Engines with few hours of operation

IMPORTANT!

On engines with few hours of operation, inspection must be carried out annually or every 5 years.

Stand-by generator sets and the like that are not used regularly should be test run and checked in accordance with the manufacturer's instructions.

The following inspection points must be carried out once the engine has been warmed up to operating temperature.

1. Checking the oil level.
2. Checking the coolant level.
3. Checking the vacuum indicator.
4. Checking the fuel level.
5. Checking for engine leaks.

Cleaning the engine

The engine must be cleaned before starting work.

Clean the engine with hot water. Also use a degreasing agent, if necessary.

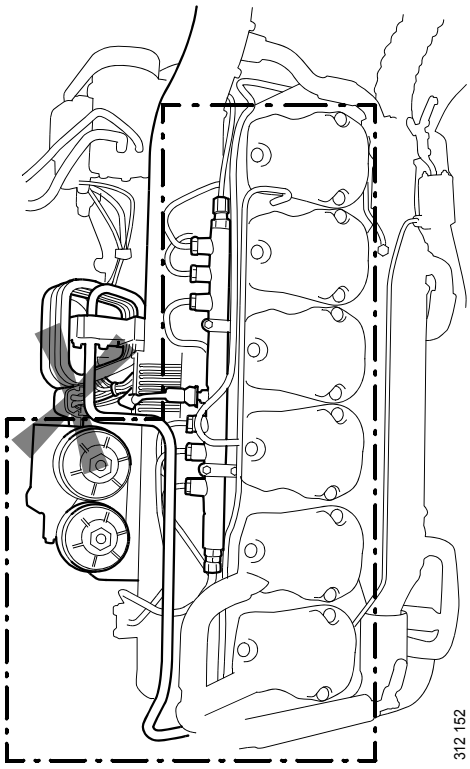
Avoid spraying water on the engine control unit, see illustration.

WARNING!

Beware of hot water! Use suitable protective equipment.

Environment

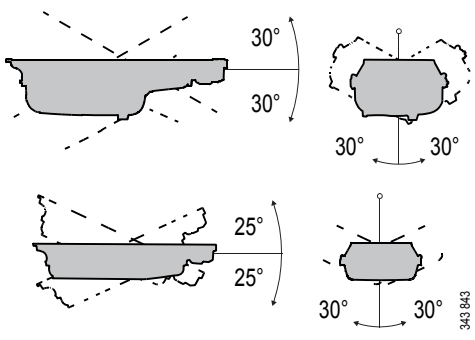
The washing water must be disposed of in compliance with the relevant national and international regulations.



Clean within the marked area

Maximum angles of inclination during operation

Maximum permissible angles during operation vary, depending on the type of oil sump; see illustration.



Labels for top-up engine oil grade

When changing oil it is important to use the correct engine oil grade.

The oil filler cap must be clearly marked with a label showing the top-up oil grade.

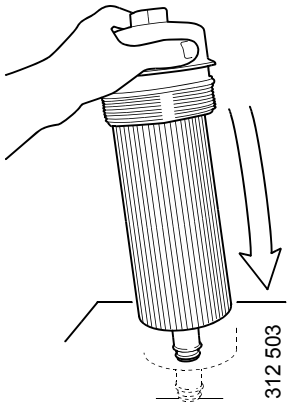
If the label is missing or the engine oil grade is changed, a new label must be fitted.

The illustration shows the label for oil grade Scania LDF-2.

Parts

Oil grade	Colour	Part No.
Scania LDF-2	Blue	2 132 424
Scania LDF-3	Red	2 132 426
Scania LDF	Grey	2 269 345
ACEA E7	White	2 132 425

Renewing the oil filter



IMPORTANT!

Clean the centrifugal oil cleaner when renewing the oil filter.

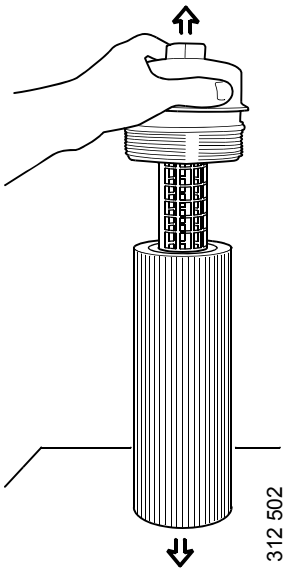
Otherwise, the oil filter will be blocked and resistance in the filter will increase. If this happens, an overflow valve in the filter retainer opens and lets the oil pass without being filtered.

1. Unscrew the filter cover with a socket wrench with hexagon driver e.g. 36 mm socket 588 475.

IMPORTANT!

Do not use an adjustable spanner or other open tool as there is risk of damaging the filter cover.

2. Lift out the filter housing cover with filter element. The filter housing will drain automatically once the filter has been removed.
3. Detach the old filter from the cover by holding the cover and carefully tapping the entire filter element against something hard. Remember that there will be oil splashes.
4. Fit the new filter and tighten the filter cover to 25 Nm (18 lbf ft).



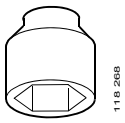
Internal: Removing oil and grease

1. Run the engine until it has reached operating temperature and then drain the cooling system.
2. Remove the thermostats.
3. Fill the system with clean, hot water mixed with liquid dishwasher detergent intended for household machines. Concentration 1% (0.1/10 l).
4. Warm up the engine for approximately 20-30 minutes. Remember to switch on the cab heating system, if one is installed.
5. Drain the cooling system.
6. Fill the system with clean, hot water and run the engine for about 20-30 minutes.
7. Drain the water from the cooling system.
8. Refit the thermostats.
9. Fill the cooling system with new coolant following the specification under Coolants earlier in the document.

Environment

Avoid spillage and use a suitable container. Used coolant must be disposed of as specified in national and international law.

Fitting

Tool No.	Designation	Illustration
588 475	Socket	

1. Unpack the new filter elements and the supplied O-rings.

IMPORTANT!

Check that there is no remaining packaging material stuck to the new filter elements.

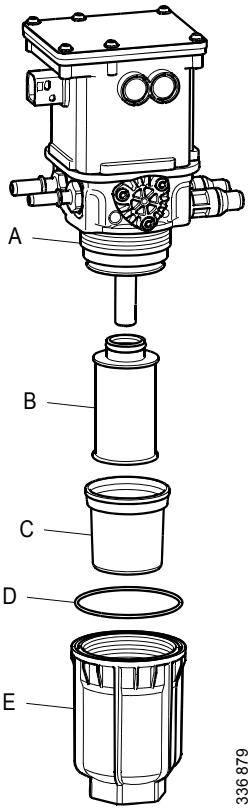
2. Fit the new O-rings to the covers. Lubricate the O-rings with O-ring grease 2 002 537.
3. Press the filter elements into the snap fasteners on the covers.

IMPORTANT!

- Fit the filter elements in the filter covers before placing them in the fuel filter housings or the filter elements may be damaged.
- Open the bleed nipple to prevent back pressure in the filter housings when the filter elements are screwed on.

4. Press down the filter elements into the fuel filter housings with the filter covers.
5. Screw on the filter covers. Use a socket wrench with hexagon driver e.g. 588 475.
6. Check that there is no gap between the filter cover and the filter housing. If there is a gap, repeat the procedure and make sure that the bleed nipple is open.

5. Remove the frost protection device (C) and the filter (B).
6. Wipe the pump clean (A).
7. Fit the new filter (B).
8. Fit the new frost protection device (C).
9. Lubricate the threads with the spray.
10. Fit the new O-ring (D) in the new cover (E).
11. Check that the frost protection device and valve ring are correctly fitted in the new cover.
12. Fit the new cover and tighten to 80 Nm (59 lbf/ft).



A Pump

B Filter

C Frost protection device

D O-ring

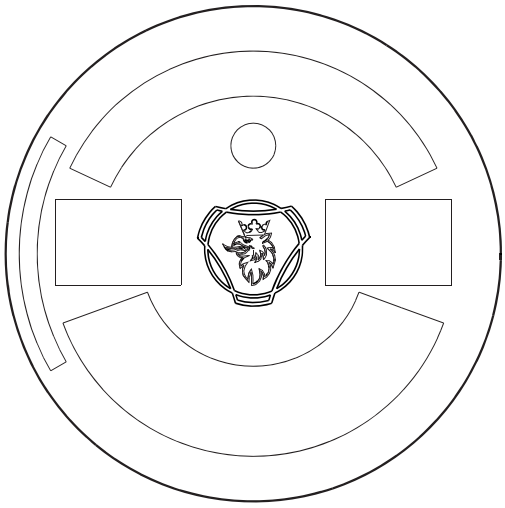
E Cover

Labels for top-up engine oil grade

When changing oil it is important to use the correct engine oil grade.

The oil filler cap must be clearly marked with a label showing the top-up oil grade. If the label is missing or if the engine oil grade is changed, a new label must be fitted.

Filling label in the cylinder block.



Filling label in the rocker cover.

Parts

Oil grade	Colour	Part No.	Part No.
		Filling in the cylinder block	Filling in the rocker cover
Scania LDF-2	Blue	2 132 424	2 296 064
Scania LDF-3	Red	2 132 426	2 296 066
Scania LDF	Grey	2 269 345	2 296 071
ACEA E7	White	2 132 425	2 296 065
Scania Low Ash	Green	2 132 427	2 296 067
Scania Bioethanol	Black	2 132 428	2 296 068
Scania BEO-2	Orange	2 258 841	2 296 070
ACEA E9	-	2 132 429	2 296 069

Antifreeze and corrosion inhibitor concentration table

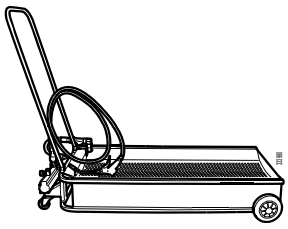
35% by volume of antifreeze provides sufficient protection against corrosion.

Example:

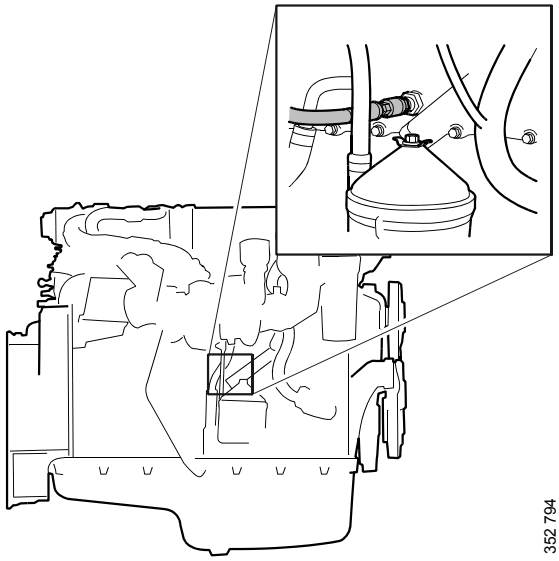
1. The total volume of the cooling system is 40 litres in this example.
2. The measured concentration of ethylene glycol is 35% by volume (freezing point -21 °C). According to the table, there are 14 litres of ethylene glycol in the cooling system.
3. The measured concentration of ethylene glycol is 45% by volume (freezing point -30°C). According to the table, 18 litres of ethylene glycol are required in the cooling system.
4. Since there are already 14 litres in the cooling system, 4 litres of ethylene glycol must be added to the cooling system (18 - 14 = 4 litres).

	Adequate protection against corrosion					
Volume of ethylene glycol (%)	**35**	**40**	**45**	**50**	**60**	**Cooling system volume (litres)**
Ice slush forms (°C)	**-21**	**-24**	**-30**	**-38**	**-50**	
Volume of ethylene glycol (litres)	11	12	14	15	18	30
	14	16	18	20	24	40
	18	20	23	25	30	50
	21	24	27	30	36	60
	25	28	32	35	42	70
	28	32	36	40	48	80
	32	36	41	45	54	90
	35	40	45	50	60	100
	39	44	50	55	66	110
	42	48	54	60	72	120
	46	52	59	65	78	130
	49	56	63	70	84	140
	53	60	68	75	90	150
	56	64	72	80	96	160
	60	68	77	85	102	170
	63	72	81	90	108	180
	67	76	86	95	114	190
	70	80	90	100	120	200

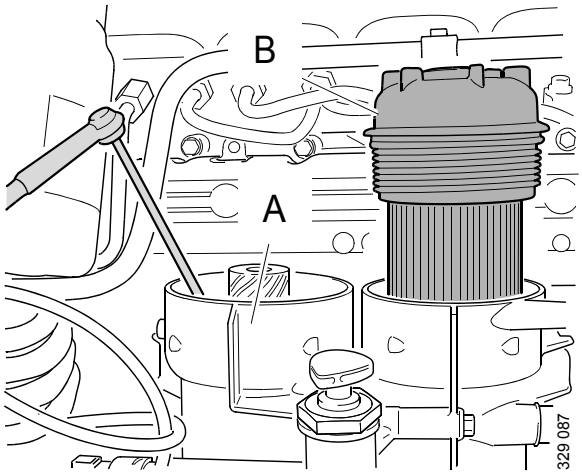
Designation
Coolant trolley



1. Connect the hose from the coolant trolley to the engine drain valve, see illustration.
2. Ensure that the cooling system bleed pipes are not blocked or damaged.
3. Open the expansion tank cap.
4. Fill with coolant using coolant trolley to pump up to the maximum level of the expansion tank.
5. Disconnect coolant trolley.



6. Unscrew the pressure filter cover (B) and lift it up slowly with the filter element.
7. Fuel from the pressure filter housing (B) will flow into the water separating suction filter housing (A). Leave the suction tool in the water separating suction filter housing (A) until it is completely drained of fuel.

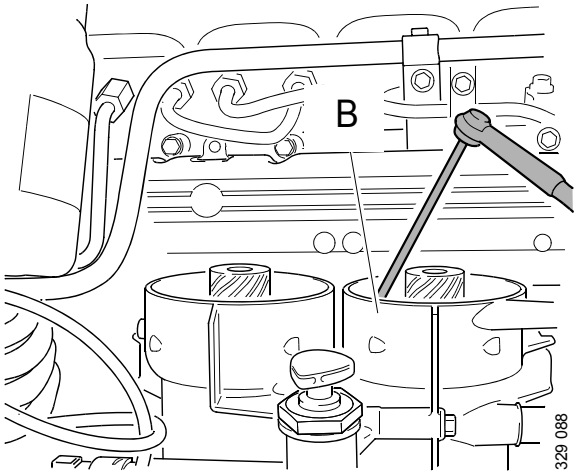


8. Move the suction tool to the pressure filter housing (B). Draw out remaining fuel and particles.

IMPORTANT!

It is important to remove remaining fuel and particles from the filter housings to prevent fuel system contamination.

9. Undo the old filter elements from the covers by carefully bending them to one side.



Start-up Report – Warranty

The warranty starts when the start-up report has been filled in and sent to Scania. The normal warranty period is 1 year, but other conditions can apply.

Fill in the particulars in the start-up report below as well. This can make things easier if you need to contact a workshop, for example.

Engine serial number _____

Date of entry into service _____

User's name and address _____

_____

_____

_____

Signature _____

Engine type _____

Variant _____

Engine type and variant are indicated on the engine data plate.

Electric welding

IMPORTANT!

When carrying out welding work on and near the engine, disconnect the battery and alternator leads. Pull out the multi-pin connector for the engine control unit as well.

Connect the welding clamp close to the component to be welded. The welding clamp must not be connected to the engine, or so that the current can cross a bearing.

When welding is finished:

1. Connect the alternator and control unit cables first.
2. Then connect the batteries.

Lubrication system

WARNING!

Hot oil can cause burns and skin irritation. Wear protective gloves and goggles when changing hot oil.

Make sure that there is no pressure in the lubrication system before starting work on it.

The oil filler cap must always be in place when starting and running the engine to prevent oil being ejected.

Environment

Always hand in used oil to an authorised waste disposal contractor.

Cooling system

WARNING!

Never open the coolant filler cap when the engine is hot. Hot coolant and steam may spray out and cause burns.

If the cap has to be opened do it slowly and carefully to release the pressure before removing the cap. Wear gloves as the coolant is still very hot.

Environment

Always hand in used coolant to an authorised waste disposal contractor.

Fuel system

WARNING!

Always wear protective goggles when testing injectors. Fuel escaping at high pressure can penetrate tissues and cause serious injury.

Scania recommends that Scania spare parts are used for the fuel and electrical systems. Scania spare parts are designed to minimise the risk of fire and explosion.

SCR catalytic converter

WARNING!

The SCR catalytic converter contains vanadium pentoxide, a chemical known to the State of California to cause cancer.

The SCR catalytic converter is fitted in the silencer and does not constitute a health hazard during normal use and handling.

When carrying out work on the SCR catalytic converter which may result in exposure to dust, safety precautions must be taken. Such work includes, for example, opening the silencer machining and scrapping the SCR catalytic converter.

Safety precautions when working on the SCR system.

- Inhalation: If dust is inhaled, the person should be provided with fresh air immediately. Seek medical attention
- Eye contact: Rinse eyes with water immediately. If irritation persists, seek medical attention.
- Skin contact: Wash with water and soap. Remove contaminated clothes.
- Ingestion: If large amounts have been ingested, drink plenty of water and induce vomiting. Seek medical attention

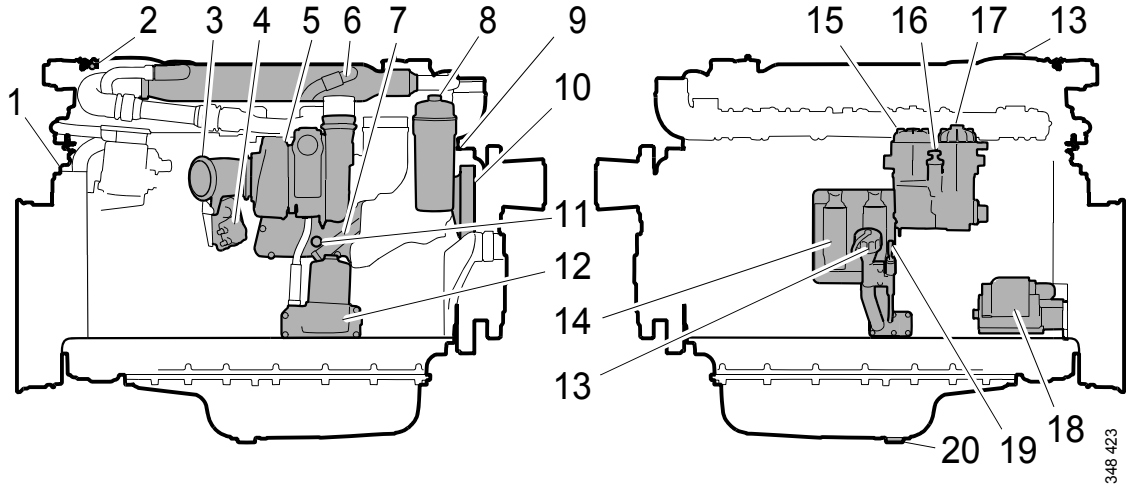
Environmental hazards

- Vanadium pentoxide is toxic to water organisms and can cause detrimental long term effects to water environment.

Environmental protection measures

- The SCR catalytic converter is a manufactured article that contains vanadium pentoxide, a hazardous substance. Before disposing of, or scrapping, a spent SCR catalytic converter, it should be tested for any hazardous characteristics (ignitability, corrosivity, reactivity, acute hazardousness, and toxicity), as those categories are described in 22 CCR § 66261.30. If the spent SCR catalytic converter exhibits hazardous characteristics and is being disposed of, it will be considered by the State of California to be a hazardous waste subject to Title 22, California Code of Regulations. Before disposing of hazardous waste, review and follow all pertinent federal and California requirements.
- Vanadium pentoxide is a listed commercial chemical product - P120 - pursuant to 22 CCR § 66261.33(e). According to the State of California, commercial chemical products that are discarded or intended to be discarded are hazardous wastes and are subject to all provisions of Title 22, California Code of Regulations. Before disposing of vanadium pentoxide, review and follow all pertinent federal and California requirements.
- If the SCR catalytic converter is opened for maintenance, any dust spillages from the catalyst should be collected and tested for the presence of vanadium pentoxide prior to proper disposal. Dust spillages should also be tested for any hazardous characteristics (ignitability, corrosivity, reactivity, acute hazardousness, and toxicity), as those categories are described in 22 CCR § 66261.30, prior to proper disposal. If the dust contains either vanadium pentoxide or exhibits hazardous characteristics and is being disposed of, it will be considered by the State of California to be a hazardous waste subject to Title 22, California Code of Regulations. Before disposing of hazardous waste, review and follow all pertinent federal and California requirements.

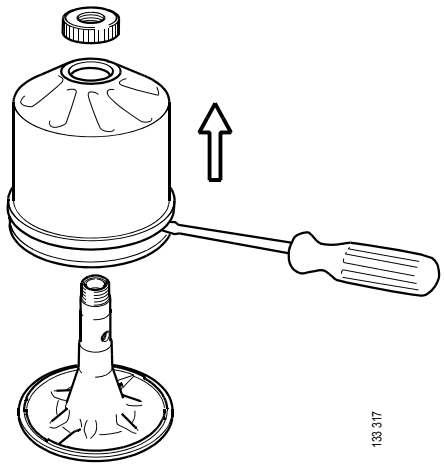
Component identification



The illustration shows a normal version of a DC13 engine. The engine ordered may have different equipment

1. Engine data plate
2. EGR valve
3. Exhaust brake
4. Actuator
5. Turbocharger
6. EGR cooler
7. Oil cooler
8. Oil filter
9. Engine serial number on the cylinder block
10. Coolant pump
11. Draining coolant
12. Centrifugal oil cleaner
13. Oil filler
14. Engine control unit
15. Water separating prefilter for fuel
16. Hand pump for fuel
17. Fuel filter
18. Starter motor
19. Oil dipstick
20. Oil plug

5. Remove the rotor cover by holding 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.