

Fig. 46-51. Fitting the thrust washers

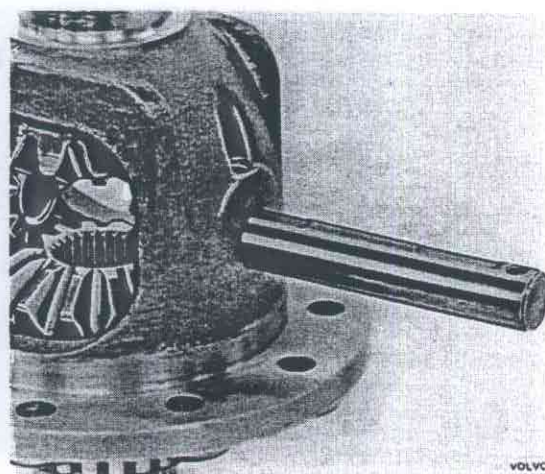


Fig. 46-53. Driving in the shaft

Assembling the differential housing

1. Grease the teeth and slide surfaces on the differential gears. Oil the thrust washers.
2. Place the differential side gears and thrust washers in the housing, see Fig. 46-51.
3. Place the dished thrust washers on the differential pinions. Place the pinions opposite each other on the differential side gears, Fig. 46-52. Roll in the pinions at the same time. Check to make sure the washers are fitted properly.
4. Drive in the shaft, Fig. 46-53. While driving in check to make sure that the thrust washers are fitted properly.
5. Rotate the gears so that the grease is evenly distributed on them.
6. Fit the differential housing in a vice. Check the backlash with a rocker indicator, Fig. 46-54. The clearance may be max. 0.22 mm (0.0088"). If the backlash is greater than this, replace the thrust washers for the differential side gears. Washers are available in the following sizes: 0.74, 0.78, 0.82, 0.86, 0.90, 0.94 and 0.98 mm (0.029, 0.030, 0.032, 0.033, 0.035, 0.037").



Fig. 46-52. Fitting the diff. side gears

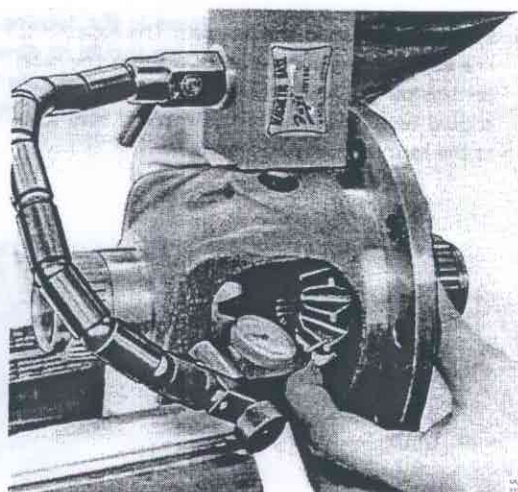


Fig. 46-54. Checking the clearance

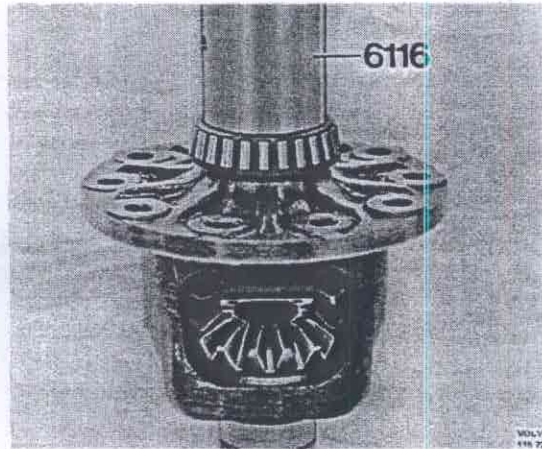


Fig. 46-55. Pressing on the bearing

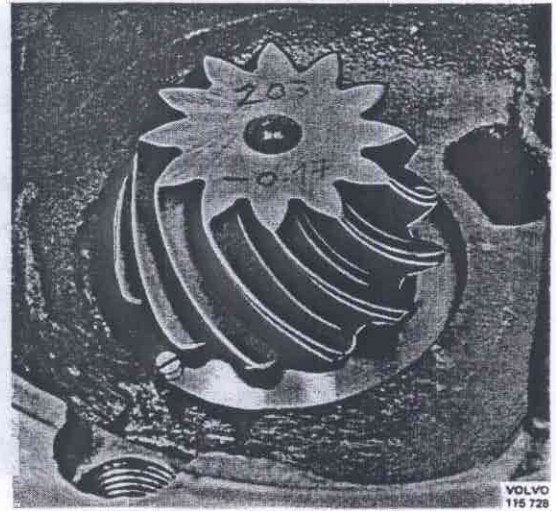


Fig. 46-57. Lock bolt

7. When correct backlash has been obtained, drive in the shaft lock pin.
8. Press on the differential bearings with 6116, Fig. 46-55.
9. Fit the crown wheel. Fit and tighten the bolts to a torque of 80–100 Nm (8–10 kpm = 58–72 lbft).

Assembling the rear differential carrier

Special tools: 1845, 2284, 2395, 2404, 2600, 2636, 2685, 2686, 2806, 2841, 6102, 6113, 6146.

1. Polish the pinion mesh face with a fine emery cloth.
2. Place the adjuster ring 2685 with lock screw facing the pinion. Tighten up spanner 2841, Fig. 46-56.
3. Place the pinion in the housing. The lock pin for the adjuster ring should go down into the recess on the carrier housing bearing face and the ring should be turned in order to make it easy to get at the lock bolt, Fig. 46-57.

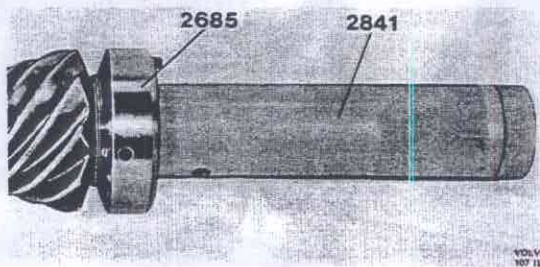


Fig. 46-56. Adjuster ring and sleeve for pinion location

4. The pinion should have a certain nominal measurement (1, Fig. 46-58) to the crown wheel centreline. Due to tolerances in manufacture, deviations from the nominal measurement arise. Deviation is indicated on the ground face of the pinion with a figure. Deviation (e.g. 1 = 0.01 mm = 0.0004") can either be + or -. To check the pinion location, use a dial indicator as well as a measuring tool 6113, which consists of two parts: a pinion gauge and an adjuster jig.

The check is carried out as follows:

Place the pinion gauge on the pinion face and the adjuster jig in the differential bearing seats, see Fig. 46-59. Screw tight parallel block 6146 on the differential carrier housing, Fig. 46-60. Place the indicator holder 2284 on the carrier housing and zero-set the indicator to the highest point on

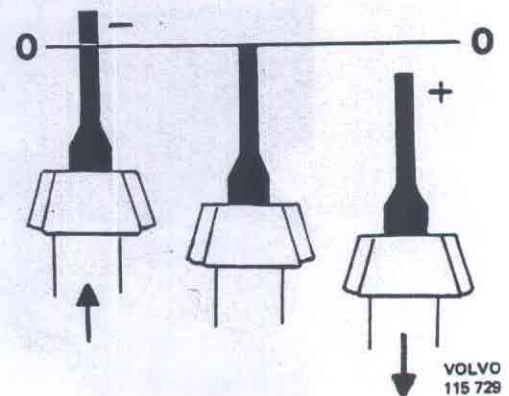


Fig. 46-58. Pinion location

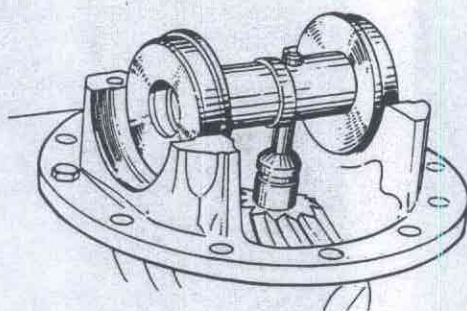


Fig. 46-59. Checking the location

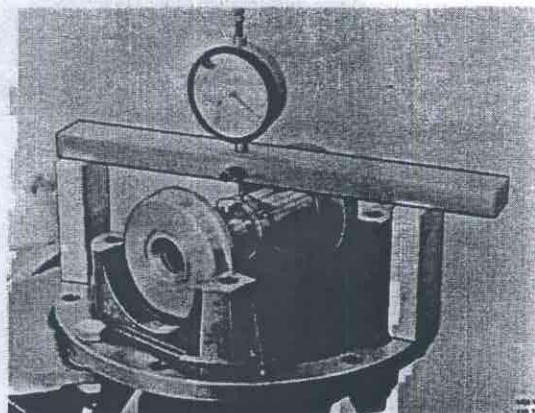


Fig. 46-61. Checking the location

the adjuster jig, Fig. 46-60. Then turn over the indicator holder so that the indicator comes towards the pinion gauge, Fig. 46-61. Read off the indicator.

If the pinion is marked 0, the adjuster jig and pinion gauge should be at the same height, if it is marked - then the pinion gauge should be higher than the adjuster jig, and if it is marked +, then the pinion gauge should be lower than the adjuster jig for correct adjustment. This is adjusted by turning the spanner on the pinion until the dial indicator shows correct value. Then lock the adjuster ring with the lock bolt. Remove the measuring tool and pinion. Remove the adjuster ring and the spanner from the pinion.

5. Place the rear pinion bearing with outer race in measuring fixture 2600. Fit on the plate, spring and nut. Turn the nut until the flat side faces

downwards. Rotate the plate (and thereby the bearing) back and forth several times so that the rollers take up their proper positions. Place the adjuster ring on the fixture, Fig. 46-62. Use holder 2284 and a dial indicator. Point the dial indicator pointer towards the bearing outer race and zero-set the indicator. Then place the pointer to point to the adjuster ring. The indicator will now indicate the thickness of shims required. NOTE! It is not always possible to obtain shims with precisely the right thickness. However, they must not be more than 0.03 mm (0.0012") thicker than the measured value but up to 0.05 mm (0.0020") thinner. Shims are available in the following dimensions: 0.08, 0.13 and 0.25 mm (0.0032, 0.0052 and 0.0098").

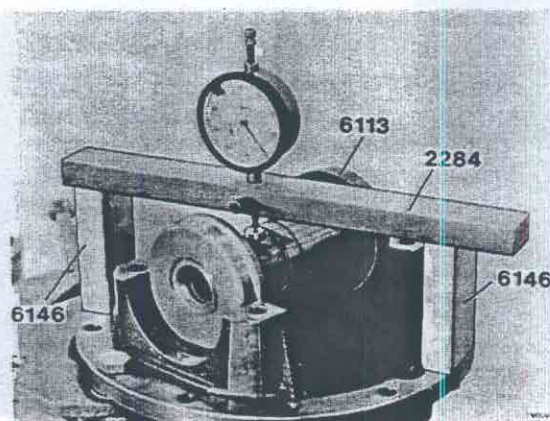


Fig. 46-60. Checking the location

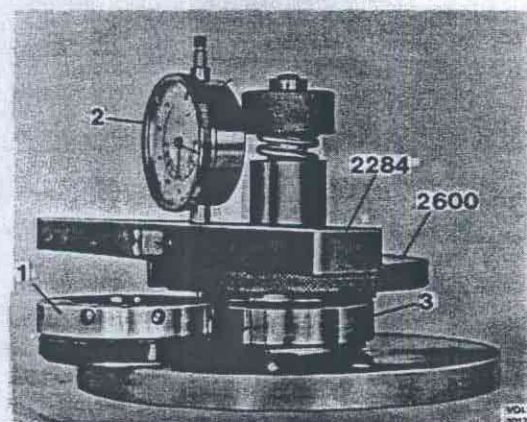


Fig. 46-62. Determining shim thickness

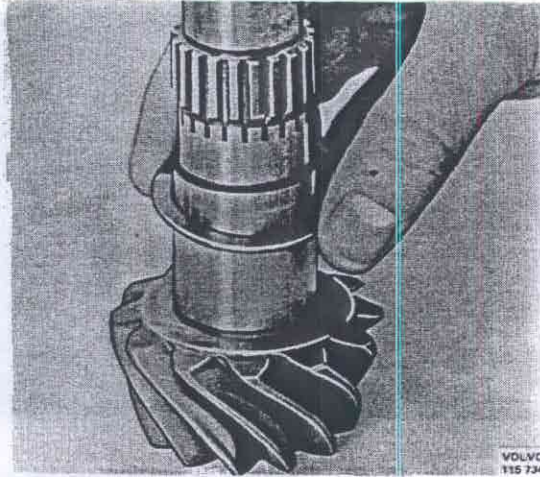


Fig. 46-63. Installing shims

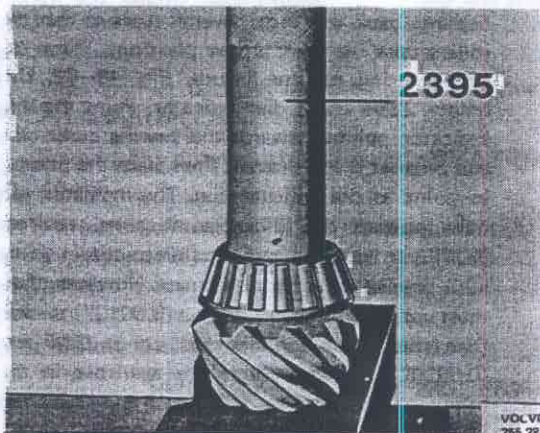


Fig. 46-64. Pressing on the bearing

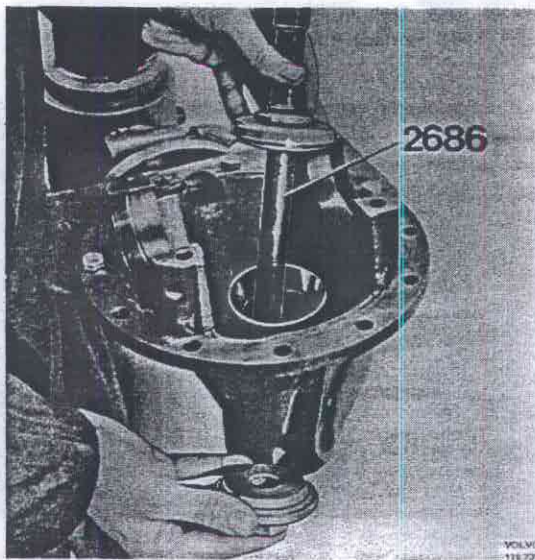


Fig. 46-65. Pressing in the bearing

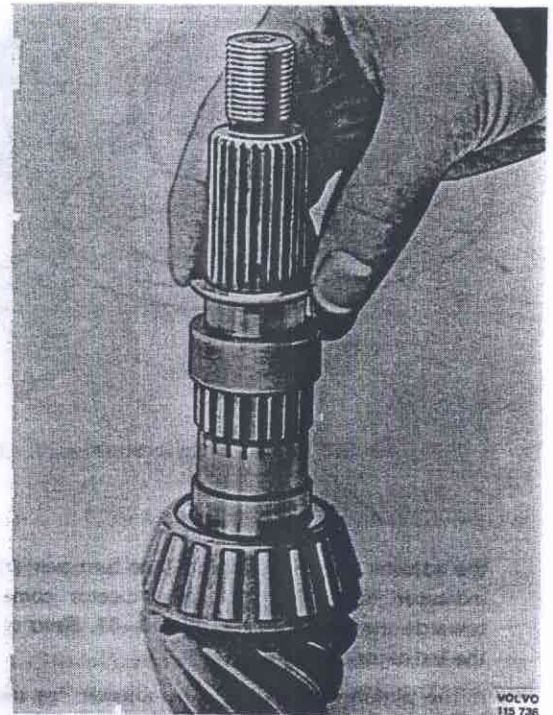


Fig. 46-66. Fitting the spacer ring

6. Place the requisite number of shims on the pinion, Fig. 46-63. Press on the bearing with 2395, Fig. 46-64.
7. Press in the rear pinion bearing outer race with 2686, Fig. 46-65.
8. Separate the tool and press in the front bearing outer race.

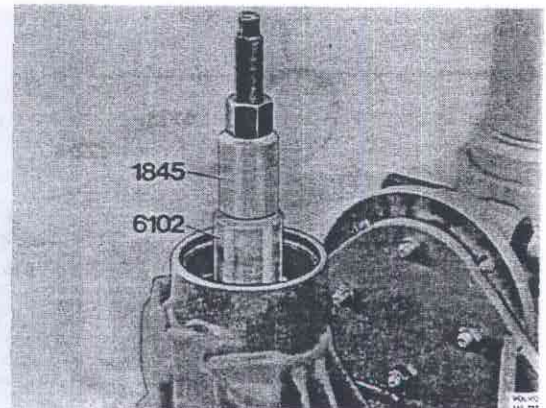


Fig. 46-67. Pressing on the bearing

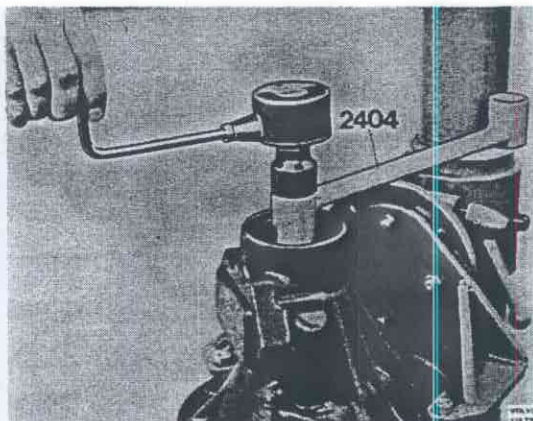
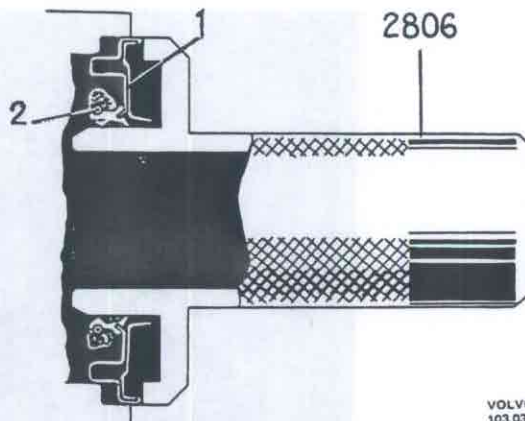


Fig. 46-68. Fixing the tool

VOLVO
103 031

1. Sealing ring
2. Spring with layer of grease

Fig. 46-69. Placing the grease

9. Place the spacer sleeve and the shims on the pinion, Fig. 46-66. Use those shims which were removed during the disassembling plus a shim of 0.5 mm (0.020").
10. Turn the carrier. Place the pinion in the housing. Place the front bearing, sleeve 6102 and press tool 1845 on the pinion, Fig. 46-67. Pull in the bearing.
11. Remove the press tool and the sleeve. Fit 2404 on the pinion and tighten with the pinion nut, Fig. 46-68. Tighten the nut to a torque of 280–300 Nm (28–30 kpm = 202–217 lbftf).
12. Turn the carrier. Place a dial indicator on the pinion measuring face. Rotate the pinion while pulling it out at the same time. Zero-set the indicator when the pointer is at its outer position. Push in the pinion while rotating it at the same time. Read off the amount the pinion is pressed in.
13. Remove the dial indicator. Turn the carrier. Remove the press tool and the sleeve from the pinion. Drive out the pinion with a plastic mallet.
14. The shims on the pinion should be reduced with the axial clearance obtained plus 0.06–0.08 mm (0.0024–0.0032") for new bearings and 0.04–0.06 mm (0.0016–0.0024") for old bearings.
15. Fit the pinion with the correct number of shims according to point 14. Place the sleeve 6102 and press tool 1845 on the pinion, pull in the bearing. Remove the sleeve and the press tool.
16. Fit the spanner 2404 and the flange nut. Tighten the nut to a torque of 280–300 Nm (28–30 kpm = 202–217 lbftf). Check the torque (see Fig. 46-68). It should be 0.6–2.0 Nm (0.06–0.2 kpm = 0.4–1.5 lbftf) for

run-in bearings and 1.5–3.5 Nm (0.15–0.35 kpm = 1.1–2.5 lbftf) for new bearings. If the torque wrench indicates another value than what is recommended, shims must be removed or added accordingly.

17. Check the location of the pinion according to point 4.
18. Remove the flange nut and spanner.
19. Place the oil deflector plate on the front bearing. Fill 1/4 of the space between the lips with grease. See Fig. 46-69. Drive in a new seal with 2806, Fig. 46-70.
20. Fit the flange with counterhold 2837. Press on the flange with 1845, Fig. 46-74.

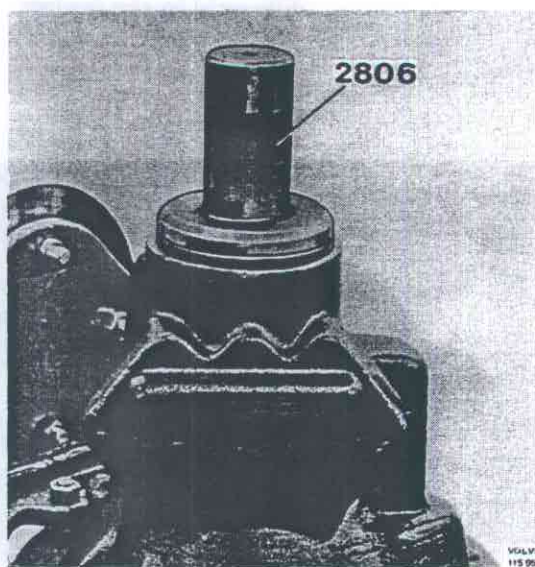
VOLVO
115 962

Fig. 46-70. Driving in the seal

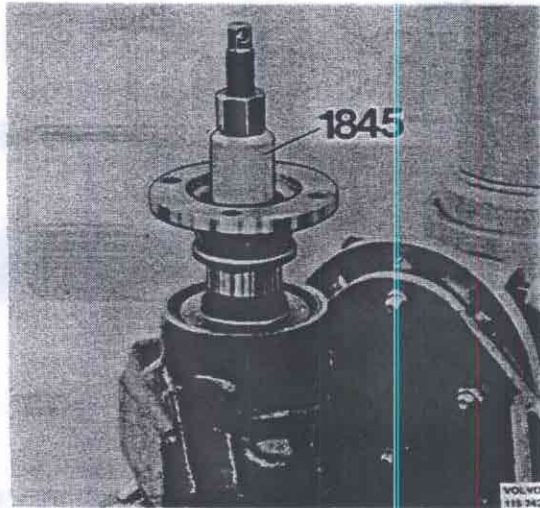


Fig. 46-71. Pressing on the flange

21. Remove the press tool. Fit the washer and the flange nut. Tighten the nut to a torque of 280–300 Nm (28–30 kpm = 202–217 lbfft). Remove the counterhold.
22. Turn the carrier. Place the spring and oil scraper in the housing.
23. Fit the differential housing in position. Oil the adjuster nuts and place them and the outer races on the housing. Check that the adjuster nuts are screwed on properly. Fit the caps, observing the line-up marks. Fit the cap bolts and tighten up. Slacken the bolts approx. 1/8 turn. Adjust the adjuster nuts so that a backlash is obtained at the same time as there is a certain clearance in the differential housing bearings.

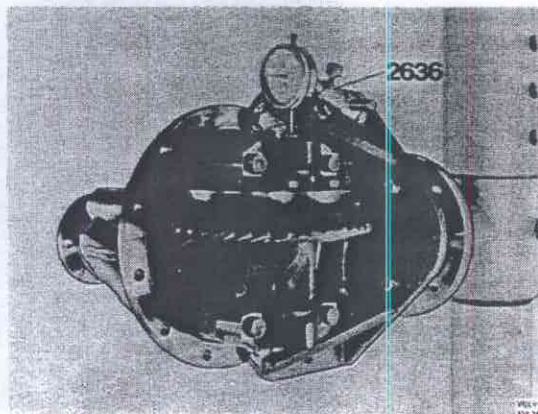


Fig. 46-72. Fixing the dial indicator

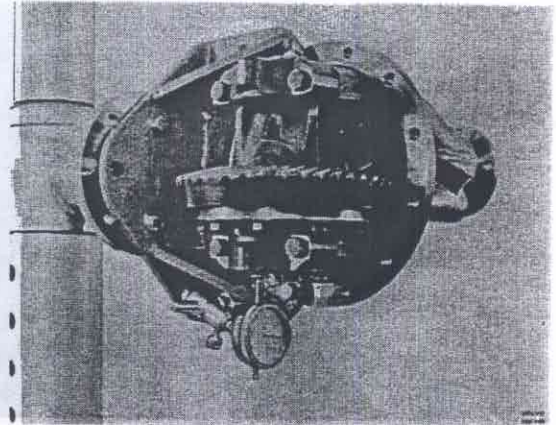


Fig. 46-73. Checking the clearance

Adjusting the backlash and pre-loading on differential housing bearings

1. Fix the dial indicator holder 2636 on the fixture, Fig. 46-72. Fix the dial indicator in position. Set the measuring point to the bearing inner race.
2. Turn the carrier so that the indicator faces downwards, see Fig. 46-73. Rotate the crown wheel while pressing down the differential housing at the same time. Zero-set the indicator.
3. Turn the carrier and rotate the crown wheel a couple of turns while pressing it down at the same time. Zero-set the indicator.
4. Turn the carrier and rotate the crown wheel a couple of turns. Adjust the lower adjuster nut so that the bearing clearance disappears until the indicator is again set to zero. Then turn the adjuster nut a further two notches and even more so that the lock washer can be fitted.
5. Rotate the carrier and start adjusting the backlash. Adjust with a rocker indicator. The indicator pointer is placed approx. 3 mm (0.12") from the heel of a tooth and three teeth at different places on the crown wheel are measured. The backlash may be 0.12–0.18 mm (0.0048–0.0072").

When adjusting, turn the adjuster nuts an equal number of notches in order to maintain the correct bearing pre-loading.

6. Lock the adjuster nuts and tighten up the cap bolts to a torque of 55–67 Nm (5.5–6.7 kpm = 40–48 lbfft). Lock the bolts.

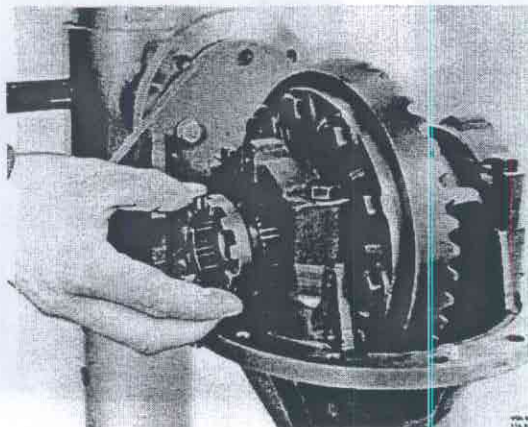


Fig. 46-74. Fitting the flange sleeve

After the carrier has been assembled and the pinion position adjusted according to the line-up marks, it is not necessary to check tooth mesh.

7. Fit the flange for the differential lock, Fig. 46-74. Fit the washer and the lock ring. Remove the carrier from the fixture.

WHEEL CARRIERS

Front wheel carrier

Removing a wheel carrier

1. Remove the wheel nuts from the wheel. Jack up the vehicle.
2. Remove the wheel.

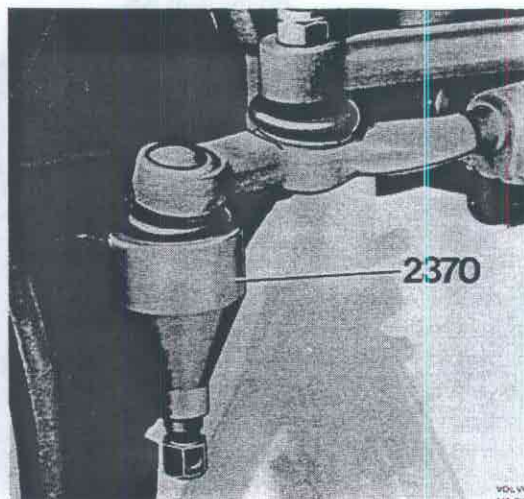


Fig. 46-75. Removing the steering rod

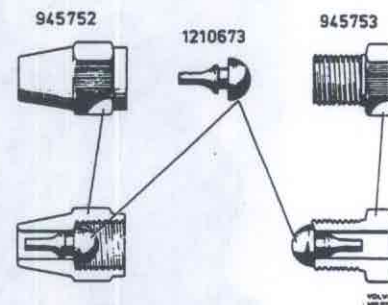


Fig. 46-76. Sealing nipples

3. Drain the oil from the wheel carrier housing. Remove the steering joint from the steering rod with puller 2370, Fig. 46-75.
4. Remove the brake lines from the brake hoses. Plug the hoses with sealing nipples, see Fig. 46-76 for a suitable nipple, Volvo part nos. 945752 + 1210673. Remove the bracket with hoses from the wheel carrier housing.
5. Remove the stop plate for the hollow rubber spring.
6. Remove the upper bolts securing the wheel carrier housing to the front axle casing. Fit the guide pin 6131 in the upper holes, Fig. 46-77. Place a jack under the wheel carrier housing.
7. Remove the lower bolts and pull out the wheel carrier housing with drive shaft.

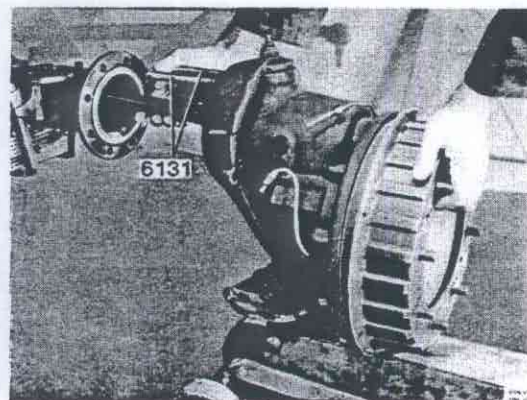


Fig. 46-77. Removing the wheel carrier

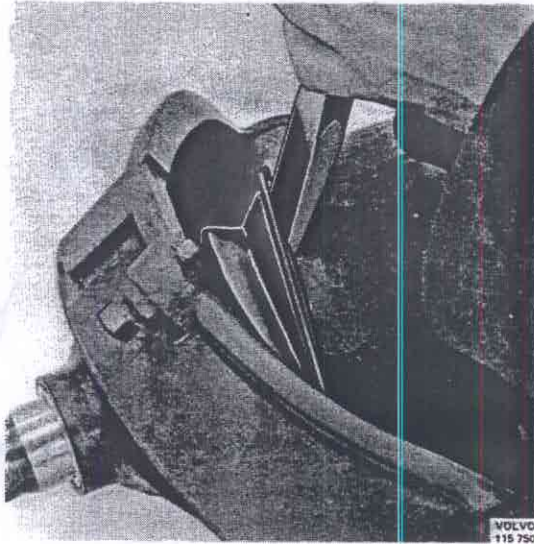


Fig. 46-78. Removing the rubber dust cover

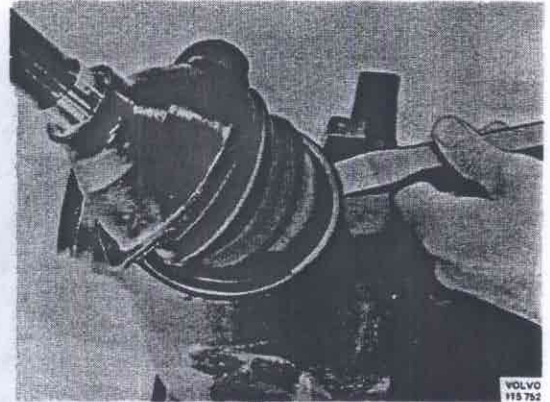


Fig. 46-80. Removing the rubber dust cover

Replacing rubber dust cover, wheel carrier

1. See under "Removing the front wheel carrier".
2. Remove the rubber dust cover with a suitable tool, Fig. 46-78.
3. Remove the bushing in the dust cover. If the bushing is in good condition, it can be re-fitted together with the new dust cover.
4. Check to make sure that the guide edge of the dust cover is clean. Grease the edge and the bushing.
5. Place the dust cover in position and drive it down with 6117, Fig. 46-79. Take care not to damage the dust cover should the shaft fall against the steering knuckle support.

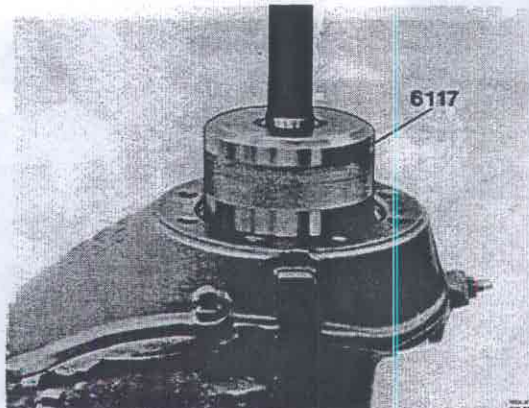


Fig. 46-79. Driving in the seal

6. See under "Installing the front wheel carrier".

Replacing the drive shaft joint

1. See under "Removing the front wheel carrier housing".
2. Remove the rubber dust cover with a suitable tool, Fig. 46-80.
3. Lift the drive shaft and knock on the wheel carrier housing with a plastic mallet at the same time, Fig. 46-81.

If the shaft pin accompanies the drive shaft:

Secure the drive shaft in a vice with copper jaws or similar. Knock out the pin with a plastic mallet, see Fig. 46-82.

If the shaft pin does not accompany the drive shaft:

Fit a standard puller, see Fig. 46-83, and pull off the shaft pin.

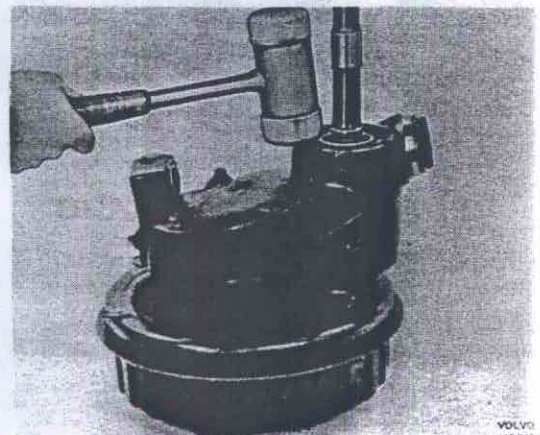


Fig. 46-81. Removing the drive shaft