SEN06202-03

Shop Manual

WHEEL LOADER **WA320-7**

SERIAL NUMBERS 80001 and up

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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 10-40
Power train system 10-40
Layout of power train parts 10-42
Damper 10-43
HST pump 10-44
HST motor1 10-57
HST motor2 10-59
Transfer 10-64
Clutch solenoid valve 10-71
Drive shaft 10-73
Axle 10-74
Differential 10-76
Torque proportional differential 10-80
Limited slip differential 10-82
Final drive 10-87
Steering system 10-89
Layout of steering devices 10-89
Steering column 10-90
Priority valve 10-91
Cushion valve 10-95

MidWestTech | Komatsu WA320-7 Wheel Loader Service Manual | Publication SEN06... Order the manual at mid-west-tech.com >

Emergency steering valve 10-96
Orbitrol valve 10-99
Brake system 10-105
Layout of brake parts 10-105
Brake accumulator charge valve 10-107
Brake valve 10-112
Brake accumulator 10-116
Slack adjuster 10-117
Brake 10-119
Parking brake control 10-122
Parking brake 10-123
Parking brake solenoid valve 10-124
Undercarriage and frame 10-126
Axle mount 10-126
Center hinge pin 10-128
Tire 10-129
Hydraulic system 10-131
Hydraulic component layout 10-131
Work equipment control 10-133
Hydraulic tank 10-134
Double type gear pump 10-137
Steering and work equipment pump 10-138
Control valve 10-150
CLSS 10-160
Hydraulic circuit diagram and names of valves 10-164
Self-pressure reducing valve 10-177
Work equipment PPC valve 10-182
Work equipment lock solenoid valve 10-190
PPC circuit accumulator 10-191
ECSS accumulator 10-192
Work equipment 10-193
Work equipment linkage 10-193
Bucket 10-194
Cab and its attachments 10-195
ROPS cab 10-195
Cab mount 10-197
Electrical system 10-198
Engine control system 10-198
Preheating system 10-201
Engine output limit function 10-203
Automatic warm-up function 10-204
Parking brake control system 10-205
System operating lamp function 10-209
Battery disconnect switch function 10-210
HST controller system 10-212
Machine monitor system 10-252
Rearview monitor system 10-273
KOMTRAX system 10-276
System component parts 10-279
Sensor 10-302
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
Related information on testing and adjusting 30-4

MidWestTech | Komatsu WA320-7 Wheel Loader Service Manual | Publication SEN06...
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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 30-20
Testing blowby pressure 30-24
Testing engine oil pressure 30-25
Testing EGR valve and KVGT oil pressures 30-26
Testing fuel pressure 30-27
Testing fuel discharge, return and leakage 30-32
Bleeding air from fuel system 30-37
Testing fuel circuit for leakage 30-39
Handling cylinder cutout mode operation 30-40
Handling no-injection cranking operation 30-41
Testing of KDPF and muffler stack for looseness and damage 30-42
Testing of installed condition of cylinder heads and manifolds 30-43
Testing engine piping for damage and looseness 30-44
Testing and adjusting air conditioner compressor belt tension 30-45
Replacing alternator belt 30-46
Power train 30-47
Testing oil leakage from axle final drive 30-47
Testing drive shaft for looseness, backlash, and damage 30-48
Testing accelerator pedal 30-49
Testing and adjusting HST oil pressure 30-50
Testing transfer clutch control pressure 30-53
Steering system 30-54
Testing directional lever 30-54
Testing steering wheel 30-55
Testing work equipment control lever 30-57
Testing and adjusting steering circuit oil pressure 30-59
Bleeding air from steering cylinder circuit 30-61
Brake system 30-62
Testing brake pedal 30-62
Testing braking performance 30-63
Testing and adjusting of accumulator charge pressure 30-64
Testing wheel brake oil pressure 30-66
Testing lowering of wheel brake pressure 30-67
Testing wear of wheel brake disc 30-69
Bleeding air from wheel brake circuit 30-70
Releasing remaining pressure in brake accumulator circuit 30-71
Testing parking brake performance 30-72
Testing wear of parking brake disc 30-73
Testing parking brake release pressure 30-74
Method of releasing parking brake manually 30-75
Hydraulic system 30-76
Testing cooling fan speed 30-76
Testing cooling fan pump circuit oil pressure 30-77
Bleeding air from hydraulic fan circuit 30-79
Testing and adjusting work equipment PPC oil pressure 30-80
Testing and adjusting work equipment oil pressure 30-82
Bleeding air from work equipment circuit 30-86
Releasing remaining pressure from work equipment circuit 30-87
Testing ECSS accumulator nitrogen gas pressure and procedure for charging accumulator with nitrogen gas 30-89
Work equipment 30-93

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Machine model	Unit	WA320-7
Serial No.		80001 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)	 127 {170} / 2,100 {2,100} 127 {170} / 2,100 {2,100} 123 {165} / 2,100 {2,100}
Max. torque (*1)	Nm {kgm}/ min^{-1} (rpm)	767 {78.2} / 1,400 {1,400}
Max. speed with no load	min^{-1} (rpm)	2,250 {2,250}
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 rated 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.

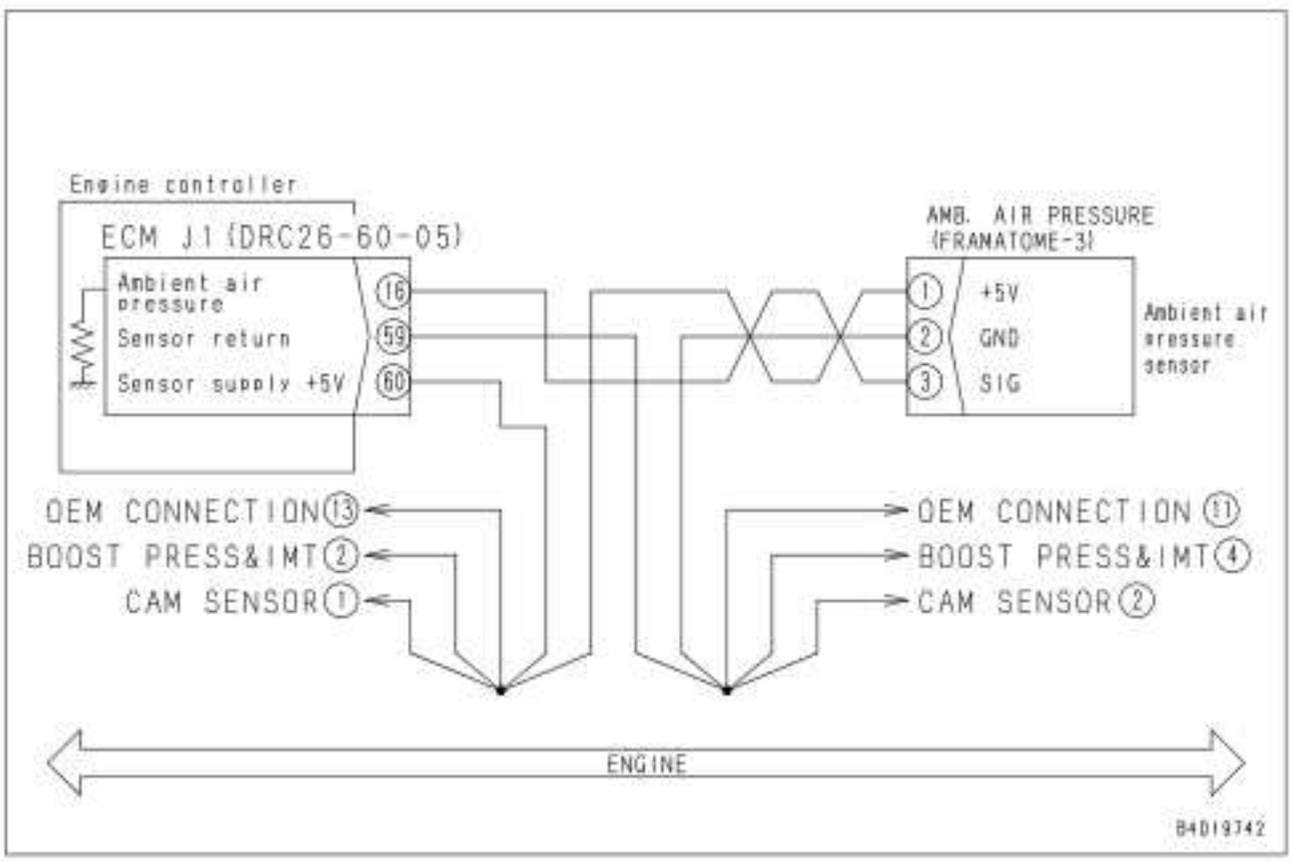
★ Following shows the rated horsepower (net) at the maximum cooling fan speed.
112 kW (151 HP) / 2,100 min^{-1} {2,100 rpm}

Power train		
HST pump Type Discharged volume	 — cm^3/rev	 Variable displacement swash plate piston type 0 to 110.4
HST motor 1 Type Discharged volume	 — cm^3/rev	 Variable displacement bent axis type piston motor 0 to 115.6
HST motor 2 Type Discharged volume	 — cm^3/rev	 Variable displacement bent axis type piston motor 41 to 115.6
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

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No.	Cause	Procedure, measuring location, criteria and remarks			
4	Ground fault in wiring harness (contact with ground circuit)	1. Turn starting switch to OFF position. 2. Disconnect connectors ECM J1 and AMB. AIR PRESSURE, and connect T-adapters to either female side.			
		Resis-tance	Between ground and ECM J1 (female) (16) or AMB. AIR PRESSURE (female) (3)		Min. 100 kΩ
5	Short circuit in wiring harness	1. Turn starting switch to OFF position. 2. Disconnect connectors ECM J1 and AMB. AIR PRESSURE, and connect T-adapters to either female side.			
		Resis-tance	Between ECM J1 (16) and (59), or between AMB. AIR PRESSURE (female) (2) and (3)		Min. 100 kΩ
6	Defective ambient pressure sensor	1. Turn starting switch to OFF position. 2. Insert T-adapters in connector ECM J1. 3. Turn starting switch to ON position.			
		Voltage	Between ECM J1 (16) and (59)	Sensor output	0.5 to 4.5 V
7	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 ambient pressure sensor



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Failure code [DK5DKA] Failure of 3rd Lever Potentio (Main) (WA320_7-DK5DKA-600-A-Z0-A)

Action level	Failure code	Failure	Failure of 3rd Lever Potentiometer (Main) (HST controller system)
L03	DK5DKA		
Detail of failure	• Controller determines that 3rd valve (PCS) potentiometer (main: A line) circuit has open circuit or ground fault because signal voltage from 3rd valve (PCS) potentiometer (main: A line) is lower than normal range. (Signal voltage from 3rd valve (PCS) potentiometer (main: A line): Max. 0.3 V)		
Action of controller	• Controls attachment by using signals from 3rd valve (PCS) potentiometer (sub: B line) if 3rd valve (PCS) potentiometer (sub: B line) is normal. However, in this case, decreases work equipment speed 30%. • Lights up centralized warning lamp and sounds alarm buzzer. • Even if cause of failure disappears, machine does not become normal until 3rd valve (PCS) is set in NEUTRAL.		
Problem on machine	• Attachment cylinder retracts momentarily, then attachment is controlled normally by using signals from sub potentiometer. However, work equipment speed decreases to 30%.		
Related information	• This failure code does not appear on a machine that is not equipped with 3rd valve (PCS). (If this failure code is displayed on the machine, select "None" for 3rd valve (PCS) setting on option setting screen of machine monitor.) • 3rd valve (PCS) potentiometer input voltage (main: A line) can be checked with monitoring function. (Code: 42018) • 3rd valve (PCS) potentiometer input voltage (sub: B line) can be checked with monitoring function. (Code: 42019) • Method of reproducing failure code: Turn starting switch to ON position.		

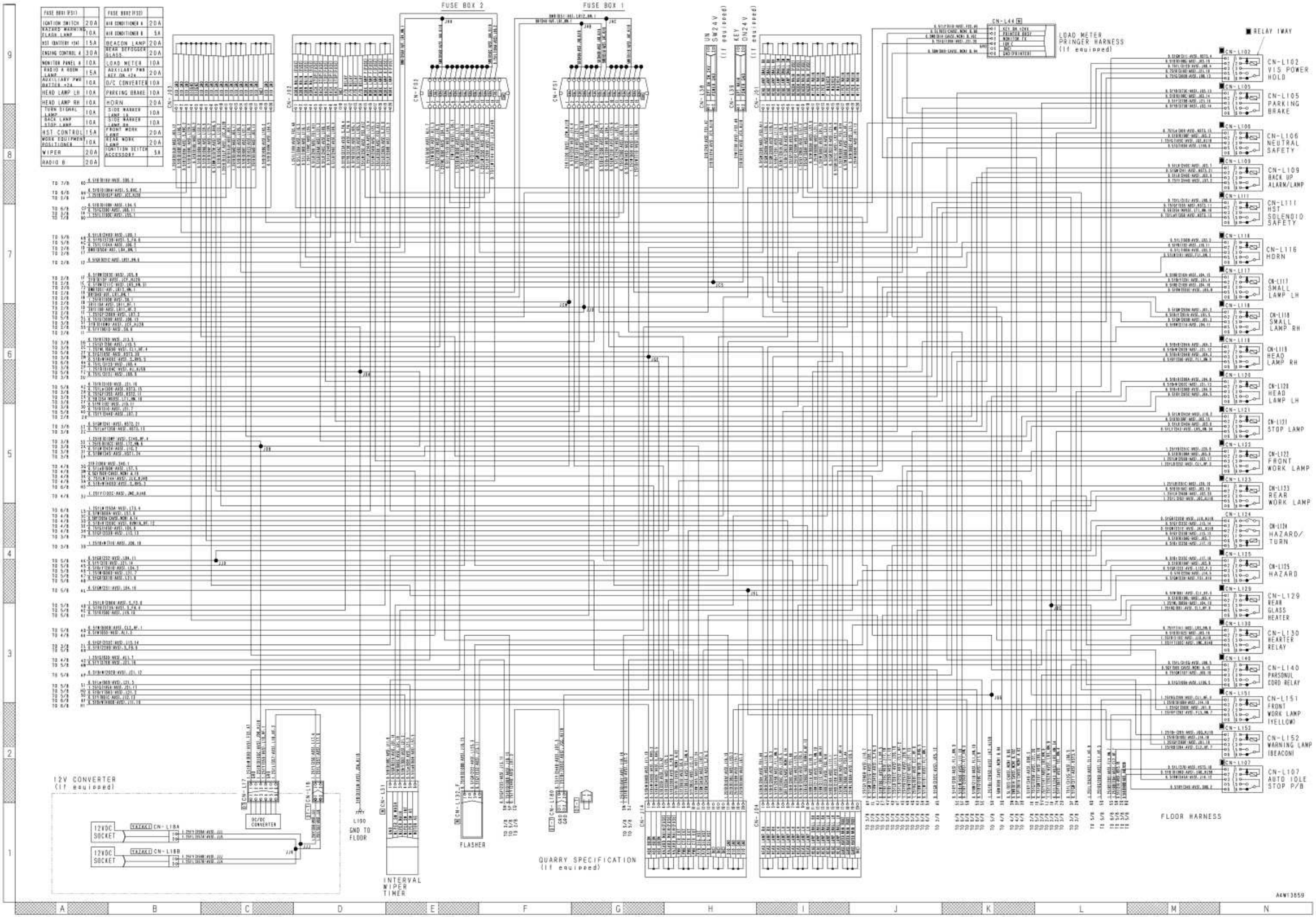
No.	Cause	Procedure, measuring location, criteria, and remarks			
1	Defective 5 V sensor power supply system	If failure code [DAJ6KX] is also displayed, perform troubleshooting for it first.			
		1. Turn starting switch to OFF position. 2. Disconnect connector L70, and connect T-adapter to female side. 3. Turn starting switch to ON position. ★ If power supply voltage is abnormal, go to check on cause 3 and after.			
		Voltage	Between L70 (female) (1) and (4)		4.8 to 5.2 V
2	Defective 3rd valve (PCS) potentiometer	1. Turn starting switch to OFF position. 2. Disconnect connector L70, and connect T-adapter to male side.			
		Resistance	Between L70 (male) (1) and ground		Min. 1 MΩ
			Between L70 (male) (2) and ground		
			Between L70 (male) (3) and ground		
			Between L70 (male) (4) and ground		
		3. Turn starting switch to OFF position. 4. Insert T-adapter into connector L70. 5. Set HST lock switch to LOCK position. 6. Turn starting switch to ON position. 7. Operated 3rd valve (PCS) to perform troubleshooting.			
		Voltage	Between L70 (2) and (4)	3rd valve (PCS): NEUTRAL	2.38 to 2.62 V
				3rd valve (PCS): Operated to extend cylinder fully	3.90 to 4.40 V
				3rd valve (PCS): Operated to retract cylinder fully	0.60 to 1.10 V

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Electrical circuit diagram of floor (1/8)

WA320-7

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



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