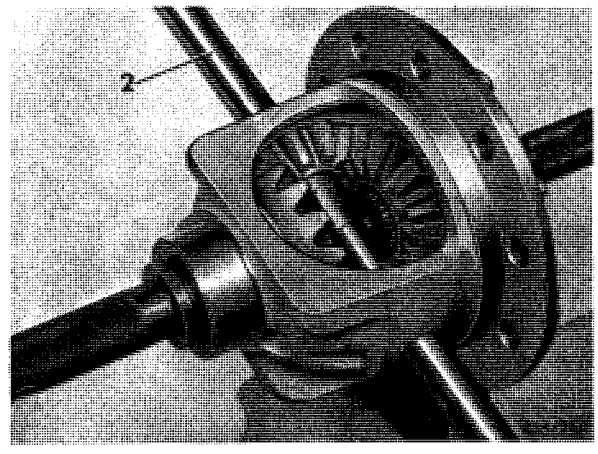
4 Check friction moment. The friction moment can be altered by installing thrust washers. Thrust washers are available in sizes of 1.3; 1.4; 1.5; 1.6 and 1.7 mm. Specified friction moment is 20–40 Nm (2–4 kpm).



1 Installer 460 589 11 15 00

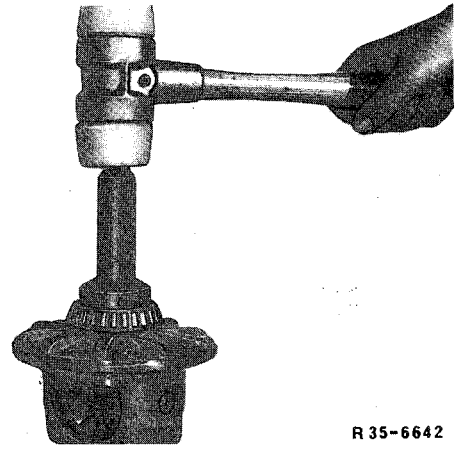
5 Knock differential pin into differential housing so that the dowel pin can be fitted.

6 Drive in new dowel pin.



2 Installer 116 589 07 61 00

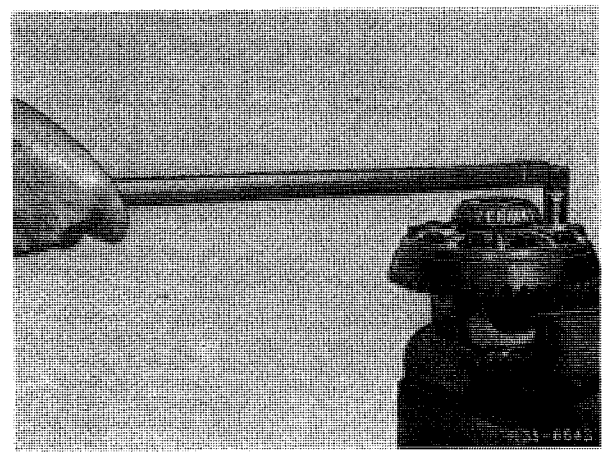
7 Drive both taper roller bearings onto differential housing with special tool.



Mandrel 116 589 08 61 00

33.61 Disassembly and Reassembly of Differential (without Differential Lock)

8 Heat ring gear to 60° C and fit to differential housing, torquing the fastening bolts to 130–145 Nm.



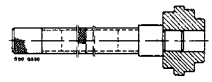
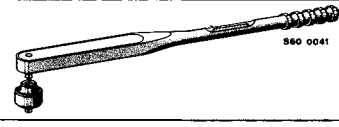
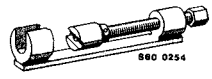
Removal, Disassembly, Reassembly and Installation of Differential Lock 33.61

730.3

Tightening torques in Nm (kpm)

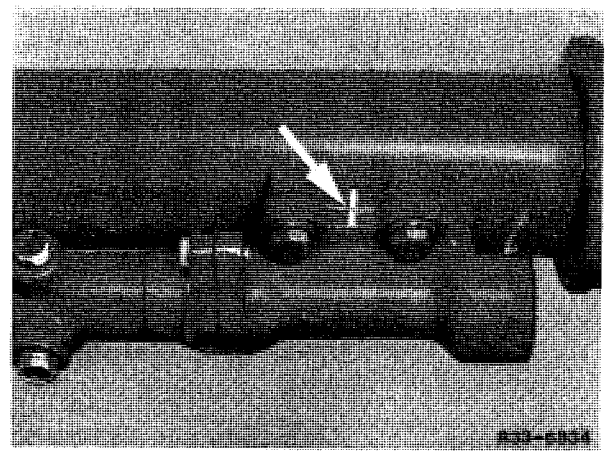
Lever on shaft	20 – 25 (2 – 2.5)

Special tools

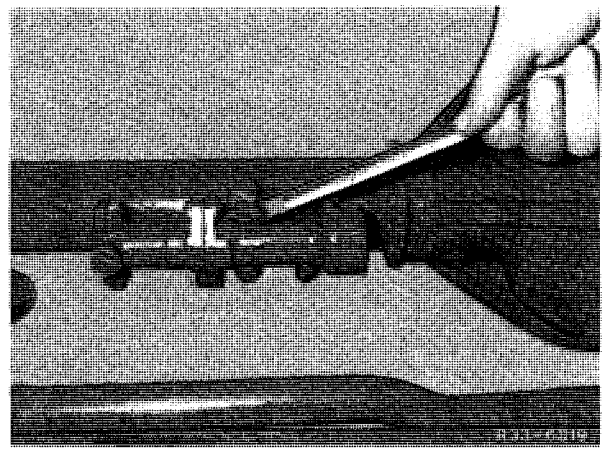
Mandrel		460 589 12 15 00
Torque wrench 20 – 100 Nm		000 589 64 21 00
Spring tensioner		381 589 00 31 00

Removal and disassembly

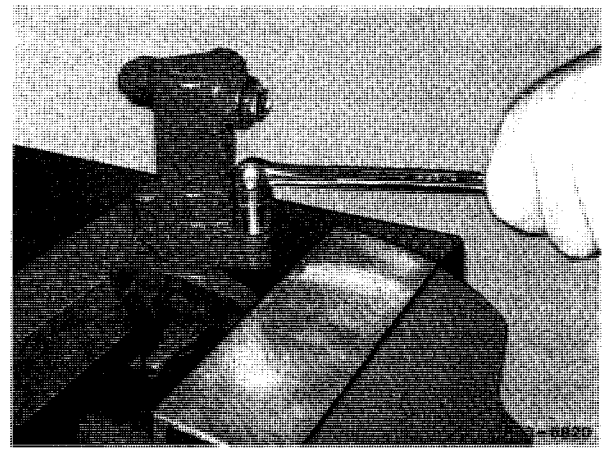
Note: Mark the installation position of the ZB selector cylinder relative to the axle housing before unscrewing the cylinder.



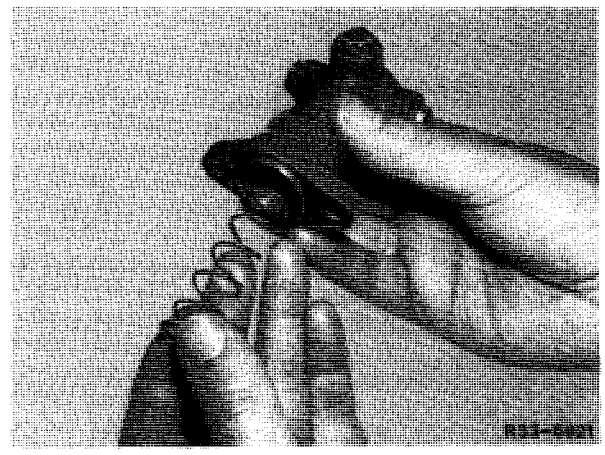
1 Unscrew differential lock from axle tube and remove with gasket.



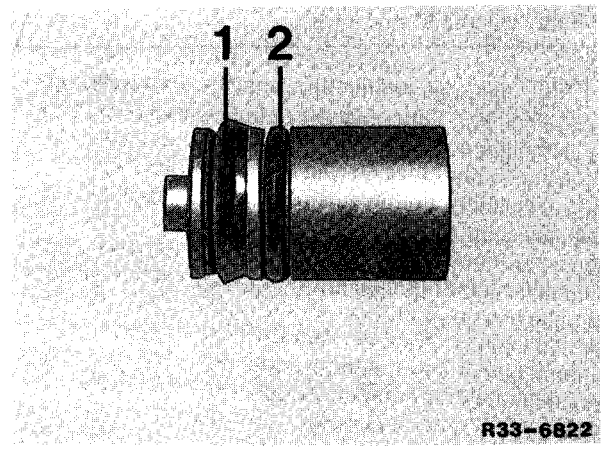
2 Unscrew cylinder from housing and remove with gasket.



3 Remove spiral spring and selector piston from cylinder.



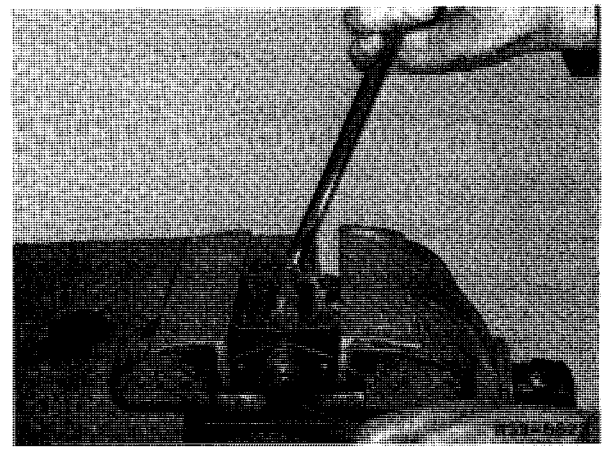
4 Check sealing ring and sleeve on selector piston, renewing if necessary.



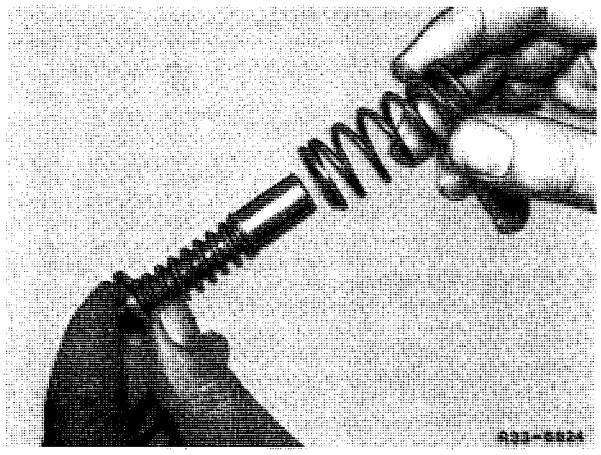
1 Sleeve
2 Sealing ring

5 Unscrew pushbutton switch for electric indicator lamp.

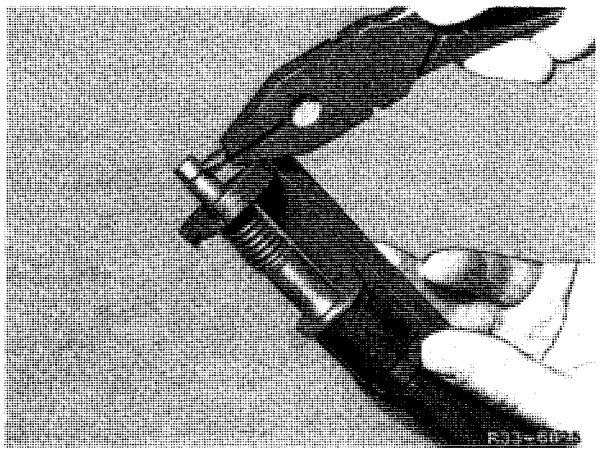
6 Pretension springs, unscrew nut from shaft, remove lever and springs with shaft.



7 Take the large compression spring off the shaft.



8 Pretension the small compression spring on the shaft with special tool and remove the locking washer.

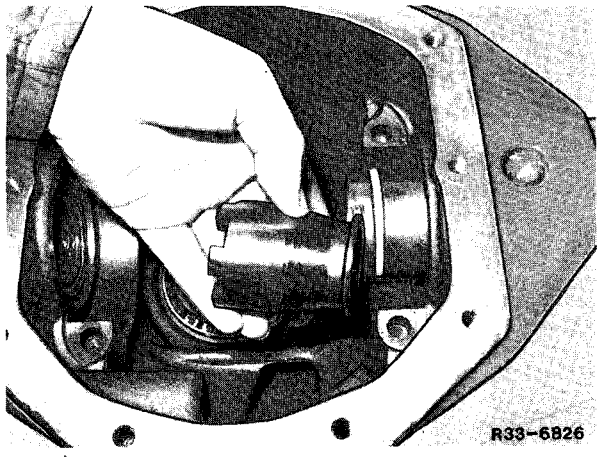


Spring tensioner 381 589 00 31 00

9 Remove constant velocity joint shaft (33.61–250).

10 Remove crown gear with differential (33.61–300).

11 Pull selector sleeve and selector tube slightly out of the axle. Take selector sleeve out at the side, then pull tube out fully.

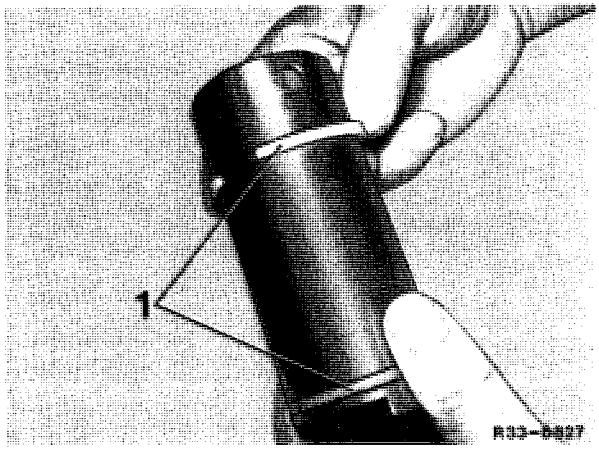


12 Take polyamide rings off tube.

13 Remove the radial seals from the axle housing with assembly iron.

Note: From Axle No. 7 023 947 the radial seal was repositioned to the outside in the supporting tube.

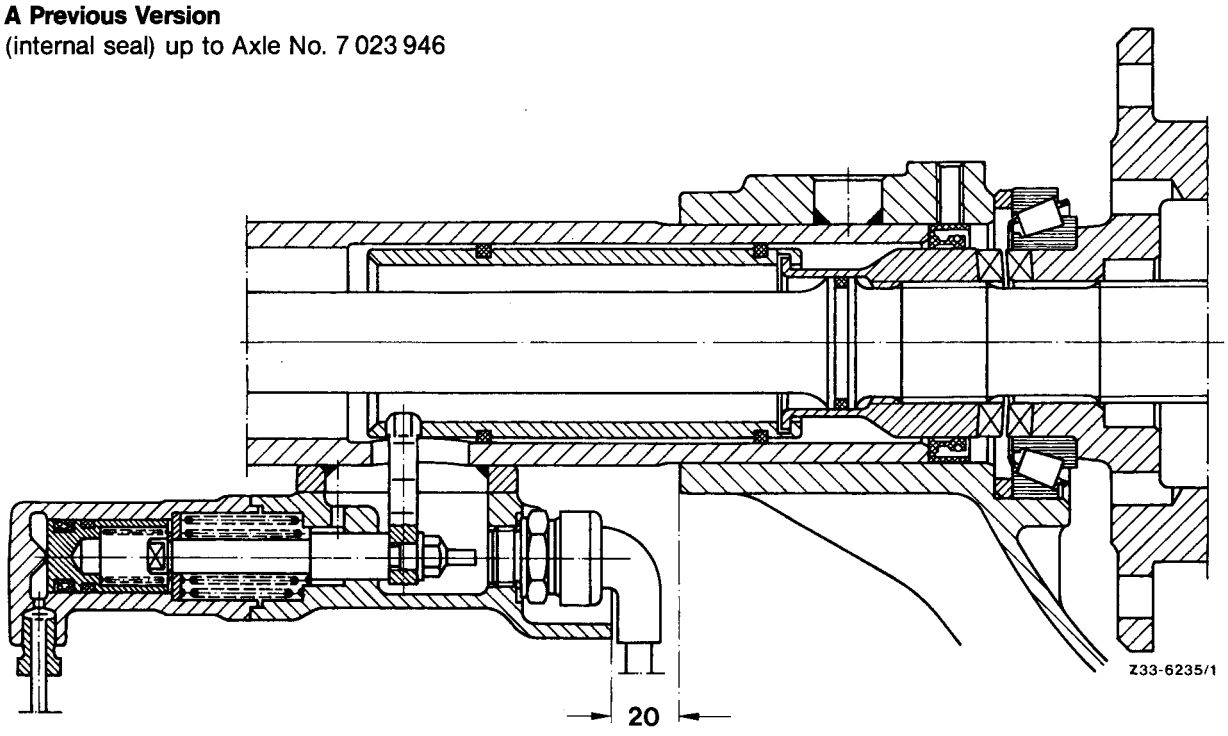
14 Clean all parts and check for signs of wear. Replace worn parts.



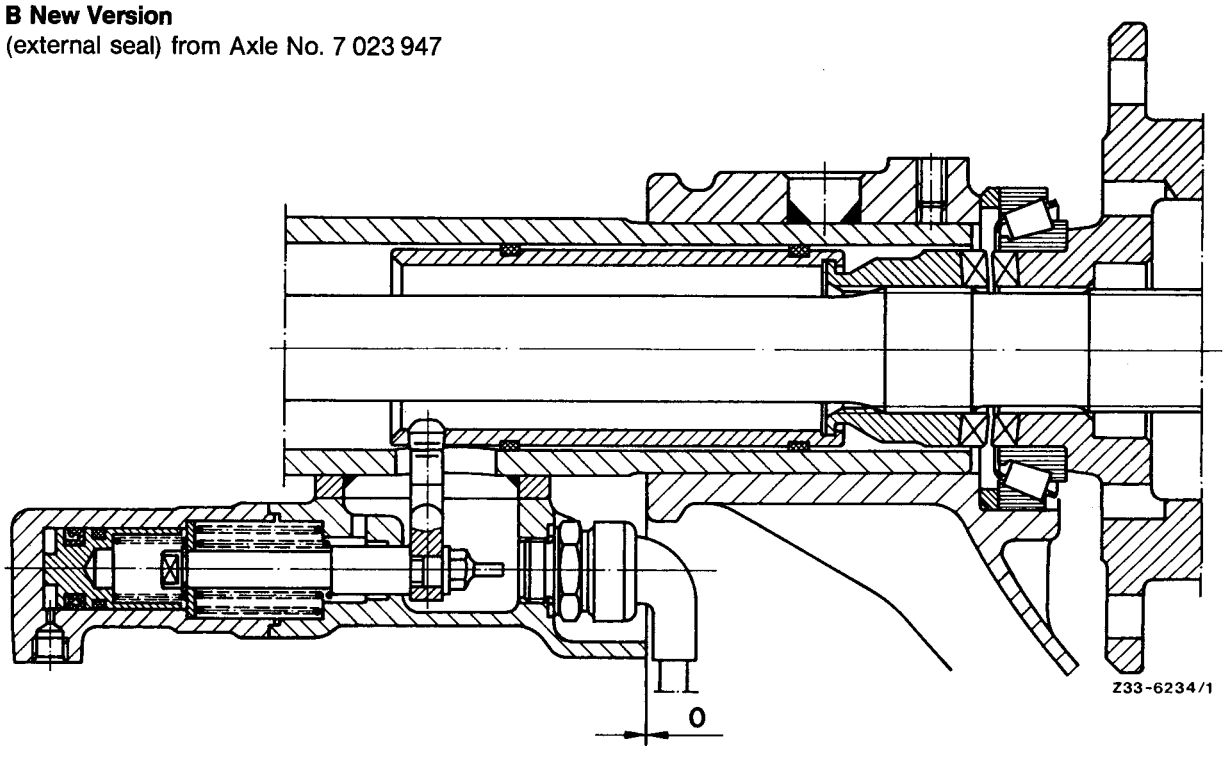
1 Polyamide rings

Reassembling and installing

A Previous Version
(internal seal) up to Axle No. 7 023 946



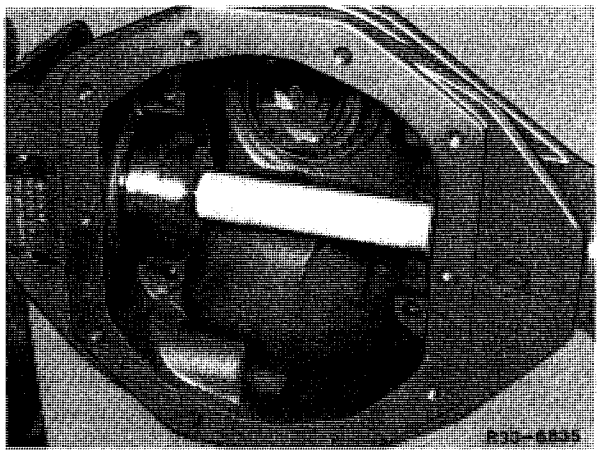
B New Version
(external seal) from Axle No. 7 023 947



1 Up to Axle No. 7 023 946 knock in radial seals with special tool.

2 Fit polyamide rings onto selector tube, firstly introduce the selector tube slightly into the axle, then insert the selector sleeve from the side and push in both parts fully.

Note: When inserting the selector tube, ensure that the hole for the lever is pointing toward the opening of the differential lock.

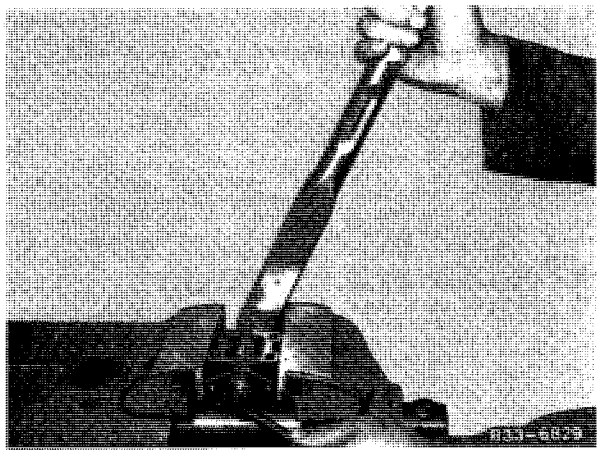


Mandrel 460 589 12 15 00

3 Pretension small compression spring and washer on shaft with special tool and fit the locking washer.

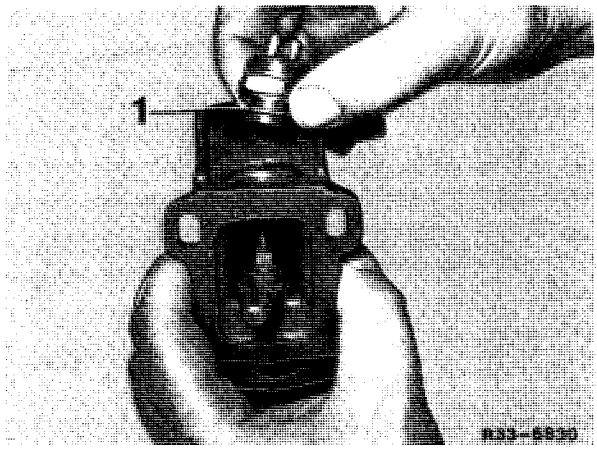
Spring tensioner 381 589 00 31 00

4 Fit the large compression spring onto the shaft, push the shaft with springs into the housing and compress fully, fit lever and tighten nut with 20–25 Nm.



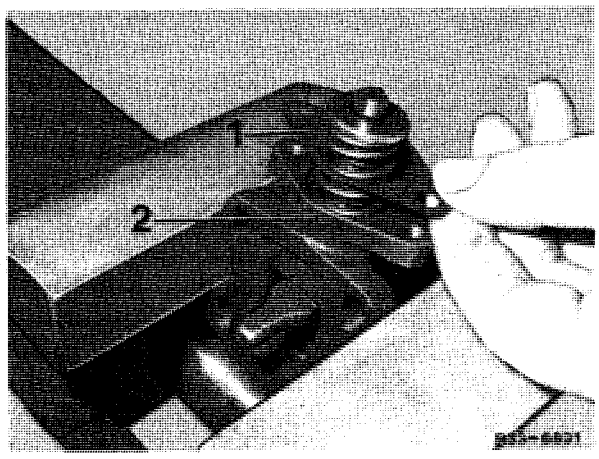
5 Screw in pressure switch with electrical indicator with seal.

6 Insert selector piston in cylinder, ensuring that the cup seal and sealing ring are fitted on the piston.



1 Seal

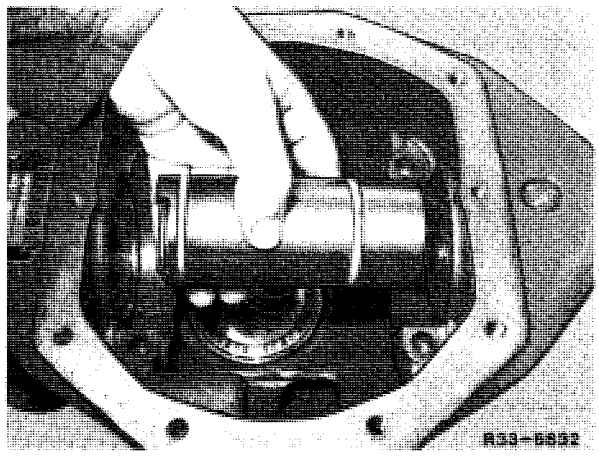
7 Insert compression spring into cylinder and screw cylinder with seal onto the housing.



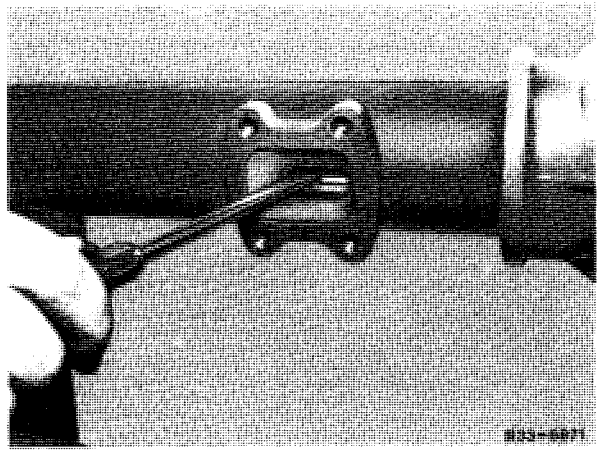
1 Seal
2 Housing

8 Introduce the selector tube with the polyamide rings fitted into the axle so that the hole for the lever is pointing toward the opening of the differential lock. Insert the selector sleeve from the side and push in the selector tube fully.

Note: The selector tube should be greased before being inserted.

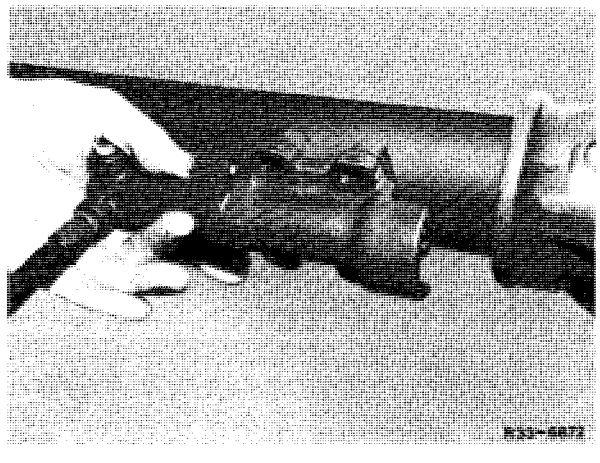


9 Push the selector tube fully toward the differential with a screwdriver so that the teeth are meshed.

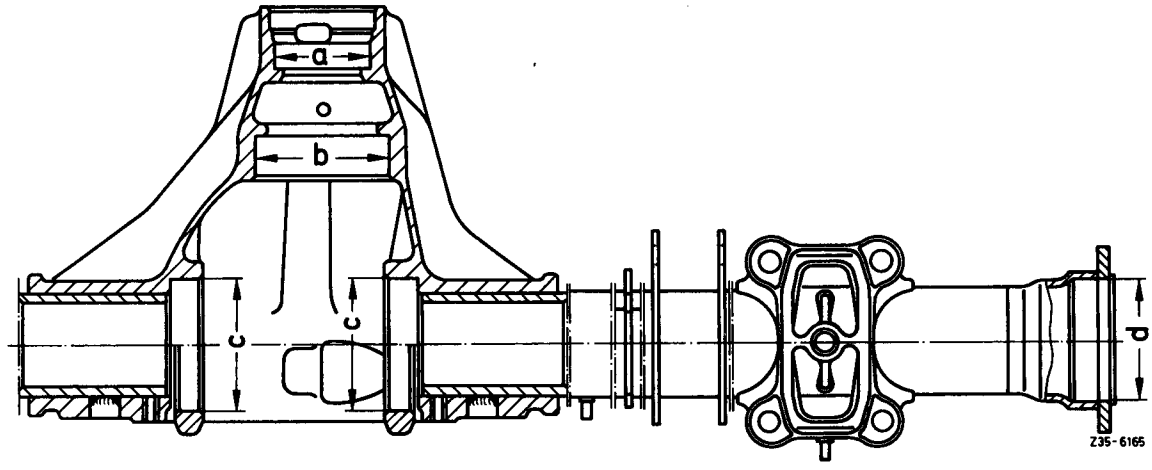


10 Introduce the shift cylinder pressurized with compressed air into the hole of selector tube, at the same time fit the seal and likewise push the shift cylinder toward the differential and screw tight.

Note: During assembly, ensure that no air escapes from the shift cylinder so that the differential lock is also fully engaged.

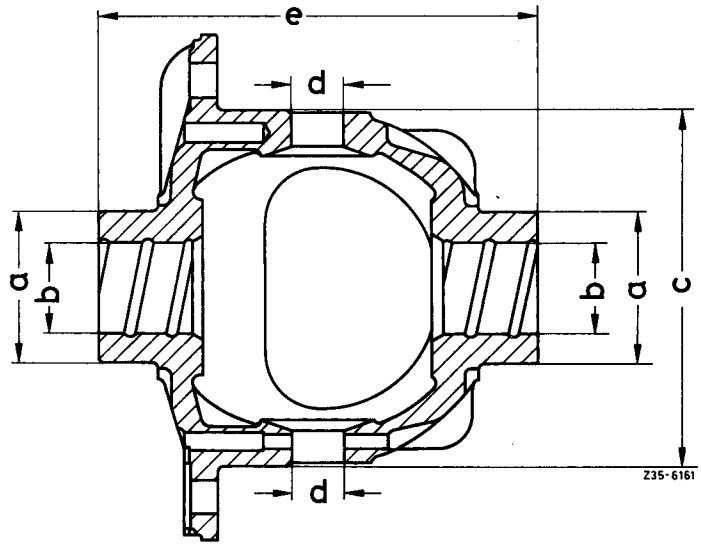


730.3



Axle housing with suspension tubes

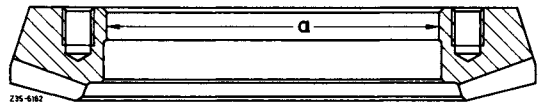
Part No.	a	b	c	d
460 330 14 05	64.274 64.255	88.870 88.848	88.958 88.936	70.046 70.000

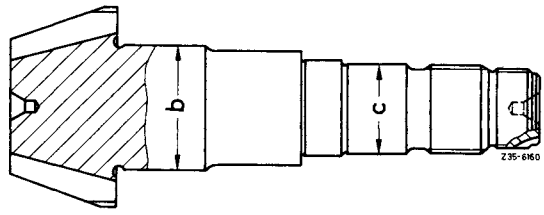


Differential housing

Part No.	a	b	c	d	e
460 353 01 01	54.039 54.013	36.039 36.000	127.040 127.015	19.021 19.000	$157^{\pm 0.1}$

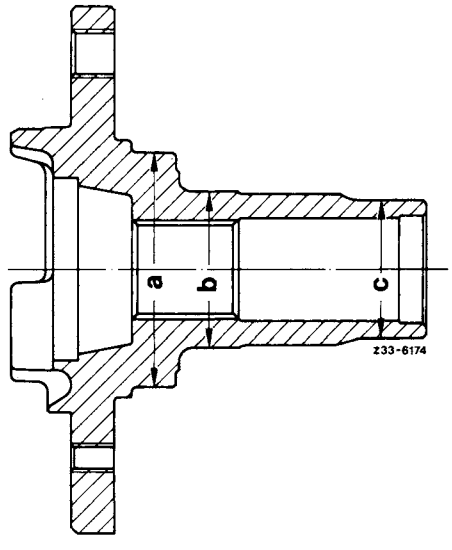
33.61 Checking Axle Components





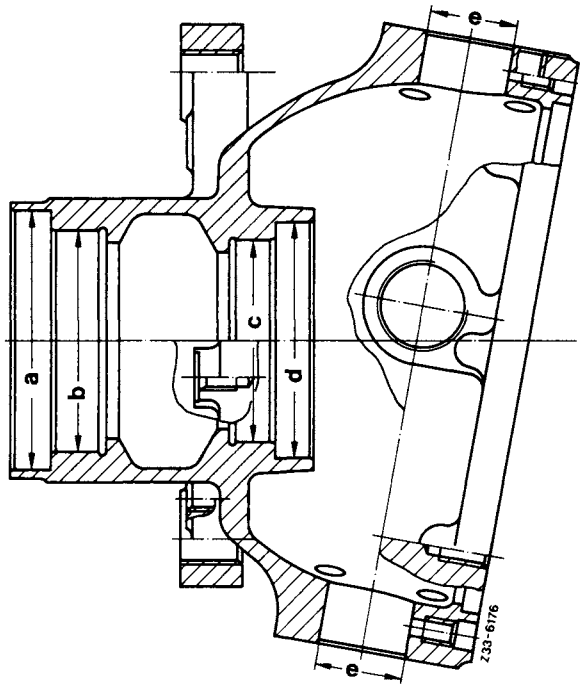
Gear set

Part No.	No. of teeth Z2 : Z1	a	b	c
601 350 53 39	44 : 9	127.025	41.312	30.191
601 350 55 39	48 : 9	127.000	41.301	30.180



Wheel hub

Part No.	a	b	c
360 334 04 01	70.000 69.810	46.033 46.017	40.991 40.975



Universal joint housing

Part No.	a	b	c	d	e
460 337 02 06 li	88.054	74.968	67.968	80.046	30.021
460 337 03 06 re	88.000	74.948	67.948	80.000	30.000