CEBM027601

Shop Manual

KOMATSU®

WA270-7

WHEEL LOADER

SERIAL NUMBERS **WA270-7 A27001 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 2016 Komatsu
Printed in U.S.A.
Komatsu America Corp.

December 2016

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 00-17
Important safety notice 00-17
How to read the shop manual 00-24
Explanation of terms for maintenance standard 00-26
Handling equipment of fuel system devices 00-28
Handling of intake system parts 00-29
Handling of hydraulic equipment 00-30
Method of disconnecting and connecting of push-pull type coupler 00-32
Handling of electrical equipment 00-35
How to read electric wire code 00-43
Precautions when performing operation 00-46
Practical use of KOMTRAX 00-51
Standard tightening torque table 00-52
List of abbreviation 00-58
Conversion table 00-63
01 Specification 01-1
Table of contents 01-2
Specifications 01-3
Specification drawing 01-3
Specifications 01-7
Weight table 01-17
Table of fuel, coolant, and lubricants 01-21
10 Structure and function 10-1
Table of contents 10-2
Engine and cooling system 10-4
Engine related parts 10-4
KVGT 10-6
EGR system piping drawing 10-13
EGR system circuit diagram 10-15
EGR valve 10-17
EGR cooler 10-19
KCCV layout drawing 10-20
KCCV ventilator 10-22
KDPF 10-24
Cooling system 10-28
Cooling fan motor 10-30
Power train 10-41
Power train system 10-41
Layout of power train parts 10-43
Damper 10-44
HST pump 10-45
HST motor1 10-58
HST motor2 10-60
Transfer 10-65
Clutch solenoid valve 10-72
Drive shaft 10-74
Axle 10-75
Differential 10-77
Torque proportional differential 10-81
Limited slip differential 10-83
Final drive 10-88
Steering system 10-91
Layout of steering devices 10-91
Steering column 10-92
Priority valve 10-93
Cushion valve 10-97

MidWestTech | Komatsu WA270-7 with 6D107E-2 Engine Wheel Loader Service Manu... Order the manual at mid-west-tech.com >

Emergency steering valve 10-98
Orbitrol valve 10-101
2way restrictor valve 10-107
Brake system 10-108
Layout of brake parts 10-108
Brake accumulator charge valve 10-110
Brake valve 10-115
Brake accumulator 10-119
Slack adjuster 10-120
Brake 10-122
Parking brake control 10-125
Parking brake 10-126
Parking brake solenoid valve 10-127
Undercarriage and frame 10-129
Axle mount 10-129
Center hinge pin 10-131
Tire 10-132
Hydraulic system 10-134
Hydraulic component layout 10-134
Work equipment control 10-136
Hydraulic tank 10-137
Double type gear pump 10-140
Steering and work equipment pump 10-141
Control valve 10-153
CLSS 10-163
Hydraulic circuit diagram and names of valves 10-167
Self-pressure reducing valve 10-180
Work equipment PPC valve 10-185
Work equipment lock solenoid valve 10-193
PPC circuit accumulator 10-194
ECSS accumulator 10-195
Work equipment 10-196
Work equipment linkage 10-196
Bucket 10-197
Cab and its attachments 10-198
ROPS cab 10-198
Cab mount 10-200
Electrical system 10-201
Engine control system 10-201
Preheating system 10-204
Engine output limit function 10-206
Automatic warm-up function 10-207
Parking brake control system 10-208
System operating lamp function 10-212
Battery disconnect switch function 10-213
HST controller system 10-215
Machine monitor system 10-255
Rearview monitor system 10-276
KOMTRAX system 10-279
System component parts 10-282
Sensor 10-305
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 20-17
30 Testing and adjusting 30-1
Table of contents 30-2

MidWestTech | Komatsu WA270-7 with 6D107E-2 Engine Wheel Loader Service Manu... Order the manual at mid-west-tech.com >

Related information on testing and adjusting 30-4
Tools for testing and adjusting 30-4
Sketch of tools for testing and adjusting 30-10
Engine and cooling system 30-11
Testing engine speed 30-11
Testing boost pressure 30-12
Testing exhaust gas temperature 30-14
Testing exhaust gas color 30-15
Testing and adjusting valve clearance 30-17
Testing compression pressure 30-19
Testing blowby pressure 30-23
Testing engine oil pressure 30-24
Testing EGR valve and KVGT oil pressures 30-25
Testing fuel pressure 30-26
Testing fuel discharge, return and leakage 30-30
Bleeding air from fuel system 30-35
Testing fuel circuit for leakage 30-37
Handling cylinder cutout mode operation 30-38
Handling no-injection cranking operation 30-39
Testing of KDPF and muffler stack for looseness and damage 30-40
Testing of installed condition of cylinder heads and manifolds 30-41
Testing engine piping for damage and looseness 30-42
Testing and adjusting air conditioner compressor belt tension 30-43
Replacing alternator belt 30-44
Power train 30-45
Testing oil leakage from axle final drive 30-45
Testing drive shaft for looseness, backlash, and damage 30-46
Testing accelerator pedal 30-47
Testing and adjusting HST oil pressure 30-48
Testing transfer clutch control pressure 30-51
Steering system 30-52
Testing directional lever 30-52
Testing steering wheel 30-53
Testing work equipment control lever 30-55
Testing and adjusting steering circuit oil pressure 30-57
Bleeding air from steering cylinder circuit 30-59
Brake system 30-60
Testing brake pedal 30-60
Testing braking performance 30-61
Testing and adjusting of accumulator charge pressure 30-62
Testing wheel brake oil pressure 30-64
Testing lowering of wheel brake pressure 30-65
Testing wear of wheel brake disc 30-67
Bleeding air from wheel brake circuit 30-68
Releasing remaining pressure in brake accumulator circuit 30-69
Testing parking brake performance 30-70
Testing wear of parking brake disc 30-71
Testing parking brake release pressure 30-72
Method of releasing parking brake manually 30-73
Hydraulic system 30-74
Testing cooling fan speed 30-74
Testing cooling fan pump circuit oil pressure 30-75
Bleeding air from hydraulic fan circuit 30-77
Testing and adjusting work equipment PPC oil pressure 30-78
Testing and adjusting work equipment oil pressure 30-80
Bleeding air from work equipment circuit 30-84
Releasing remaining pressure from work equipment circuit 30-85
Testing ECSS accumulator nitrogen gas pressure and procedure for charging accumulator with nitrogen gas 30-87

MidWestTech | Komatsu WA270-7 with 6D107E-2 Engine Wheel Loader Service Manu... Order the manual at mid-west-tech.com >

Machine model / Serial No.	Unit	WA270-7 / A27001 and up
Engine		
Model	-	SAA6D107E-2
Type	-	4-cycle, water-cooled, in-line, vertical, direct injection, with variable geometry turbocharger and air-cooled aftercooler
No. of cylinders - bore x stroke	mm	6 – 107 x 124
Total piston displacement	ℓ {cc}	6.69 {6,690}
Performance Rated horsepower • SAE J1995 (Gross) (*1) • ISO 14396 • ISO 9249/SAE J1349 (Net) (*2)	kW {HP}/ min^{-1} {rpm}	 115 {153} / 2,000 {2,000} 115 {153} / 2,000 {2,000} 111 {149} / 2,000 {2,000}
Max. torque (*2)	Nm {kgm}/ min^{-1} {rpm}	679 {69.3} / 1,300 {1,300}
Max. speed with no load	min^{-1} {rpm}	2,225 {2,225}
Min. speed with no load	min^{-1} {rpm}	825 {825}
Min. fuel consumption ratio	g/kWh {g/HPh}	212 {158}
Starting motor	-	24 V, 5.5 kW
Alternator	-	24 V, 60 A
Battery (*3)	-	12 V, 92 Ah x 2 pieces

*1: Indicates the value of the basic engine (without cooling fan).

*2: Indicates the value at the minimum cooling fan speed.

*3: The battery capacity (Ah) is indicated in the 5-hour rate.

★ The engine rated horsepower is indicated in the net value and gross value. The gross denotes the flywheel horsepower measured on the basic engine unit, while the net denotes the value measured of an engine under the condition essentially the same as that when it is installed on a machine.

★ Following shows the rated horsepower (net) at the maximum cooling fan speed.
101 kW {135 HP} / 2,000 min^{-1} {2,000 rpm}

Power train		
HST pump Type Discharge	 - cm^3/rev	 Variable displacement swash plate piston type 0 to 110.4
HST motor 1 Type Discharge	 - cm^3/rev	 Variable displacement bent axis piston type 0 to 85.2
HST motor 2 Type Discharge	 - cm^3/rev	 Variable displacement bent axis piston type 32.5 to 85.2
Transfer	-	Multi-axis planetary gear compound type, helical gear constant mesh type, with selectable 2 power systems
Reduction gear system	-	Spiral bevel gear, splash lubrication type
Differential	-	Straight bevel gear type, torque proportioning
Final drive	-	Planetary gear, single reduction, splash lubrication type

MidWestTech | Komatsu WA270-7 with 6D107E-2 Engine Wheel Loader Service Manu... Order the manual at mid-west-tech.com >

Failure code [CA3134] KDPF Outlet Press Sens Low Error (WA320_7-CA3134-400-A-Z0-A)

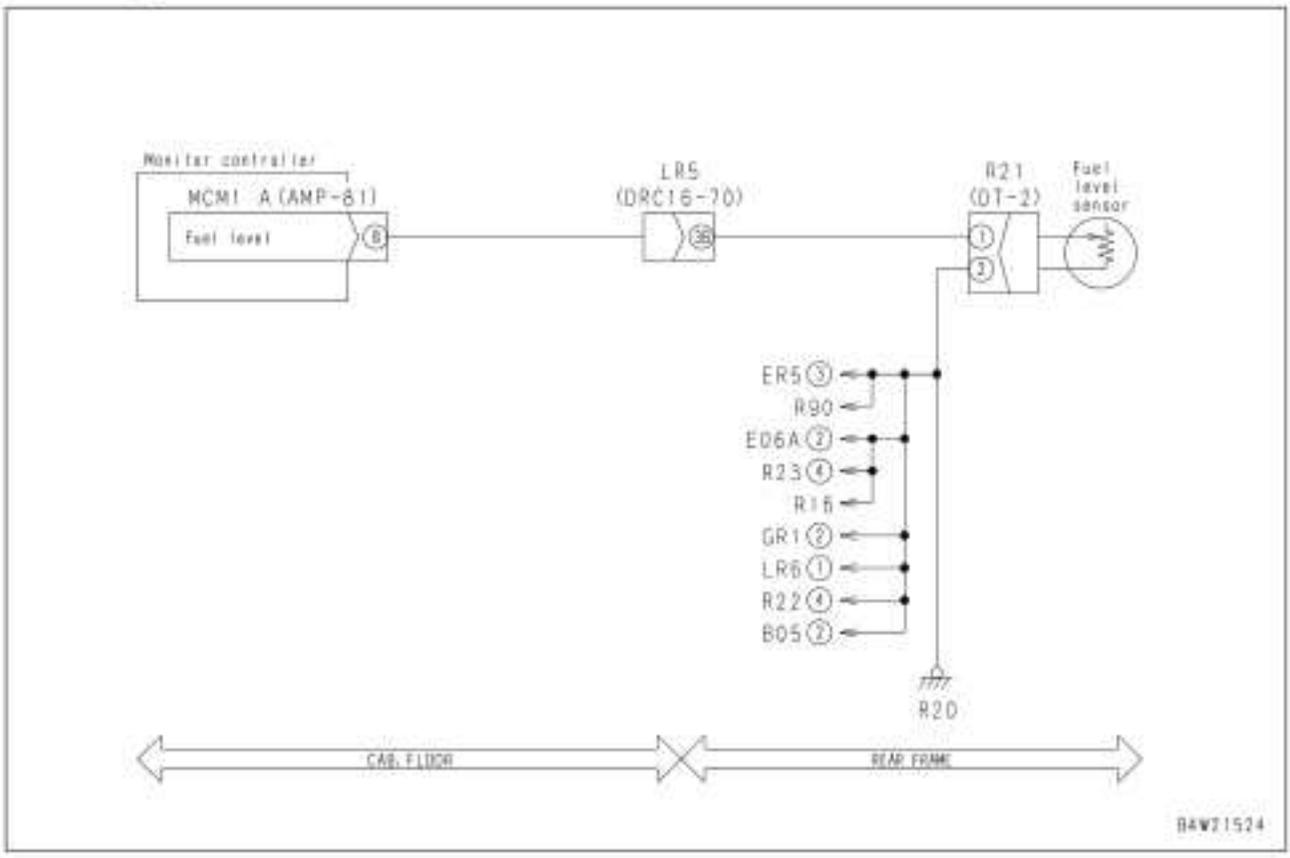
Action level	Failure code	Failure	KDPF Outlet Pressure Sensor Low Error (Engine controller system)
L03	CA3134		
Detail of failure	• Low voltage appears in signal circuit of KDPF outlet pressure sensor.		
Action of controller	• Sets KDPF outlet pressure to a recommended value (gauge pressure) and continues operation. (Controller may use 0 kPa (gauge pressure) to run engine if another failure code is also displayed.)		
Problem on machine	• None		
Related information	⚠ **Since KDPF is heated to 500°C or above, take care not to get burn injury.** • KDPF differential pressure sensor and KDPF outlet pressure sensor are integrated. • If failure code [CA1696] is not displayed but failure code [CA1881] is on screen, sensor connector is probably disconnected or 5 V circuit probably has open circuit (defective contact of connector). • This failure code appears if sensor connector is disconnected. • Signal voltage from KDPF outlet pressure sensor can be checked with monitoring function. (Code: 47001 (V)) • Differential pressure sensed by KDPF outlet pressure sensor can be checked with monitoring function. (Code: 47000 (kPa)) • Method of reproducing failure code: Turn starting switch to ON position.		

No.	Cause	Procedure, measuring location, criteria, and remarks		
1	Defective wiring harness connector	1. See descriptions of wiring harness and connectors in "c: Electrical equipment" in "Checks before troubleshooting" of "Related information on troubleshooting", and check it. 2. Turn starting switch to ON position.		
		If this failure code is not displayed, wiring harness connector is defective. ★ If this failure code is displayed, perform following checks.		
2	Defective sensor power supply system	If failure code [CA1695] or [CA1696] is displayed, perform troubleshooting for [CA1695] or [CA1696] first.		
		1. Turn starting switch to OFF position. 2. Disconnect connector E25 and connect T-adapter to female side. 3. Turn starting switch to ON position.		
		Voltage	Between E25 (female) (4) and (1)	4.75 to 5.25 V
3	Open circuit in wiring harness (Wire breakage or defective contact of connector)	1. Turn starting switch to OFF position. 2. Disconnect connectors EC3 and E25, and connect T-adapters to each female side.		
		Resistance	★ If no failure is found by check on cause 2, this check is not required. Between EC3 (female) (43) and E25 (female) (1)	Max. 10 Ω
			★ If no failure is found by check on cause 2, this check is not required. Between EC3 (female) (52) and E25 (female) (4)	Max. 10 Ω
			Between EC3 (female) (58) and E25 (female) (3)	Max. 10 Ω
4	Ground fault in wiring harness (Contact with ground circuit)	1. Turn starting switch to OFF position. 2. Disconnect connectors EC3 and E25, and connect T-adapter to either female side.		
		Resistance	Between ground and EC3 (female) (58) or E25 (female) (3)	Min. 100 kΩ

MidWestTech | Komatsu WA270-7 with 6D107E-2 Engine Wheel Loader Service Manu... 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 MCM1 A and R21, and connect T-adapter to female side of MCM1 A. ★ Check by using multimeter in continuity mode.		
		Continu-ity	Between MCM1 A (female) (8) and each pin other than pin (8)	No continuity (No sound is heard.)
7	Defective monitor controller	If no failure is found by above checks, monitor controller is defective.		

Circuit diagram related to fuel level sensor

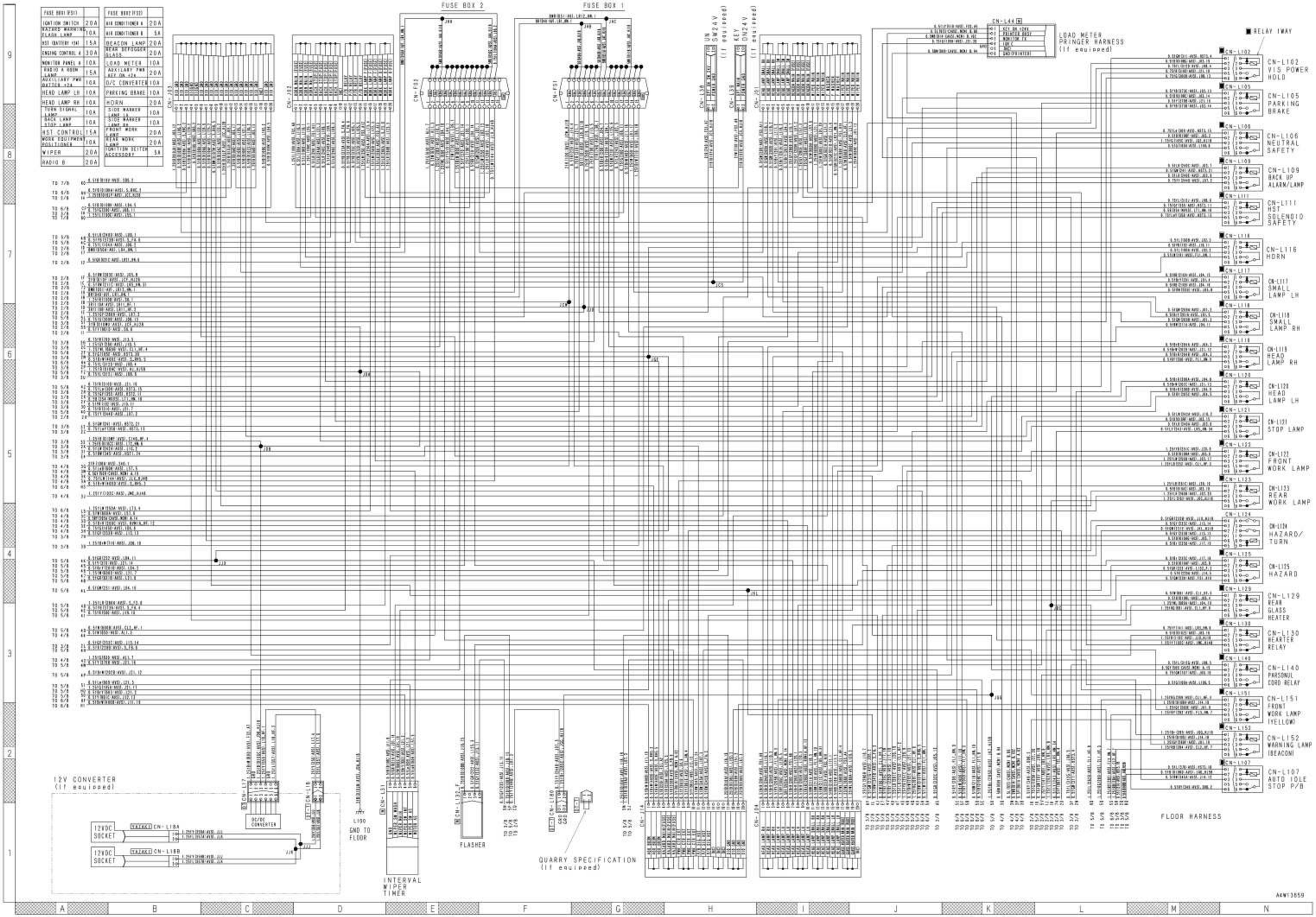


MidWestTech | Komatsu WA270-7 with 6D107E-2 Engine Wheel Loader Service Manu... Order the manual at mid-west-tech.com >

Electrical circuit diagram of floor (1/8)

WA270-7

★ This diagram covers optional components that are unavailable in some areas.



MidWestTech | Komatsu WA270-7 with 6D107E-2 Engine Wheel Loader Service Manual | Publication CEBM027601

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