CX27B

Compact Hydraulic Excavator

PIN number PV13 - and higher

SERVICE MANUAL

Part number S5PV0022E02

English

August 2010

CASE CONSTRUCTION

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(2) Slewing / swing switching operation can not be carried out

When key is switched ON.

• Swithching operation dose not change from slewing to swing.

When slewing / swing select switch is depressed.

Voltage between light green and black harness of connector (CN-120F) of slewing/swing select solenoid (SV-12) is 12V.
- YES → Check on slewing/swing select solenoid. (To troubleshooting for hydraulic system).
- NO →

Voltage between green white and black harness of connector (CN-65F) of slewing / swing select relay is 12V.
- YES → Voltage between ground and green/white harness of connector (CN-65F) of slewing/swing select relay.
  - YES → Check and replace.
  - NO → No.3 fuse is blown.
    - NO → Disconnection of harness between relay and fuse. → Check on harness.
    - YES → Harness is short-circuited to frame. → Check harness on the short-circuited section.
- NO →

Voltage between ground and white harness of connector (CN-64F) of slewing/swing select switch (SW-28) is 12V.
- YES → Disconnection of harness between slewing/swing select switch (SW-28) and slewing/swing select relay (R-14). → Check on harness.
- YES → Failure of slewing/swing select switch (SW-28). → Replace slewing/swing select switch.
- NO →

Voltage between blue green and black harness of connector (CN-67F) of switch change relay (R-22) is 12V.
- YES → Check on slewing lever pressure switch RH (SW-31) slewing lever pressure switch LH (SW-30) and harness.
- NO →

Voltage between ground and yellow/green harness of connector (CN-67F) of switch change relay (R-22) is 12V.
- YES → Failure of switch change relay (R-22). → Replace switch change relay.
- NO → No.3 fuse is blown.
  - NO → Disconnection of harness between relay and fuse. → Check on harness.
  - YES → Harness is short-circuited to frame. → Check harness on the short-circuited section.
  - YES → Check that line in the fuse box is free from disconnection.

Check that line in the fuse box is free from disconnection.

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(10) 4TNV98T

Engine name		Unit	4TNV98T						
Engine specification class		-	CL		VM				
Type		-	Vertical, in-line, 4-cycle, water-cooled diesel engine						
Combustion chamber		-	Direct injection						
Number of cylinders		-	4						
Cylinder bore×stroke		mm×mm	88×110						
Displacement		L	3.318						
Continuous rating	Revolving speed	Min^{-1}	1500	1800	-				
	Output	kW (hp)	37.9 (51.5)	45.6 (62.0)	-				
Rated output	Revolving speed	Min^{-1}	1500	1800	2000	2200	2400	2500	2600
	Output	kW (hp)	41.9 (57.0)	50.4 (68.5)	50.7 (69.0)	55.5 (75.5)	60.3 (82.0)	62.5 (85.0)	64.0 (87.0)
Max. no-load speed (±25)		min^{-1}	1600	1895	2180	2400	2590	2700	2810
Ignition order		-	1-3-4-2-1(No.1 cylinder on flywheel side)						
Power take off		-	Flywheel						
Direction of rotation		-	Counterclockwise (viewed from flywheel)						
Cooling system		-	Radiator						
Lubrication system		-	Forced lubrication with trochoid pump						
Starting system		-	Electric						
Applicable fuel		-	Diesel oil-ISO 8217 DMA, BS 2869 A1 or A2 (cetane No.45 min.)						
Applicable lubricant		-	API grade class CD or CF						
Lubricant capacity (oil pan) *	Total	L	10.2						
	Effective	L	4.5						
Coolant water capacity (engine only)		L	4.2						
Engine dimensions ** (with flywheel housing)	Overall length	mm	715						
	Overall width	mm	575						
	Overall height	mm	779						
Engine mass (dry) ** (with flywheel housing)		kg	258 (equivalent to SAE#3)		245 (equivalent to SAE#4)				
Cooling fan (std.)		mm	430 mm O/D, 8 blades suction type						
Crankshaft V pulley diameter & Fun V pulley diameter (std.)		mm	130×130						

* Engine oil capacity may differ from the above depending on an engine installed on a machine unit.
** Engine mass and dimensions without radiator

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3.2 Quick Reference Table for Troubleshooting

The following table summarizes the general trouble symptoms and their causes. If any trouble symptom occurs, take corrective action before it becomes a serious problem so as not to shorten the engine service life.

	Cause \ Trouble symptom	Starting failure				Insufficient engine output			Poor exhaust color		High knocking sound during combustion	Abnormal engine sound	Uneven combustion sound	Hunting		Large engine vibration	Difficulty in returning to low speed	Excessive fuel consumption	Lubricating oil				Much blow-by gas	Cooling water		Air intake		Exhaust temperature rise	Corrective action
			Engine starts but stops soon.			Exhaust color			During work																					
			Exhaust smoke																											
		Engine does not start.	None	Little	Much	Ordinary	White	Black	White	Black				During idling	During work				Excessive consumption	Dilution by fuel oil	Mixture with water	Low L.O. pressure		Overheat	Low water temperature	Pressure drop	Pressure rise		
Engine system	Improper clearance of intake/exhaust valve	○	○			○						○														○		○	Adjust the valve clearance. (See 2.2.6 in Chapter2.)
	Compression leakage from valve seat					○		○		○		○						○					○			○		○	Lap the valve seat. (See 4.2.6 in Chapter4.)
	Seizure of intake/exhaust valve	○			○	○		○		○		○			○	○				○			○			○			Correct or replace.
	Blowout from cylinder head gasket					○															○			○					Replace the gasket. (See 4.2.2-11) in Chapter4.)
	Seized or broken piston ring	○			○		○		○			○		○		○			○	○			○	○				○	Replace the piston ring. (See 4.2.2-5)10) in Chapter4.)
	Worn piston ring, piston or cylinder	○			○		○		○										○	○			○						Perform honing and use oversize parts. (See 4.4.5-1)4) and 4.4.6 in Chapter4.)
	Seized crankpin metal or bearing	○	○									○		○	○	○							○						Repair or replace.
	Improper arrangement of piston ring joints		○				○												○				○						Correct the ring joint positions. (See 4.4.4-6 in Chapter4.)
	Reverse assembly of piston rings						○		○										○				○						Reassemble correctly. (See 4.4.4-6 in Chapter4.)
	Worn crankpin and journal bearing					○						○		○	○	○						○							Measure and replace. (See 4.4.5-2) in Chapter4.)
	Loosened connecting rod bolt											○				○						○							Tighten to the specified torque. (See 4.4.4-2 in Chapter4.)
	Foreign matter trapped in combustion chamber	○										○							○				○						Disassemble and repair.
	Excessive gear backlash											○																	Adjust gear meshing. (See 4.3.4-2 in Chapter4.)
	Worn intake/exhaust valve guide						○												○				○						Measure and replace. (See 4.2.5-2) and 4.2.7 in Chapter4.)
	Defective governor		○											○	○	○	○												Make adjustment.
	Improper open/close timing of intake/exhaust valves	○					○	○	○	○		○																	Adjust the valve clearance. (See 2.2.6-3) in Chapter2.)
Turbocharger	Fouled blower							○		○																			Wash the blower.
	Waste gate malfunction							○		○																			Disassemble and inspect.
	Worn floating bearing						○		○																				Disassemble and inspect.

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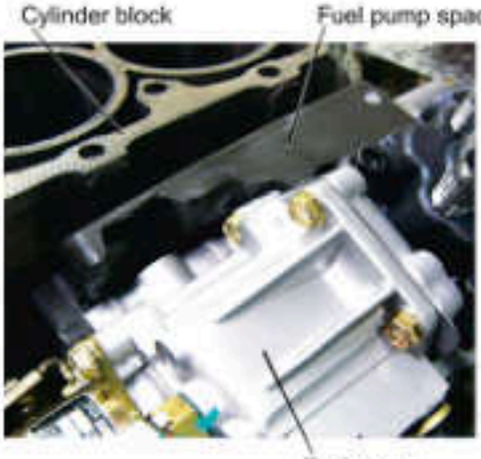
Point 3

[Disassemble]

There is an acoustic material part to name as fuel pump spacer between the fuel pump and the cylinder block. Loosen fuel pump installation bolts with a closed wrench when disassembling a fuel pump.

[NOTICE]

An intake manifold may obstruct the disassembly of the fuel pump by the engine model. Remove the fuel pump after removing the intake manifold first.



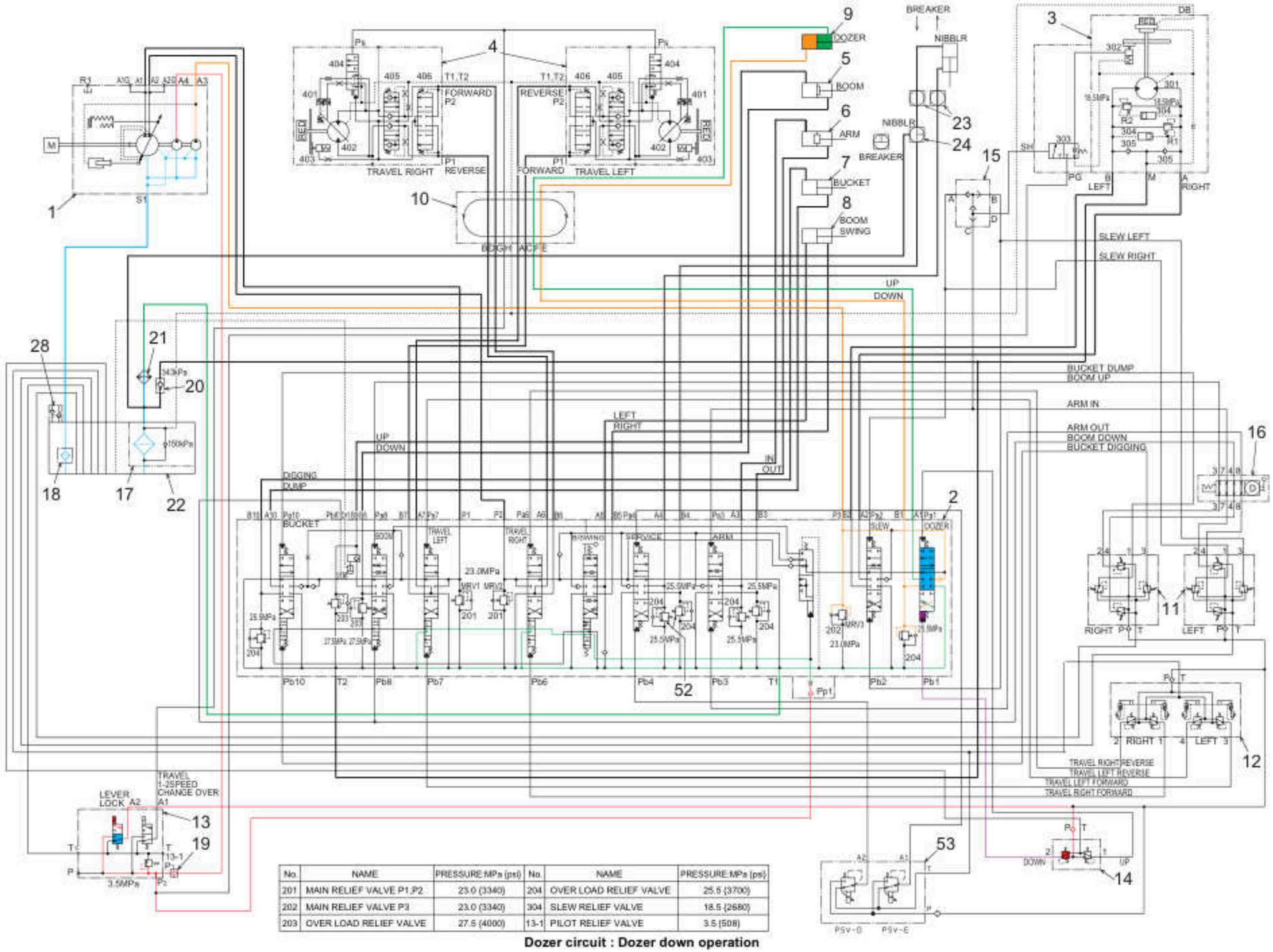


Disassembling a fuel pump

[Reassemble]

When installing a fuel pump on the gear case, put a fuel pump spacer between the cylinder blocks, and install it .

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No.	NAME	PRESSURE:MPa {psi}	No.	NAME	PRESSURE:MPa {psi}
201	MAIN RELIEF VALVE P1,P2	23.0 {3340}	204	OVER LOAD RELIEF VALVE	25.5 {3700}
202	MAIN RELIEF VALVE P3	23.0 {3340}	304	SLEW RELIEF VALVE	18.5 {2680}
203	OVER LOAD RELIEF VALVE	27.5 {4000}	13-1	PILOT RELIEF VALVE	3.5 {508}

Dozer circuit : Dozer down operation

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