

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.



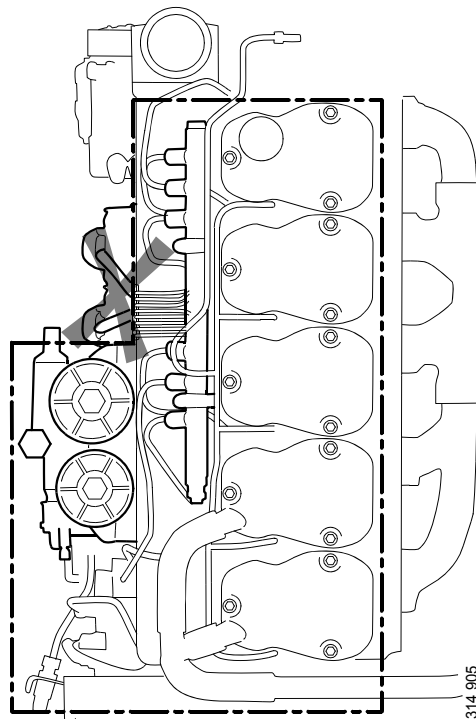
WARNING!

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.

Changing the oil

Note:

Renew the oil filter and clean the centrifugal oil cleaner when changing oil.



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.



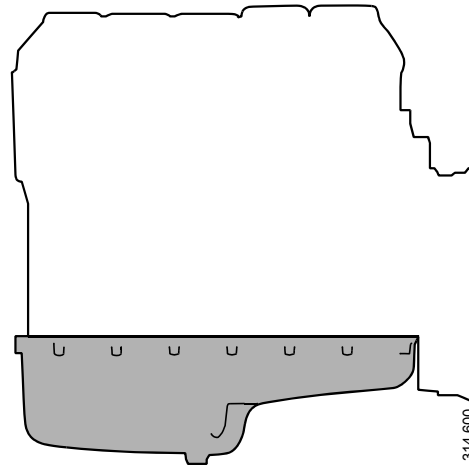
Environment

Use a container to avoid spillage. Used oil must be disposed of as specified in national and international law.

Note:

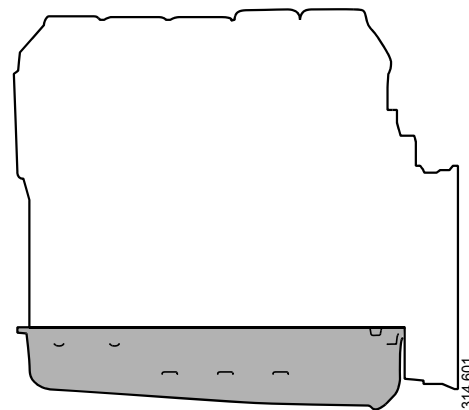
Change oil more often if the engine is subjected to particularly demanding operation, such as a dusty environment, or if deposits in the centrifugal oil cleaner are thicker than 28 mm (1.1 in).

1. Unscrew the oil plug and drain the oil when the engine is hot.
 - In certain engines the oil is pumped out by means of a bilge pump.
2. Clean the magnet on the oil plug.
3. Refit the oil plug.
4. Top up with oil.
5. Check the level on the oil dipstick.



Max. 36 litres (9.5 US gallons)

Min. 31 litres (8.2 US gallons)



Max. 34 litres (9 US gallons)

Min. 29 litres (7.7 US gallons)

Cleaning the centrifugal oil cleaner

When cleaning the centrifugal oil cleaner there will be some dirt deposits in the rotor cover. If this is the case, this indicates that the rotor is working. If it is not working, the cause must be established immediately.

If the dirt deposit exceeds 28 mm at the recommended intervals, the rotor cover should be cleaned more often.



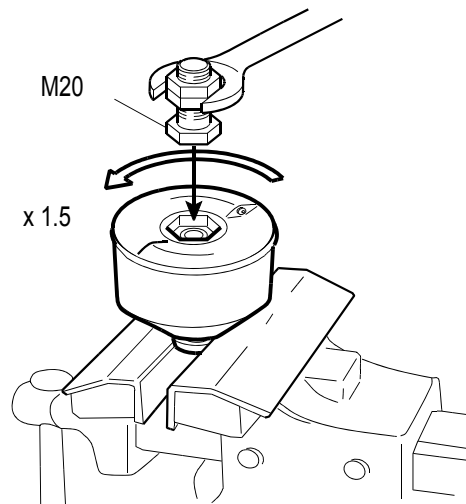
WARNING!

The oil may be hot. Carefully remove the cover from the centrifugal oil cleaner.

1. Clean the cover. Unscrew the nut securing the outer cover.
2. Let the oil run out from the rotor.
3. Lift out the rotor. Wipe off the outside. Undo the rotor nut and unscrew it about 1.5 turns to protect the bearing.

Note:

Take care not to damage the rotor shaft.

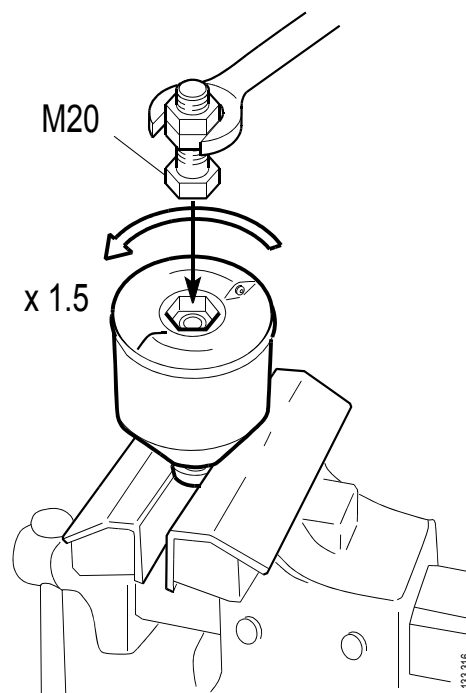


4. If the rotor nut is difficult to get loose, turn the rotor upside down and fasten the rotor nut in a vice. Turn the rotor counterclockwise 1.5 turns by hand or use an M20 nut, see illustration.



IMPORTANT!

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



Checking antifreeze and corrosion inhibitor

Note:

Use only pure fresh water that is free from particles, sludge and other impurities.

1. Pour a small amount of coolant into a container and check that the coolant is pure and clear.
2. Change the coolant if it is contaminated or cloudy.
3. Measure the content of antifreeze and corrosion inhibitor with one of the following instruments:

Part No.	Designation
588 805	Refractometer
588 226	Refractometer

The following rules apply to ethylene glycol-based coolant:

- The antifreeze and corrosion inhibitor content must be minimum 35 percent by volume for corrosion protection to be sufficient.
- An antifreeze and corrosion inhibitor content greater than 55 percent by volume impairs the ability to protect against frost.
- If ice forms in the coolant, there are disruptions initially, but there is no immediate risk of damage. The engine should not be subjected to heavy loads when ice starts to form.

Internal: Removing deposits

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 some commercially available radiator detergent which is based on sulphamic acid and contains dispersing agents. Follow the manufacturer's instructions for the concentration and cleaning period.
4. Run the engine for the specified time. Remember to switch on the cab heating system, if one is installed.
5. Drain the cooling system.
6. Fill the cooling 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 system with new coolant following the specification under Coolants earlier in the document.



Environment

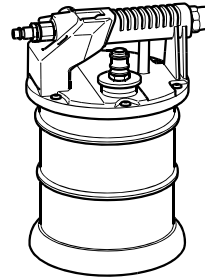
Avoid spillage and use a suitable container. Used coolant must be disposed of as specified in national and international law.

Bleeding the fuel system

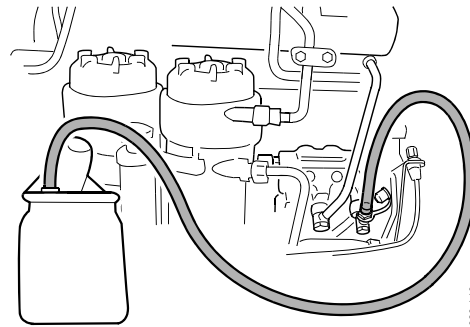
Tool No.
588 793

Designation
Suction tool

Illustration



1. Open the bleed nipple at the high pressure pump and connect a clear plastic hose from suction tool 588 793 or similar tool.
2. Drain the suction tool. Hold the suction tool straight and draw out a full container of fuel. Bleeding is now complete.
3. Start the engine.



Maintenance

The maintenance programme covers a number of points that are divided into the following sections:

- Lubrication system
- Cooling system
- Air cleaners
- Fuel system
- Other



WARNING!

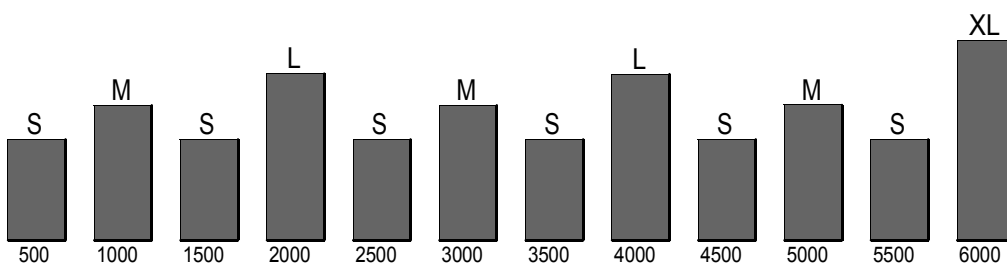
Block the starting device when working on the engine. If the engine starts unexpectedly, there is a serious risk of injury.

There is always a risk of sustaining burns when an engine is hot. Particularly hot parts are turbochargers, oil sumps, hot coolant and oil in pipes and hoses.

The maintenance programme includes the following:

- S maintenance: Minimum basic maintenance.
- M maintenance: More extensive maintenance.
- L maintenance: Includes nearly all maintenance items.
- XL maintenance: Includes all maintenance items.

During a period, the sequence is S-M-S-L-S-M-S-L-S-M-S-XL.



313 163



IMPORTANT!

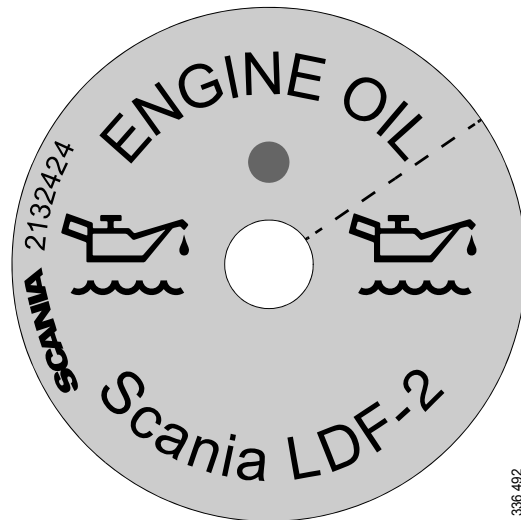
On delivery a Scania engine is optimised for its application. However, regular maintenance is necessary to:

- prevent unplanned stops
- extend the service life of the engine
- maximise the long-term emission performance of the engine
- give the best possible operating economy.

Labels for top-up engine oil grade

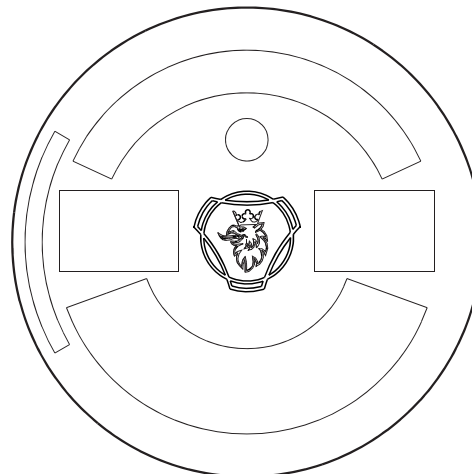
When changing oil it is important to use the correct engine oil grade.

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.



336 492

Filling label in the cylinder block.



353 114

Filling label in the rocker cover.

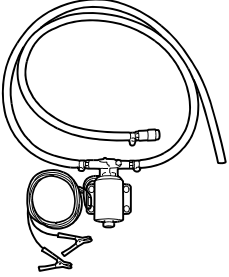
Parts

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

Changing the coolant and cleaning the cooling system

Draining coolant

Special tools

Number, designation	
2 443 679, coolant pump	 <p style="text-align: right; font-size: small;">360 625</p>



WARNING!

Do not open the coolant filler cap in the expansion tank if the engine is hot. Hot coolant and steam may spray out and cause burns.

If the cap has to be opened do it slowly to release the pressure before removing the cap.

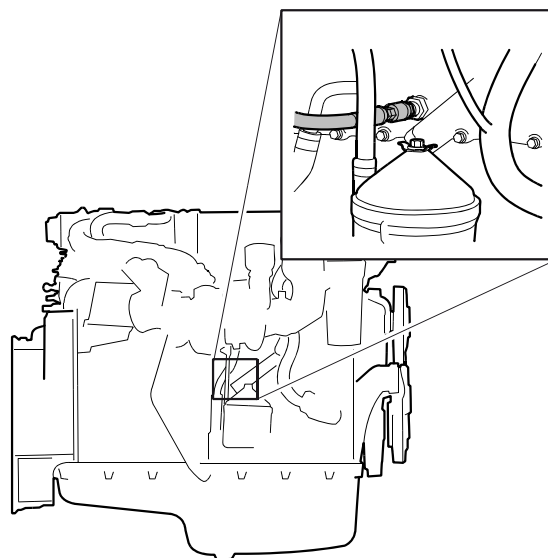
Use protective gloves as coolant can cause irritation if it comes in contact with the skin. Hot coolant can also cause scalding.



Environment

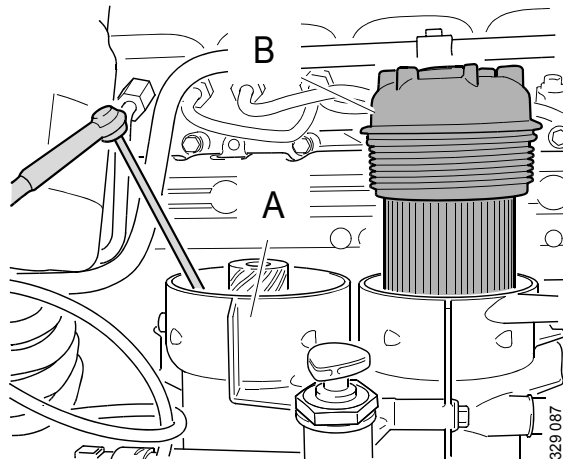
Use a suitable container. Used coolant must be disposed of as specified in national and international laws and regulations.

1. Open the expansion tank cap.
2. Place the hose of the coolant pump in an empty container.
3. Connect the pump to the draining nipple in the cylinder block. See illustration.
4. Connect the pump's 2 cable terminals to the battery's negative and positive terminal. Make sure that the drainage starts. If the drainage does not start: Change the position of the cable terminals.



352 704

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.



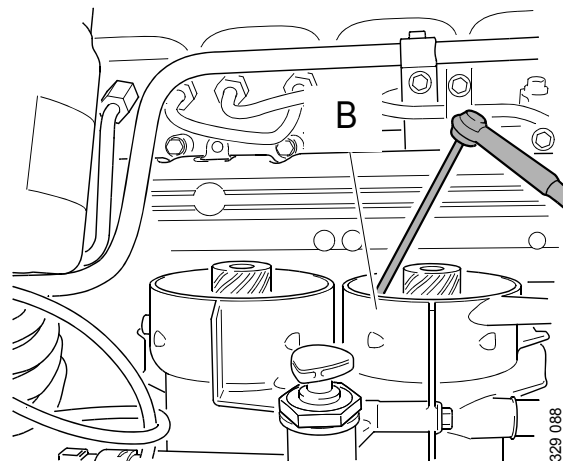
8. Move the suction tool to the pressure filter housing (B). Draw out remaining fuel and particles.



IMPORTANT!

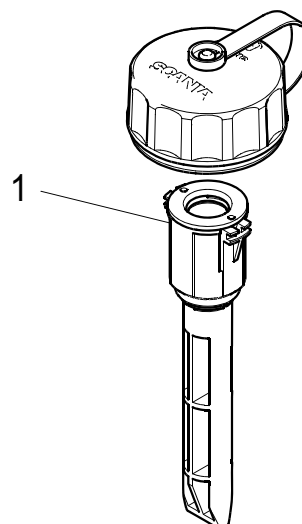
It is important to remove remaining fuel and particles from the filter housings to prevent fuel system contamination.

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



Cleaning the reductant tank filler filter

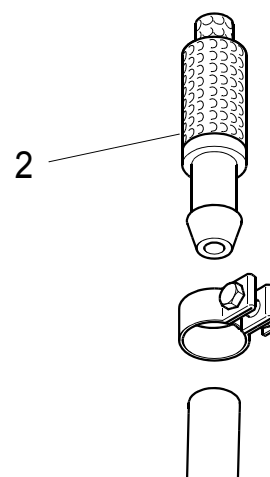
Make sure that the filler filter (1) is clean. If it is dirty: Clean the filler filter with clean water and refit it.



350 114

Cleaning the reductant tank ventilation filter

Make sure that the ventilation filter (2) is clean. If it is dirty: Clean the ventilation filter with clean water and refit it.



352 009

3. Any warranted part which is scheduled for replacement as required maintenance in Scania's written instructions for maintenance and use of the engine by owner shall be warranted for the period of time prior to the first scheduled replacement point for that part. If the part fails prior to the first scheduled replacement, the part shall be repaired or replaced by the engine manufacturer according to Subsection (4) below. Any such part repaired or replaced under warranty shall be warranted for the remainder of the period prior to the first scheduled replacement point for the part.
4. Repair or replacement of any warranted part under the warranty provisions of this article shall be performed at no charge to the owner at a warranty station.
5. Notwithstanding the provisions of Subsection (4) above, warranty services or repairs shall be provided at all manufacturer distribution centers that are franchised to serve the subject engines.
6. The owner shall not be charged for diagnostic labor that leads to the determination that a warranted part is in fact defective, provided that such diagnostic work is performed at a warranty station.
7. The engine manufacturer shall be liable for damages to other engine components proximately caused by a failure under warranty of any warranted part.
8. Throughout the engine's warranty period defined above, the engine manufacturer shall maintain a supply of warranted parts sufficient to meet the expected demand for such parts.
9. Any replacement part, as defined in Section 1900(b), Title 13 of the California Code of Regulations, may be used in the performance of any maintenance or repairs and must be provided without charge to the owner. It is not necessary for replacement parts to be the same brand or by the same manufacturer as the original part sold with the engine. Such use shall not reduce the warranty obligations of the engine manufacturer.
10. Add-on or modified parts, as defined in Section 1900(b), Title 13 of the California Code of Regulations, that are not exempted by the California Air Resources Board may not be used. The use of any non-exempted add-on or modified parts shall be grounds for disallowing a warranty claim made in accordance with this article. The engine manufacturer

shall not be liable under this article to warrant failures of warranted parts caused by the use of a non-exempted add-on or modified part.

11. The Executive Officer of the California Air Resources Board may request, and in such case, the engine manufacturer shall provide, any documents which describe that manufacturer's warranty procedures or policies.

Parts covered by the Warranty

The following is a list of parts considered to be part of the Emission Control Systems covered by the Emission Warranty for Scania industrial engines which were built to conform to federal and California emission control regulations:

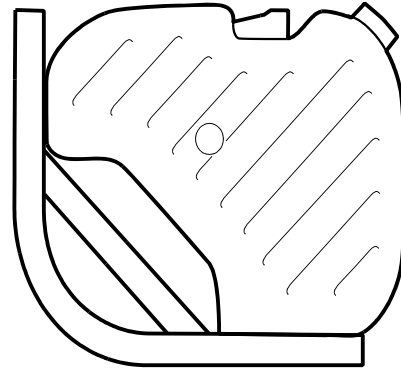
1. Fuel injection system.
2. Air induction system.
3. Exhaust manifold system.
4. Smoke puff limiter (included in ECU).
5. Oil filler cap.
6. EGR system (when applicable):
 - a) Cooler.
 - b) EGR valve.
7. Exhaust brake (when applicable).
8. NOx sensors:
 - a) NOx sensor, engine out.
 - b) NOx sensor, tail pipe.
9. DOC (when applicable).
10. SCR system:
 - a) DEF tank.
 - b) DEF tank level, temperature and quality sensors.
 - c) DEF hose.
 - d) DEF injector.
 - e) DEF injector pressure and temperature sensors.
 - f) Evaporator.
 - g) SCR catalyst inlet temperature sensor.
 - h) SCR catalyst including the ammonia-slip catalyst.
 - i) SCR control unit (EEC3).

Reductant tank

Reductant tanks come in 4 different sizes. The volumes indicated for each tank are filling volumes.

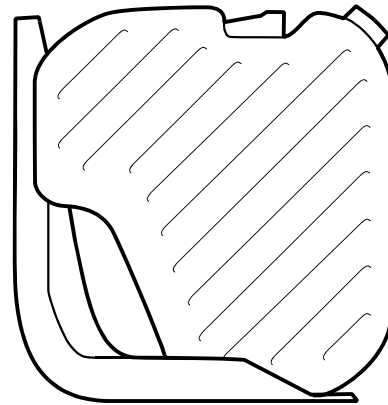
A filler filter with magnet is fitted in the reductant tank to prevent the reductant from becoming contaminated when topping up. The filler filter with magnet is used when topping up at a filling station.

A filler filter without a magnet is also supplied for use when manually topping up reductant.



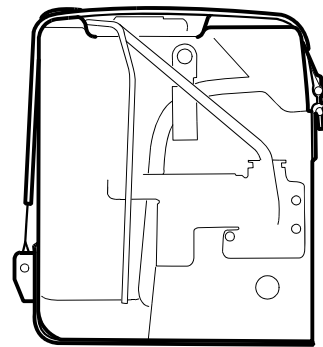
348 425

38 litres (10 US gallons)



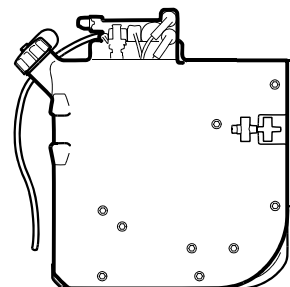
348 422

60 litres (15.8 US gallons)



348 421

69 litres (18.2 US gallons)



348 426

70 litres (18.5 US gallons)

Engines with few hours of operation



IMPORTANT!

On engines with few hours of operation, maintenance 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 maintenance items must be carried out once the engine has been warmed up to operating temperature.

1. Checking oil level.
2. Checking coolant level.
3. Checking vacuum indicator.
4. Checking 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.



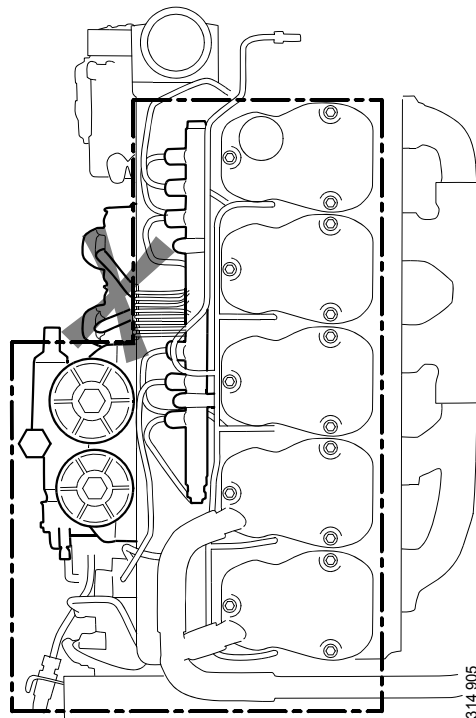
WARNING!

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.

Renewing the fuel filter with draining nipple

Tool No.	Designation	Illustration
588 475	Socket	

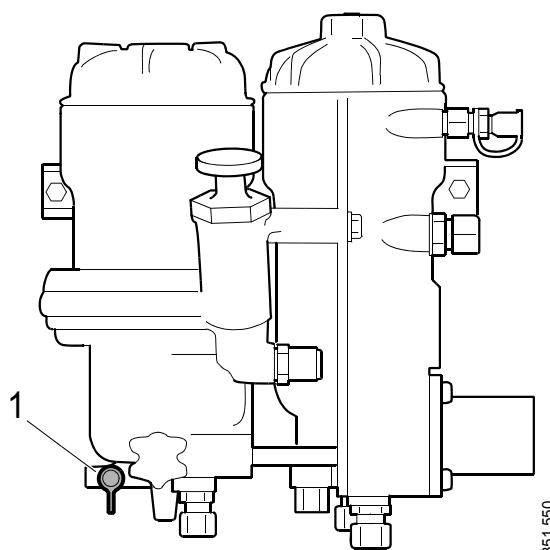
On certain engines, there is a draining nipple (1) on the fuel filter housing. If there is no draining nipple, see *Renewing the fuel filter using a suction tool* or *Renewing the fuel filter if there is no suction tool*.

If the fuel tank is positioned higher than the fuel filter housing, the shut-off valve between the fuel tank and the fuel filter housing must be closed. This is to prevent fuel running into the fuel filter housing.



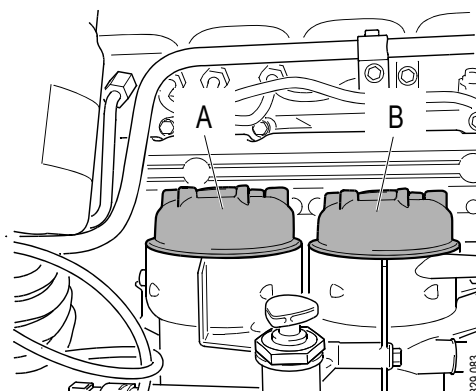
Environment

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



351 550

1. Open the draining nipple (1).
2. To ensure that the filter housings are drained properly, the filter covers must be removed as follows:
 - On the pressure filter: Make a mark on the cover. Unscrew the cover 3 to 4 turns using a closed tool with hexagon driver, e.g. 588 475.
 - On the water separating suction filter: Make a mark on the cover. Unscrew the cover 3 to 4 turns using a closed tool with hexagon driver, e.g. 588 475.



329 083

A Water separating suction filter.

B Pressure filter.