VOLVO SERVICE

PART 7

FRAME
SUSPENSION
WHEELS

C 3-series

SERVICE MANUAL

CONTENTS

Part 7

GROUP 70 GENERAL

Data

FRAME

Type	Fully welded with box-section side members
Length, 2-axle vehicle, wheelbase 2300 mm (90.5")	2530 mm (100")
, 2-axle vehicle, wheelbase 2530 mm (100")	3990 mm (157")
, 3-axle vehicle, wheelbase 2720 + 1050 mm (107 + 41")	5674 mm (223")

Front springs

2-axle vehicle, wheelbase 2300 mm (90.5")

Type	Leaf springs
Length between anchorage centres	1300 mm (51")
Width	76 mm (3")
Number of leaves	7
Thickness of leaves:	
Leaves 1–7	7 mm (0.28")
Test values (complete spring)	
Load with deflection of 1 cm (0.4")	560 N (56 kp = 123 lb.)
Load for straight spring (spring must first be loaded to negative deflection of 150 mm = 6")	5900 N (590 kp = 1300 lb.)

2-axle vehicle, wheelbase 2530 mm (100")

Type	Leaf springs
Length between anchorage centres	1300 mm (51")
Width	76 mm (3")
Number of leaves	8
Thickness of leaves:	
Leaves 1–8	7 mm (0.28")
Test values (complete spring)	
Load with deflection of 1 cm (0.4")	640 N (64 kp = 140 lb.)
Load for straight spring (spring must first be loaded to negative deflection of 150 mm = 6")	7000 N (700 kp = 1400 lb.)

3-axle vehicle

Type	Leaf springs
Length between anchorage centres	1300 mm (51")
Width	76 mm (3")
Number of leaves	8
Thickness of leaves:	
Leaves 1–8	7 mm (0.28")
Test values (complete spring)	
Load with deflection of 1 cm (0.4")	640 N (64 kp = 140 lb.)
Load for straight spring (spring must first be loaded to negative deflection of 150 mm = 6")	7000 N (700 kp = 1400 lb.)

Rear springs

2-axle vehicle, wheelbase 2300 mm (90.5")

Type	Leaf springs
Length between anchorage centres	1300 mm (51")
Width	76 mm (3")
Number of leaves	8

Thickness of leaves:		
Leaves 1–8	7 mm	(0.28")
Test values (complete spring)		
Load with deflection of 1 cm (0.4")	640 N	(64 kp = 140 lb.)
Load for straight spring must first be loaded to negative deflection of 150 mm = 6 ")	7000 N	(700 kp = 1400 lb.)

2-axle vehicle, wheelbase 2530 mm (100")

Type	Leaf springs	
Length between anchorage centres	1300 mm	(51")
Number of leaves	9	
Thickness of leaves:		
Leaves 1–9	7 mm	(0.28")
Test values (complete spring)		
Load with deflection of 1 cm (0.4")	720 N	(72 kp = 160 lb.)
Load for straight spring (spring must first be loaded to negative deflection of 150 mm = 6")	8300 N	(830 kp = 1825 lb.)

3-axle vehicle

Type	Leaf springs of parallel type	
Length	1320 mm	(51")
Width	76 mm	(3")
Number of leaves	4	
Thickness of leaves in centre:		
Leaves 1–4	13 mm	(0.5")
Test values (complete spring)		
Load with deflection of 1 cm (0.4")	1040 N	(104 kp = 230 lb.)
Load for straight spring	19900 N	(1990 kp = 4380 lb.)

Helper spring

Type	Hollow-rubber

Shock absorbers

Type	Telescopic	
Length between anchorage centres:		
Compressed	404 mm	(16")
Extended	671 mm	(26")

Wheels

Rims

Type	Disc	
Size	7.5 L x 16"	
Number of wheel nuts	8	
Max. radial throw	2 mm	(0.08")
Max. lateral throw	2 mm	(0.08")
Circle diameter of wheel studs	222 mm	(8.75")

Tyres

Size	280/85 x 16" 4-ply special	
Wheel revs per km (mile)	approx. 375	
Tyre pressure, front	1.6 kp/cm^2	(23 lbf/in^2)
, rear	1.75 kp/cm^2	(25 lbf/in^2)

Hubs (front and rear)

Pre-load, new wheel bearings	42–48 N (4.2–4.8 kp = 9–10 lbftf) + friction of sealing rings
, run-in wheel bearings	24–28 N (2.4–2.8 kp = 5–6 lbftf) + friction of sealing rings
Bearing clearance when about to adjust	0.08 mm (0.0032")

Bogie

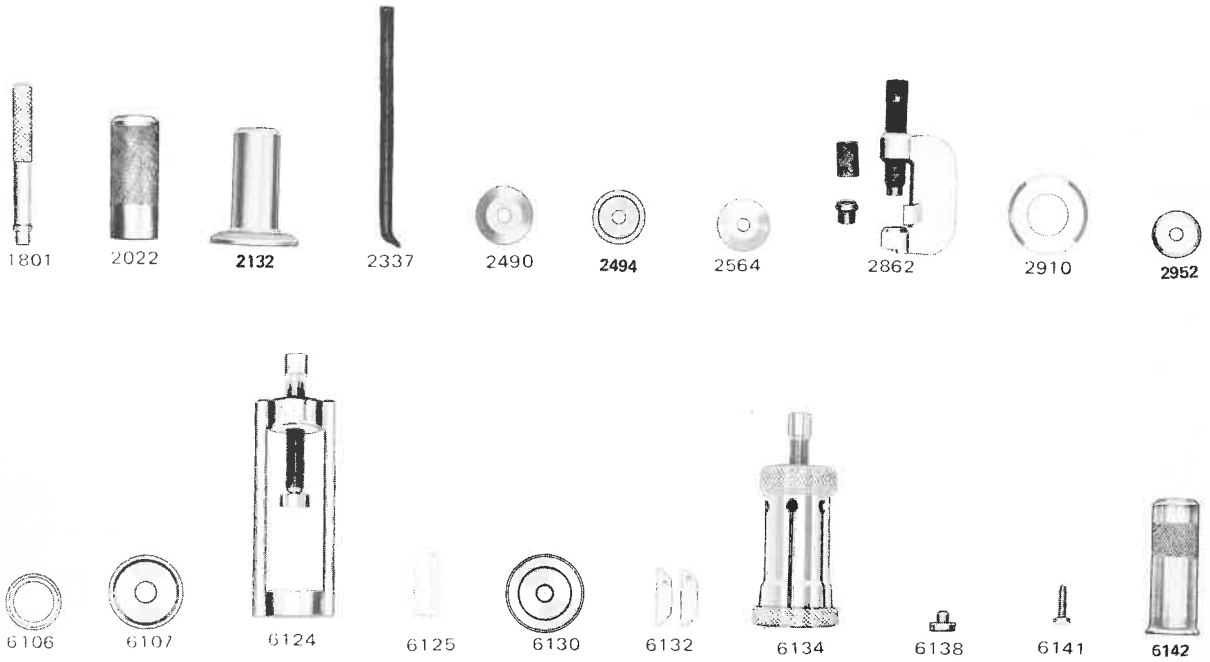
Bogie distance	1050 mm (41.3")
Axial clearance, cradle journalling	0.1 mm (0.004")

Tightening torques

	Nm	kpm	lbftf
Nut, U-bolt	230–280	23–28	166–202
Nut, spring bolt	160–190	16–19	115–137
Wheel nuts	150–210	15–21	108–152
Nut, hub-wheel carrier housing	55– 67	5.5–6.7	40– 48
Lock bolt for spring	180–230	18–23	130–166

Tools

The following special tools are required for work on the frame, suspension, wheels



1801 Standard handle
2022 Sleeve for pressing on gear wheel
2132 Sleeve for pressing sealing ring into cradle
2337 Drift
2490 Drift for removing outer bearing outer ring in hub
2494 Drift for pressing needle bearing into cradle
2564 Drift for removing inner bearing outer ring in hub
2862 Press tool for removing and installing wheel studs
2910 Sleeve for installing outer sealing ring in hub
2952 Drift for pressing needle bearing out of cradle
6106 Sleeve for installing inner and outer bearing inner ring in hub
6107 Drift for installing inner bearing outer ring in hub
6124 Press tool for removing and installing spring bushings
6125 Drift. Used together with 6124 when removing spring bushing and for removing and installing rubber bushings on reaction rods
6130 Drift for installing inner seals in hub
6132 Press washers for removing outer bearing outer ring in hub
6134 Puller for removing outer bearing inner ring in hub
6138 Guide. Used together with 6124 and 6125
6141 Bolt for pressing out hub
6142 Sleeve for installing bearing races

GROUP 71 FRAME

Description

The frame is made up of two box-profile side members which are joined together by means of four crossmembers. The front and rear crossmembers are of box-section while the two intermediate are gas-tight tubular members which function as vacuum tanks.

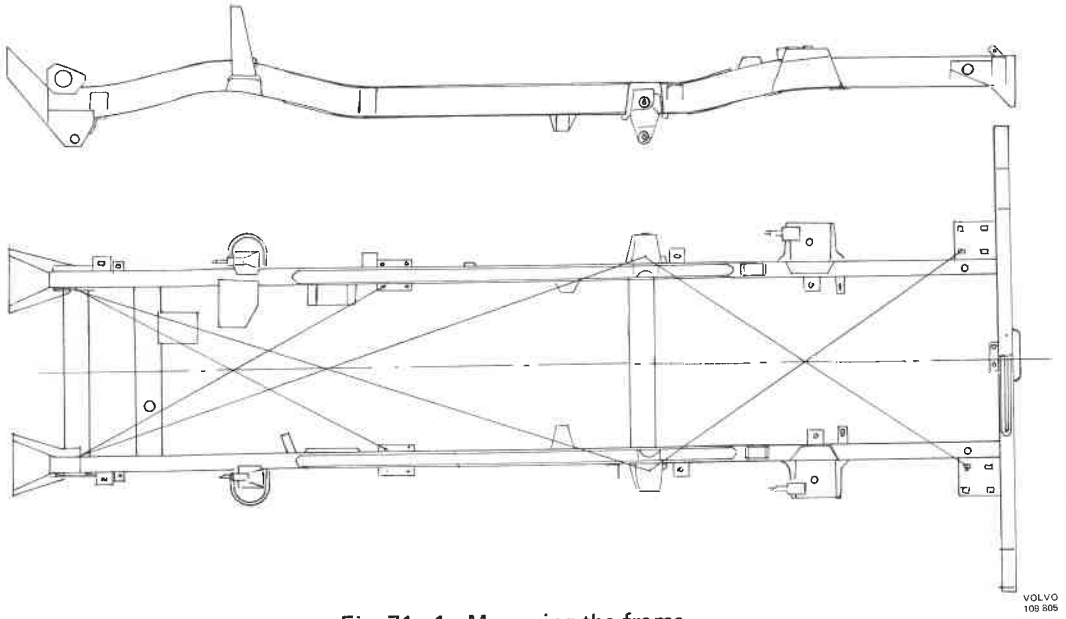


Fig. 71–1. Measuring the frame

Service Procedures

Measuring the frame

If it is suspected that for some reason or other the frame is faulty, it should be check-measured. This can be done by transferring the position for certain fixed points to a flat, clean floor. Measuring is then done on the floor. The points shown in Fig. 71–1, for example, can be used.

Suspend a pointed plumb over one of the points. The vehicle must be securely parked with the parking brake or blocks behind the wheels. At the point on the floor over which the plumb hangs mark clearly with chalk. Then with a pencil or scriber make a cross on this mark, immediately below the plumb pointer. Repeat this procedure at the other points. Then remove the vehcile. Talc a piece of string and stretch this between two of the points. Pull upp the middle of the string slightly and let it strike against the floor. This will cause the talced string to make a white line between the points. Do the same between the other points so that you get diagonal lines as shown on Fig. 71–1. When measuring between the points marked where the plumb was suspended, the length of two diagonals crossing each other should agree with a permitted deviation of max. 3 mm (1/8"). If the deviation exceeds this, then the frame is crooked and must be straightened.

To find out whether the frame is twisted or bent, place it on trestles with the side members straight upper edges parallel with the floor and both sides at the same height. Measure the distance from the floor to the straight upper edge on the frame. This measurement is then to be used as a basic measurement when check-measuring. If this measuring is to be reliable, the floor must be absolutely flat. Be particularly thorough when marking and measuring. A faultless frame should be flat and the side members straight and in parallel.

Straightening and repairing the frame

The frame should preferably be straightened when in a cold condition. If it must be heated, do not go too far with this. Under no circumstances may the frame be heated to more than a cherry colour, that is, a dark red heat.

Before you start to straighten the frame, examine it for cracks, etc. If you find major cracks in any of the frame members, then the frame should be replaced. If you find only minor cracks, drill stop holes where the crack ends. After you have straightened the frame, weld the crack together.

Before you start to straighten the frame, first think carefully the best way for doing this. Special jacks are available for straightening and these are fixed to the frame by means of hooks and chains.

If any part of the frame is to be cut off, the cutting must be done 10–15 mm (3/8–9/16") from the material that has to remain. The rest of the material to be removed must be removed by filing and sandpapering.

Any welding work on a frame requires great experience and must be carried out with great care. No cracks must be allowed to remain. Inspect the weld joints thoroughly after they have cooled.

GROUP 72 SPRINGS

Description

2-axle vehicle

Both the front and rear springs are of the conventional leaf type. The front end of the springs is rigidly suspended in spring bolts. The rear ends hang from spring shackles. The vehicle is provided with hollow-rubber springs, both front and rear.

3-axle vehicle

The design and suspension of the front springs is the same as for 2-axle vehicles. But the rear springs are of the parabel type. Rear springing is progressive with slip suspension at both ends, see Fig. 76—2. The vehicle has hollow-rubber springs front and rear.

Service Procedures

SPRINGS

2-axle vehicle and 3-axle vehicle (front)

Removing a spring

1. Jack up the vehicle.
2. Unbolt the wheel covering the spring.
3. Remove the front spring bolt.
4. Remove the four bolts for the rear spring anchorage so that the entire spring shackle is also removed at the same time.
5. Unscrew the nuts on the U-bolts and lift out the spring.

Installing a spring

1. Place the spring in position.
2. Bolt on the front spring bolt, but only a couple of threads. IMPORTANT! Make sure that the spring bolt in the rear spring takes the right thread in order no to damage the threads on the weld nut.
3. Fit the spring plate with the U-bolts. If you have any difficulty in centring the centre bolt on the rear spring, release the reaction rod. Tighten the nuts on the U-bolts.
4. Bolt tight the rear spring anchorage.
5. Make sure that all released spring bolts are not tightened up. Jack up the vehicle under the axle. Load the vehicle until there is an angle of 90° between the spring shackle and frame. Then tighten the spring shackle upper bolt. Load the vehicle further until the spring is flat and tighten up the remaining spring bolts.
6. Mount the wheel, tighten up the wheel studs and lower the vehicle.

Testing a spring

A spring can be tested in a hydraulic press. The press, however, must be provided with a sufficiently accurate pressure gauge and it must have such a device that the spring cannot slide out sideways.

Invert the spring and place it in the press. Place supports at both ends. Apply pressure to the centre bolt, see Fig. 72—1. Check the spring test value against the data. If the pressure gauge indicates that the spring is faulty, straighten it or replace it.

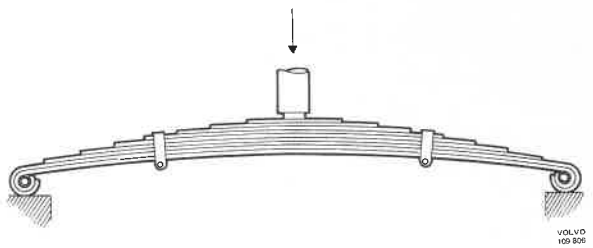


Fig. 72—1. Testing a spring

Fractured spring leaves

When one or several of the spring leaves are fractured, not only must they be replaced but the reason for the fracture should be looked into.

If the fracture is towards the middle of the spring, then the reason may be a faulty shock absorber. A fracture may also be due to a broken centre bolt or overloading.

Replacing spring bushings

Special tools:

6124 Press tool
6125 Drift
6138 Guide

Front springs

1. Jack up the vehicle.
2. Unbolt and remove the wheel covering the spring.

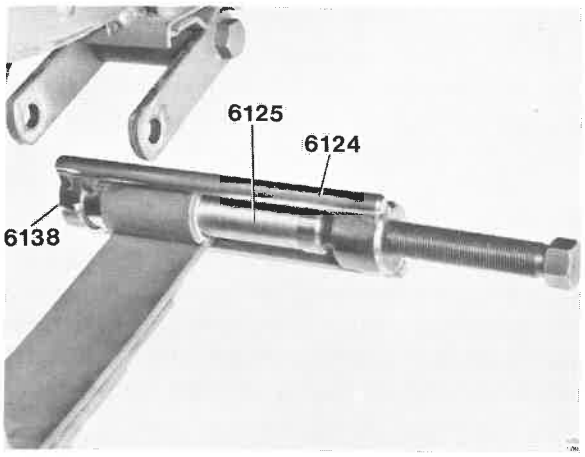


Fig. 72–2. Pressing out a spring bushing

3. Unscrew the spring bolt for the bushing to be replaced.
4. Fit press tool 6124, drift 6125 and guide 6138 according to Fig. 72–2 and press out the bushing.
5. Press in the new bushing using only press tool 6124, see Fig. 72–3, and screw in the spring bolt.

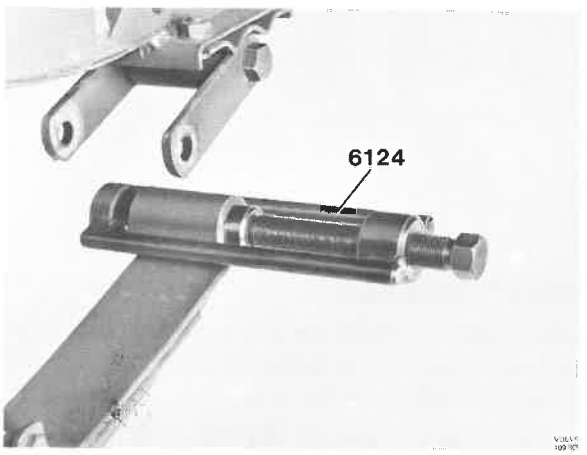


Fig. 72–3. Pressing in a spring bushing

6. Make sure that all spring bolts that were loosened are not tightened up. Jack up the vehicle under the axle. Load the vehicle to an angle of 90° between the spring shackle and frame. Then tighten up the spring shackle upper bolt. Load the vehicle further until the spring is straight and tighten up the remaining spring bolts.
7. Replace the upper bushing in the rear anchorage in the press with the drift 6125, see Fig. 72–4.
8. Mount and screw tight the wheel. Lower the vehicle.

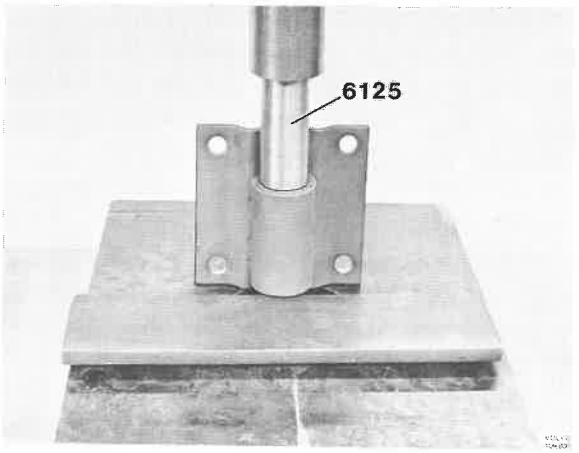


Fig. 72–4. Pressing bushing out of anchorage

Rear springs

1. Screw down the rear spring according to the instructions given under the heading "Removing a spring".
2. Press out the bushings in the spring with press tool 6124 and drift 6125, see Fig. 72–2.
3. Press in the bushings with only press tool 6124, see Fig. 72–3.
4. Replace the upper bushing in the rear anchorage in the press with drift 6125, see Fig. 72–4.
5. Bolt tight the spring according to the instructions given under the heading "Installing a spring".

3-axle vehicle, rear springs

Removing a rear spring

1. Jack up the vehicle and unbolt and remove the wheels.
2. Release the U-bolts and the lock bolts (4, Fig. 76–2). Lift out the spring.

Installing a rear spring

1. Place the spring and fit the U-bolts. Do not tighten up the U-bolts.
2. Torque the lock bolts to 230–280 Nm (23–28 kpm = 166–202 lbftf), and tighten up the lock nuts.
3. Torque the U-bolts to 230–280 Nm (23–28 kpm = 166–202 lbftf).
4. Mount the wheels, screw tight the wheel studs and lower the vehicle.

Testing a spring-fractured spring leaf

See under the heading "2-axle vehicle and 3-axle vehicle (front)".

GROUP 76 SHOCK ABSORBERS, STABILIZERS AND SUSPENSION COMPONENTS

Description

Shock absorbers

The shock absorbers are of the hydraulic, double-operating, telescopic type. They are maintenance-free but cannot be disassembled for repairs. If they leak or function poorly, the shock absorbers are replaced complete.

Design

The design of the shock absorbers can be seen from Fig. 76–1. The outer cylinder (1) protects against dust and dirt. The other two cylinders (2) and (4) are arranged concentrically with the one entirely pushed into the other. The inner cylinder (2) is the real working cylinder and has a valve (6) at its lower end. A piston (5) with channels regulated by valves run inside the inner cylinder. This piston is attached to a piston rod (3) at the opposite end of which there is a ring (9) for attaching the shock absorber to the frame. At the other end of the shock absorber there is a similar ring fixed to a cylinder (4). The intermediate space between the cylinders (2) and (4) serves as a reservoir and is only partly filled with fluid. The inner cylinder (2) is entirely filled with fluid on both sides of the piston (5). The cover (8) provides the sealing and guide for the piston rod (3). The ring (7) acts as a baffle for the fluid.

Function

When a shock absorber is compressed or extended according to the weight on the vehicle, the piston (5) moves in the inner cylinder (2). This causes fluid to flow through the valve-regulated channels in the piston. The speed at which the piston can move in the cylinder will depend on how fast the fluid flows through the channels from one side of the piston to the other side. Since the drilled channels are very narrow, the fluid can only pass through them slowly and this brakes the movement of the piston. It also has a damping effect on the movement of the spring. When a shock absorber is suddenly compressed or extended, further braking effect is caused by turbulence in the fluid passing through the channels in the piston. When the shock absorber is compressed or extended, this does not alter the volume equally on both sides of the piston due to the fact that the piston rod occupies a certain space. During compression of the absorber, some of the fluid flows through the valve (6) out into the reservoir, and when extension takes place, fluid is re-sucked into the cylinder (2) on the underside of the piston.

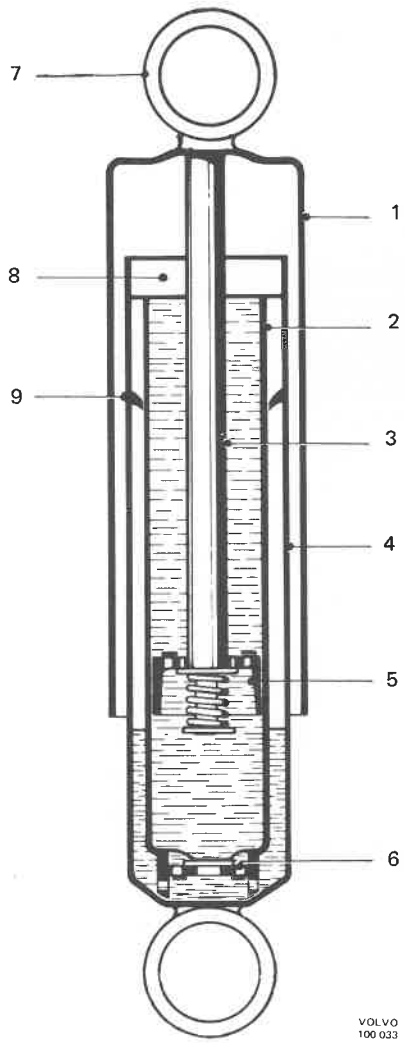


Fig. 76–1. Shock absorber

1. Outer cylinder
2. Inner cylinder
3. Piston rod
4. Intermediate cylinder
5. Piston
6. Valve
7. Ring
8. Cover
9. Ring

Reaction rods

2-axle vehicle

Two reaction rods have been fitted to the rear axle for more stable location.

The reaction rods are fixed at both ends with rubber bushings.

3-axle vehicle

See under the heading "Bogie"

Bogie

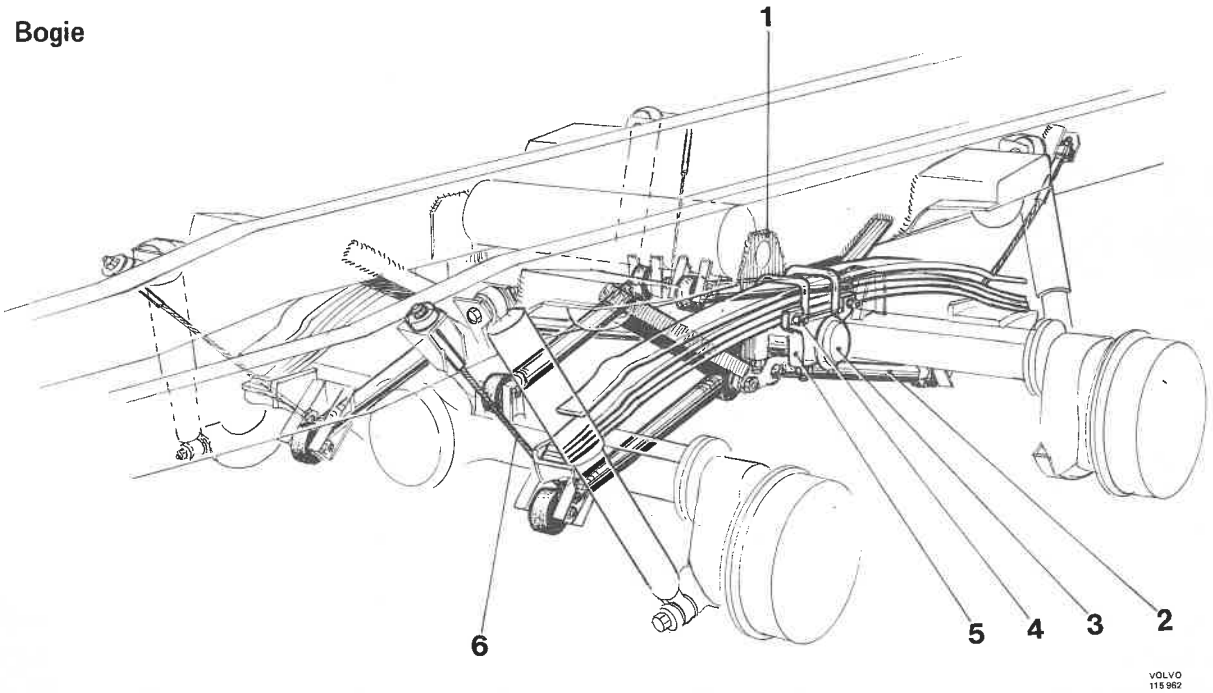


Fig. 76–2. Bogie

1. Bogie anchorage
2. Reaction rod
3. Cover
4. Lock bolt
5. Cradle
6. Stop line

The bogie is dimensioned for a 3.9 ton bogie pressure. The suspension is progressive and has slip suspension at both ends. Each axle is anchored by means of three reaction rods. These absorb both longitudinal and transversal forces. The relation of the rear axles to each other and to the frame cannot be adjusted. In the event of some faulty relationship between the rear axle and the rear axles – frame, examine what the defect is and replace the parts that are defective.

The cradle (5, Fig. 76–2) is journalled on the bogie attachment's (1) journal pin with needle bearings (4 and 8, Fig. 76–3) for radial forces and with synthetic thrust washers (3 and 9) for axial forces. Axial clearance is adjusted with the help of the nut (10).

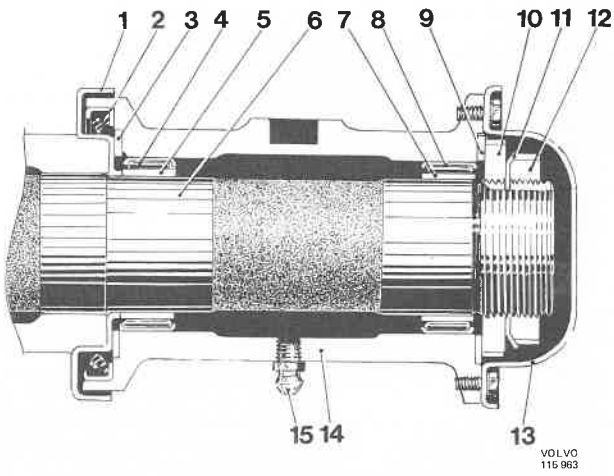


Fig. 76–3. Cradle journalling

1. Dust protective plate
2. Sealing ring
3. Inner thrust washer
4. Inner needle bearing
5. Inner bearing race
6. Bogie axle
7. Outer bearing race
8. Outer needle bearing
9. Outer thrust washer
10. Inner nut
11. Lock washer
12. Outer nut
13. Cover
14. Cradle
15. Lubricating nipple

Service Procedures

Shock absorbers

Removing

To remove a shock absorber, first remove the upper and lower anchorage bolts. A rear wheel must be removed in order to remove a rear shock absorber.

Installing

Before installing a shock absorber, bleed it by holding it in the vertical position with the protective cover upwards and pump 4–5 complete strokes or until you feel there is a certain amount of resistance in both directions. When installing a shock absorber, hold the dust protective cover upwards all the time.

Reaction rods

2-axle vehicle

Special tool:

6125 Drift

Replacing reaction rod rubber bushings

1. Unscrew the reaction rod.
2. Place the reaction rod in a press and press out the bushings with drift 6125, see Fig. 76–4.
3. Press in the bushings with the same drift used for pressing them out.
4. Screw tight the reaction rod with the vehicle loaded to a straight rear spring.

3-axle vehicle

If any of the rod ends is loose, replace the rod compelte.

Bogie

Special tools:

2952 Drift
1801 Standard handle
2494 Drift
2132 Sleeve
6142 Sleeve

Removing the cradle

1. Jack up the vehicle and remove the wheels.
2. Release the U-bolts and the lock bolts, see Fig. 76–5. Lift out the spring.
3. Screw off the cover (13, Fig. 76–3).
4. Knock up the lock washer (11) and screw off the outer nut (12) with a wrench, see Fig. 76–6.
5. Screw off the inner nut with a wrench and pull off the cradle. Remove the outer axial washer (9) and clean the cradle and bogie axle.

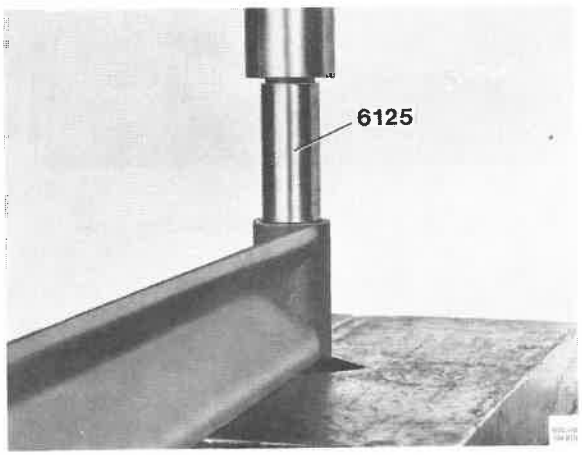


Fig. 76–4. Pressing out the bushing

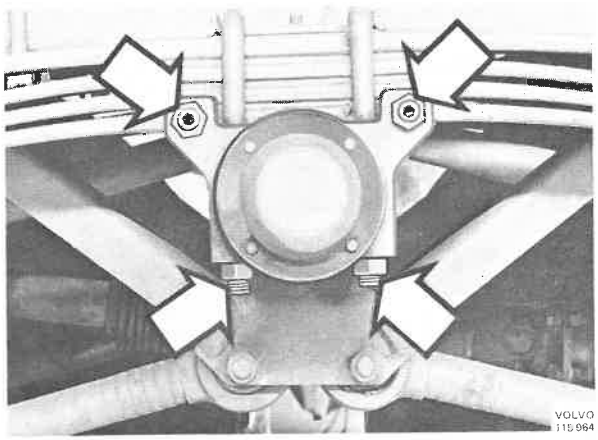


Fig. 76–5. Removing the spring

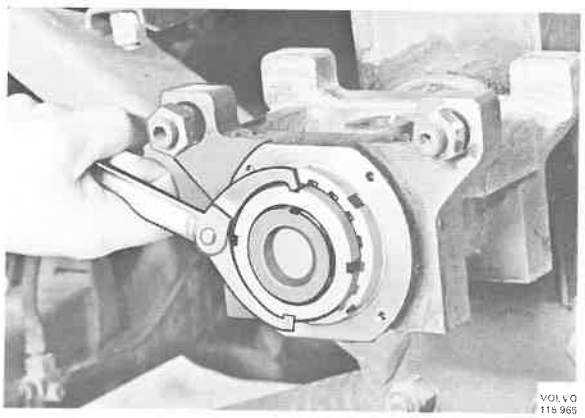


Fig. 76–6. Removing the outer nut

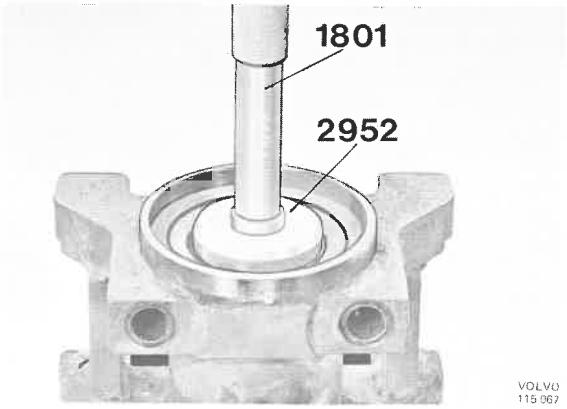


Fig. 76–8. Removing the needle bearing

Disassembling the cradle and removing the bearing races

1. Knock out the sealing ring with a chisel, see Fig. 76–7. If there is any burr underneath the sealing ring, remove it with a shaver.

Fig. 76–7. Removing the sealing ring

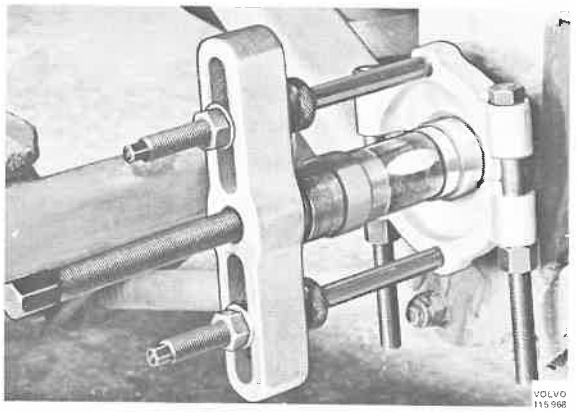


Fig. 76–9. Removing the bearing races

2. Press out the needle bearings with drift 2952 and standard handle 1801, see Fig. 76–8. Press out both the bearings at the same time. Pluck out the inner axial washer (3).
3. Pull off the bearing races (5 and 7) with a jackknife tool, see Fig. 76–9. Pull off both the races at the same time. Remove the dust protective plate by hand.

Inspection

Clean all the parts thoroughly. Check the bearings, bearing races, axial washers and bearing surfaces. Check the dust cover plate at the sealing surface for the sealing ring and the slide surface for the inner axial washer. The shaft pin where the dust cover plate sits must be properly cleaned.

Assembling and installing the cradle, also installing the bearing races

1. Press in the needle bearings with drift 2494 and standard handle 1801, see Fig. 76–10. Press in the bearings so that they are flush with the cradle.

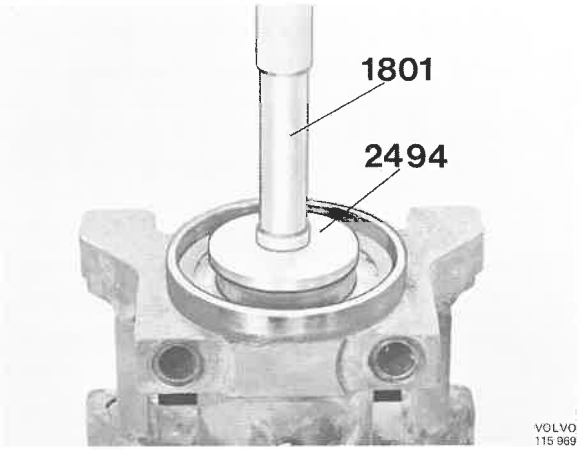


Fig. 76–10. Installing the needle bearing

2. Place the inner axial washer with a little grease on and press in the sealing ring with sleeve 2132, see Fig. 76–11.

Fig. 76–11. Installing the sealing ring

3. Place the dust protective plate in position and fit the inner bearing race with sleeve 6142. Tap in the bearing race until it bottoms, see Fig. 76–12.

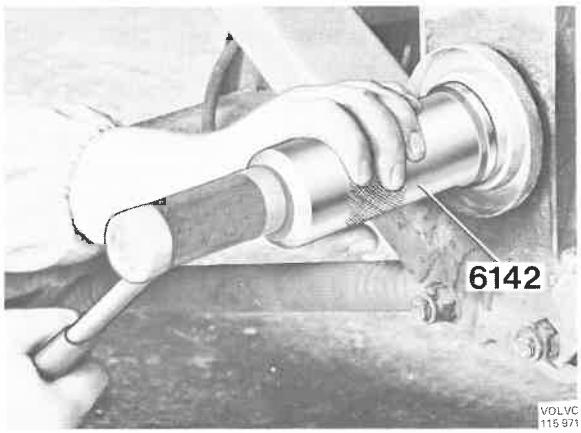


Fig. 76–12. Installing the inner bearing race

4. Tap in the outer bearing race halfway. Grease the lips of the sealing ring and the bearings with a little grease and place the cradle in position. Tap in the bearing race with sleeve 6142 until the sleeve goes against the cradle, see Fig. 76–13.

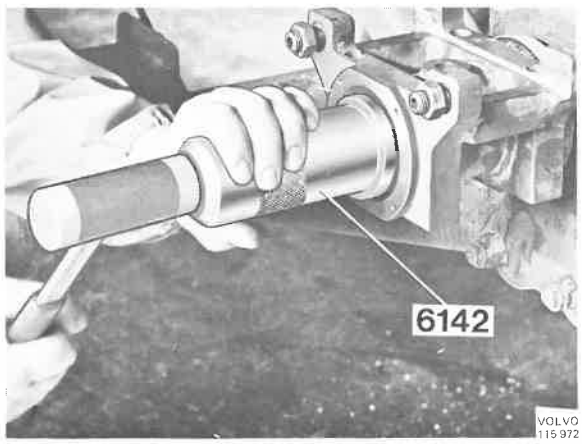


Fig. 76–13. Installing the outer bearing race

5. Grease the outer axial washer with a thin layer of grease and place it in position.
6. Screw on the inner nut and place the lock washer in postion. Screw on the outer nut and tighten it against the inner nut when the hub has a little clearance. Do not lock the lock washer.
7. Position a dial indicator according to Fig. 76–14. Turn the cradle while pressing it inwards at the same time and zero-set the dial indicator. Turn the cradle and pull it outwards. Read off the clearance. The correct clearance should be 0.1 mm (0.0039''). If necessary, adjust the clearance. When correct clearance has been obtained, lock both the nuts with the lock washer.
8. Grease the cradle journalling through the lubricator underneath the cradle.
   Lubricate until grease squeezes out at one of the cradle ends.
9. Fill the cover halfway with grease and screw it into position.
10. Place the spring in position and fit the U-bolts. Do not tighten up the U-bolts. Tighten the lock bolts to a torque of 230–280 Nm (23–28 kpm = 166–202 lbftf) and tighten up the lock nuts.
11. Tighten the U-bolts to a torque of 230–280 Nm (23–28 kpm = 166–202 lbftf).
12. Bolt on the wheels and lower the vehicle.

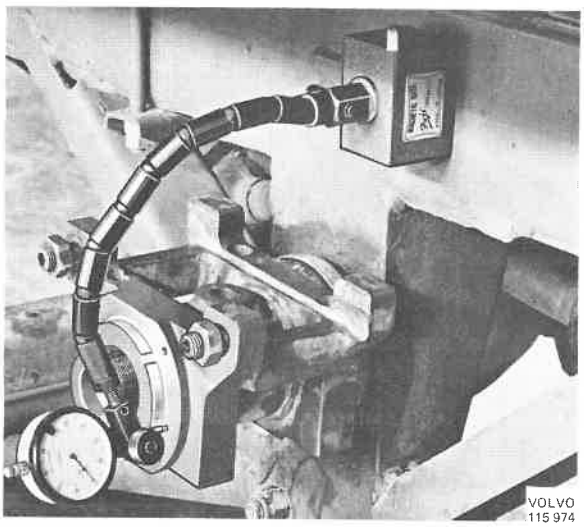


Fig. 76–14. Measuring the axial clearance

GROUP 77 WHEELS, HUBS

Description

Tyres

The tyres are balanced at the factory. The tyre tube should have its valve opposite (180°) the red centre of gravity marking on the tyre.

The front tyres should be fitted with the "points" on the tyre pattern facing opposite the direction of rotation, while they should be facing in the direction of rotation on the rear tyres.

Rims

The rims are of the disc type. They can be used for tyres with or without tubes.

Hubs

The front wheel and rear wheel hubs (Fig. 77–1) are of the same type. The stub axle (11) is journalled in the hub (10) by means of two tapered roller bearings (3 and 4). Oil sealing is provided by a sealing ring (1), which seals against a wear ring (2) and against the stub axle, as well as a sealing ring (9) which seals against the gear wheel (5).

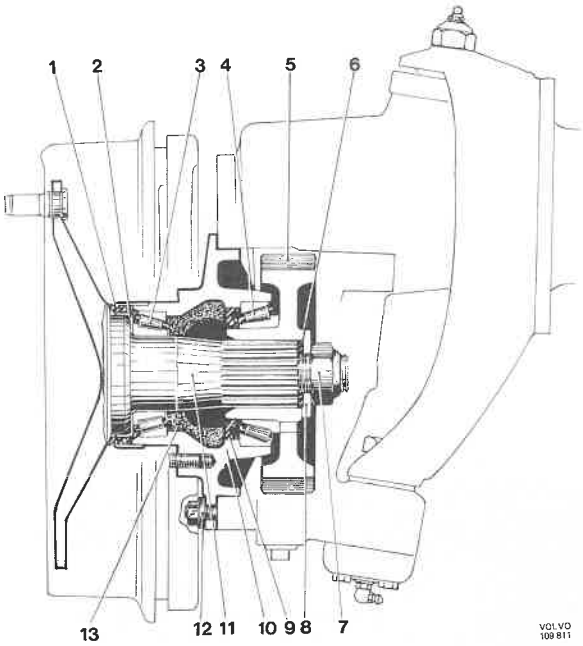


Fig. 77–1. Hub

1. Sealing ring
2. Wear ring
3. Outer bearing
4. Inner bearing
5. Gear wheel
6. O-ring
7. Nut
8. Washer
9. Sealing ring
10. Hub housing
11. Stub axle
12. Retaining nut
13. Grease

Service Procedures

Wheels

Removing a wheel

1. Slacken the wheel nuts several turns.
2. Jack up the front or rear end with a jack so high that the wheel to be removed comes off the ground.
3. Unscrew the wheel nuts and lift off the wheel.

Fitting a wheel

1. Clean thoroughly the contact surfaces on the rim and wheel nuts.
2. Lift the wheel in position and screw on the wheel nuts a couple of turns or so.
3. Lower the vehicle and tighten up the wheel nuts crosswise a little at a time until all are tightened to a torque of 160–210 Nm (16–21 kpm = 115–152 lbftf).

Replacing a wheel stud

Special tool:

2862 Press tool

1. Jack up the vehicle.
2. Remove the wheel, adjust down the brake shoes and remove the brake drum.

   If necessaey use two puller bolts 3/8-24 UNF.
3. Remove the brake shoes, see Part 5.
4. Press out the wheel stud with press tool 2862, see Fig. 77–2.

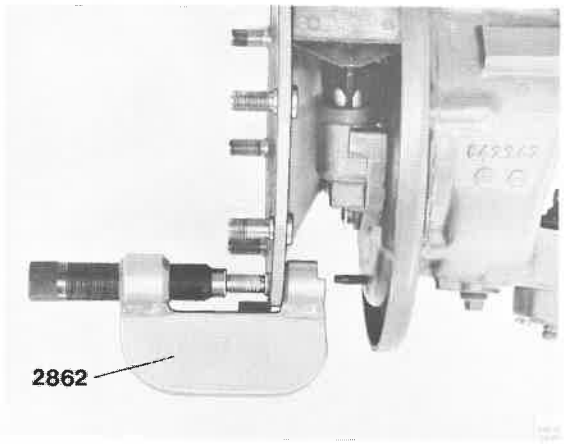


Fig. 77–2. Pressing out the wheel stud

5. Press in the new wheel stud with press tool 2862, see Fig. 77–3.

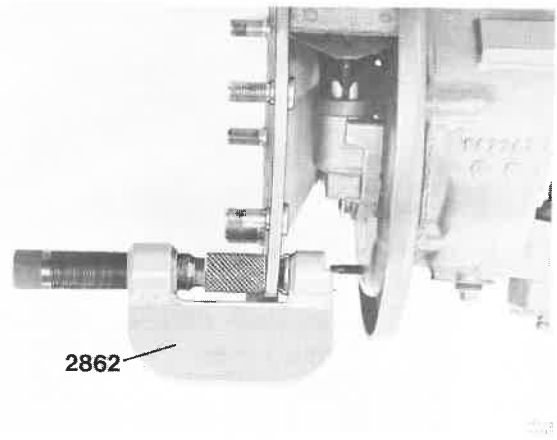


Fig. 77–3. Pressing in the wheel stud

6. Fit the brake shoes, see Part 5.
7. Fit the brake drum and adjust up the brake shoes.
8. Mount the wheel and tighten the wheel nuts crosswise to a torque of 160–210 Nm (16–21 kpm = 115–152 lbftf).
9. Lower the vehicle.

Hubs

Special tools:

6132 Press washer
2564 Drift
1801 Standard handle
2490 Drift
2337 Drift
6134 Puller
6107 Drift
6106 Sleeve
6130 Drift
2910 Sleeve
2022 Sleeve

Checking, adjusting the wheel bearings

1. Jack up the vehicle.
2. Remove the wheel for the hub or hubs to be checked.
3. Apply a dial indicator as shown in Fig. 77–4. Press in and rotate the hub, zero-set the dial indicator. Pull out and rotate the hub, read off any clearance in the bearings. If clearance exceeds 0.08 mm (0.0032''), adjust the wheel bearings as follows:

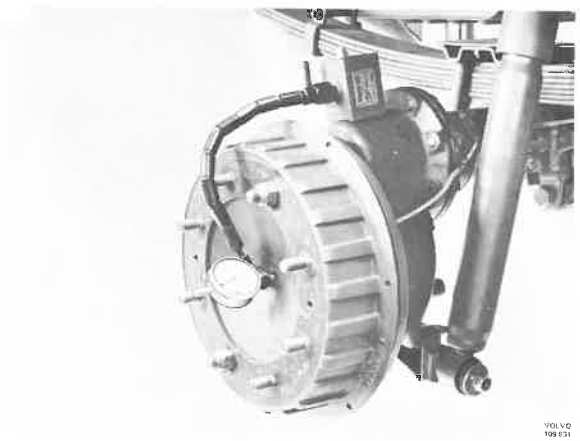


Fig. 77–4. Checking wheel bearing clearance

4. Remove the hub according to the instructions given under the heading "Removing a hub".
5. Disassemble the hub according to the instructions given under the heading "Disassembling a hub".
6. Check the wheel bearings. If damaged, replace the bearings according to the instructions given under the heading "Replacing wheel bearings".
7. Assembling, which also includes adjusting, is to be carried out according to the instructions given under the heading "Assembling a hub".
8. Installing is according to the instructions given under the heading "Installing a hub".

Removing a hub

1. Jack up the vehicle.
2. Remove the wheel for the hub concerned.
3. Drain the oil in the wheel carrier housing.
4. Disconnect the brake lines and plug them.
5. Unscrew the nuts between hub and wheel carrier housing.
6. Remove the plug on the reverse side of the wheel carrier housing and screw in a M10 bolt with thread length minimum 50 mm (2"), see Fig. 77–5. Screw in the bolt so that the hub releases fully.

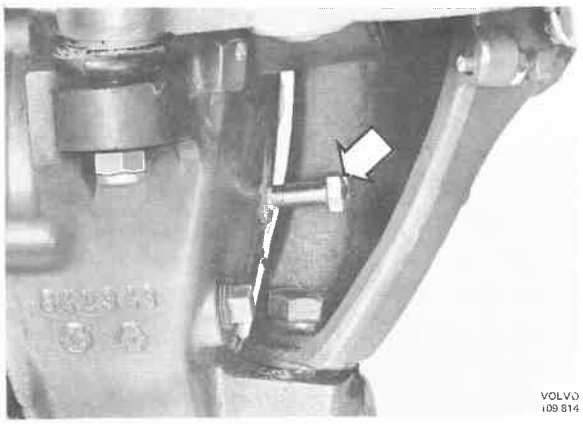


Fig. 77–5. Pressing out the hub

Disassembling a hub

1. Knock up the lock ring on the nut (7, Fig. 77–1) with a hammer and drift and unscrew the nut. Remove the washer (8) and the O-ring (6).
2. Pull off the gear wheel (5) with the Kukko standard jackknife 20–2, see Fig. 77–6. Lift off the hub (10) together with the brake backing plate.

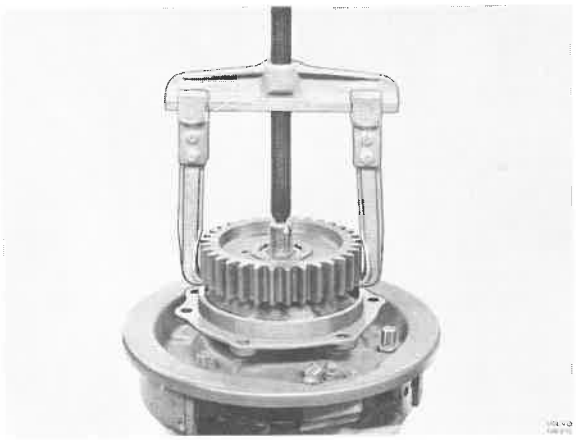


Fig. 77–6. Removing the gear wheel

3. Clean all the parts thoroughly. Clean the surface between the hub and the wheel carrier housing well so that no old sealing agent remains.

Replacing wheel bearings

1. Press out the inner bearing outer ring and inner sealing ring with two 6132, drift 2564 and standard handle 1801, see Fig. 77–7. Place tool 6132 as shown in Fig. 77–8.

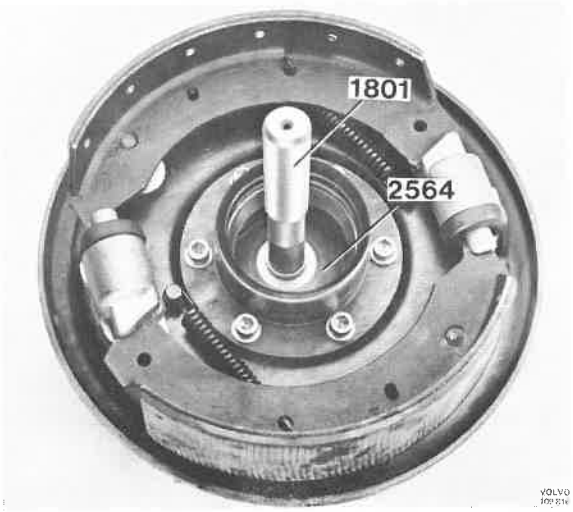


Fig. 77–7. Removing the inner bearing outer ring and inner sealing ring

Fig. 77–8. Location of thrust washers 6132

2. Press out the outer bearing outer ring with drift 2490 and standard handle 1801, see Fig. 77–9.

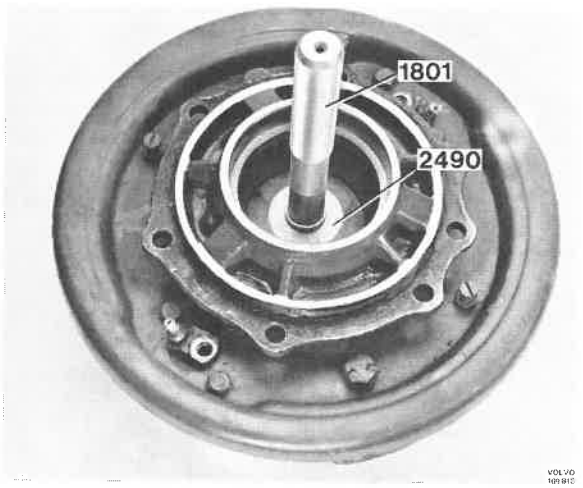


Fig. 77–9. Removing the outer bearing outer ring

3. Knock out the outer sealing ring with drift 2337, see Fig. 77–10.
4. Pull off the outer bearing inner ring with puller 6134, see Fig. 77–11.
   IMPORTANT! Knock down the ring on the puller well.

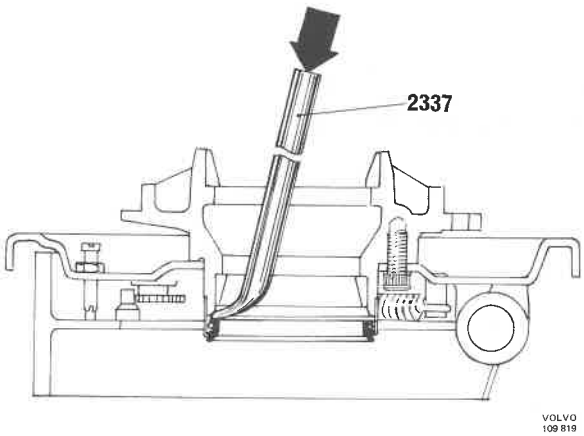


Fig. 77–10. Removing the outer sealing ring

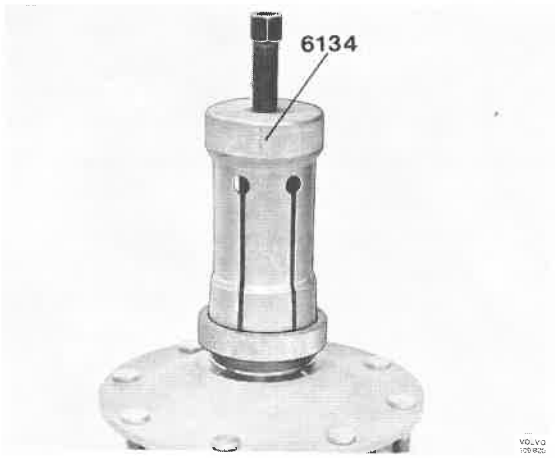


Fig. 77–11. Removing the outer bearing inner ring

5. Tap off the inner bearing inner ring with a 6 mm (1/4") drift, see Fig. 77–12.

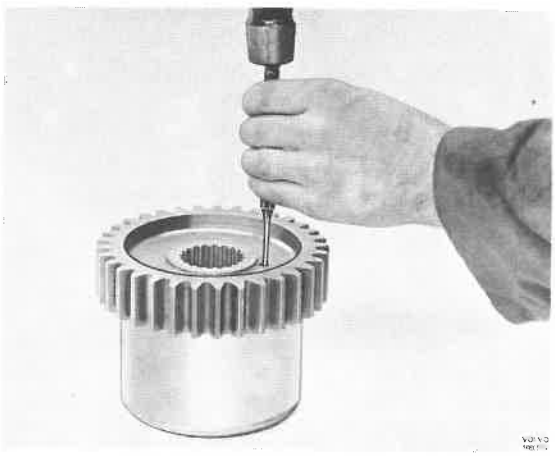


Fig. 77–12. Removing the inner bearing inner ring

6. Check the contact surfaces of the sealing rings according to the instructions given under the heading "Replacing sealing rings".
7. Press on the outer bearing inner ring with sleeve 6106, see Fig. 77–13.

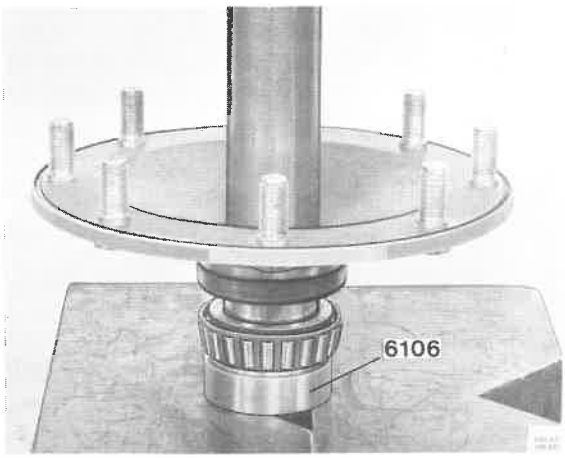


Fig. 77–13. Installing the outer bearing inner ring

8. Press on the inner bearing inner ring with sleeve 6106, drift 2490, and standard handle 1801, see Fig. 77–14.

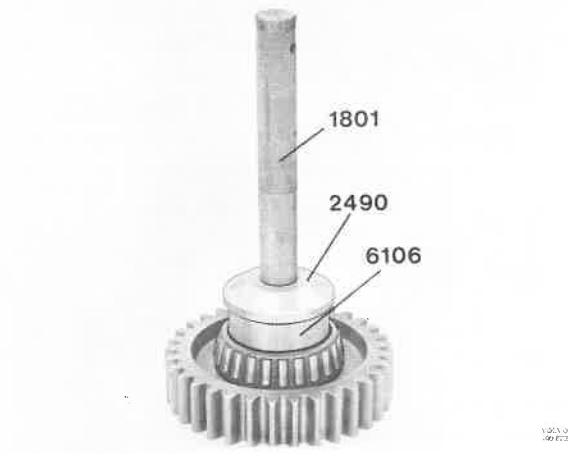


Fig. 77–14. Installing the inner bearing inner ring

9. Tap in the inner sealing ring with drift 6130, see Fig. 77–15. The sealing ring should be 2 mm (5/64") under the outer ring. Press in the inner bearing outer ring with drift 6107 and standard handle 1801, see Fig. 77–16.

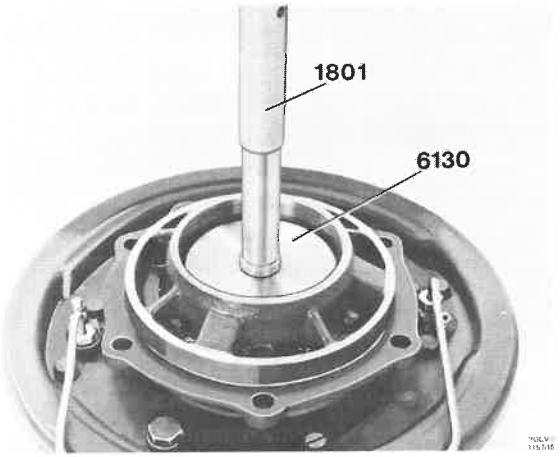


Fig. 77–15. Installing the inner sealing ring

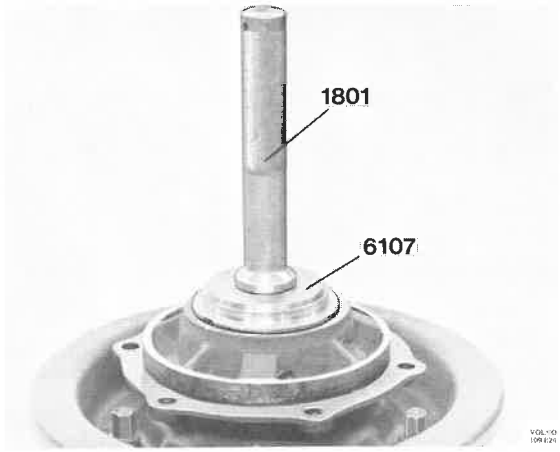


Fig. 77–16. Installing the inner bearing outer ring

10. Press on the outer bearing outer ring with drift 6107 and standrad handle 1801, see Fig. 77–17.

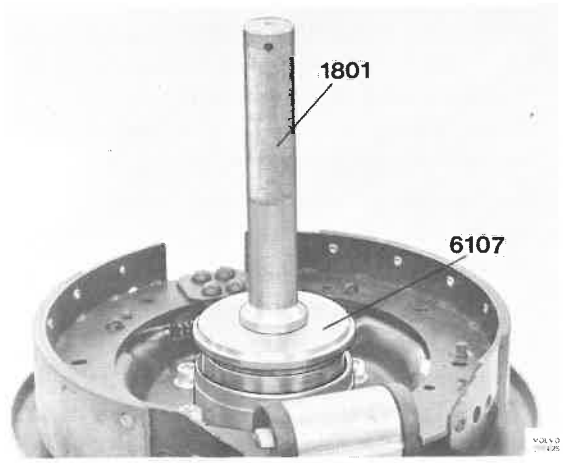


Fig. 77–17. Installing the outer bearing outer ring

11. Press on the outer sealing ring with sleeve 2910, see Fig. 77–18.

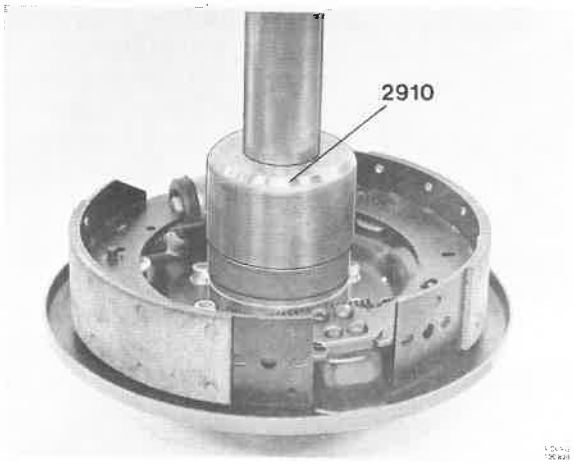


Fig. 77–18. Installing the outer sealing ring

Replacing sealing rings

1. Remove and disassemble the hub according to the instructions given under the headings "Removing a hub" and "Disassembling a hub".
2. Knock out the outer sealing ring with drift 2337, see Fig. 77–10.
3. Press out the inner sealing ring and inner outer ring with two 6132, drift 2564 and standard handle 1801, see Fig. 77–7. Place 6132 as shown in Fig. 77–8.
4. Check the sealing surfaces of the sealing rings. If the sealing surface on the stub axle is damaged, replace the stub axle. If the surface on the wear ring is damaged, replace the wear ring as follows: Pull loose the outer bearing inner ring with puller 6134, Fig. 77–11. Pull loose the wear ring with Kukko standard jackknife 15–17, Fig. 77–19.
   If the sealing surface on the gear wheel is damaged, replace the gear wheel.
5. Press on the new wear ring and the bearing inner ring on the stub axle with press ring 6106, Fig. 77–13.
6. Press on the outer sealing ring with sleeve 2910, Fig. 77–18.
7. Tap in the inner sealing ring with drift 6130, Fig. 77–15. The sealing ring should lie 2 mm (5/64") below the outer ring. Press in the inner bearing outer ring with drift 6107 and standard handle 1801, Fig. 77–16.

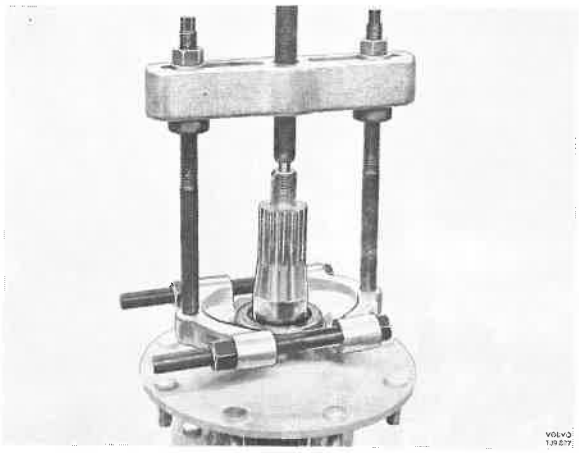


Fig. 77–19. Removing the wear ring

8. Assemble and install the hub according to the instructions given under the headings "Assembling a hub" and "Installing a hub".

Assembling a hub

1. Grease all bearings and sealing rings. Fill half the space in the hub with wheel bearing grease according to 13, Fig. 77–1. Grease the splines on the stub axle.
2. Place the hub with brake backing plate on the stub axle.
3. Press down the gear wheel with sleeve 2022 so far that the hub has a clearance of a small fraction of an inch, Fig. 77–20, while rotating the hub at the same time in order to make it easier for the gear wheel to fit into the inner sealing ring. Fit the O-ring, the washer with the sealing agent on the underside and a new nut. Pull down the gear wheel with the nut so that the clearance disappears.

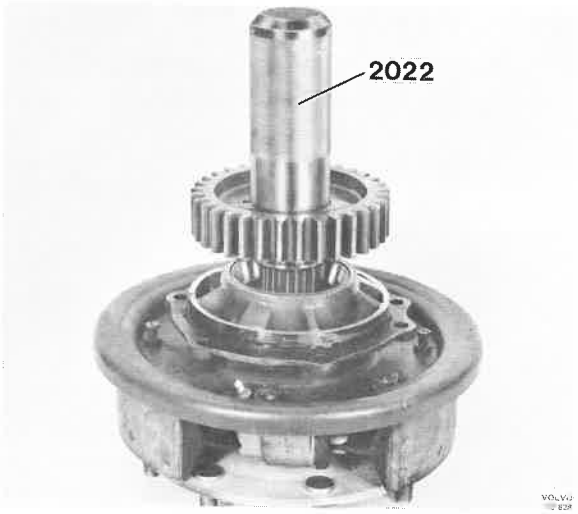


Fig. 77–20. Installing the gear wheel

4. Fit a spring balance like the one shown in Fig. 77–21. Note the reading on the balance. This shows the friction of the sealing rings.

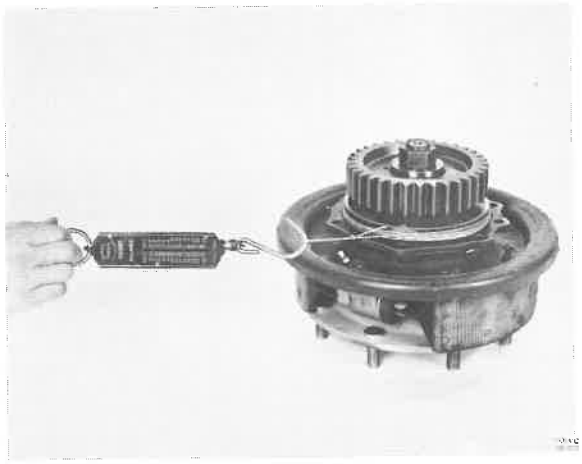


Fig. 77–21. Measuring the pre-load on hub

5. Tighten the nut so that the clearance disappears and changes to pre-loading. Check the pre-loading with the spring balance according to Fig. 77–21. Correct load on the spring balance should be the value obtained in point 4 plus 42–48 N (4.2–4.8 kp = 9.2–10.5 lbf) for new bearings. For run-in bearings, the load should be that obtained in point 4 plus 24–28 N (2.4–2.8 kp = 5.3–6.2 lbf).
6. When correct pre-load has been obtained, lock the nut by peening the edge in the shaft recess.

Installing a hub

1. Coat the sealing surfaces on the hub and wheel carrier housing with sealing agent.
2. Fit the hub and tighten up all retaining nuts.
3. Disconnect and plug the brake lines and bleed the wheel cylinders. Remove the contact for the pressure difference, see Fig. 77–22, during the bleeding. If a bleeder apparatus is used, the working pressure should be 0.2 MPa (2 kp/cm^2 = 28 lbf/in^2). For more detailed instructions concerning bleeding, see Part 5.

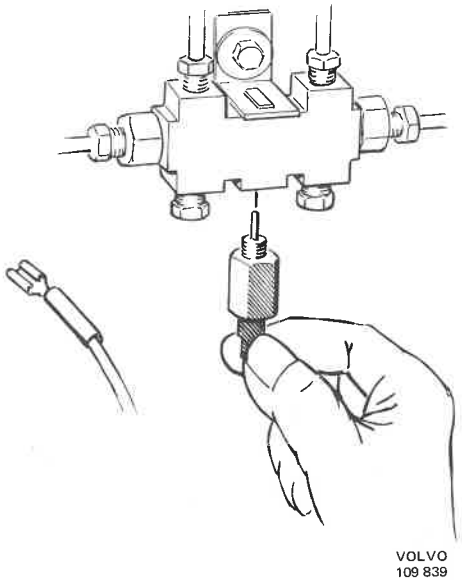


Fig. 77–22. Contact for pressure difference

4. Screw in the plug on the reverse side of the wheel carrier housing and fill with oil.
5. Mount the wheel, tighten up the nuts crosswise and lower the vehicle.

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