

Document Title: Engine, description	Function Group: 200	Information Type: Service Information	Date: 2014/4/11
Profile: CEX, EC55B [GB]			

Engine, description

Model name (4TNV94L: EC55B Serial no. ~ 33452/ EW55B Serial no. ~ 30335)

Machine	Place of manufacture, serial number (4TNV94L)	
	Korea	China
EC55B	~ 33292	~ 50064
EW55B	~ 33452	-

Model code (4TNV94L)

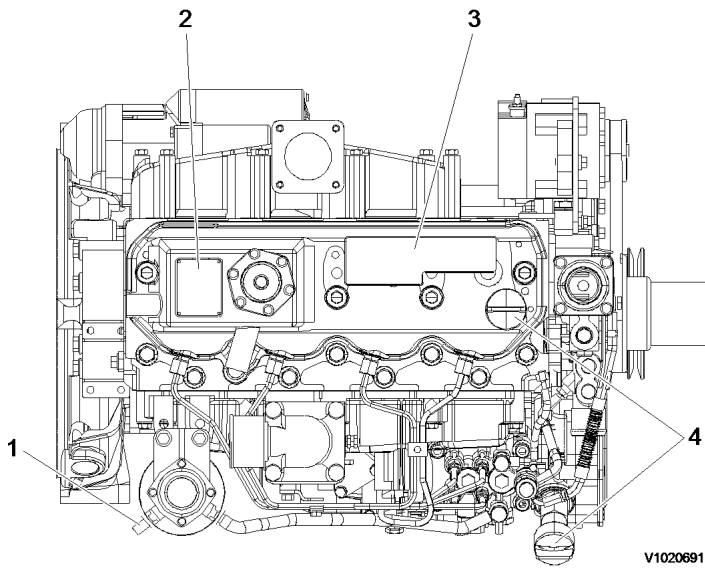
Symbol	Description	Remarks
4	Number of cylinders	
TNV	Model series	
94	Cylinder bore (mm)	
L	The subdivision code of the model name	

Model name (D3.1: EC55B Serial no.: 33453 ~ / EW55B Serial no.: 30336 ~)

Machine	Place of manufacture, serial number (D3.1)	
	Korea	China
EC55B	33293 ~	50065 ~
EW55B	30336 ~	-

Symbol	Description	Remarks
D	Diesel Engine	
3.1	Displacement	

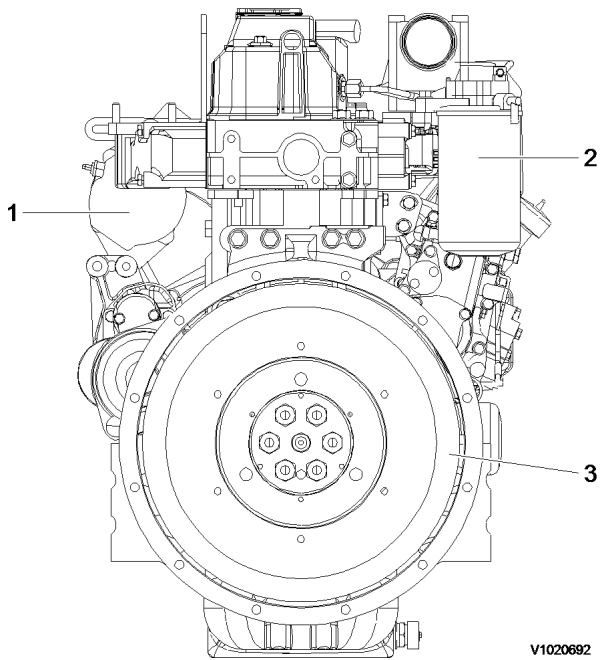
- The engine is a 4-cycle, 4-cylinder, direct injected, water cooled diesel engine.
- The engine produces powerful performance using direct injection type combustion chamber.



V1020691

Figure 1
Engine, top side view

1. Fuel oil inlet
2. Engine data plate
3. EPA or EU label
4. Oil filler port



V1020692

Figure 2
Engine, rear side view

1. Alternator
2. Fuel filter
3. Flywheel

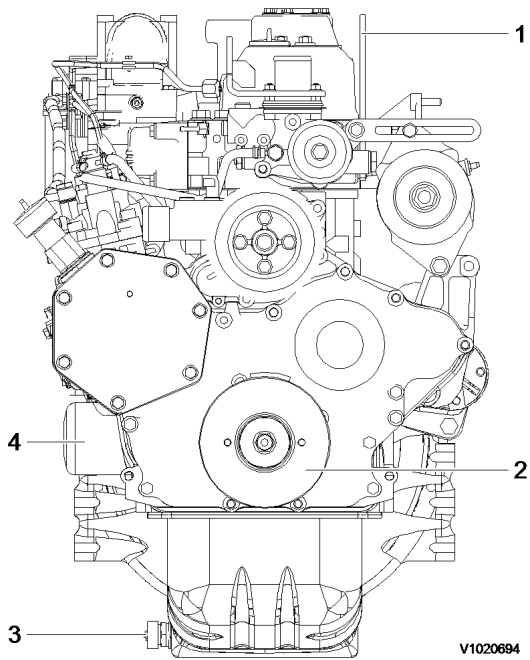


Figure 3
Engine, front side view

1. Lifting eye
2. Crankshaft V-pulley
3. Oil drain valve (M22 × 1.5P)
4. Engine oil filter

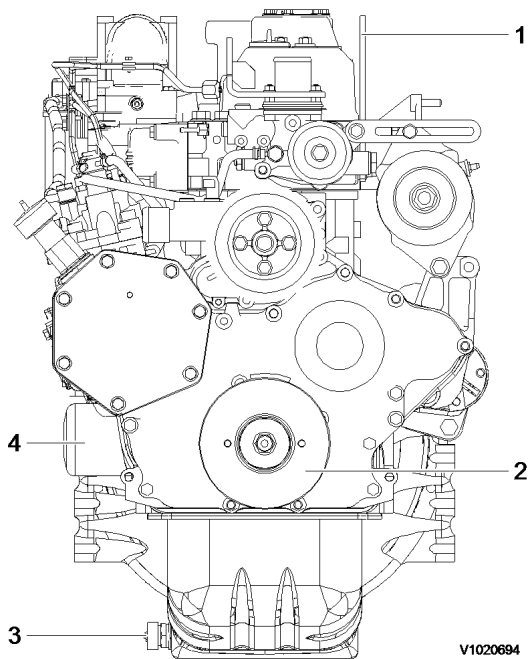
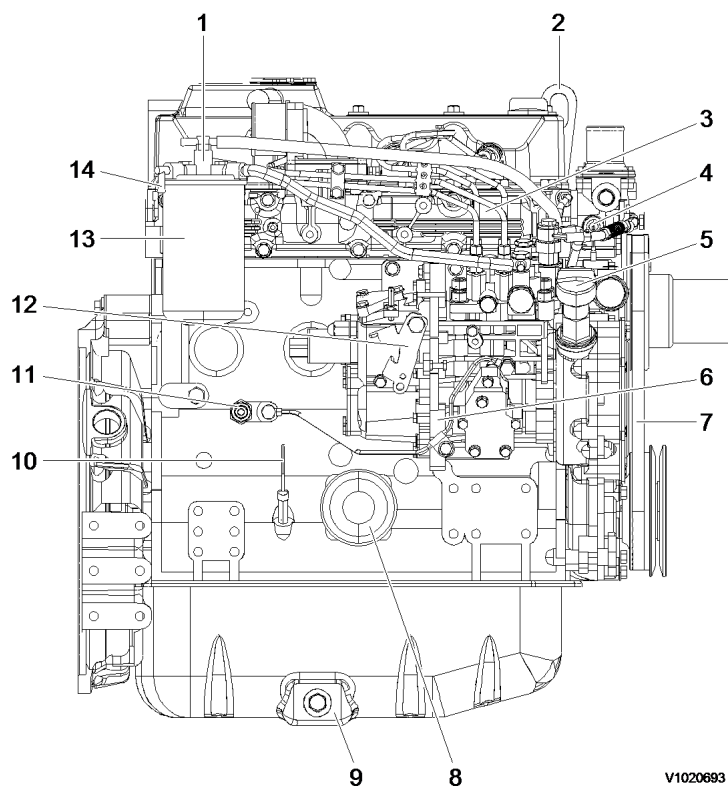


Figure 4
Engine, starter motor side view

1. Alternator
2. Lifting eye
3. Exhaust manifold
4. Rocker arm cover
5. Starter motor



V1020693

Figure 5
Engine, fuel filter side view

1	Fuel filter mounting	6	Fuel injection pump	11	Oil pressure switch
2	Lifting eye	7	V-belt	12	Governor lever
3	Intake manifold	8	Engine oil filter	13	Fuel filter
4	C. W. switch	9	Engine oil drain plug	14	Fuel oil inlet
5	Oil filler port	10	Engine oil dipstick		

Engine performance curve (EC55B)

Place of manufacture, serial number	
Korea	China
~ 34475	~ 50129

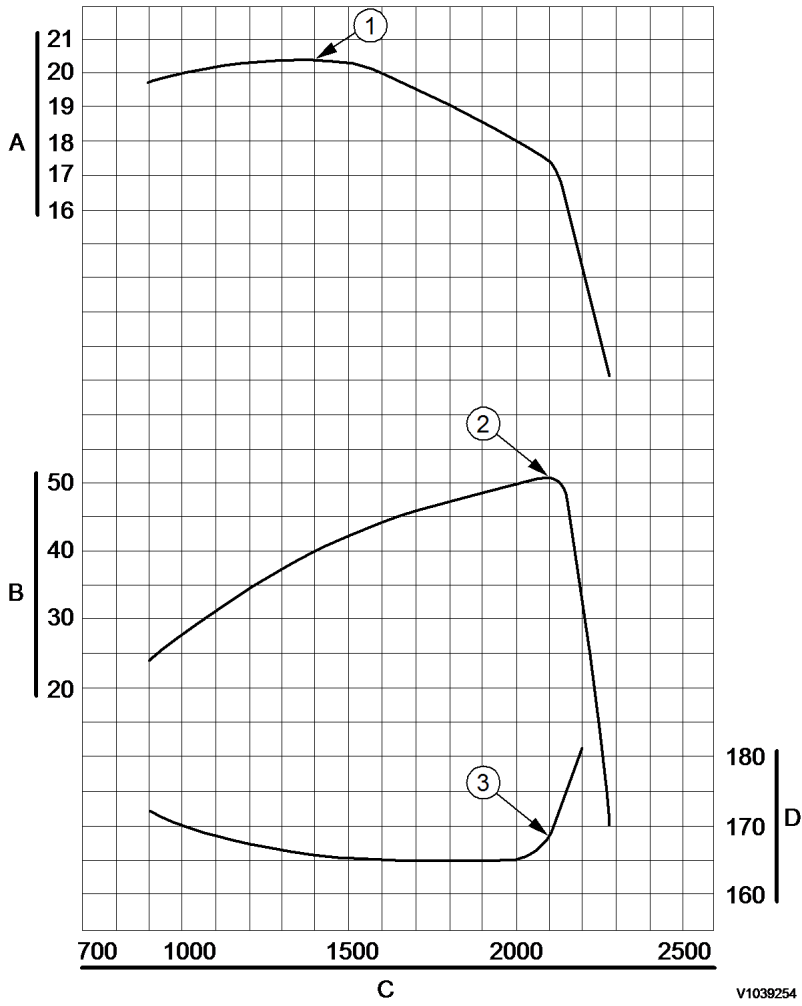


Figure 6
Engine performance curve (EC55B)

- A. Torque (kg-m)
 - B. Power (PS)
 - C. Speed (rpm)
 - D. Fuel consumption (g/ps hr)
1. 200.0 N m (20.4 kgf m) (147.2 lbf ft) at (400 rpm)
 2. 38.2 kW (51.2 HP) (52.0 PS) at (2100 rpm)
 3. 168 p/PS h (229 g/kW h)

Engine performance curve (EC55B)

Place of manufacture, serial number	
Korea	China
34476 ~	50130 ~

- A. Torque (kg-m)
 - B. Power (PS)
 - C. Speed (rpm)
 - D. Fuel consumption (g/ps hr)
1. 200.0 N m (20.4 kgf m) (147.2 lbf ft) at (1400 rpm)
 2. 37.1 kW (49.7 HP) (50.5 PS) at (2100 rpm)
 3. 168 p/PS h (229 g/kW h)

Engine performance curve (EW55B)

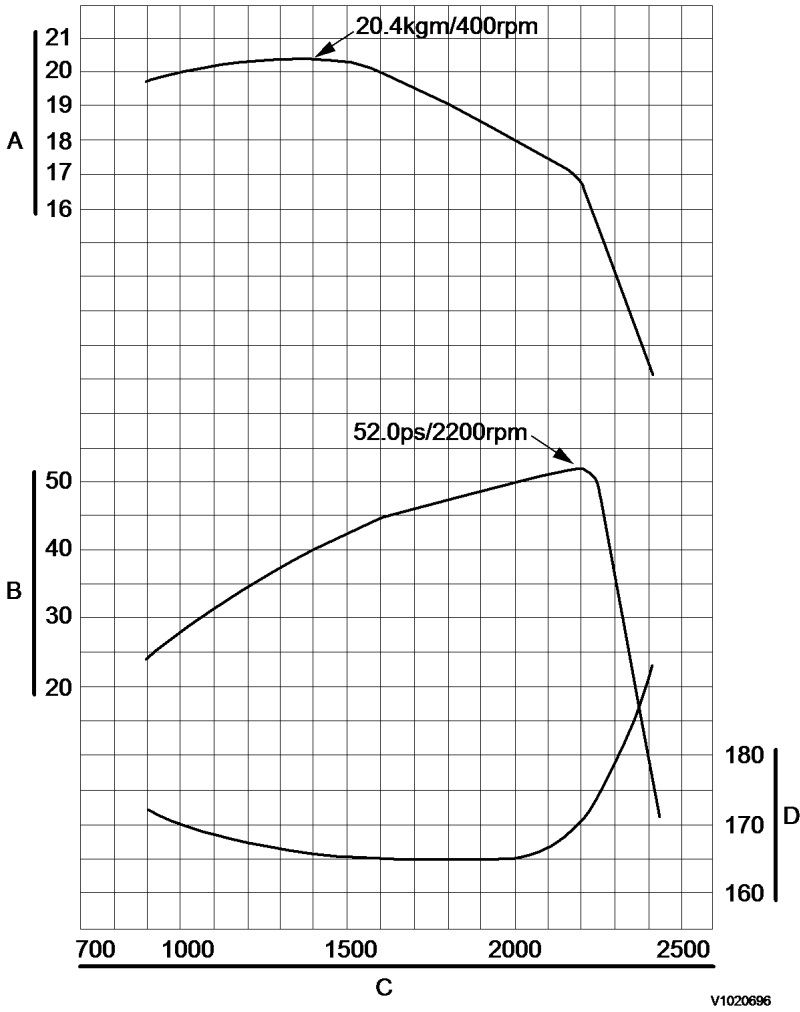


Figure 8
Engine performance curve (EW55B)

- A. Torque (kg-m)
- B. Power (PS)
- C. Speed (rpm)
- D. Fuel consumption (g/ps hr)

Document Title: Engine, tightening torque	Function Group: 200	Information Type: Service Information	Date: 2014/4/11
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Engine, tightening torque

Tightening torque, unit: Nm (lbf ft)

Item	Nominal size	Tighten torque	Lubricating oil application (thread portion, and seat surface)
Cylinder head screw	M 11 × 1.25	103.1 ~ 112.9 (76 ~ 83)	Applied
Connecting rod screw	M10 × 1.0	53.9 ~ 58.8 (40 ~ 43)	Applied
Flywheel set screw	M14 × 1.5	186.2 ~ 205.8 (137 ~ 152)	Applied
Bearing cap set screw	M 11 × 1.25	108.1 ~ 117.9 (80 ~ 87)	Applied
Crankshaft pulley set screw	M14 × 1.5	107.9 ~ 127.5 (80 ~ 94)	Applied
Fuel injection nozzle set screw	M 8 × 1.25	22.6 ~ 28.4 (17 ~ 21)	Not applied
Fuel feed pump drive gear set nut	M 18 × 1.5	113 ~ 123 (83 ~ 90)	Not applied
High-pressure fuel lines screw	M 12 × 1.5	19.6 ~ 24.5 (174 ~ 217)	Not applied
Fuel return pipe joint screw	M 6 × 1.0	7.8 ~ 9.8 (70 ~ 86)	Not applied

Tightening torque for standard screws and nuts, unit: Nm (lbf ft)

Item	Nominal size	Tighten torque	Lubricating oil application (thread portion, and seat surface)
Screw (7T) and nut	M 6 × 1.0	9.8 ~ 11.8 (7 ~ 9)	<ul style="list-style-type: none"> Use 80% of the value at left when the tightening part is aluminium. Use 60% of the value at left for 4T screws and lock nuts.
	M 8 × 1.25	22.6 ~ 28.4 (17 ~ 21)	
	M 10 × 1.5	44.1 ~ 53.9 (33 ~ 40)	
	M 12 × 1.75	78.4 ~ 98 (58 ~ 72)	
	M 14 × 1.5	127.5 ~ 147.1 (94 ~ 108)	
	M 16 × 1.5	215.7 ~ 235.4 (157 ~ 174)	
PT plug	1/8	9.8 (7)	
	1/4	19.6 (14)	
	3/8	29.4 (22)	
	1/2	58.5 (43)	
Pipe joint screw	M 8	12.7 ~ 16.7 (9 ~ 12)	
	M 10	19.6 ~ 25.5 (14 ~ 19)	
	M 12	24.5 ~ 34.3 (18 ~ 25)	
	M 14	39.2 ~ 49 (29 ~ 36)	
	M 16	49 ~ 58.8 (36 ~ 43)	

NOTE!

Lubricating oil is not applied to threaded portion and seat surface.

Document Title: Precautions	Function Group: 200	Information Type: Service Information	Date: 2014/4/11
Profile: CEX, EC55B [GB]			

Precautions

Make preparation as follows before starting engine inspection and service.



Risk of personal injury. Very heavy object.

Be sure to fix the engine securely to prevent injury or damage due to parts falling during the work.



Risk of personal injury! Wear safety glasses and use protective gloves.

Always wear glasses or a protective face shield when using compressed air or steam to prevent any foreign matter from getting into the eyes.

- Fix the engine on a horizontal base.
- Remove the coolant hoses, fuel oil pipes, wire harness, control wires etc. connecting the driven machine and engine, and drain coolant, lubricating oil and fuel.
- Remove soil, oil, dust, etc. from the engine by washing with solvent, air, steam, etc. Carefully operate so as not to let any foreign matter enter the engine.
- Any part which is found defective as a result of inspection or any part whose measured value does not satisfy the standard or limit shall be replaced.
- Any part predicted to dissatisfy the standard or limit before the next service as estimated from the state of use should be replaced even when the measured value then satisfies the standard or limit.

Document Title: Maintenance standards	Function Group: 200	Information Type: Service Information	Date: 2014/4/11
Profile: CEX, EC55B [GB]			

Maintenance standards

Engine service standard

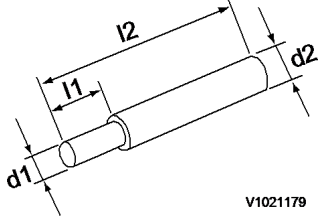
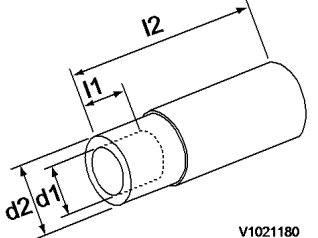
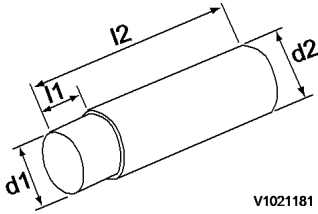
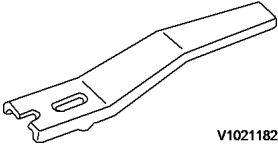
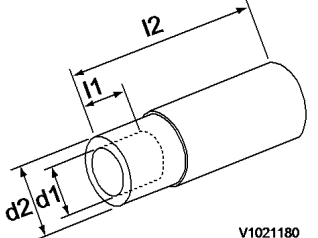
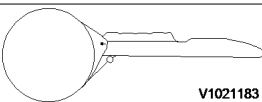
Inspection item	Unit	Standard	Limit
Intake / Exhaust Valve Clearance	mm (inch)	0.15 ~ 0.25 (0.006 ~ 0.010)	
Fuel injection pressure	MPa (kgf/cm ²) (psi) (bar)	21.6 ~ 22.6 (220 ~ 230) (3129 ~ 3271) (21.6 ~ 225.6)	
Compression at 250 rpm	MPa (kgf/cm ²) (psi) (bar)	3.43 ±0.09 (35 ±1) (498 ±14) (34.3 ±0.98)	2.74 ±0.09 (28 ±1) (398.2 ±14.2) (27.4 ±0.98)
Coolant capacity (engine only)	Liters (US gal)	4.2 (1.1)	
Lubricating oil capacity (oil pan)	High	11.5 (3)	
	Low	5 (1.3)	
Oil pressure switch operating pressure	MPa (kgf/cm ²) (psi)	0.04 ~ 0.06 (0.4 ~ 0.6) (5.8 ~ 8.8)	
Thermostat	Valve opening temperature	°C (°F)	82 (179.6)
	Full opening lift (temperature)	mm (inch) / °C (°F)	8 (0.32) or more / 95 (203)
Coolant Temperature Switch	°C (°F)	107 ~ 113 (225 ~ 235)	

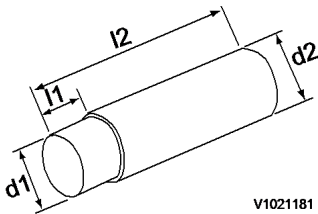



Document Title: Special tools	Function Group: 200	Information Type: Service Information	Date: 2014/4/11
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Special tools

Special tools



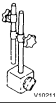












Special tools





Tool name	Applicable model and tool size	Illustration
Valve guide tool (for extracting valve guide)	Part number: 14527850 Drift <ul style="list-style-type: none"> ○ l1 : 20 mm (0.787 in) ○ l2 : 75 mm (2.953 in) ○ d1 : 6.5 mm (0.256 in) ○ d2 : 10 mm (0.394 in) 	 V1021179
Valve guide tool (for inserting valve guide)	Part number: 14527851 Drift <ul style="list-style-type: none"> ○ l1 : 7 mm (0.276 in) ○ l2 : 60 mm (2.362 in) ○ d1 : 13 mm (0.512 in) ○ d2 : 16 mm (0.630 in) 	 V1021180
Connecting rod bushing replacer (for removal/installation of connecting rod bushing)	Part number: 14527852 Drift <ul style="list-style-type: none"> ○ l1 : 20 mm (0.787 in) ○ l2 : 100 mm (3.937 in) ○ d1 : 30 mm (1.181 in) ○ d2 : 33 -0.3/-0.6 mm (1.299 -0.012/-0.024 in) 	 V1021181
Valve spring compressor (for removal/installation of valve spring)	Part number: 8931-00060 Press tool	 V1021182
Stem seal inserter (for inserting stem seal)	Part number: 14527853 Drift <ul style="list-style-type: none"> ○ l1 : 11.8 mm (0.465 in) ○ l2 : 65 mm (2.559 in) ○ l3 : 4 mm (0.157 in) ○ d1 : 15.2 mm (0.598 in) ○ d2 : 21 mm (0.827 in) ○ d3 : 12 mm (0.472 in) 	 V1021180
Filter wrench (for removal/installation of lubrication oil filter)	Available on the market	 V1021183

Camshaft bushing tool (for removing camshaft bushing)	Part number: 8931-00080 Installation tool <ul style="list-style-type: none"> ○ l1 : 18 mm (0.709 in) ○ l2 : 70 mm (2.756 in) ○ d1 : 50 -0.3/-0.6 mm (1.967 -0.012/-0.024 in) ○ d2 : 53-0.3/-0.6 mm (2.087 -0.012/-0.024 in) 	
Flex-hone (for re-honing of cylinder liner)	<ul style="list-style-type: none"> ○ Applicable bore : 89 ~ 101 mm (3.504 ~ 3.976 in) 	
Piston insertion tool (for inserting piston)	The above piston insertion tool is applicable to 60 ~ 125 mm (2.362 ~ 4.921 in) diameter piston.	
Piston ring replacer (for removal/installation of piston ring)	Available on the market	

Measuring tools

Measuring tools

Instrument name	Application	Illustration
Dial gauge	Measurements of shaft bending, strain and gap of surface	
Test indicator	Measurements of narrow or deep portions that cannot be measured by dial gauge.	
Magnetic stand	For holding the dial gauge when measuring using a dial gauge, standing angles adjustable	
Micrometer	For measuring the outside diameter of crankshaft, pistons, piston pins, etc.	
Cylinder gauge	For measuring the side diameters of cylinder liners, rod metal, etc.	
Callipers	For measuring outside diameters, depth, thickness and width	
Depth micrometer	For measuring of valve sink	
Square	For measuring valve spring inclination and straightness of parts	
V-block	For measuring shaft bend	
Torque wrench	For tightening nuts and screws to the specified torque	
Feeler gauge	For measuring gaps between ring and ring groove, and shaft joints during assembly	
Cap tester	For checking water leakage	
Battery/coolant tester	For checking concentration of antifreeze and the battery electrolyte charge status	
Nozzle tester	For measuring injection spray pattern of fuel injection nozzle and injection pressure	
Digital thermometer	For measuring temperature	

Speedometer (contact type)	For measuring revolution by contacting the mortise in the revolving shaft	
Speedometer (photoelectric type)	For measuring revolution by sensing the reflecting mark on the outer periphery of the revolving shaft	 1 : Revolving shaft 2 : Reflection mark
Circuit tester	For measuring resistance voltage and continuity of electrical circuits	
Compression gauge kit	Part number: 14546935 For measuring compression pressure	

Document Title: Periodic maintenance chart	Function Group: 200	Information Type: Service Information	Date: 2014/4/11
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Periodic maintenance chart

NOTE!

Make a periodic inspection plan according to the state of use. Perform periodic inspections accurately so that inspection items will not be skipped. If periodic inspection is neglected, failures may occur or durability may be lost. Inspection and maintenance after 1000 hours require expertise and skill, so consult our dealer or distributor.

Periodic maintenance chart

Part	Item	Daily	Maintenance period				
			Every 50 hours	Every 250 hours or 3 months	Every 500 hours or 6 months	Every 1000 hours or one year	Every 2000 hours or two years
Fuel oil system	Check the fuel level and refill	<input type="radio"/> (before operation)					
	Drain the fuel tank sediment		<input type="radio"/>				
	Drain the water separator		<input type="radio"/> (when warning LAMP on)				
	Replace the water separator element				<input type="radio"/>		
	Replace the fuel filter element					<input type="radio"/>	
Lube oil system	Check the lube oil level	<input type="radio"/> (before operation)					
	Replace the lube oil		<input type="radio"/> (1st time)	<input type="radio"/> (2nd time and thereafter)			
	Replace lube oil filter element		<input type="radio"/> (1st time)	<input type="radio"/> (2nd time and thereafter)			
Cooling system	Check the coolant level and refill	<input type="radio"/> (before operation)					
	Clean the radiator fins			<input type="radio"/>			
	Check the cooling fan V-belt tension		<input type="radio"/> (1st time)	<input type="radio"/> (2nd time and thereafter)			
	Replace the coolant				<input type="radio"/>		
	Check and maintain the coolant system						<input type="radio"/>
Rubber hose	Inspect and maintain the fuel pipe and coolant pipe	<input type="radio"/> (before operation)					<input type="radio"/>
Governor	Inspect and adjust the governor and accelerator	<input type="radio"/> (before operation)		<input type="radio"/>			
Air intake system	Clean and replace the air cleaner element			<input type="radio"/>	<input type="radio"/>		

Electrical system	Check warning lamps and instruments function	O					
	Check the battery electrolyte level and refill		O				
Cylinder body	Adjust the inlet and exhaust valve clearance					O (S)	
	Lap the inlet and exhaust valve seat						O (S)
Fuel injection pump and nozzle	Inspect the fuel injection nozzle pressure					O (S)	
	Inspect the fuel injection timing						O (S)

NOTE!

Item marked "S" should be serviced by an authorized Volvo Construction Equipment dealer, unless the owner has proficient mechanical ability and the proper tools.

Document Title: Periodic inspection and maintenance procedure	Function Group: 200	Information Type: Service Information	Date: 2014/4/11
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Periodic inspection and maintenance procedure

Check before daily operation

Be sure to check the following points before starting the engine every day.

Visual check around engine

If any problem is found, do not use the machine before the engine repairs have been completed.

- Oil leak from the lubrication system
- Fuel leak from the fuel system
- Coolant leak from the cooling system
- Damaged parts
- Loosened or lost screws
- Fuel, radiator rubber hoses cracked, loosened clamp

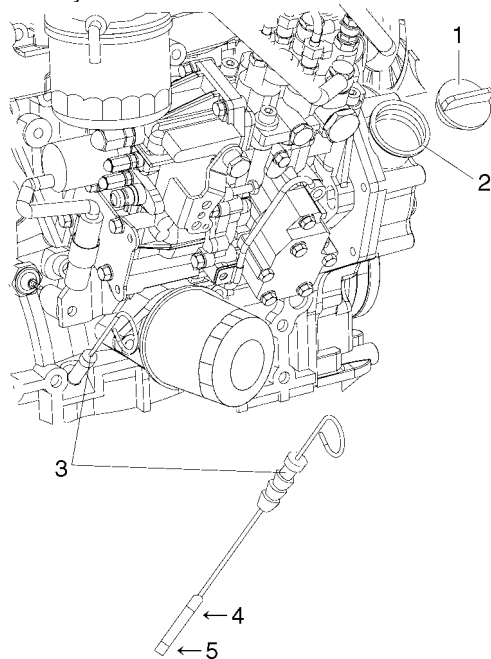
Checking and refueling

Check the remaining fuel oil level in the fuel tank and refuel with the recommended fuel if necessary.

Checking oil level and replenishing with engine oil

1. Checking oil level

Check the engine oil level with the dipstick, after adjusting the posture of the machine unit so that the engine is level. Insert the dipstick fully and check the oil level. The oil shall not be contaminated heavily and have appropriate viscosity. No coolant or diesel oil shall be mixed.



V1020549

Figure 1
Checking oil level and replenishing with engine oil

1. Filler cap
2. Filler port (engine oil)

3. Dipstick gauge
 4. Upper limit
 5. Lower limit
- Standard
The level shall be between the upper and lower limit lines on the dipstick.

Engine oil capacity, unit: liters (US gal)

Total volume	Effective volume
10.1 (2.7)	4.5 (1.2)

2. Replenishing oil pan with engine oil
If the remaining engine oil level is low, fill the oil pan with the specified engine oil to the specified level through the filler port.

NOTE!

The oil should not be overfilled to exceed the upper limit line. Otherwise, oil may jet out from the breather or the engine may become faulty.

Coolant inspection

Daily inspection of the coolant should be done only by sub-tank.



Risk of scalding and burns. The coolant may be hot.

Do not open the radiator filler cap while the engine and radiator are still hot. Steam and hot water will spurt out and seriously burn you. Wait until the radiator is cooled down after the engine has stopped, wrap the filler cap with a rag inside the radiator.



Risk of burns! Use protective work gloves.

Securely tighten the filler cap after checking the radiator. Steam can spurt out during operation, if the cap is not properly tightened.

1. Checking coolant volume
Check the coolant level in the sub-tank. If the water level is close to the LOW mark, open the sub-tank cap and replenish the sub-tank with clean soft water or premix to the FULL mark.

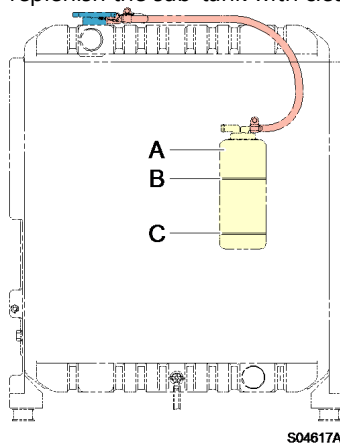


Figure 2
Checking, coolant level in the sub-tank

- A. Sub-tank
 - B. Upper limit
 - C. Lower limit
- Standard

The coolant level of the sub-tank shall be between the upper and lower limit lines.

2. Replenishment engine with coolant

If the sub-tank coolant level is lower than the LOW mark, open the radiator cap and check the coolant level in the radiator. Replenish the radiator with coolant, if the level is low.

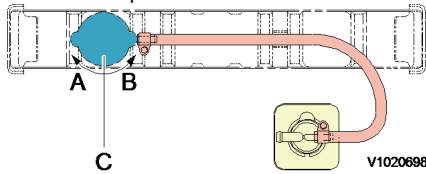


Figure 3
Replenishment, coolant

- A. Tighten
- B. Loosen
- C. Radiator cap

- Check the coolant level while the engine is cool. Checking when the engine is hot is dangerous. And the coolant volume is expanded due to the heat.
- Daily coolant level check and replenishing shall be done only at the sub-tank. Usually do not open the radiator cap to check or replenish.

NOTE!

If the coolant runs short quickly or when the radiator runs short of coolant with the sub-tank level unchanged, coolant may be leaking or the air tightness may be lost. Increase in the sub-tank level during operation is not abnormal. The increased coolant in the sub-tank returns to the radiator when the engine is cooled down. If the level is normal in the sub-tank but low in the radiator, check for loosened clamping of the rubber hose between the radiator and sub-tank or a tear in the hose.

- Standard
Engine: The radiator shall be filled up.

Coolant capacity, unit: liters (US gal)

Coolant volume in the engine
4.2 (1.11)

Checking accelerator operation

Make sure the accelerator of the machine unit can be operated smoothly before starting the engine. If it feels heavy to manipulate, lubricate the accelerator cable joints and pivots. Adjust the accelerator cable if there is a dislocation or excessive play between the accelerator and the governor lever.

Inspection after initial 50 hours operation



Risk of burns! Use protective work gloves.

When an engine is still hot, be careful, a splash of hot engine oil can cause burns to unprotected skin. Replace engine oil after the engine oil becomes warm. It is most effective to drain the engine oil while the engine is still warm.

In early period of use, the engine oil gets dirty rapidly because of the initial wear of internal parts. Replace the engine oil earlier. Engine oil filter should also be replaced when the engine oil is replaced. Engine oil and engine oil filter replacing procedures are as follows. Remove the oil filler cap to drain easily while draining the engine oil.

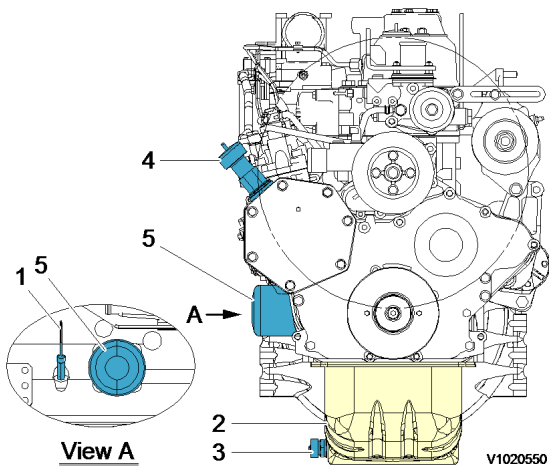


Figure 4
Dipstick gauge, oil pan and drain plug

1. Dipstick
 2. Oil pan
 3. Drain plug
- Drain engine oil
 - Prepare a waste oil container collecting waste oil.
 - Remove the drain plug using a wrench to drain the engine oil.
 - Securely tighten the drain plug after draining the engine oil.
 - Replacing oil filter

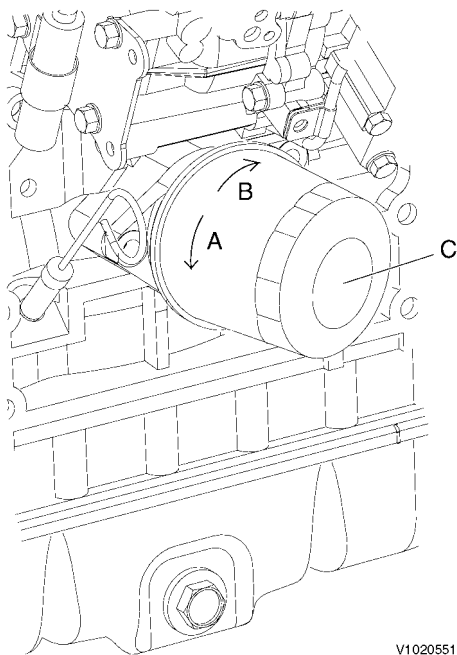


Figure 5
Replacement, engine oil filter

- A. Loosen
 - B. Tighten
 - C. Engine oil filter
- Turn the engine oil filter counterclockwise using a filter wrench to remove it.
 - Clean the mounting face of the oil filter.

- Moisten the new oil filter gasket with the engine oil and install the new engine oil filter manually turning it clockwise until it comes into contact with the mounting surface, and tighten it further to 3/4 of a turn with the filter wrench.
 - Tightening torque: 19.61 N m (2.0 ~ 2.4 kgf m) (14.4 ~ 17.3 lbf ft)
 - Applicable oil filter part number: 129150–35151

- Filling oil and inspection

- Fill with new engine oil until it reaches the specified level.

NOTE!
Do not overfill the oil pan with engine oil. Be sure to keep the specified level between upper and lower limit on the dipstick.
- Warm up the engine by running for 5 minutes while checking any oil leakage.
- Stop the engine after warming up and leave it stopped for about 10 minutes then recheck the engine oil level with dipstick and replenish the engine oil. If any oil is spilled, wipe it away with a clean cloth.

Checking and adjusting radiator fan V-belt

When there is not enough tension in the V-belt, the V-belt will slip making it impossible for the alternator to generate power and water pump and cooling fan will not work causing the engine to overheat. Check and adjust the V-belt tension (deflection) in the following manner.

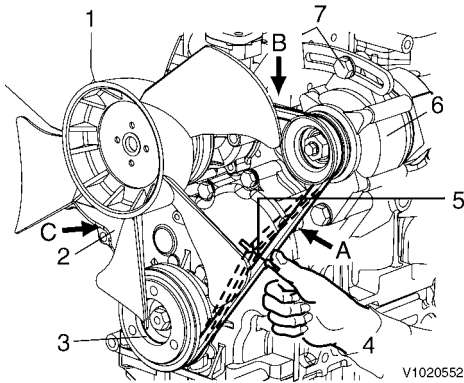


Figure 6
Checking and adjustment, radiator fan V-belt

1. Radiator fan
 2. V-belt
 3. Crankshaft V-pulley
 4. Press with thumb
 5. Deflection
 6. Alternator
 7. Set screw
- Press the V-belt with your thumb [approx. 98 N m (10 kgf m) (98.06 lbf ft)] at the middle of the V-belt span to check the tension (deflection). Available positions to check and adjust the V-belt tension (deflection) are at the A, B or C direction as shown in the illustration right. You may choose a position whichever you can easily carry out the check and adjustment on the machine unit.
 - "New V-belt" refers to a V-belt which has been used less than 5 minutes on a running engine.
 - "Used V-belt" refers to a V-belt which has been used on a running engine for 5 minutes or more.
 - The specified deflection to be measured at each position should be as follows.

V-belt deflection, unit: mm (inch)

Direction	A	B	C
For used V-belt	10 ~ 14	7 ~ 10	9 ~ 13

	(0.39 ~ 0.55)	(0.28 ~ 0.39)	(0.35 ~ 0.51)
For new V-belt	8 ~ 12 (0.31 ~ 0.47)	5 ~ 8 (0.20 ~ 0.31)	7 ~ 11 (0.28 ~ 0.43)

- If necessary, adjust the V-belt tension (deflection).
To adjust the V-belt tension, loosen the set screw and move the alternator to tighten the V-belt.
After replacing with a new V-belt and adjusting it, run the engine for 5 minutes and readjust the deflection to the value in the table above.

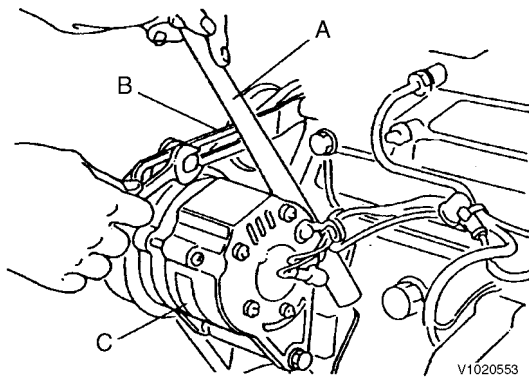


Figure 7
Adjustment, V-belt tension

- A. Bar
- B. Adjuster
- C. Alternator

- Visually check the V-belt for cracks, oiliness or wear.
If any, replace the V-belt with a new one.

Inspection 50 hours

Be sure to check the following points every 50 hours operation.

Draining of the fuel tank

- Prepare a waste oil container.

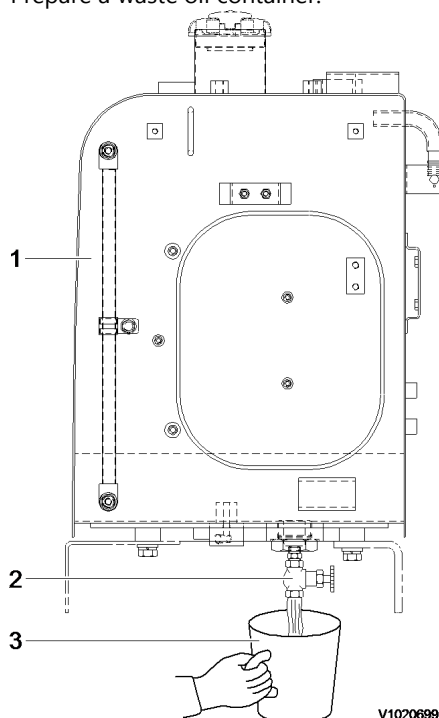


Figure 8

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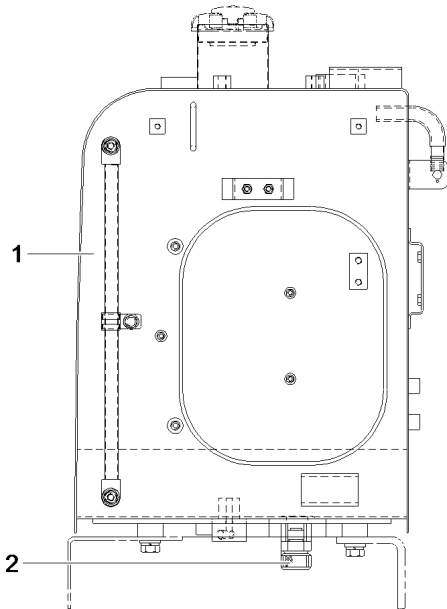
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Draining, fuel (EC55B, EW55B)

Machine	Place of manufacture, serial number	
	Korea	China
EC55B	~ 34500	~ 50117

1. Fuel tank
2. Drain cock valve
3. Oil container



V1039799

Figure 9
Draining, fuel (EC55B)

Machine	Place of manufacture, serial number	
	Korea	China
EC55B	34501 ~	50118 ~

1. Fuel tank
2. Drain plug

- Turn the drain cock valve of the fuel tank to drain (water, dirt, etc.) from the fuel tank bottom.
- Drain until fuel with no water and dirt flow out. Then tighten the drain cock valve firmly.

Draining of the oil/water separator

Drain off the oil/water separator whenever there is a lot of drain collected in the oil/water separator at the bottom of the cup even if not the time for periodic inspection hour. The cup of the oil/water separator is made from semi-transparency material and in the cup, the red colored float ring which rises on the surface of the drain is installed to visualize the amount of drain. Also, the oil/water separator with a sensor to detect the drain for warning device on the control panel is provided as an option.

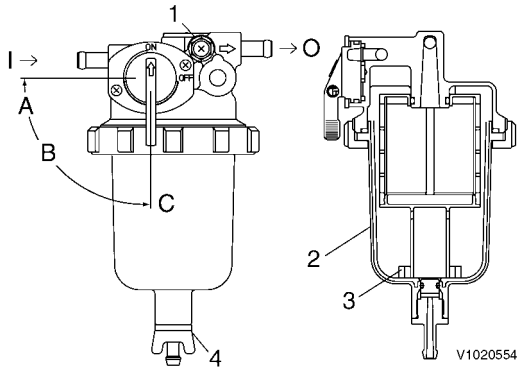


Figure 10
Draining, oil/water separator (EC55B, EW55B)

Machine	Machine serial number
EC55B	~ 33895

1	Air bleeding screw
2	Cup
3	Float ring
4	Drain cock
A	Close
B	Fuel cock
C	Open
I	Inlet
O	Outlet

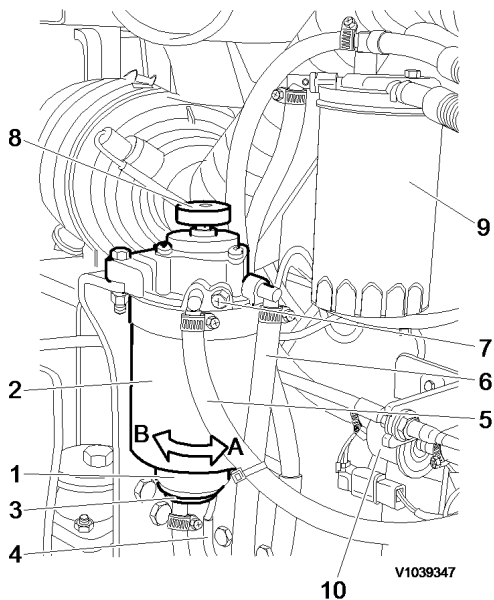


Figure 11
Draining, oil/water separator (EC55B, EW55B)

Machine	Machine serial number
EC55B	33896 ~

1	Use the adjustable wrench or 36 mm (1.42 inch) wrench
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