UEN00001-01

Shop Manual

HYDRAULIC
EXCAVATOR

PC290LC-8
PC290NLC-8

SERIAL NUMBERS PC290LC- K50001 and up
PC290NLC- K50001

KOMATSU®

MidWestTech | Komatsu PC290LC-8, PC290NLC-8 Hydraulic Excavator Service Manual | Publication UEN00001-01
Order the manual at mid-west-tech.com >

Table of contents

00 Index and foreword
Index UEN00002-01
Organization list of the shop manual 2
Table of contents 4

Foreword and general information UEN00003-00
Foreword and general information 2
Safety notice 2
How to read the shop manual 6
Explanation of terms for maintenance standard 8
Handling electric equipment and hydraulic component 10
How to read electric wire code 18
Method of disassembling and connecting push-pull type coupler 21
Standard tightening torque table 24
Conversion table 28

01 Specification
Specification and technical data UEN00004-00
Specification and technical data 2
Specification dimension drawings 2
Working range diagram 3
Specifications 4
Weight table 6
Table of fuel, coolant and lubricants 8

10 Structure, function and maintenance standard
Engine and cooling system UEN00005-00
Engine and cooling system 2
Engine related parts 2
Radiator, oil cooler, aftercooler and fuel cooler 3
Power train UEN00006-00
Power train 2
Power train 2
Final drive 4
Swing machinery 6
Swing circle 8
Undercarriage and frame UEN00007-00
Undercarriage and frame 2
Track frame and recoil spring 2
Idler 4
Carrier roller 6
Track roller 7
Track shoe 8
Hydraulic system, Part 1 UEN00008-01
Hydraulic system, Part 1 2
Hydraulic equipment layout drawing 2
Hydraulic tank and filter 4
Hydraulic pump 6
Pilot oil filter 28
Hydraulic system, Part 2 UEN00009-00
Hydraulic system, Part 2 2
Control valve 2
CLSS 13
Functions and operation by valve 18

MidWestTech | Komatsu PC290LC-8, PC290NLC-8 Hydraulic Excavator Service Manu... Order the manual at mid-west-tech.com >

Hydraulic system, Part 3 UEN00010-01
Hydraulic system, Part 3 3
Swing motor 3
Center swivel joint 12
Travel motor 15
PPC valve 28
Valve control 50
ATT EPC Valve Assembly 52
Solenoid valve 54
PPC Accumulator 56
Return oil filter 57
Attachment circuit selector valve 58
Quick coupler control valve 60
Quick coupler control valve 62
Hydraulic cylinder 64
Work equipment UEN00011-00
Work equipment 2
Dimensions of components 2
Cab and its attachments UEN00012-00
Cab and its attachments 2
Air conditioner piping 2
Electrical system UEN00013-01
Electrical system 3
Engine control 3
Electrical control system 12
Monitor system 37
Sensor 68
PPC Levers 71
KOMTRAX terminal system 73

20 Standard value table
Standard service value table UEN00014-00
Standard service value table 2
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 UEN00015-00
Testing and adjusting, Part 1 3
Tools for testing, adjusting, and troubleshooting 3
Measuring engine speed 6
Measuring intake air pressure (boost pressure) 7
Checking exhaust gas color 8
Adjusting valve clearance 9
Measuring compression pressure 11
Measuring blow-by pressure 13
Measuring engine oil pressure 14
Handling fuel system parts 15
Releasing residual pressure from fuel system 15
Measuring fuel pressure 16
Measuring fuel return rate and leakage 18
Bleeding air from fuel circuit 20
Checking fuel circuit for leakage 22
Checking and adjusting air conditioner compressor belt tension 23
Measuring swing circle bearing clearance 24
Checking and adjusting track shoe tension 25

MidWestTech | Komatsu PC290LC-8, PC290NLC-8 Hydraulic Excavator Service Manu... Order the manual at mid-west-tech.com >

Measuring and adjusting oil pressure in work equipment, swing, and travel circuits 27
Measuring control circuit basic pressure 30
Measuring and adjusting oil pressure in pump PC control circuit 31
Measuring and adjusting oil pressure in pump LS control circuit 34
Measuring solenoid valve output pressure 38
Measuring PPC valve output pressure 41
Adjusting play of work equipment and swing PPC valves 43
Checking parts which cause hydraulic drift of work equipment 45
Releasing residual pressure from hydraulic circuit 46
Measuring oil leakage 47
Bleeding air from each part 50
Checking cab tipping stopper 52
Adjusting mirrors 54
Testing and adjusting, Part 2 UEN00016-00
Testing and adjusting, Part 2 2
Special functions of machine monitor 2
Testing and adjusting, Part 3 UEN00017-00
Testing and adjusting, Part 3 2
Handling high-voltage circuit of engine controller 2
Preparation work for troubleshooting of electrical system 3
Procedure for testing diodes 7
Pm Clinic service 9

40 Troubleshooting
General information on troubleshooting UEN00018-00
General information on troubleshooting 2
Points to remember when troubleshooting 2
Sequence of events in troubleshooting 3
Check before troubleshooting 4
Classification and procedures for troubleshooting 5
How to read electric wire code 9
Connection table for connector pin numbers 12
T-boxes and T-adapters table 35
Troubleshooting by failure code (Display of code), Part 1 UEN00019-00
Troubleshooting by failure code (Display of code), Part 1 3
Failure codes table 3
Before carrying out troubleshooting when failure code is displayed 8
Information in troubleshooting table 12
Failure code [989L00] Engine Controller Lock Caution 1 14
Failure code [989M00] Engine Controller Lock Caution 2 14
Failure code [989N00] Engine Controller Lock Caution 3 15
Failure code [AA10NX] Air Cleaner Clogging 15
Failure code [AB00KE] Charge Voltage Low 16
Failure code [B@BAZG] Eng Oil Press. Low 18
Failure code [B@BAZK] Eng Oil Level Low 18
Failure code [B@BCNS] Eng Water Overheat 19
Failure code [B@BCZK] Eng Water Level Low 19
Failure code [B@HANS] Hydr Oil Overheat 20
Failure code [CA111] EMC Critical Internal Failure 20
Failure code [CA115] Eng Ne and Bkup Speed Sens Error 21
Failure code [CA122] Chg Air Press Sensor High Error 22
Failure code [CA123] Chg Air Press Sensor Low Error 24
Failure code [CA131] Throttle Sensor High Error 26
Failure code [CA132] Throttle Sensor Low Error 28
Failure code [CA144] Coolant Temp Sens High Error 30
Failure code [CA145] Coolant Temp Sens Low Error 32
Failure code [CA153] Chg Air Temp Sensor High Error 34

MidWestTech | Komatsu PC290LC-8, PC290NLC-8 Hydraulic Excavator Service Manu... Order the manual at mid-west-tech.com >

Measuring and adjusting quick coupler control valve output pressure

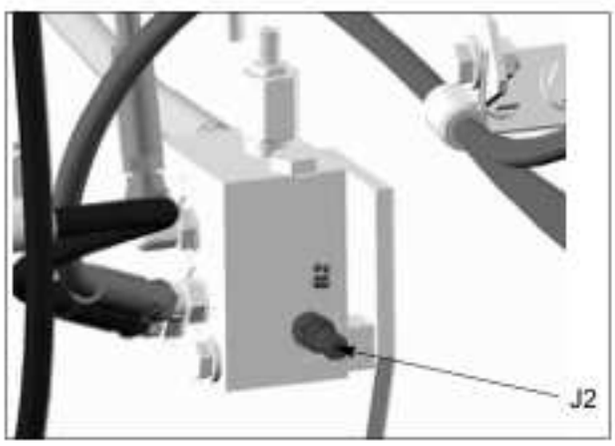
★ Measuring and adjusting tools for oil pressure in quick coupler circuit.

Symbol		Part No.	Part name
J	1	799-101-5002	Hydraulic tester
		790-261-1204	Digital hydraulic tester
	2	799-101-5220	Nipple (10 × 1.25 mm)
		07002-11023	O-ring

⚠ **Stop the machine on a level ground and lower the work equipment to the ground. Then, release the residual pressure from the hydraulic circuit. For details, see "Releasing residual pressure from hydraulic circuit".**

Measuring

- Measure quick coupler control valve output pressure after checking that work equipment, swing and travel circuit pressures are normal.
- Fit nipple J2 to port B2 and connect it to oil pressure gauge of hydraulic tester.



- Use an oil pressure gauge with the capacity of 59MPa (600kg/cm²)
- Start the engine. In order to raise the pressure to the set pressure of the pressure regulating valve it will be necessary to operate one of the main control circuits (bucket, boom, arm or swing). If using swing circuit set the swing lock to ON.

NOTE: When delivered from the factory the regulated pressure is set to 4MPa (41kg/cm².

Adjustment

If the regulated pressure is not suitable for the quick coupler to be installed adjust the pressure of the regulating valve as follows:

1. Loosen the locknut (1a). (using a 17mm spanner).



2. Turn the adjustment screw (1b) to adjust the pressure. (Using a 5mm hexagon key).
   - If the screw is turned to the right the pressure increases.
   - If the screw is turned to the left the pressure reduces.
   - Quantity of adjustment per turn of the screw: Approx 5.5MPa.



3. After required pressure is acheived, hold adjustment screw (1b) and tighten the lock nut (1a). (Torque of lock nut (1a) 12+/-2Nm)

MidWestTech | Komatsu PC290LC-8, PC290NLC-8 Hydraulic Excavator Service Manu... Order the manual at mid-west-tech.com >

Failure code [B@HANS] Hydr Oil Overheat

User code	Failure code	Trouble	Hydraulic oil overheat (Pump controller system)
—	**B@HANS**		
Contents of trouble	• While engine was running, signal circuit of hydraulic oil temperature sensor detected overheating of hydraulic oil (above about 102°C).		
Action of controller	• Displays hydraulic oil temperature monitor with red on machine monitor. • If cause of failure disappears, system resets itself.		
Problem that appears on machine	• If machine is operated as it is, engine may be seized.		
Related information	• Hydraulic oil temperature sensor signal is input to engine controller and then transmitted to machine monitor. • Hydraulic oil temperature can be checked with monitoring function (Code: 04401 Hydraulic oil temperature) • Method of reproducing failure code: Start engine.		

Possible causes and standard value in normal state		Cause	Standard value in normal state/Remarks on troubleshooting
	1	Overheating of hydraulic oil (when system is normal)	Hydraulic oil may be overheating. Check it and remove cause if it is overheating.
	2	Defective hydraulic oil temperature gauge system	If cause 1 is not detected, hydraulic oil temperature gauge system may be defective. Carry out troubleshooting for "E-10 Hydraulic oil temperature gauge does not work normally" in E-mode.

Failure code [CA111] EMC Critical Internal Failure

User code	Failure code	Trouble	Critical internal failure (Engine controller system)
E10	**CA111**		
Contents of trouble	• Memory or power supply circuit in engine controller is defective.		
Action of controller	• None in particular.		
Problem that appears on machine	• Engine does not start.		
Related information			

Possible causes and standard value in normal state		Cause	Standard value in normal state/Remarks on troubleshooting
	1	Defective engine controller	Engine controller may be defective. (Since trouble is in system, troubleshooting cannot be carried out.)

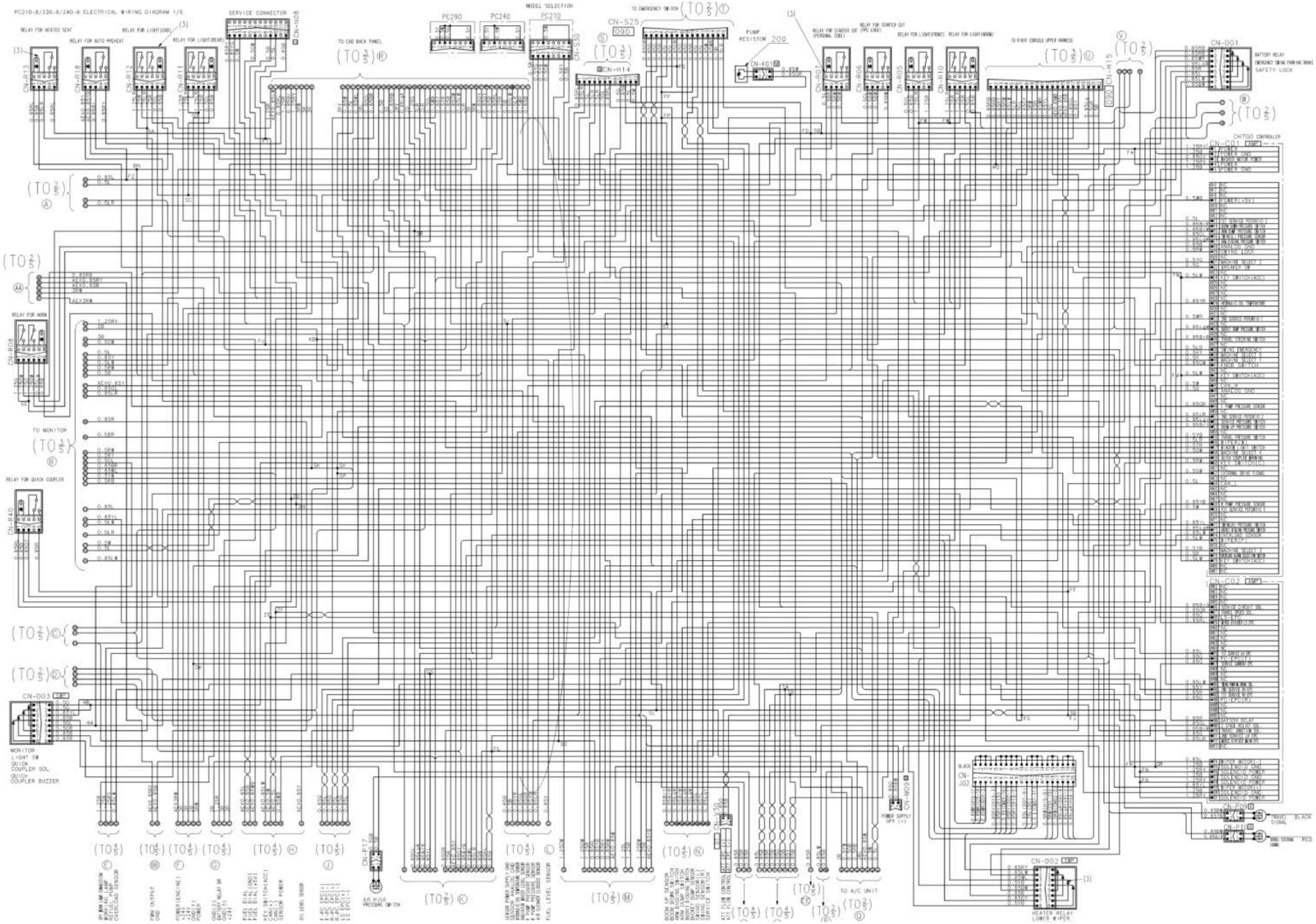
MidWestTech | Komatsu PC290LC-8, PC290NLC-8 Hydraulic Excavator Service Manu... Order the manual at mid-west-tech.com >

	Cause		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	2	Ground fault in wiring harness (Short circuit with GND circuit)	Wiring harness between C01 (female) (9) – J06 – P07 (female) (3) [Swing RIGHT PPC pressure sensor system]	Resistance	Min. 1 MΩ
			Wiring harness between C01 (female) (9) – J06 – P25 (female) (3) [F pump pressure sensor system]	Resistance	Min. 1 MΩ
			Wiring harness between C01 (female) (9) – J06 – P26 (female) (3) [R pump pressure sensor system]	Resistance	Min. 1 MΩ
	3	Hot short (Short circuit with 24V circuit) in wiring harness	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			Wiring harness between C01 (female) (9) – J06 – P01 (female) (3) [Bucket CURL PPC pressure sensor system]	Voltage	Max. 1 V
			Wiring harness between C01 (female) (9) – J06 – P03 (female) (3) [Swing LEFT PPC pressure sensor system]	Voltage	Max. 1 V
			Wiring harness between C01 (female) (9) – J06 – P04 (female) (3) [Arm IN PPC pressure sensor system]	Voltage	Max. 1 V
			Wiring harness between C01 (female) (9) – P05 (female) (3) [Bucket DUMP PPC pressure sensor system]	Voltage	Max. 1 V
			Wiring harness between C01 (female) (9) – J06 – P06 (female) (3) [Boom RAISE PPC pressure sensor system]	Voltage	Max. 1 V
			Wiring harness between C01 (female) (9) – J06 – P07 (female) (3) [Swing RIGHT PPC pressure sensor system]	Voltage	Max. 1 V
			Wiring harness between C01 (female) (9) – J06 – P25 (female) (3) [F pump pressure sensor system]	Voltage	Max. 1 V
			Wiring harness between C01 (female) (9) – J06 – P26 (female) (3) [R pump pressure sensor system]	Voltage	Max. 1 V
	4	Defective pump controller	If causes 1 – 3 are not detected, pump controller may be defective. (Since trouble is in system, troubleshooting cannot be carried out.)		

MidWestTech | Komatsu PC290LC-8, PC290NLC-8 Hydraulic Excavator Service Manu... Order the manual at mid-west-tech.com >

Electrical diagrams and drawings (For PC290 K50105 and up

Electrical circuit diagram (1/5)



MidWestTech | Komatsu PC290LC-8, PC290NLC-8 Hydraulic Excavator Service Manual | Publication UEN00001-01

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