CEBM029201

Shop Manual

KOMATSU®

PC210LL-10

HYDRAULIC EXCAVATOR

SERIAL NUMBERS **PC210LL-10 A52001 and up**

ENGINE **6D107E-2**

This material is proprietary to Komatsu America Corp. and is not to be reproduced, used, or disclosed except in accordance with written authorization from Komatsu America Corp.

It is our policy to improve our products whenever it is possible and practical to do so. We reserve the right to make changes or improvements at any time without incurring any obligation to install such changes on products sold previously.

Due to this continuous program of research and development, revisions may be made to this publication. It is recommended that customers contact their distributor for information on the latest revision.

Copyright 2015 Komatsu
Printed in U.S.A.
Komatsu America Corp.

August 2015

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

Index (ALL-0310-001-A-00-A)

00 Index and foreword 00-1
Index 00-2
Foreword, safety and general information 00-14
Important safety notice 00-14
How to read the shop manual 00-21
Explanation of terms for maintenance standard 00-23
Handling equipment of fuel system devices 00-25
Handling of intake system parts 00-26
Handling of hydraulic equipment 00-27
Method of disconnecting and connecting of push-pull type coupler 00-29
Handling of electrical equipment 00-32
How to read electric wire code 00-40
Precautions when performing operation 00-43
Practical use of KOMTRAX 00-47
Standard tightening torque table 00-48
List of abbreviation 00-52
Conversion table 00-57
01 Specification 01-1
Table of contents 01-1
Specifications 01-2
Specification drawing 01-2
Working range drawings 01-5
Specifications 01-6
Weight table 01-8
Table of fuel, coolant, and lubricants 01-10
10 Structure and function 10-1
Table of contents 10-2
Engine and cooling system 10-3
Engine related parts 10-3
KVGT 10-5
EGR system piping drawing 10-12
EGR system circuit diagram 10-14
EGR valve 10-16
EGR cooler 10-18
KCCV layout drawing 10-19
KCCV ventilator 10-21
KDPF 10-23
Cooling system 10-27
Power train 10-29
Power train system 10-29
Swing circle 10-31
Swing machinery 10-32
Final drive 10-34
Undercarriage and frame 10-36
Track frame and idler cushion 10-36
Hydraulic system 10-38
Hydraulic equipment layout drawing 10-38
Valve control 10-40
Hydraulic tank 10-42
CLSS 10-44
Main pump 10-49
Control valve 10-74
Swing motor 10-131
Travel motor 10-144
PPC valve 10-156
Solenoid valve 10-176

MidWestTech | Komatsu PC210LL-10 with 6D107E-2 Engine Hydraulic Excavator Servi... Order the manual at mid-west-tech.com >

Center swivel joint 10-186
Accumulator 10-188
Work equipment 10-189
Work equipment 10-189
Work equipment shim 10-190
Bucket play adjustment shim 10-191
Cab and its attachments 10-193
Electrical system 10-194
Electrical control system 10-194
Machine monitor system 10-245
KOMTRAX system 10-267
Sensor 10-270
20 Standard value tables 20-1
Table of contents 20-2
Standard service value table 20-3
Standard value table for engine 20-3
Standard value table for machine 20-5
Standard value table for electrical system 20-18
30 Testing and adjusting 30-1
Table of contents 30-2
General information on testing and adjusting 30-3
Tools for testing and adjusting 30-3
Sketch of tools for testing and adjusting 30-7
Engine and cooling system 30-8
Testing engine speed 30-8
Testing boost pressure 30-9
Testing exhaust gas color 30-11
Measuring and adjusting valve clearance 30-13
Testing compression pressure 30-16
Testing blowby pressure 30-20
Testing engine oil pressure 30-21
Testing EGR valve and KVGT oil pressures 30-22
Measuring fuel pressure 30-23
Measuring fuel delivery, return and leakage 30-29
Bleeding air from fuel system 30-34
Checking fuel circuit for leakage 30-36
Handling cylinder cutout mode operation 30-37
Handling no injection cranking operation 30-38
Checking and adjusting air conditioner compressor belt tension 30-39
Replacing fan belt 30-41
Power train 30-42
Testing swing circle bearing clearance 30-42
Undercarriage and frame 30-43
Testing and adjusting track shoe tension 30-43
Hydraulic system 30-44
Releasing remaining pressure from hydraulic circuit 30-44
Testing and adjusting oil pressure in work equipment, swing, and travel circuits 30-45
Testing oil pressure of control circuit 30-49
Testing and adjusting oil pressure in pump PC control circuit 30-52
Testing and adjusting oil pressure in pump LS control circuit 30-55
Testing output pressure of solenoid valve 30-60
Testing PPC valve output pressure 30-64
Adjusting play of work equipment and swing PPC valves 30-66
Testing pump swash plate sensor 30-67
Isolating the parts causing hydraulic drift in work equipment 30-68
Testing oil leakage 30-69

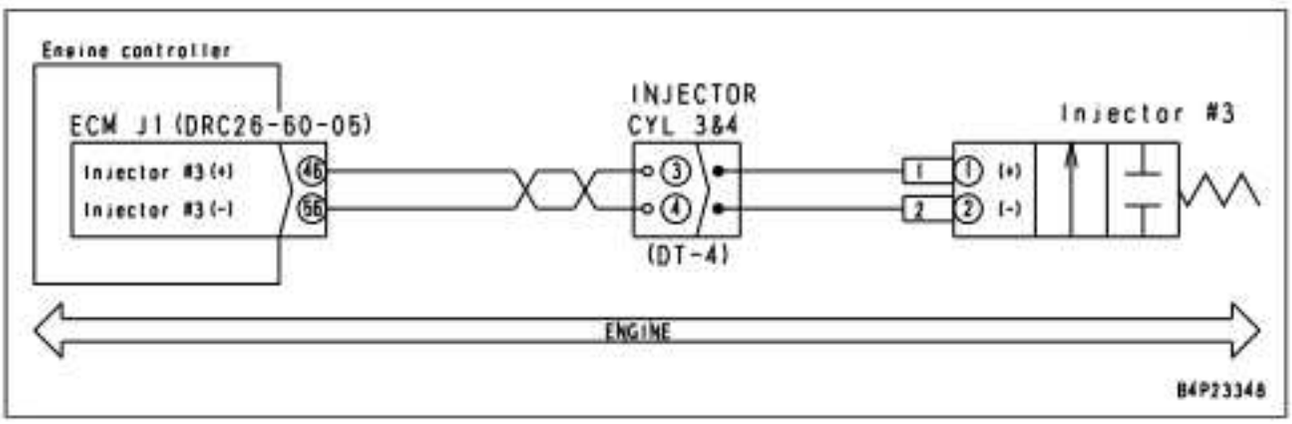
MidWestTech | Komatsu PC210LL-10 with 6D107E-2 Engine Hydraulic Excavator Servi... Order the manual at mid-west-tech.com >

Bleeding air from hydraulic circuit 30-72
Cab and its attachments 30-75
Adjusting mirrors 30-75
Electrical system 30-77
Special functions of machine monitor 30-77
Adjusting rearview camera angle 30-148
Handling voltage circuit of engine controller 30-150
Handling battery disconnect switch 30-151
Testing diodes 30-152
Pm clinic 30-153
Pm Clinic service 30-153
40 Troubleshooting 40-1
Table of contents 40-2
General information on troubleshooting 40-9
Troubleshooting points 40-9
Sequence of events in troubleshooting 40-11
Testing before troubleshooting 40-13
Inspection procedure before troubleshooting 40-15
Preparation work for troubleshooting of electrical system 40-34
Classification and procedure for troubleshooting 40-38
Symptom of probable failure and troubleshooting No. 40-41
Information in troubleshooting table 40-44
Diagnostic procedure for wiring harness open curcuit of pressure sensor system 40-46
Connector list and layout 40-48
Connector contact identification 40-59
T-branch box and T-branch adapter table 40-95
Fuse location table 40-101
Precautions for KDPF (KCSF and KDOC) Cleaning and Replacement 40-103
Fabrication of dummy temperature sensor (for KDOC and KDPF temperature sensors) 40-106
Fabrication of short-circuit connector (for CA1883 and CA3135) 40-107
Failure codes table 40-108
Troubleshooting by failure code (Display of code) 40-117
Failure code [879AKA] A/C Inner Sensor Open Circuit 40-117
Failure code [879AKB] A/C Inner Sensor Short Circuit 40-118
Failure code [879BKA] A/C Outer Sensor Open Circuit 40-119
Failure code [879BKB] A/C Outer Sensor Short Circuit 40-120
Failure code [879CKA] Ventilating Sensor Open Circuit 40-121
Failure code [879CKB] Ventilating Sensor Short Circuit 40-122
Failure code [879DKZ] Sunlight Sensor Open or Short Circuit 40-123
Failure code [879EMC] Ventilation Damper Abnormality 40-124
Failure code [879FMC] Air Mix Damper Abnormality 40-125
Failure code [879GKX] Refrigerant Abnormality 40-126
Failure code [989L00] Engine Controller Lock Caution1 40-127
Failure code [989M00] Engine Controller Lock Caution2 40-128
Failure code [989N00] Engine Controller Lock Caution3 40-129
Failure code [A1U0N3]: KDPF Dry Request (HC Release) 40-130
Failure code [A1U0N4] KDPF Dry Request (HC Release) 40-132
Failure code [A1U0R7] Manual Stationary Regeneration Request (96 Hour Timer Request) 40-133-1
Failure code [AA10NX] Air Cleaner Clogging 40-134
Failure code [AB00KE] Charge Voltage Low 40-136
Failure code [B@BAZG] Engine Oil Pressure Low 40-138
Failure code [B@BAZK] Eng Oil Level Low 40-139
Failure code [B@BCNS] Engine Coolant Overheat 40-140
Failure code [B@BCZK] Radiator Coolant Level Low 40-141
Failure code [B@HANS] Hyd Oil Overheat 40-143
Failure code [CA115] Eng Ne and Bkup Speed Sens Error 40-144
Failure code [CA122] Chg Air Press Sensor High Error 40-145
Failure code [CA123] Chg Air Press Sensor Low Error 40-147

MidWestTech | Komatsu PC210LL-10 with 6D107E-2 Engine Hydraulic Excavator Servi... Order the manual at mid-west-tech.com >

No.	Cause	Procedure, measuring location, criteria and remarks		
6	Short circuit in wiring harness	1. Turn starting switch to OFF position. 2. Disconnect connectors ECM J1 and INJECTOR CYL 3 & 4, and connect T-adapters to female side of ECM J1. ★ Check by using multimeter in continuity mode.		
		Continuity	Between ECM J1 (female) (46) and each pin other than pin (46)	No continuity (No sound is heard)
			Between ECM J1 (female) (56) and each pin other than pin (56)	No continuity (No sound is heard)
7	Defective injector of other cylinder	If failure codes of other injectors are displayed, perform troubleshooting for them first.		
8	Defective injector harness of other cylinder	If failure codes of other injectors are displayed, perform troubleshooting for them first.		
9	Defective engine controller	If no failure is found by above checks, engine controller is defective. (Since this is an internal defect, troubleshooting cannot be performed.)		

Circuit diagram related to injector #3



MidWestTech | Komatsu PC210LL-10 with 6D107E-2 Engine Hydraulic Excavator Servi... Order the manual at mid-west-tech.com >

Failure code [CA2637] KDOC Face Plugging (PC200LC_10-CA2637-400-A-Z0-A)

Action level	Failure code	Failure	KDOC Face Plugging (Engine controller system)
L01	CA2637		
Detail of failure	• KDOC face is plugged. 1. The KDOC surface is contaminated due to the operating conditions, and the catalytic efficiency has dropped (clean the DOC). 2. Deteriorated KDOC due to high temperature, dropped efficiency due to deposit, or dropped efficiency due to damage (Replace KDOC with a new or used one.)		
Action of controller	• Closes EGR valve • Stops fuel dosing.		
Problem on machine	• None in particular		
Related information	⚠ **Since temperature of the turbocharger exhaust connector, KDOC and KDPF exceeds 500 °C, take care not to get burn injury.** ★ When KDOC in KDPF is changed, perform reset procedure for KDOC change and then finish repair. • Procedure of performing manual stationary regeneration from Regeneration for Service. ★ When soot accumulation is at level 3 or lower, the manual stationary regeneration can be performed only from "Regeneration for Service". 1. Start the engine. 2. Make sure that machine is in safe condition. 3. From service menu of machine monitor, display the "Diagnostic Tests" screen, open "02 Regeneration for service", and then perform the "Manual Stationary Regeneration". • If the KDOC efficiency is still low, this failure code [CA2637] may be displayed repeatedly and failure code [CA1691] indicating the poor regeneration may be displayed. <How to clear failure code> • Start the engine and perform the warm-up operation, then operate the machine under normal conditions for approximately 3 hours. (If the exhaust gas temperature is high, this operation time can be reduced.)		

No.	Cause	Procedure, measuring location, criteria and remarks
1	Defective KVGT	If failure code [CA238*] is displayed, troubleshoot for it first.
2	Defective EGR valve	If failure code [CA227*], [CA23**] or others is displayed, troubleshoot for it first.
3	Defective turbocharger exhaust connector	1. Remove turbocharger exhaust connector. 2. Check for oil or fuel inside turbocharger exhaust connector. • If contaminated, troubleshoot for failure codes [CA227*], [CA23**], etc., relating to the EGR valve and KVGT.
4	Defective exhaust connector and ducts connected to the KDPF	Check exhaust system between turbocharger and KDPF for damage of connector and ducts, and for loose connection.
5	Unusual exhaust gas color	1. Rapidly accelerate engine from low idle to high idle two times, and then keep engine running at high idle for 5 seconds. • If excessive black smoke is exhausted when running the engine at high idle, troubleshoot for "S-9 KDPF gets clogged in a short time". ★ It does not matter that black smoke particles are exhausted during engine acceleration but are not exhausted during running at high idle.

MidWestTech | Komatsu PC210LL-10 with 6D107E-2 Engine Hydraulic Excavator Servi... Order the manual at mid-west-tech.com >

1] Tighten the bolts to 53 ± 5 Nm {5.4 ± 0.5 kgm} in the order of [1] to [12] shown in the figure.
2] Retighten bolts [1] to [4] only shown in the figure to 53 ± 5 Nm {5.4 ± 0.5 kgm}.

6) Tighten mounting bolt (74) to the specified torque.

Mounting bolt:
43 ± 6 Nm {4.4 ± 0.6 kgm}

7) Tighten EGR cooler (75) to the bracket to the specified torque.

Mounting bolt:
24 ± 4 Nm {2.45 ± 0.41 kgm}

8) Install tube (77).

Joint bolt:
12 ± 2 Nm {1.2 ± 0.2 kgm}

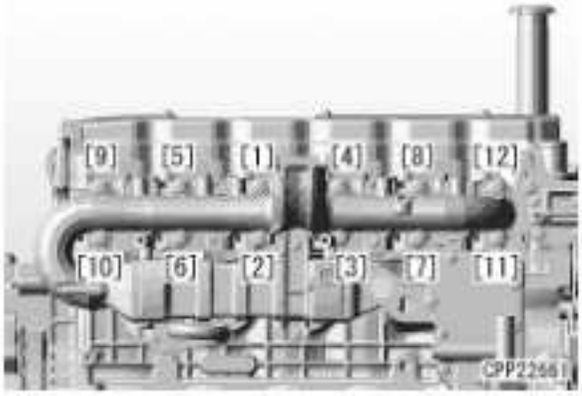
Sleeve nut:
15 ± 1 Nm {1.5 ± 0.1 kgm}

9) Install tube (73).

Sleeve nut (sensor bracket side):
24.5 ± 9.8 Nm {2.5 ± 1.0 kgm}

Sleeve nut (exhaust manifold side):
18 ± 3 Nm {1.8 ± 0.3 kgm}





10)Install tube (55).

Hose clamp (72):
5 ± 1 Nm {0.5 ± 0.1 kgm}

Tube mounting bolt:
9.5 ± 2 Nm {0.96 ± 0.2 kgm}

11)Install tube clamp (71).

Mounting nut:
9.5 ± 2 Nm {0.96 ± 0.2 kgm}



9. Alternator

1) Install exhaust manifold pressure sensor connector (EXHAUST PRESSURE) (70).
2) Install alternator (66).

Mounting bolt (to bracket):
43 ± 6 Nm {4.4 ± 0.6 kgm}

Mounting bolt (to plate):
24 ± 4 Nm {2.45 ± 0.41 kgm}

3) Install terminal B (67) and connector E12 (68) to alternator (66).

Terminal B (67):
5.9 to 9.8 Nm {0.6 to 1.0 kgm}

4) Install wiring harness clamp (69).

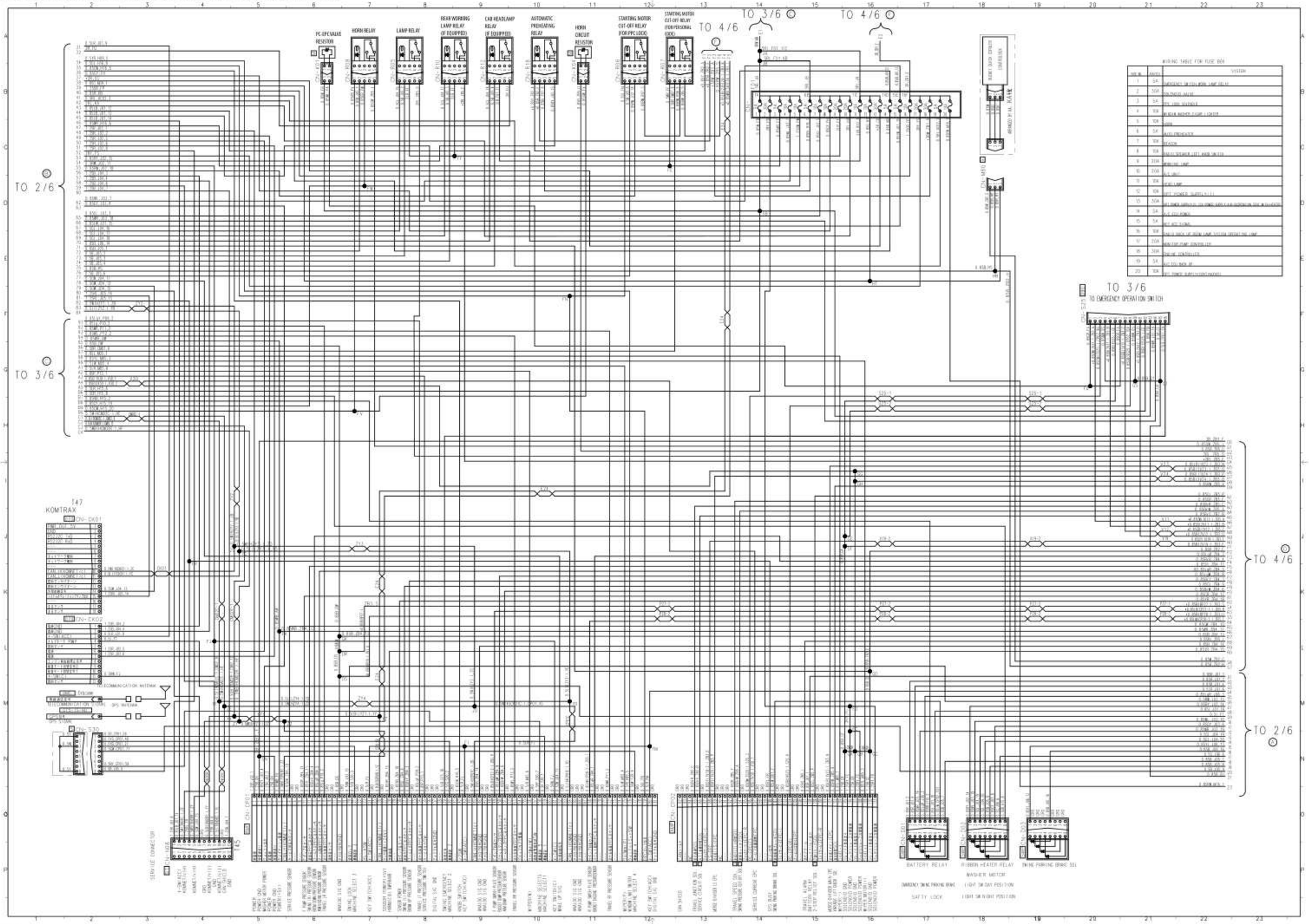


MidWestTech | Komatsu PC210LL-10 with 6D107E-2 Engine Hydraulic Excavator Servi... Order the manual at mid-west-tech.com >

Electrical circuit diagram (1/6)

PC210LL-10

★ This figure covers the eqipment and devices that are unavailable as optional items is some areas.



MidWestTech | Komatsu PC210LL-10 with 6D107E-2 Engine Hydraulic Excavator Service Manual | Publication CEBM029201
Order the manual at mid-west-tech.com >