UEN01983-03

Shop Manual

HYDRAULIC
EXCAVATOR

PC350LC-8
PC350LCD-8
PC350NLC-8
PC350NLCD-8

SERIAL NUMBERS

PC350LC-8	K50001 and up
PC350LCD-8	K50001 and up
PC350NLC-8	K50001 and up
PC350NLCD-8	K50001 and up

KOMATSU®

MidWestTech | Komatsu PC350LC-8, PC350LCD-8, PC350NLC-8, PC350NLCD-8 Hydraulic Excavator Service Manual | Publication UEN01983-03

Order the manual at mid-west-tech.com >

Table of contents

00 Index and foreword
Index UEN01985-03
Composition of shop manual ... 2
Table of contents ... 4

Foreword and general information UEN01986-00
Safety notice ... 2
How to read the shop manual ... 7
Explanation of terms for maintenance standard ... 9
Handling electric equipment and hydraulic component ... 11
How to read electric wire code ... 23
Precautions when carrying out operation ... 26
Method of disassembling and connecting push-pull type coupler ... 29
Standard tightening torque table ... 32
Conversion table ... 36

01 Specification
Specification and technical data UEN01988-02
Specification dimension drawings ... 2
Dimensions ... 2
Working ranges ... 3
Weight table ... 7
Table of fuel, coolant and lubricants ... 8

10 Structure, function and maintenance standard
Engine and cooling system UEN01990-01
Engine related parts ... 2
Radiator, oil cooler and aftercooler ... 3
Diesel Particulate Filter ... 4
Power train UEN01991-00
Power train ... 2
Final drive ... 4
Sprocket ... 6
Swing machinery ... 8
Swing circle ... 10
Undercarriage and frame UEN01992-00
Track frame and recoil spring ... 2
Idler ... 4
Carrier roller ... 6
Track roller ... 7
Track shoe ... 8
Hydraulic system, Part 1 UEN01993-00
Hydraulic equipment layout drawing ... 2
Hydraulic tank and filter ... 4
Hydraulic pump ... 6
Hydraulic system, Part 2 UEN01994-00
Control valve ... 2
CLSS ... 14
Outline of CLSS ... 14
Basic principle ... 15
Functions and operation by valve ... 18
Hydraulic circuit diagram and the name of valves ... 18
Unload valve ... 20
Introduction of LS pressure ... 22

MidWestTech | Komatsu PC350LC-8, PC350LCD-8, PC350NLC-8, PC350NLCD-8 Hyd... Order the manual at mid-west-tech.com >

LS bypass plug ... 23
Pressure compensation valve ... 24
Pressure compensation valve inner shuttle valve ... 27
Boom regeneration circuit ... 29
Arm regeneration circuit ... 31
Merge-divider valve ... 33
LS select valve ... 35
Self pressure reducing valve ... 36
Travel junction valve ... 39
Travel PPC shuttle valve ... 41
Boom drift prevention valve ... 43
Arm drift prevention valve ... 46
Quick return valve ... 50
Lift check valve ... 52
Main relief valve ... 53
2-stage safety-suction valve ... 54
Variable pressure compensation valve ... 56
Attachment circuit selector valve ... 58
Hydraulic drift prevention valve ... 60
Hydraulic system, Part 3 UEN01995-01
Valve control ... 2
PPC valve ... 4
Solenoid valve ... 26
PPC accumulator ... 28
Return oil filter ... 29
Centre swivel joint ... 30
Travel motor ... 31
Swing motor ... 43
Hydraulic cylinder ... 52
Work equipment UEN01996-01
Work equipment ... 2
Dimensions of components ... 4
Cab and its attachments UEN01997-00
Air conditioner piping ... 2
Electrical system UEN01998-02
Engine control ... 2
Electronic control system ... 11
Monitor system ... 37
Sensor ... 64
KOMTRAX terminal system ... 67
Auto Grease system UEN01999-00
Assembly ... 3
Components ... 3
The Greasing Cycle ... 6
Introduction ... 7

20 Standard value table
Standard service value table UEN02624-01
Standard value table for engine related parts ... 2
Standard value table for chassis related parts ... 3

30 Testing and adjusting
Testing and adjusting, Part 1 UEN02625-00
Tools for testing, adjusting and troubleshooting ... 3
Measuring engine speed ... 7
Measuring air boost pressure ... 8

MidWestTech | Komatsu PC350LC-8, PC350LCD-8, PC350NLC-8, PC350NLCD-8 Hyd... Order the manual at mid-west-tech.com >

Measuring exhaust gas color 9
Adjusting valve clearance 11
Measuring compression pressure 13
Measuring blow-by pressure 17
Measuring engine oil pressure 18
Measuring fuel pressure 19
Handling during cylinder cut-out operation 23
Handling during no injection cranking operation 23
Measuring fuel return rate and leakage 24
Bleeding air from fuel circuit 26
Checking fuel circuit for leakage 27
Testing and adjusting air compressor belt tension 28
Measuring clearance in swing circle bearings 29
Testing and adjusting track shoe tension 30
Testing and adjusting oil pressure in work equipment, swing and travel circuit 31
Testing and adjusting control circuit oil pressure 35
Testing and adjusting pump PC control circuit oil pressure 36
Testing and adjusting pump LS control circuit oil pressure 39
Measuring solenoid valve output pressure 44
Measuring PPC valve output pressure 48
Adjusting play of work equipment and swing PPC valves 49
Inspecting locations of hydraulic drift of work equipment 50
Releasing remaining pressure in hydraulic circuit 52
Measuring oil leakage amount 52
Bleeding air from various parts 55
Diode inspection procedures 57
Testing and adjusting, Part 2 UEN02626-00
Special functions of machine monitor 2
Testing and adjusting, Part 3 UEN02663-00
Handling voltage circuit of engine controller 2
Preparation work for troubleshooting of electrical system 3
Procedure for testing diodes 7
Pm clinic service 8

40 Troubleshooting
Failure code table and fuse locations UEN02627-00
Failure codes table 2
Fuse locations 5
General information on troubleshooting UEN02628-02
Points to remember when troubleshooting 2
Sequence of events in troubleshooting 3
Checks before troubleshooting 4
Classification and troubleshooting steps 5
Information in troubleshooting table 6
Connection table for connector pin numbers 11
T-adapter box and T-adapter table 43
Troubleshooting by failure code (Display of code), Part 1 UEN02629-00
Failure code [A000N1] Eng. Hi Out of Std 3
Failure code [AA10NX] Air cleaner Clogging 4
Failure code [AB00KE] Charge Voltage Low 6
Failure code [B@BAZK] Eng Oil Level Low 10
Failure code [B@BCNS] Eng. Water Overheat 12
Failure code [B@BCZK] Eng Water Level Low 14
Failure code [B@HANS] Hydr Oil Overheat 16
Failure code [CA111] EMC Critical Internal Failure 17
Failure code [CA115] Eng Ne and Bkup Speed Sens Error 17
Failure code [CA122] Chg Air Press Sensor High Error 18

MidWestTech | Komatsu PC350LC-8, PC350LCD-8, PC350NLC-8, PC350NLCD-8 Hyd... Order the manual at mid-west-tech.com >

Tools for testing, adjusting and troubleshooting

Testing and adjusting item	Symbol		Part No.	Part name	Q'ty	Remarks
Intake air pressure (boost pressure)	A	1	799-201-2202	Boost gauge kit	1	–101 – 200 kPa {–760 – 1,500 mmHg}
		2	799-401-2220	Hose	1	
Checking exhaust gas color	B	1	799-201-9001	Handy smoke checker	1	Degree of contamination 0 to 70% (with the standard color) (Degree of contamination x 1/10 ≒ Bosch index)
		2	Commercially available	Smoke meter	1	
Adjusting valve clearance	C	1	795-799-1131	Gear	1	
		2	Commercially available	Clearance gauge	1	
Measuring compression pressure	D	1	795-799-6700	Puller	1	
		2	795-502-1590	Compression gauge	1	0 – 7.0 MPa {0 – 70 kg/cm²}
		3	795-790-6110	Adapter	1	
		4	6754-11-3130	Gasket	1	
Measuring blow-by pressure	E	1	799-201-1504	Blow-by checker	1	0 – 5.0 kPa {0 – 500mm H_2O}
		2	795-790-3300	Tool (nozzle)	1	
Measuring engine oil pressure	F	1	799-101-5002	Hydraulic tester	1	Pressure gauge: 2.5, 6.0, 40, 60 MPa {25, 60, 400, 600 kg/cm²}
			799-261-1204	Digital hydraulic tester	1	Pressure gauge: 60 MPa {600 kg/cm²}
		2	799-401-2320	Gauge	1	Pressure gauge: 1.0 MPa {10 kg/cm²}
		3	6732-81-3170	Adapter	1	Size: 10 x 1.0 mm
			6215-81-9710	O-ring	1	
Measuring fuel pressure	G	1	799-101-5002	Hydraulic tester	1	Pressure gauge: 2.5, 6.0, 40, 60 MPa {25, 60, 400, 600 kg/cm²}
			790-261-1204	Digital hydraulic tester	1	Pressure gauge: 60 MPa {600 kg/cm²}
		2	6732-81-3170	Adapter	1	Size: 10 x 1.0 mm
			6215-81-9710	O-ring	1	
		3	799-401-2320	Gauge	1	Pressure gauge: 1.0 MPa {10 kg/cm²}
		4	795-790-1500	Fuel vacuum gauge	1	Male: 7/8 – 14UNF Female: 7/8 – 14UNF
			799-201-1201		1	Male: 3/4 – 16UNF Female: 3/4 – 16UNF
Measuring fuel return rate and leakage	H	1	795-790-4800	Hose kit	1	
		2	795-790-6700	Adapter	1	
		3	Commercially available	Measuring cylinder	1	
Measuring swing circle bearing clearance	J		Commercially available	Dial gauge	1	

MidWestTech | Komatsu PC350LC-8, PC350LCD-8, PC350NLC-8, PC350NLCD-8 Hyd... Order the manual at mid-west-tech.com >

Related circuit diagram

This drawing is a part of the electric circuit diagram related to trouble-shooting.

- Connector No.: Indicates (Model – Number of pins) and (Colour).
- "Connector No. and pin No." from each branching/merging point: Shows the ends of branch or source of merging within the parts of the same wiring harness.
- Arrow (⇔): Roughly shows the location on the machine.

MidWestTech | Komatsu PC350LC-8, PC350LCD-8, PC350NLC-8, PC350NLCD-8 Hyd... Order the manual at mid-west-tech.com >

Failure code [CA689] Eng Ne Speed Sensor Error

Action code	Failure code	Trouble	Engine Ne speed sensor error (Engine controller system)
E11	**CA689**		
Contents of trouble	• There is error in signal from engine Ne speed sensor.		
Action of controller	• Continues control with signal from engine Bkup speed sensor.		
Problem that appears on machine	• Engine hunts. • Engine does not start easily. • Engine output lowers.		
Related information	• Method of reproducing failure code: Start engine.		

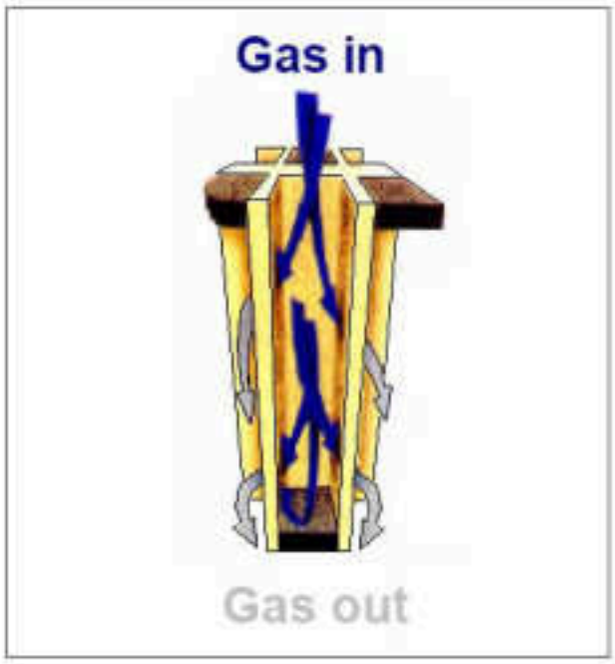
	Cause		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective Ne speed sensor power supply system	If failure code [**CA238**] is also indicated, carry out troubleshooting for it first.		
	2	Defective engine Ne speed sensor	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			C15 (male)		Voltage
			Between (1) – (2)	Power supply	4.75 – 5.25 V
			Voltage is measured with wiring harness connected. Accordingly, if voltage is abnormal, check wiring harness and controller, too, for another cause of trouble, and then judge.		
	3	Breakage or improper clearance of engine Ne speed sensor	Engine Ne speed sensor may be broken or may have improper clearance. Check it directly.		
	4	Breakage of rotation sensor wheel	Rotation sensor wheel may be broken. Check it directly.		
	5	Disconnection in wiring harness (Disconnection in wiring or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between CE01 (female) (27) – C15 (female) (3)	Resistance	Max. 10 Ω
	6	Ground fault in wiring harness (Short circuit with GND circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between CE01 (female) (27) – C15 (female) (3) and chassis ground	Resistance	Min. 100 kΩ
	7	Hot short (Short circuit with 5V/24V circuit) in wiring harness	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			Wiring harness between CE01 (female) (27) – C15 (female) (3) and chassis ground	Voltage	Max. 1 V

MidWestTech | Komatsu PC350LC-8, PC350LCD-8, PC350NLC-8, PC350NLCD-8 Hyd... Order the manual at mid-west-tech.com >

System Description

This diesel particulate filter effectively removes particulate matter (soot) from diesel exhaust. The regeneration function also removes carbon monoxide (CO) and hydrocarbons.

The filter is a ceramic monolith, protected by an insulated stainless steel housing. The many parallel channels that run through the monolith are closed at alternate ends. The walls of the channels are porous. The exhaust gas flowing into a channel is forced by the closed end to flow through the walls and into the neighbouring channels. The particulate matter is deposited on the surface and in the pores of the channel walls. The filtered exhaust gas flows out through the open ends of the channels it has crossed into.

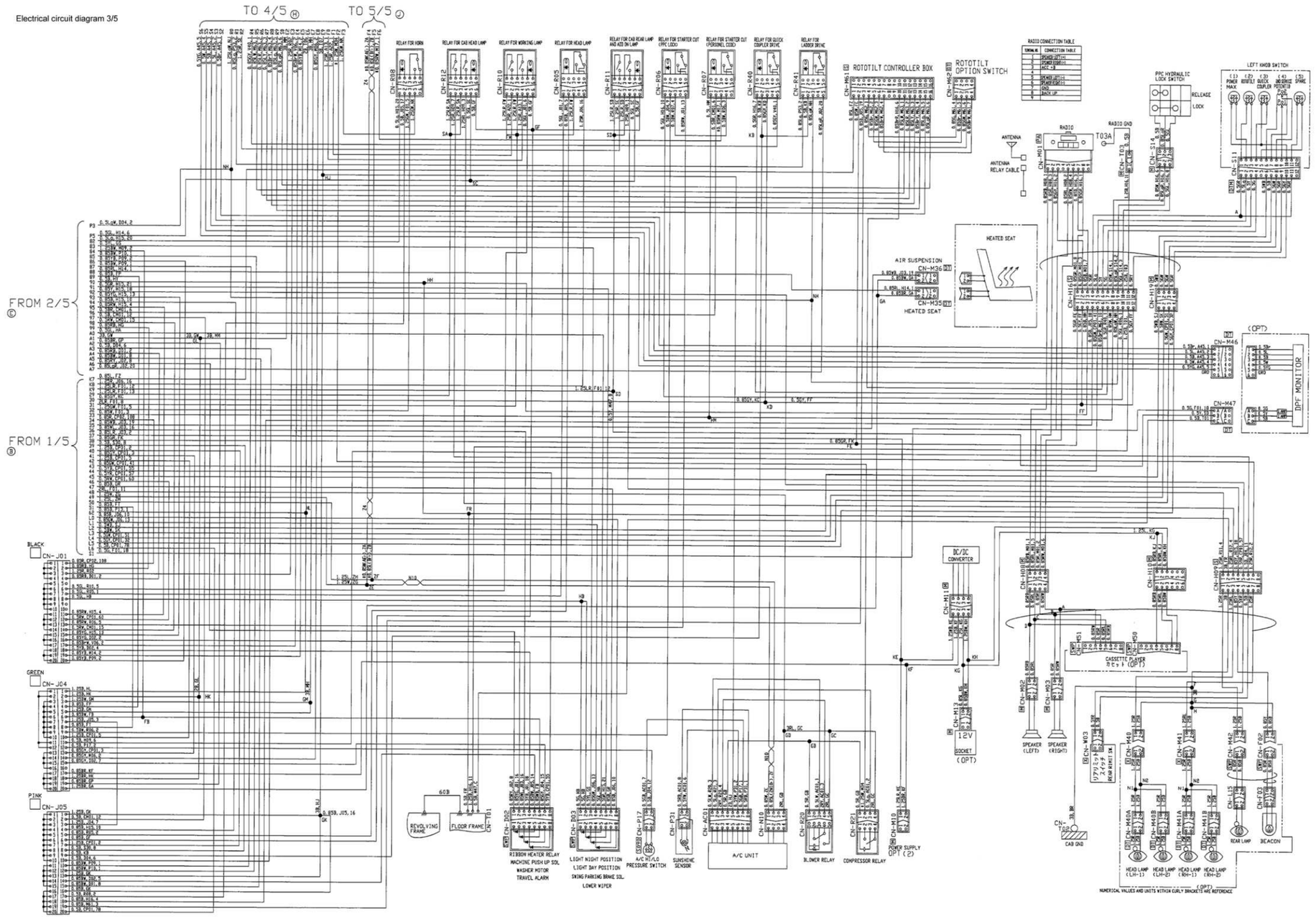


Regeneration

The regeneration of the filter is effected by an oxidation catalyst. Soot is burnt continuously in the filter unit without input of additional energy.
The catalyst turns some of the nitric oxide (NO) in the exhaust gases into nitrous dioxide (NO_2), which acts as an oxygen carrier. The NO_2 reacts with the soot collected in the filter, producing carbon dioxide (CO^2) and and NO.
The preconditions for almost maintenance-free operation is the use of diesel fuel containing max. 50ppm sulphur. The exhaust gas temperature should be between 250°C and 450°C for more than half of the operating time.

MidWestTech | Komatsu PC350LC-8, PC350LCD-8, PC350NLC-8, PC350NLCD-8 Hyd... Order the manual at mid-west-tech.com >

Electrical circuit diagram 3/5



MidWestTech | Komatsu PC350LC-8, PC350LCD-8, PC350NLC-8, PC350NLCD-8 Hydraulic Excavator Service Manual | Publication UEN01983-03

Order the manual at mid-west-tech.com >