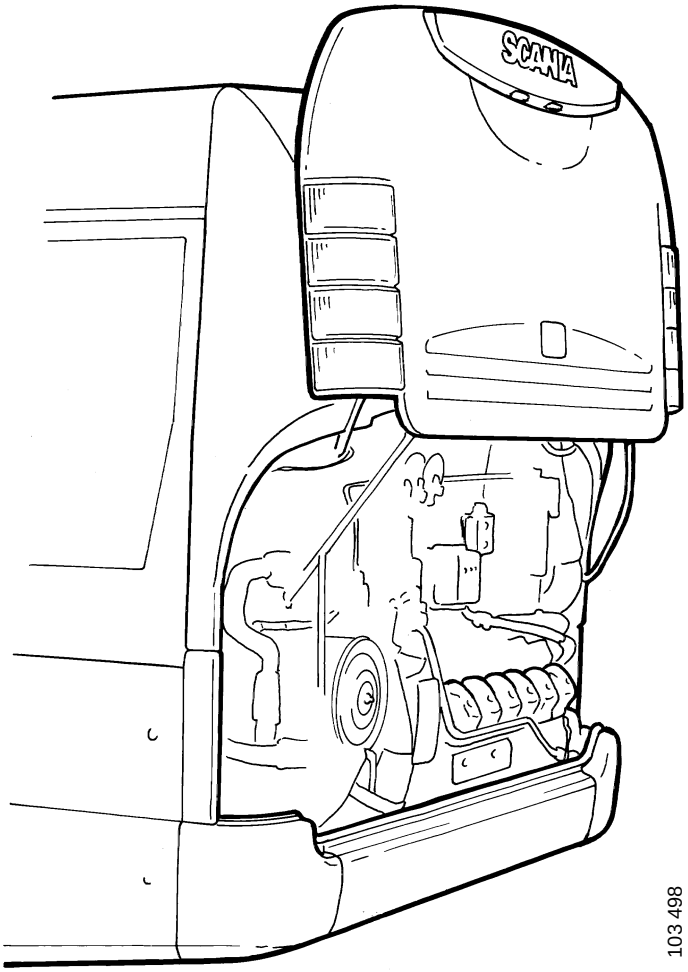
SCANIA

00:03-57/1

Issue 10 **en-GB**

Inspection instructions part 1

4 series buses



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Contents

Changes from the previous issue

2-01 Coolant

Corrosion inhibitor has been discontinued.

0 General

0-01 Inspection programme for buses

Inspection instructions have been prepared to provide inspection information in one booklet. For simplicity, the booklet has been divided into groups 0-19 in the same way as the rest of the Workshop Manual.

How the programme is structured

The Scania maintenance programme is designed to provide the bus maintenance required with a minimum of downtime. The programme depends on the distance driven and type of operation, of which there are 3 variants.

Safety

Scania can only be responsible for the safety of the mechanic and vehicle where inspection is carried out in accordance with these instructions.

The reliability of the vehicle between each inspection depends on each step being carried out correctly and on no steps being neglected. Some steps in the inspection programme are of crucial importance to the roadworthiness of the bus.

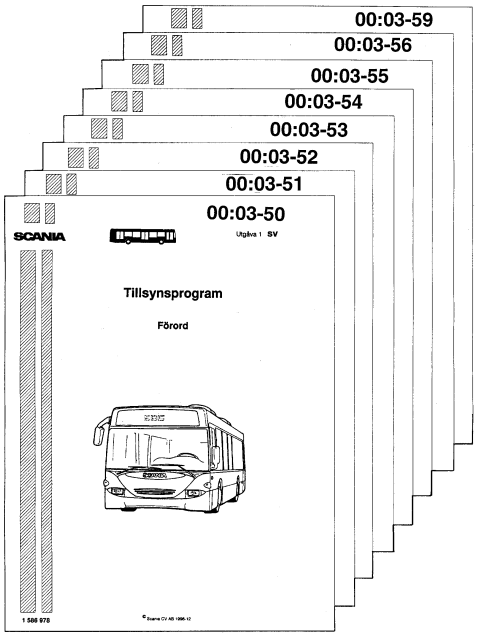
Some procedures can result in personal injury to mechanics if they are carried out incorrectly. These inspection instructions provide information on how the work can be carried out safely.

For more detailed information, refer to Workshop Manual booklet Safety in the workshop in group 0.

0-02 Inspection forms

The following forms can be found in group 0:

- Inspection programme - Preface
- D Inspection
- R Inspection
- S Inspection
- M Inspection
- L Inspection
- X Inspection
- Inspections for buses with ethanol engines

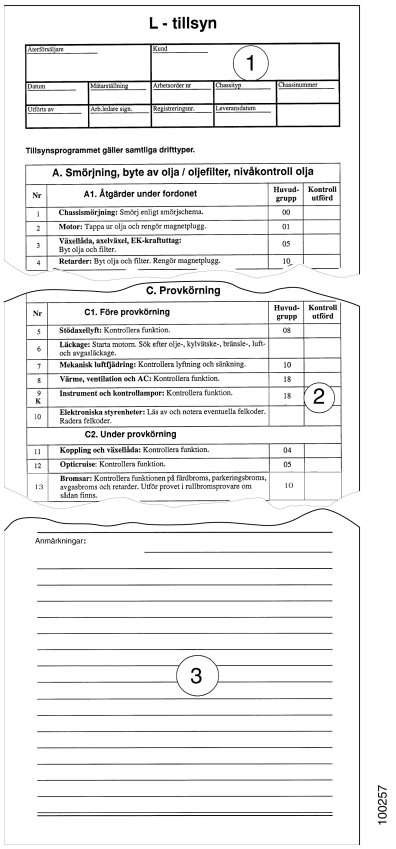


Make copies of the inspection forms as required.

1 Fill in the customer details.

2 After completing one inspection step, put a cross in that column and fill in the values where applicable. For example, fill in the thickness of the brake linings.

3 Whenever it is necessary to add a remark, write the step number, the remark and the proposed action in the notebook for the relevant inspection.



0-03 Lifting and supporting on stands

WARNING!

There is a risk of injury if the pressure in the air bellows falls while work is being carried out under the bus.

Always use axle stands when working under the bus.

If the torque rod is to be removed, the bus must first be supported under the chassis frame to give free access to the axle in question.

Supporting the vehicle under the chassis frame using a jack

Use the level control function to gain greater access under low-floor buses.

Supporting on stands at the front

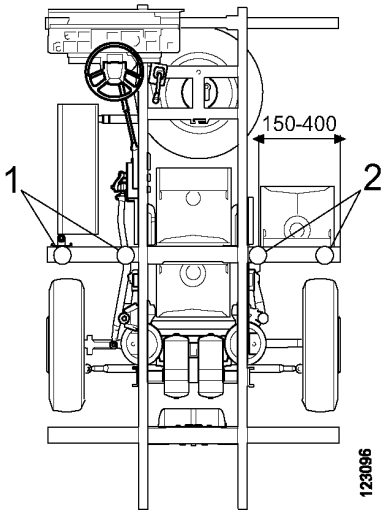
1 Rigid front axle. Position the jack centrally under the front axle or under the front axle air bellows and carefully raise the vehicle.

2 Place axle stands under jacking points 1 and 2, no more than 150-400 mm from the outer end of the crossmember.

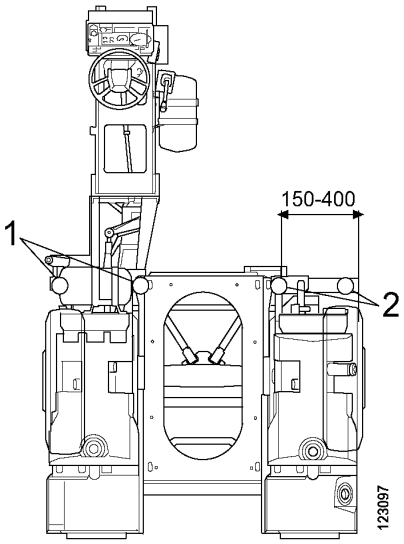
3 Independent front suspension (AMI axle). Raise the vehicle using two jacks simultaneously under points 1 and 2.

4 Place axle stands under jacking points 3 and 4.

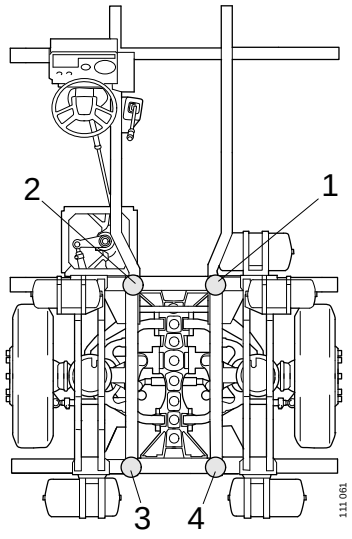
5 Lower the bus carefully, making sure that it is secure on the axle stands.



K and L buses with rigid front axle



N and L buses (low-floor) with rigid front axle



K bus with AMI axle

Supporting on axle stands, front/rear

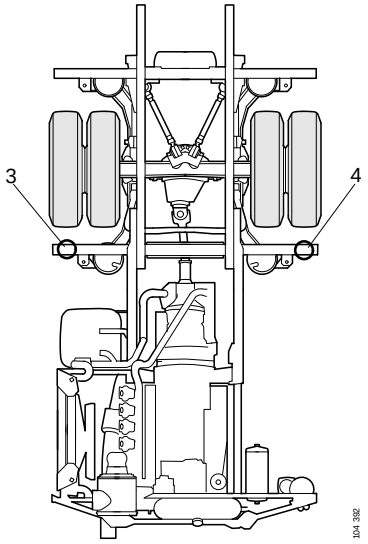
IMPORTANT! No load must be placed on the oil drain plug.

F bus

1 Position the jack centrally under the axle and carefully jack up the bus.

2 Place axle stands under the frame.

3 Lower the bus carefully, making sure that it is secure on the axle stands.



The illustration shows an L bus

Supporting on stands, rear

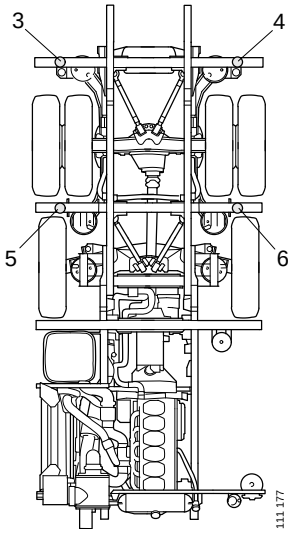
IMPORTANT! No load is to be applied to the oil drain plug.

K and L buses

1 Position the jack centrally under the rear axle and raise the vehicle carefully.

2 Place the axle stands under jacking points 3 and 4 (also 5 and 6 on 6x2), max. 150 mm from the outer end of the crossmember.

3 Lower the bus carefully, making sure that it is secure on the axle stands.



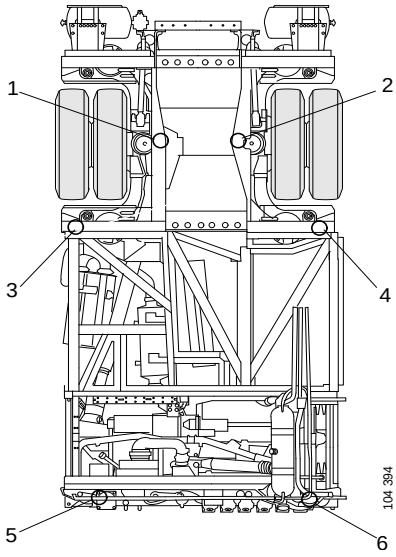
K bus 6x2

N bus

1 Lift with a jack at points 1 and 2.

2 Place axle stands under jacking points 3 and 4, max. 150 mm from the outer end of the crossmember and jacking points 5 and 6

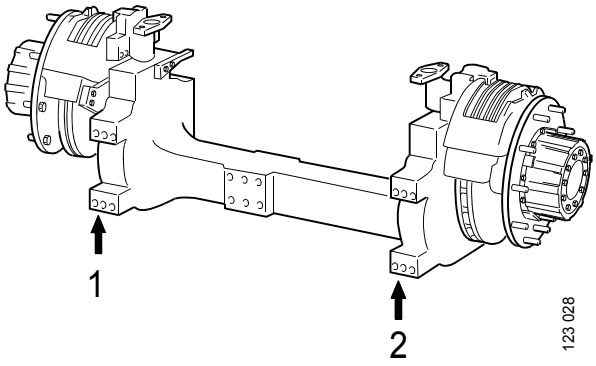
3 Lower the bus carefully, making sure that it is secure on the axle stands.



The illustration shows an N bus

Supporting the articulated bus centre axle on stands

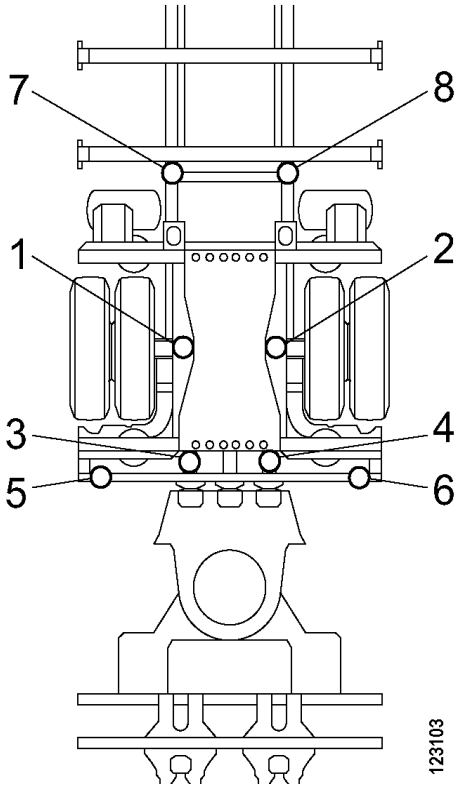
Note: Applies to the ZF axle only.



1 Raise the vehicle using two jacks simultaneously under points 1 and 2.

2 Place axle stands under jacking points 3 and 4 if possible. Alternatively jacking points 5 and 6 or 7 and 8 can be used.

3 Lower the bus carefully, making sure that it is secure on the axle stands.



Articulated bus

0-04 Chassis lubrication

Lubricating with a grease gun

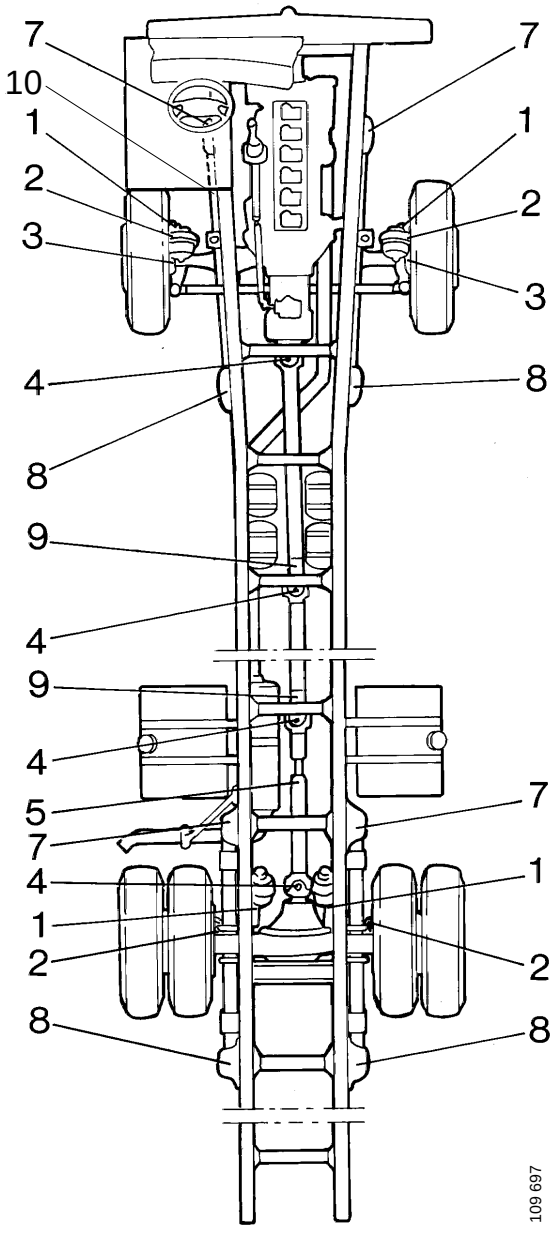
Please note that the lubrication schedules are designed for vehicles with **drum brakes**.

They can also be used on vehicles with **disc brakes** although some lubrication points, such as the brake camshaft, no longer apply.

Use universal grease for lubrication points on the chassis and for wheel bearings and spring bearings.

Grease grade: Consistency NLGI 0 to NLGI 2.

Note: When lubricating with grease, make sure grease is forced out from all bearing cups. This will ensure good lubrication.



Lubrication points F 94

1 Brake slack adjuster (drum brakes)

2 Brake camshaft (2 nipples on rear axle. Drum brakes)

3 Kingpin bearings (2 nipples, raised front axle)

4 Universal joint *)

5 Slip joint *)

7 Spring bolt

8 Spring shackle

9 Support bearing

10 Spare wheel carrier (inspected at L inspection)

*) Does not apply to maintenance free propeller shafts

Lubrication points K and L buses

1 Brake slack adjuster (drum brakes)

2 Brake camshaft (2 nipples on rear axle. Drum brakes)

3 Kingpin bearings (2 nipples, raised front axle)

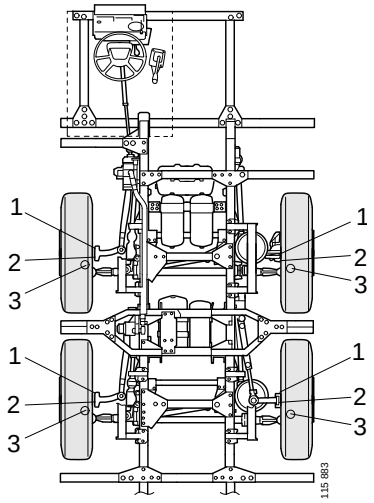
4 Universal joint *)

5 Slip joint *)

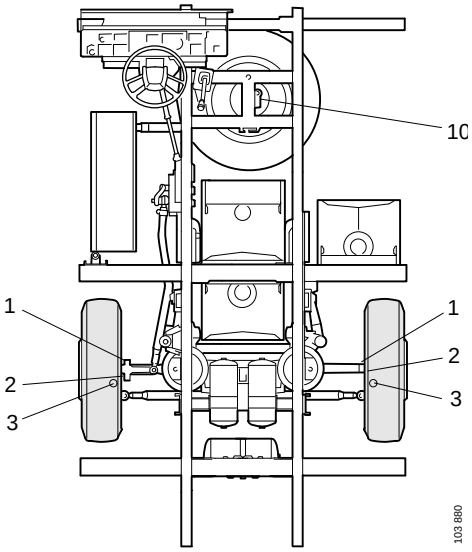
10 Spare wheel carrier (inspected at L inspection)

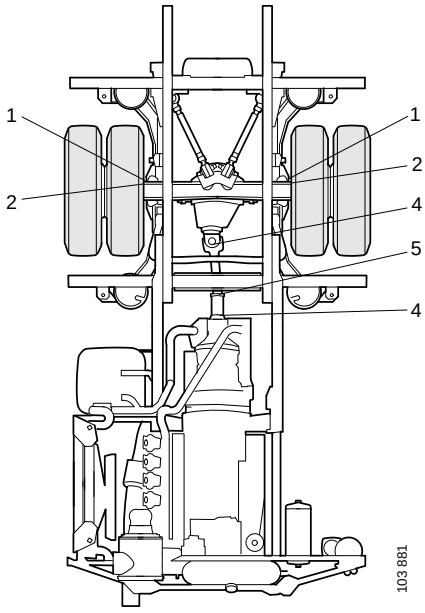
11 Battery shelf

*) Does not apply to maintenance free propeller shafts



The illustration shows a K bus 8x2





The illustration shows an L bus

Lubricate using an oil can

- Accelerator pedal bearing
- Brake pedal bearing
- Locks for the noise shields
- Battery shelf lock screw

Lubricate with high-temperature grease

- Ball joint on the exhaust brake link rod.
- Ball joints on the throttle control link rod.

Lubricating using a grease gun

1 Brake slack adjuster (drum brakes)

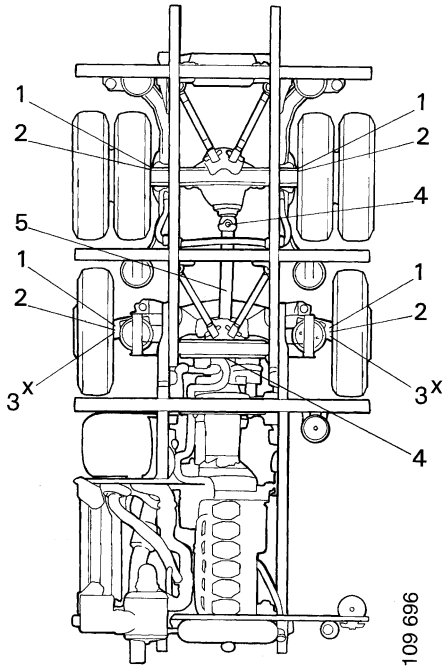
2 Brake camshaft (2 nipples on rear axle. Drum brakes).

3[x] In addition, there is also a lubrication point 3, kingpin bearing, on vehicles with a steered tag axle (2 nipples, axle raised)

4 Universal joint *)

5 Slip joint *)

*) Does not apply to maintenance free propeller shaft



The illustration shows a K bus with tag axle

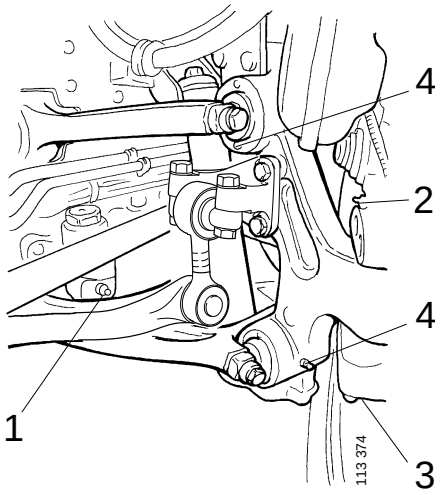
Lubrication points on buses with AMI axle

1 Guide arm bearing

2 Brake camshaft

3 Kingpin bearings (2 nipples, raised front axle)

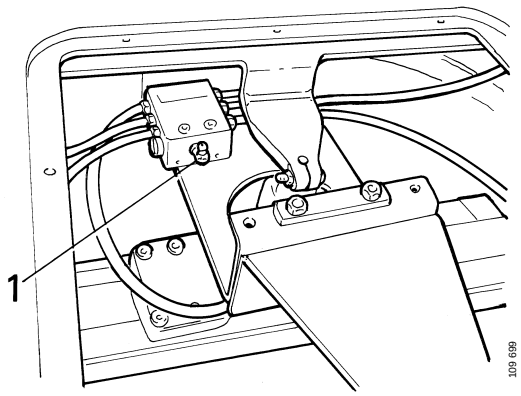
4 Vertical link



Lubricating the main bearing, articulation hoop bearing and checking the grease distributor

IMPORTANT! Only use a hand pump for lubricating. Compressed air lubrication guns can damage the lubrication system.

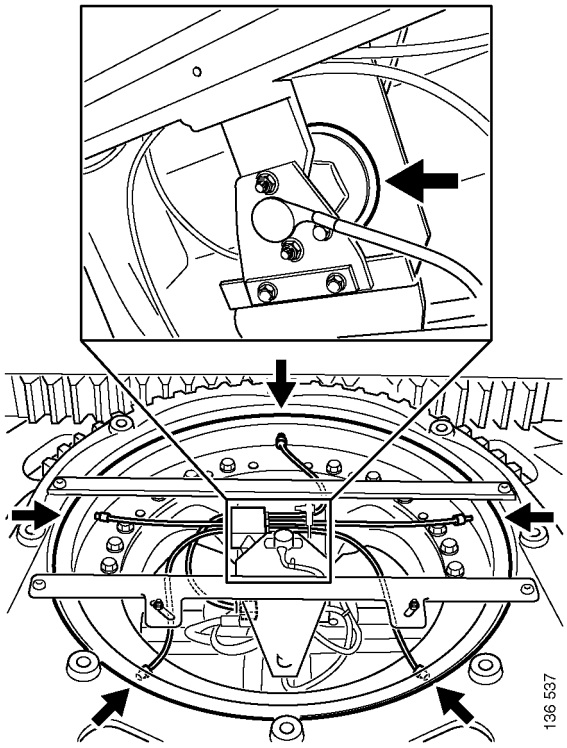
1 Inject grease into the grease distributor.



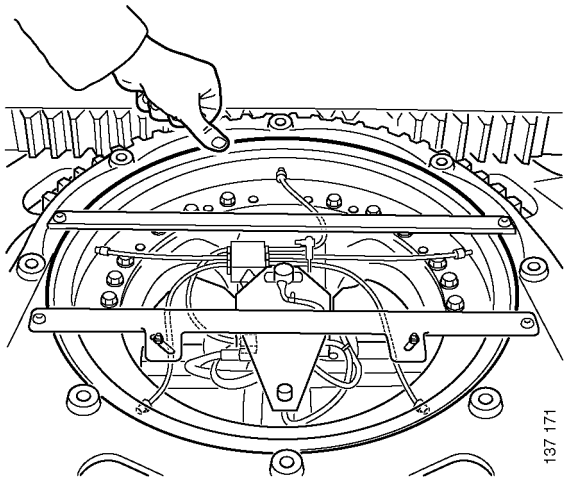
1 Grease distributor

2 Check that the grease distributor functions correctly and that grease comes out of all grease points.

IMPORTANT! When lubricating, it is important to remove the floor pans to check that grease comes out of all grease points. See illustration.



3 Pull back and wipe clean the sealing lip on the large joint bearing after lubricating.

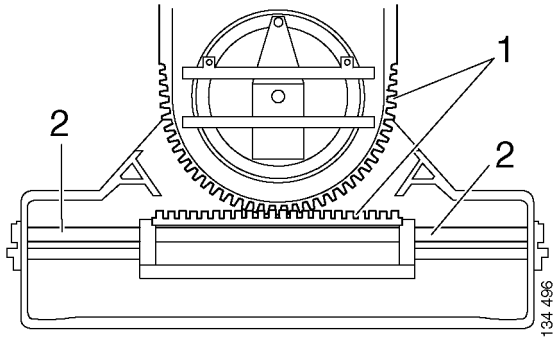


Lubricating the external ring gear

IMPORTANT! Make sure that you do not get grease on the adjacent joint components.

1 Clean the external ring gear teeth. Turn the bus articulation unit so that you can reach the entire surface.

2 Lubricate the external ring gear with grease spray 1 752 954 for external ring gears.



1 External ring gear
2 Guiding shafts

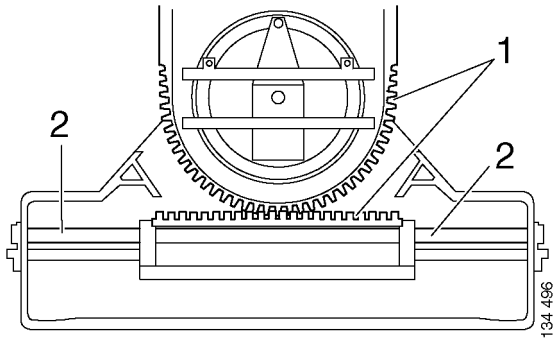
Lubricating the guiding shafts and checking bearing play

The guiding shafts have a bearing which should be lubricated in order to extend the service life of the bushes and shafts.

IMPORTANT! The shaft must first be cleaned of all dirt and must be dry before lubrication is applied.

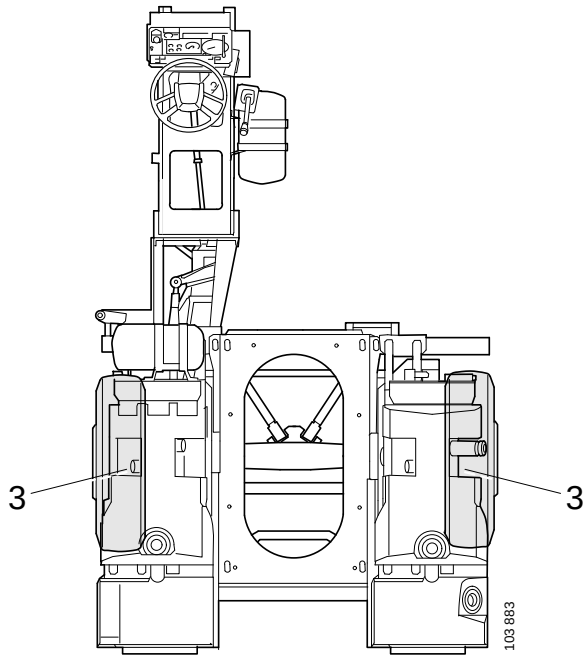
1 Check the bearing play for bushes and guiding shafts. Refer to the workshop manual, main group 11, Renewing bushes in the articulation unit.

2 Lubricate the guiding shafts with grease spray 1 751 994 for guiding shafts or other Teflon based protective film.



1 External ring gear
2 Guiding shafts

Lubrication points N bus



Note: The universal joint and slip joint are to be lubricated with high-temperature grease.

Recommended grease:

SHELL Retinax LX

FUCHS Renolith Duraplex GWB

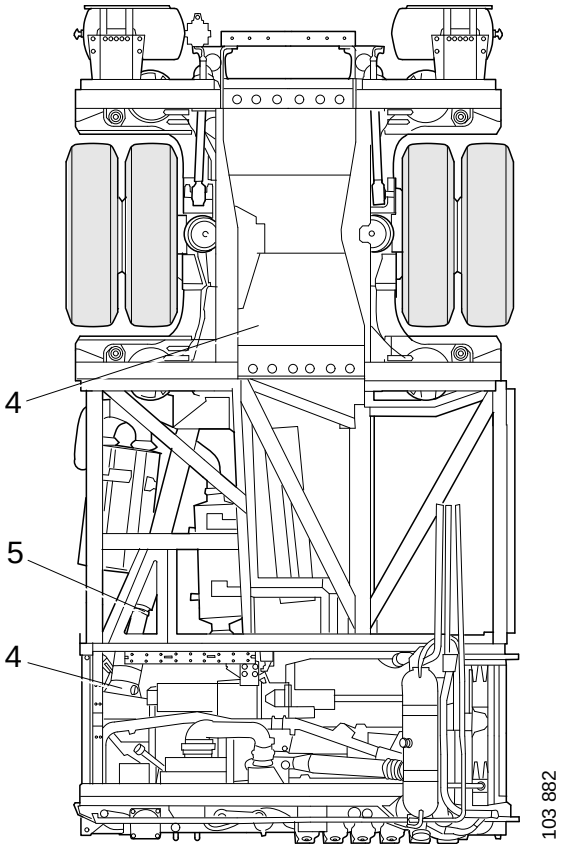
RENUS Norplex LKP 2

3 Kingpin bearings (2 nipples, raised front axle)

4 Universal joint (Applies to propeller shaft with 100 mm diameter).

5 Slip joint (Applies to propeller shaft with 100 mm diameter).

11 Battery shelf



Lubricate using an oil can

- Accelerator pedal bearing
- Brake pedal bearing
- Locks for the noise shields
- Battery shelf lock screw

Lubricate with high-temperature grease

- Ball joint on the exhaust brake link rod.
- Ball joints on the electric throttle link rod

0-05 Correct Operator's manual

The vehicle comes with an Operator's Manual including booklets corresponding to the vehicle specification. These booklets are to be kept in a special binder.

The Operator's Manual is divided into the following sections:

Order No.	Title	Contents
OM-52	Inspection programme	The Scania inspection programme.
OM-53	Opticruise	Information on computer-aided gear shifting.
OM-54	Driver's Instructions K/L/N bus	Driving information.
OM-55	Maintenance and care K/L/N bus	Maintenance information.
OM-56	Driver's Instructions OmniCity, OmniLink	Driving information.
OM-57	Comfort Shift	Information on computer-aided gear shifting.
OM-58	Automatic gearbox, ZF	Information on driving and maintenance.
OM-59	Auxiliary brake system Scania Retarder, Telma Retarder	Description and driving tips.
OM-60	Driver's Instructions F bus	Driving information. Only En, Es.
OM-61	Maintenance and care	Maintenance information. Only En, Es.
OM-62	Fire extinguishing equipment	Only Sv, En, Nl.
OM-23	EDC	Information on electronically controlled fuel injection.
OM-26	Gas engine	
OM-30	Scania Particle Filter	

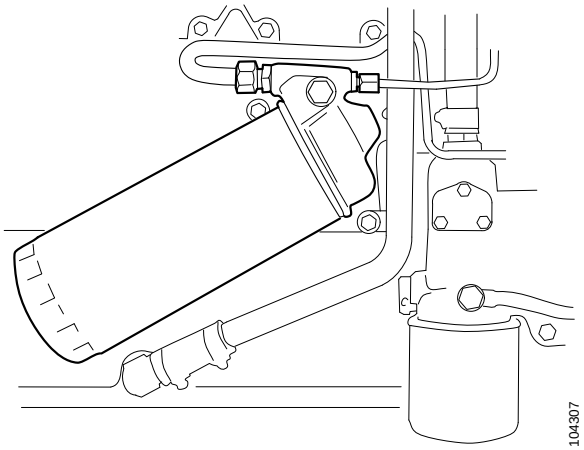
1 Engine

1-01 Oil change

Oil grade: Oils, refer to booklet 00:03-09.

WARNING!

Beware of hot oil! Wear protective gloves and goggles.



IMPORTANT! Help protect our environment! Avoid spillage. Use a suitable container.

1 Drain the oil.

2 Renew the oil filter.

3 Clean the magnet and renew the sealing washer. Fill up with oil.

	Max. volume
9 litre engine F	29 litres
9 litre engine K	25 litres
9 litre engine N and L	31 litres
9 litre engine 5 cyl K	35 litres
11 litre engine K	22 litres
12 litre engine K	22 litres

Note: All volumes are approximate. Check with oil dipstick and top up if necessary.

Place the oil dipstick in the correct position. You should be able to feel the dipstick, and not the handle, "stop" in the oil sump.

IMPORTANT! Make sure that the oil is suitable for all variations in outdoor temperature that are likely to occur before the next oil change.

1-02 Centrifugal oil cleaner

Cleaning

When cleaning the oil cleaner, you should find a certain amount of dirt in the rotor cover. If not, this indicates that the rotor is not spinning. The cause must be established immediately.

If, at the recommended intervals, the dirt layer exceeds 28 mm (26 mm for older versions), the rotor cover should be cleaned more often.

IMPORTANT! On the 9 litre engine, the oil filter must be removed so that the centrifugal oil cleaner can be disassembled.

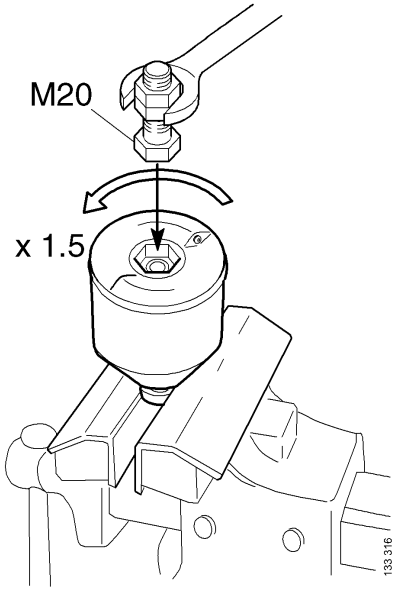
1 Unscrew the nut securing the outer cover.

2 Let the oil run out from the engine.

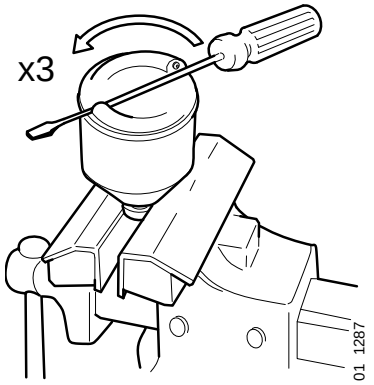
3 Lift out the rotor and wipe the outside. Loosen the rotor nut and screw it out about 1.5 turns (3 turns on the older version) to protect the bearing.

4 If the rotor nut is difficult to get loose, turn the rotor upside down and fasten the rotor nut in a vice. Turn the rotor anticlockwise 1.5 turns by hand or use a M20 nut (3 turns using a screwdriver on the older version).

IMPORTANT! The rotor must not be put in a vice. Never strike the rotor cover. This may cause damage resulting in imbalance.



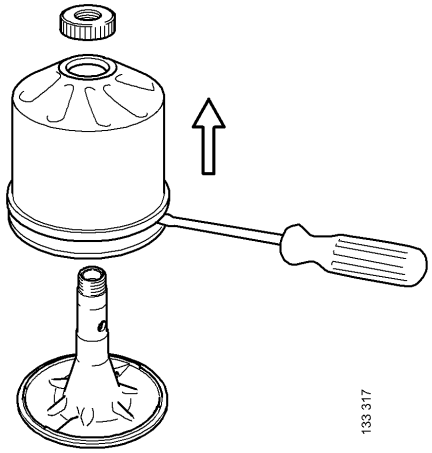
New design

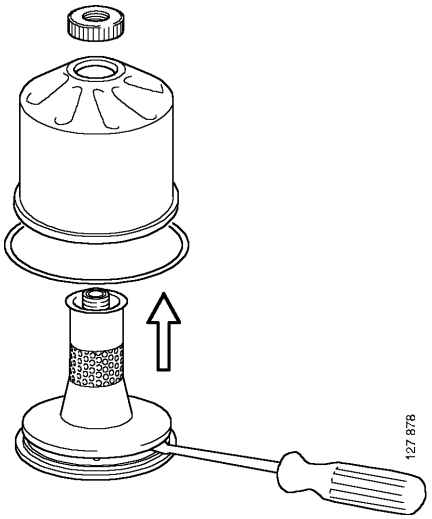


Old design

5 Remove the rotor cover by grasping the rotor in both hands and tapping the rotor nut against the table. Never strike the rotor directly as this may damage its bearings.

6 Remove the strainer from the rotor cover. If the strainer is stuck, insert a screwdriver between the rotor cover and strainer and carefully prise them apart.





7 Scrape away the deposits inside the bowl with a knife.

8 Wash the parts.

9 Inspect the two nozzles on the rotor. Ensure that they are not blocked or damaged. Renew any damaged nozzles.

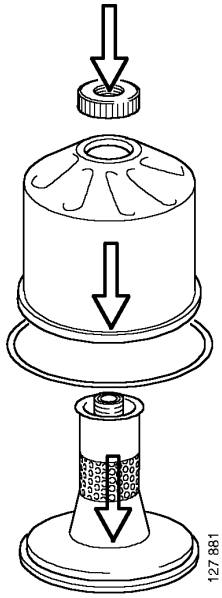
10 Check that the bearings are undamaged.

11 Fit the strainer onto the rotor.

12 Fit a new O-ring by sliding it over the strainer.

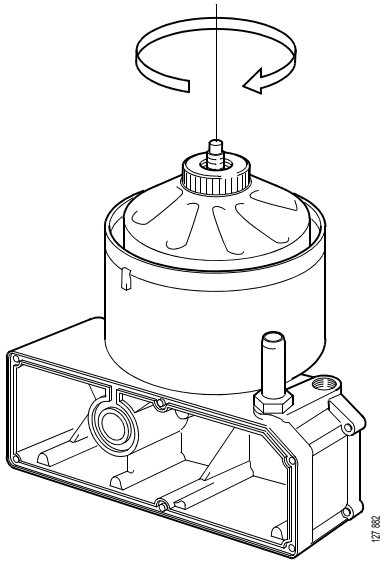
13 Refit the rotor cover. Make sure that the O-ring is not outside the cover.

14 Screw the rotor nut back on by hand.

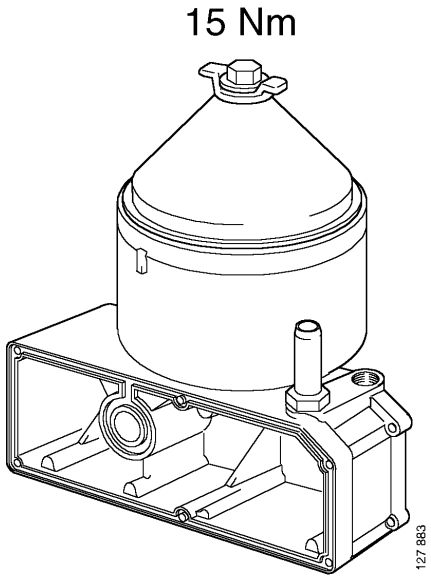


15 Check that the shaft is not loose. If it is, it should be locked using locking compound 561 200. First clean thoroughly using a suitable solvent. Tighten the rotor shaft using socket wrench 98 421. Tightening torque 34 Nm.

16 Refit the rotor and spin it by hand to make sure it rotates easily.



17 Check the O-ring on the cover of the oil cleaner housing and fit it. Torque tighten the lock nut to 15 Nm.



Operational testing

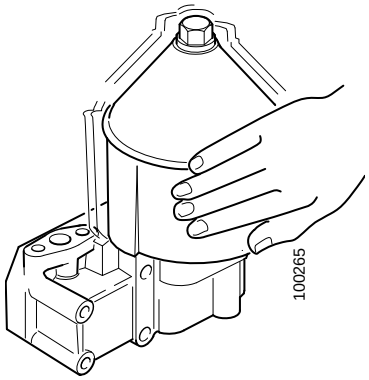
A functional inspection only needs to be carried out if there is a suspicion that the oil cleaner is not working properly. For example, if there is an abnormally small amount of deposits in the oil cleaner in relation to the mileage.

The rotor rotates very fast and should continue to turn when the engine has stopped.

1 Run the engine until it is warm.

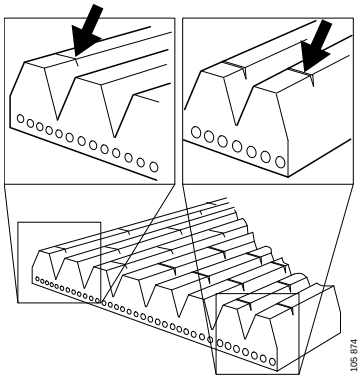
2 Stop the engine and listen for the rotor. Use your hand to feel if the filter housing is vibrating.

3 If the filter housing is not vibrating, dismantle and check the oil cleaner.



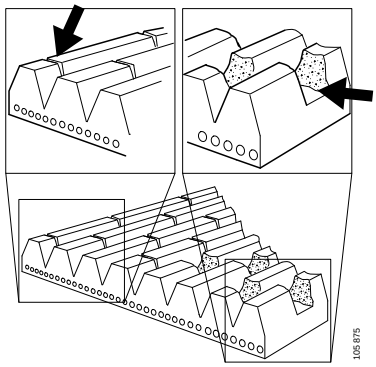
1-03 Checking the poly-V-belt

IMPORTANT! Make sure you do not change the belt's direction of rotation when refitting.



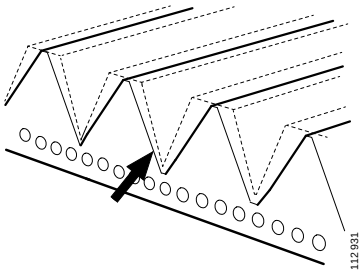
Small cracks may be acceptable.

- Detach the belt from the belt pulleys but leave it on the fan shaft. This is to make sure the direction of rotation of the belt is not changed
- Check the belt carefully. Renew if it has one or more cracks.

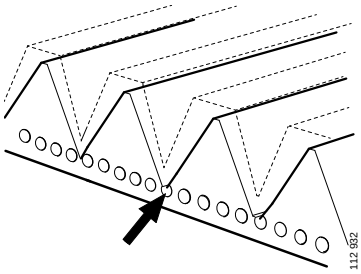


If there are large cracks or if pieces are missing, renew the belt.

- Also check belt wear.



The poly-V-belt shows signs of wear. Can be refitted.

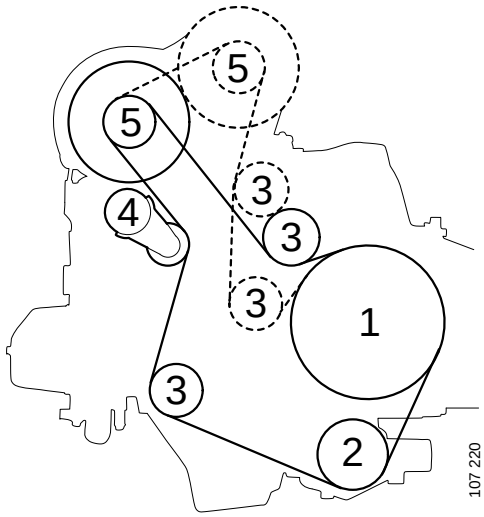


The poly-V-belt is worn down to the cord. Renew the poly-V-belt.

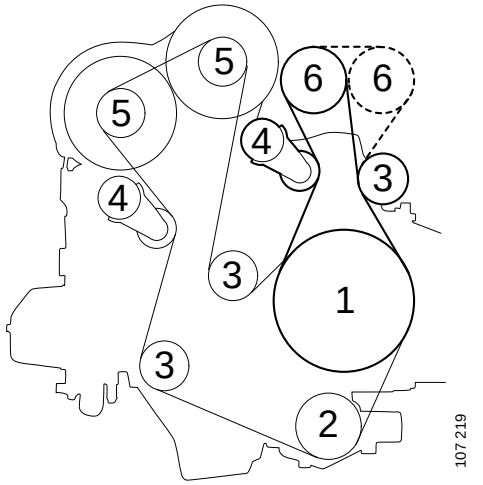
Belt transmission

9 litre engine

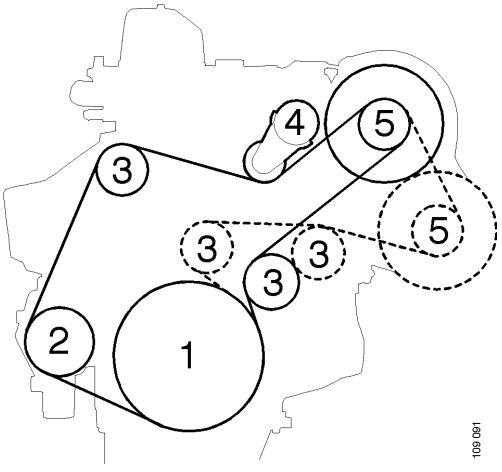
1 Crankshaft
2 Coolant pump
3 Idler roller
4 Belt tensioner
5 Alternator
6 AC compressor



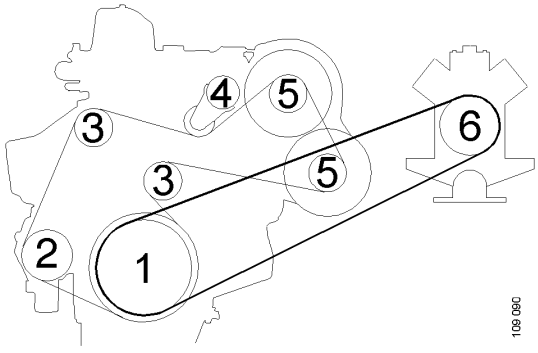
L/N chassis without AC



L/N chassis with AC



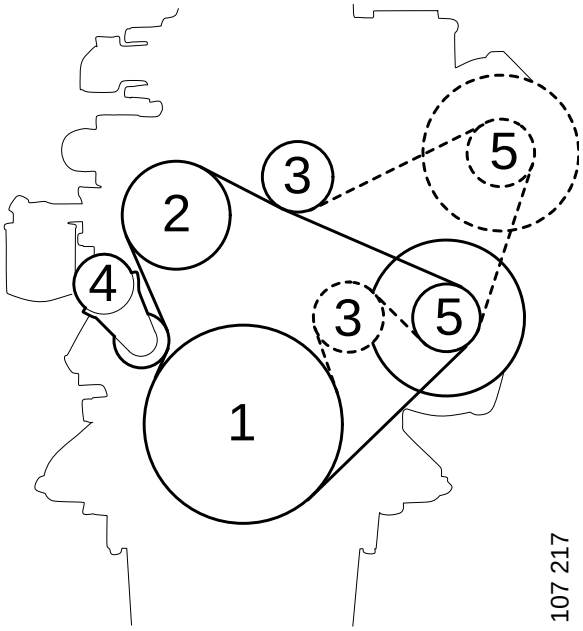
K chassis without AC



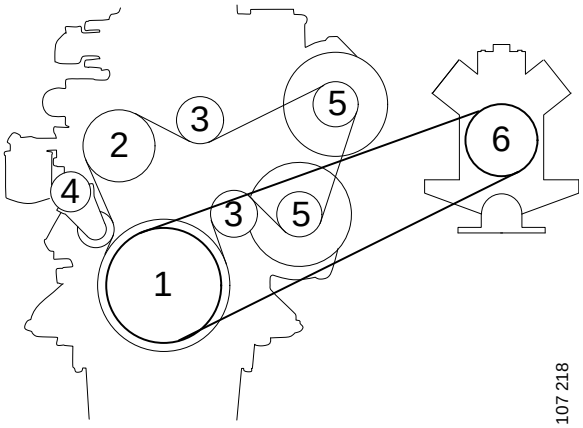
K chassis with AC.

9 (5 cyl), 11 and 12 litre engine

1 Crankshaft
2 Coolant pump
3 Idler roller
4 Belt tensioner
5 Alternator
6 AC compressor



K114/124 without AC



K114/124 with AC

1-04 Valve clearance

Note: Check and adjust with the engine cold.

Checking

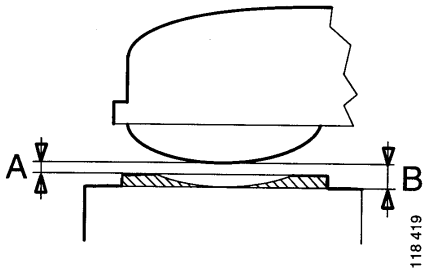
Check the valve clearance. The clearance should be:

9 litre engine: Intake valves 0.45 mm and exhaust valves 0.80 mm.

DC9 (5 cyl): See section 1-06, Adjusting valves and unit injectors DC9, in this booklet.

DC11 and 12 litre engine: Intake valves 0.45 mm and exhaust valves 0.70 mm.

IMPORTANT! Make sure the wear washer on the valve bridge is not excessively worn.



A - measured valve clearance
B - actual valve clearance

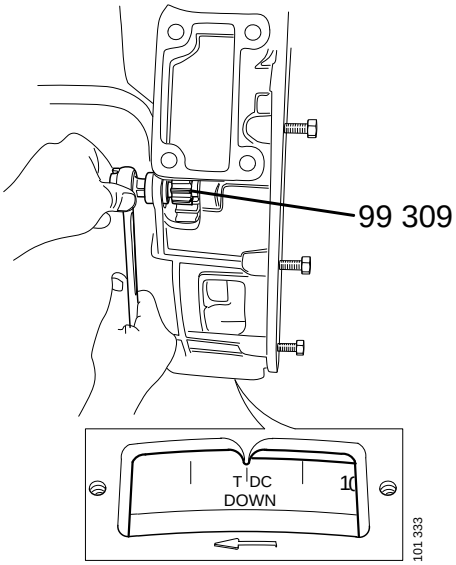
Adjusting

The following alternative methods of adjustment can be used:

Alternative A:

- Adjust both valves for each cylinder when at TDC after the compression stroke. Rotate the crankshaft 1/3 turn each time with tool 99 309. Adjust the valves in the injection order for the cylinders:

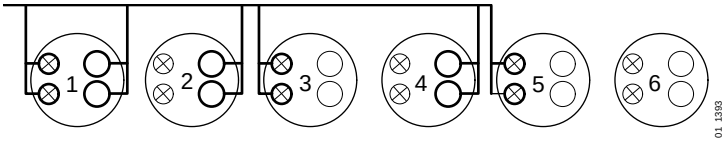
  1 - 5 - 3 - 6 - 2 - 4



Alternative B:

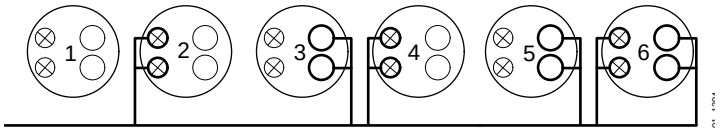
1 Set cylinder 1 exactly at TDC after the compression stroke. Adjust the following valves.

cyl 1	Intake and exhaust
cyl 2	Intake
cyl 3	Exhaust
cyl 4	Intake
cyl 5	Exhaust



2 Turn the crankshaft exactly one revolution. Adjust the following valves.

cyl 2	Exhaust
cyl 3	Intake
cyl 4	Exhaust
cyl 5	Intake
cyl 6	Intake and exhaust



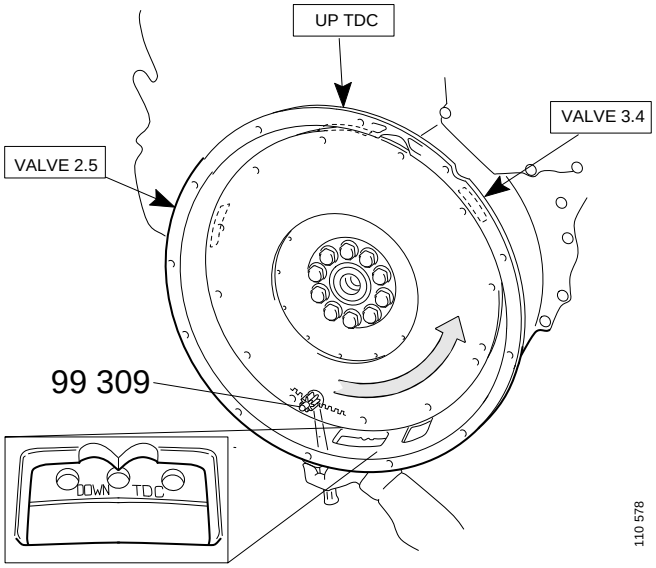
A 12 litre engine is shown in the illustrations
O Intake valve
X Exhaust valve

1-05 PDE unit injector

Checking and adjusting spring height

1 Clean the rocker cover and the area around it.

2 Remove the rocker cover.



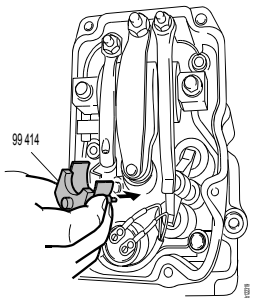
WARNING!

Always place axle stands under the frame when working underneath vehicles with air suspension. Empty the air bellows.

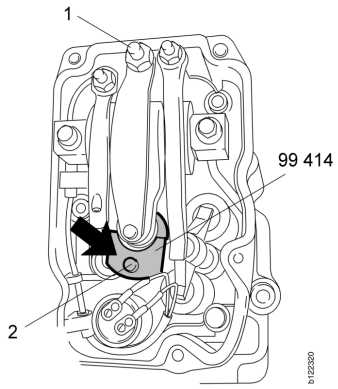
3 Rotate the flywheel using tool 99 309 so that the mark on the flywheel is visible in the **lower** window according to the table below. Never read off the flywheel mark in the upper window - this reading will be incorrect.

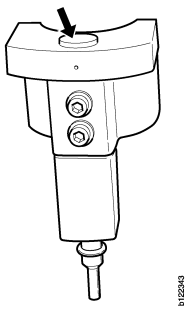
Mark on flywheel (degrees)	Valve transition on cylinder	Adjust injector rocker arm on cylinder
TDC Down (0°)	1	2
Valve 2, 5 (120°)	5	4
Valve 3, 4 (240°)	3	1
TDC Down (0°)	6	5
Valve 2, 5 (120°)	2	3
Valve 3, 4 (240°)	4	6

4 Fit adjusting tool 99 414 with the metal plate around the unit injector.

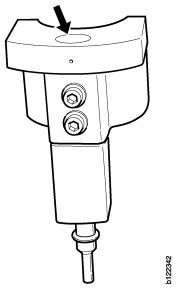


5 When adjusting, loosen the lock nut and adjust the unit injector with adjusting screw 1. The unit injector is correctly set when the small piston 2 is level with the flat upper surface of the tool. Use a finger to check. It is possible to feel differences of less than a millimetre.

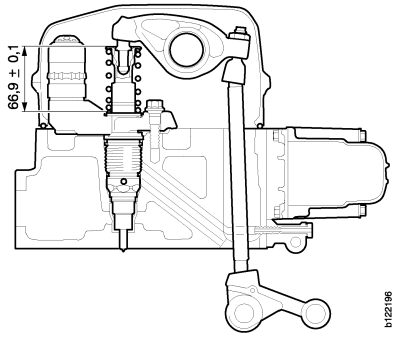




The tool piston is higher or lower than the flat upper surface of the tool - Adjust the unit injector



The tool piston is level with the flat upper surface of the tool - The unit injector is correctly set



Adjusting tool 99 414 acts as a gauge with the measurement 66.9 mm.

6 Torque tighten the adjusting screw lock nut to 39 Nm.

1-06 Adjusting valves and unit injectors DC9 (5 cyl)

Note: Check and adjust the valve clearance and unit injectors with the engine cold.

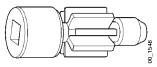
Specification

Unit injector measurement (cold engine)	66.9 ± 0.1 mm
Valve clearance, intake valve	0.45 mm
Valve clearance, exhaust valve	0.70 mm

Tightening torques

Adjusting screw lock nut on rocker arm for unit injector	39 Nm
Adjusting screw lock nut on the valve rocker arm	35 Nm

Special tools

Number	Denomination	Illustration	Tool board
99 309	Tool to rotate flywheel		D5
99 414	Setting tool		Measuring element cabinet
588 179	Torque screwdriver		

Order of adjustment

The adjustment applies to a 9 litre engine with 5 cylinders.

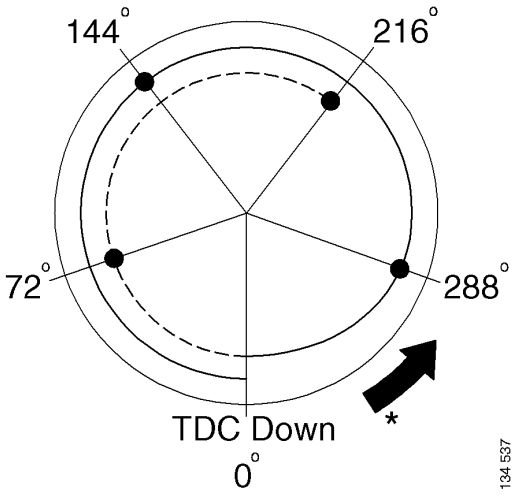
To make sure that adjusting is carried out on the correct revolution, proceed as follows:

1 Rotate the flywheel so that the 72° mark on the flywheel can be seen in the lower window of the flywheel housing and there is a valve transition on cylinder 5.

2 Then turn the flywheel clockwise so that it passes TDC Down (0°) by about 20° and then turn it anticlockwise until TDC Down (0°) is visible in the lower window of the flywheel housing. The reason for turning past TDC Down (0°) and then back is to counteract any backlash.

3 You are now on the first revolution and can adjust the valves and unit injectors as shown in the following table.

   Turn the flywheel anti-clockwise so that the mark on the flywheel can be seen in the lower window in the flywheel housing.



Flywheel seen from the rear of the engine.

** Direction of rotation when adjusting.*

The solid line shows the order for angles on rotation 1 and the broken line the order for rotation 2.

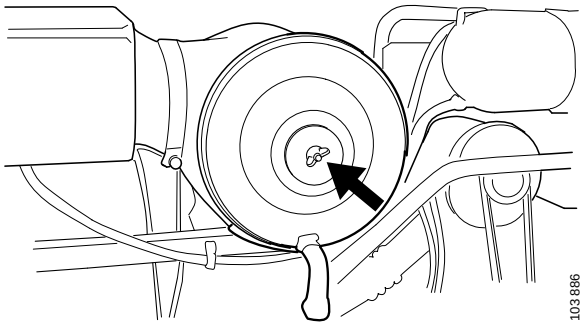
Mark on flywheel (°):	**Rotation:**	**Adjust the unit injector rocker arm on cylinder:**	**Adjust intake and exhaust valves on cylinder**	**Valve transition on cylinder:**
TDC Down 0	1	2	1	
	2			1
144	1	4	2	
504	2			2
288	1	5	4	
648	2			4
72	1			5
432	2	3	5	
216	1			3
576	2	1	3	

1-07 Air cleaner

Air is drawn through the aperture on the side of the air cleaner. It is filtered through the paper filter and is then drawn through the aperture in the end plate on the turbocharger.

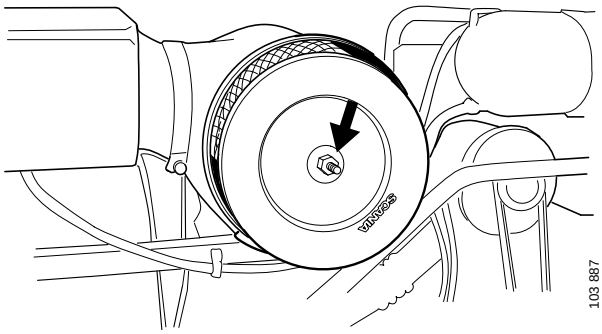
A rubber valve at the bottom of the filter cover acts as a drain. Water that enters the air cleaner is collected at this point. The rubber valve opens when the pressure exerted by the water is greater than the pressure in the air cleaner.

1 Detach the wing nut that holds the filter cover in place.



2 Detach the nut that holds the filter in place

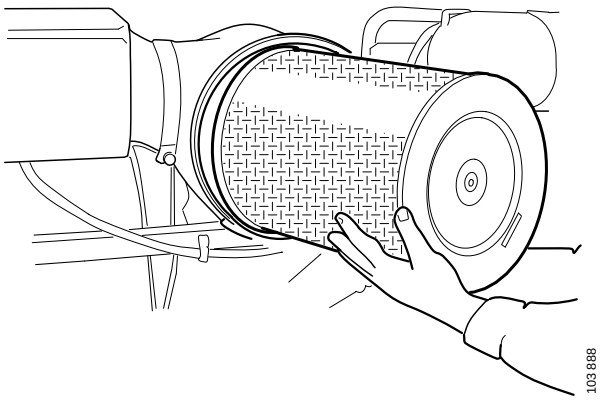
3 Clean the inside of the filter housing.



4 Renew the filter element.

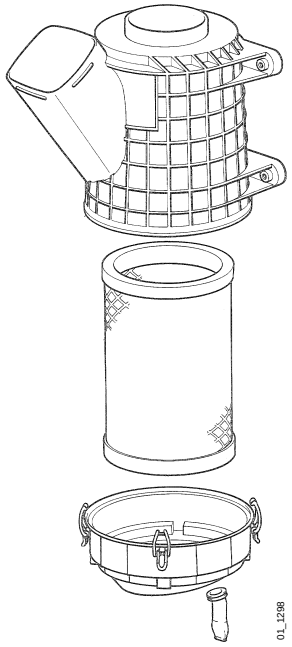
Make sure that the rubber valve is facing downwards when the filter cover is refitted.

Note: Do not forget to reset the indicator, see "Vacuum indicator".

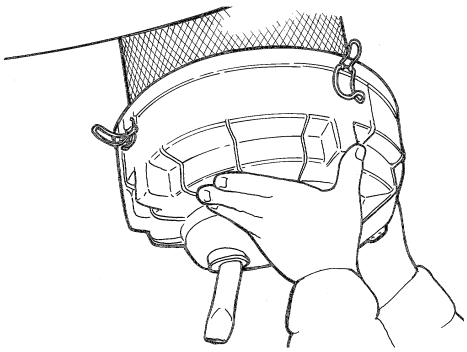


Air cleaner F94

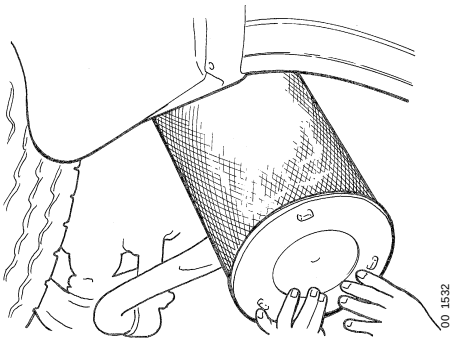
There is a rubber valve underneath the air cleaner that acts as a drain. Water that enters the air cleaner is collected at this point. The rubber valve opens when the pressure exerted by the water is greater than the pressure in the air cleaner.



1 Loosen the clips that hold the filter cover in place.



2 Renew the filter element.

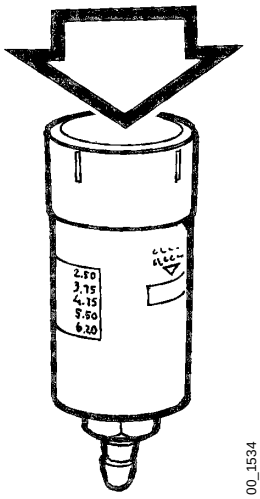


Note: Do not forget to reset the indicator, see "Vacuum indicator".

Vacuum indicator

Engine power will be reduced if the filter admits insufficient air to the engine. Other related effects are increases in fuel consumption and the amount of carbon particles in the exhaust, both of which are caused by the reduced output being compensated for by increased throttle actuation. There is also an increased risk of damage to the turbocharger.

The indicator has two windows. The smaller window indicates the need for filter renewal by changing colour, and the larger window is graduated. When the indicator shows 6.20 kPa, the filter element should be renewed.



Note: Reset the indicator by pressing the centre as shown.

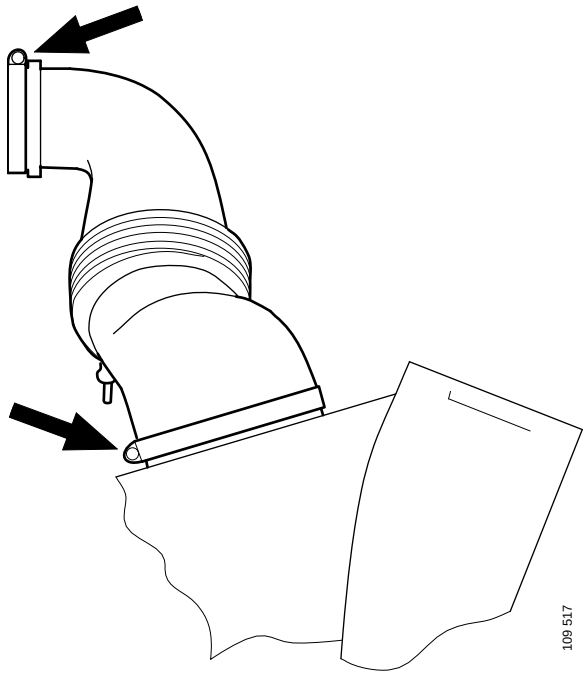
1-08 Inlet pipe

Retightening retaining straps

Retighten the retaining straps on the inlet pipe between the air cleaner and the turbocharger.

The retaining straps, two on each inlet pipe, must be tightened by hand to 2.5 ± 0.4 Nm.

Use torque screwdriver 588 179.



The illustration shows the retaining straps on a 12 litre engine

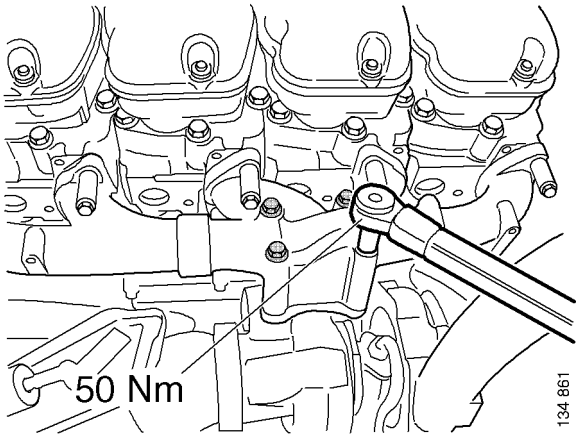
1-09 Turbocharger bracket

Retighten screws

Applies to 5 cyl. 9 litre engine

Note: The work must be carried out on a cold engine.

Retighten the screws in the turbocharger bracket to 50 Nm.



2 Cooling system

2-01 Coolant

Only the product Scania antifreeze and corrosion inhibitor, or other products tested to provide proper antifreeze and protection against corrosion for Scania, may be used in Scania engines. For the part number, refer to 00:03-09 Fuel, lubricants and fluids.

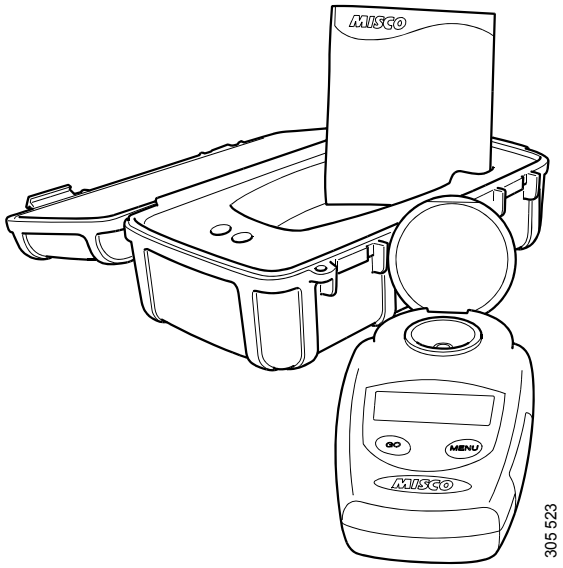
The antifreeze and corrosion inhibitors recommended by Scania are designed for Scania engines. Scania can largely control and influence the content of antifreeze and corrosion inhibitor with Scania part numbers.

WARNING!

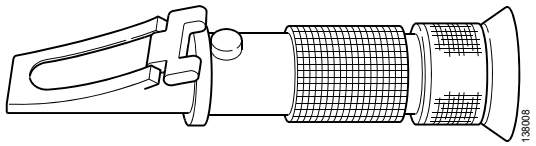
Hot coolant can cause burns. Ethylene glycol is highly dangerous if imbibed and can prove fatal. It has a toxic effect on the skin, particularly when the coolant is hot. Wear protective gloves.

Measure the content of ethylene glycol (antifreeze and corrosion inhibitor) with one of the following:

Part No.	Denomination
588 226	Refractometer
588 805	Refractometer



Refractometer 588 226



Refractometer 588 805

Antifreeze and corrosion inhibitor concentration table

35% by volume of antifreeze provides sufficient protection against corrosion.

Example:

1 The total volume of the cooling system is 40 litres.

2 The measured ethylene glycol concentration is 20% by volume (the freezing point is -9°C). According to the table, there are 8 litres of ethylene glycol in the cooling system.

3 The required ethylene glycol concentration is 35% by volume (freezing point -21°C). According to the table, 14 litres of ethylene glycol are required in the cooling system. Since there are already 8 litres in the cooling system, add 6 litres of ethylene glycol to the cooling system (14 - 8 = 6 litres).

Freezing point °C	**-21**	**-24**	**-30**	**-38**	**-45**	**-55**	**Cooling system volume in litres**
Ethylene glycol (% by vol.)	**35**	**40**	**45**	**50**	**55**	**60**	
Ethylene glycol (litres)	11	12	14	15	17	18	30
	13	14	16	18	20	21	35
	14	16	18	20	22	24	40
	16	18	21	23	25	27	45
	18	20	23	25	28	30	50
	20	22	25	28	31	33	55
	21	24	27	30	33	36	60
	23	26	30	33	36	39	65
	25	28	32	35	39	42	70
	27	30	34	38	42	45	75
	28	32	36	40	44	48	80
	30	34	39	43	47	51	85
	32	36	41	45	49	54	90
	34	38	43	48	53	57	95
	35	40	45	50	55	60	100
	37	42	48	53	58	63	105
	40	44	50	55	61	66	110
	41	46	52	58	64	69	115
	42	48	54	60	66	72	120
	44	50	57	63	69	75	125
	46	52	59	65	72	78	130

Topping up coolant

Note: Do not top up with water **only** .

Coolant must only be topped up with pre-mixed coolant. The pre-mixed coolant can either be concentrate mixed with pure freshwater or coolant ready mixed from the factory.

Note: The coolant must be changed if it is contaminated with oil or grease. The longest change interval is 4 years or 600,000 km.

2-02 Renewing the coolant filter

Tools

Filter tongs	587 025

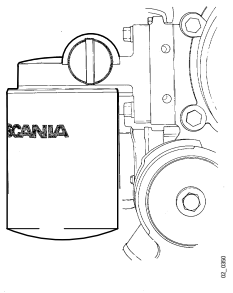
1 Close the drain tap and renew the coolant filter.

2 Open the drain tap.

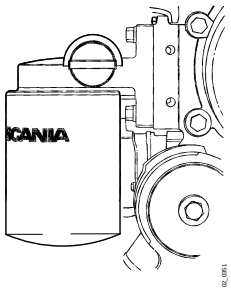
If the vehicle is fitted with a coolant filter, the filter must be renewed at every L inspection in order to uphold the functionality of the filter.

IMPORTANT! Scania coolant filters no longer contain corrosion inhibitor.

As of August 2000 the coolant filter has been discontinued and is therefore not fitted to vehicles manufactured after that date.



Drain tap open



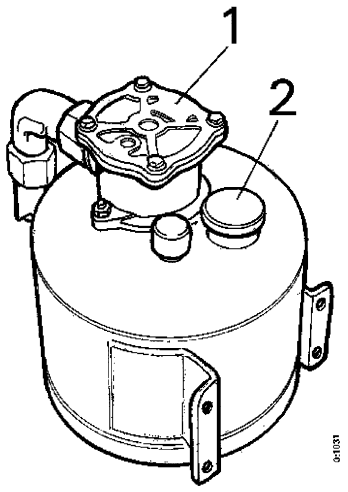
Drain tap closed

2-03 Hydraulic fan system

Oil grade: Oils, refer to booklet 00:03-09.

The cooling fan is driven by a hydraulic system. The hydraulic oil reservoir with filter and dipstick is located in the engine compartment.

Note: Observe the utmost cleanliness. The hydraulic system is extremely sensitive to dirt.



Hydraulic oil reservoir

1 Filter cover

2 Dipstick and filler cap

Oil level

The engine must be warm and switched off.

Check the oil level on the dipstick in the hydraulic oil reservoir. The level should be between the marks on the dipstick.

Renewing the filter

1 Remove the screws on the cover of the oil reservoir.

2 Remove the filter.

3 Fit a new filter and refit the cover.

4 Check the oil level.

Note: Before test driving, make sure the fan rotates at high speed when the engine is warm or at low speed when the engine is cold.

3 Fuel and exhaust systems

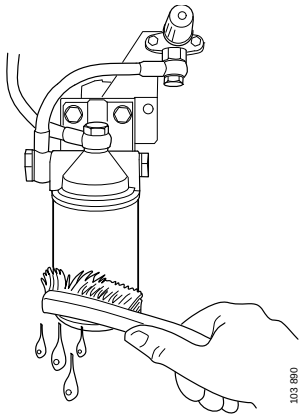
WARNING!

Diesel fuel is harmful to the skin and eyes. Wear protective gloves and goggles.

3-01 Renewing the fuel filter, bleeding

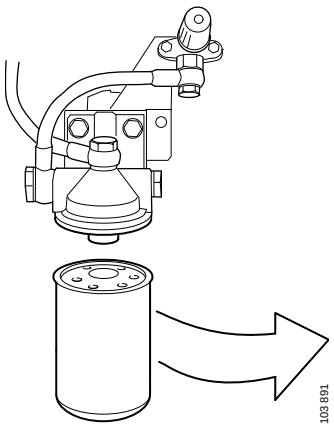
1 Place a suitable container under the engine.

2 Wash the filter and the filter retainer.

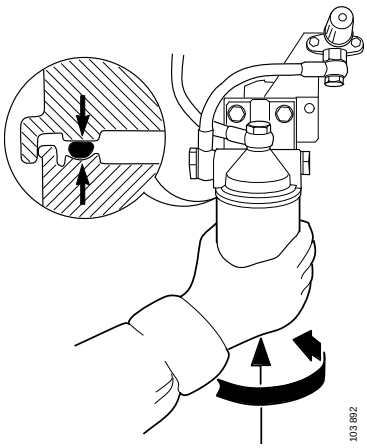


3 Unscrew the filter.

Use filter tongs, e.g. 587 025.



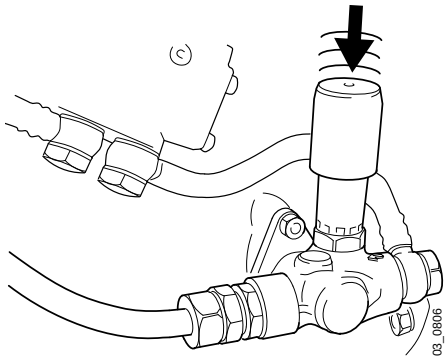
4 Lubricate the filter O-ring and screw the new filter into place by hand until the gasket comes into contact with the filter retainer. Tighten a further half turn. Bleed the fuel system as described below.



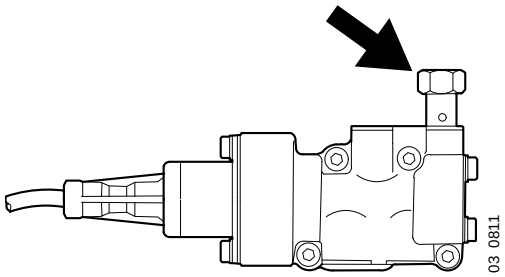
Engines with injection pump

Bleeding the in-line pump

1 Turn the starter key to the drive position. Undo the banjo screw on top of the fuel filter a few turns. Place a suitable container underneath. Pump with the hand pump until clean fuel runs out with no air bubbles. Tighten the banjo screw.

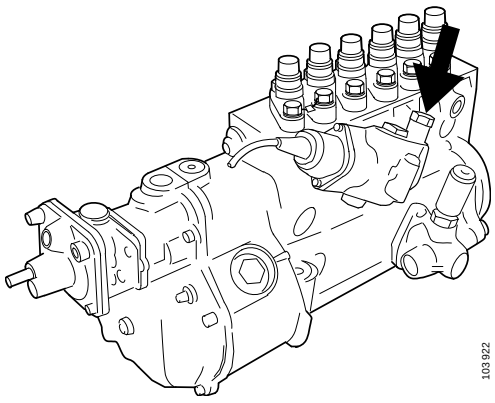


2 Undo the overflow valve (with a ball in the middle) on the fuel valve a few turns. Pump with the hand pump until the fuel running out of the open overflow valve is free of air bubbles.



3 Close the overflow valve. Keep pumping for a while. The air in the injection pump will then be pushed out through the overflow valve.

4 Start the engine and check for leaks.



Renewing the filter element on engines with PDE

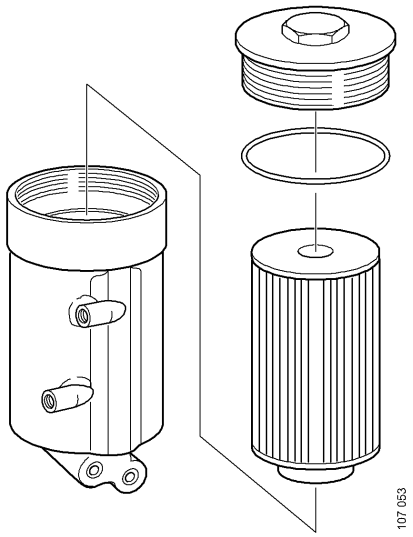
1 Open the bleed nipple on the fuel filter to release any remaining pressure.

2 Unscrew the filter cover with socket 588 475.

3 Connect a hose to the bottom valve on the filter housing and allow the oil to run out into a collecting container.

4 Wipe the fuel filter base clean.

5 Renew the O-ring in the cover. Lubricate the O-ring with O-ring grease 1 402 039.



IMPORTANT! Fit the filter element into the cover before placing it in the filter housing, otherwise the filter element may be damaged.

6 Fit the filter element and the cover in the filter housing and tighten the cover to 25 Nm ± 5 Nm. Bleed the fuel system as described below.

Bleeding DC11 and DC12 engines with PDE

1 Attach a clear plastic hose to the bleed nipple at the front of the fuel manifold.

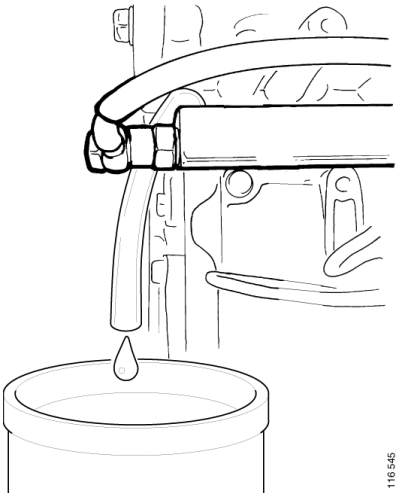
2 Open the bleed nipple and pump with the hand pump until fuel comes out of the hose.

- If the system is completely empty, approximately 250 strokes are required.
- After renewing the fuel filter, approximately 170 strokes are required.
- Approximately 150 strokes are required to bleed the fuel manifold.

3 Pump an additional 20 strokes to remove the air.

4 Close the bleed nipple and remove the hose. Pump with the hand pump until the overflow valve opens, approximately 20 strokes.

5 Start the engine and check for leaks.



Bleeding 9 litre engines, (5 cyl) with PDE

1 Attach a clear plastic hose to the bleed nipple on the fuel filter housing.

2 Open the bleed nipple and pump with the hand pump until fuel comes out of the hose. When the fuel system is empty, approximately 100 pump strokes will be needed to draw fuel up to the bleed nipple.

3 Pump until fuel without air bubbles comes out, approximately 20 strokes.

4 Close the bleed nipple and remove the hose.

5 Transfer the plastic hose to the fuel manifold bleed nipple.

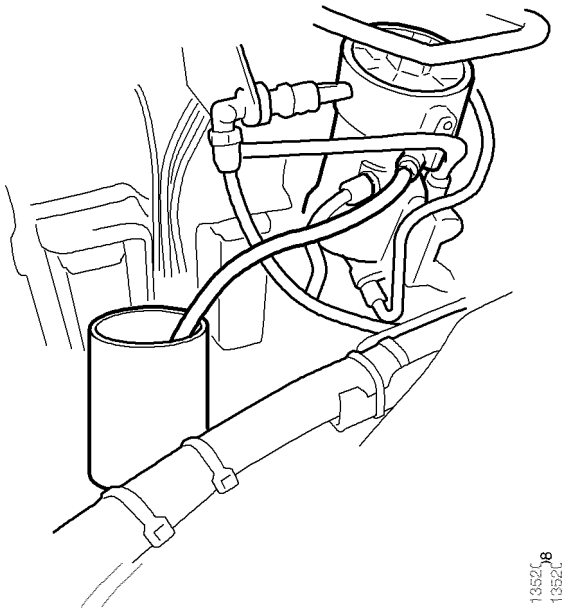
6 Open the fuel manifold ventilating valve.

7 Pump using the hand pump until fuel without air bubbles comes out, approximately 50 strokes.

8 Close the bleed nipple on the fuel manifold and remove the plastic hose.

9 Pump approximately 20 strokes with the hand pump until the overflow valve opens. A hissing sound should be heard.

10 Start the engine. The engine should be easy to start.



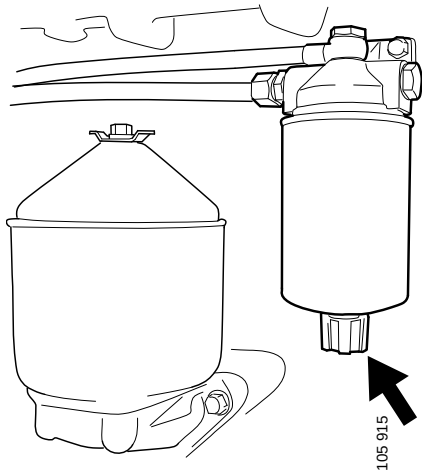
3-02 Water separating fuel filter

IMPORTANT! Help protect our environment! Avoid spillage. Use a suitable container.

A water separating fuel filter is available as an accessory. It can be used instead of the usual type of fuel filter.

The same renewal intervals as for ordinary fuel filters apply.

Drain at every inspection.



Drain valve

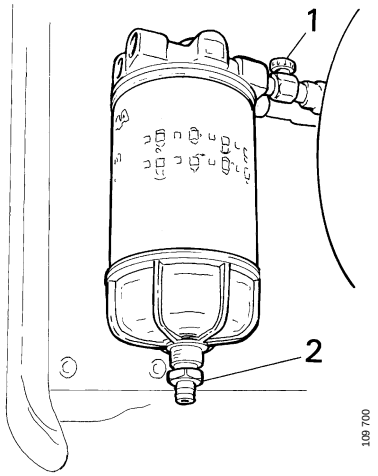
Additional water separating fuel filter

Some vehicles are equipped with an additional water separating fuel filter attached to the chassis.

Note: Close the shut-off cock when renewing the filter.

The same renewal intervals as for ordinary fuel filters apply.

Drain at every inspection.

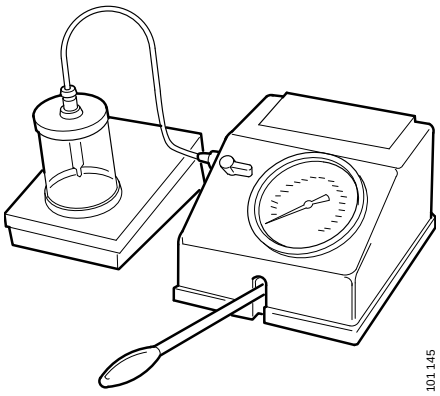


1 Shut-off cock
2 Drain valve

3-03 Ethanol engines

IMPORTANT! Read all the texts in Regulations for ethanol vehicles in 00:01-02 Safety and fire protection in service workshops.

Cleaning and pressure testing injectors



Remove the injectors from the engine. Check the opening pressure with a Scania approved injector tester, e.g. 587 635.

If the opening pressure is out of tolerance, reset the injector to nominal value, refer to Workshop Manual main group 3.

If the nozzle is blocked, clean it using ultrasonic washing or a cleaning needle.

Checking the injection pump

Because of the chemical properties of ethanol and lubricating oil, there is a risk that deposits will be formed around the pump elements. This may cause impaired idling properties and/or reduced engine output. The following checks must be carried out to determine whether the injection pump requires servicing:

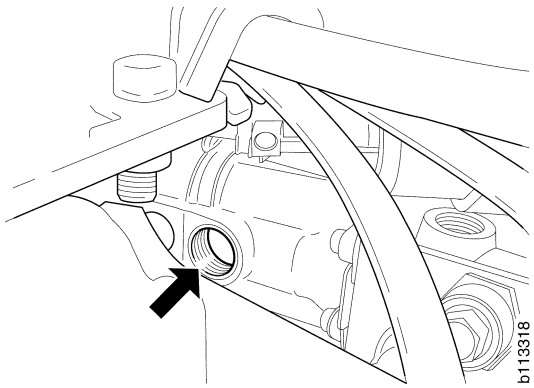
1 Run the engine until the engine temperature reaches at least 40°C.

2 Switch off the engine.

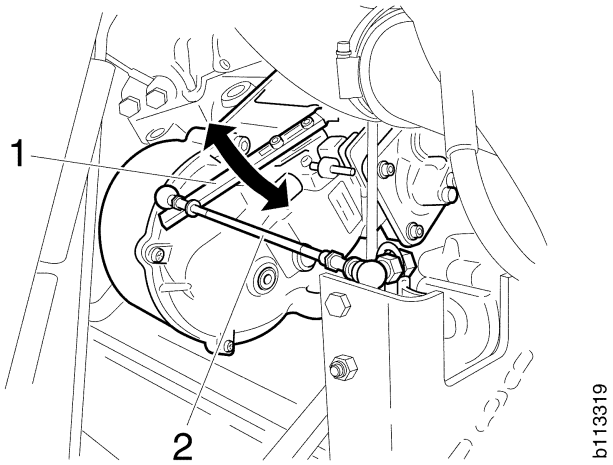
3 Clean the area around the internal hexagon plug on the top of the governor housing.

4 Remove the internal hexagon plug on the top of the governor housing. A fork link can be felt through the hole between the governor and the control rack.

5 Release the control lever (1) from the electric throttle linkage/throttle cable (2).



6 Move the control lever (1) back and forth from idling position to wide open throttle position. Use your finger to feel that the fork link is moving. You can feel that the control rack is moving from its end positions with some time delay in the governor springs. There is no direct connection or immediate movement. Repeat at least three times. Only if the fork link is not moving should the pump be sent to an authorised Bosch workshop for service. If the fork link moves freely, refit the control lever and the internal hexagon plug.



3-04 Gas engines

WARNING!

Beware of the risk of fire. Make sure there are no glowing embers, sparks, naked flames or similar in the vicinity when working on the gas system.

IMPORTANT! All work on the gas system must be carried out in compliance with the specific regulations of the country in question concerning gas and the handling of gas equipment.

Gas system, leak test

Check for leaks in the gas system after each repair or adjustment during which a part of the gas system has been dismantled.

Make sure that all valves are open. Check for leaks using Scania leakage spray 584 018 or soapy water. Any leaks will appear as bubbles.

Renewing the spark plugs

IMPORTANT! Close the main tap before all engine repairs and empty the gas system by leaving the engine idling until it stops.

Spark plugs and spark plug gaps

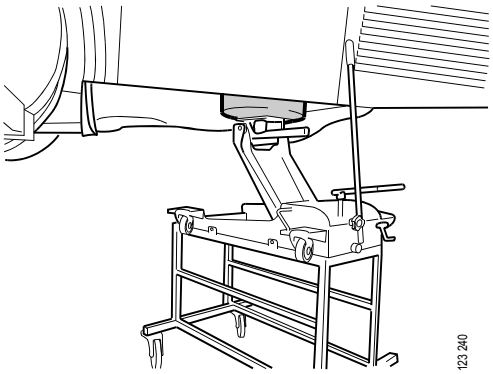
Type	Champion RN 79G (spark gap 0.38 mm, 0.015")
Spark plug gap	0.35-0.5 mm
Tightening torque	35-40 Nm

Checking the lambda

Refer to Workshop Manual 01:02-04, main group 1, for checking the lambda.

3-05 Scania particle filter

Cleaning the filter unit



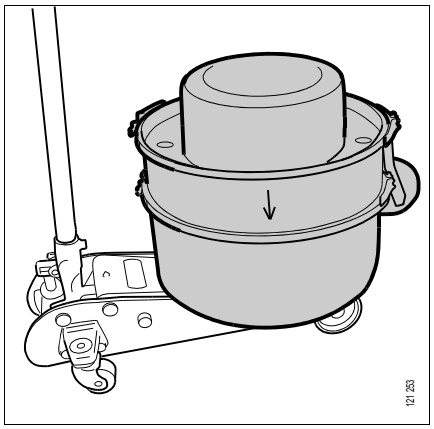
IMPORTANT! Handle the filter unit with care. The filter unit consists of ceramic material and is impact and shock sensitive.

1 Raise the bus with wheel lifts, or raise it in another way to reach the particulate filter. Lift the bus at least 35 cm. Open the side cover on the body (if applicable).

2 Place a component hoist with large platform underneath the particulate filter.

3 Remove the exhaust pipe V-clamp and undo the outlet pipe.

4 Mark the direction in which the filter is installed.



Note: The filter unit should be turned 180 degrees when fitted.

WARNING!

A face mask and protective goggles must be worn when cleaning the particulate filter.

5 Remove the upper V-clamp holding the filter unit in place.

6 Lower and remove the lower part. Remove the lower V-clamp and the exhaust pipe bracket screws.

7 Check for traces of soot (dots or lines) on the outlet side of the filter unit. If this is the case, the filter unit probably is damaged and must be renewed.

8 Clean the filter unit as follows:

9 Carefully shake the filter unit to remove all loose ash deposits from the filter unit cells.

10 Using an industrial vacuum cleaner, remove all ash deposits and soot from visible surfaces both on the catalytic converter and the filter unit.

11 Inspect the surfaces on the catalytic converter and filter unit to check for:

- Cracks in the surface or pitting.

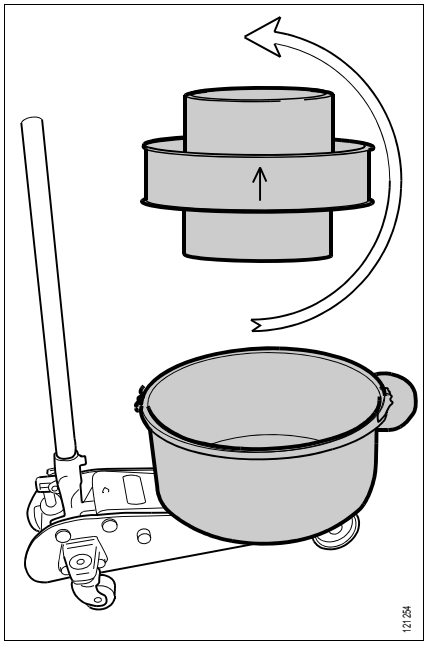
- That the ceramic filter is firmly seated in the outer container.

12 If no defects can be found on the filter unit, turn it 180 degrees and fit. See illustration.

13 Refit the filter unit on the bus in reverse order.

14 Connect an extractor to the exhaust pipe. Start the engine and rev it a couple of times.

Discarded particulate filters and filter units, and ash deposits and soot from the filter must be disposed of according to local regulations.

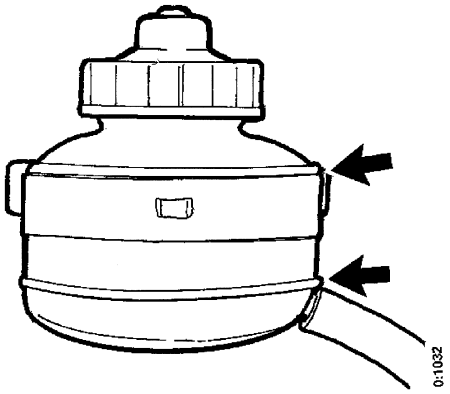


4 Clutch

4-01 Fluid level in clutch control

Fluid grade: Refer to booklet 00:03-09.

Check that the fluid level is between the marks on the reservoir.



The fluid reservoir is normally located in front of the driver area. The bus bodybuilder may, however, place it somewhere else. Refer therefore to the bus bodybuilder's instructions.

WARNING!

The fluid is toxic if swallowed. Avoid contact with the skin. Wear protective gloves and goggles.

4-02 Changing clutch fluid

Change the clutch fluid by bleeding the clutch hydraulic system. The work description below is for vehicles with a bleed nipple.

For vehicles without a bleed nipple and for bleeding without filling equipment, refer to Workshop Manual main group 04, Clutch and clutch control, function and work descriptions.

Bleeding using filling equipment 587 949

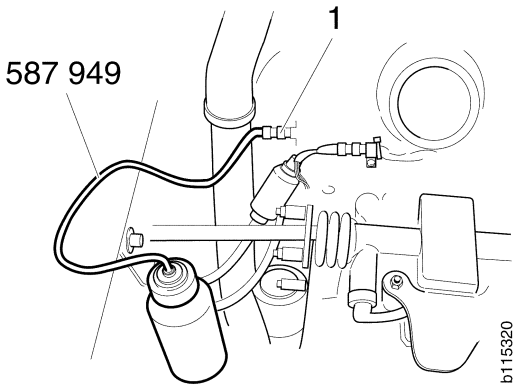
WARNING!

Wear protective goggles. Hydraulic fluid is corrosive and can cause permanent eye damage.

IMPORTANT! Use new hydraulic fluid of the type SAE J 1703 D.O.T: 3-4 Brake Fluid.

1 Fill the reservoir of the filling equipment with hydraulic fluid. The reservoir volume is 5 litres.

2 Connect the filling equipment and connect a supply of compressed air.



1 Bleed nipple

3 Fill and bleed the hydraulic system by opening the bleed nipple on the gearbox. Repeat the bleeding until all the air has been removed and only pure hydraulic fluid flows from the bleed nipple. The hydraulic system volume is approximately 0.5 litres.

IMPORTANT! Make sure that the hydraulic fluid reservoir does not become empty during bleeding.

4-03 Checking clutch wear

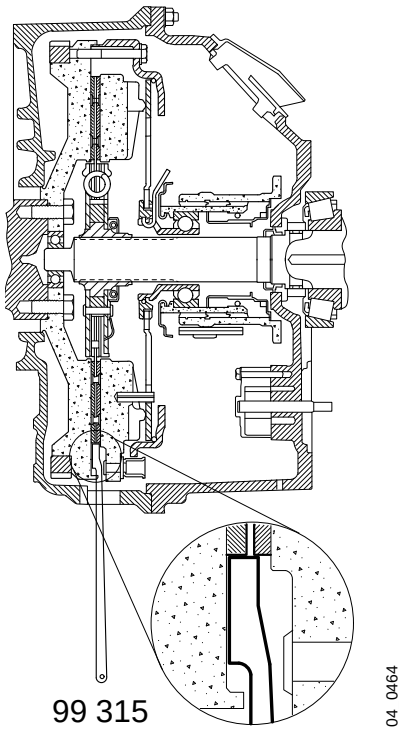
Use gauge 99 315, which indicates the minimum dimension of the clutch lining.

New disc: 10 mm. Worn disc: 7 mm.

1 Remove the noise shield.

2 Remove the protective casing over the inspection opening on the bottom of the flywheel housing. Fit the gauge 99 315 and make sure the lining is more than 7 mm thick.

It may be difficult to reach the disc with the gauge in some cases. If so, turn the crankshaft using turning tool 99 309.



5 Gearbox

5-01 Oil change and filter renewal in manual gearbox

Oil grade: Oils, refer to booklet 00:03-09.

1 Remove the noise shield.

2 Place a suitable container under the gearbox.

WARNING!

Beware of hot oil! Wear protective gloves and goggles.

3 Remove the drain and level plugs. Drain the oil when it is warm.

4 Clean the magnet on the plugs.

5 Unscrew the filter.

Note: Make sure that the old gasket has also been removed.

6 Lubricate the rubber gasket for the new filter with oil.

7 Screw on the filter by hand until the gasket rests against the gearbox housing. Tighten the filter a further half turn by hand.

8 Refit the drain plug and torque tighten to 50 Nm G701 and others to 100 Nm, top up with oil in the level hole.

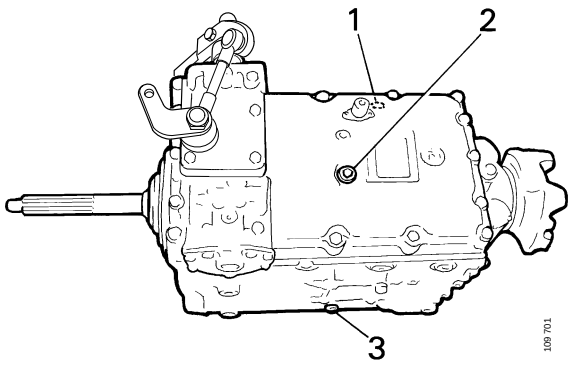
9 Refit the level plug and torque tighten to 50 Nm G701 and others to 100 Nm.

Oil volumes

Gearbox with oil volumes

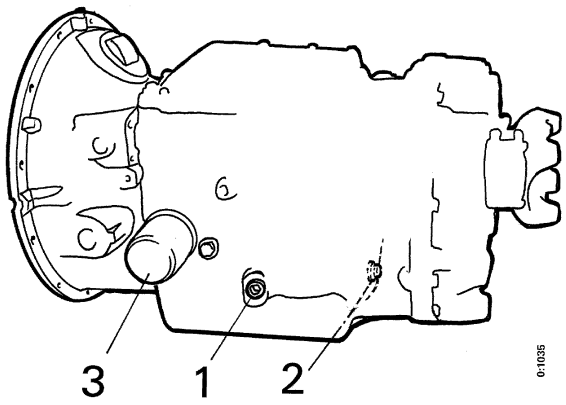
GR801	approx. 9.0 litres
GR801R	approx. 10.0 litres
G701	approx. 13.0 litres

Note: All volumes are approximate. Check the oil level, top up as and when necessary (the correct level is no lower than 5 mm below the level hole).



G701

1 *Filling (through cover in floor)*
2 *Level plug*
3 *Drain plug*



GR801

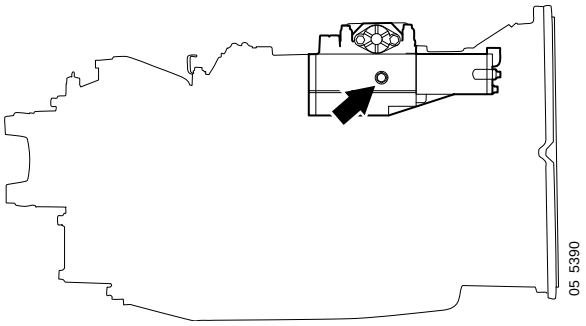
1 *Level plug*
2 *Drain plug*
3 *Filter*

5-02 Oil level, Opticruise/CS

Oil level in longitudinal stroke cylinder

Remove the level plug and make sure the oil reaches up to the level hole.

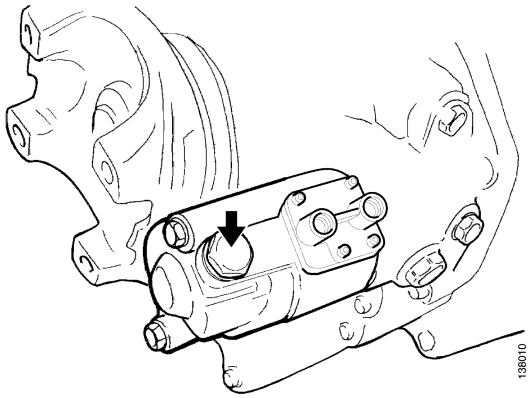
Top up with automatic transmission fluid if necessary.



Oil level - damping cylinder

Remove the level plug and make sure the oil reaches up to the level hole.

Top up with automatic transmission fluid if necessary.



5-03 Checking oil level, ZF automatic gearbox

Both too high and too low an oil level can damage the gearbox. If the oil level is too low, the discs in the clutches will start to slip and then they will rapidly be worn out. If the oil level is too high, it will froth and overheat.

Methods of checking

The oil level in the gearbox must be checked at least once a week. The check can be carried under three different conditions:

1 At operating temperature and with the engine idling (oil temperature 80-90°C).

2 When the oil is cold and the engine idling (oil temperature 20-30°C).

3 The level will be higher with the engine turned off than when it is running as the oil pump is not operating. This can be used as a rough check after a long stationary period or after changing oil to make sure there is oil in the gearbox so that the engine can be started without any risk.

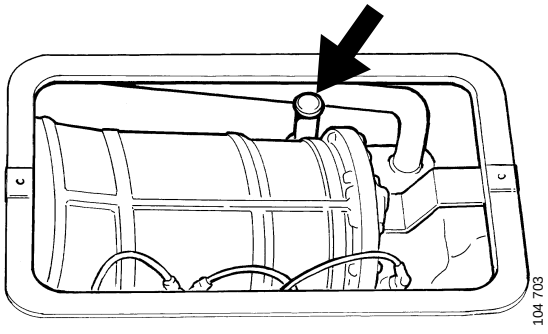
When checking the oil level at operating temperature, the bus should first be driven for approx 30 minutes, repeatedly changing gear up and down. The gearbox will then have attained operating temperature even when the outdoor temperature is well below 0°C.

IMPORTANT! It is the oil level at operating temperature that applies. If the oil level is checked with the oil cold, e.g. after a long stationary period or after changing oil, a final check must be made at operating temperature. The oil level can only be correctly checked at operating temperature.

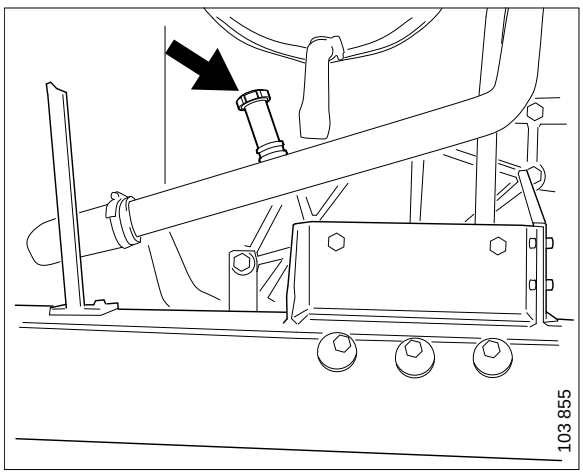
Dipstick

The dipstick is in the oil filler pipe. To access the oil filler, open the rear hatch or remove the hatch in the floor, depending on the type of bus.

IMPORTANT! Observe strict cleanliness. The gearbox is very sensitive to contaminants. Clean the dipstick and the area around it.



Dipstick location on K/L buses



Dipstick location on N buses

Always check the oil level under the following basic conditions:

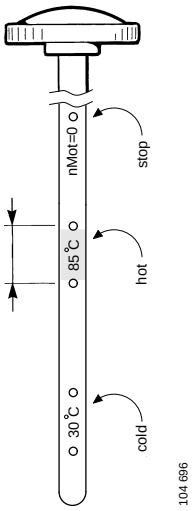
- The bus must be on a level surface.
- The parking brake must be applied.

Checking at operating temperature

- Oil temperature 80-90°C.
- The engine must be idling.
- The drive mode selector must be in position N.

The oil level must be between the two upper marks, "hot" and "85°C". The oil level should be close to the top mark after filling.

Top up or drain off oil as necessary. 1 litre of oil corresponds to approx. 10 mm on the dipstick.



Checking with cold oil

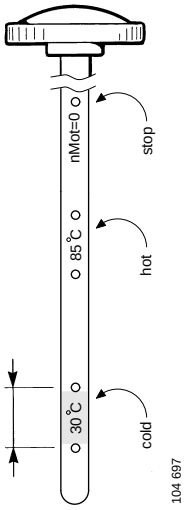
- Oil temperature 20-30°C.
- The drive mode selector must be in position N.

Start the engine and run it at idling speed for 3-5 minutes.

The oil level must be between the two lower marks, "cold" or "30°C".

If the oil does not reach up to the bottom mark, the oil must be topped up immediately.

Check the oil level at operating temperature as described above.



5-04 Oil change and filter renewal in ZF automatic gearbox

Oil grade: Oils, refer to booklet 00:03-09.

Note: Do not mix different grades of oil. The filter must be renewed at every oil change. Change the oil whilst at operating temperature.

IMPORTANT! Observe strict cleanliness. The gearbox is very sensitive to contaminants.

Warm oil runs faster and it will be possible to remove more of it from the gearbox.

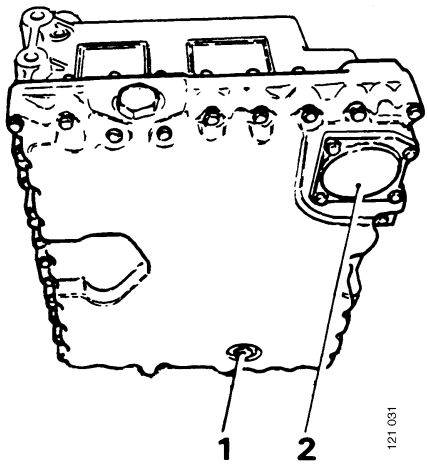
1 Place a suitable container underneath. Clean around the drain plug and the filter cover.

WARNING!

Beware of hot oil. Wear protective gloves and goggles.

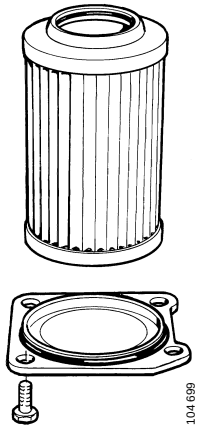
2 Unscrew the oil plug, making sure the copper washer is also removed.

Let the oil run out.

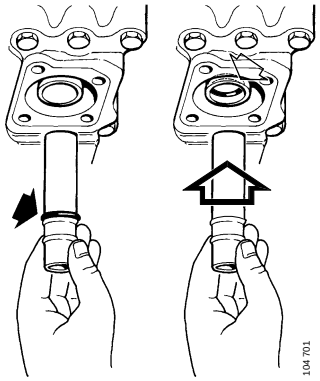


1 Oil plug
2 Oil filter cover

3 Remove the cover. Remove the old filter and discard it.



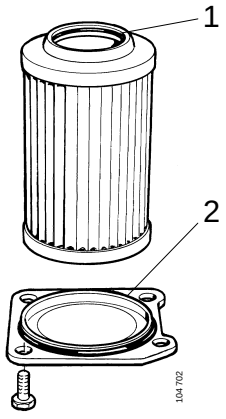
4 If the suction pipe comes out with the filter, the O-ring on the suction pipe must be discarded. If this occurs, fit a new O-ring in the seat in the gearbox and then refit the suction pipe.



5 Make sure the O ring on the new filter is in place and not damaged. Make sure the contact surfaces are clean and not damaged. Apply a little automatic transmission fluid to the O-ring. Fit the filter.

6 Renew the O-ring in the cover. Fit the cover and tighten the screws to 23 Nm.

7 Put a new copper washer on the oil plug and fit the plug. Tightening torque 50 Nm.

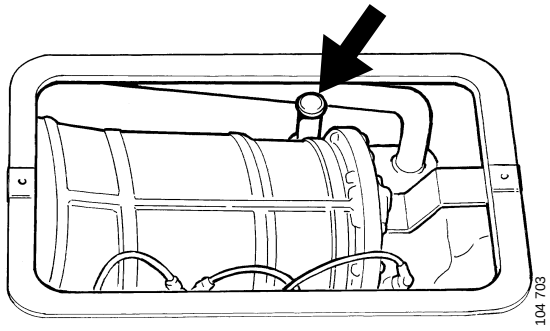


1 Filter O-ring
2 Cover O-ring

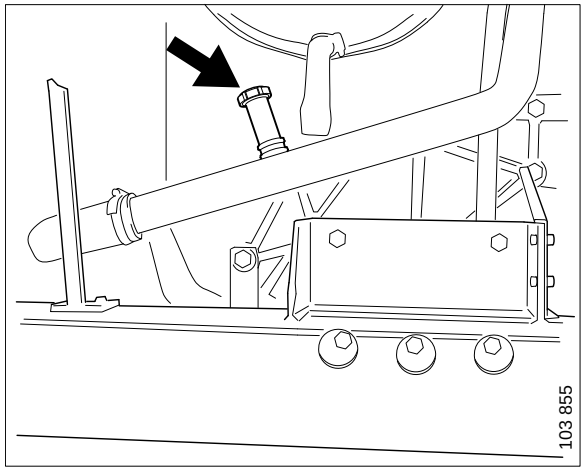
IMPORTANT! Observe strict cleanliness. The gearbox is very sensitive to contaminants.

8 Remove the cover in the floor over the gearbox on K/L buses. Open the rear cover on CN buses. Clean the dipstick and the area around it.

Oil volume **approx. 15 litres**

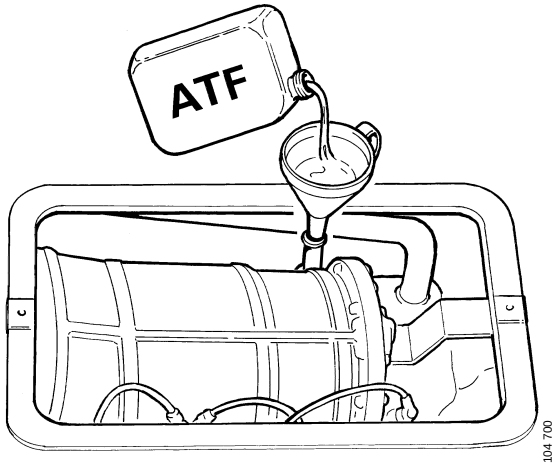


Dipstick location on K/L buses



Dipstick location on N buses

9 Remove the dipstick and pour in **max. 10 litres** of automatic transmission fluid.



10 Start the engine and run it at idling speed. Immediately start to slowly pour in approx. 4 litres of automatic transmission fluid.

11 Check the oil level with cold oil as described in Checking with cold oil.

12 Drive the bus until the gearbox has attained operating temperature and check the oil level at operating temperature as described in Checking at operating temperature.

5-05 Checking load sensor, ZF automatic gearbox

Requires two persons:

- The engine must be switched off.
- The parking brake must be applied.
- Turn off the main power switch.

WARNING!

Turn off the main power switch or there will be risk of an electric shock as the load sensor is located close to the electrical connections on the starter motor.

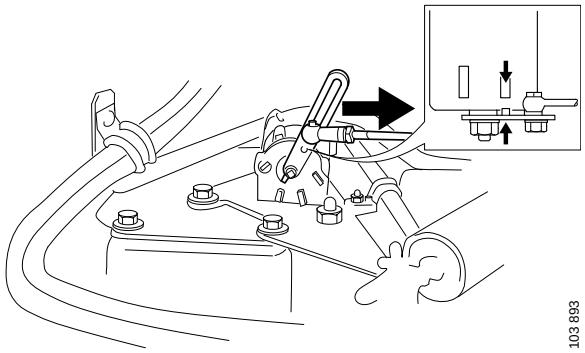
1 Remove the cover in the floor over the injection pump.

2 Feel with your fingers to check that the mark on the back of the load sensor arm is aligned with the idling mark on the housing.

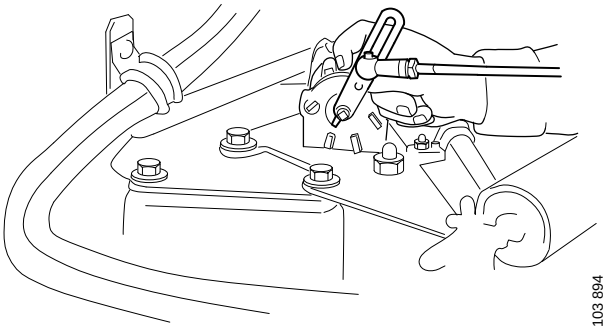
3 Press the pump lever arm towards the full throttle stop and hold it there.

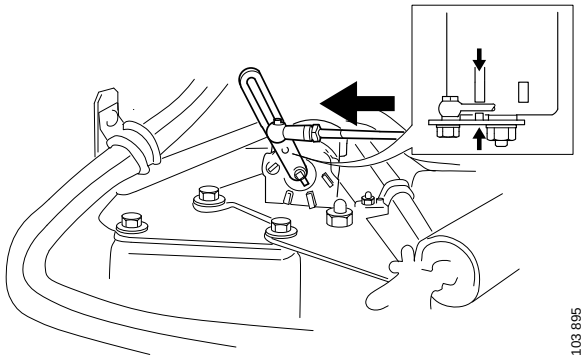
Alternatively, ask a colleague to press the accelerator pedal to full throttle position, but not to kick-down, and keep it there.

4 Check that the mark on the lever arm is aligned with the full throttle mark on the housing.



Load sensor idling mark





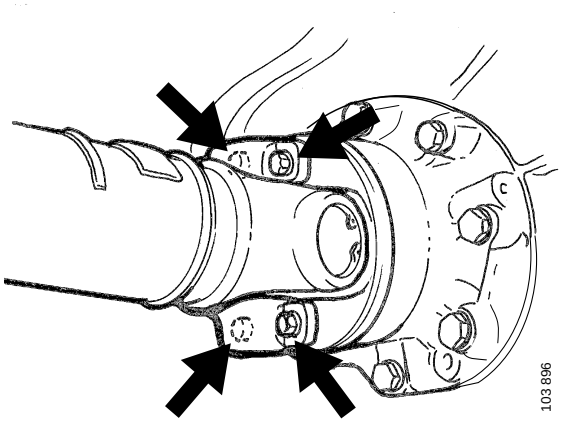
Load sensor full load mark

6 Propeller shafts

6-01 Checking the propeller shaft

1 Check that the propeller shaft is not damaged.

2 Check that there is no play in the universal joints.



3 Check-tighten the bearing cap screws.

Tightening torques

Bearing cap screws		
K, L, F	P 400	105 Nm
N		120 Nm

7 Front axles

7-01 Checking steering axles

- It is important that approved axle stands are used and that they are standing securely when working on the front axle.
- The air bellows must be empty when working underneath vehicles with air suspension.
- Make sure the dust cover, track rod, track rod arm, draglink and draglink arm are not damaged.

Kingpin bearings

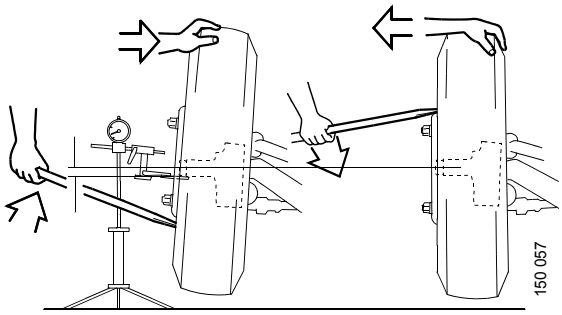
1 Raise the front vehicle unit and place on axle stands under the front axle

2 Remove the hub cap from the wheel bearings.

3 Apply the brakes to prevent play in the wheel bearings from affecting the measurement.

4 Measure the vertical play at the outer tip of the stub axle while moving the wheel sideways. Use a dial gauge.

Note: Move the wheel smoothly so that the position of entire front vehicle unit is not disturbed.



Radial play in kingpin bearing
A max = 1.0 mm
Indicator stand 587 571

Ball joint

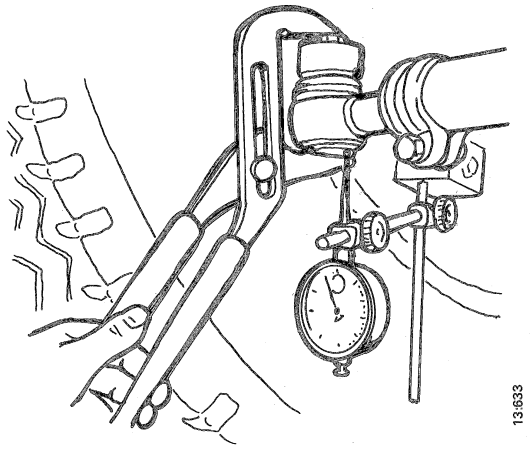
1 Lower the front wheels into the straight-ahead position.

2 Place a dial gauge in line with the ball joint pin.

3 Clamp the ball joint with water pump pliers and read off the play.

4 Repeat the measurement on the other ball joints.

Note: If the play is greater than 2.0 mm, the ball joint must be renewed.



Play in ball joint
max. 2.0 mm

8 Rear axles

8-01 Changing oil in axle gear

Oil grade: Oils, refer to booklet 00:03-09.

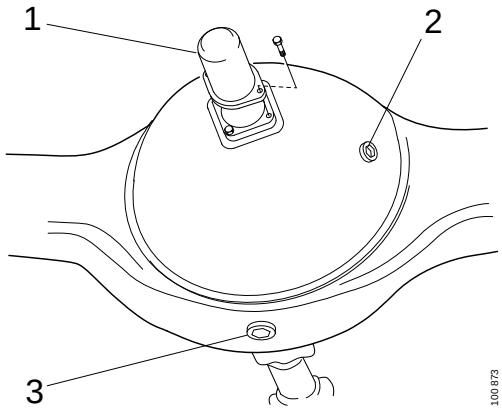
In extremely demanding conditions, we recommend SAE 75W-140 synthetic oil.

The oil should be changed and the filter renewed while the axle gear is warm. Warm oil runs faster.

WARNING!

Beware of hot oil! Wear protective gloves and goggles.

- Place a suitable container underneath. Clean around the drain plug (and the oil filter).
- Drain the oil.
- Clean the magnet on the plugs.



1 Oil filter with protective casing
2 Level plug
3 Drain plug

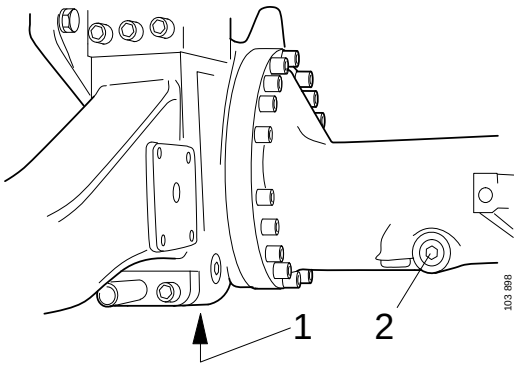
- Remove the filter and, if applicable, the protective casing.
- Lubricate the rubber gasket for the new filter with oil.
- Screw on the filter by hand until the gasket rests against the housing. Tighten the filter a further half turn by hand. Refit the protective casing.
- Refit the drain plug and torque tighten RD760 to 70 Nm and others to 100 Nm; top up with oil in the level hole.
- Refit the level plug and torque tighten RD760 to 70 Nm and others to 100 Nm.

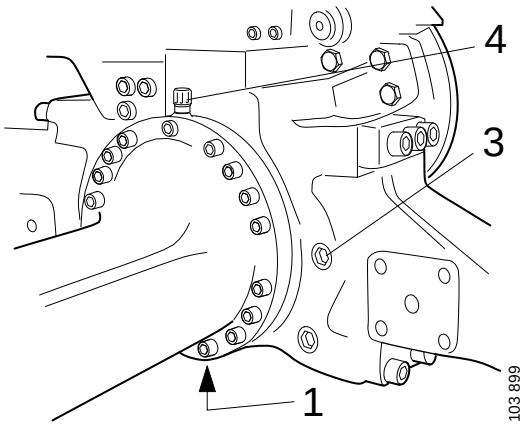
Oil volume

R 660[a]	12.5 litres
R780	12.5 litres
RD 760	19.5 litres

a. An additional 1.0 litre is required for the filter.

Note: All volumes are approximate. Check oil level and top up as necessary.





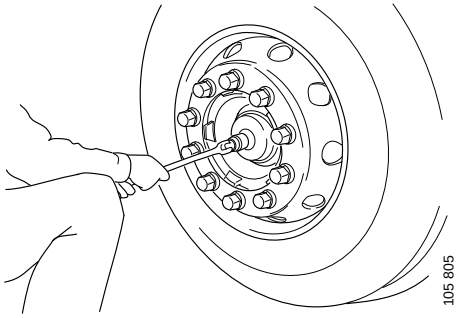
1 and 2 Drain plug
3 Level plug
4 Ventilation

9 Hubs and wheels

9-01 Checking front wheel bearings

1 Raise the front vehicle unit and set on axle stands under the front axle. Release the parking brake.

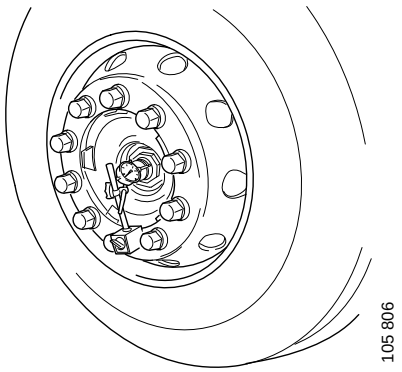
2 Rotate the wheels with a wheel spinner. Listen for any noise from the bearings. A ticking sound may be heard if the wheel is rotated by hand.



3 Unscrew the plug from the centre hole of the hub cap and screw in a 50 mm long fully threaded M20 screw. Screw in the screw until the cover comes off.

4 Examine for any sign of grease leakage.

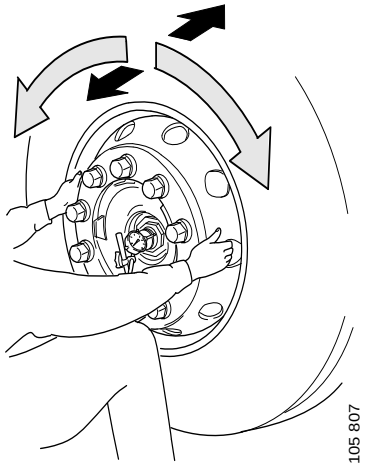
5 Position dial gauge 98 075 and magnetic stand 587 250 as illustrated. The tip of the dial gauge must be in the same direction as the shaft journal.



6 Press and turn the hub by hand simultaneously until the wheel bearings fit. Zero the dial gauge.

7 Pull out and turn the hub simultaneously. Read the bearing play. Measure several times and work out an average value.

8 If the play is greater than 0.2 mm the bearing should be renewed.



Permitted axial clearance

Front axle	0.2 mm

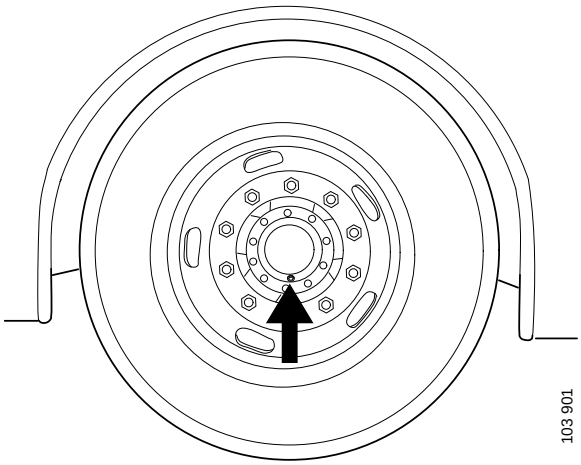
9-02 Changing oil in the hub

1 Park the bus on a flat surface.

2 Place a suitable container underneath.

3 Clean the hub cover.

4 Turn the hub so that the plug is at the bottom. See illustration.

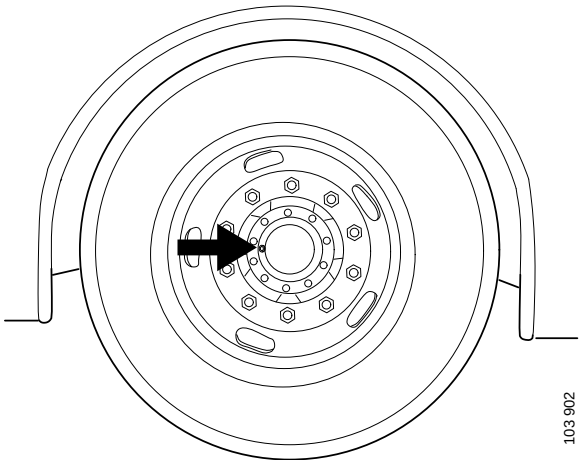


Draining

5 Remove the plug and drain the oil when it is warm.

6 Clean the plug.

7 Rotate the hub so that the hole in the cover is in the horizontal position See illustration.



Filling

8 Fill with oil up to the hole.

9 Refit the plug.

Oil volume is approx. 0.7 litres

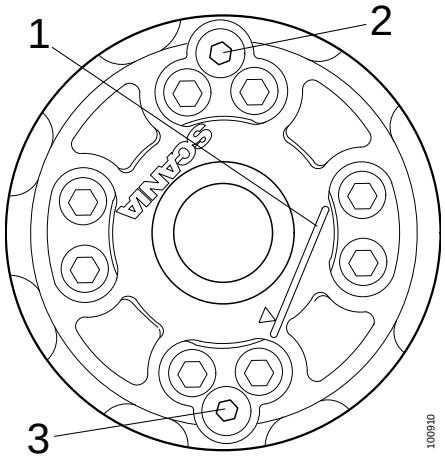
Oil change RH 832

Oil grade: Oils, refer to booklet 00:03-09.

1 Place a container under the hub reduction gear.

2 Clean the hub cover.

3 Rotate the hub until the drain plug points straight down. Refer to the draining illustration.



1 Marking line
2 Filler plug
3 Drain plug

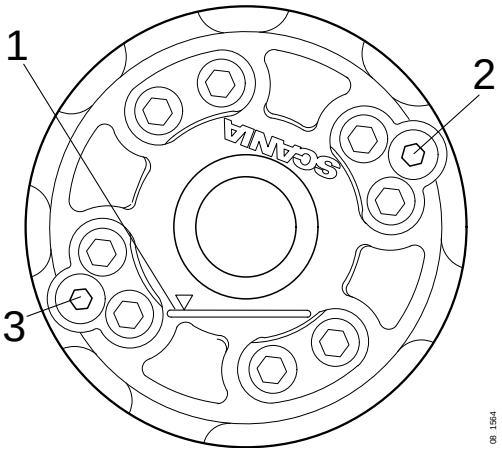
4 Remove the filling and drain plugs and drain the oil.

5 Turn the hub until the marking line on the cover is in a horizontal position. Refer to the filling illustration.

6 Fill oil through the upper hole until oil runs out of the lower hole.

7 Fit the filling and drain plugs. Tightening torque 10 Nm.

Oil volume	**Litres**
RH 832	2.0



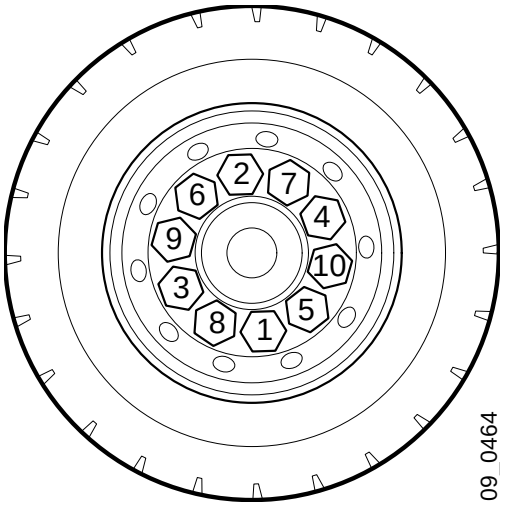
1 Marking line
2 Upper hole
3 Lower hole

9-03 Check-tightening wheel nuts

1 Use a torque wrench or impact nut runner that provides a torque of 1,500-2,700 Nm using torque socket 98 661 when tightening wheels with steel disc rims.

2 Use a torque wrench when tightening aluminium disc rims.

3 Tighten the nuts in the sequence shown in the figures.



Disc wheel

Special tools

Torque socket	98 661

Tightening torques

Disc rim, steel	600 Nm
Disc rim, aluminium	600 Nm

9-04 Checking tyres

1 Check that tyre wear is even and evenly distributed across the whole tread.

2 Check tread depth: Must not be below 3 mm if the tyres are to be retreaded. The minimum safe tread depth is 3.0 mm. The tread wear indicator is at 1.6 mm.

Note: Refer to tread depth regulations. This can vary between markets.

3 Check the tyre pressure. Refer to the Operator's Manual or the tyre manufacturer's instructions. All applicable legal requirements and regulations are to be complied with.

9-05 Wheel alignment

(Applies to buses with externally built bodies)

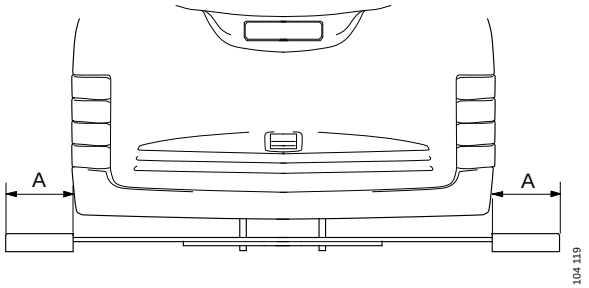
Check wheel alignment on all axles.

Note: The air spring height must be checked and adjusted if necessary **before** checking wheel and axle alignment. See chapter 12.

Hang the straight edges on the frame of buses with frames, on other buses hang them or fasten them to the bus body.

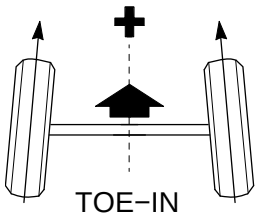
Centring

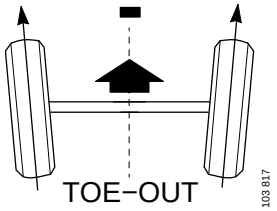
It is essential that the measuring scales are centred on the bus centre line. This can be checked by measuring and adjusting the distance between the scale and the side of the body.



Settings for wheels and axles

Wheel angles change when a steering axle is loaded. The wheels will go towards toe-in as the load increases.



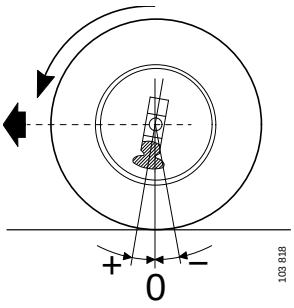


At kerb weight, the front axle weight of K, L, N buses is approx. 3,500-4,000 kg and of F buses approx. 4,500-5,000 kg.

The following settings apply at bus kerb weight:

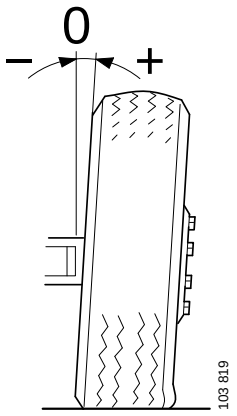
Toe-in measured with laser

AM920	+2.0 ± 1.0 mm/m
AM/AMA/ARA860	+1.0 ± 1.0 mm/m
AMA780	+1.0 ± 0.5 mm/m
AMI 700	+4.0 ± 1.0 mm/m



Caster

Rigid axle	+2 ± 0.5°
AMI 700	+3 ± 0.25°
ARA 860	+2 ± 0.5°



Camber

AM920	+0.5 ± 0.4°
AM/AMA/ARA860	+0.4 ± 0.4°
AMA780	+0.3 ± 0.4°
AMI 700	-0.6 ± 0.3°

Rear axle and centre axle

Permitted deviation in rolling direction: max 2.0 mm/m

Tag axle

Permitted deviation in relation to driving axle: max 1.5 mm/m

Rear-steer axle

Permitted deviation in relation to driving axle: max 1.5 mm/m