



























# SAFETY INSTRUCTIONS

**In the service – and repair work of the engine there is always the possibility of injury. Before starting the work read and understand the following safety instructions and remarks!**

-  Do not start a repair work that you do not fully handle.
-  Make sure that the place of the repair and the surrounding gives the possibility for safe working.
-  Always be sure of the cleanness and the good order of the repairing place.
-  Do not use faulty or otherwise useless tools.
-  Remove all finger rings, chains and watch before starting work.
-  Use up-to-date protection equipment when you work. For example eye protection as working with compressed air for cleaning, grinding, hammering or other work.
-  Use lifting device for lifting and transporting heavy (over 20 kg) pieces. make sure of good condition of lifting hooks and chains. The lifting ears on the engine must not be applied by side forces when lifting.
-  Never work under an engine that is left handling under a lifting device or lifted up by a jack. Always use strong supports before starting the work.
-  Use only genuine **Sisudiesel** spare parts.
-  Start the engine only by using the starting switch in the cabin.
-  Do not start an engine if the protection covers are removed. **NOTE!** The fan is difficult to see as the engine is running! Make sure that wide clothes or long hair is not caught in the rotating parts of the engine.
-  If you start the engine indoors, be sure you have proper ventilation.
-  Never use aerosol type of starting aid while operating the thermostart device (risk for explosion).

-  When you are operating the engine or working near it, use hearing protectors to avoid noise injuries.
-  Stop the engine always before service – or repair work.
-  Avoid touching the exhaust manifold, turbocharger and the other hot parts of the engine.
-  Open the radiator cap with care when the engine is hot as the cooling system is pressurised. The cooling liquid and lubrication oil of a hot engine causes injuries when touching the skin.
-  Open fire, smoking and sparks should not be allowed near the fuel system and batteries. (Specially when loading batteries, explosive.)
-  Always disconnect the minus (–) wire of the battery when doing service or repair of the electric system.
-  At temperatures on excess of 300°C, e.g. if the engine is burnt by a fire, the viton seals of the engine (e.g. the undermost o-ring of the oil pressure regulating valve) produce very highly corrosive hydrofluoric acid. Do not touch with bare hands, viton seals subjected to abnormally high temperatures. Always use neoprene rubber or heavy duty gloves and safety glasses when decontaminating. Wash the seals and the contaminated area with a 10% calcium hydroxide or other alkali solution. Put all removed material in sealed plastic bags and deliver them to the point stated by the Authorities concerned. **NOTE!** Never destroy viton-seals by burning!
-  When checking fuel injectors do not let the jet of high pressure fuel contact your skin. The fuel penetrates the skin causing severe injuries. Contact your doctor immediately!
-  The fuel, lubricating oil and coolant cause irritation in skin contact for long time.
-  Avoid unnecessary idling of the engine.
-  Do not let oil and other liquids drop into the soil when servicing the engine.
-  All the gaskets of the engine are of non-asbestos material.
-  Be careful when washing the engine with a high pressure washing machine. Do not use high pressure to wash e.g. the electric and fuel equipment or the radiator because they can easily be damaged.

## CONSTRUCTION

### General

The Sisudiesel 20/34-series engines (3-, 4-, or 6-cylinders) are water-cooled, four stroke, direct-injection in-line diesel engines. All engines are produced as naturally aspirated engines, turbocharged engines and the four- and six cylinder engines also as intercooled.

The engines have a rigid and ribbed cylinder block. The crank mechanism is designed for supercharging. The cylinder liners are wet and supported at the middle. The cylinder head bolts are high tensile bolts.

### Cylinder block

The cylinder block is the main body of the engine, to which other engine parts are attached. Wet and replaceable cylinder liners are supported at the middle which reduces vibrations and directs coolant circulation mainly to the upper part of the liners.

The seal between the cylinder liner lower part and the cylinder block is achieved by three o-rings, which are fitted in grooves in the liner. The upper part is sealed by the cylinder head gasket.

The camshaft is located in the cylinder block. The camshaft front bearing location is fitted with a separate bearing sleeve. The remaining bearing locations are machined directly in the cylinder block. The latest 620/634-engines have separate bearing sleeves in all camshaft bearing locations. The drilling for the camshaft rear end is covered with a plug.

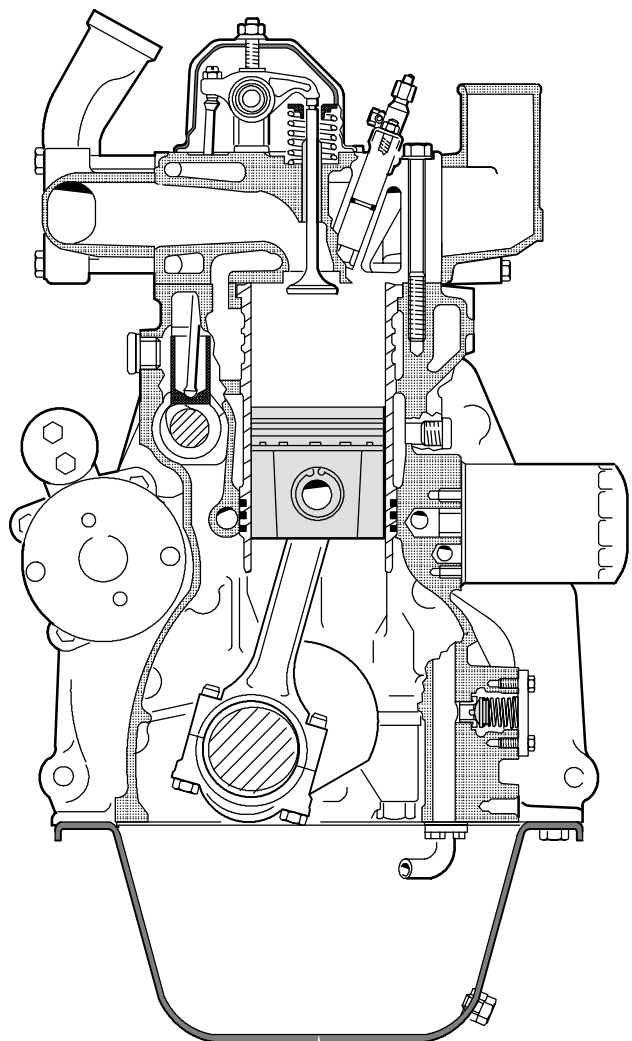
There are spaces on both sides of the rear main bearing for guide bearing shims (the crankshaft thrust bearings).

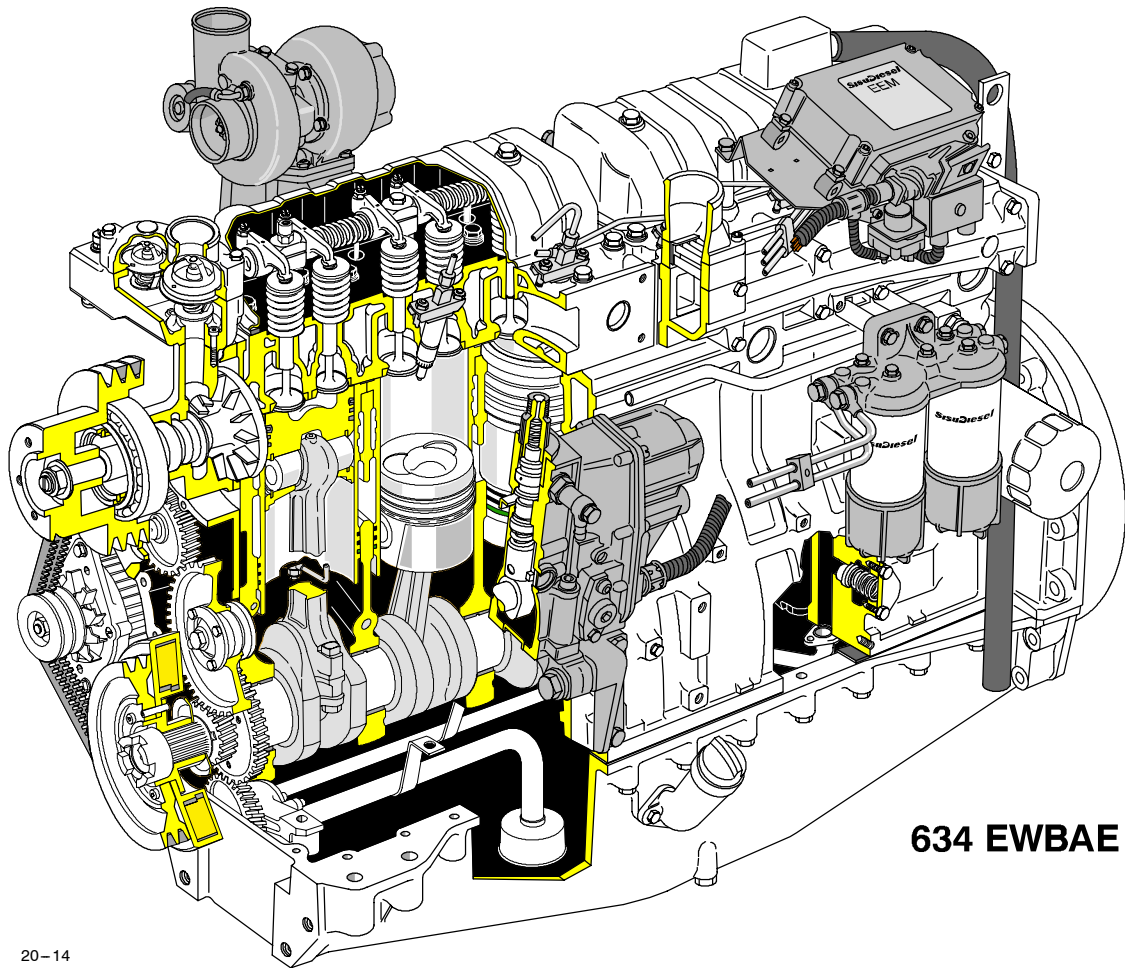
### Flywheel housing

The flywheel housing is fitted at the rear end of the cylinder block. The seal for the crankshaft rear end is placed in a bore in the housing. The starter motor fixing point is fitted in the flywheel housing.

The lower face of the flywheel housing functions as a sealing surface for the oil sump gasket. This means that the lower face of the cylinder block must be level with the flywheel housing. When fitting the flywheel housing, its position is determined by tension pins.

The flywheel housing are delivered according to the requirements set, by the engine application and different flywheel housings can be mounted on all engine types.





20-14

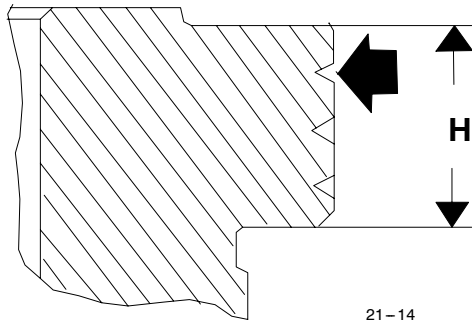
## Electronic Engine Management system (EEM)

The Sisudiesel EEM system is a microprocessor based diesel engine control system to replace the traditional mechanical speed governor on the engine. This system significantly improves the properties of the engine and adds several functions and operational features that could not be realised with mechanical governors. The EEM system is applicable to all kinds of vehicles, on- or off-road.

The system consists of the following components:

- Fuel injection pump with electrical actuator system
- Electronic control unit
- Sensors for engine parameters and speed demand value
- Wiring harness

6. If the cylinder liner height is too low, a liner with a higher flange is fitted.



21-14

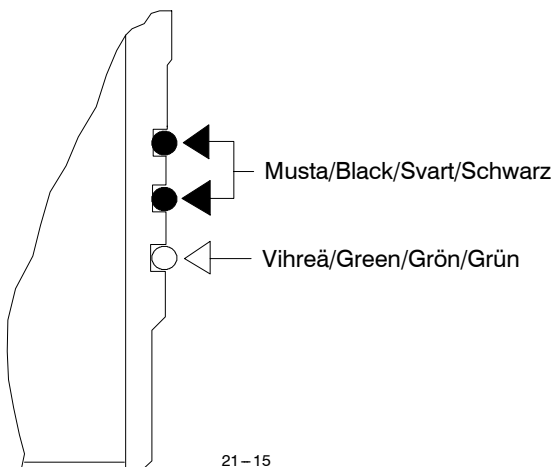
Order no	H	Marking grooves pcs
8366 47420	9,03 <sup>+0,02</sup>	- (std.)
8366 47933	9,08 <sup>+0,02</sup>	1
8366 47934	9,13 <sup>+0,02</sup>	2
8366 47935	9,23 <sup>+0,02</sup>	3

Cylinder liners with oversize flanges (higher flanges) are marked with grooves on the outer circumference as follows:

- 1st oversize, 0,05 mm = 1 marking groove
- 2nd oversize, 0,10 mm = 2 marking grooves
- 3rd oversize, 0,20 mm = 3 marking grooves

**Note!** Recess depth is adjusted with a cylinder liner recess cutter 9101 65600.

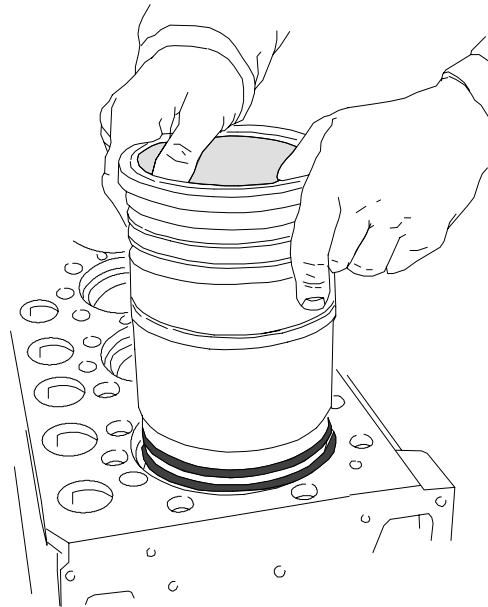
7. If the liner height of a cylinder liner is not the same all the way round, the cylinder liner flange and the cylinder block recess depth should be checked. Cylinder liners with warped flanges should be discarded.



21-15

8. Fit the o-rings into the grooves in the cylinder lower part and lubricate them with a liquid soap (not with engine oil).

**Note!** Stretch the o-rings as little as possible when fitting them. Max allowable stretching is 6 %.



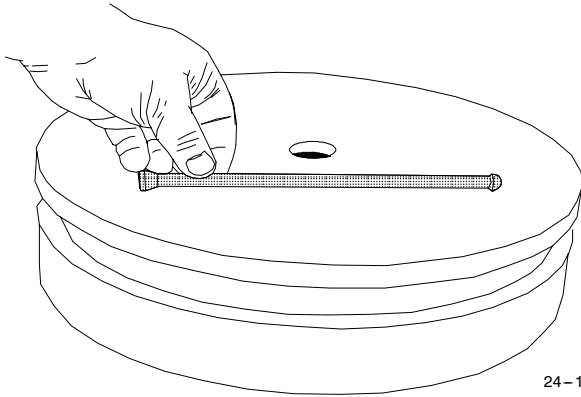
21-16

9. Press the cylinder liners into the cylinder block. It should be easy to press them fully home. Make sure that the liners do not rise up after fitting.

## 4. VALVE MECHANISM

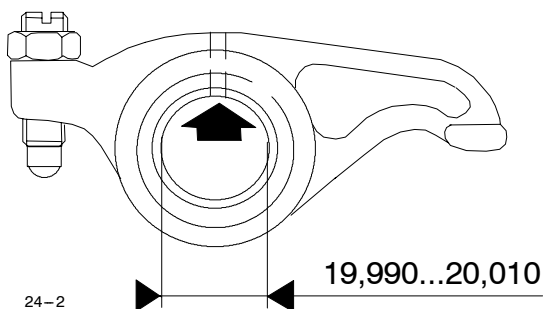
### A. Reconditioning valve mechanism

1. Check the valve tappets, especially the contact surface against the camshaft. Worn or damaged tappets should be discarded.

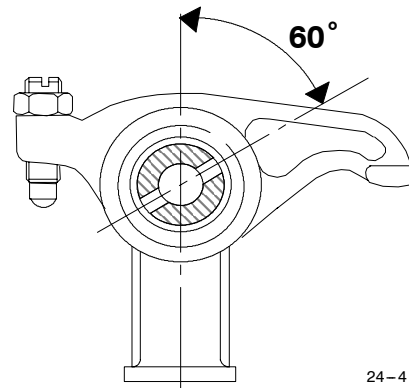
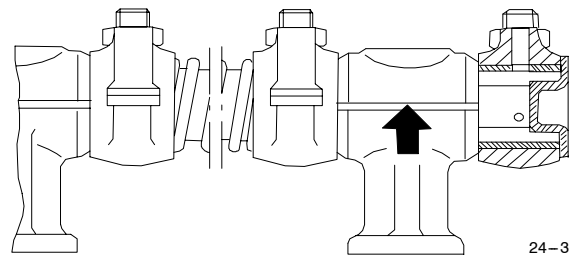


2. Check the straightness of the pushrods by rolling them on a surface table. Check also the spherical surfaces at the ends.

3. Dismantle and clean the rocker arm mechanism. Check the shaft for wear and that the oilways are clean.



4. Check that the rocker arm bushings are not worn. Ensure that the oil hole is positioned correctly when pressing in new bushings. After pressing in the bushings they should be reamed to **19,990...20,010 mm**. Where necessary grind the rocker arm valve contact surface to the correct shape. Do not grind more than necessary as the hardened layer is thin.

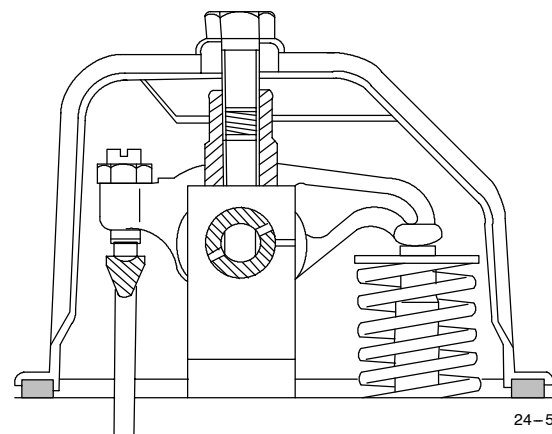


5. Fit the plug to the other end of the rocker arm shaft. Lubricate the shaft and fit various parts in a correct order. Note the correct position of the shaft and the bearing brackets. The split side of the bracket and the shaft oil holes must be turned to the valve side (see figure above). Fit the other end plug.

**NOTE! ENGINES FROM 96 WEEK 34**

From the above mentioned date a new valve mechanism, push rods and rocker cover fastening taken in use.

The modification effects mainly the under mentioned parts:



– Valve mechanism shaft diameter grows from 20 ⇒ **23 mm**. The plugs in both ends are replaced by threaded plugs.

– The rocker arm is without bushing. The adjusting screw is modified from M8 ⇒ **M10x1**.

– The push rod top end ball cup is growing from R4 ⇒ **R5**.

– The bracket structure and material is modified.

– The rocker cover studs are shorter and the cover is tightened with hexagon screws.

As spare part the separate parts are not exchangeable. The whole valve mechanism can be replaced with the new one together with the new push rods. The fastening parts do not have to be modified.

## 7. COUNTERBALANCE (420)

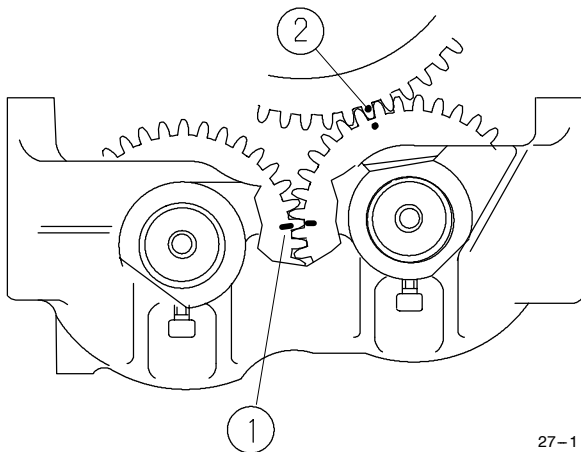
### A. Removing and disassembling counterbalance unit

1. Remove the oil sump
2. Disconnect the lubricating oil pipe of the counterbalance unit.
3. Remove the counterbalance unit. Take care of any shims.
4. Loosen the locking screws and press out the shafts in the direction of the locking screws. Remove the counterweights and thrust washers.
5. Clean all parts.

### B. Reconditioning counterbalance unit

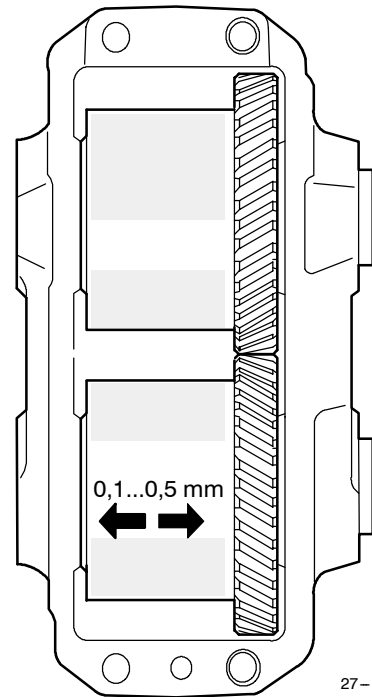
Check the shafts, gear wheels and bushings for wear and damage.

1. If one of the gear wheels is damaged, change both counterweights as a complete unit. The gear wheels are not available separately as a spare part.
2. Remove, if necessary, the old bearing bushings with a suitable drift. Before removing them, mark the position of the bushing oil groove on the counter weigh. Press in new bushings in the correct position. After fitting the bushings should be reamed to a correct dimension, see Specifications.



1. Synchronisation marking (notch)
2. Marking against crankshaft (punch mark)

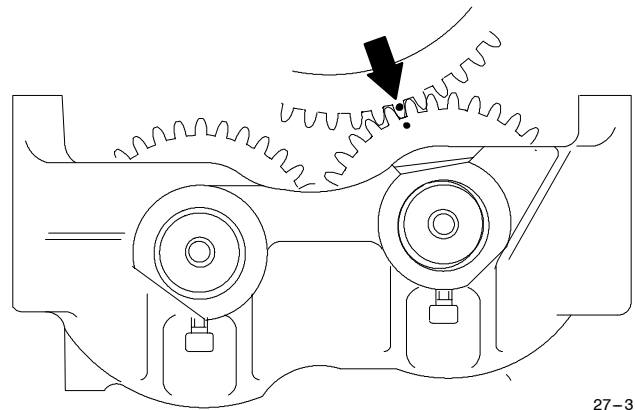
3. Place the weights in the body, observing the notch markings. The gear wheel with the punch mark runs against the crankshaft and should therefore be placed highest. Insert the shafts, remembering the thrust bearings. Apply thread lock fluid Loctite 270 to the locking screws, and lock the shafts.



4. Check that the tooth backlash is **0,05...0,25 mm** and that the end float is **0,1...0,5 mm**

### C. Fitting counterbalance unit

1. Fit the tension pins to the cylinder block.



2. Turn the crankshaft and weights so that the markings agree, and lift the unit into place.

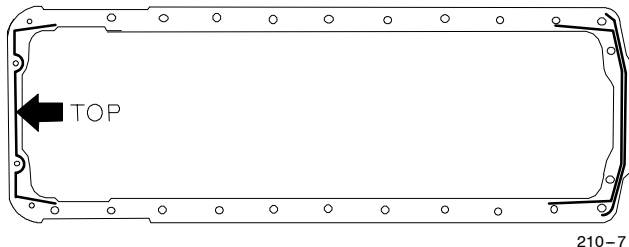
3. Tighten the bolts to **60 Nm**. Check that the tooth backlash between the crankshaft and counterweight is **0,1...0,3 mm**. The backlash can be increased by placing shims 0,2 mm thick (order no 8361 19920) between the cylinder block and balancer unit body. One shim (0,2 mm) changes tooth backlash about 0,07 mm.

4. Fit the lubricating oil pipe, using new seals.

5. Fit the oil sump.

### D. Fitting oil sump gasket

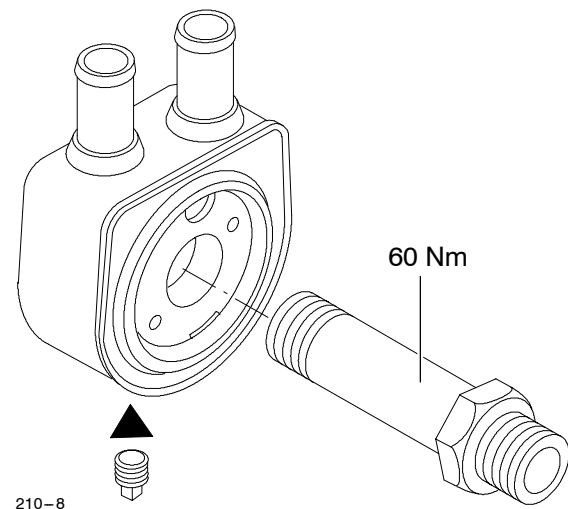
Fit the oil sump gasket with the silicone stripes against the cylinder block (self carrying and casted oil sumps).



### E. Lubricating oil cooler

Some engines are equipped with a oil cooler, positioned in between the oil filter and the cylinder block.

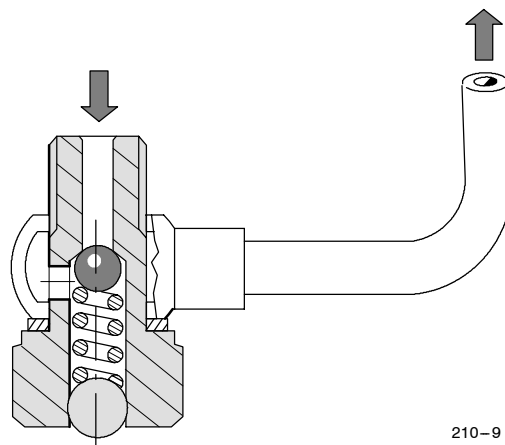
1. The engine coolant should be drained before removing the lubricating oil cooler.



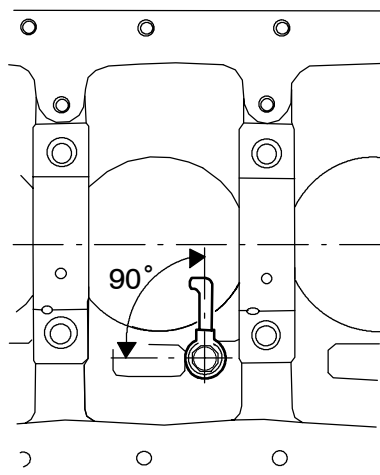
2. Fit new sealing rings. Fit the cooler with draining plug turned downwards. Connect coolant pipes in the correct way.
3. Apply locking fluid to the nipple (the thread which attaches to the filter head) and tighten it to a torque of **60 Nm**.

### F. Piston cooling nozzles (620/634)

The cooling nozzles can be removed after removing the oil sump. The nozzles have a ball valve with an opening pressure of  $3 \pm 0,25$  bar.



1. Change the valve if necessary. Detach the valve from the engine and remove the nozzle pipe. Fit a new valve.



2. Fit the nozzle pipe at the angle of **90°** to the centre line of the crankshaft according to the above picture. Tighten the valve to **30 Nm**. Ensure that the pipe does not touch the pistons or connecting rods when the engine is running.

## 13. FUEL SYSTEM

### IN-LINE FUEL INJECTION PUMP

**Note!** This manual gives only general instructions for repair and service measures related to the fuel system. This applies particularly to the injection pump which can be repaired only by a specially trained person who has the necessary special tools and gauges. All service and repair work related to the fuel system requires special care and cleanliness!

### TECHNICAL DATA

#### Injection pump Bosch-A/Bosch-P

Type (pump/governor) .....	Bosch PES_A/RSV (PES6P/RSV)
Injection order:	
– 320 .....	1-2-3
– 420 .....	1-2-4-3
– 620, 634 .....	1-5-3-6-2-4
Direction of rotation .....	clockwise
Diameter of pump piston:	
– Bosch-A .....	9,5 mm
– Bosch-P .....	12 mm
Stroke:	
– Bosch-A .....	8 mm
– Bosch-P .....	11 mm
Injection advance .....	see injection pump adjusting values
Oil fillings <sup>1)</sup> :	
– 320 .....	0,3 l
– 420 .....	0,4 l
– 620/634 .....	0,6 l

<sup>1)</sup> When fitting fuel injection pump.

#### Fuel feed pump

Type:	
– 320 .....	Bosch FP/KSG 24 AD 207
– 420, 620, 634 .....	Bosch FP/KEG 24 AD 504
Construction .....	piston pump, separate hand pump
Fuel feed pressure (overflow valve opening pressure) .....	0,7 – 1,2 bar (70 – 120 kPa)
Pressure from fuel feed pump (without overflow valve) .....	2,7 bar (270 kPa)

#### Injectors

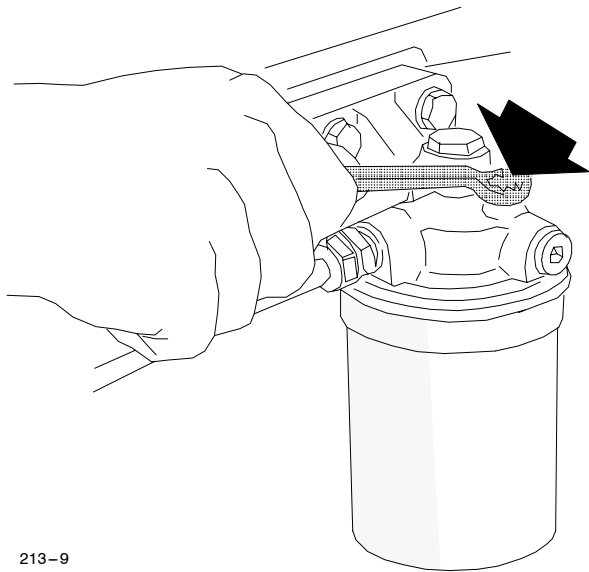
Type .....	
Opening pressure .....	
Sealing ring .....	

#### Tightening torques

Injection pump gear nut:	
– Bosch-A .....	
– Bosch-P .....	
Overflow valve .....	
Injector nozzle sleeve .....	
Injector attaching nuts (on	

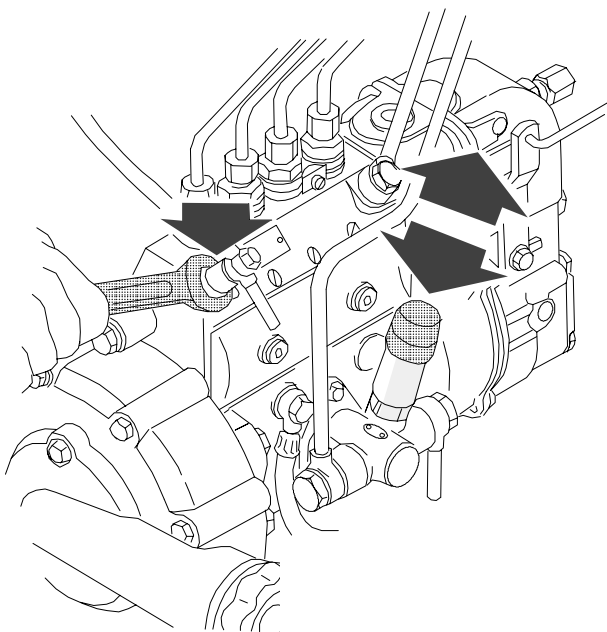


**A. Bleeding fuel system**



213-9

1. Slacken the bleeder screw on the filter head. Pump with the hand pump until the fuel flowing out at the bleeder screw is free from air bubbles. Then tighten the bleeder screw.



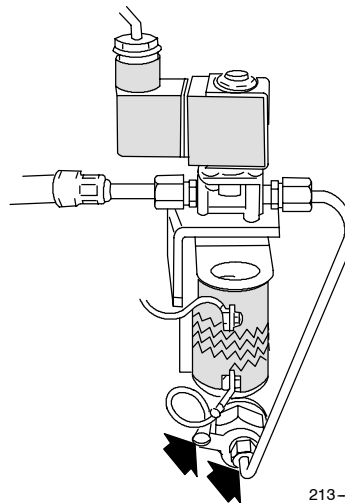
3. Slacken the injection pump hand pump until the fuel flows. Tighten the overflow.

4. Wipe off any fuel from the

**B. Bleeding Thermostart system**

Always remove air from the glow plug fuel pipe when the pipe or reservoir has been emptied during repair work etc. This prevents damages to the glow plug caused by lack of fuel during starting.

**System with the magnetic valve**

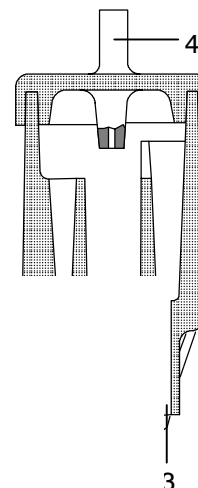


213-11

1. Disconnect the electrical wire from the glow plug and the fuel pipe.
2. Connect electricity to the magnetic valve and rotate the engine until fuel comes out from the fuel pipe connection.
3. Tighten the pipe connection and connect the electrical wire.

**System with a fuel reservoir**

1. Reservoir filling
2. To the glow plug
3. Return the fuel tank



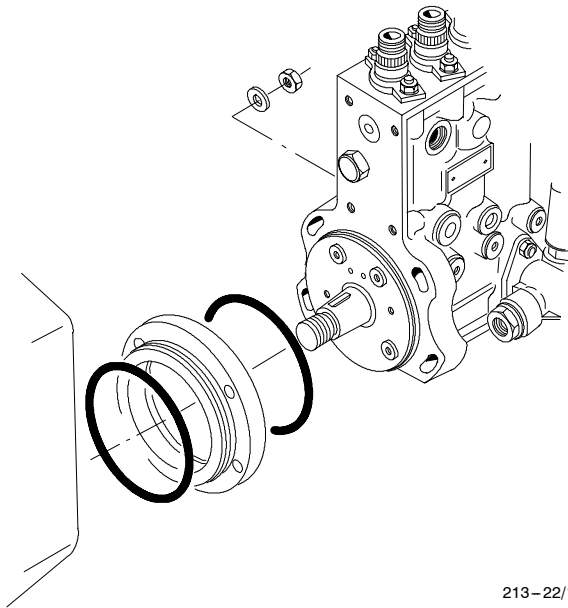
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**Bosch-P injection pump**

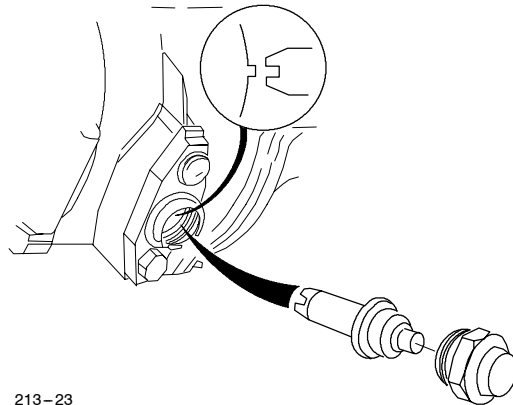
1. Check the condition of the o-rings between the pump and the timing gear casing. Change the o-rings if necessary.



2. Lubricate the o-ring and put the fit ring to the timing gear casing.
3. Lubricate the o-ring and place the injection pump so that the key on the pump shaft aligns with the key slot inside the gear. Tighten the gear nut to **200 Nm** and fit the cover.
4. Adjust the injection timing, see instruction **13 G**.
5. Connect the supply and return fuel lines. Connect the lubricating oil line. Use new sealing washers. Fit the delivery pipes.
6. Bleed the fuel system, see instruction **13 A**.

**Note!** In some types of injection pumps the injection starting point in the 1st cylinder has been positioned with aid of an indicator pin in the pump governor housing. This type of injection pump is installed as follows:

1. Turn the crankshaft to a position where the 1st cylinder piston reaches its compression stroke top dead centre. Then turn the crankshaft backwards until the mark on the pulley passes the timing indicator. After that rotate the crankshaft slowly to running direction until the mark on the pulley is at the point of the timing indicator or the timing mark on the flywheel is at the point of locator 9025 99100 (see instruction **13 F**).



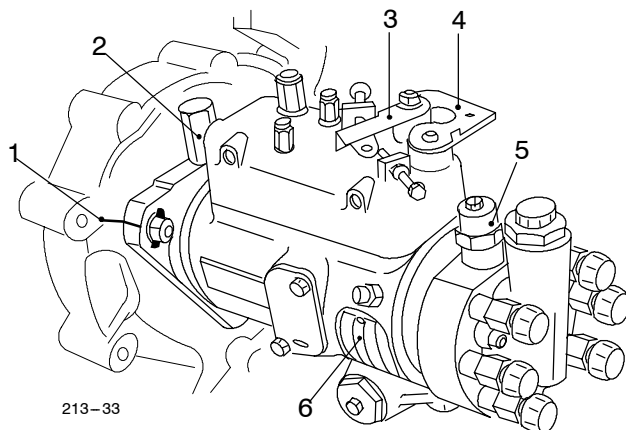
2. Unscrew the plug on the side of the injection pump. Take out the indicator pin.
3. Turn the indicator pin and push it into the hole so that the groove at the end of the pin points towards the pump.
4. Install the injection pump and tighten the installation nuts and the nut on the gear. **Note!** The groove for the key has been left out for the gear.

**Warning!** Do not rotate the crankshaft when the groove end of the pin is inside the pump, since the pin end damages easily and plastic pieces remain in the governor housing.

5. When the adjustment is correct, turn the indicator pin so that the groove points outwards (running position) and push the pin into the hole. Refit the plug.

**CAV DISTRIBUTOR PUMP**

Some 420– and 620–engines are having a CAV made DPA–type distributor pump. The pump is equipped with an electrical solenoid (ignition key starting and stopping) and automatic bleeding system. The internal lubrication of the injection pump is done by the fuel it is pumping. The separate feed pump, of diaphragm type, is driven by the camshaft of the engine. The system is also equipped with a Thermostat–device that receives the fuel through the fuel filter.



- 1. Installation marks of injection pump
- 2. Overflow flange
- 3. Throttle lever
- 4. Stop lever
- 5. Stop solenoid
- 6. Identification plate

**TECHNICAL DATA**

**Injection pump CAV**

Type .....	DPA
Injection order	
420 .....	1–2–4–3
620 .....	1–5–3–6–2–4
Direction of rotation .....	clockwise
Injection advance .....	see pump installation marks

**Fuel feed pump**

Construction .....	diaphragm pump, separate hand lever
Fuel feeding pressure (static) .....	0,48 bar (48 kPa)
Fuel feeding pressure min. (used pump) .....	0,20 bar / max. rpm

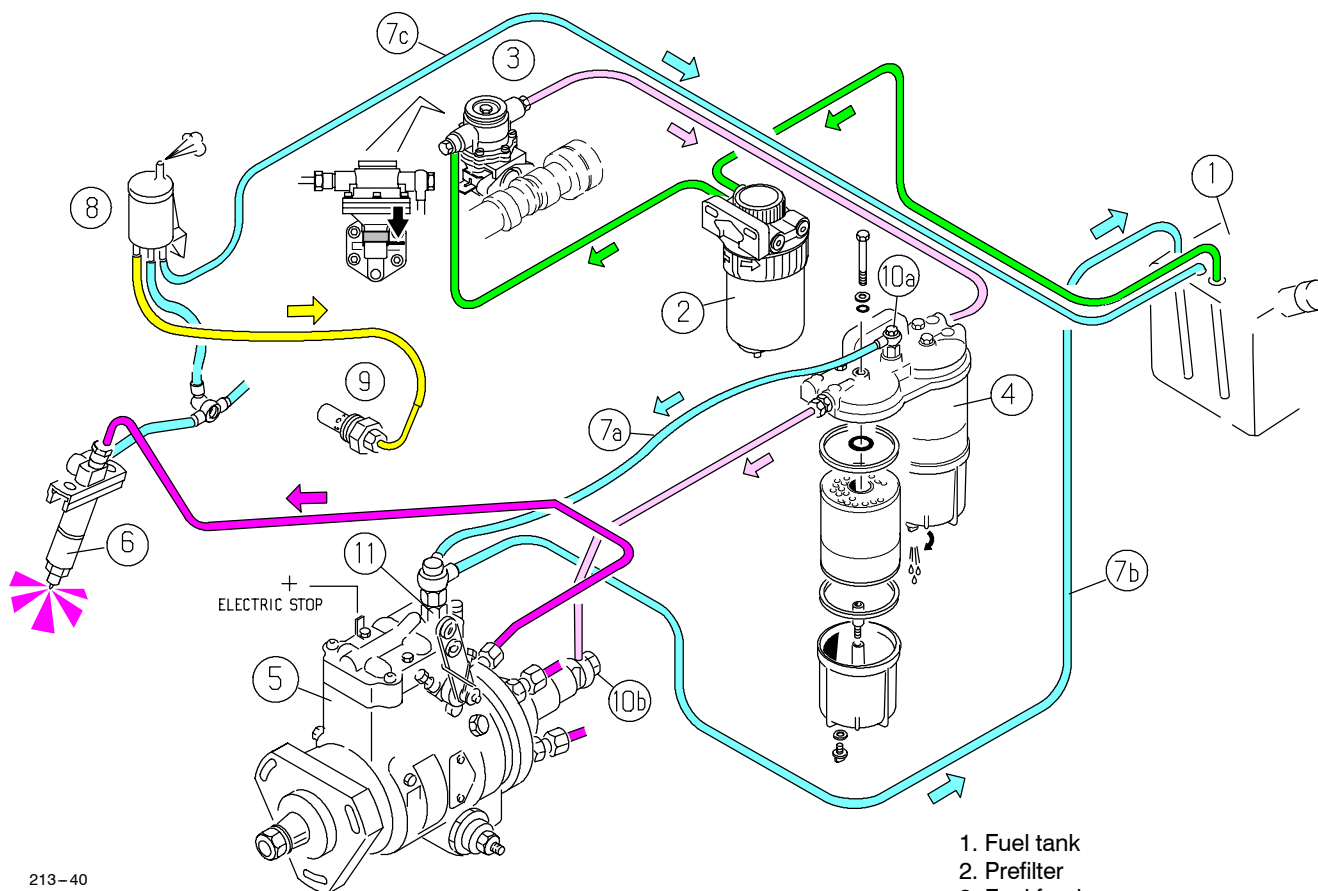
**Injectors CAV**

Construction .....	five–hole nozzle
Control pressure (new injector) .....	250 <sup>+8</sup> bar
Control pressure (used injector) .....	230 <sup>+8</sup> bar
Sealing ring .....	8999 01495

**Tightening torques**

Pump gear retaining nut .....	90 Nm
Nozzle retaining nut .....	60 Nm
Injector retaining nuts (for the studs) .....	15 Nm

## Fuel system with distributor pump



1. Fuel tank
2. Prefilter
3. Fuel feed pump
4. Fuel filter
5. Distributor pump
6. Injector
- 7a,b,c. Return fuel to tank
8. Thermostart reservoir
9. Glow plug
- 10a,b. Bleeding screws
11. Valve of reverse back flow

In this fuel system, there is a separate fuel feed pump (3) on the RH side of the engine.

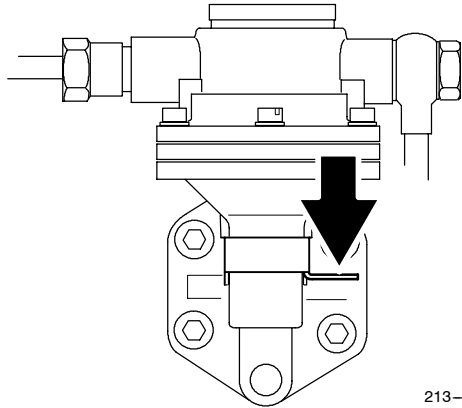
The system includes a separate prefilter (2) and a fuel filter (4). The lower parts of the fuel filter housings have a space for possible impurities and there is a draining tap under both filter housings.

The fuel feed pump has a washable filter. There is also a tapered metal net filter inside the distributor pump in the inlet line before the pump transfer pump.

The fuel system is often equipped with the Thermostart device to be used in cold conditions. The glow plug (9) receives fuel from a separate reservoir (8) of the thermostart device or from the overflow valve of the injection pump regulated by the magnetic valve.

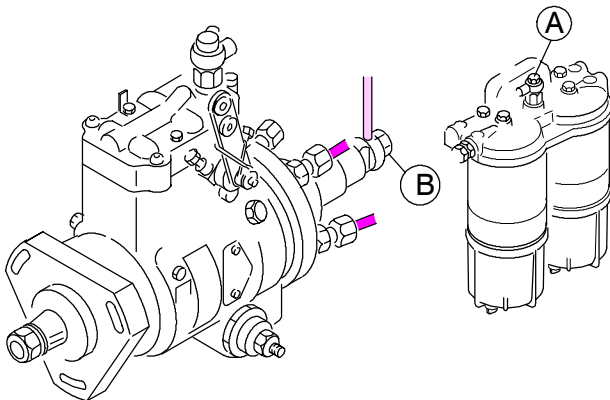
## C. Bleeding fuel system

**Note!** This fuel system removes automatically small amounts of air bubbles from the filter and the pump when the engine is running. However, bleed the system always, when the system has been opened or fuel has been exhausted during driving or a new spare pump has been fitted (to avoid long starting time).



213–45

1. Pump by hand the fuel feed pump lever. If the pumping seems to be ineffective, turn the engine a little so that the camshaft cam is not at the feed pump lifter.



213–46

2. Loosen the bleeding screw **A** on the filter. Pump with the hand pump until no air bubbles flows out of the bleeding screw hole. Tighten the bleeding screw.

3. Pump further with the hand pump and loosen the fuel inlet connection **B** on the pump, until the fuel coming out is free from air bubbles. Tighten the connection.

4. Start the engine and assure, that no leaks exist.

**Note!** When the bleeding is done in this way, fuel flows immediately into the internal transfer pump when the starter motor is rotating and the distributor pump housing is filled quickly with fuel. In the pump housing there is a stop solenoid, which must not be switched on for longer periods when the pump housing is empty of fuel.

## D. Fuel feed pump

For the membrane type fuel feed pump no spare parts are supplied. The feed pump must be changed for a new one, if the feed pressure has dropped noticeably (min. **0,20 bar**/max. rpm) or if the fuel feed pump has been damaged.

**Note!** From engine number H 6794 have engines provide with new type fuel feed pump. New pump is fixed to cylinder block with four screws instead of the previous two. The new pump can be used as spares also to earlier made engines using repair kit 8366 62052, see Service information no 50 98.

### Measuring fuel feed pressure

- Clean the injection pump, filter and all fuel pipes.
- Connect a pressure gauge between the filter and the injection pump, connect the pressure gauge to the inlet pipe in the middle of the injection pump rear end (point **B** in the previous instruction).
- Allow the engine to run at the idling speed and read off the fuel feed pressure in the pressure gauge.

**Note!** If the feed pressure value is below the rated value, possible reason can be:

- blocked fuel filter/fuel feed pump metal gauze filter
- faulty fuel feed pump
- blocked or leaked fuel pipes or pipe connections

**Important!** Under the fuel feed pump cover there is a washable filter. If much impurities have gathered on this filter, fuel cannot flow to the feed pump and further to the injection pump and this causes malfunctions in the fuel system. Always when malfunctions appear, the feed pump cover should be removed and the metal gauze filter must be checked and cleaned.

## E. Injectors

Injectors are checked and serviced according to instructions **13 L...O** on pages **13–13...13–15**.

Opening and setting pressures of the injectors are on page **14–10**.

Adjustment is achieved by changing the shims. The thickness of the shims varies from 1.00...1,90 mm and they are available in increments of 0,05 mm. A thicker shim will raise the opening pressure while a thinner one lowers it. A difference in shim thickness of 0,05 mm changes the opening pressure by approx. 5,0 bar. As the opening pressure of the injector drops slightly after adjustment, the opening pressure should be set to approximately 10 bar above the value given in the specifications. This value applies both to new and used injector.

**FUEL SYSTEM  
EQUIPMENT AND FEEDING TABLE**

320

Test equipment ISO 4008  
Fluid ISO 4113  
Pipes ø 6 x 2 x 600 ISO 4093

Nozzle ISO 4010 173 bar or  
nozzle ISO 7440 207 bar  
0,60 orifice plate

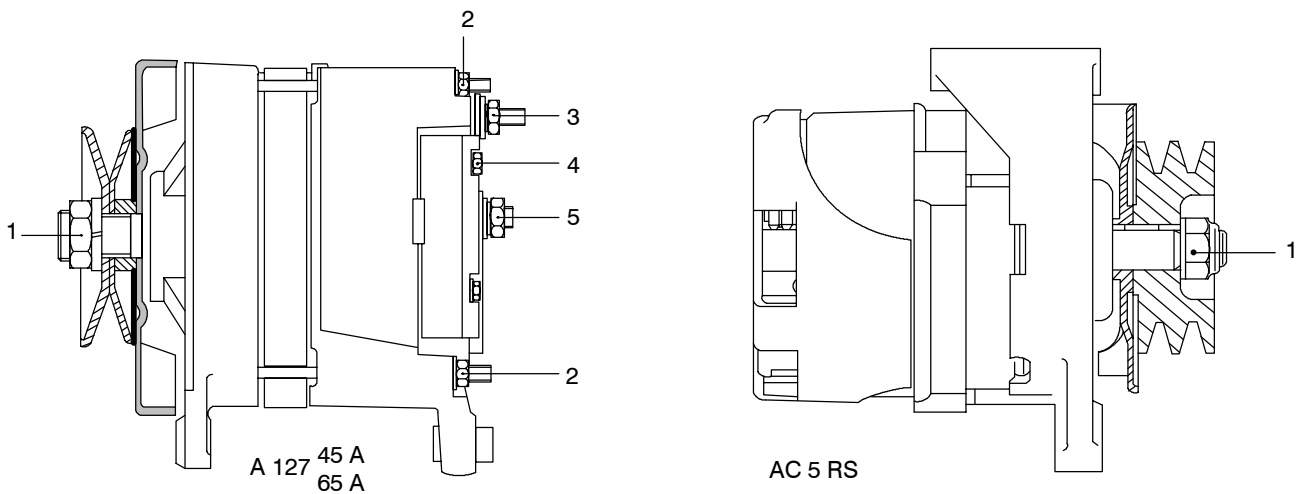
Engine	Application	Pump spare part no Fuel adjustment card	Pump Governor	Injection advance° Max. output r/min Idling r/min Output kW	ISO 4010 mm <sup>3</sup>	Feed rate mm <sup>2</sup> /stroke rpm	ISO 7440 mm <sup>3</sup>	RW mm	Control rod min. rpm	Control rod position 4 mm rpm	Element Pressure valve Governor spring
320 DS	Valmet 6100	8366 40199 13.222/1	PES 3A 95D	19	102-104	1150	101-103	12,1...12,5 +0,1...0,2 +0,3...0,4 +0,3...0,4 4,1...4,7	1170-1190	1240-1260	8353 31161
			320 RS 2810 /C	2300							8353 39126
			RSV 375-1175 A2C 2178-10R	750 58							8353 31163
				375							
320 D	Valmet 355	8366 40198 13.202/1	PES 3A 95D	21	79-81	1150	73-88	10,7...11,1 11,1...11,5 11,6...12,0 11,6...12,0 4,1...4,7	1200	1280-1300	8353 31161
			320 RS 2810 /B	2350							8353 39126
			RSV 375-1175 A2C 2178-10R	750 45							8353 31163
				800 500 325							
320 DS	Valmet 455	8366 40197 13.223/1	PES 3A 95D	19	79-81	1150	82-84	10,0...10,4 +0,2...0,3 +0,5...0,6 +0,5...0,6 4,1...4,7	1200-1220	1270-1300	8353 31161
			320 RS 2810 /A	2350							8353 39126
			RSV 375-1175 A2C 2178-10R	750 49							8353 31163
				800 500 325							
320 DS	Valmet 555	8366 40156 13.230	PES 3A 95D	19	94-96	1175	94-96	11,3...11,7 11,3...11,7 12,0...12,4 11,9...12,5 4,1...4,7	1200	1255-1285	8353 31161
			320 RS 2810	2350							8353 39126
			RSV 375-1175 A2C 2178-10R	750 53							8353 31163
				800 500 375							
320 DG	Aggregate	8366 40382 13.250/1	PES 3A 95D	21	78-80	740	82-84	10,9...11,3 10,9...11,3 8,6...9,0 6,1...6,5 3,8...4,2	754-756	778-782	8353 31161
			320 RS 2810 /D	1500							8353 39126
			RSV 375-750 A2C 2178-10R	1570 33							8367 54532
				760 770 780							

# 15. ELECTRICAL SYSTEM

## A. Alternators

**Magneti Marelli A 127 45 A/65 A** (Sisu Diesel no. 8366 40127 45 A)  
 (Lucas) (Sisu Diesel no. 8366 40128 65 A)

Nominal voltage .....	12 V
Max. voltage 6000 r/min .....	A 127 45 A ..... 45 A
	A 127 65 A ..... 65 A
Earthing .....	(-) minus
Max. allowed speed .....	15 000 r/min
Brush length when new .....	17 mm
Min. brush length .....	5 mm
Brush spring tension .....	1,3...2,7 N
Number of stator poles .....	12
Number of stator phases .....	3
Stator resistance .....	A 127 45 A ..... 0,25 ohm
	A 127 65 A ..... 0,18 ohm
Rotor resistance .....	2,9 ohm
Regulating voltage .....	13,6...14,4 V
Tightening torques:	
1. Shaft nut .....	60 Nm
2. Assembling screws .....	5,5 Nm
3. Phase connection (M5) .....	4,0 Nm
4. Regulator screws .....	2,5 Nm
5. Main connection .....	4,0 Nm



**CAV AC 5 RS 24 V 55 A** (Sisu Diesel no. 8353 39422)

Nominal voltage .....	24 V
Output	
2000 r/min .....	27 A
3000 r/min .....	42,5 A
4000 r/min .....	49 A
Charge begins .....	1250 r/min
Max. allowed speed .....	10 000 r/min
Min. slip ring diameter .....	32 mm
Min. brush length .....	8 mm
Brush spring tension .....	2,23 N
Rotor resistance .....	8,0...8,3 ohm
Stator resistance .....	0,09 ohm
Tightening torques:	
1. Shaft nut .....	55 Nm