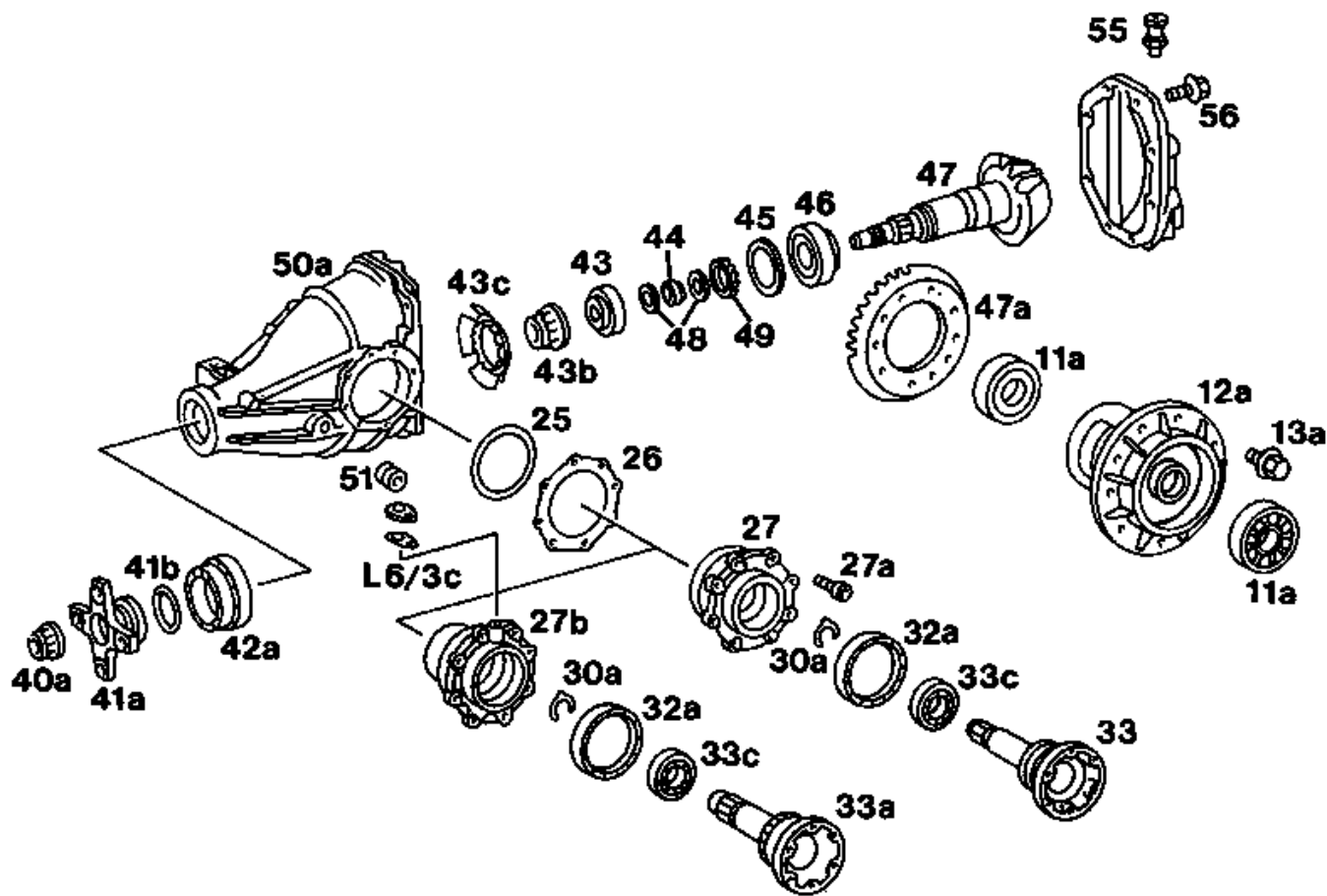


35-550 Rear axle center piece with 210 mm dia. crown wheel (reinforced)

Preceding work:
Removing and installing rear axle center piece (35-520)

Operation no. of operation texts and work units or
standard texts and flat rates: 35-0815



P35-5000-57

Hypoid transmission fluid	Drain; fill as far as lower edge of oil filler bore. Tightening torque of oil screw plug (51) 50 Nm.
Rear axle center piece (50)	Clamp in jig; release from jig. Jig 129 589 00 31 00.
Rear axle end cover (54)	Detach, attach. Clean sealing surface and coat with sealant. Tightening torque of collared bolt (56b) 55 Nm. Torque wrench 001 589 66 21 00 (Paragraphs 3 and 86-87)
Breather (55)	Replace, 30 Nm (paragraph 91).
Circlips (30a)	Remove, install, replace. Hook 116 589 01 62 00 (Paragraphs 4 and 84-85)
Connecting flanges (33 and 33a)	Remove, install. Adjust play of connecting flanges (33 and 33a), (paragraphs 5 and 85).

Side bearing covers (27 and 27b)	Remove and install by unscrewing and screwing in Allen bolts (27a). Tightening torque 20 Nm.								
	Adjusting backlash and expansion.								
	<table border="0" style="width: 100%;"> <tr> <td>Contact blocks</td> <td style="text-align: right;">201 589 01 63 00</td> </tr> <tr> <td>Contact arm</td> <td style="text-align: right;">126 589 08 21 00</td> </tr> <tr> <td>Torque wrench</td> <td style="text-align: right;">001 589 66 21 00</td> </tr> <tr> <td>Backlash meter</td> <td style="text-align: right;">140 589 08 21 00</td> </tr> </table>	Contact blocks	201 589 01 63 00	Contact arm	126 589 08 21 00	Torque wrench	001 589 66 21 00	Backlash meter	140 589 08 21 00
Contact blocks	201 589 01 63 00								
Contact arm	126 589 08 21 00								
Torque wrench	001 589 66 21 00								
Backlash meter	140 589 08 21 00								
	(Paragraphs 6 and 73-80)								
Differential housing (12a)	Remove, install (paragraphs 7 and 73).								
O-rings (25)	Remove, install, replace (paragraphs 8 and 67).								
Shims (26)	Remove, install and mark together with bearing covers (27 and 27b) for left and right sides (paragraphs 8 and 67).								
Radial oil seals (32a)	Press out, press in, replace. Drift 140 589 03 15 00 (paragraphs 9 and 66).								
Tapered roller bearing inner races (11a)	Pull off, mark and press on. Puller 123 589 08 33 00 Drift 140 589 09 15 00 (Paragraphs 10 and 65)								
Tapered roller bearing outer races (11)	Pull out, mark and press in. Puller 000 589 88 33 00, Puller arms 126 589 00 34 00, Thrust piece 124 589 02 34 00, Drift 140 589 09 15 00 (Paragraphs 11 and 71)								
Crown wheel (47a)	Remove, install. Mark position of crown wheel with respect to differential housing (12a), and press off carefully. Heat crown wheel to 75-85 °C prior to installing. Replace crown wheel bolts. Tightening torque of serrated locking bolts 140 Nm. Torque wrench 001 589 67 21 00 (Paragraph 12)								

Twelve-point collared nut (40a)	Slacken, tighten, replace and lock. Tightening torque 120-130 Nm. 30 mm socket wrench attachment 126 589 02 09 00, pin wrench 129 589 01 07 00, adapter 100 589 02 59 00, torque wrench 001 589 66 21 00 (paragraphs 13 and 63-64).
Propeller flange (41a)	Remove, install. Mark position of propeller flange with respect to bevel drive pinion. Check contact surface for radial oil seal for wear, and replace propeller flange if necessary. Pull off if necessary using puller 129 589 01 33 00. (Paragraphs 15 and 62)
O-ring (41b)	Replace (paragraph 61).
Radial oil seal (42a)	Press out, press in, replace. Drift 140 589 02 15 00 (Paragraphs 16 and 60)
Oil slinger (43c)	Press off, press on, replace. Drift 140 589 02 15 00 (Paragraphs 17 and 59)
Twelve-point collared nut (43b)	Slacken, tighten, replace and lock.

Adjusting friction torque.

Socket wrench attachment WAF 41	140 589 01 09 00
Socket wrench attachment 3/4"	140 589 00 08 00
Torque meter	001 589 49 21 00
Adapter	100 589 02 59 00
Torque wrench	001 589 74 21 00

(Paragraphs 18, 51-53 and 55)

Bevel drive pinion (47)	Remove, install and check adjustment. Use two arm puller 000 589 65 33 00 to press bevel drive pinion out of housing. When installing, support bevel drive pinion with removal/ installation tool 140 589 10 43 00 (paragraphs 19 and 49).
Tapered roller bearing inner race (43)	Take off, push on. Press on using sleeve 140 589 04 15 00 (paragraphs 19 and 50).

Tapered roller bearing outer races (43 and 46)	Remove, install. Remove shim, install and measure. Removal/installation tool 140 589 10 43 00 Thrust piece 140 589 10 43 00 Teil 03 Thrust piece 140 589 10 43 00 Teil 16 Puller 140 589 01 43 00 (Paragraphs 20-22 and 33-47)
Spacer sleeve (44) with contact washers (48)	Remove, install. Replace spacer sleeve and contact washers (paragraphs 23 and 48)
ABS rotor (49).....	Pull off, press on, except rear axle center piece with ASR. To press on, use sleeve 140 589 04 15 00. Puller 000 589 88 33 00 with arms 116 589 12 33 00 (paragraphs 24 and 32).
Tapered roller bearing inner race (46)	Pull off bevel drive gear (47), press on. Pulling device 001 589 36 33 00 Extension 000 589 35 34 00 Collet chuck 140 589 02 34 00 Open-end wrench WAF 55×65 140 589 00 01 00 To press on, use sleeve 140 589 04 15 00 without internal sleeve (paragraphs 25-27 and 31).
Check.....	All parts (paragraphs 28-30).

Rear axle center piece with ASR

Shim (L6/3c) for speed sensor	Remove. Calculate check distance "a", determine gauge of shim and secure with self-adhesive paper (paragraph 89).
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Oil types and capacity

Standard differential	Hypoid transmission fluid SAE 90
Differential with ASR	see Specifications for Service Products, sheet 235
Capacity	1.4 liters

Adjustment data for crown wheel/pinion

Backlash of crown wheel/pinion	0.08-0.14 mm
--------------------------------	--------------

Setting of tapered roller bearings for differential: The tapered roller bearings are biased by expanding (spreading) the rear axle housing by	0.15-0.20 mm
Permissible tolerance for distance "A" of bevel drive pinion	+ 0.01 mm - 0.02 mm
Permissible radial run-out at tapered roller bearing seats	0.02 mm

Shims for adjustment of backlash and housing expansion

Gauge	1.0-2.60 mm
Graduation	0.05 to 0.05

Note

If necessary, a shim should be ground down to the required thickness.

Shims for adjustment of bevel drive pinion

Gauge	1.5-2.40 mm
Graduation	0.05 to 0.05

Note

If necessary, a shim should be ground down to the required thickness.

Rotor for ABS speed sensor

Part no.	Ratio i	No. of teeth
See parts microfilm	2.82	34
See parts microfilm	2.64/2.65	36
See parts microfilm	2.24	43

Friction torque for bevel drive pinion bearing ¹⁾

Tapered roller bearing manufacturer's pairing		Friction torque
Large tapered roller bearing	Small tapered roller bearing	
Timken	SKF	235-255 Ncm
Timken	FAG	270-280 Ncm
Run-in tapered roller bearings		50-100 Ncm

¹⁾ To properly adjust the tapered roller bearings, the twelve-point collared nut on the propeller flange must be tightened until the specified friction torque is reached when the bevel drive pinion slips. The differential with crown wheel must not be installed to check the friction torque when the bevel drive pinion slips.

Retaining bolts for crown wheel

Differential housing flange thickness	Hexagon head bolt length	Part no.
8 mm	20 mm, self-locking	See parts microfilm

Propeller flange on bevel drive pinion

Diameter of contact surface for radial oil seal on propeller flange	40.00 mm

	39.84 mm
Permissible radial run-out of sealing surface of propeller flange	0.06 mm

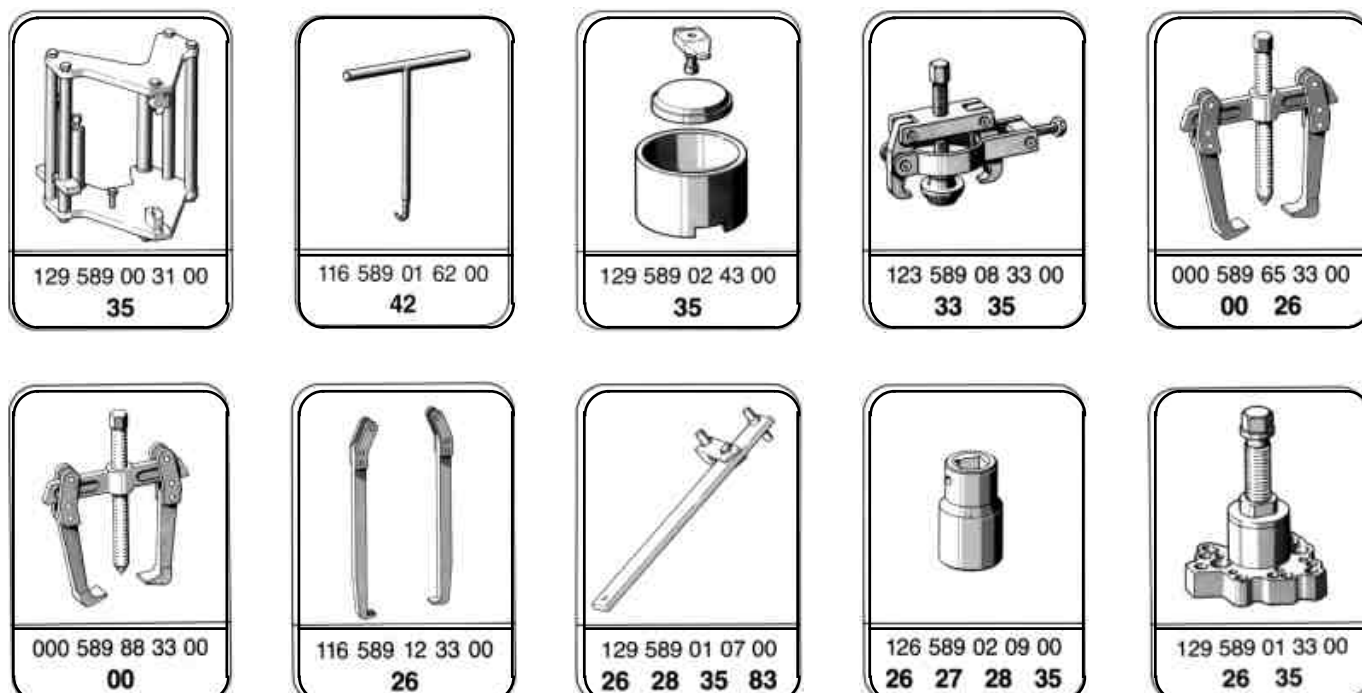
Circlips for adjusting axial play of connecting flanges

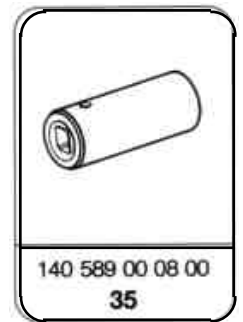
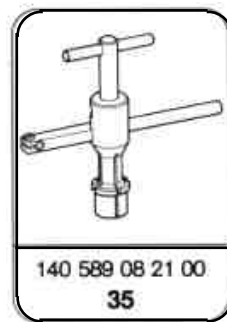
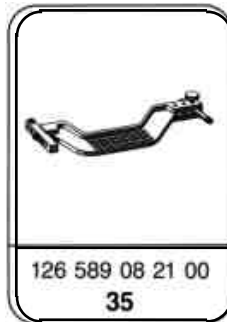
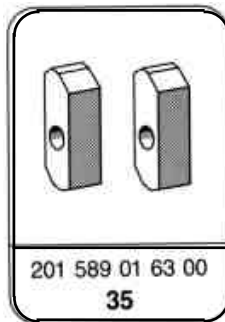
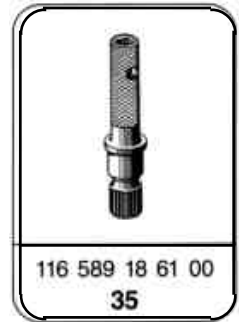
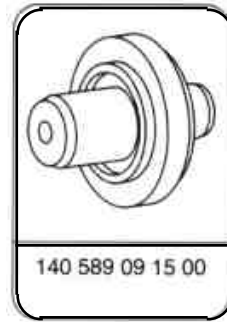
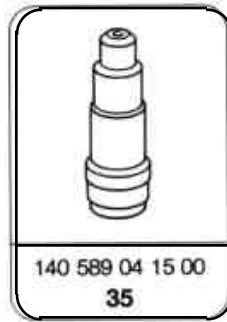
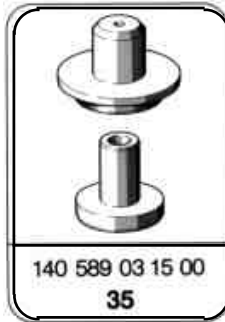
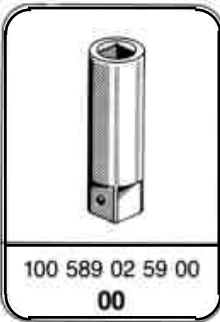
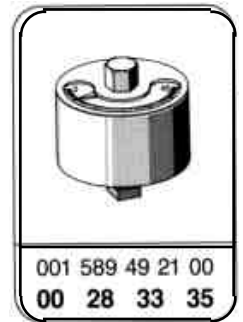
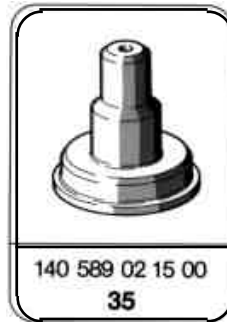
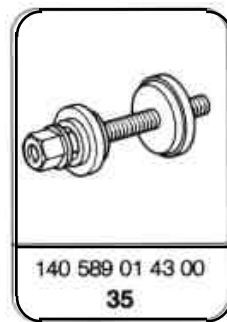
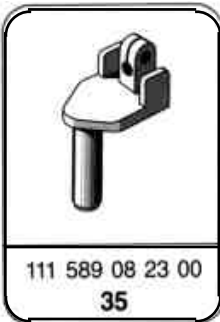
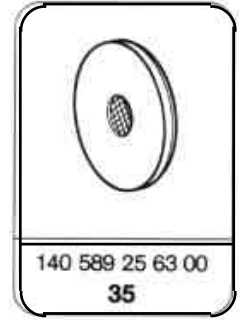
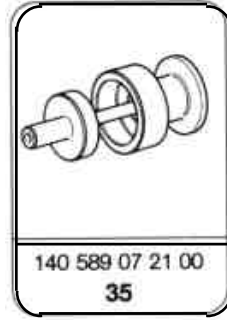
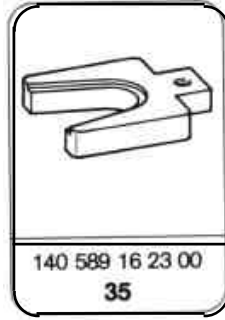
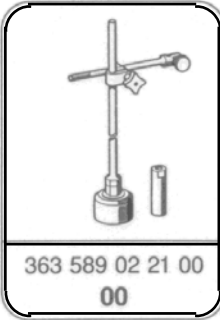
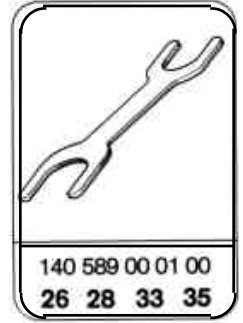
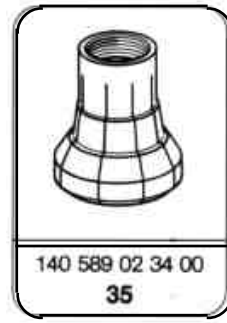
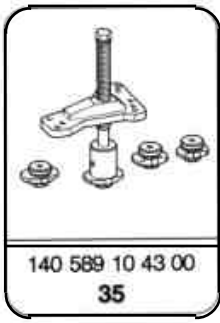
Gauge	1.40-2.70 mm
Graduation	0.05 to 0.05 mm

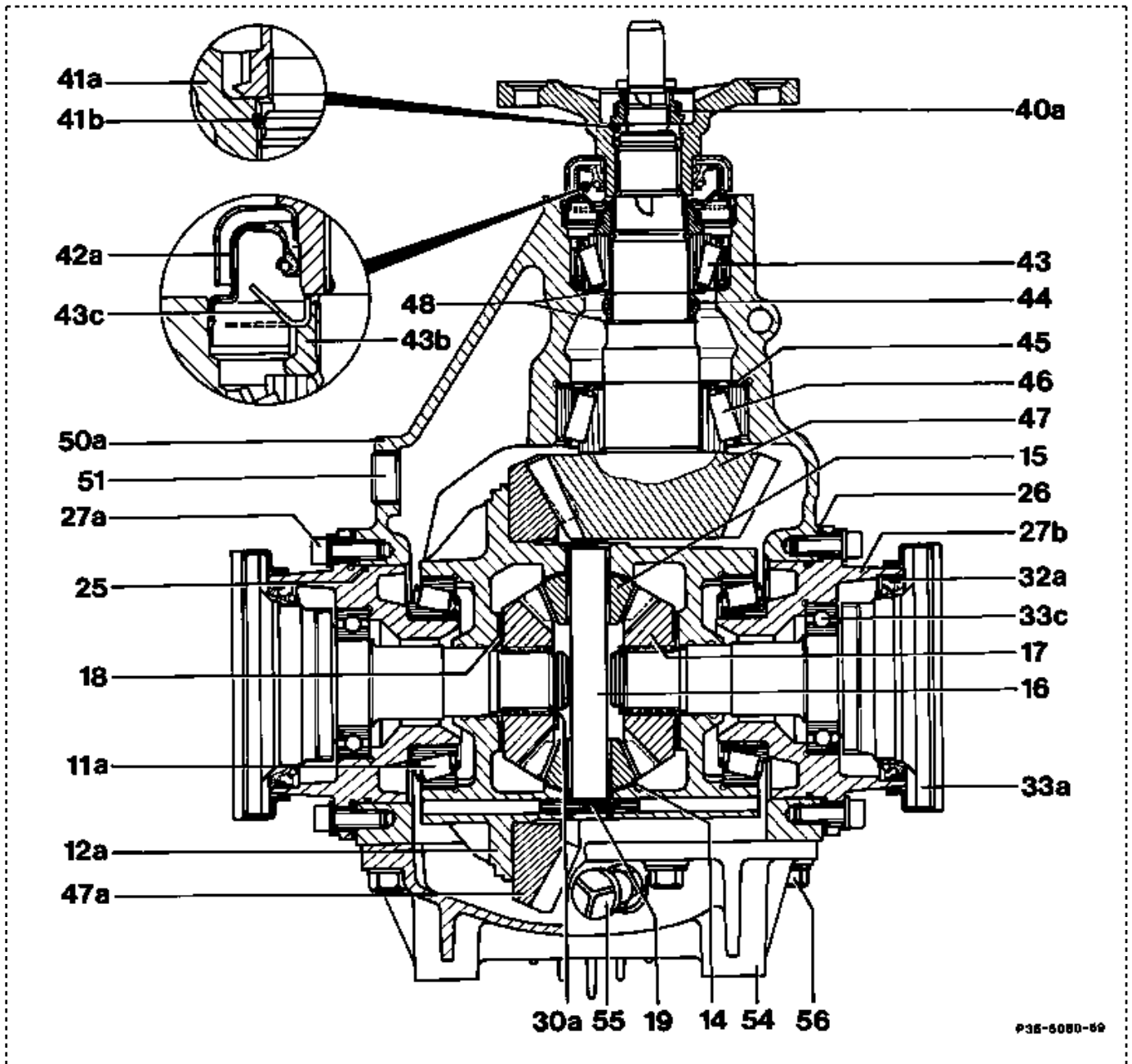
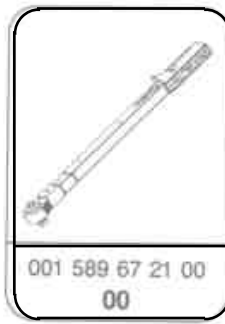
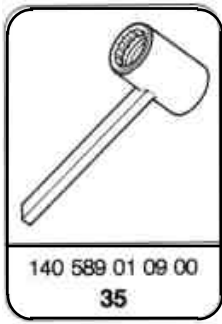
Shim for adjusting distance of ASR speed sensor from connecting flange

Part no.	Check distance "a" [mm]	Gauge ± 0.02 mm [mm]
See parts microfilm	44.5	2.3
See parts microfilm	44.6	2.2
See parts microfilm	44.7	2.1
See parts microfilm	44.8	2.0
See parts microfilm	44.9	1.9
See parts microfilm	45.0	1.8
See parts microfilm	45.1	1.7
See parts microfilm	45.2	1.6
See parts microfilm	45.3	1.5
See parts microfilm	45.4	1.4
See parts microfilm	45.5	1.3

Special tools







- 11a Tapered roller bearing
- 12a Differential housing
- 14 Spherical washer
- 15 Differential bevel gear
- 16 Differential pin
- 17 Rear axle shaft gear
- 18 Thrust washer
- 19 Retaining sleeve
- 25 O-ring
- 26 Shims

- 42a Radial oil seal
- 43 Tapered roller bearing
- 43b 12-point collared nut for bevel drive pinion bearing
- 43c Oil slinger
- 44 Spacer sleeve
- 45 Shim
- 46 Tapered roller bearing
- 47 Bevel drive pinion
- 47a Crown wheel

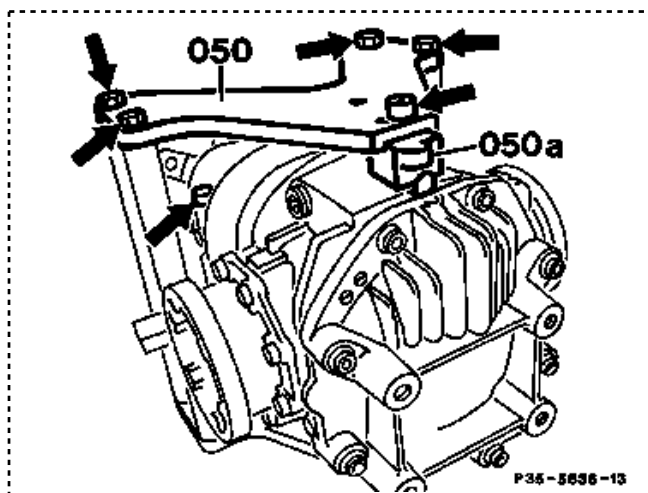
27a	Allen bolts
27b	Side bearing covers
30a	Circlip
32a	Radial oil seal
33a	Connecting flange
33c	Deep-groove ball bearing
40a	12-point collared nut for 4-arm propeller flange
41a	Propeller flange
41b	O-ring

48	Contact washers
50a	Rear axle housing
51	Oil filler screw
54	End cover
55	Breather
56	Hexagon head bolt with collar

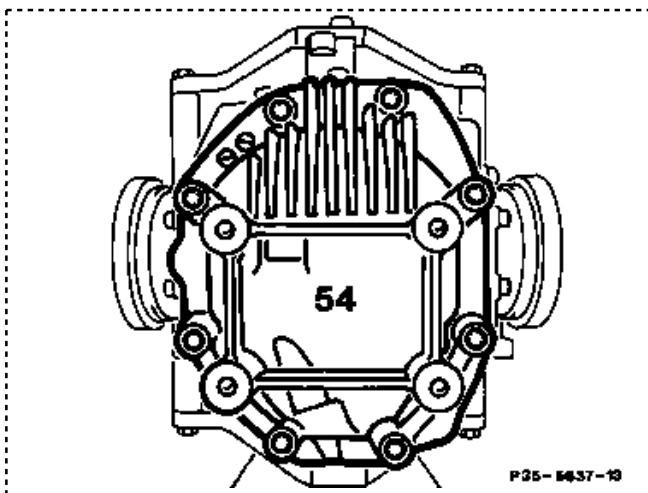
Dismantling

1 Drain hypoid transmission fluid.

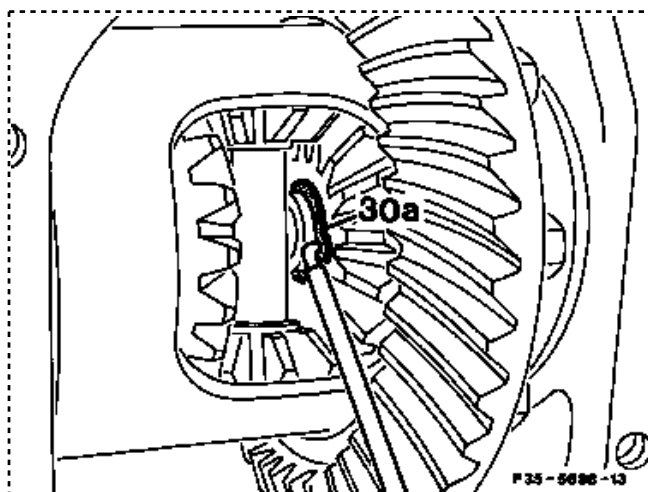
2 Clamp rear axle center piece in jig (050) 129 589 00 31 00 with attachment (050a) 129 589 00 31 00 part 15 and tighten bolts (arrows).



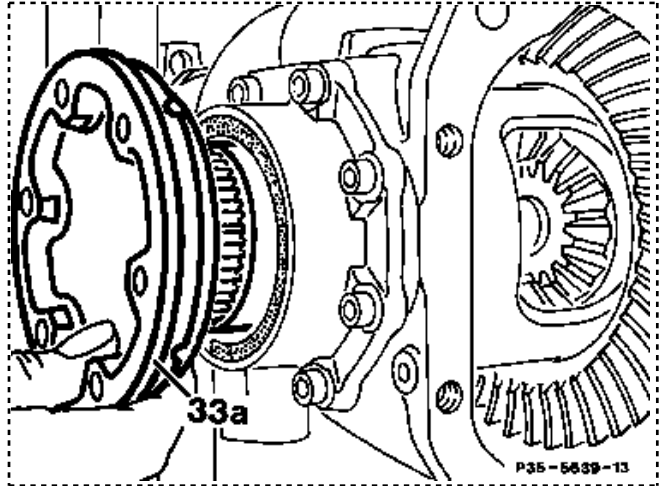
3 Remove rear axle end cover (54) from rear axle center piece.



4 Pull circlips (30a) off both connecting flanges using suitable pliers or hook 116 589 01 62 00.



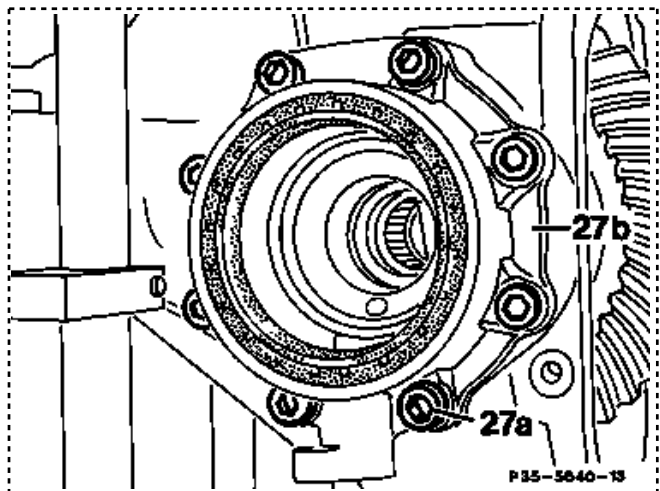
5 Pull connecting flanges (33a) out of rear axle shaft gears.



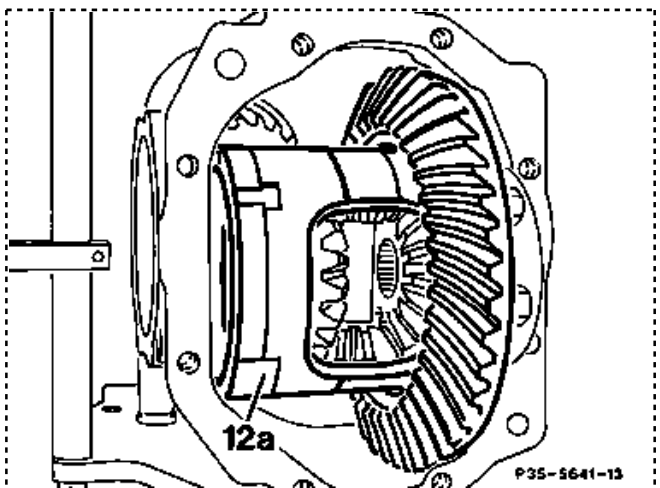
6 Unscrew Allen bolts (27a). Pull side bearing covers (27b) out of rear axle housing and remove together with shims.



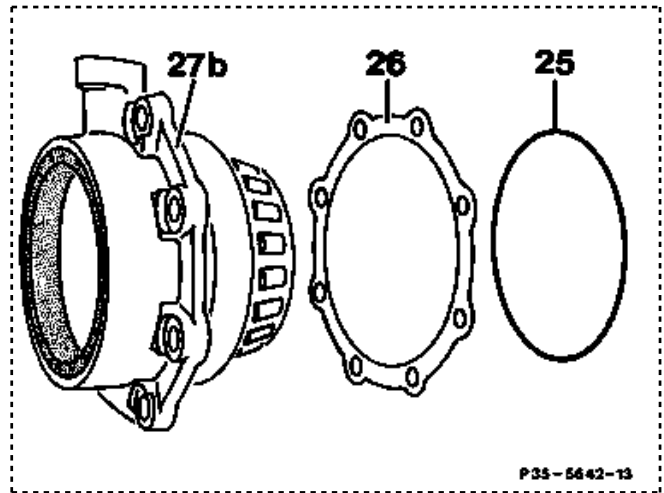
Ensure that the differential does not fall out of the rear axle housing.



7 Remove differential (12a) from rear axle housing.

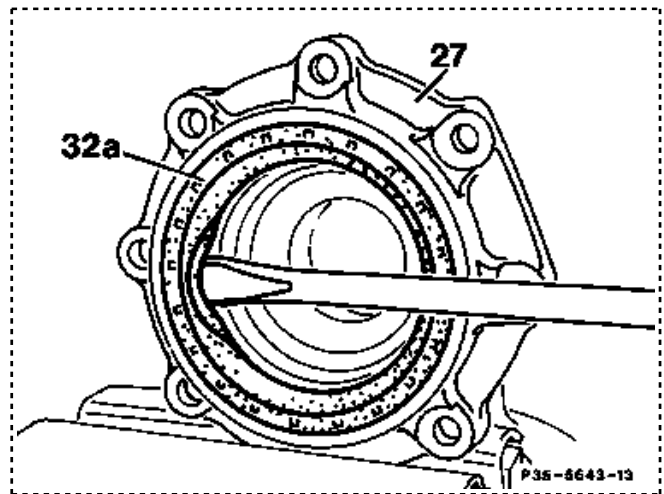


8 Pull off O-rings (25). Remove shims (26) for adjusting backlash and housing expansion, and mark together with the bearing covers (27b) for left and right sides.

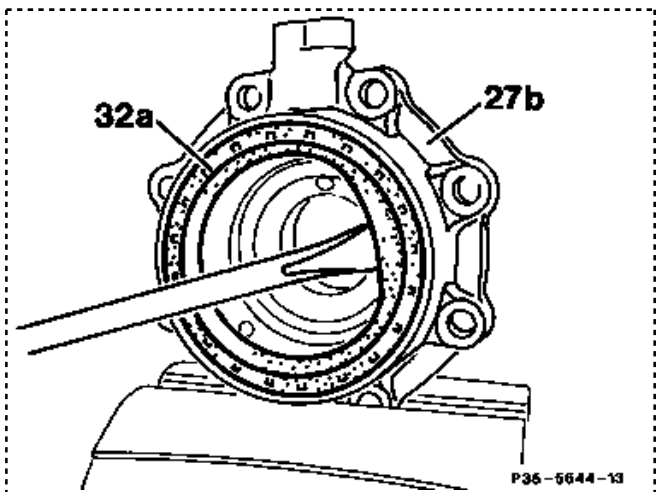


ASR Arrangement of bearing cover with

9 Clamp side bearing covers in vice and press radial oil seal (32a) out of side bearing covers (27 and 27b) using a screwdriver.

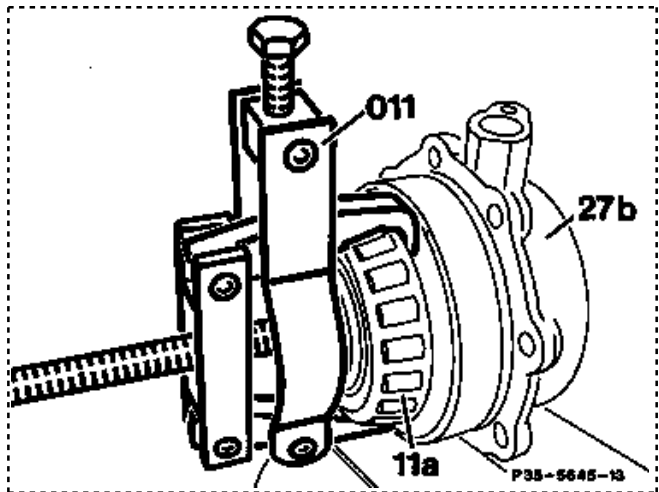


27 ABS bearing cover



27b ASR bearing cover

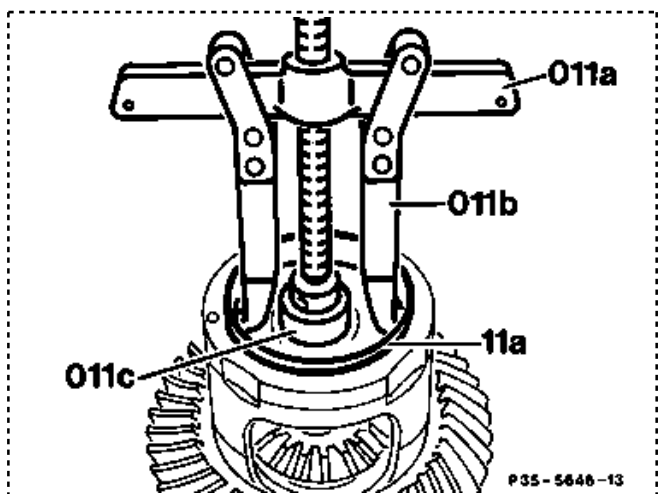
10 Pull tapered roller bearing inner race (11a) out of bearing cover (27b) using puller (011)
123 589 08 33 00, and mark for left and right sides.



11 Pull both tapered roller bearing outer races (11a) out of differential housing using puller (011a)
000 589 88 33 00 and arms (011b) 126 589 00 34 00, and mark in order to avoid confusion when reinstalling.

Note

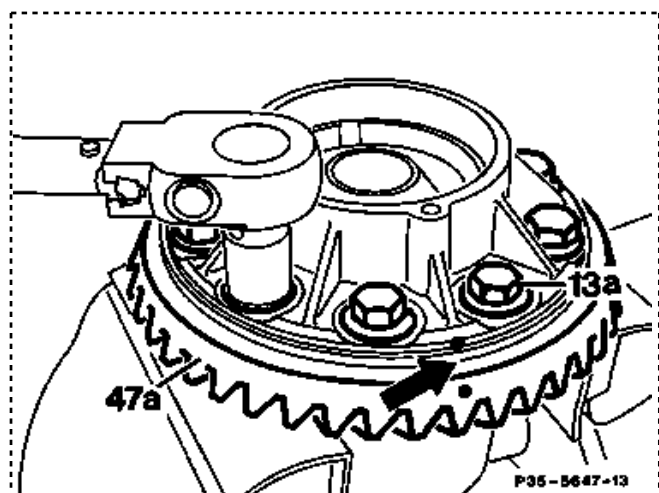
Use the thrust piece (011c) 124 589 02 34 00 for support.



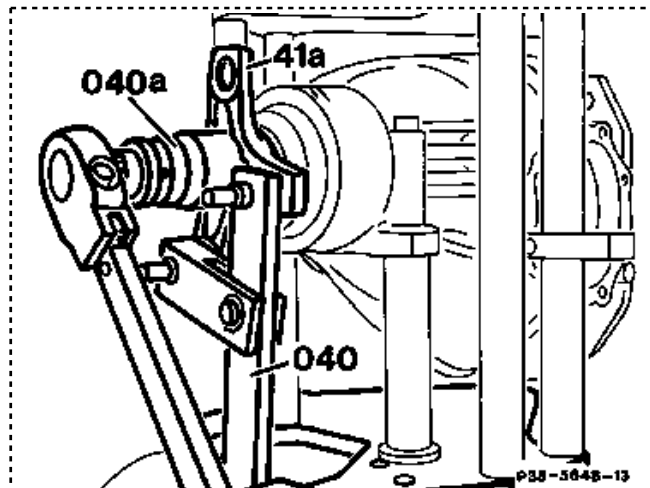
12 Slacken locking bolts (serrated bolts) (13a) and carefully press off crown wheel (47a).

Note

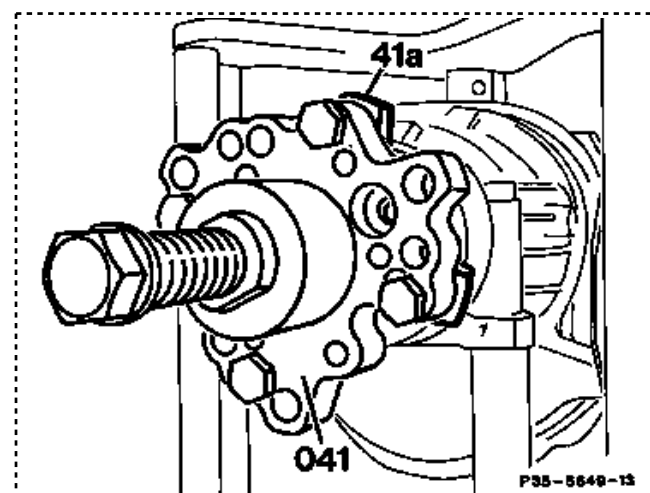
If the crown wheel/pinion is to be reinstalled, mark the position of the crown wheel with respect to the differential housing (arrow) so that the crown wheel can be returned to the same position when reinstalling.



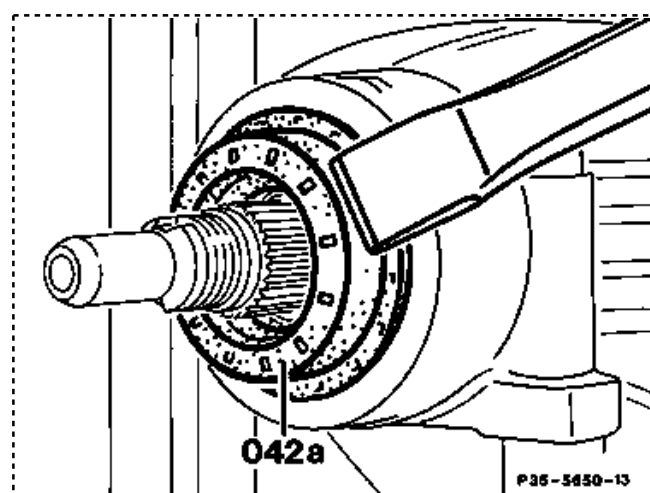
13 Place pin wrench (040) 129 589 01 07 00 on propeller flange (41a). Unscrew twelve-point collared nut using 30 mm socket wrench attachment (040a) 126 589 02 09 00 and remove.



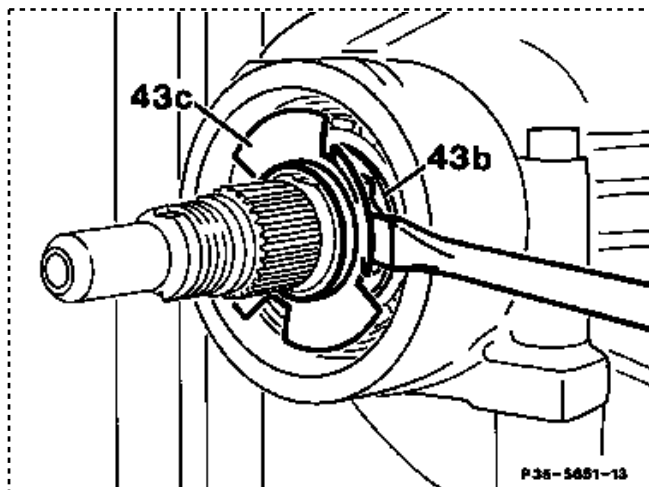
15 If necessary, pull propeller flange (41a) off bevel drive pinion using puller (041) 129 589 01 33 00 and remove.



16 Press radial oil seal (42a) out of rear axle housing using a suitable screwdriver or chisel.



17 Press oil slinger (43c) off twelve-point collared nut (43b) using a screwdriver.

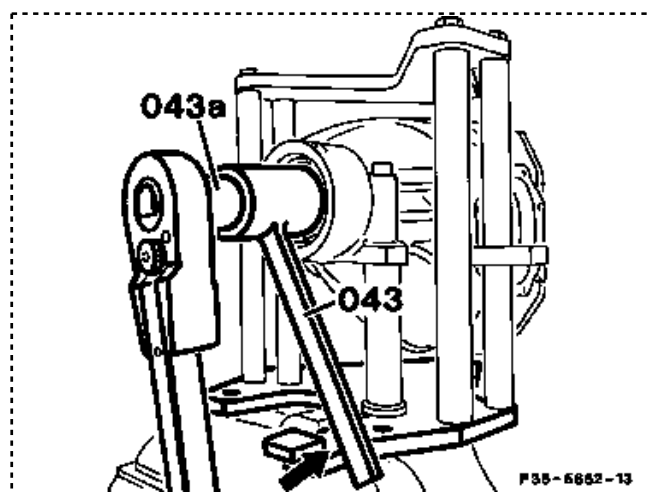


18 Unscrew inner twelve-point collared nut using socket wrench attachment WAF 41 (043)

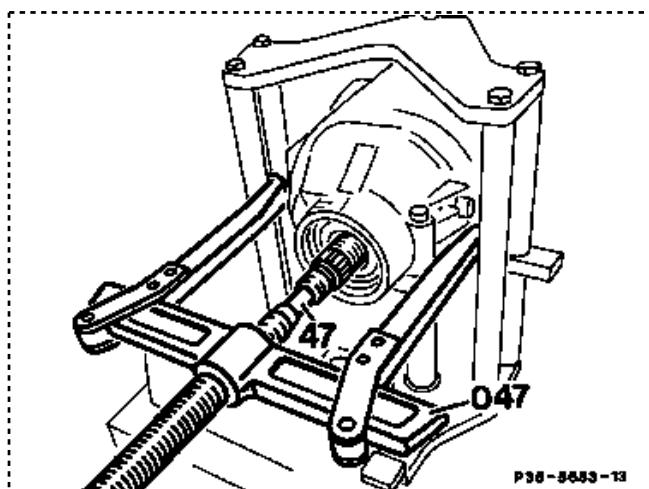
140 589 01 09 00 and 3/4" socket wrench attachment (043a) 140 589 00 08 00 and remove.



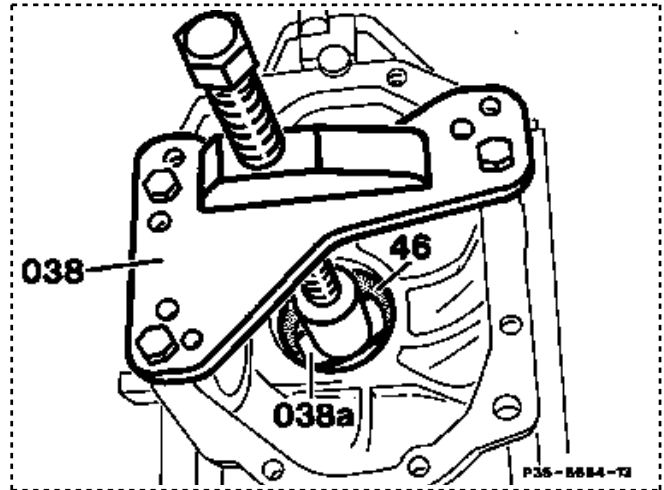
When releasing the twelve-point collared nut, allow the socket wrench extension (043) to rest on the jig (arrow).



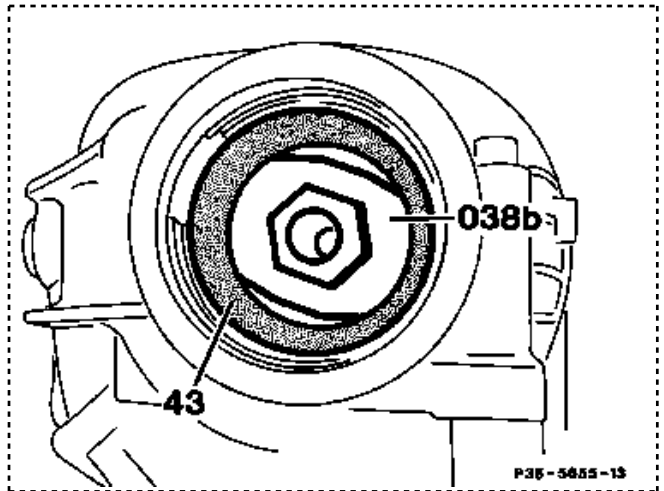
19 Press bevel drive pinion (47) out of rear axle housing using two-arm puller (047) 000 589 65 33 00 and remove with tapered roller bearing inner race.



20 Attach removal/installation tool (038) 140 589 10 43 00 part 03 to rear axle housing. Use thrust piece (038a) 140 589 10 43 00 part 16 to pull inner tapered roller bearing outer race (46) out of rear axle housing. Remove shim.

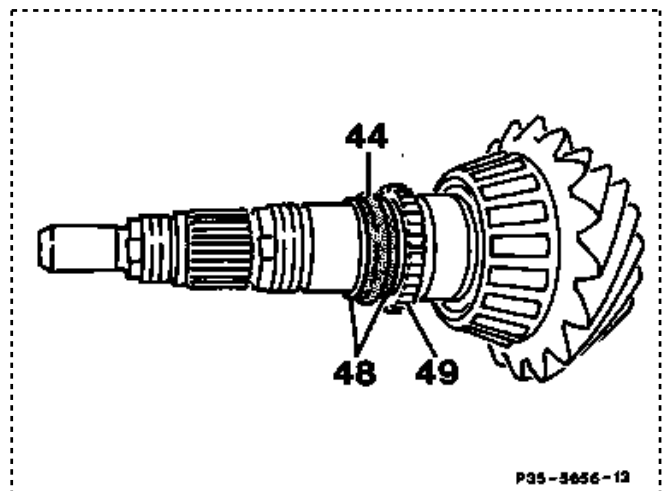


21 Use thrust piece (038b) 140 589 10 43 00 part 18 to press out outer tapered roller bearing outer race (43).



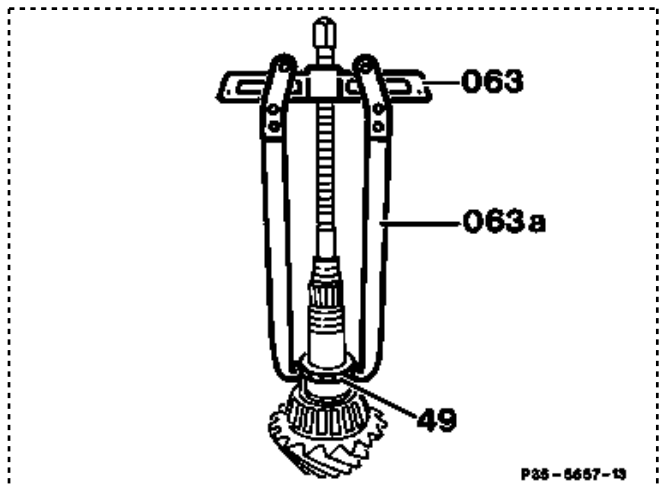
22 Unscrew removal/installation tool from rear axle housing.

23 Remove spacer sleeve (44) and contact washers (48) from bevel drive pinion.



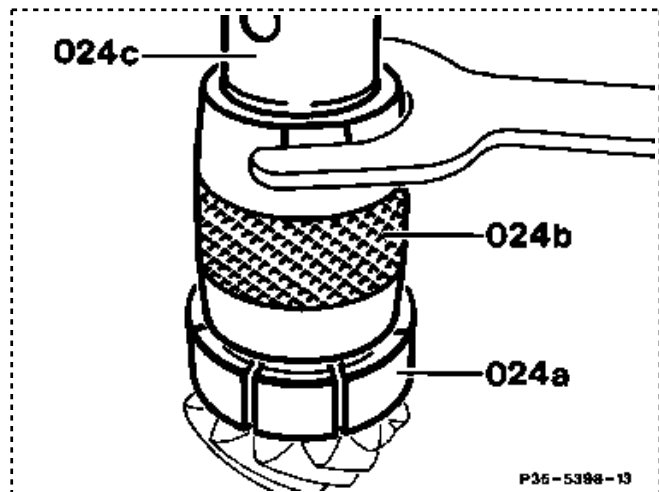
- 44 Spacer sleeve
- 48 Contact washers
- 49 ABS rotor

24 Pull ABS rotor (49) off bevel drive pinion using puller (063) 000 589 88 33 00 and arms (063a) 116 589 12 33 00, except on rear axle center pieces with ASR.

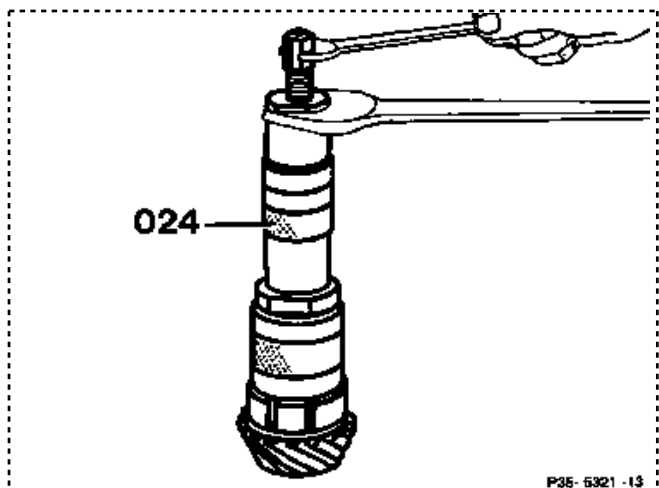


25 Assemble pulling device 001 589 36 33 00 with extension (024c) 000 589 35 34 00 and collet chuck (024a) 140 589 02 34 00.

26 Push collet chuck (024a) of pulling device over tapered roller bearing and secure behind rollers of tapered roller bearing with clamping sleeve (024b).
Open-end wrench WAF 55x65 140 589 00 01 00



27 Pull tapered roller bearing inner race off bevel drive pinion using puller (024).



Checking

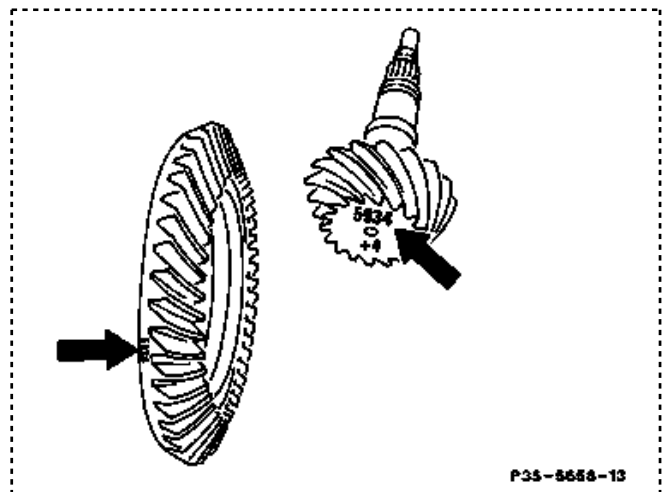
28 Check all parts to see if they can be reinstalled. Check bearing seats on bevel drive pinion for radial run-out. Maximum radial run-out **0.02 mm**.

29 Check contact surface for radial oil seal on propeller flange. Replace propeller flange if contact surface is worn.

30 Push propeller flange onto bevel drive pinion, aligning the marks drawn earlier. Check radial run-out of propeller flange at contact surface for radial oil seal. If the radial run-out exceeds 0.06 mm, even after altering the position of the propeller flange on the splines, replace the propeller flange.

Note

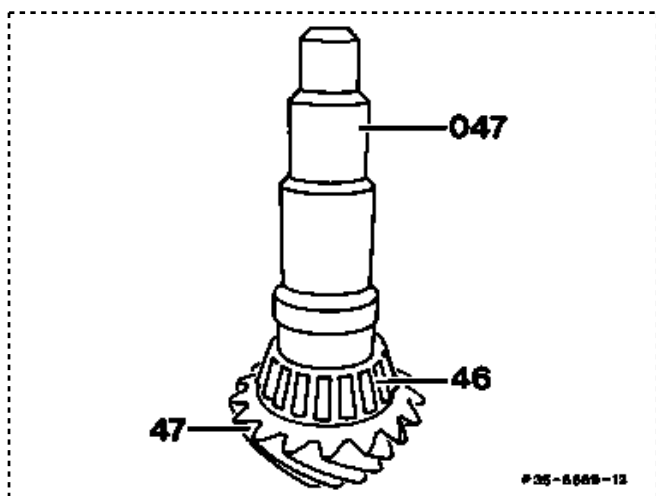
Each bevel drive pinion and crown wheel of a set is marked with a serial number (arrows) which is stamped on both parts. In addition, the bevel drive pinion is always marked with the specific distance (with the sign + or -) for this crown wheel/pinion that is to be set between the two gears.



A data sheet must be used to calculate the gauge of the shim required to adjust the bevel drive pinion. **A specimen data sheet can be found at the end of this operation number.** The measurement and calculation procedures of the example given in this data sheet are described in detail below.

Assembling and adjusting crown wheel/ pinion

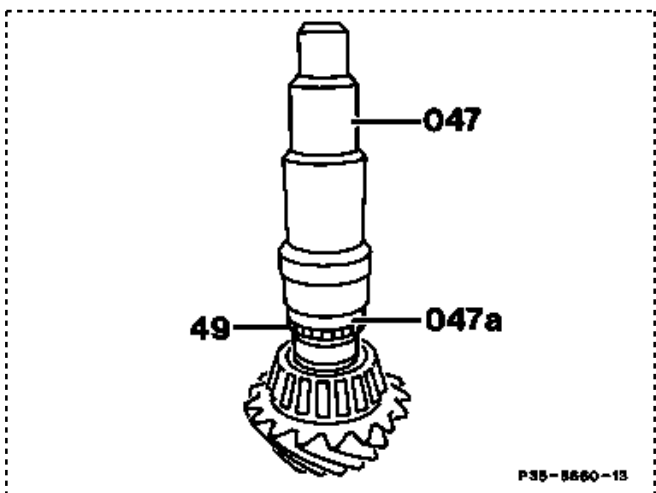
31 Press large tapered roller bearing (46) onto bevel drive pinion (47) using sleeve (047) 140 589 04 15 00 part 01. To do this, first remove inner sleeve, part 02.



32 Press on ABS rotor (49) using sleeve (047) 140 589 04 15 00 part 1 and inner sleeve (047a) part 2, except on rear axle center pieces with ASR.

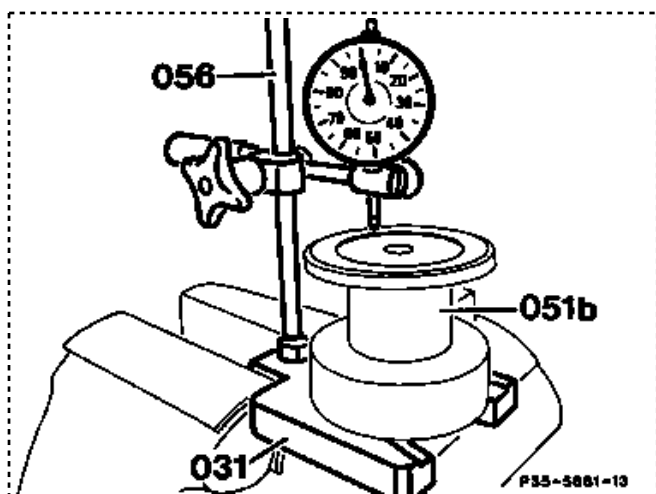
Note

The number of teeth on the rotor must correspond with the rear axle ratio (see technical data).



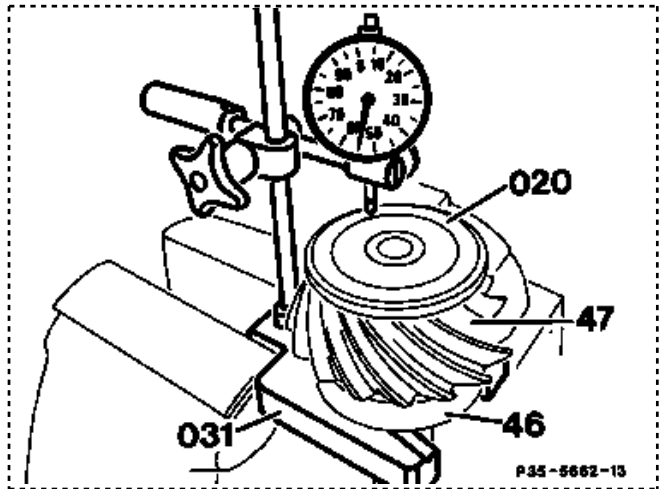
33 Screw gauge and gauge holder (056) 363 589 02 21 00 (remove magnetic stand) onto measuring base (031) 140 589 16 23 00.

34 With approx. **3 mm** bias, first set gauge to "0" on gauging member (051b) 140 589 07 21 00 part 01.



35 Press outer bearing race (46) onto roller cage of bevel drive pinion (47) and add magnetic plate (020)

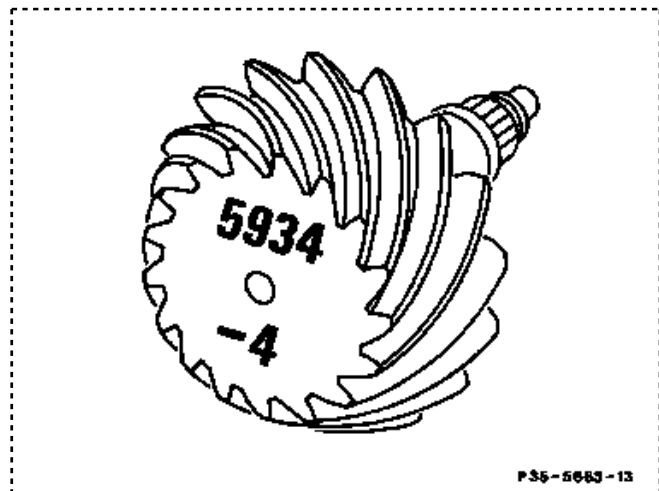
140 589 25 63 00. Insert bevel drive pinion (47) into measuring base (031) and measure height of bevel drive pinion with bearing and magnetic plate.



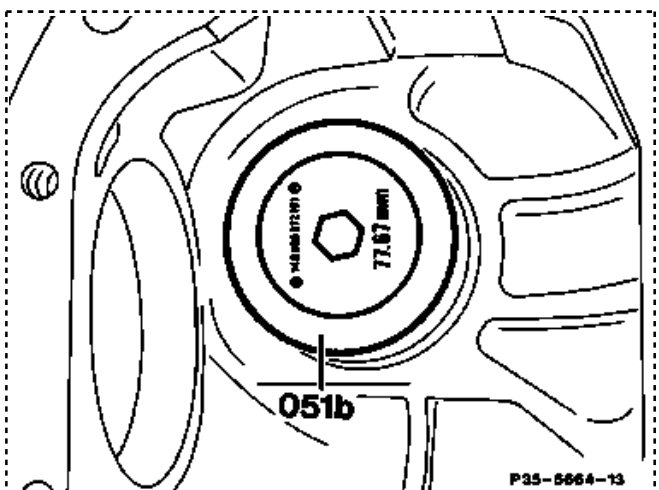
36 Read off difference between height of gauging member "B1" and height of bevelled end of drive pinion "B" and enter the value calculated (e.g. 1.46 mm) beside section 1 in the data sheet.

37 Enter fundamental deviation "a" of bevel drive pinion (see arrow, + or -) beside section 2 (e.g. - 0.04 mm) in the data sheet.

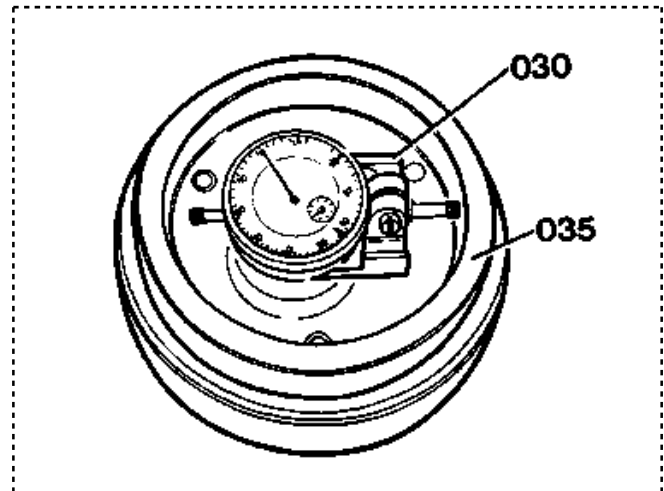
38 According to the sign of the number on the bevel drive pinion, either add (+) or subtract (-) values from sections 1 and 2.



39 Insert gauging member (051b) 140 589 07 21 00 part 01 into rear axle housing and screw together with retaining piece 140 589 07 21 00 part 02.



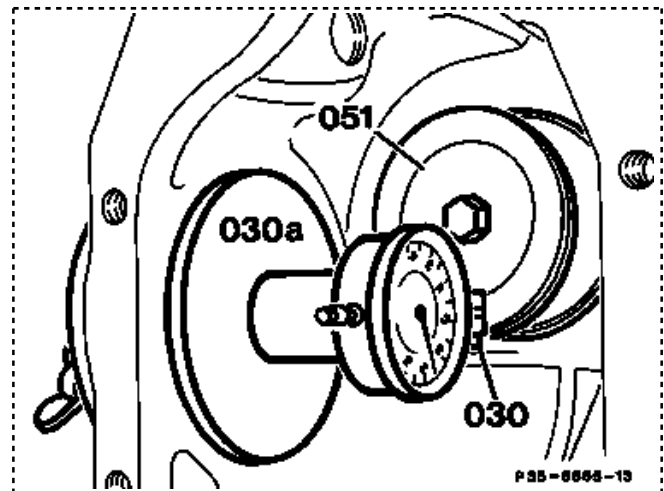
40 Install gauge with gauge holder (030)
 111 589 08 23 00 in adjustment gauge (035)
 115 589 05 21 00 and set to "0" with **3 mm**
 bias.



41 Clean contact surfaces of bearing covers
 on sides of rear axle housing.

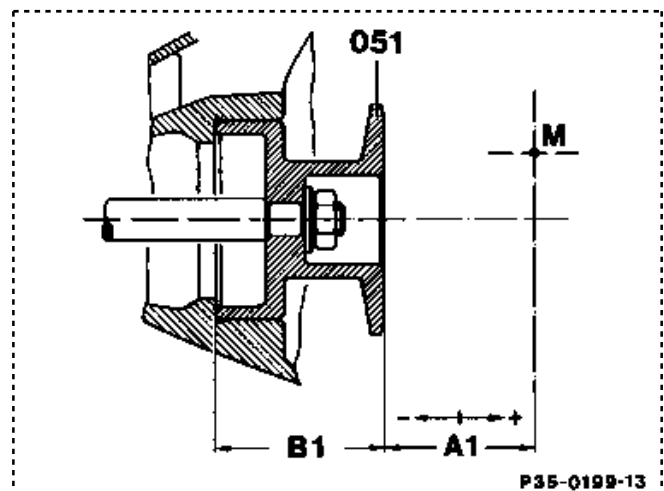
42 Insert measuring bracket (030a) 116 589
 01 21 00 part 01 together with gauge holder
 (030) and gauge into left-hand bore in rear
 axle housing and screw in place.

43 Read off difference between set gauge
 distance and end face of gauging member,
 and enter beside section 3 in either the
 positive or negative direction (e.g. - 0.55
 measured, therefore in negative direction).



Note

The direction positive (+) or negative (-)
 refers to the direction of rotation of the gauge
 needle. Any counterclockwise deviation from
 the zero position is in the **negative direction**,
 clockwise is the **positive direction**.



44 Add (+) or subtract (-) the subtotal from sections 1 and 2 with the value from section 3. The result obtained gives the gauge of the shim.

Example:

Section 1		=	1.46
Section 2		= +	
		= -	0.04

Subtotal		=	1.42
Section 3	Negative direction	=	+0.55
	Positive direction	=	-

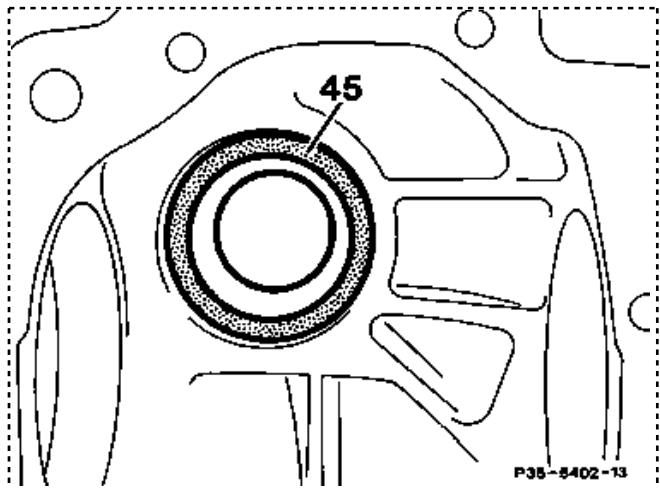
Gauge of shim "S"		=	1.97

45 Remove measuring bracket and gauging member from rear axle housing.

46 Insert shim (45) of calculated gauge "S" into rear axle housing (see example).

Note

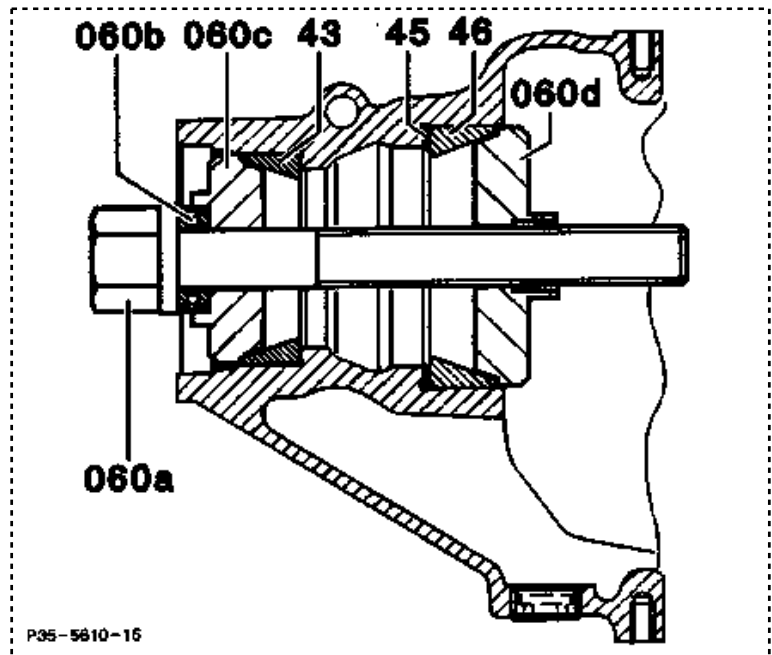
Only tempered shims must be used. Shims are available in various gauges (see technical data). If necessary, a shim should be ground down as required.



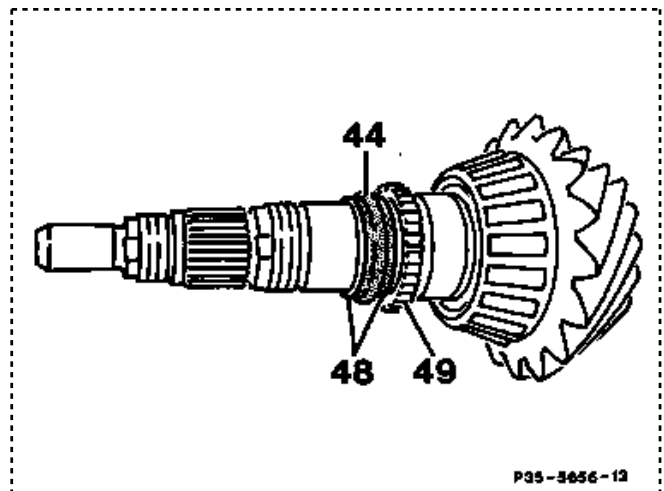
47 Pull outer races of front (43) and rear (46) tapered roller bearings into rear axle housing using puller (060a-d) 140 589 01 43 00.



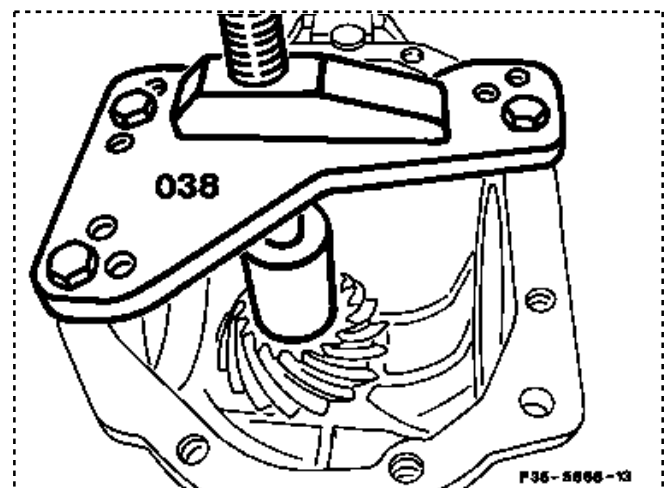
Ensure that the outer races do not tilt during installation.



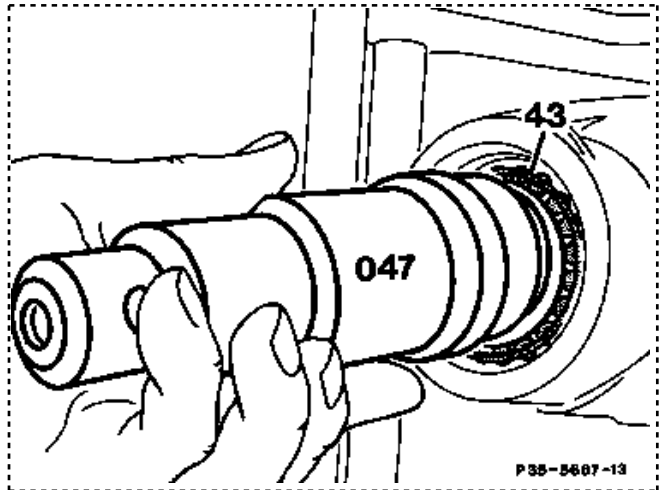
48 Add one contact washer (48) to each side of **new** spacer sleeve (44) and push onto bevel drive pinion.




49 Install bevel drive pinion in rear axle housing and support with removal/installation tool (038) 140 589 10 43 00 by carefully screwing in threaded spindle by hand as far as end face of bevel drive pinion.

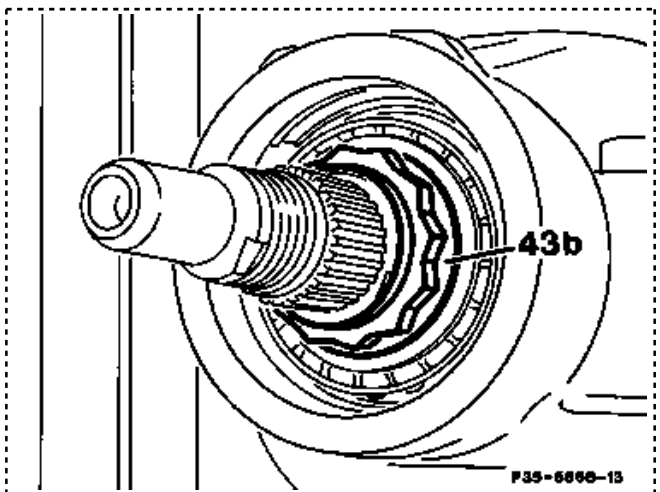


50 Push tapered roller bearing inner race (43) onto bevel drive pinion and press in with sleeve (047)
140 589 04 15 00.

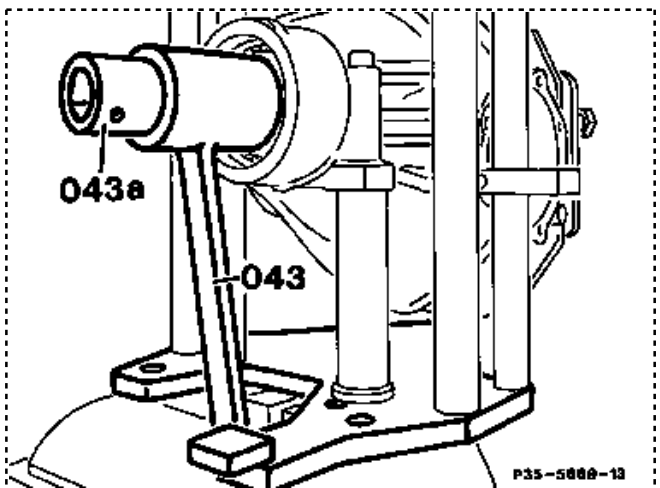


51 Screw on new inner twelve-point collared nut (43b).

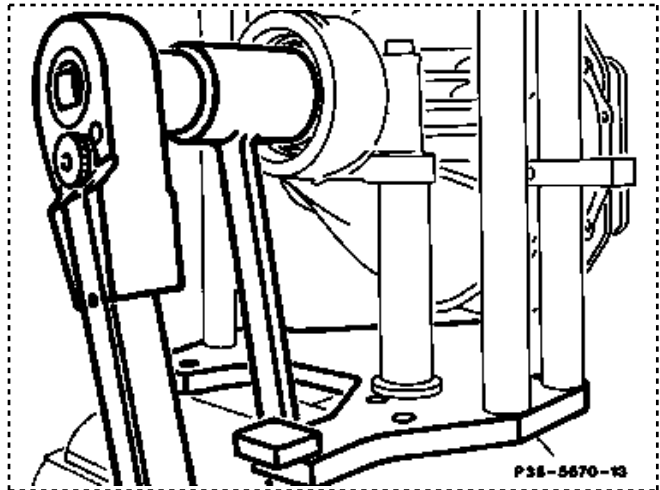

Coat the contact collar of the twelve-point collared nut with molycote grease.



52 Push socket wrench attachment WAF 41 (043)
140 589 01 09 00 and 3/4" socket wrench attachment (043a) 140 589 00 08 00 onto bevel drive pinion.



53 **Carefully** tighten twelve-point collared nut using torque wrench 001 589 74 21 00 until the specified friction torque is attained (see table "Friction torque for bevel drive pinion bearing").



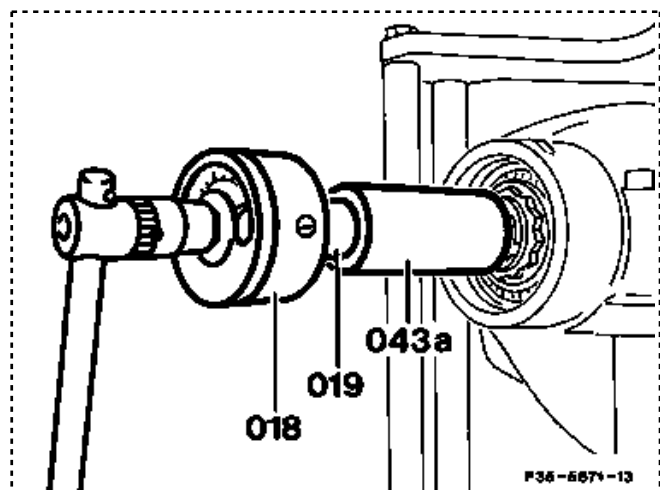
When tightening the twelve-point collared nut, turn the bevel drive pinion several times and gently tap the rear axle housing to ensure that the tapered rollers properly engage in their tracks.

54 Remove removal/installation tool with socket wrench attachment WAF 41 from rear axle housing.

55 To check installation, attach torque meter (018) 001 589 48 21 00 with adapter (019) 100 589 02 59 00 to 3/4" socket wrench attachment (043a) 140 589 00 08 00 and crank bevel drive pinion.

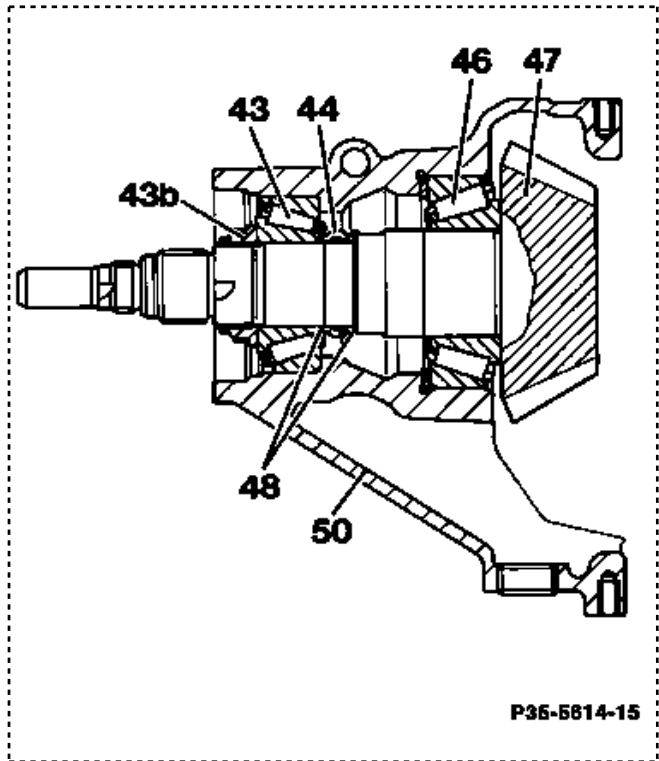


To measure the friction torque, the bevel drive pinion must be cranked by hand at approx. 50-60 revs/min.



Note

The tapered roller bearings (43 and 46) of the bevel drive pinion (47) must be installed with a certain bias. This permanent bias is obtained by compressing the spacer sleeve (44) located between the inner bearing race of the front tapered roller bearing and the bevel drive pinion while tightening the twelve-point collared nut (43b).



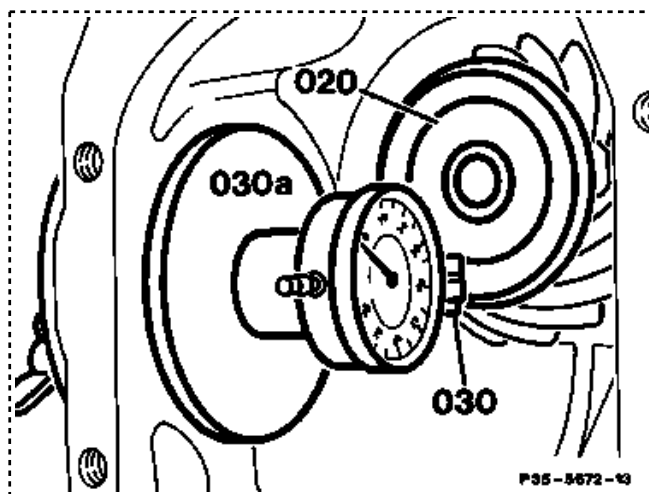
- 43 Tapered roller bearing
- 43b Twelve-point collared nut
- 44 Spacer sleeve
- 45 Shim
- 46 Tapered roller bearing
- 47 Bevel drive pinion
- 48 Contact washers
- 50 Rear axle housing

If the friction torque when the bevel drive pinion slips is too low (i.e. if the bias is insufficient), the twelve-point collared nut (43b) should be tightened further slightly. If the specified friction torque is exceeded, the bevel drive pinion must be removed again and a **new** spacer sleeve (44) installed. **The friction torque must never be reduced by slackening the twelve-point collared nut,** or the bias of the tapered roller bearings will be insufficient. This would result in play in the bevel drive pinion during driving and possible noises in the rear axle drive unit.

56 Again install measuring equipment (040) 116 589 01 21 00 part 01, together with gauge holder (030) 111 589 08 23 00 and gauge, in left-hand bore in rear axle housing to check the setting. Place magnetic plate (020) 140 589 25 63 00 on end face of bevel drive pinion to measure adjustment distance "A".

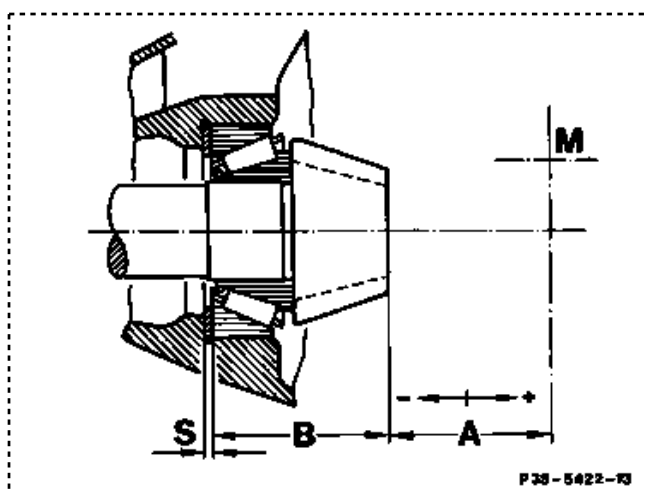
Note

The deviation of the crown wheel/pinion in this example is - 0.04 mm from the basic dimension in the negative direction and corresponds to the value stamped on the end face of the bevel drive pinion.



The permissible fundamental deviation of the adjustment distance "A" must not be exceeded by more than 0.01 mm in the positive and 0.02 mm in the negative direction.

If the deviation is larger, the installed shim must be re-ground or a new shim of the corresponding gauge must be installed. It is absolutely essential, however, that a **new spacer sleeve** for the tapered roller bearings be installed.

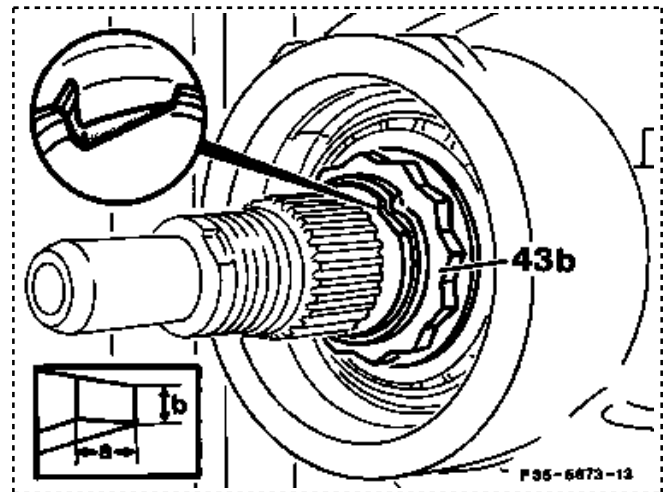


57 Remove measuring equipment, magnetic plate and gauge with holder from rear axle housing.

58 Caulk twelve-point collared nut (43b) into one of the two grooves in the bevel drive pinion so that there is no gap between the groove and locking tab (detail, top left).



Do not deal any strong blows in the axial direction.

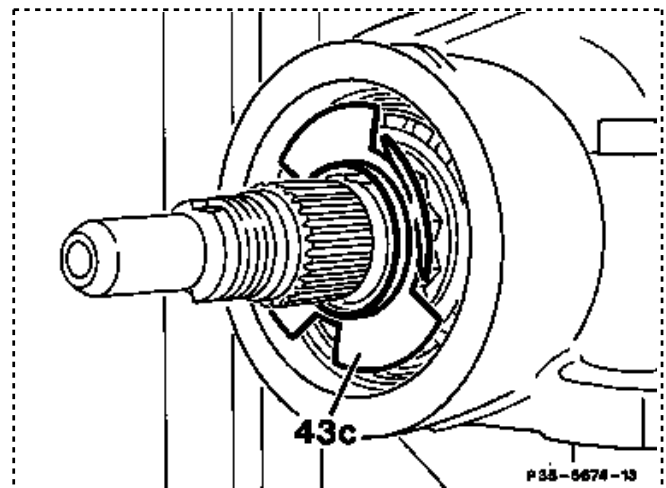


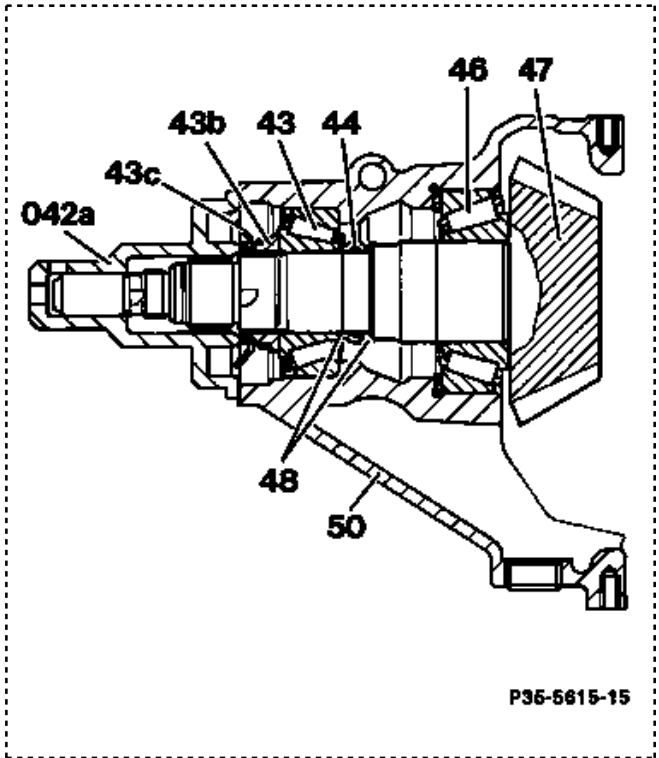
Dimensions for caulker, detail bottom left:

a=approx. 8 mm

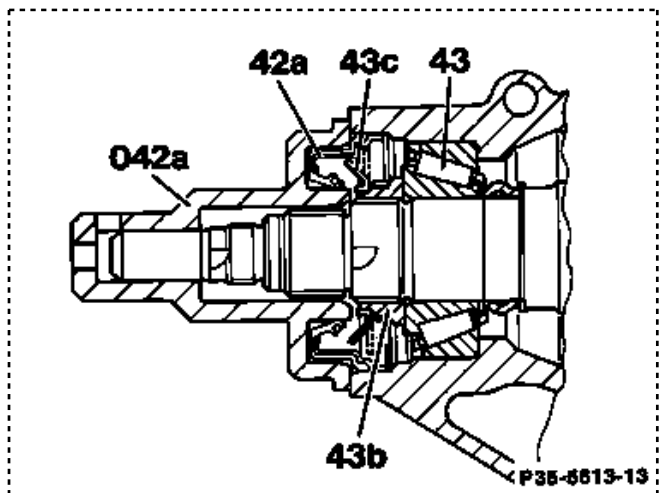
b=approx. 4 mm

59 Push on new oil slinger (43c). Press onto collar of twelve-point nut using drift (042a) 140 589 02 15 00.



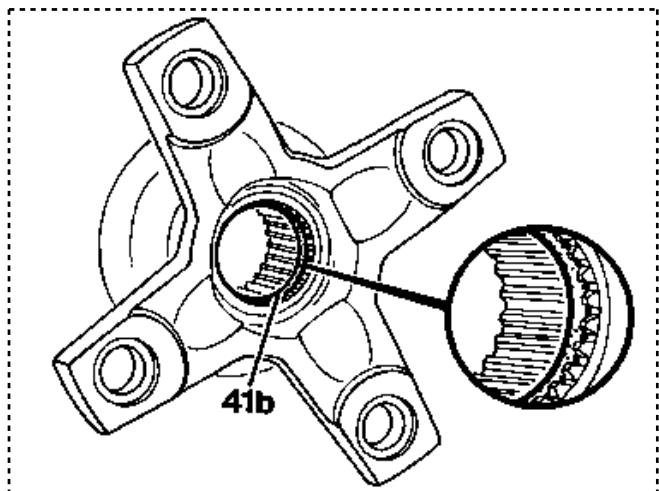


60 Coat lip of rubber/metal radial oil seal (42a) with hypoid transmission fluid and press into rear axle housing using drift (042a) 140 589 02 15 00.

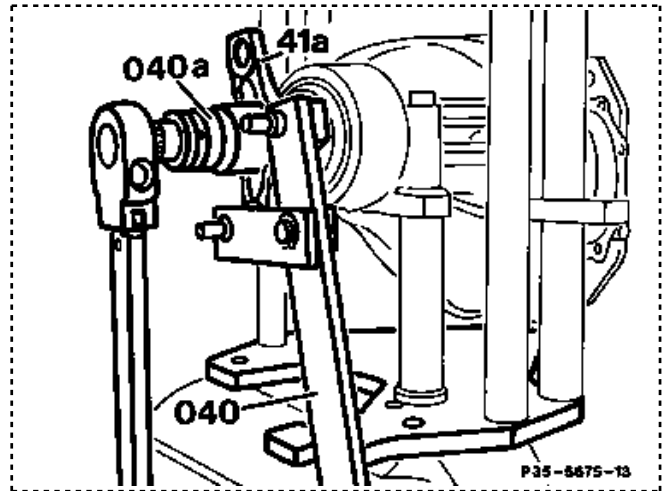


61 Replace O-ring (41b) in 4-arm propeller flange.


62 Push propeller flange onto bevel drive pinion noting the alignment marks made earlier on propeller flange and bevel drive pinion.



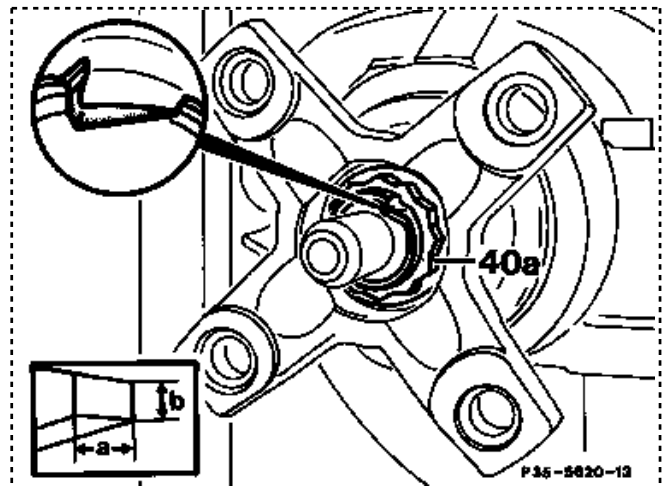
63 Screw on new twelve-point collared nut.
 Push pin wrench (040) 129 589 01 07 00 and
 30 mm socket wrench attachment (040a) 126
 589 02 09 00 onto propeller flange (41a) and
 tighten twelve-point collared nut to 120-130
 Nm.



64 Caulk twelve-point collared nut (40a) into
 one of the two grooves in the bevel drive
 pinion so that there is no gap between the
 groove and locking tab (detail, top left).

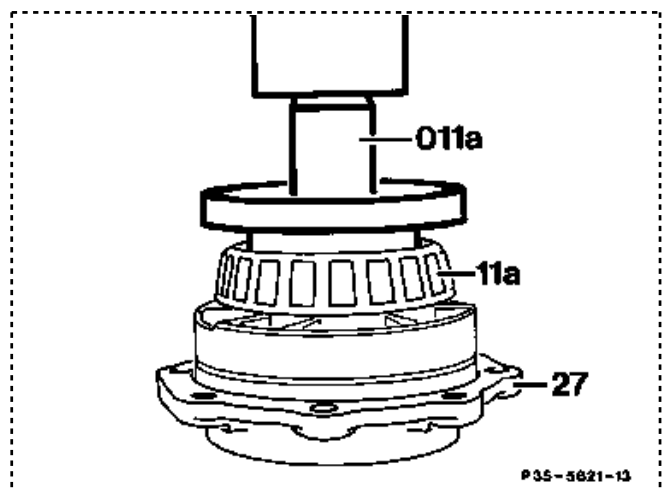
 Do not deal any strong blows in the axial
 direction.

Dimensions for caulker, detail bottom left:
 "a"=approx. 8 mm
 "b"=approx. 4 mm

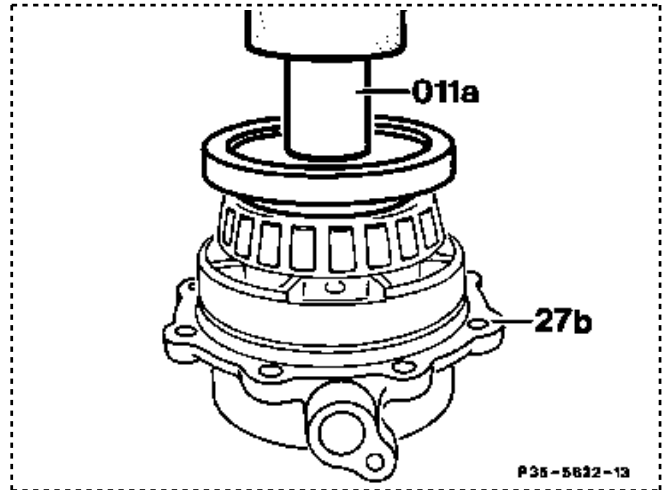


65 Press tapered roller bearing inner race
 (11a) into side bearing covers (27 and 27b)
 using drift (011a)
 140 589 09 15 00.

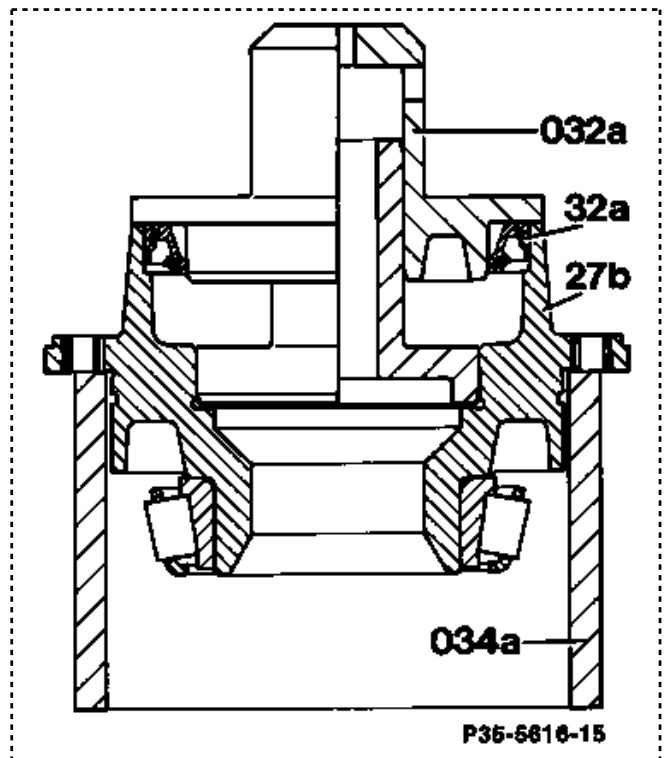
Arrangement with ABS



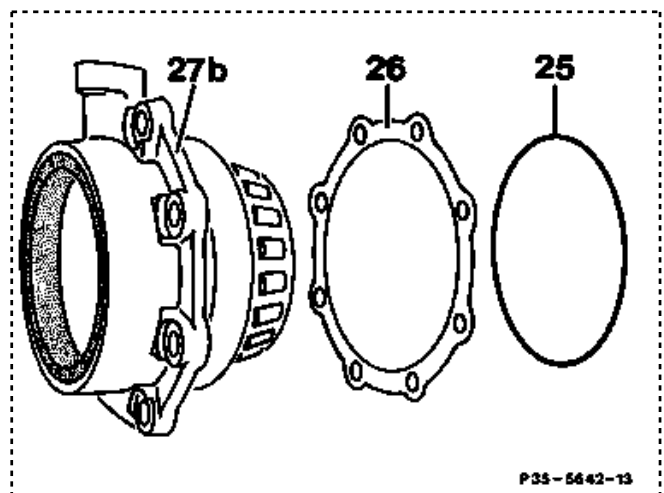
Arrangement with ASR



66 Press in radial oil seal (32a) using drift (032a) 140 589 03 15 00. To do this, lay bearing cover (27b) on removal/installation tool (034a) 129 589 02 43 00 part 01.



67 Place previously removed shims (26) on bearing covers (27b) and insert new O-rings (25) into grooves in bearing cover.



ASR
Arrangement of bearing cover with

Adjusting backlash

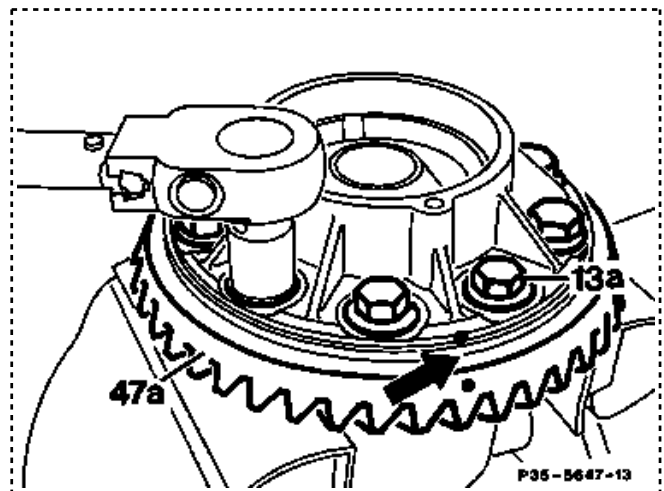
Note

The backlash of the crown wheel/pinion and the necessary bias in the tapered roller bearings for the differential are adjusted by installing shims between the bearing covers and the rear axle housing. The shims are available in various gauges. To install, first reinstall the previously removed bearing cover and shims on the appropriate side to obtain a provisional basic setting.

68 Dismantle and assemble differential (35-560).

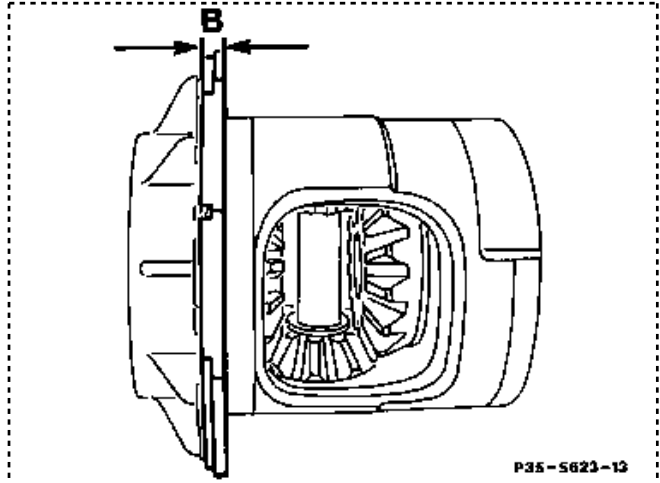
69 Carefully clean crown wheel and seat on differential housing. Heat crown wheel (47a) to 75-85 °C and place on differential housing. If appropriate, note the alignment marks made earlier on the crown wheel and differential housing (arrow).

If the crown wheel will not go on the differential housing, ease it into place by tapping with a plastic mallet.





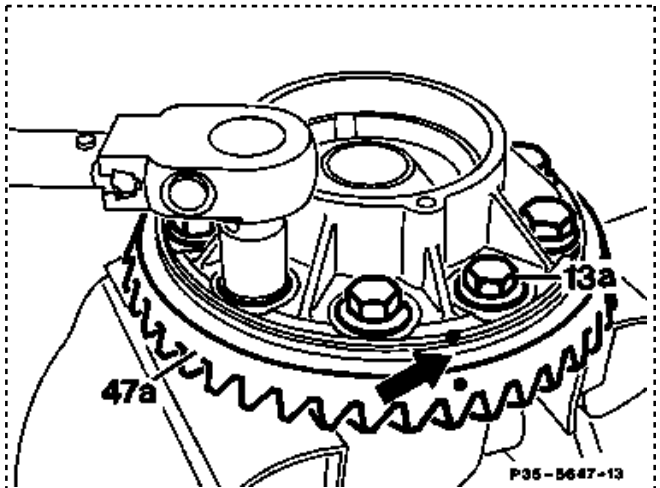
When installing a new differential housing or if using new crown wheel bolts, note the length of the crown wheel bolts. For differential housings with **8 mm thick** contact flange (distance "B"), use crown wheel bolts **20 mm long**.



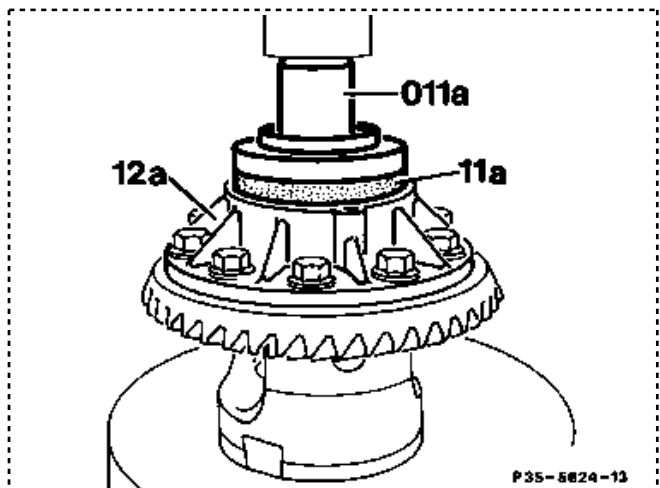
70 Tighten new serrated locking bolts (13a) to 140 Nm in a cross-wise pattern. Torque wrench 001 589 67 21 00.



Always replace crown wheel bolts when they have been used once.



71 Press tapered roller bearing outer race (11a) into differential housing (12a) using drift (011a)
140 589 09 15 00.

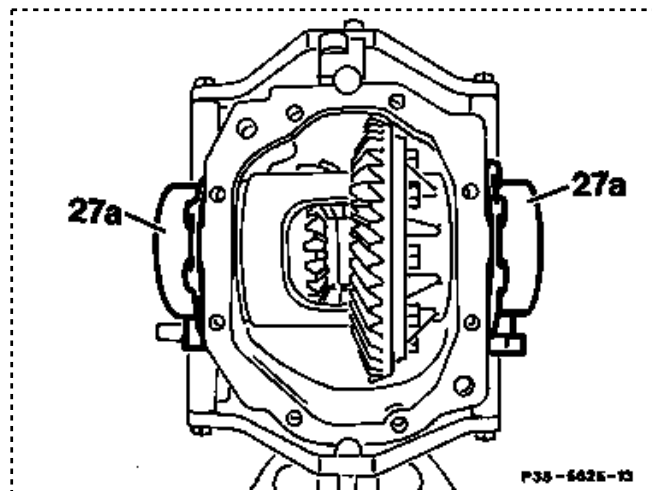


72 Lightly coat circumference of O-rings and bearing cover (27a) with hypoid transmission fluid.

73 Insert differential into rear axle housing and push in both side bearing covers (27a) as far as they will go.



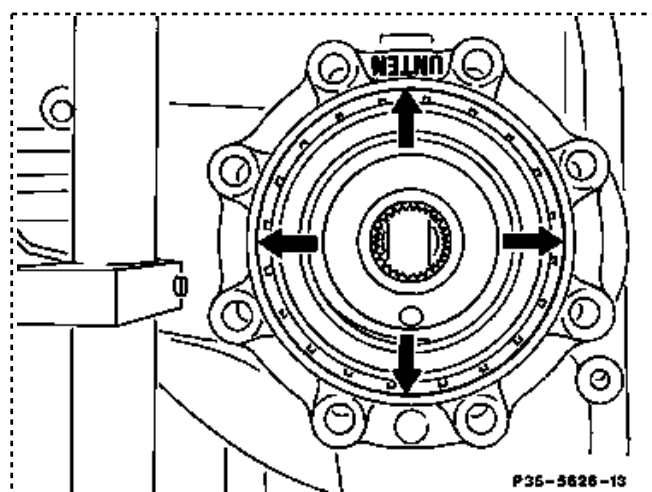
Do not damage the O-rings when installing the bearing covers.



Not installed position of the side bearing covers.

The ABS bearing covers are marked with the word

"**UNTEN**" (= down). ASR bearing covers must be installed with the speed sensor connection pointing upwards. This information refers to the installed position of the rear axle center piece in the vehicle.

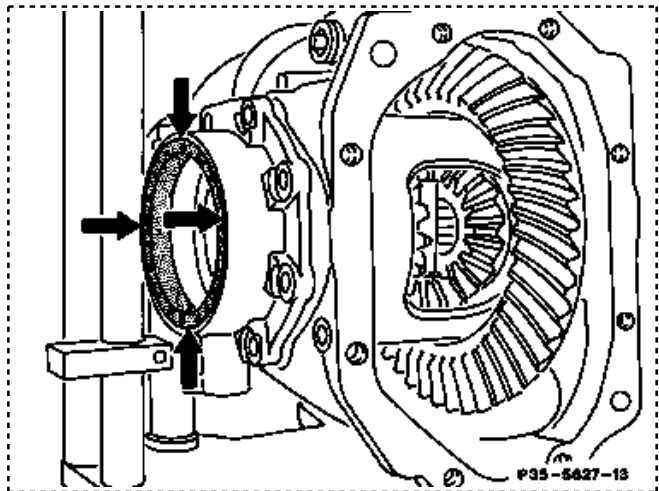


Arrangement with ABS

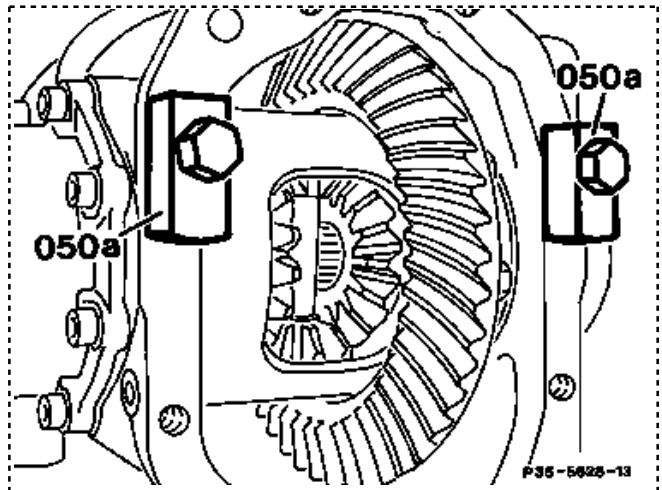
Note

If the side bearing covers stick in the bore in the rear axle housing, ease them into place by tapping with a plastic mallet (arrows).

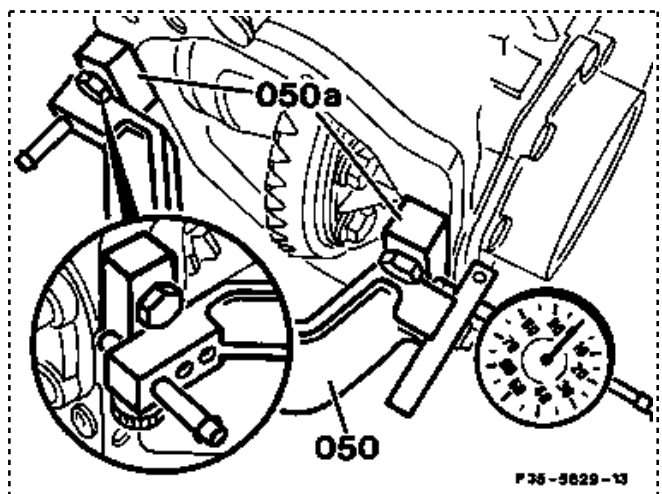
Arrangement with ASR



74 Screw contact blocks (050a) 201 589 01 63 00 for contact arm (050) 126 589 08 21 00 to left and right sides of sealing surface on rear axle housing.

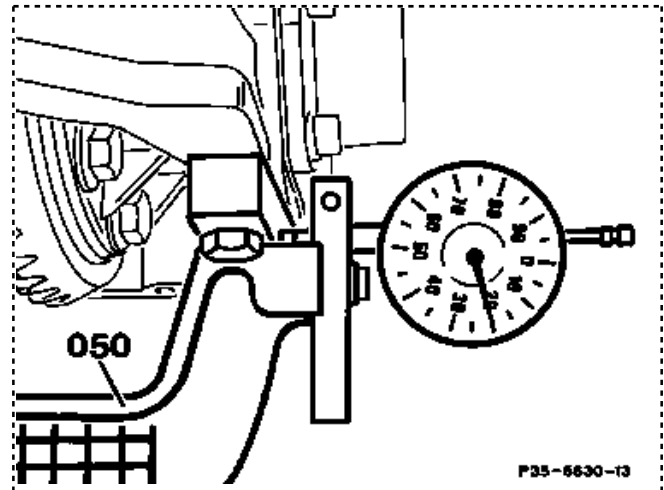


75 Place contact arm for measuring housing expansion and gauge on contact blocks and set gauge to "0" with approx. 3 mm bias.



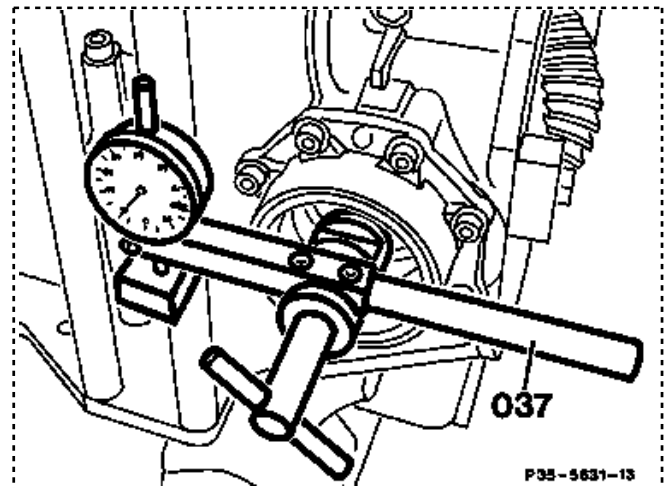
76 Screw in all Allen bolts (27a) on side bearing covers and tighten to 20 Nm. Torque wrench 001 589 66 21 00.

77 Use contact arm again. The required expansion (spread) of the rear axle housing, and thus the correct bias for the tapered roller bearings on the differential, is obtained when the expansion measures between **0.15 and 0.20 mm**.



78 Install backlash meter (037) 140 589 08 21 00 with bushing in left-hand bore in differential housing and secure.

79 By moving the gauge holder or the crown wheel, measure the backlash at four points referred to the circumference of the crown wheel. The smallest measurement applies. **The backlash must measure 0.08-0.14 mm.** During each measurement, hold the bevel drive pinion securely by the propeller flange.



Note

The adjustment of the tapered roller bearings and the crown wheel/pinion is correct when both the spread (expansion) of the rear axle housing and the backlash are within the nominal ranges. If these values are not attained, the adjustment must be repeated using thicker or thinner shims as required (see technical data).

Example 1

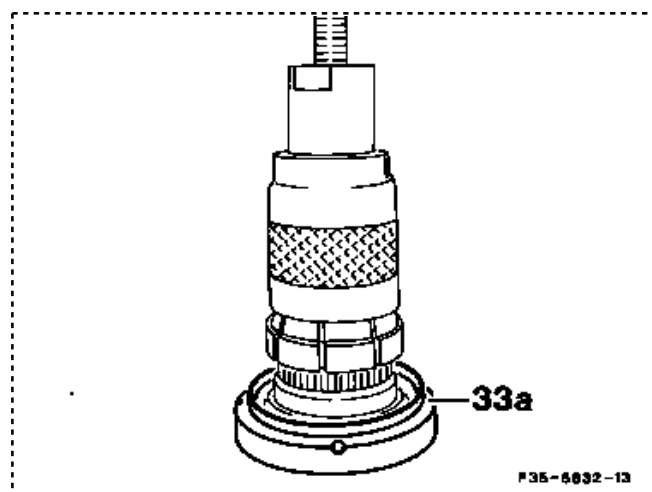
If the backlash is correct but the expansion of the rear axle housing is too small, then shims of equally smaller gauge must be installed on both side bearing covers.

Example 2

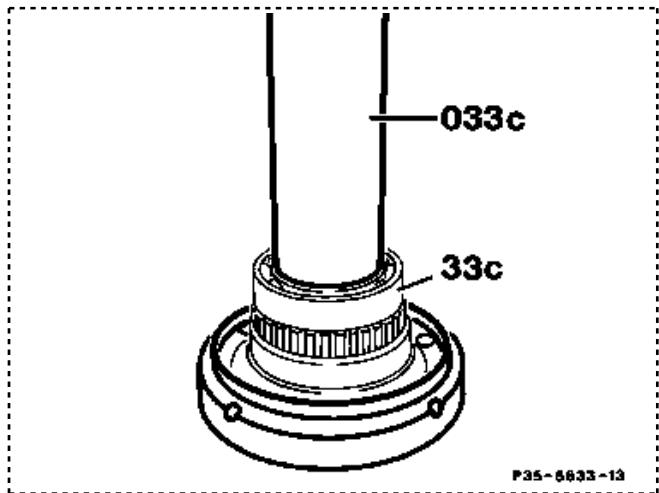
If the expansion is correct but the backlash is excessive, then a shim which is thicker by the missing amount must be installed on the left-hand side, and a shim which is thinner by the same amount on the right-hand side. If the backlash is insufficient, proceed in the reverse sequence.

80 Remove contact blocks.

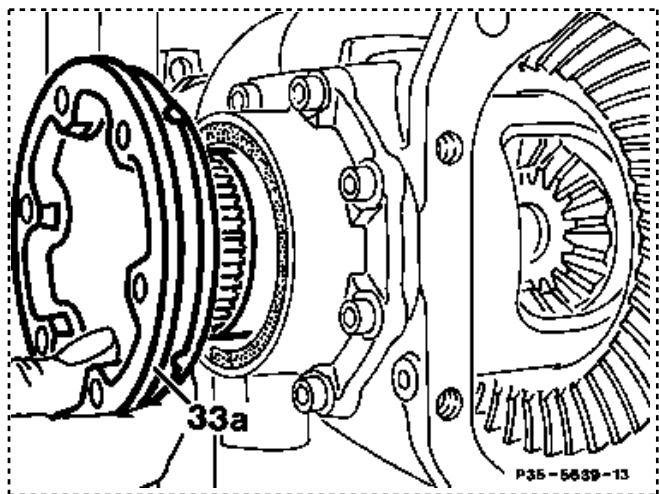
81 Pull deep-groove ball bearing from connecting flange (33a). Use pulling device 001 589 36 33 00, collet chuck 140 589 00 34 00 and open-end wrench WAF 55x65 mm 140 589 00 01 00.



82 Press deep-groove ball bearing (33c) all the way onto flange using a suitable tube (033c).

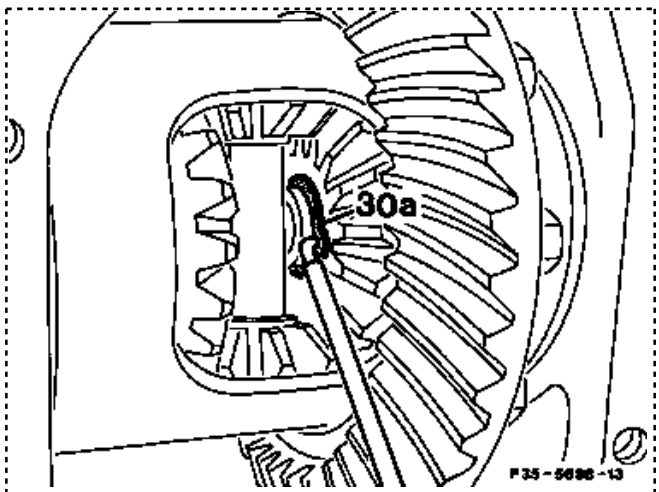


83 Push left and right connecting flanges (33a) into rear axle shaft gear.



84 Press new circlip (30a) of same gauge as that previously installed between connecting flange and rear axle shaft gear.

85 Check axial play between connecting flange and rear axle shaft gear. There must be no perceptible play. The circlip should still be free to rotate in the groove. If necessary, install a thicker or thinner circlip as required (see technical data).

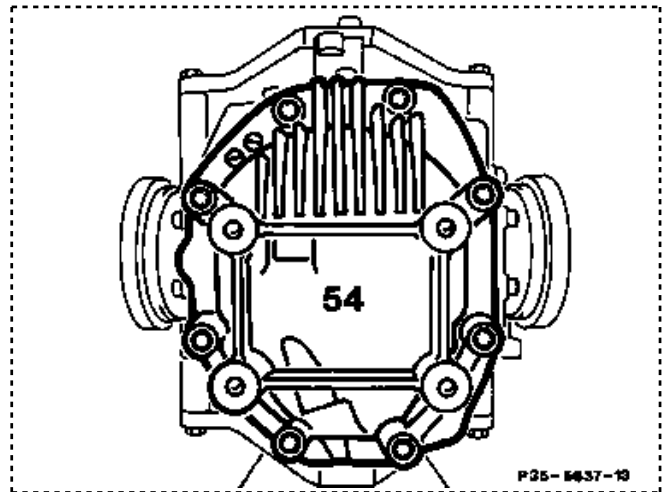


 **Replace the circlip if it has been used once.**

86 Clean sealing surfaces on rear axle end cover (54) and rear axle housing, and coat with sealant.

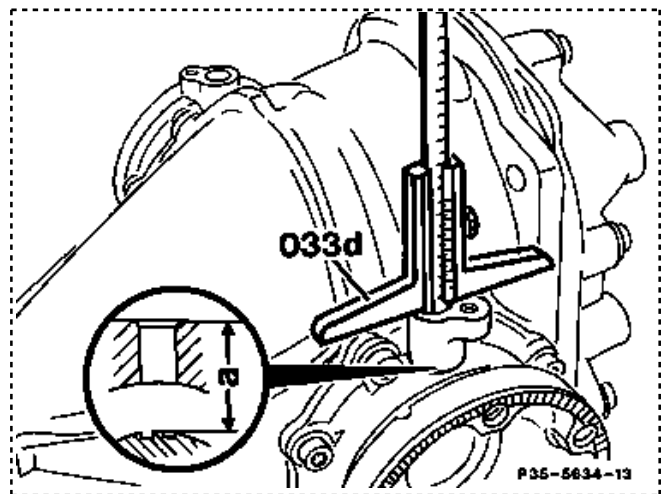
87 Install rear axle end cover. Tightening torque of multi-point Allen bolts 55 Nm.
Torque wrench 001 589 66 21 00

88 Remove rear axle center piece from the jig.



Rear axle center piece with ASR

89 Measure distance "a" between contact surface of speed sensor and head dia. of ASR rotor (see detail) using commercially available depth gauge (033d). Determine gauge of shim from table (see technical data) and stick appropriate shim onto contact surface with sel-adhesive paper.



90 Fill with hypoid transmission fluid up to lower edge of oil filler bore (for oil type and capacity, see technical data). Tightening torque of screw plug 50 Nm.

91 Replace breather (55) on rear axle housing. Tightening torque 30 Nm.

