SEN03911-04

Shop Manual

WHEEL LOADER

WA320 -6
WA320PZ-6

SERIAL NUMBERS WA320- 70001 and up
WA320PZ- 70001

ecot3

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Composition of shop manual

The contents of this shop manual are shown together with Form No. in a list.

Note 1: Always keep the latest version of this manual in accordance with this list and utilize accordingly.
The marks shown to the right of Form No. denote the following:
○: New issue (to be filed additionally) ●: Revision (to be replaced for each Form No.)

Note 2: This shop manual can be supplied for each Form No.

Note 3: To file this shop manual in the special binder for management, handle it as follows:
- Place a divider on the top of each section in the file after matching the Tub No. with No. indicated next to each Section Name shown in the table below:
- File overview and other materials in sections in the order shown below and utilize them accordingly.

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Shop Manual, contents binder, binder label and tabs	SEN03911-04	
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100 Index	SEN03920-04	●
200 Foreword and general information	SEN03921-01	
01 Specification	SEN03913-01	
100 Specification and technical data	SEN03922-01	
10 Structure, function and maintenance standard	SEN03914-02	
100 Engine and cooling system	SEN03923-01	
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300 Steering system	SEN03925-01	
400 Brake system	SEN03926-00	
500 Undercarriage and frame	SEN03927-00	
600 Hydraulic system	SEN03928-00	
700 Work equipment	SEN03929-01	
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Machine model							WA320-6	
Category	Item		Measurement conditions			Unit	Standard value for new machine	Service limit value
Work equipment control valve	Relief pressure		• Engine speed: High idle • Hydraulic oil temperature: 45 – 55°C			MPa {kg/cm²}	20.6 ± 0.4 {210 ± 4}	20.6 ± 2.0 {210 ± 20}
Work equipment	Speed	Lift arm	• Engine speed: High idle • Hydraulic oil temperature: 45 – 55°C • Steering valve: Neutral • Apply no load ★ For measuring posture, see Fig. E – Fig. H at the end of this section	RAISE	*1	Sec.	5.7 ± 0.5	Max. 8.6
				LOWER			3.5 ± 0.5	Max. 5.3
		Bucket		TILT	*2		1.9 ± 0.3	Max. 2.9
				DUMP			1.2 ± 0.3	Max. 1.8
				TILT	*3		1.2 ± 0.3	Max. 2
	Hydraulic drift	Lift arm cylinder	• Bucket no load • Position of work equipment: Lift arm and bucket in level position • Engine stopped • Hydraulic oil temperature: 45 – 55°C • Stop engine and leave for 5 minutes, then measure for 15 minutes. ★ For measuring posture, see Fig. J at the end of this section			mm	Max. 20	Max. 30
		Bucket cylinder					Max. 17	Max. 26
Hydraulic drive fan	Max. fan speed		• Engine speed: High idle • Engine coolant temperature: Min. 90°C • Boost temperature: Min. 70°C • HST oil temperature: Min. 95°C			rpm	1,690 ± 50	1,690 ± 200
	Fan drive pressure		• Engine speed: High idle • Engine coolant temperature: Min. 90°C • Boost temperature: Min. 70°C • HST oil temperature: Min. 95°C			MPa {kg/cm²}	14.7 ± 1.5 {150 ± 15}	14.7 ± 2.3 {150 ± 23}
Proximity switch	Clearance between bucket positioner switch		• Hydraulic oil temperature: 45 – 55°C			mm	3 – 5	—
	Clearance between boom kick-out switch						3 – 5	—

*1: Time taken to raise bucket from contact with ground (bottom of bucket horizontal) to max. height of lift arm.
*2: Time taken to move bucket from max. tilt to max. dump.
*3: Time taken to move bucket from horizontal position to max. tilt.

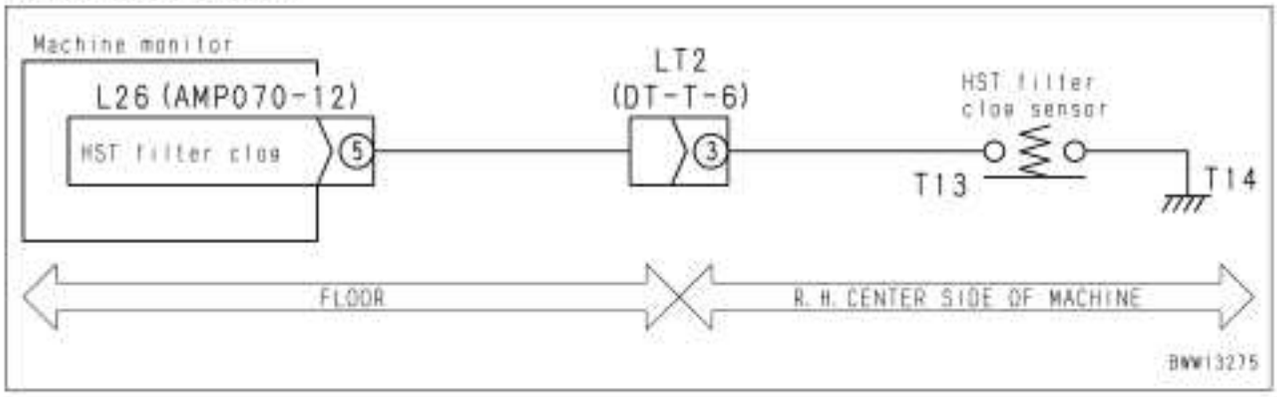
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Failure code [6091NX] HST filter: Clogging

Action code	Failure code	Trouble	HST filter: Clogging (Machine monitor system)
E01	6091NX		
Contents of trouble	• When HST oil temperature was above 50°C, HST oil filter clogging sensor signal circuit was closed (in contact with GND).		
Action of machine monitor	• Turns HST clogging caution lamp ON. • If cause of failure disappears, system resets itself.		
Problem that appears on machine	• If machine is used as it is, foreign matter may enter HST circuit.		
Related information	The input state from the HST oil filter clogging sensor can be checked with monitoring function (Monitoring code: MONITOR PANEL – 40903 – D-IN-24)		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Clogged HST oil filter	System is normal. ★ Check HST oil filter directly.			
	2	Defective HST oil filter clogging sensor (Internal defect)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			T13	Filter condition	Resistance	
			Between T13 – ground	Not clogged (Normal)	Min. 1 MΩ	
				Clogged	Max. 1 Ω	
	3	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 T13 – L26 (female) (5)		Resistance	Max. 1 Ω
			Wiring harness between HST oil filter clogging sensor body – ground		Resistance	Max. 1 Ω
	4	Defective machine monitor	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			L26	Filter condition	Voltage	
			Between (5) – ground	Not clogged (Normal)	20 – 30 V	
				Clogged	Max. 1 V	

Related circuit diagram



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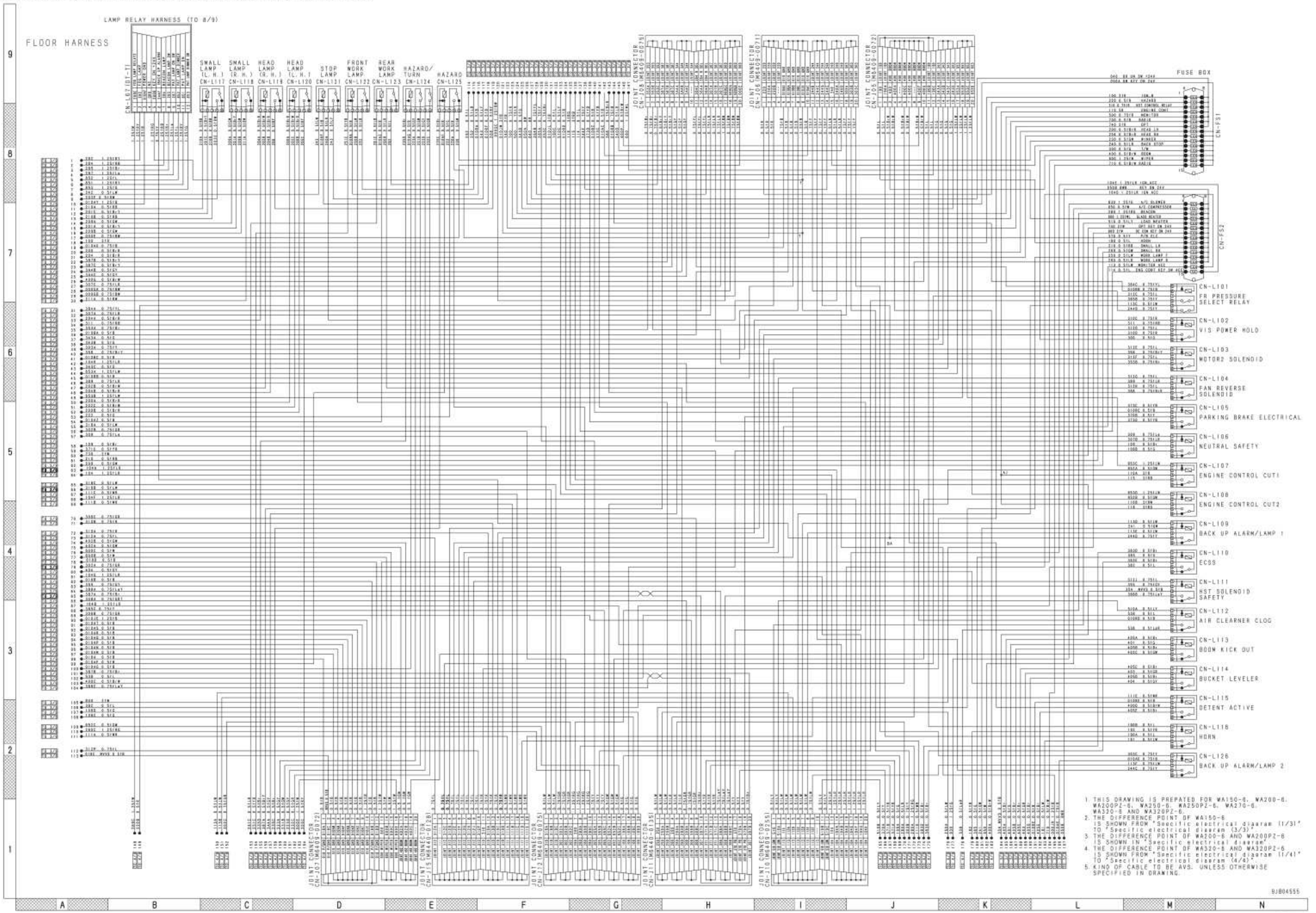
Failure code [D1B0KY] HST safety relay: Hot short

Action code	Failure code	Trouble	HST safety relay: Hot short (HST controller system)
E03	D1B0KY		
Contents of trouble	• Hot short was detected in HST safety relay circuit.		
Action of machine monitor	• Turns clutch EPC solenoid output OFF. • Turns motor 1 solenoid output OFF. • Turns HST safety relay output OFF. • Even if trouble disappears, system does not reset itself until starting switch is turned OFF. • Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• Traction force decreases. • Travel speed is not limited with speed range selector switch and travel speed control dial. • If engine is stopped without applying parking brake securely on slope, machine moves down suddenly.		
Related information	• If [**DAJ2L3**] or [**DAJ2L4**] is displayed, carry out troubleshooting for it first. • Following output command values can be checked with monitoring function. Motor 1 solenoid output: HST – 80000 – MOTOR SOL DIR (mA) HST safety relay output: HST – 40979 – D_OUT_15 (ON/OFF) Clutch EPC solenoid output: HST – 80100 – CLUTCH SOL DIR (mA).		

Possible causes and standard value in normal state	Causes		Standard value in normal state/Remarks on troubleshooting			
	1	Defective HST safety relay (Internal defect)	★ Prepare with starting switch OFF, then start engine and carry out troubleshooting.			
			Replace HST safety relay (L111) with another relay.	Condition becomes normal.	Relay (L111) is defective.	
				Condition does not become normal.	Relay (L111) is normal.	
			★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Between L111 (male) (1) – (2)		Resistance	200 – 400 Ω
	2	Hot short (Contact with 5 V, 24 V circuit) in wiring harness	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			Between wiring harness HST (female) (17) – L111 (female) (2) and ground		Voltage	Max. 1 V
	3	Defective HST controller	If causes 1 and 2 are not detected, HST controller may be defective. (Since trouble is in system, troubleshooting cannot be carried out.)			

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



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