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WHEEL LOADER

WA430-6

Machine Model	Serial Number
WA430-6	65001 and up

40 Troubleshooting

Troubleshooting by failure code (Display of code), Part 1

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Failure code [1500L0] (TORQFLOW transmission: Double meshing)

Action code	Failure code	Trouble	TORQFLOW transmission: Double meshing (Transmission controller)
E03	**1500L0**		
Contents of trouble	• A combination for double meshing is input as a fill signal.		
Action of controller	• Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• The transmission may be broken. • The machine does not travel.		
Related information	• Method of reproducing failure code: Turn the starting switch ON.		

Possible causes and standard value in normal state	Causes		Standard value in normal state/Remarks on troubleshooting
	1	See failure codes [15SAL1], [15SBL1], [15SEL1], [15SFL1], [15SGL1], and [15SHL1].	

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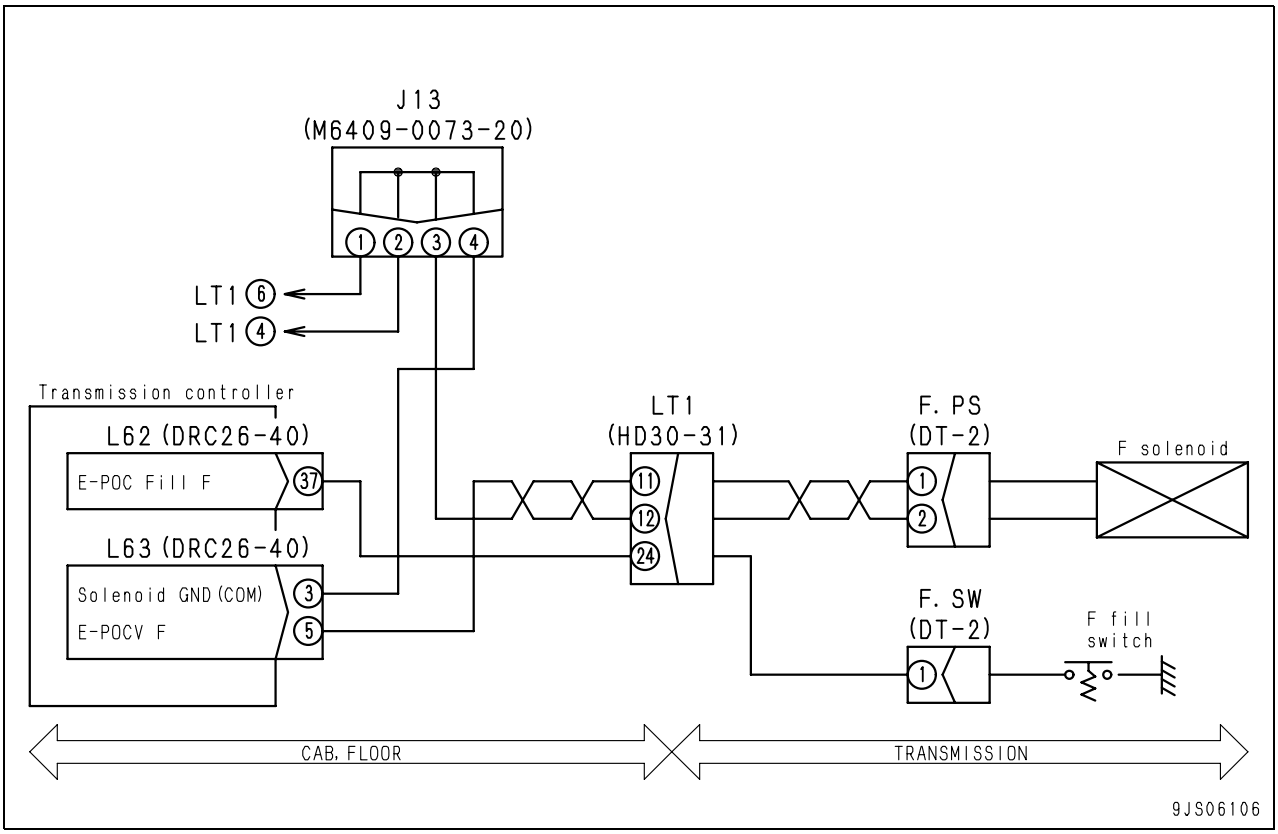
Failure code [15SAL1] (ECMV F clutch: When command current is OFF, fill signal is ON)

Action code	Failure code	Trouble	ECMV F clutch: When command current is OFF, fill signal is ON (Transmission controller)
E03	**15SAL1**		
Contents of trouble	• When F ECMV solenoid output is turned OFF, F ECMV fill switch signal ON is input, and clutch is not released.		
Action of controller	• Judges that the F ECMV fill switch signal is turned ON. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until FNR (directional) lever, joystick steering FNR (directional) switch or right FNR (directional) switch is set to N (Neutral).		
Problem that appears on machine	• F travel is enabled, but R travel is disabled.		
Related information	• The output state (current value) to the F clutch ECMV solenoid can be checked with the monitoring function (Code: 31608, ECMV F DIR). • The input state (ON/OFF) from the F fill switch can be checked with the monitoring function (Code: 40908, D-IN-24). • Method of reproducing failure code: Start engine		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	F clutch oil pressure error	When there is no residual pressure other than the F clutch oil pressure, the failure code is displayed. (See “Troubleshooting of hydraulic and mechanical system (H-mode)”.)			
	2	Defective F ECMV fill switch (Internal short circuit)	★ Prepare with starting switch OFF, then start engine and carry out troubleshooting. • Turn transmission cut-off switch OFF. • Turn parking brake switch OFF. • Keep pressing brake pedal to prevent machine from traveling.			
			F.SW (male)	FNR (directional) lever, joystick steering FNR (directional) switch or right FNR (directional) switch	Resistance	
			Between (1) and chassis ground	F (Forward)	Max. 1 Ω	
				Other than above	Min. 1 MΩ	
	3	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L62 (female) (37) – F.SW (female) (1) and chassis ground		Resistance	Min. 1 MΩ
	4	Defective transmission controller	★ Prepare with starting switch OFF, then start engine and carry out troubleshooting. • Turn transmission cut-off switch OFF. • Turn parking brake switch OFF. • Keep pressing brake pedal to prevent machine from traveling.			
			L62	FNR (directional) lever, joystick steering FNR (directional) switch or right FNR (directional) switch	Voltage	
			Between (37) and chassis ground	F (Forward)	Max. 1 V	
				Other than above	8 – 10 V	

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Circuit diagram related to transmission F clutch



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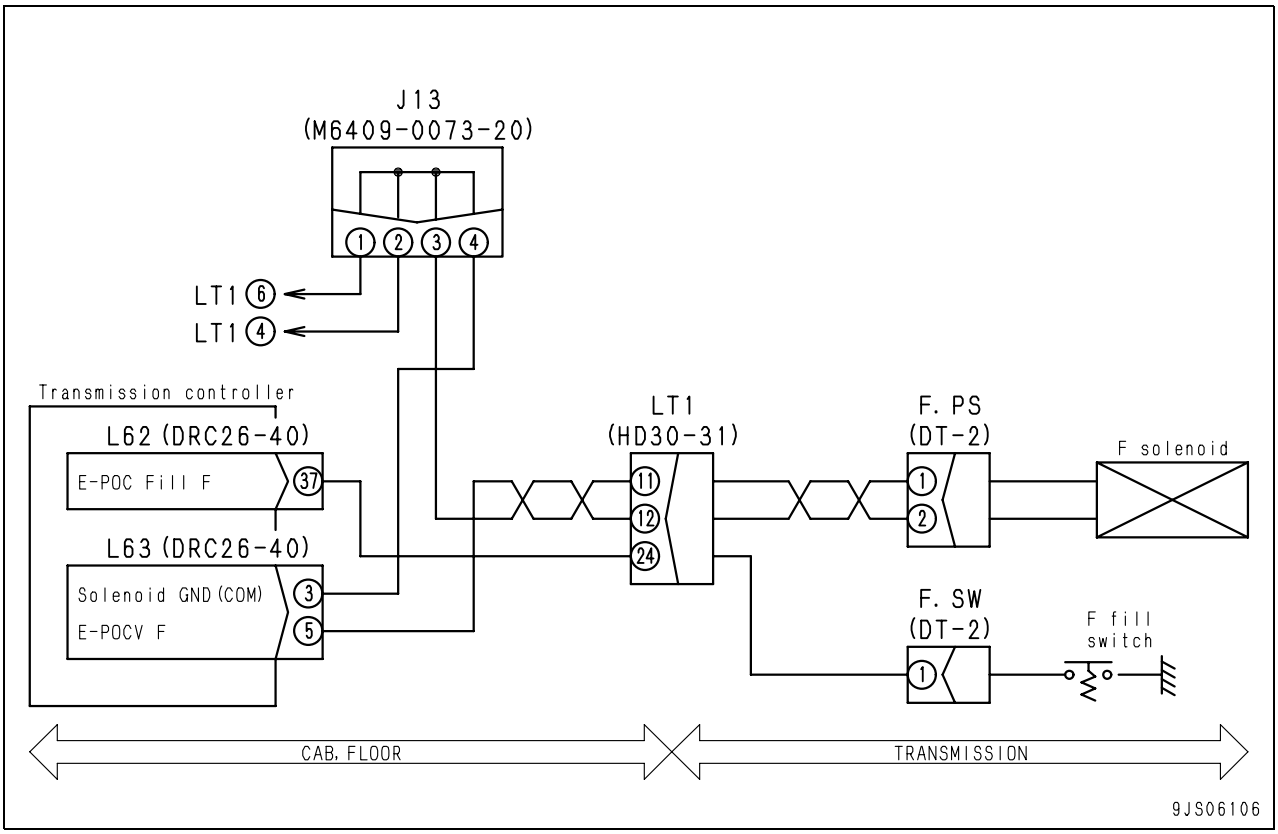
Failure code [15SALH] (ECMV F clutch: When command current is ON, fill signal is OFF)

Action code	Failure code	Trouble	ECMV F clutch: When command current is ON, fill signal is OFF (Transmission controller)
E01	**15SALH**		
Contents of trouble	• When F ECMV solenoid output is turned ON, F ECMV fill switch signal ON is not input.		
Action of controller	• Judges that the F ECMV fill switch signal is turned OFF. • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• When the travel direction is changed, a shock or a time lag may be made.		
Related information	• This failure code may also be displayed immensely after replacement of the transmission oil. • The output state (current value) to the F clutch ECMV solenoid can be checked with the monitoring function (Code: 31608, ECMV F DIR). • The input state (ON/OFF) from the F fill switch can be checked with the monitoring function (Code: 40908, D-IN-24). • Method of reproducing failure code: Start engine and then set FNR (directional) lever, joystick steering FNR (directional) switch, or right FNR (directional) switch to F (forward).		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	F clutch oil pressure error	This failure code is displayed if there was no F clutch oil pressure when F ECMV solenoid output is turned ON. (See “Troubleshooting of hydraulic and mechanical system (H-mode)”.)			
	2	Defective F ECMV fill switch (Internal disconnection)	★ Prepare with starting switch OFF, then start engine and carry out troubleshooting. • Turn transmission cut-off switch OFF. • Turn parking brake switch OFF. • Keep pressing brake pedal to prevent machine from traveling.			
			F.SW (male)	FNR (directional) lever, joystick steering FNR (directional) switch or right FNR (directional) switch	Resistance	
			Between (1) and chassis ground	F (Forward)	Max. 1 Ω	
				Other than above	Min. 1 MΩ	
	3	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harnesses between L62 (female) (37) – F.SW (female) (1)		Resistance	Max. 1 Ω
	4	Defective transmission controller	★ Prepare with starting switch OFF, then start engine and carry out troubleshooting. • Turn transmission cut-off switch OFF. • Turn parking brake switch OFF. • Keep pressing brake pedal to prevent machine from traveling.			
			L62	FNR (directional) lever, joystick steering FNR (directional) switch or right FNR (directional) switch	Voltage	
			Between (37) and chassis ground	F (Forward)	Max. 1 V	
				Other than above	8 – 10 V	

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Circuit diagram related to transmission F clutch



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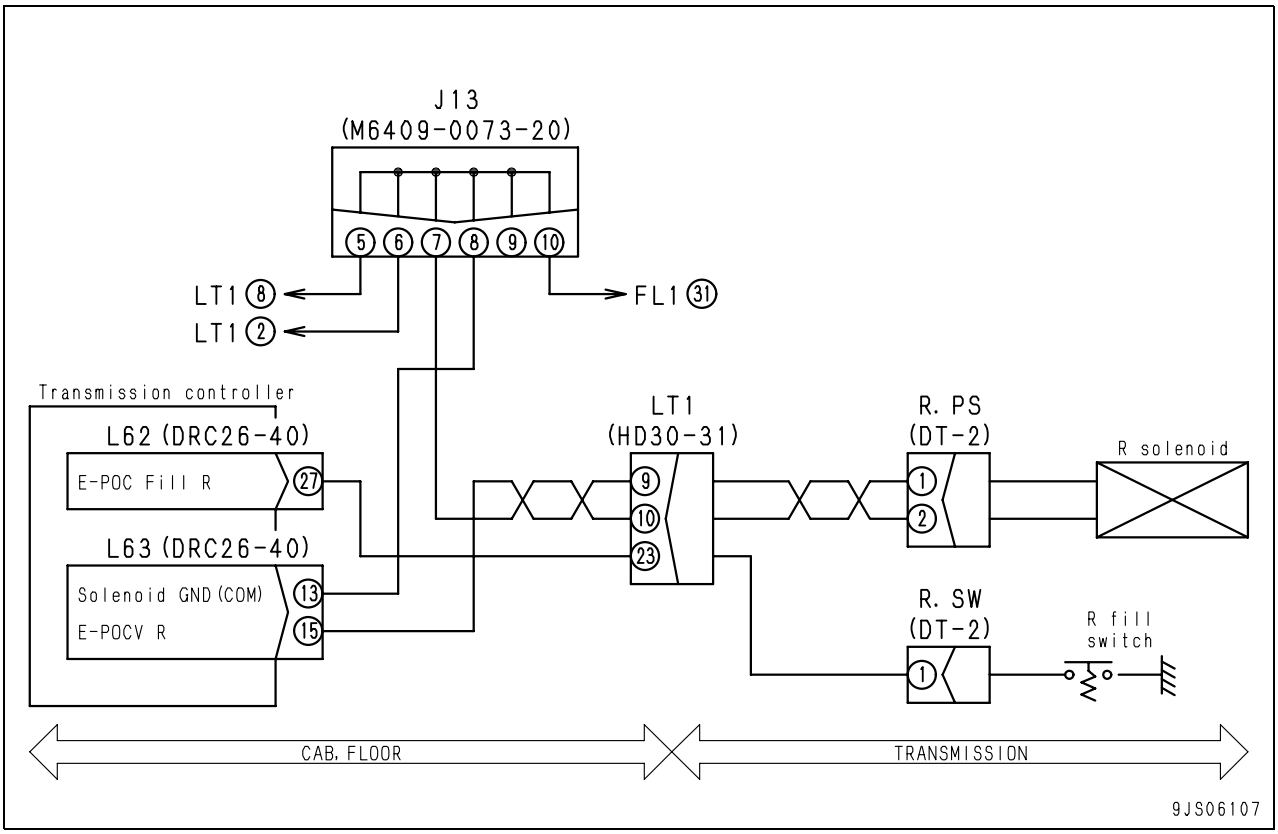
Failure code [15SBL1] (ECMV R clutch: When command current is OFF, fill signal is ON)

Action code	Failure code	Trouble	ECMV R clutch: When command current is OFF, fill signal is ON (Transmission controller)
E03	**15SBL1**		
Contents of trouble	• When R ECMV solenoid output is turned OFF, R ECMV fill switch signal ON is input, and clutch is not released.		
Action of controller	• Judges that the R ECMV fill switch signal is turned ON. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until FNR (directional) lever, joystick steering FNR (directional) switch or right FNR (directional) switch is set to N (Neutral).		
Problem that appears on machine	• The machine can travel in the R position, but cannot travel in the F position.		
Related information	• The output state (current value) to the R clutch ECMV solenoid can be checked with the monitoring function (Code: 31606, ECMV R DIR). • The input state (ON/OFF) from the R fill switch can be checked with the monitoring function (Code: 40908, D-IN-25). • Method of reproducing failure code: Start engine		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	R clutch oil pressure error	When there is no residual pressure other than the R clutch oil pressure, the failure code is displayed. (See “Troubleshooting of hydraulic and mechanical system (H-mode)”.)			
	2	Defective R ECMV fill switch (Internal short circuit)	★ Prepare with starting switch OFF, then start engine and carry out troubleshooting. • Turn transmission cut-off switch OFF. • Turn parking brake switch OFF. • Keep pressing brake pedal to prevent machine from traveling.			
			R.SW (male)	FNR (directional) lever, joystick steering FNR (directional) switch or right FNR (directional) switch	Resistance	
			Between (1) and chassis ground	R (Reverse)	Max. 1 Ω	
				Other than above	Min. 1 MΩ	
	3	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L62 (female) (27) – R.SW (female) (1) and chassis ground		Resistance	Min. 1 MΩ
	4	Defective transmission controller	★ Prepare with starting switch OFF, then start engine and carry out troubleshooting. • Turn transmission cut-off switch OFF. • Turn parking brake switch OFF. • Keep pressing brake pedal to prevent machine from traveling.			
			L62	FNR (directional) lever, joystick steering FNR (directional) switch or right FNR (directional) switch	Voltage	
			Between (27) and chassis ground	R (Reverse)	Max. 1 V	
				Other than above	8 – 10 V	

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Circuit diagram related to transmission R clutch



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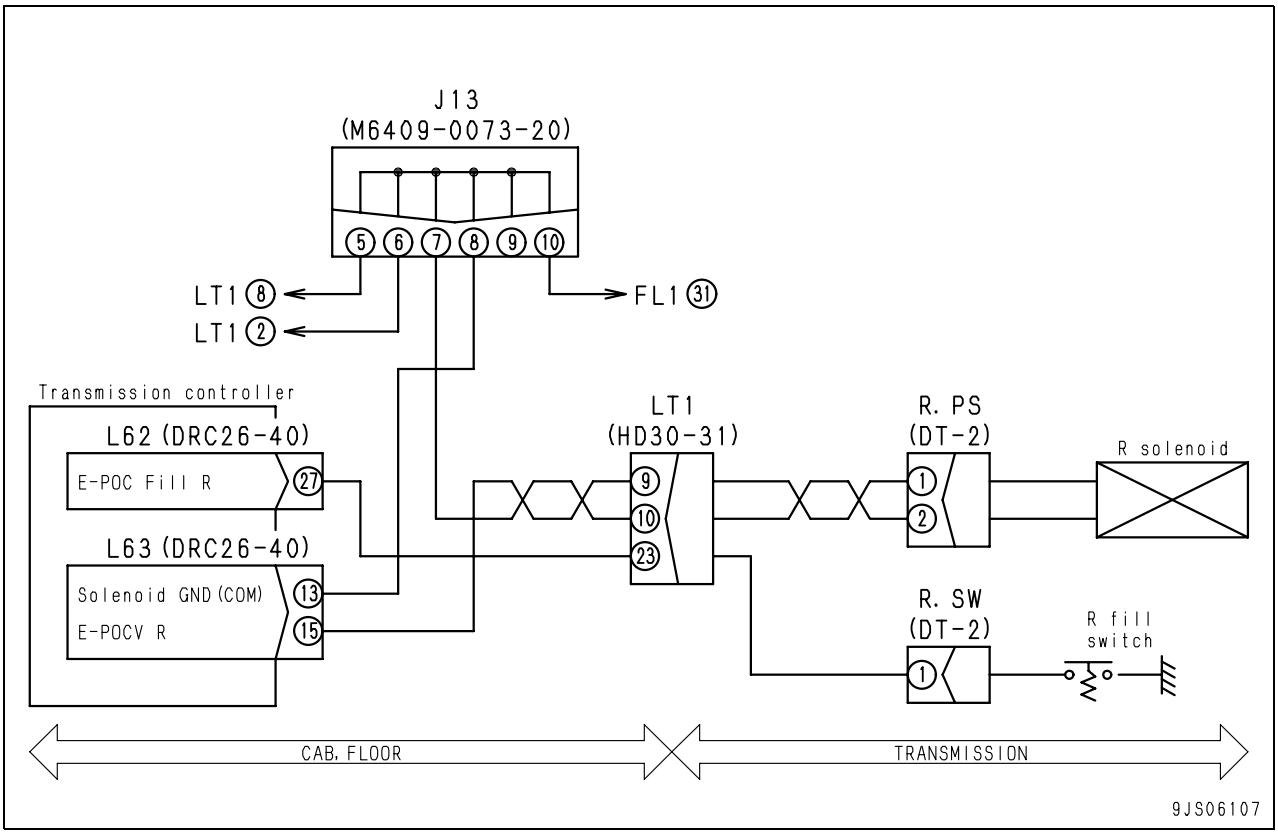
Failure code [15SBLH] (ECMV R clutch: When command current is ON, fill signal is OFF)

Action code	Failure code	Trouble	ECMV R clutch: When command current is ON, fill signal is OFF (Transmission controller)
E01	**15SBLH**		
Contents of trouble	• When R ECMV solenoid output is turned ON, clutch does not mesh because R ECMV fill switch ON signal is not input and the condition requires to set the engine speed at 500 rpm or below.		
Action of controller	• Judges that the R ECMV fill switch signal is turned OFF. • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• When the travel direction is changed, a shock or a time lag may be made.		
Related information	• This failure code may also be displayed immensely after replacement of the transmission oil. • The output state (current value) to the R clutch ECMV solenoid can be checked with the monitoring function (Code: 31606, ECMV R DIR). • The input state (ON/OFF) from the R fill switch can be checked with the monitoring function (Code: 40908, D-IN-25). • Method of reproducing failure code: Start engine, then set FNR (directional) lever, joystick steering FNR (directional) switch, or right FNR (directional) switch to R (reverse).		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	R (Reverse) clutch oil pressure error	This failure code is displayed if there was no R clutch oil pressure when F ECMV solenoid output is turned ON. (See “Troubleshooting of hydraulic and mechanical system (H-mode)”.)			
	2	Defective R ECMV fill switch (Internal short circuit)	★ Prepare with starting switch OFF, then start engine and carry out troubleshooting. • Turn transmission cut-off switch OFF. • Turn parking brake switch OFF. • Keep pressing brake pedal to prevent machine from traveling.			
			R.SW (male)	FNR (directional) lever, joystick steering FNR (directional) switch or right FNR (directional) switch	Resistance	
			Between (1) and chassis ground	R (Reverse)	Max. 1 Ω	
				Other than above	Min. 1 MΩ	
	3	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harnesses between L62 (female) (27) – R.SW (female) (1)		Resistance	Max. 1 Ω
	4	Defective transmission controller	★ Prepare with starting switch OFF, then start engine and carry out troubleshooting. • Turn transmission cut-off switch OFF. • Turn parking brake switch OFF. • Keep pressing brake pedal to prevent machine from traveling.			
			L62	FNR (directional) lever, joystick steering FNR (directional) switch or right FNR (directional) switch	Voltage	
			Between (27) and chassis ground	R (Reverse)	Max. 1 V	
				Other than above	8 – 10 V	

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Circuit diagram related to transmission R clutch



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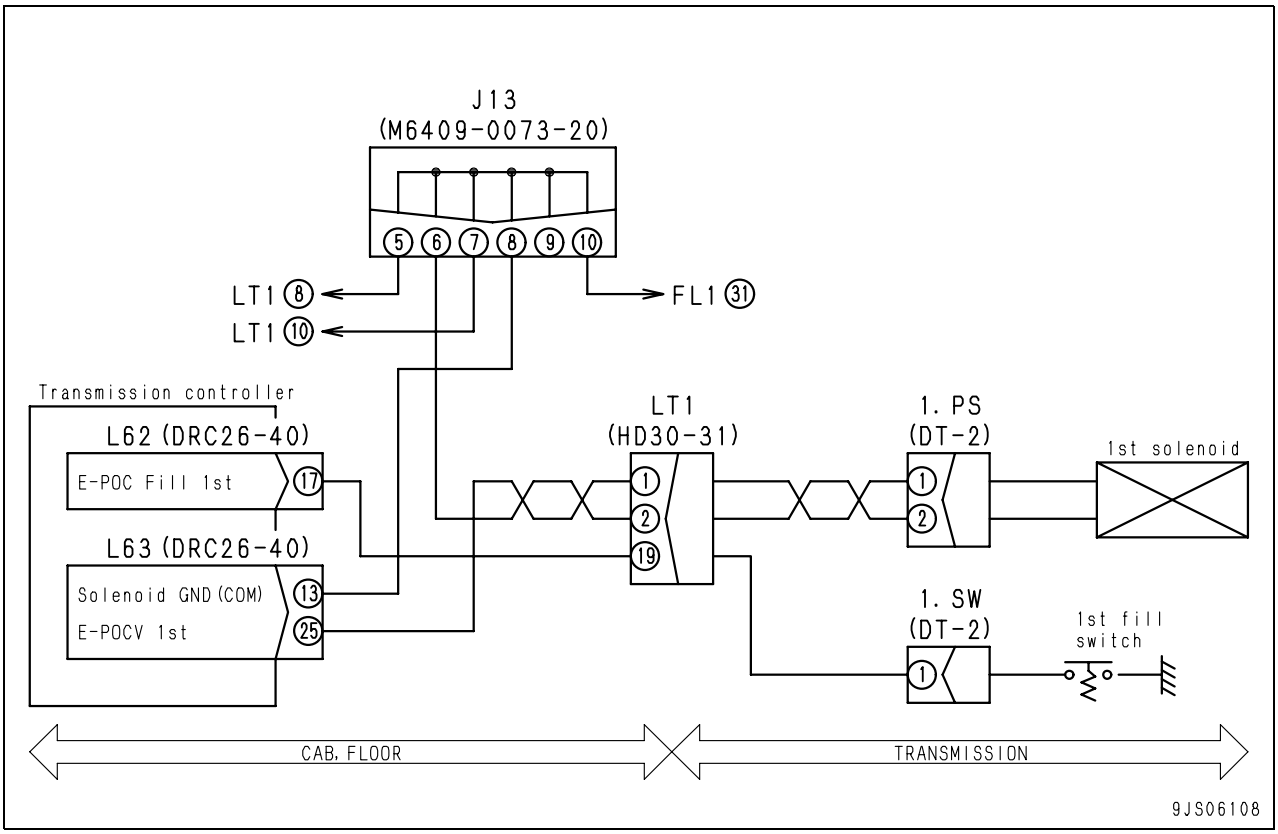
Failure code [15SEL1] (ECMV 1st clutch: When command current is OFF, fill signal is ON)

Action code	Failure code	Trouble	ECMV 1st clutch: When command current is OFF, fill signal is ON (Transmission controller)
E03	**15SEL1**		
Contents of trouble	• When 1st ECMV solenoid output is turned OFF, 1st ECMV fill switch signal ON is input, and clutch is not released.		
Action of controller	• Judges that the 1st ECMV fill switch signal is turned ON. • Holds 2nd, 3rd, and 4th proportional solenoid outputs OFF. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until FNR (directional) lever, joystick steering FNR (directional) switch or right FNR (directional) switch is set to N (Neutral).		
Problem that appears on machine	• The machine can travel at 1st, but not at 2nd, 3rd, and 4th.		
Related information	• The output state (current value) to the 1st clutch ECMV solenoid can be checked with the monitoring function (Code: 31602, ECMV 1 DIR). • The input state (ON/OFF) from the 1st fill switch can be checked with the monitoring function (Code: 40908, D-IN-26). • Method of reproducing failure code: Start engine		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	1st clutch oil pressure error	When there is not residual pressure other than the 1st clutch oil pressure, the failure code is displayed. (See “Troubleshooting of hydraulic and mechanical system (H-mode)”.)			
	2	Defective 1st ECMV fill switch (Internal short circuit)	★ Prepare with starting switch OFF, then start engine and carry out troubleshooting. • Turn transmission cut-off switch OFF. • Turn parking brake switch OFF. • Keep pressing brake pedal to prevent machine from traveling.			
			1.SW (male)	Shift lever	Resistance	
			Between (1) and chassis ground	1st (1st speed)	Max. 1 Ω	
				Other than above	Min. 1 MΩ	
	3	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L62 (female) (17) – 1.SW (female) (1) and chassis ground		Resistance	Min. 1 MΩ
	4	Defective transmission controller	★ Prepare with starting switch OFF, then start engine and carry out troubleshooting. • Turn transmission cut-off switch OFF. • Turn parking brake switch OFF. • Keep pressing brake pedal to prevent machine from traveling. • Set the auto shift and manual shift selector switch in the MANUAL position. • Set FNR (directional) lever, joystick steering FNR (directional) switch or right FNR (directional) switch to the F (forward) or R (reverse) position.			
			L62	Shift lever	Voltage	
			Between (17) and chassis ground	1st (1st speed)	Max. 1 V	
				Other than above	8 – 10 V	

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Circuit diagram related to transmission 1st clutch



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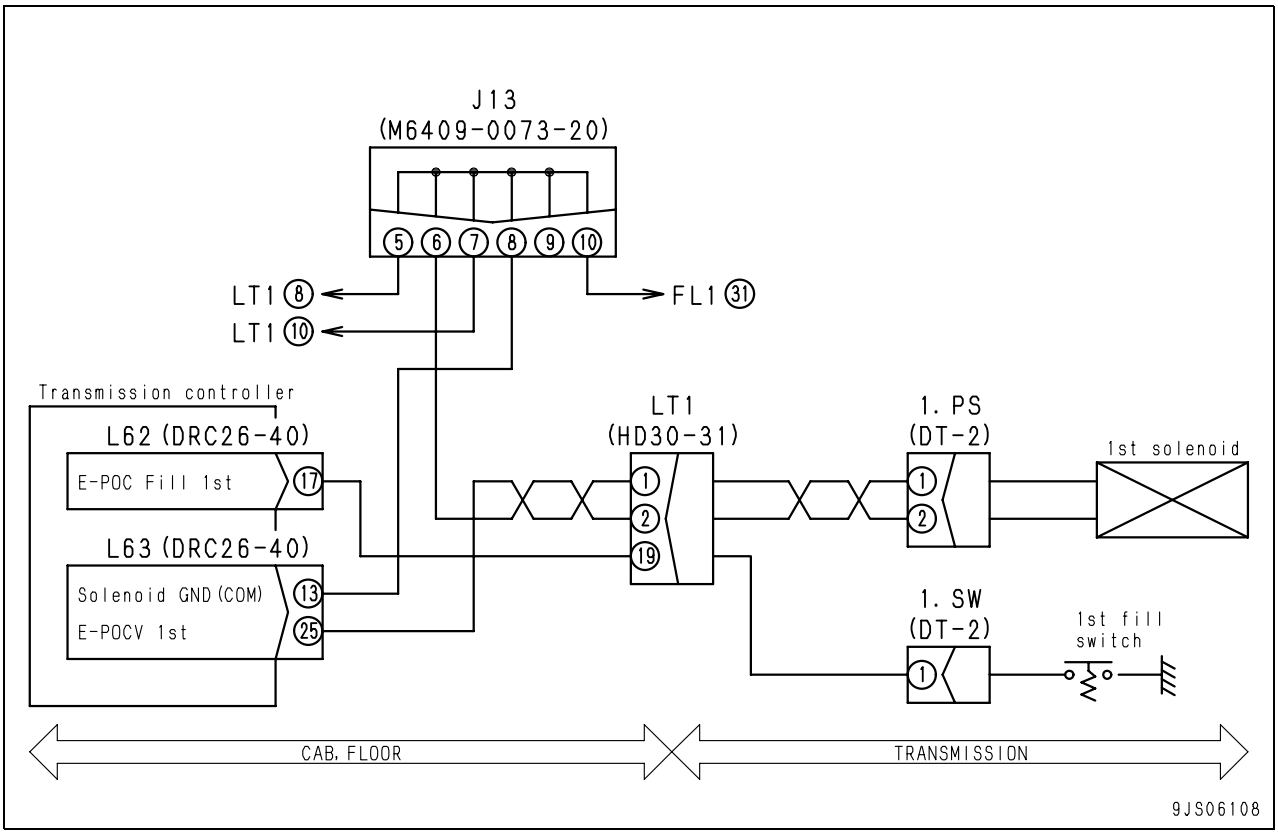
Failure code [15SELH] (ECMV 1st clutch: When command current is ON, fill signal is OFF)

Action code	Failure code	Trouble	ECMV 1st clutch: When command current is ON, fill signal is OFF (Transmission controller)
E01	**15SELH**		
Contents of trouble	• When 1st ECMV solenoid output is turned ON, 1st ECMV fill switch signal ON is not input.		
Action of controller	• Judges that the 1st ECMV fill switch signal is turned OFF. • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• The machine may not travel at 1st speed. • When the 1st gear speed is changed, a shock or a time lag may be made.		
Related information	• This failure code may also be displayed immensely after replacement of the transmission oil. • The output state (current value) to the 1st clutch ECMV solenoid can be checked with the monitoring function (Code: 31602, ECMV 1 DIR). • The input state (ON/OFF) from the 1st fill switch can be checked with the monitoring function (Code: 40908, D-IN-26). • Method of reproducing failure code: Start the engine, set the manual/auto shift selector switch in the MANUAL position, set FNR (directional) lever, joystick steering FNR (directional) switch or right FNR (directional) switch to the F (forward) or R (reverse), then set shift lever to 1st speed position.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	1st clutch oil pressure error	This failure code is displayed if 1st clutch oil pressure were absent when 1st ECMV solenoid output is turned ON. (See “Troubleshooting of hydraulic and mechanical system (H-mode)”.)			
	2	Defective 1st ECMV fill switch (Internal disconnection)	★ Prepare with starting switch OFF, then start engine and carry out troubleshooting. • Turn transmission cut-off switch OFF. • Turn parking brake switch OFF. • Keep pressing brake pedal to prevent machine from traveling.			
			1.SW (male)	Shift lever	Resistance	
			Between (1) and chassis ground	1st (1st speed)	Max. 1 Ω	
				Other than above	Min. 1 MΩ	
	3	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harnesses between L62 (female) (17) – 1.SW (female) (1)		Resistance	Max. 1 Ω
	4	Defective transmission controller	★ Prepare with starting switch OFF, then start engine and carry out troubleshooting. • Turn transmission cut-off switch OFF. • Turn parking brake switch OFF. • Keep pressing brake pedal to prevent machine from traveling. • Set the auto shift and manual shift selector switch in the MANUAL position. • Set FNR (directional) lever, joystick steering FNR (directional) switch or right FNR (directional) switch to the F (forward) or R (reverse) position.			
			L62	Shift lever	Voltage	
			Between (17) and chassis ground	1st (1st speed)	Max. 1 V	
				Other than above	8 – 10 V	

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Circuit diagram related to transmission 1st clutch



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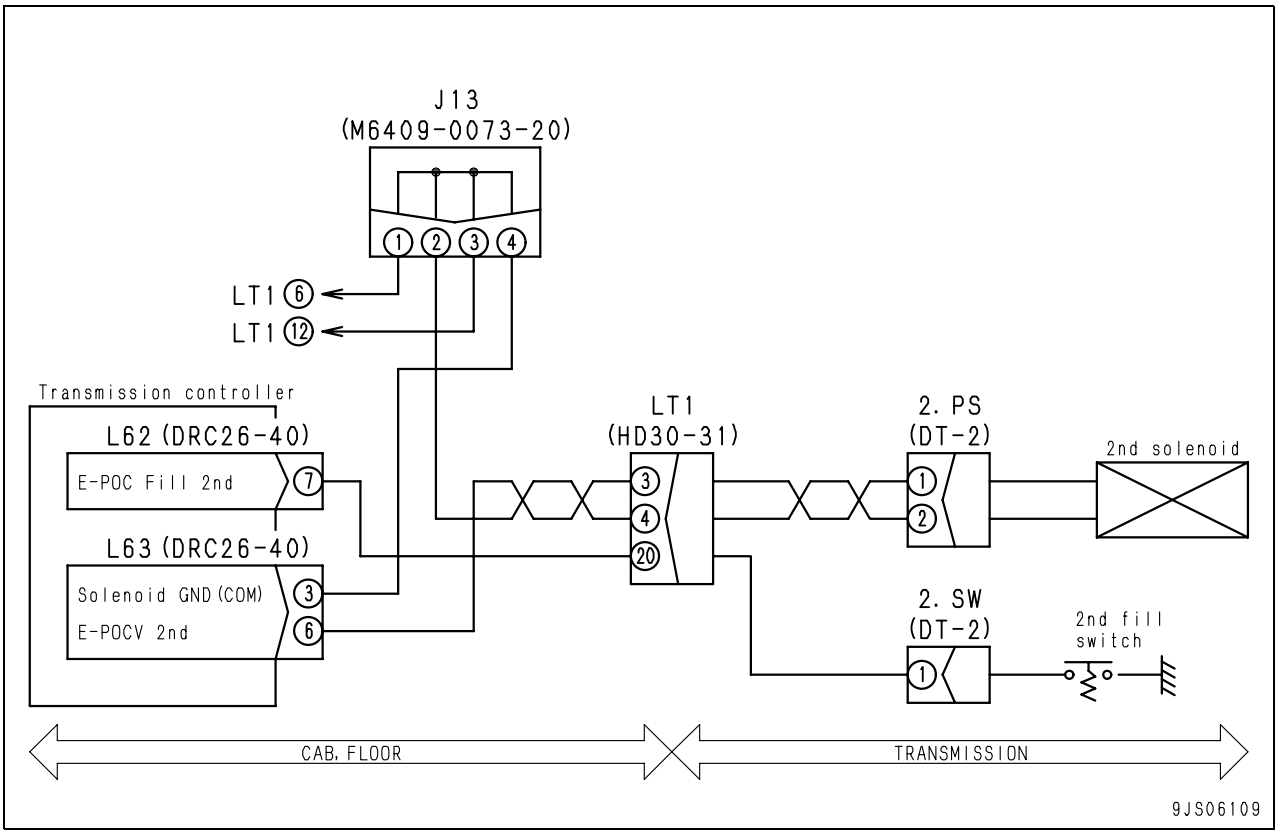
Failure code [15SFL1] (ECMV 2nd clutch: When command current is OFF, fill signal is ON)

Action code	Failure code	Trouble	ECMV 2nd clutch: When command current is OFF, fill signal is ON (Transmission controller)
E03	**15SFL1**		
Contents of trouble	• When 2nd ECMV solenoid output is turned OFF, 2nd ECMV fill switch signal ON is input, and clutch is not released.		
Action of controller	• Judges that the 2nd ECMV fill switch signal is turned ON. • Holds 1st, 3rd, and 4th proportional solenoid outputs OFF. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until FNR (directional) lever, joystick steering FNR (directional) switch or right FNR (directional) switch is set to N (Neutral).		
Problem that appears on machine	• The machine can travel at 2nd, but not at 1st, 3rd, and 4th.		
Related information	• The output state (current value) to the 2nd clutch ECMV solenoid can be checked with the monitoring function (Code: 31603, ECMV 2 DIR). • The input state (ON/OFF) from the 2nd fill switch can be checked with the monitoring function (Code: 40908, D-IN-27). • Method of reproducing failure code: Start engine		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	2nd clutch oil pressure error	When there is no residual pressure other than the 2nd clutch oil pressure, the failure code is displayed. (See “Troubleshooting of hydraulic and mechanical system (H-mode)”.)			
	2	Defective 2nd ECMV fill switch (Internal short circuit)	★ Prepare with starting switch OFF, then start engine and carry out troubleshooting. • Turn transmission cut-off switch OFF. • Turn parking brake switch OFF. • Keep pressing brake pedal to prevent machine from traveling.			
			2.SW (male)	Shift lever	Resistance	
			Between (1) and chassis ground	2nd (2nd speed)	Max. 1 Ω	
				Other than above	Min. 1 MΩ	
	3	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L62 (female) (7) – 2.SW (female) (1)		Resistance	Min. 1 MΩ
	4	Defective transmission controller	★ Prepare with starting switch OFF, then start engine and carry out troubleshooting. • Turn transmission cut-off switch OFF. • Turn parking brake switch OFF. • Keep pressing brake pedal to prevent machine from traveling. • Set the auto shift and manual shift selector switch in the MANUAL position. • Set FNR (directional) lever, joystick steering FNR (directional) switch or right FNR (directional) switch to the F (forward) or R (reverse) position.			
			L62	Shift lever	Voltage	
			Between (7) and chassis ground	2nd (2nd speed)	Max. 1 V	
				Other than above	8 – 10 V	

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Circuit diagram related to transmission 2nd clutch



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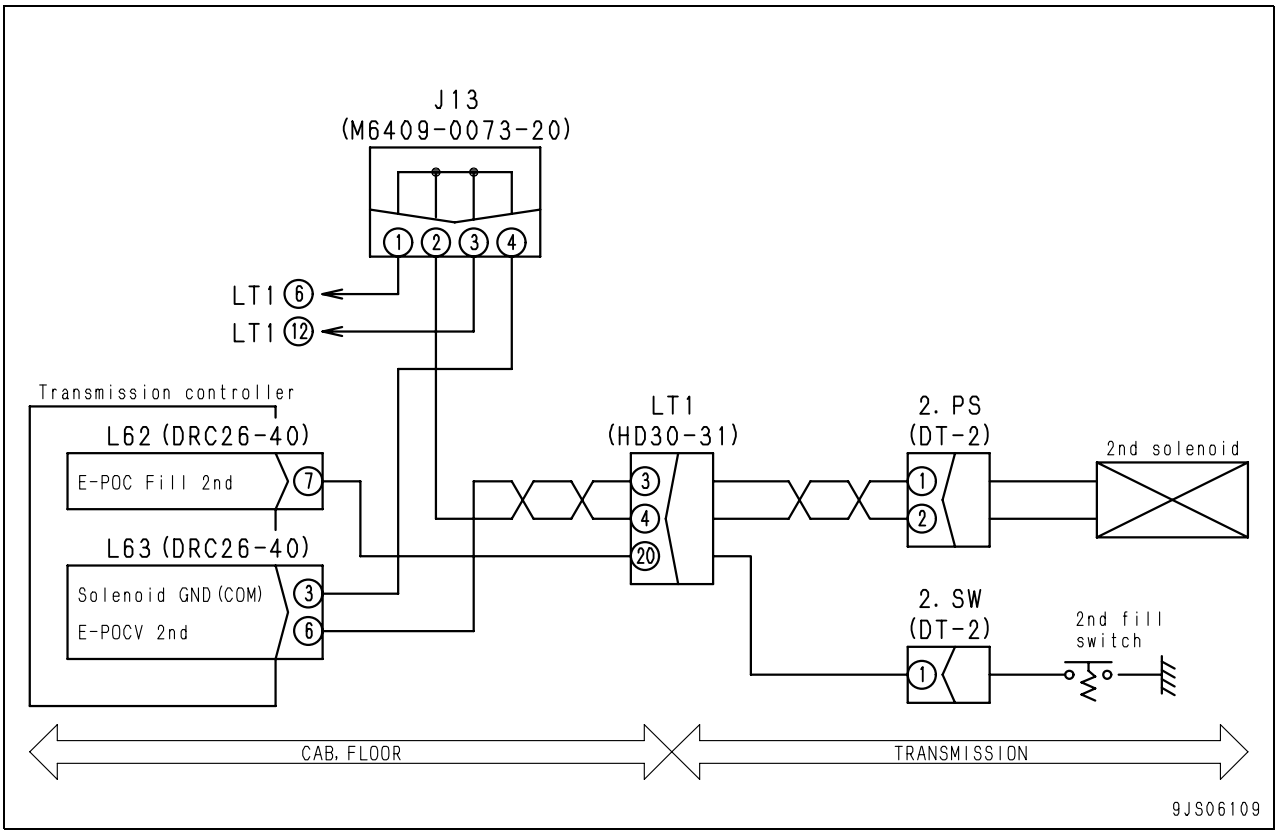
Failure code [15SFLH] (ECMV 2nd clutch: When command current is ON, fill signal is OFF)

Action code	Failure code	Trouble	ECMV 2nd clutch: When command current is ON, fill signal is OFF (Transmission controller)
E01	**15SFLH**		
Contents of trouble	• When 2nd ECMV solenoid output turned ON, 2nd ECMV fill switch signal ON is not input.		
Action of controller	• Judges that the 2nd ECMV fill switch signal is turned OFF. • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• The machine may not travel at 2nd speed. • When the 2nd gear speed is changed, a shock or a time lag may be made.		
Related information	• This failure code may also be displayed immensely after replacement of the transmission oil. • The output state (current value) to the 2nd clutch ECMV solenoid can be checked with the monitoring function (Code: 31603, ECMV 2 DIR). • The input state (ON/OFF) from the 2nd fill switch can be checked with the monitoring function (Code: 40908, D-IN-27). • Method of reproducing failure code: Start engine, set the manual/auto shift selector switch in the MANUAL position, set FNR (directional) lever, joystick steering FNR (directional) switch or right FNR (directional) switch to the F (forward), R (reverse), then set shift lever to 2nd speed position.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	2nd clutch oil pressure error	This failure code is displayed if 2nd clutch oil pressure were absent when 2nd ECMV solenoid output is turned ON. (See “Troubleshooting of hydraulic and mechanical system (H-mode)”.)			
	2	Defective 2nd ECMV fill switch (Internal disconnection)	★ Prepare with starting switch OFF, then start engine and carry out troubleshooting. • Turn transmission cut-off switch OFF. • Turn parking brake switch OFF. • Keep pressing brake pedal to prevent machine from traveling.			
			2.SW (male)	Shift lever	Resistance	
			Between (1) and chassis ground	2nd (2nd speed)	Max. 1 Ω	
				Other than above	Min. 1 MΩ	
	3	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harnesses between L62 (female) (7) – 2.SW (female) (1) and chassis ground		Resistance	Max. 1 Ω
	4	Defective transmission controller	★ Prepare with starting switch OFF, then start engine and carry out troubleshooting. • Turn transmission cut-off switch OFF. • Turn parking brake switch OFF. • Keep pressing brake pedal to prevent machine from traveling. • Set the auto shift and manual shift selector switch in the MANUAL position. • Set FNR (directional) lever, joystick steering FNR (directional) switch or right FNR (directional) switch to the F (forward) or R (reverse) position.			
			L62	Shift lever	Voltage	
			Between (7) and chassis ground	2nd (2nd speed)	Max. 1 V	
				Other than above	8 – 10 V	

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Circuit diagram related to transmission 2nd clutch



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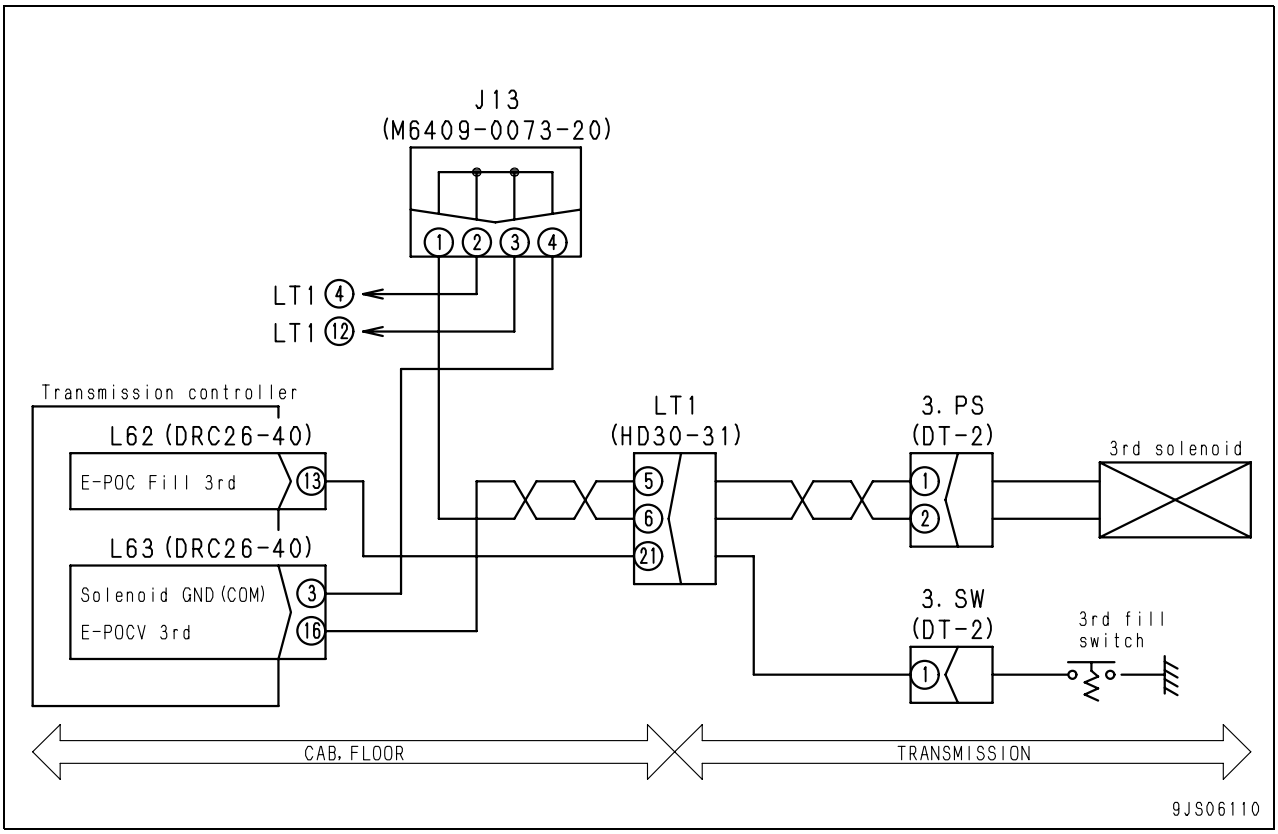
Failure code [15SGL1] (ECMV 3rd clutch: When command current is OFF, fill signal is ON)

Action code	Failure code	Trouble	ECMV 3rd clutch: When command current is OFF, fill signal is ON (Transmission controller)
E03	**15SGL1**		
Contents of trouble	• When 3rd ECMV solenoid output is turned OFF, 3rd ECMV fill switch signal ON is input, and clutch is not released.		
Action of controller	• Judges that the 3rd ECMV fill switch signal is turned ON. • Holds 1st, 2nd, and 4th proportional solenoid outputs OFF. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until FNR (directional) lever, joystick steering FNR (directional) switch or right FNR (directional) switch is set to N (Neutral).		
Problem that appears on machine	• The machine can travel at 3rd, but not at 1st, 2nd, and 4th.		
Related information	• The output state (current value) to the 3rd clutch ECMV solenoid can be checked with the monitoring function (Code: 31604, ECMV 3 DIR). • The input state (ON/OFF) from the 3rd fill switch can be checked with the monitoring function (Code: 40908, D-IN-28). • Method of reproducing failure code: Start engine		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	3rd clutch oil pressure error	When there is no residual pressure other than the 3rd clutch oil pressure, the failure code is displayed. (See “Troubleshooting of hydraulic and mechanical system (H-mode)”.)			
	2	Defective 3rd ECMV fill switch (Internal short circuit)	★ Prepare with starting switch OFF, then start engine and carry out troubleshooting. • Turn transmission cut-off switch OFF. • Turn parking brake switch OFF. • Keep pressing brake pedal to prevent machine from traveling.			
			3.SW (male)	Shift lever	Resistance	
			Between (1) and chassis ground	3rd (3rd speed)	Max. 1 Ω	
				Other than above	Min. 1 MΩ	
	3	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L62 (female) (13) – 3.SW (female) (1) and chassis ground		Resistance	Min. 1 MΩ
	4	Defective transmission controller	★ Prepare with starting switch OFF, then start engine and carry out troubleshooting. • Turn transmission cut-off switch OFF. • Turn parking brake switch OFF. • Keep pressing brake pedal to prevent machine from traveling. • Set the auto shift and manual shift selector switch in the MANUAL position. • Set FNR (directional) lever, joystick steering FNR (directional) switch or right FNR (directional) switch to the F (forward) or R (reverse) position.			
			L62	Shift lever	Voltage	
			Between (13) and chassis ground	3rd (3rd speed)	Max. 1 V	
				Other than above	8 – 10 V	

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Circuit diagram related to transmission 3rd clutch



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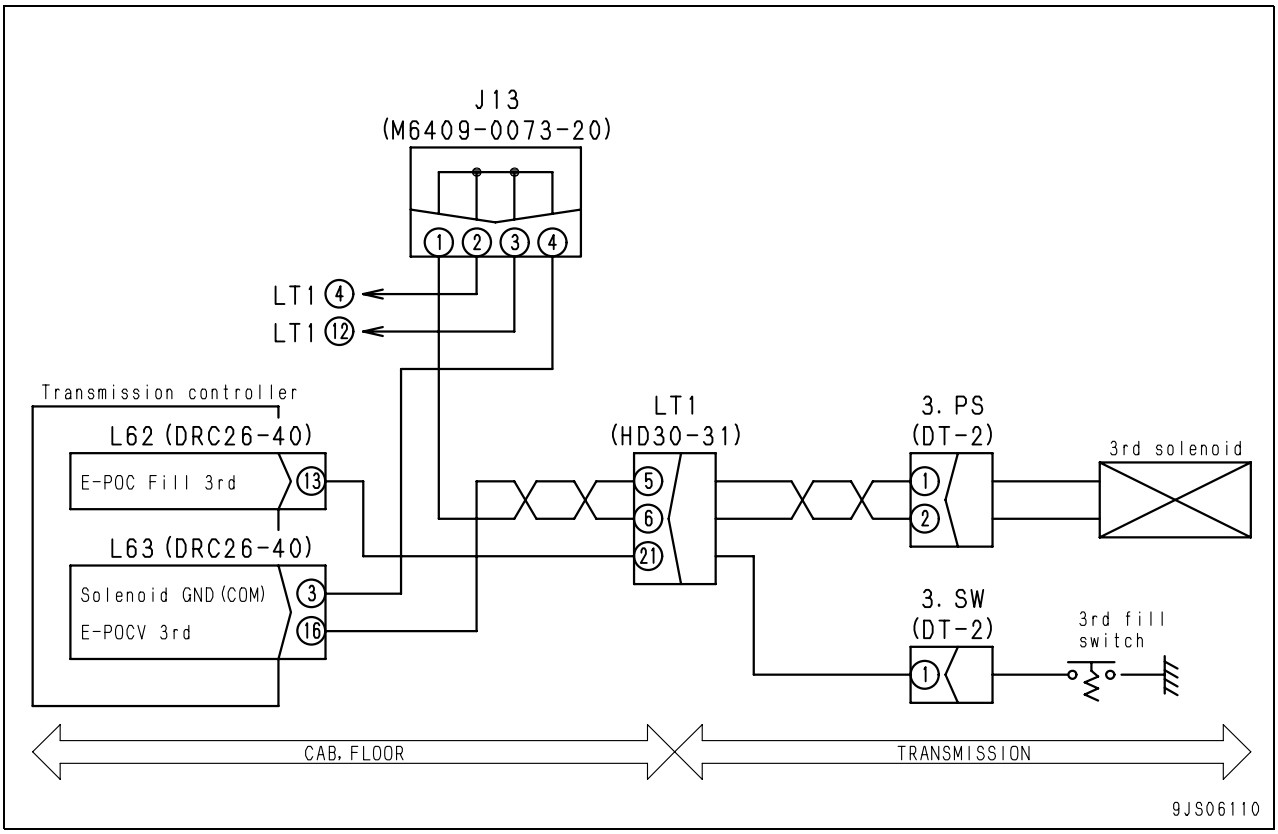
Failure code [15SGLH] (ECMV 3rd clutch: When command current is ON, fill signal is OFF)

Action code	Failure code	Trouble	ECMV 3rd clutch: When command current is ON, fill signal is OFF (Transmission controller)
E01	**15SGLH**		
Contents of trouble	• When 3rd ECMV solenoid output is turned ON, clutch does not mesh because 3rd ECMV fill switch ON signal is not input and the condition requires to set the engine speed at 500 rpm or below.		
Action of controller	• Judges that the 3rd ECMV fill switch signal is turned OFF. • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• The machine may not travel at 3rd speed. • When the 3rd gear speed is changed, a shock or a time lag may be made.		
Related information	• This code may also be displayed immensely after replacement of the transmission oil. • The output state (current value) to the 3rd clutch ECMV solenoid can be checked with the monitoring function (Code: 31604, ECMV 3 DIR). • The input state (ON/OFF) from the 3rd fill switch can be checked with the monitoring function (Code: 40908, D-IN-28). • Method of reproducing failure code: Start engine, set the manual/auto shift selector switch in the MANUAL position, set FNR (directional) lever, joystick steering FNR (directional) switch or right FNR (directional) switch to the F (forward), R (reverse), and then set shift lever to 3rd speed position.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	3rd clutch oil pressure error	This failure code is displayed if 3rd clutch oil pressure were absent when 3rd ECMV solenoid output is turned ON. (See “Troubleshooting of hydraulic and mechanical system (H-mode)”.)			
	2	Defective 3rd ECMV fill switch (Internal disconnection)	★ Prepare with starting switch OFF, then start engine and carry out troubleshooting. • Turn transmission cut-off switch OFF. • Turn parking brake switch OFF. • Keep pressing brake pedal to prevent machine from traveling.			
			3.SW (male)	Shift lever	Resistance	
			Between (1) and chassis ground	3rd (3rd speed)	Max. 1 Ω	
				Other than above	Min. 1 MΩ	
	3	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harnesses between L62 (female) (13) – 3.SW (female) (1)		Resistance	Max. 1 Ω
	4	Defective transmission controller	★ Prepare with starting switch OFF, then start engine and carry out troubleshooting. • Turn transmission cut-off switch OFF. • Turn parking brake switch OFF. • Keep pressing brake pedal to prevent machine from traveling. • Set the auto shift and manual shift selector switch in the MANUAL position. • Set FNR (directional) lever, joystick steering FNR (directional) switch or right FNR (directional) switch to the F (forward) or R (reverse) position.			
			L62	Shift lever	Voltage	
			Between (13) and chassis ground	3rd (3rd speed)	Max. 1 V	
				Other than above	8 – 10 V	

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Circuit diagram related to transmission 3rd clutch



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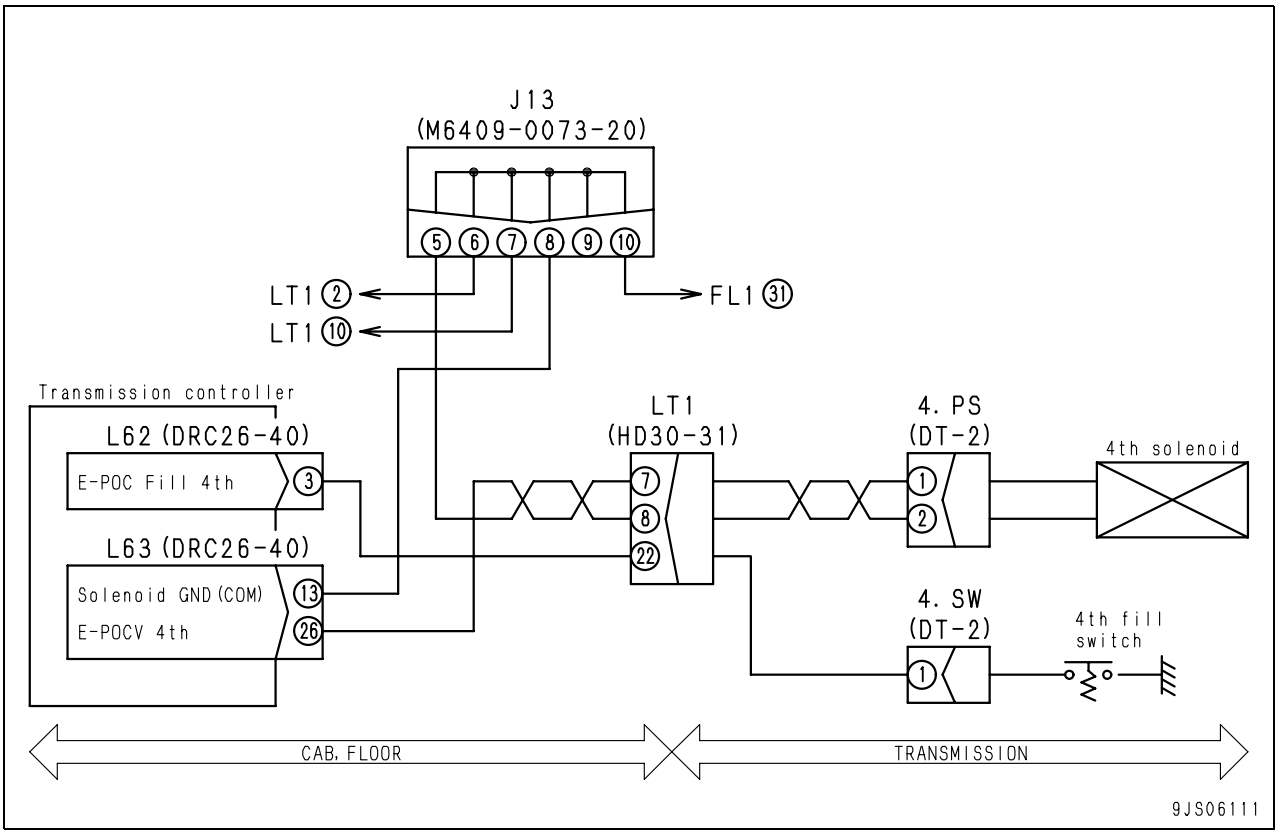
Failure code [15SHL1] (ECMV 4th clutch: When command current is OFF, fill signal is ON)

Action code	Failure code	Trouble	ECMV 4th clutch: When command current is OFF, fill signal is ON (Transmission controller)
E03	**15SHL1**		
Contents of trouble	• When 4th ECMV solenoid output is turned OFF, 4th ECMV fill switch signal ON is input, and clutch is not released.		
Action of controller	• Judges that the 4th ECMV fill switch signal is turned ON. • Holds 1st, 2nd, and 3rd proportional solenoid outputs OFF. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until FNR (directional) lever, joystick steering FNR (directional) switch or right FNR (directional) switch is set to N (Neutral).		
Problem that appears on machine	• The machine can travel at 4th, but not at 1st, 2nd, and 3rd.		
Related information	• The output state (current) to the 4th clutch ECMV solenoid can be checked with the monitoring function (Code: 31605, ECMV 4 DIR). • The input state (ON/OFF) from the 4th fill switch can be checked with the monitoring function (Code: 40908, D-IN-29). • Method of reproducing failure code: Start engine		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	4th clutch oil pressure error	When there is no residual pressure other than the 4th clutch oil pressure, the failure code is displayed. (See “Troubleshooting of hydraulic and mechanical system (H-mode)”.)			
	2	Defective 4th ECMV fill switch (Internal short circuit)	★ Prepare with starting switch OFF, then start engine and carry out troubleshooting. • Turn transmission cut-off switch OFF. • Turn parking brake switch OFF. • Keep pressing brake pedal to prevent machine from traveling.			
			4.SW (male)	Shift lever	Resistance	
			Between (1) and chassis ground	4th (4th speed)	Max. 1 Ω	
				Other than above	Min. 1 MΩ	
	3	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L62 (female) (3) – 4.SW (female) (1) and chassis ground		Resistance	Min. 1 MΩ
	4	Defective transmission controller	★ Prepare with starting switch OFF, then start engine and carry out troubleshooting. • Turn transmission cut-off switch OFF. • Turn parking brake switch OFF. • Keep pressing brake pedal to prevent machine from traveling. • Set the auto shift and manual shift selector switch in the MANUAL position. • Set FNR (directional) lever, joystick steering FNR (directional) switch or right FNR (directional) switch to the F (forward) or R (reverse) position.			
			L62	Shift lever	Voltage	
			Between (3) and chassis ground	4th (4th speed)	Max. 1 V	
				Other than above	8 – 10 V	

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Circuit diagram related to transmission 4th clutch



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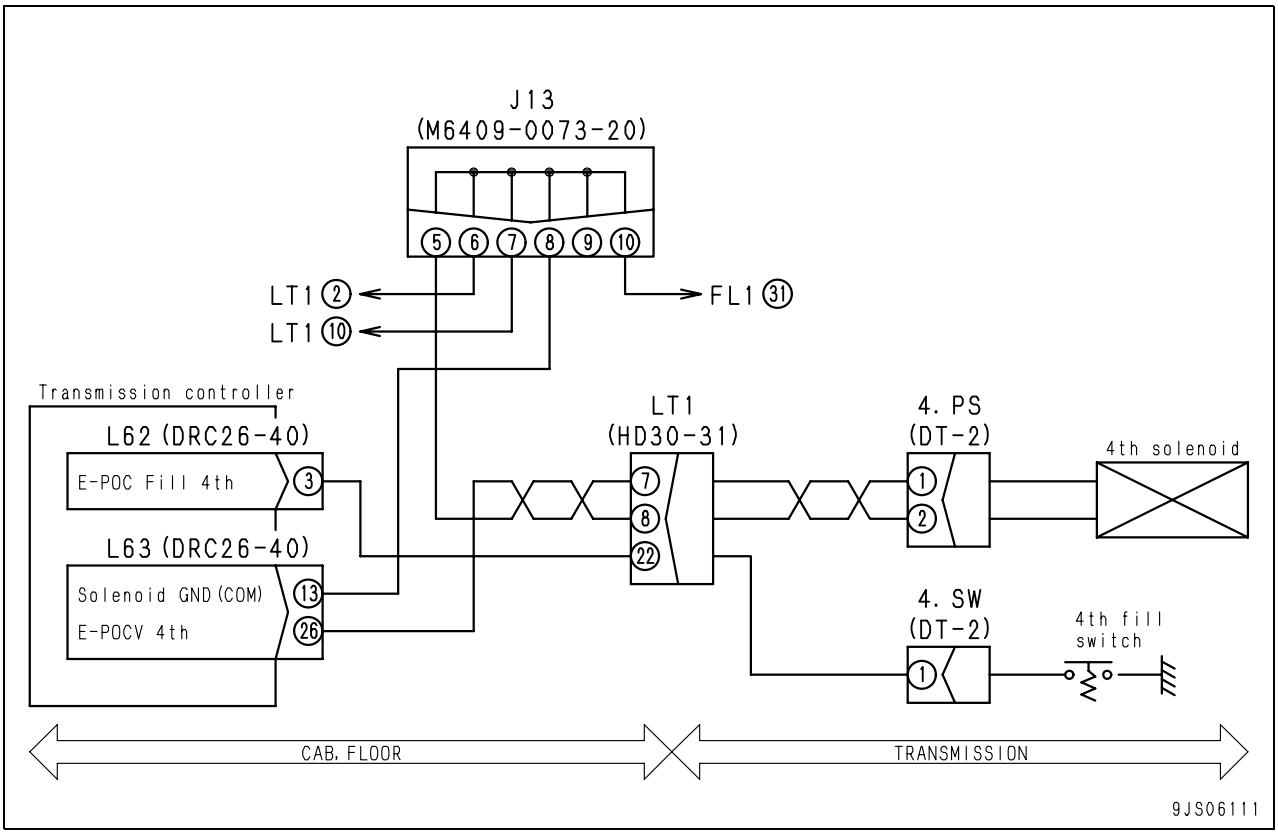
Failure code [15SHLH] (ECMV 4th clutch: When command current is ON, fill signal is OFF)

Action code	Failure code	Trouble	ECMV 4th clutch: When command current is ON, fill signal is OFF (Transmission controller)
E01	**15SHLH**		
Contents of trouble	• When 4th ECMV solenoid output is turned ON, 4th ECMV fill switch signal ON is not input.		
Action of controller	• Judges that the 4th ECMV fill switch signal is turned OFF. • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• The machine may not travel at 4th speed. • When the 4th gear speed is changed, a shock or a time lag may be made.		
Related information	• This code may also be displayed immensely after replacement of the transmission oil. • The output state (current value) to the 4th clutch ECMV solenoid can be checked with the monitoring function (Code: 31605, ECMV 4). • The input state (ON/OFF) from the 4th fill switch can be checked with the monitoring function (Code: 40908, D-IN-29). • Method of reproducing failure code: Start engine, set the manual/auto shift selector switch in the MANUAL position, set FNR (directional) lever, joystick steering FNR (directional) switch or right FNR (directional) switch to the F (forward), R (reverse), then set shift lever to 4th speed position.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	4th clutch oil pressure error	This failure code is displayed if 4th clutch oil pressure were absent when 4th ECMV solenoid is turned ON. (See “Troubleshooting of hydraulic and mechanical system (H-mode)”.)			
	2	Defective 4th ECMV fill switch (Internal disconnection)	★ Prepare with starting switch OFF, then start engine and carry out troubleshooting. • Turn transmission cut-off switch OFF. • Turn parking brake switch OFF. • Keep pressing brake pedal to prevent machine from traveling.			
			4.SW (male)	Shift lever	Resistance	
			Between (1) and chassis ground	4th (4th speed)	Max. 1 Ω	
				Other than above	Min. 1 MΩ	
	3	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harnesses between L62 (female) (3) – 4.SW (female) (1)		Resistance	Max. 1 Ω
	4	Defective transmission controller	★ Prepare with starting switch OFF, then start engine and carry out troubleshooting. • Turn transmission cut-off switch OFF. • Turn parking brake switch OFF. • Keep pressing brake pedal to prevent machine from traveling. • Set the auto shift and manual shift selector switch in the MANUAL position. • Set FNR (directional) lever, joystick steering FNR (directional) switch or right FNR (directional) switch to the F (forward) or R (reverse) position.			
			L62	Shift lever	Voltage	
			Between (3) and chassis ground	4th (4th speed)	Max. 1 V	
				Other than above	8 – 10 V	

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Circuit diagram related to transmission 4th clutch



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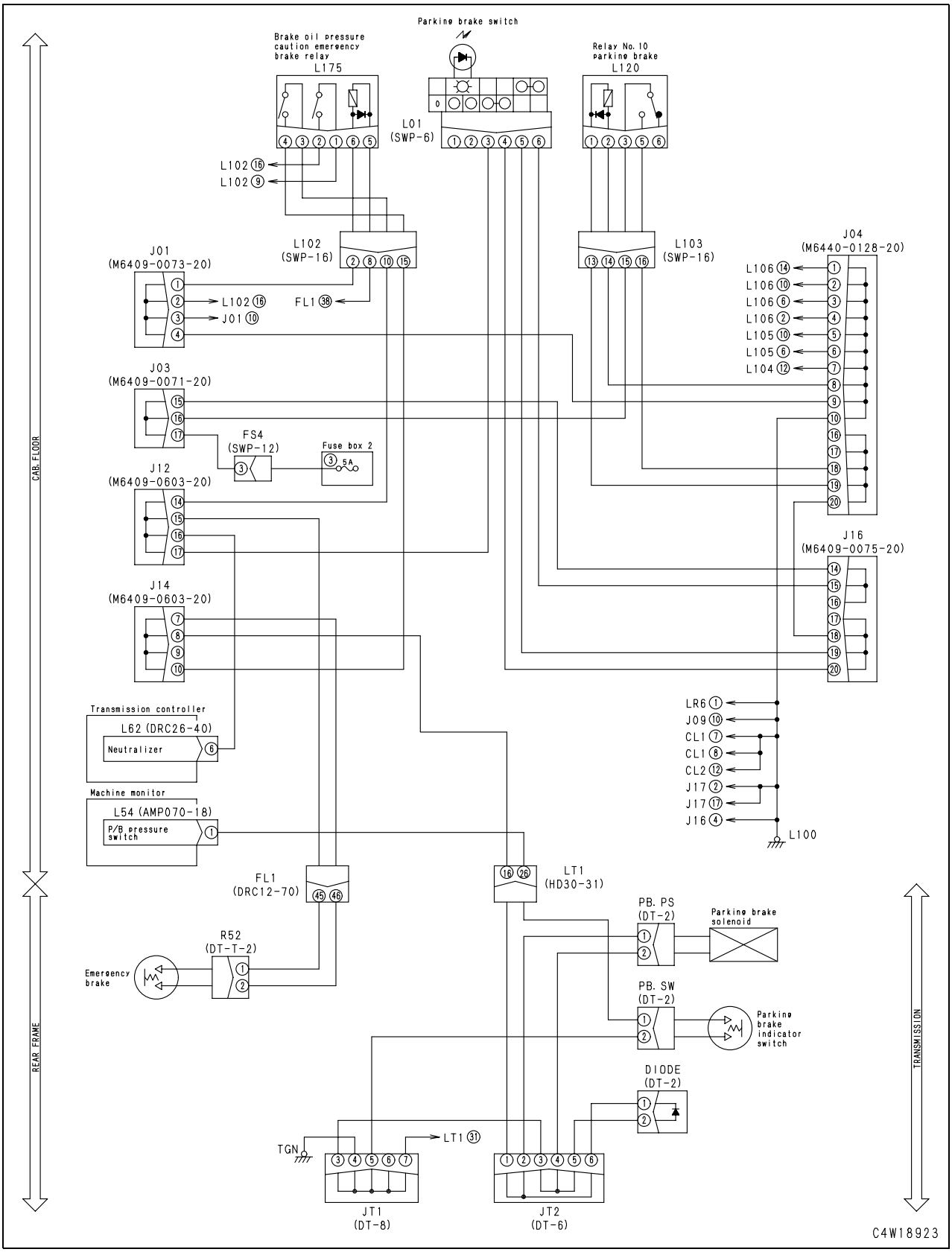
Failure code [2F00MA] (Parking brake: Malfunction)

Action code	Failure code	Trouble	Parking brake: Malfunction (Machine monitor system)
E03	**2F00MA**		
Contents of trouble	• While the F or R clutch is operated, the parking brake operation sensor circuit remains OPEN.		
Action of controller	• Turns the centralized warning lamp and alarm buzzer ON. • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• Although the parking brake lamp is turned on, a gear speed other than neutral is actually selected.		
Related information	• This code may also be displayed if engine stalls or the emergency brake is operated while the machine is traveling. • The input state (ON/OFF) from the parking brake indicator switch can be checked with the monitoring function (Code: 40903, D-IN-26). • Method of reproducing failure code: Turn the starting switch ON, parking brake indicator switch OFF, operate to forward or reverse.		

Possible causes and standard value in normal state	Causes		Standard value in normal state/Remarks on troubleshooting			
	1	Defective parking brake indicator switch (Internal disconnection)	★ Prepare with starting switch OFF, disconnect PB.SW connector and then start the engine to carry out troubleshooting.			
			PB.SW (male)	Parking brake	Resistance	
			Between (1) and (2)	Released	Max. 1 Ω	
				Operating	Min. 1 MΩ	
	2	Disconnection in wiring harness (Disconnection or defective contact)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L54 (female) (1) – PB.SW (female) (1)		Resistance	Max. 1 Ω
			Wiring harness between PB.switch (female) (2) – chassis ground		Resistance	Max. 1 Ω
	3	Defective machine monitor	★ Prepare with starting switch OFF, then start engine and carry out troubleshooting.			
			L54	Parking brake oil pressure	Voltage	
			Between (1) and chassis ground	Released	Max. 1 V	
				Operating	20 – 30 V	

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Circuit diagram related to parking brake



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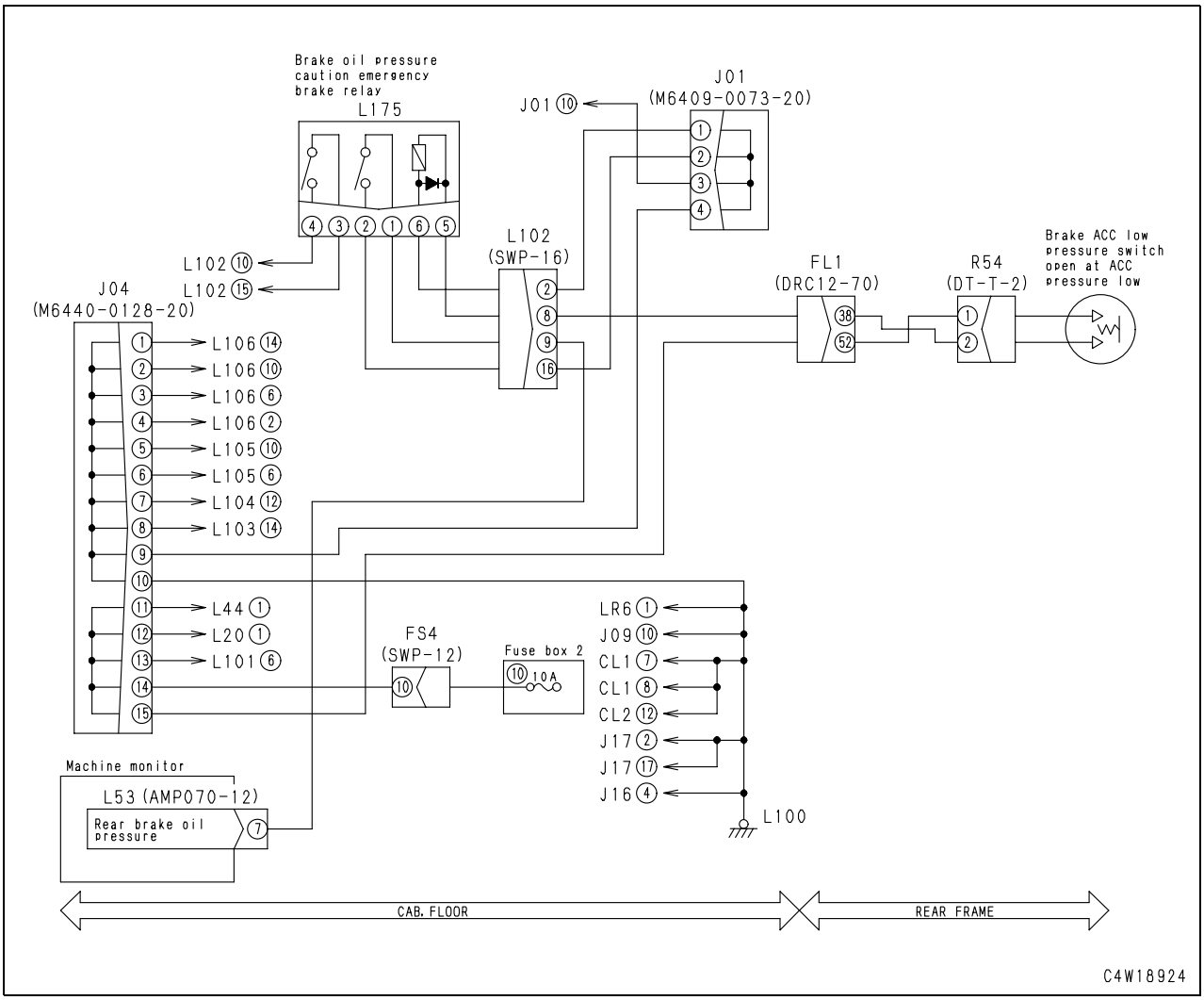
Failure code [2G43ZG] (Accumulator: Low oil pressure)

Action code	Failure code	Trouble	Accumulator: Low oil pressure (Machine monitor system)
E03	**2G43ZG**		
Contents of trouble	• After the engine is started, the brake accumulator pressure sensor circuit once reaches the specified pressure, then the circuit conditions turns to OPEN.		
Action of controller	• Turns the centralized warning lamp and alarm buzzer ON. • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• Low brake accumulator oil pressure • The brake may not work.		
Related information	• The input state (ON/OFF) from the brake oil pressure sensor can be checked with the monitoring function (Code: 40902, D-IN-17). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Low brake accumulator oil pressure	Check the brake accumulator oil pressure. (See "Testing and adjusting".)			
	2	Defective brake oil pressure sensor (Internal disconnection)	★ Prepare with starting switch OFF, then start engine and carry out troubleshooting.			
			R54 (Male)	Brake accumulator oil pressure	Resistance	
			Between (1) and (2)	Pressure normal Min. 5.88 MPa {Min. 60 kg/cm^2}	Max. 1 Ω	
				Low pressure Max. 3.92 MPa {Max. 40 kg/cm^2}	Min. 1 MΩ	
	3	Disconnection in wiring harness (Disconnection or defective contact)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between fuse box A (6) and R54 (female)		Resistance	Max. 1 Ω
			Wiring harness between L53 (female) (7) and L175 (female) (1)		Resistance	Max. 1 Ω
			Wiring harness between L175 (female) (2) and chassis ground		Resistance	Max. 1 Ω
			Wiring harness from R54 (female) (2) to chassis ground		Resistance	Max. 1 Ω
	4	Defective machine monitor	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L53 (female)	Brake accumulator oil pressure	Resistance	
			Wiring harnesses between (7) – chassis ground	Pressure normal Min. 5.88 MPa {Min. 60 kg/cm^2}	Max. 1 Ω	
				Low pressure Max. 3.92 MPa {Max. 40 kg/cm^2}	Min. 1 MΩ	

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Circuit diagram related to brake accumulator



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Failure code [44K0L4] (Bucket positioner: ON/OFF signals disagree)

Action code	Failure code	Trouble	Bucket positioner: ON/OFF signals disagree (Work equipment controller system)
E01	**44K0L4**		
Contents of trouble	• The signals input from the bucket proximity switch are combined impossibly. • After bucket level-over signal ON and full stroke signal OFF were continued for 3 seconds, full stroke signal ON was detected for one second. • After bucket level-over signal ON and full stroke signal OFF were continued for 3 seconds, bucket level-over signal OFF was detected for one second. • If problem is removed, system is returned to normal operating state.		
Action of controller	• Judged to be below bucket level.		
Problem that appears on machine	• Bucket lever does not function.		
Related information	• Only for load meter and electric lever (If equipped) • The input state (ON/OFF) from the bucket cylinder full stroke proximity switch can be checked with the monitoring function (Code: 40911, D-IN-8). • The input state (ON/OFF) from the bucket cylinder level proximity switch can be checked with the monitoring function (Code: 40911, D-IN-9). • Method of reproducing failure code: Start engine, then drive the bucket slowly between the full tilt and full dump position.		

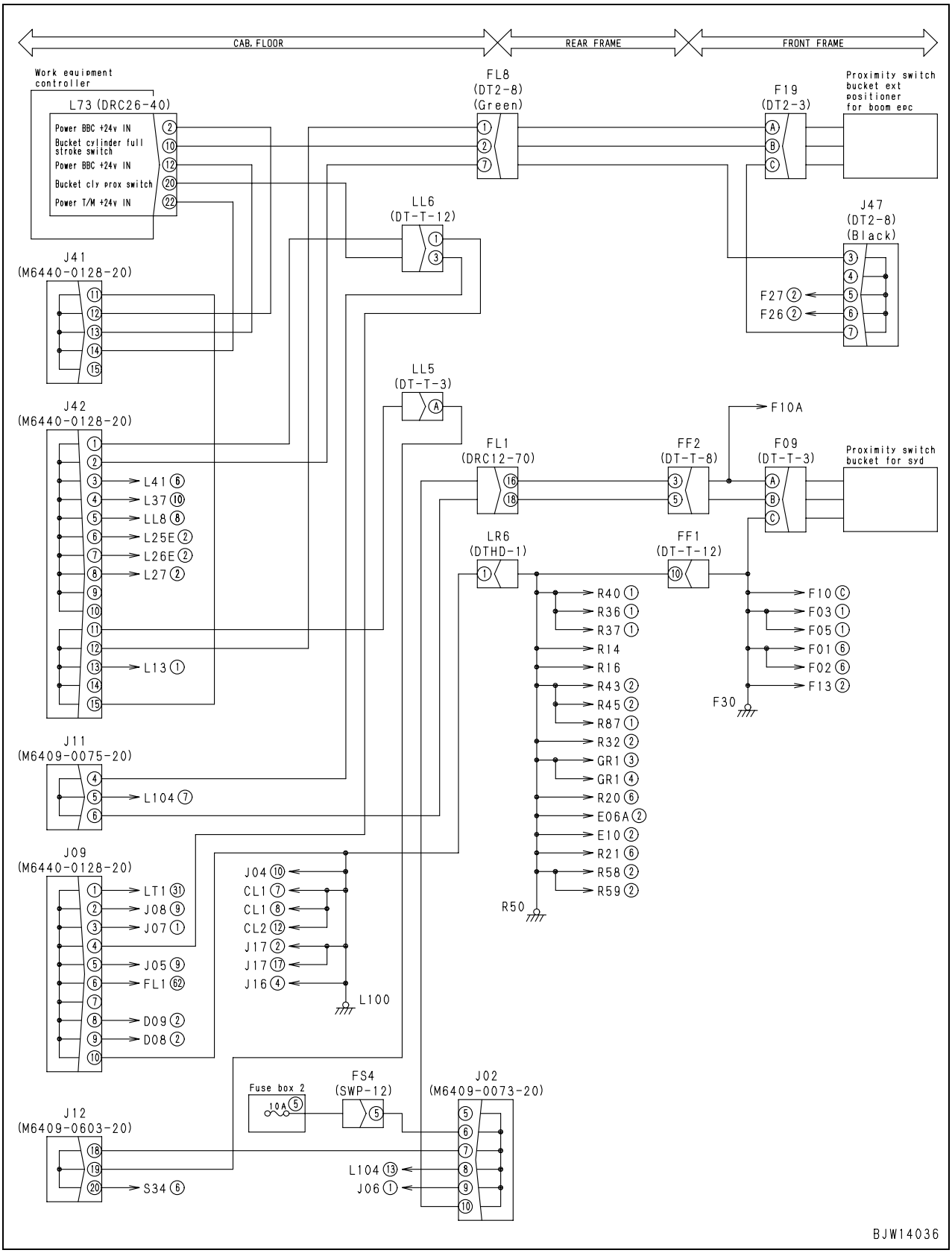
	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective bucket cylinder level proximity switch (Internal disconnection or short circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			F19	Position of bucket	Voltage	
			Between (A) and (C)	Constant	20 – 30 V	
			Between (B) and (C)	Below horizontal	Max. 1 V	
				Above horizontal	8 – 10 V	
	2	Defective bucket cylinder full stroke proximity switch (Internal disconnection or short circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			F19	Position of bucket	Voltage	
			Between (A) and (C)	Constant	20 – 30 V	
			Between (B) and (C)	Tilt full stroke	8 – 10 V	
				Other than tilt full stroke	Max. 1 V	
	3	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between F19 (female) (B) – L73 (female) (10)		Resistance	Max. 1 Ω
			Wiring harness between F19 (female) (A) – fuse No.5 of fuse box 2		Resistance	Min. 1 MΩ
			Wiring harness between F19 (female) (C) – chassis ground		Resistance	Min. 1 MΩ
	4	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between F09 (female) (B) – L73 (female) (20) and chassis ground		Resistance	Min. 1 MΩ

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<table>
<tr><td rowspan="7">Possible causes and standard value in normal state</td><td colspan="2">Causes</td><td colspan="3">Standard value in normal state/Remarks on troubleshooting</td></tr>
<tr><td rowspan="6">5</td><td rowspan="6">Defective work equipment controller</td><td colspan="3">★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.</td></tr>
<tr><td>L73</td><td>Position of bucket</td><td>Voltage</td></tr>
<tr><td rowspan="2">Between (20) and chassis ground</td><td>Below horizontal</td><td>Max. 1 V</td></tr>
<tr><td>Above horizontal</td><td>8 – 10 V</td></tr>
<tr><td rowspan="2">Between (10) and chassis ground</td><td>Tilt full stroke</td><td>8 – 10 V</td></tr>
<tr><td>Other than tilt full stroke</td><td>Max. 1 V</td></tr>
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Circuit diagram related to bucket proximity switch



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WA430-6 Wheel loader

Form No. SEN01738-04

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WHEEL LOADER

WA430-6

Machine model	Serial number
WA430-6	65001 and up

40 Troubleshooting

Troubleshooting by failure code (Display of code), Part 2

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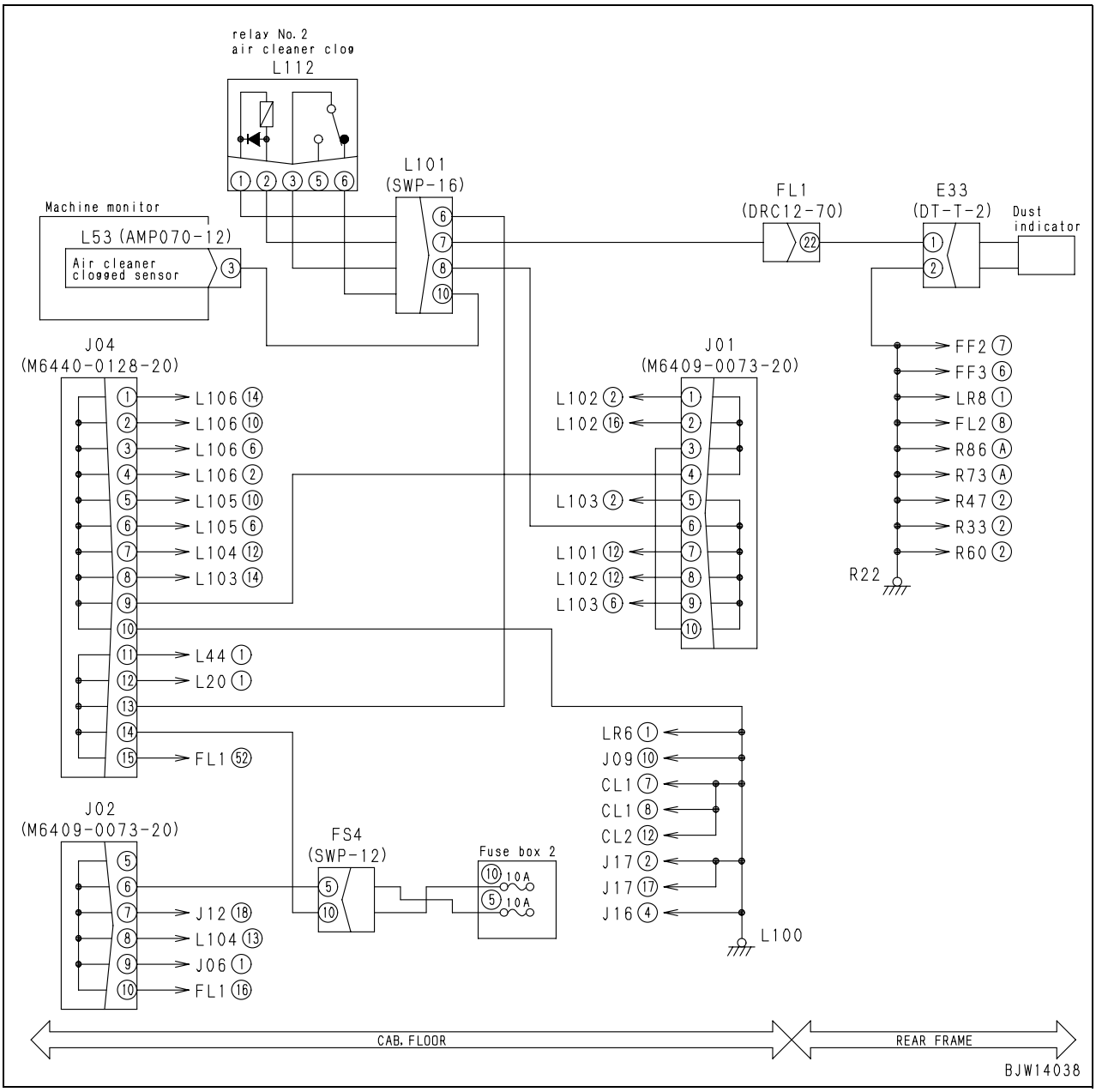
Failure code [AA1ANX] (Air cleaner: Clogging)

Action code	Failure code	Trouble	Air cleaner: Clogging (Machine monitor system)
E01	**AA1ANX**		
Contents of trouble	• When the engine is started, the air cleaner clogging sensor circuit is OPEN.		
Action of controller	• Turns the air cleaner clogging caution lamp ON. • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• The engine does not start or pick up easily, its output is insufficient, and its exhaust gas color is black.		
Related information	• The input state (ON/OFF) from the air cleaner clogging sensor can be checked with the monitoring function (Code: 40902, D-IN-20). • Method of reproducing failure code: Start engine		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective fuse No. 5, 10 of fuse box 2	If the fuse is burnt, the circuit probably has a grounding fault.			
	2	Clogged air cleaner	The air cleaner may be clogged. Check it directly.			
	3	Defective dust indicator (Internal short circuit)	★ Prepare with starting switch OFF, then start engine and carry out troubleshooting.			
			Replace the dust indicator	If the condition becomes normal, the trouble is attributable to defective indicator.		
	4	Defective dust indicator relay (L112) (Internal disconnection or short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L112 (Male)	Resistance		
			Between (1) and (2)	200 – 400 Ω		
			★ Prepare with starting switch OFF, then start engine and carry out troubleshooting.			
			When dust indicator relay (L112) is replaced with a relay of the same type (5-pin type), if the condition becomes normal, the exchange relay is defective.			
	5	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harnesses between L112 (female) (2) – E33 (female) (1)	Resistance	Max. 1 Ω	
			Wiring harnesses between E33 (female) (2) – chassis ground	Resistance	Max. 1 Ω	
	6	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L112 (female) (2) – E33 (female) (1) and chassis ground	Resistance	Min. 1 MΩ	
	7	Defective machine monitor	★ Prepare with starting switch OFF, then start engine and carry out troubleshooting.			
			L53	Dust indicator	Voltage	
			Between (3) and chassis ground	Normal (Air cleaner is normal)	20 – 30 V	
				Defective (Air cleaner is clogged)	Max. 1 V	

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Circuit diagram related to dust indicator



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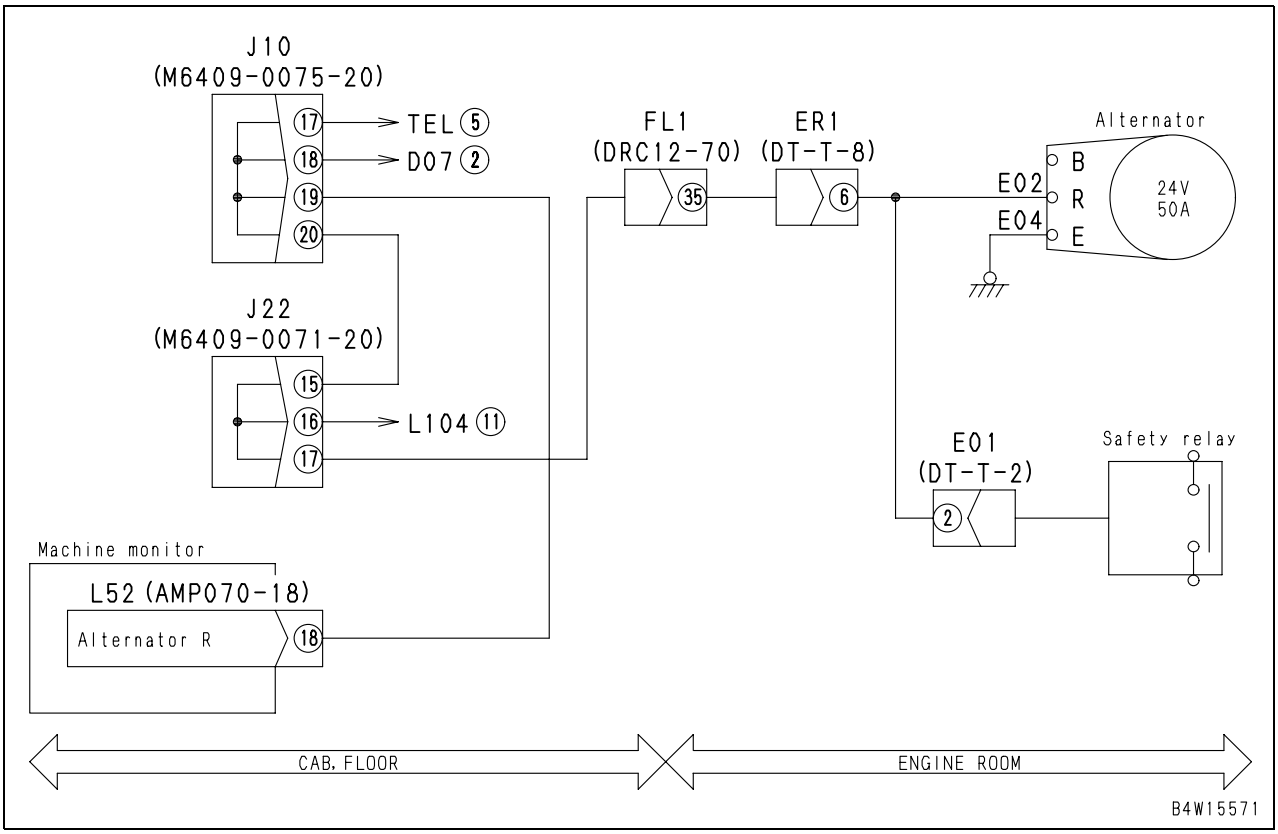
Failure code [AB00L6] (Alternator: Signal disagrees with operating state of engine)

Action code	Failure code	Trouble	Alternator: Signal disagrees with operating state of engine (Machine monitor system)
E03	**AB00L6**		
Contents of trouble	• When engine is stopped, alternator terminal R input voltage is above 12 V.		
Action of controller	• Turns the charge circuit error caution lamp ON. • Turns the centralized warning lamp and alarm buzzer ON. • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• After the engine is started, just turning on the starting switch runs the service meter.		
Related information	• The input state (voltage) from the alternator can be checked with the monitoring function (Code: 04302, ALTERNATOR R). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective alternator (Internal trouble)	★ Prepare with starting switch OFF, then start engine and carry out troubleshooting.			
			Alternator	Engine	Voltage	
			Wiring harness between E02 (female) (1) – chassis ground	Running (Throttle: Above 1/2)	27.5 – 29.5 V	
				Holds in position	Max. 1 V	
	2	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			Wiring harnesses between E02 (female) (1) – L52 (female) (18), – circuit branch end		Voltage	Max. 1 V
	3	Defective machine monitor	★ Prepare with starting switch OFF, then start engine and carry out troubleshooting.			
			L52	Engine	Voltage	
			Between (18) and chassis ground	Running (Throttle: Above 1/2)	27.5 – 29.5 V	
				Holds in position	Max. 1 V	

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Circuit diagram related to alternator



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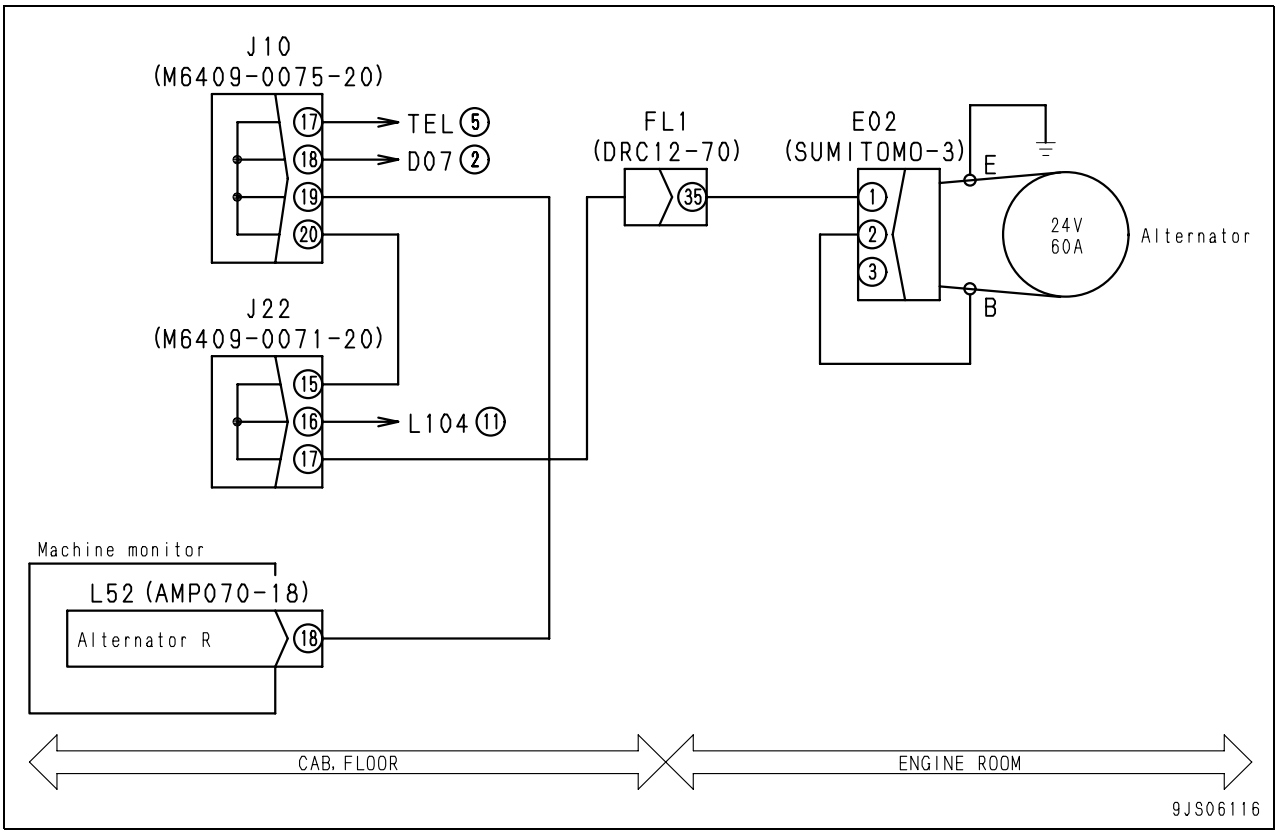
Failure code [AB00MA] (Alternator: Malfunction)

Action code	Failure code	Trouble	Alternator: Malfunction (Machine monitor system)
E03	**AB00MA**		
Contents of trouble	• While the engine is running, the alternator terminal R input voltage is below 5 V.		
Action of controller	• Turns the charge circuit failure caution lamp ON. • Turns the centralized warning lamp and alarm buzzer ON. • If problem is removed (min. 12 V), system is returned to normal operating state.		
Problem that appears on machine	• Deterioration of battery or insufficient charging		
Related information	• The input state (voltage) from the alternator can be checked with the monitoring function (Code: 04302, ALTERNATOR R). • Method of reproducing failure code: Start engine		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	The battery is deteriorated.	The battery may be deteriorated. Check it directly.			
	2	Defective alternator (Internal trouble)	★ Prepare with starting switch OFF, then start engine and carry out troubleshooting.			
			Alternator	Engine	Voltage	
			Wiring harness between E02 (female) (1) – chassis ground	Running (Throttle: Above 1/2)	27.5 – 29.5 V	
				Holds in position	Max. 1 V	
	3	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harnesses between E02 (female) (1) – L52 (female) (18)		Resistance	Max. 1 Ω
	4	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare by turning starting switch OFF and then start engine to carry out troubleshooting.			
			Wiring harness between E02 (female) (1) – L52 (female) (18) – circuit branch end and chassis ground		Resistance	Min. 1 MΩ
	5	Defective machine monitor	★ Prepare with starting switch OFF, then start engine and carry out troubleshooting.			
			L52	Engine	Voltage	
			Between (18) and chassis ground	Running (Throttle: Above 1/2)	27.5 – 29.5 V	
				Holds in position	Max. 1 V	

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Circuit diagram related to alternator



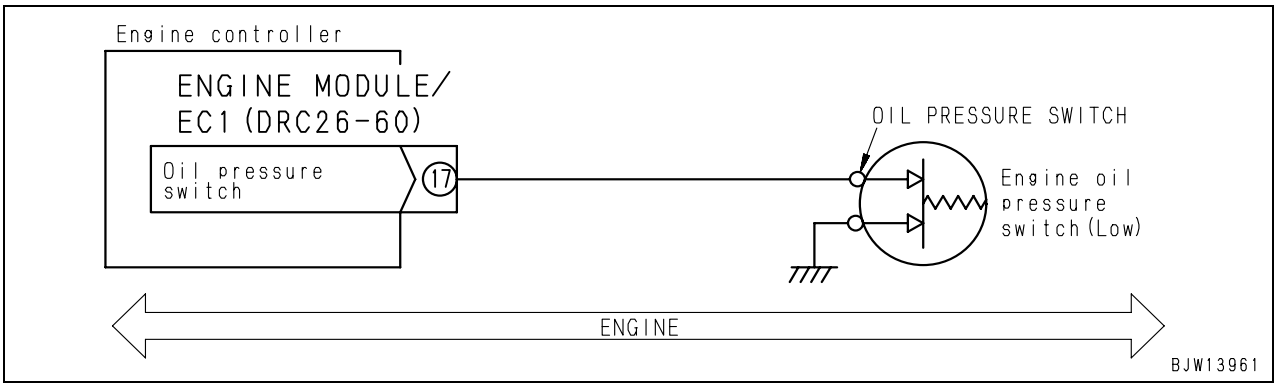
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Failure code [B@BAZG] (Rotation derating by low engine oil pressure)

Action code	Failure code	Trouble	Rotation derating by low engine oil pressure (Engine controller system)
E03	**B@BAZG**		
Contents of trouble	• While engine is run, engine oil pressure became lower than operating range.		
Action of controller	• Limits output and continues operation (Limits fuel injection rate and engine speed). • Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• Engine output lowers.		
Related information	• The input state (oil pressure) from the engine oil pressure sensor can be checked with the monitoring function (Code: 37200, ENG OIL PRESS). • If failure code [CA435] (engine oil pressure switch error) is indicated, carry out troubleshooting for it first. • Method of reproducing failure code: Start engine		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Low engine oil pressure (When the system is normal)	Engine oil has potentially gone low. Check the pressure and if it is below the specified level, locate and eliminate the cause.		
	2	Defective engine oil pressure switch (Internal trouble)	Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			OIL PRESSURE SWITCH	Resistance	
			Between (1) and (2)	Max. 10 Ω	
	3	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harnesses between EC1 (female) (17) – OIL PRESSURE SWITCH	Resistance	Max. 1 Ω
			Wiring harnesses between OIL PRESSURE SWITCH – chassis ground	Resistance	Max. 1 Ω
	4	Defective engine controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			EC1	Resistance	
			Between (17) and chassis ground	Max. 10 Ω	

Circuit diagram related to engine oil pressure switch



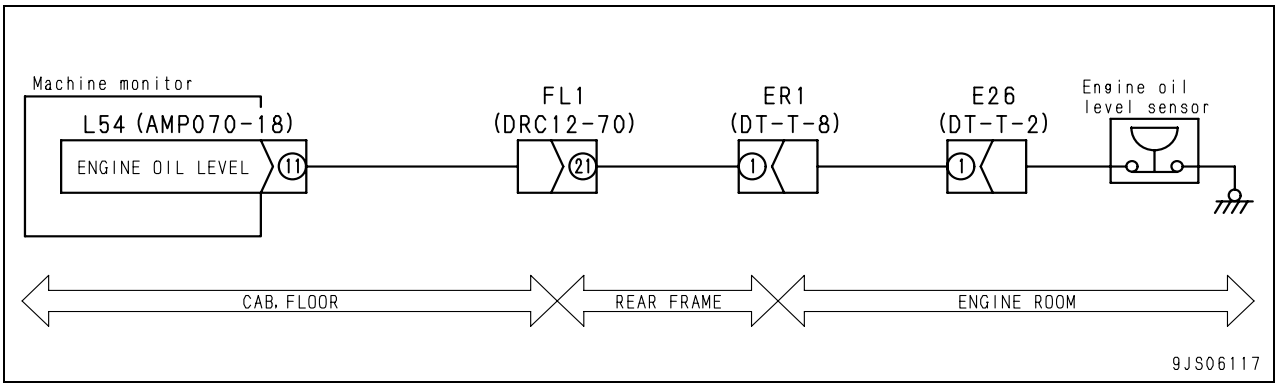
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Failure code [B@BAZK] (Engine oil: Low level)

Action code	Failure code	Trouble	Engine oil: Low level (Machine monitor system)
E01	**B@BAZK**		
Contents of trouble	• While engine is stopped, the engine oil level sensor circuit was detected to have remained in OPEN condition for more than 2 seconds. (This error, however, is not detected for 5 minutes from the engine stop) • An error being detected at stopping the engine remains as the error after the engine is started again until the normal condition is recovered.		
Action of controller	• Turns the engine oil level caution lamp ON. • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• The engine oil level is low (The engine may be broken).		
Related information	• The input state (ON/OFF) from the engine level sensor can be checked with the monitoring function (Code: 40903, D-IN-29). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Low engine oil level	The engine oil level may be low. Check it directly.			
	2	Defective engine oil level sensor (Internal disconnection)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			E26 (male)	Engine oil level	Resistance	
			Between (1) and chassis ground	Oil level is normal	Max. 1 Ω	
				Oil level is insufficient (low level)	Min. 1 MΩ	
	3	Disconnection in wiring harness (Disconnection or defective contact)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harnesses between L54 (female) (11) – E26 (female) (1)		Resistance	Max. 1 Ω
	4	Defective machine monitor	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L54 (female)	Engine oil level	Resistance	
			Wiring harness between (11) – chassis ground	Oil level is normal	Max. 1 Ω	
				Oil level is insufficient (low level)	Min. 1 MΩ	

Circuit diagram related to engine oil level sensor



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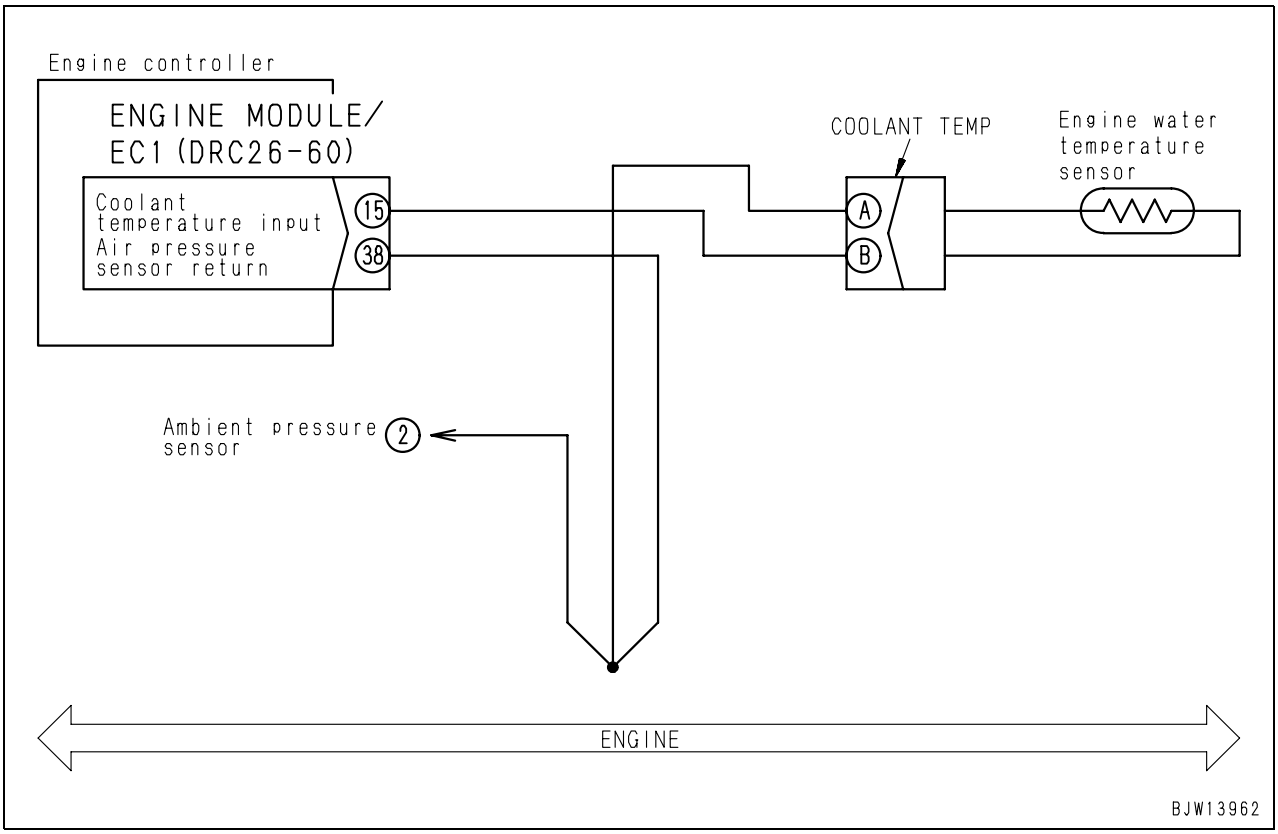
Failure code [B@BCNS] (Coolant: Overheating)

Action code	Failure code	Trouble	Coolant: Overheating (Engine controller system)
E02	**B@BCNS**		
Contents of trouble	• While the engine is run, the engine coolant temperature exceeded the operating range.		
Action of controller	• Limits output and continues operation. • Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• Engine output lowers.		
Related information	• The input state (temperature) from the engine coolant temperature sensor can be checked with the monitoring function (Code: 04104, COOLANT TEMP). • The input state (voltage) from the engine coolant temperature sensor can be checked with the monitoring function (Code: 04105, COOLANT TEMP). • if failure code [CA144] (Engine coolant temperature sensor high error) or [CA145] (Engine coolant temperature sensor high error) is indicated, carry out troubleshooting for it first. • Method of reproducing failure code: Start engine		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Engine coolant overheat (When the system is normal)	Overheating of engine coolant can be suspected. Check the temperature to locate and eliminate the cause.			
	2	Defective coolant temperature sensor (Internal trouble)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			COOLANT TEMP (male)	Temperature	Resistance	
			Between (A) and (B)	0°C	30 – 37 kΩ	
				25°C	9.3 – 10.7 kΩ	
				50°C	3.2 – 3.8 kΩ	
				80°C	1.0 – 1.3 kΩ	
				95°C	700 – 800 Ω	
			Between (B) and chassis ground	Whole range	Min. 100 kΩ	
	3	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between EC1 (female) (15) – COOLANT TEMP (female) (B)		Resistance	Max. 1 Ω
			Wiring harness between COOLANT TEMP (female) (A) – EC1 (female) (38)		Resistance	Max. 1 Ω
	4	Defective engine controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			EC1 (male)		Resistance	
			Between (15) and chassis ground		Min. 100 kΩ	

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Circuit diagram related to coolant temperature sensor



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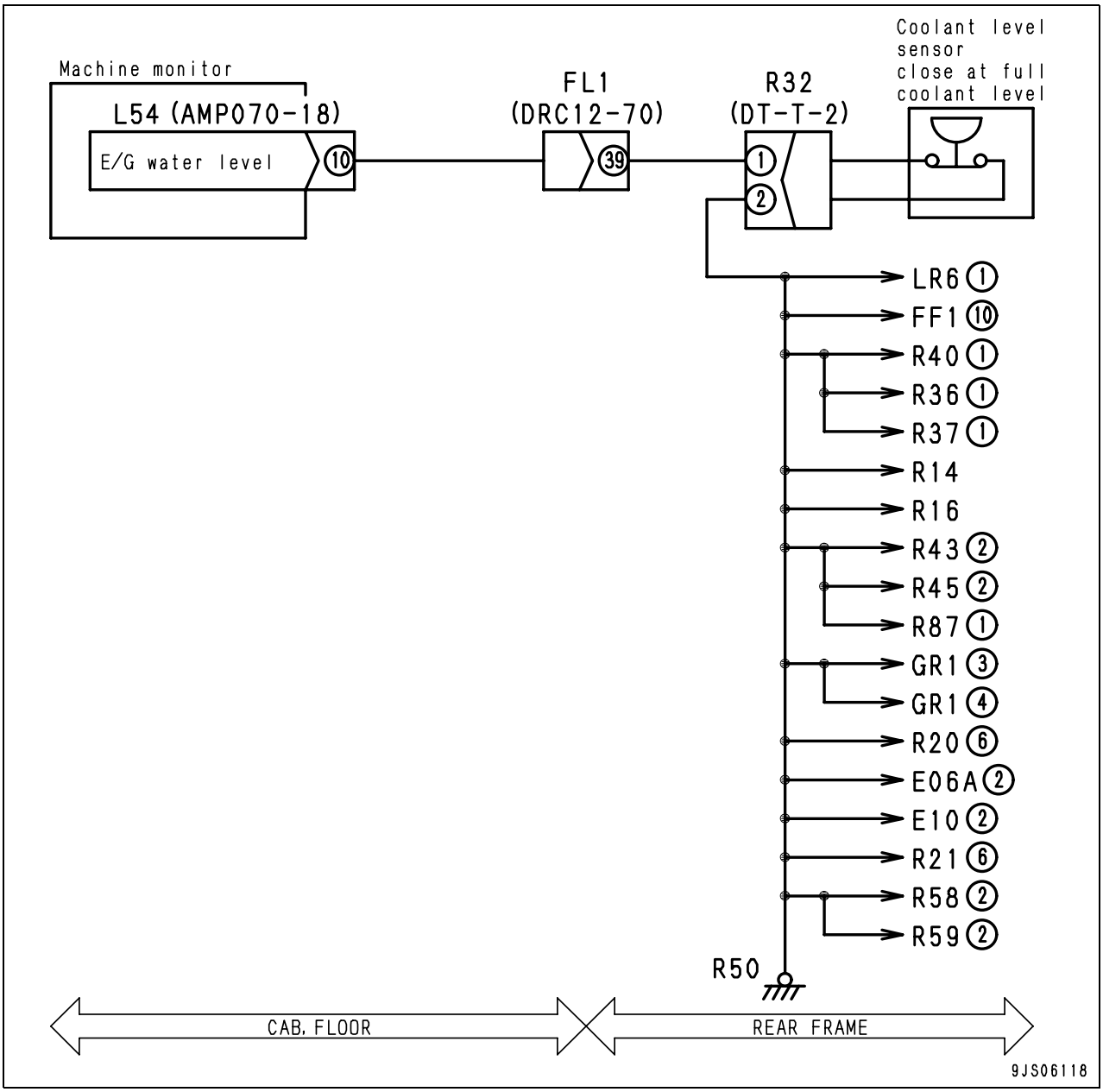
Failure code [B@BCZK] (Coolant: Low level)

Action code	Failure code	Trouble	Coolant: Low level (Machine monitor system)
E01	**B@BCZK**		
Contents of trouble	• The coolant level sensor circuit is OPEN (circuit was in this condition for 30 seconds)		
Action of controller	• Turns the coolant level caution lamp ON. • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• The coolant level is low. The engine overheats (The engine may be broken).		
Related information	• The input state (ON/OFF) from the coolant level sensor can be checked with the monitoring function (Code: 40903, D-IN-27). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Low coolant level	The coolant level may be low. Check it directly.			
	2	Defective coolant level sensor (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			R32 (Male)	Sub-tank	Resistance	
			Between (1) and (2)	Below LOW level (Abnormal)	Max. 1 Ω	
				Above LOW level (Normal)	Min. 1 MΩ	
	3	Disconnection in wiring harness (Disconnection or defective contact)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L54 (female) (10) – R32 (female) (1)		Resistance	Max. 1 Ω
			Wiring harness from R32 (female) (2) and chassis ground		Resistance	Max. 1 Ω
	4	Defective machine monitor	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L54 (female)	Sub-tank	Resistance	
			Wiring harness between (10) – chassis ground	Below LOW level (Abnormal)	Max. 1 Ω	
				Above LOW level (Normal)	Min. 1 MΩ	

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Circuit diagram related to coolant level sensor



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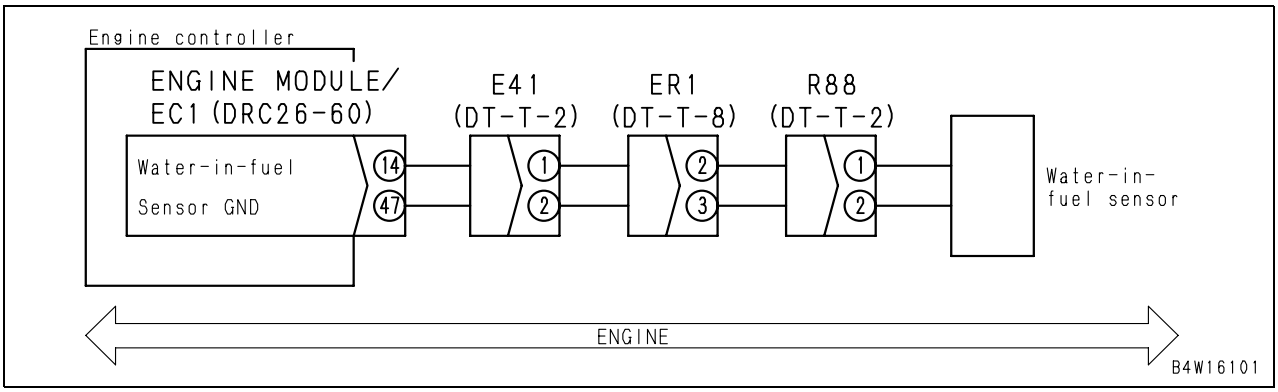
Failure code [B@BEBF] (Water in fuel error)

Action code	Failure code	Trouble	Water in fuel error (Engine controller system)
E02	**B@BEBF**		
Contents of trouble	• Abnormal voltage occurred in signal circuit of fuel water-in-fuel sensor.		
Action of controller	• None in particular.		
Problem that appears on machine	• White smoke comes out. • Output drops. • Starting performance is defective.		
Related information	• Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective fuel water sensor	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			R88 (female)	Resistance	
			Between (1) and (2)	Max. 10 Ω	
			Between (1) and chassis ground	Min. 100 kΩ	
	2	Ground fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between EC1 (female) (14) – R88 (male) (1) and chassis ground	Resistance	Min. 100 kΩ
	3	Short circuit in wiring harness (with another wiring harness)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness among all pins between EC1 (female) (14) – EC1 (female) (With all connectors of wiring harness disconnected)	Resistance	Min. 100 kΩ
	4	Defective wiring harness connector	Connecting parts among fuel water sensor, engine wiring harness, and engine controller are suspected. Inspect them directly. • Loose connector, broken lock, broken seal • Corrosive, bent, broken, forced-in, or extended pin • Humidity in connector, entry of dirt or dust, poor insulation		
	5	Defective engine controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			EC1 (female)	Resistance	
			Between (14) and (47)	Max. 10 Ω	
			Between (14) and chassis ground	Min. 100 kΩ	

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Circuit diagram related to fuel water sensor



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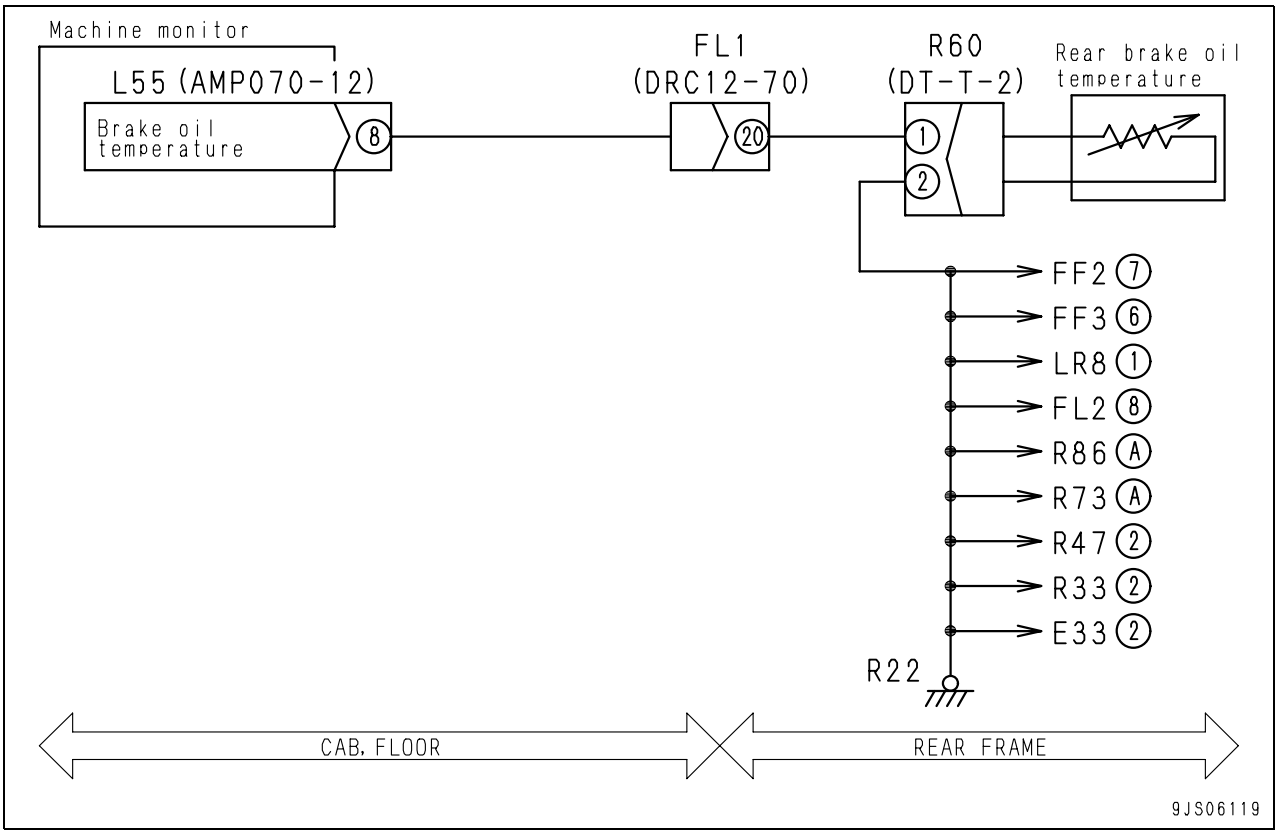
Failure code [B@C7NS] (Brake oil: Overheating)

Action code	Failure code	Trouble	Brake oil: Overheating (Machine monitor system)
E02	**B@C7NS**		
Contents of trouble	• Brake oil temperature is above 130°C for 5 seconds. • When travel speed is above 35 km/h, brake oil temperature, 125°C and above, is detected continuously for 5 seconds.		
Action of controller	• Turns the centralized warning lamp and alarm buzzer ON. • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• Brake oil temperature caution lamp lights up. • The brake may be damaged.		
Related information	• The input state (oil temperature) from the rear brake oil temperature sensor can be checked with the monitoring function (Code: 30202, R BRAKE OIL). • The input state (voltage) from the rear brake oil temperature sensor can be checked with the monitoring function (Code: 30205, R BRAKE OIL). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective brake operation	Brake may overheat because brake was operated improperly during travel. • Instruct the operator on the correct way of operating the brake.		
	2	Defective rear brake oil temperature sensor (Internal defect)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			R60 (Male)	Rear brake oil temperature	Resistance
			Between (1) and (2)	25°C (Normal temperature)	35 – 50 kΩ
				100°C	3.1 – 4.5 kΩ
	3	Defective machine monitor	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			L55 (female)	Rear brake oil temperature	Voltage
			Wiring harnesses between (8) – chassis ground	25°C (Normal temperature)	4.4 – 4.6 V
				100°C	2.1 – 2.3 V

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Circuit diagram related to rear brake oil temperature sensor



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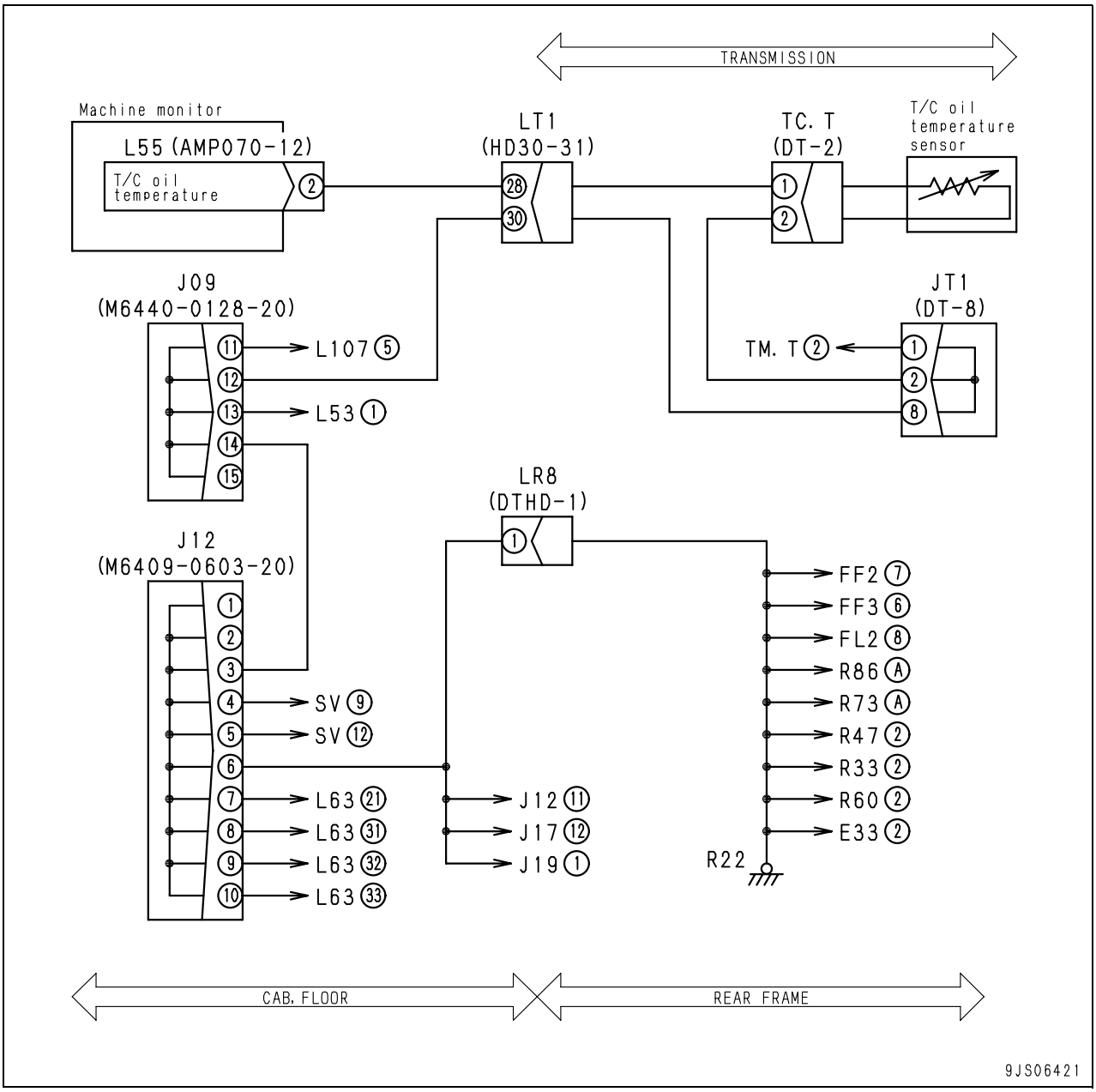
Failure code [b@CENS] (Torque converter oil: Overheating)

Action code	Failure code	Trouble	Torque converter oil: Overheating (Machine monitor system)
E02	**b@CENS**		
Contents of trouble	• The torque converter oil temperature is above 120°C.		
Action of controller	• If cause of failure disappears, system resets itself. (120°C and below was detected continuously for 1 seconds.)		
Problem that appears on machine	• The torque converter oil temperature caution lamp is turned ON (If the machine is used as it is, the torque converter may be broken).		
Related information	• The input state (oil temperature) from the torque converter oil temperature sensor can be checked with the monitoring function (Code: 40100, TC OIL TEMP). • The input state (voltage) from the torque converter oil temperature sensor can be checked with the monitoring function (Code: 40101, TC OIL TEMP). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Overheating of torque converter oil	Torque converter oil may overheat due to torque converter stall, etc. (See Troubleshooting of hydraulic and mechanical system (H-mode).)		
	2	Defective torque converter oil temperature sensor (Internal defect)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			TC.T (male)	Torque converter oil temperature	Resistance
			Between (1) and (2)	25°C (Normal temperature)	35 – 50 kΩ
				100°C	3.1 – 4.5 kΩ
	3	Defective machine monitor	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			L55 (female)	Torque converter oil temperature	Voltage
			Between (2) and chassis ground	25°C (Normal temperature)	4.4 – 4.6 V
				100°C	2.1 – 2.3V

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Circuit diagram related to torque converter oil temperature sensor



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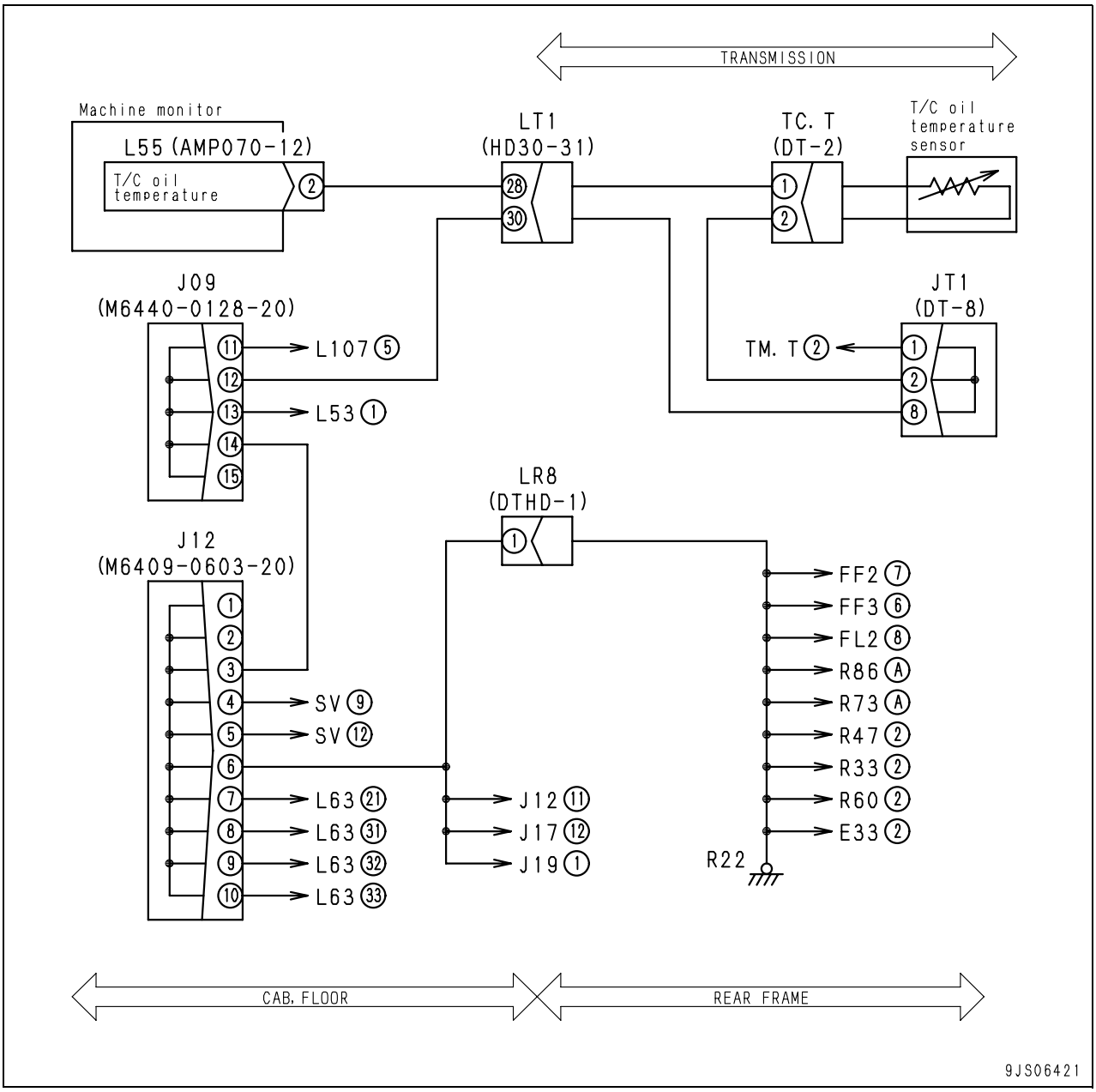
Failure code [B@CENS] (Torque converter oil: Overheating)

Action code	Failure code	Trouble	Torque converter oil: Overheating (Machine monitor system)
E02	**B@CENS**		
Contents of trouble	• The torque converter oil temperature is above 130°C.		
Action of controller	• Turns the centralized warning lamp and alarm buzzer ON. • If cause of failure disappears, system resets itself. (130°C and below was detected continuously for 1 seconds.)		
Problem that appears on machine	• The torque converter oil temperature caution lamp is turned ON (If the machine is used as it is, the torque converter may be broken).		
Related information	• The input state (oil temperature) from the torque converter oil temperature sensor can be checked with the monitoring function (Code: 40100, TC OIL TEMP). • The input state (voltage) from the torque converter oil temperature sensor can be checked with the monitoring function (Code: 40101, TC OIL TEMP). • Method of reproducing failure code: Turn the starting switch ON.		

Possible causes and standard value in normal state	Causes		Standard value in normal state/Remarks on troubleshooting		
	1	Overheating of torque converter oil	Torque converter oil may overheat due to torque converter stall, etc. (See Troubleshooting of hydraulic and mechanical system (H-mode).)		
	2	Defective torque converter oil temperature sensor (Internal defect)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			TC.T (male)	Torque converter oil temperature	Resistance
			Between (1) and (2)	25°C (Normal temperature)	35 – 50 kΩ
				100°C	3.1 – 4.5 kΩ
	3	Defective machine monitor	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			L55 (female)	Torque converter oil temperature	Voltage
			Between (2) and chassis ground	25°C (Normal temperature)	4.4 – 4.6 V
				100°C	2.1 – 2.3 V

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Circuit diagram related to torque converter oil temperature sensor



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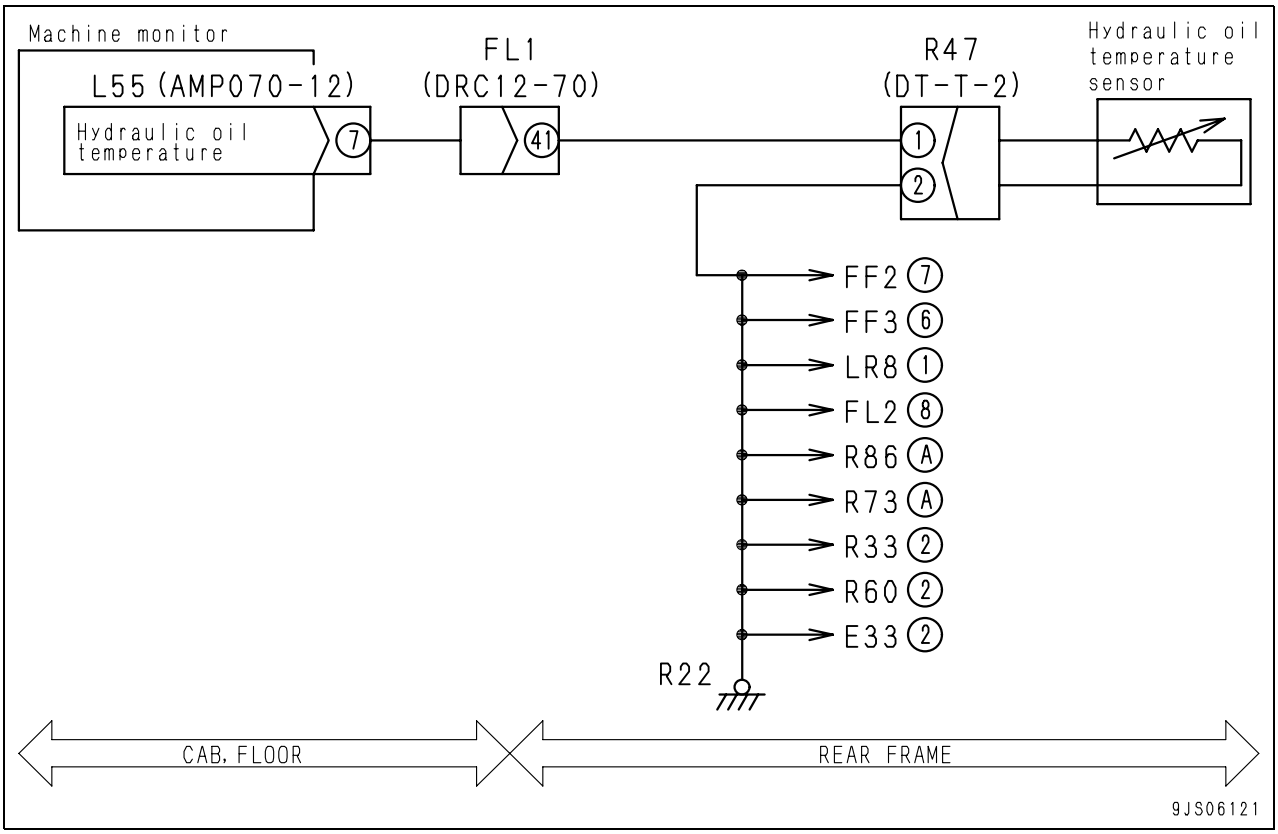
Failure code [B@HANS] (Hydraulic oil: Overheating)

Action code	Failure code	Trouble	Hydraulic oil: Overheating (Machine monitor system)
E02	**B@HANS**		
Contents of trouble	• The hydraulic oil temperature is above 100°C (this level was detected for 10 seconds)		
Action of controller	• Turns the centralized warning lamp and alarm buzzer ON. • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• The hydraulic oil overheat warning is turned ON (If the machine is used as it is, the pump and cylinder seals may be broken).		
Related information	• The input state (oil temperature) from the hydraulic oil temperature sensor can be checked with the monitoring function (Code: 04401, HYD TEMP). • The input state (voltage) from the hydraulic oil temperature sensor can be checked with the monitoring function (Code: 04404, HYD TEMP). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Overheating of hydraulic oil	The hydraulic oil may be overheating.		
	2	Defective hydraulic oil temperature sensor (Internal trouble)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			R47 (Male)	Hydraulic oil temperature	Resistance
			Between (1) and (2)	25°C (Normal temperature)	35 – 50 kΩ
				100°C	3.1 – 4.5 kΩ
	3	Defective machine monitor	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			L55 (female)	Hydraulic oil temperature	Voltage
			Wiring harnesses between (7) – chassis ground	25°C (Normal temperature)	4.4 – 4.6 V
				100°C	2.1 – 2.3 V

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Circuit diagram related to hydraulic oil temperature sensor



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Failure code [CA111] (Abnormality in engine controller)

Action code	Failure code	Trouble	Abnormality in engine Controller (Engine controller system)
E03	**CA111**		
Contents of trouble	• Abnormality occurred in memory of engine controller or power supply circuit.		
Action of controller	• Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• The engine does not start or operates normally.		
Related information	• Method of reproducing failure code: Start engine		

Possible causes and standard value in normal state	Causes	Standard value in normal state/Remarks on troubleshooting
	Carry out troubleshooting of failure code [CA757].	

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Failure code [CA115] (Engine Ne or Bkup speed sensor error)

Action code	Failure code	Trouble	Engine Ne or Bkup speed sensor error (Engine controller system)
E03	**CA115**		
Contents of trouble	• Abnormality occurred in signals of engine Ne speed sensor and engine Bkup speed sensor circuit.		
Action of controller	• Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• Engine stops • The engine does not start.		
Related information	• Method of reproducing failure code: Start engine		

	Causes		Standard value in normal state/Remarks on troubleshooting
Possible causes and standard value in normal state	1	Defective Ne speed sensor	Ne speed sensor can be defective. Carry out troubleshooting of failure code [CA689].
	2	Defective Bkup speed sensor	Bkup speed sensor can be defective. Carry out troubleshooting of failure code [CA778].
	3	Defective connection of sensor connector	Check Ne speed sensor and Bkup speed sensor directly for defective connection (wrong connection).

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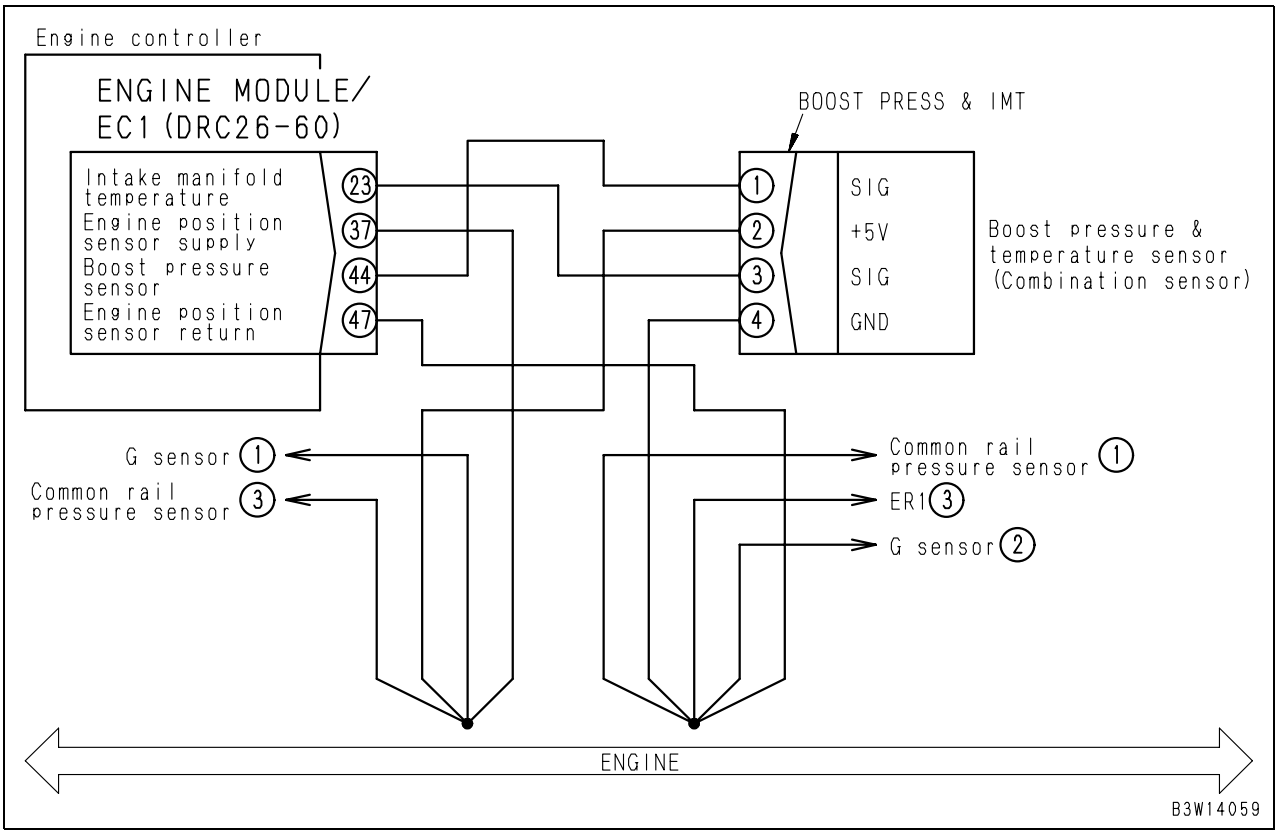
Failure code [CA122] (Charge pressure sensor high error)

Action code	Failure code	Trouble	Charge pressure sensor high error (Engine controller system)
E03	**CA122**		
Contents of trouble	• High voltage is detected in pressure signal circuit of boost pressure sensor and temperature sensor.		
Action of controller	• Fixes charge pressure (boost pressure) and continues operation. • Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• Engine output drops.		
Related information	• The input state (boost pressure) from the charge pressure sensor (boost pressure sensor) can be checked with the monitoring function (Code: 36500, CHG PRESS-A). • The input state (voltage) from the charge pressure sensor (boost pressure sensor) can be checked with the monitoring function (Code: 36502, CHG PRESS-A). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective sensor power supply 2 system	If failure code [**CA227**] is indicated simultaneously, carry out troubleshooting for it first.		
	2	Defective boost pressure sensor and temperature sensors [pressure signal system] (Internal trouble)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			BOOST PRESS & IMT		Voltage
			Between (1) and (4)	Voltage	4.75 – 5.25 V
			Voltage is measured with wiring harness connected. Accordingly, if voltage is abnormal, check wiring harness and controller, too, for another cause of trouble, and then judge.		
	3	Hot short (Short circuit with 5V, 24V circuit) in wiring harness	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			Wiring harness between EC1 (female) (44) – BOOST PRESS & IMT (female) (1) and chassis ground	Voltage	Max. 1 V
	4	Short circuit in wiring harness (with another wiring harness)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harnesses between EC1 (female) (44) – BOOST PRESS & IMT (female) (1), EC1 (female) (47) – BOOST PRESS & IMT (female) (4).	Resistance	Min. 100 kΩ
	5	Defective wiring harness connector	Connecting parts among boost pressure sensor/temperature sensor, engine wiring harness, and engine controller are suspected. Inspect them directly. • Loose connector, broken lock and, broken seal • Corrosive, bent, broken, forced-in, or extended pin • Humidity in connector, entry of dirt or dust, poor insulation		
	6	Defective engine controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			EC1		Voltage
			Between (37) and (47)	Power supply	4.75 – 5.25V

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Circuit diagram related to boost pressure and temperature sensors



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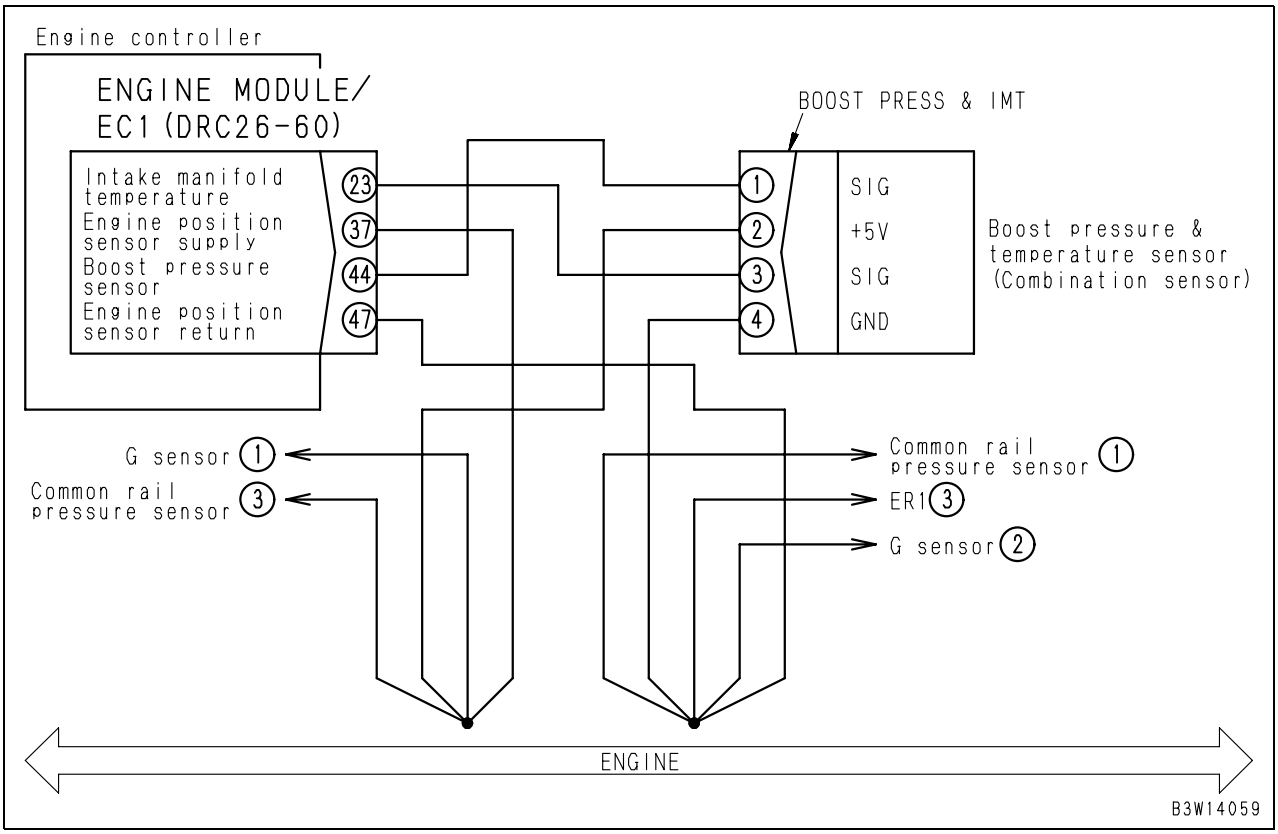
Failure code [CA123] (Charge pressure sensor low error)

Action code	Failure code	Trouble	Charge pressure sensor low error (Engine controller system)
E03	**CA123**		
Contents of trouble	• Low voltage is detected in pressure signal circuit of boost pressure sensor and temperature sensor.		
Action of controller	• Fixes charge pressure (boost pressure) and continues operation. • Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• Engine output drops.		
Related information	• The input state (boost pressure) from the charge pressure sensor (boost pressure sensor) can be checked with the monitoring function (Code: 36500, CHG PRESS-A). • The input state (voltage) from the charge pressure sensor (boost pressure sensor) can be checked with the monitoring function (Code: 36502, CHG PRESS-A). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective sensor power supply 2 system	If failure code [**CA187**] is indicated simultaneously, carry out troubleshooting for it first.			
	2	Defective boost pressure sensor or temperature sensor [pressure signal circuit] (Internal trouble)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			BOOST PRESS & IMT		Voltage	
			Between (1) and (4)	Power supply	4.75 – 5.25 V	
			Voltage is measured with wiring harness connected. Accordingly, if voltage is abnormal, check wiring harness and controller, too, for another cause of trouble, and then judge.			
	3	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between EC1 (female) (44) – BOOST PRESS & IMT (female) (1) and chassis ground		Resistance	Min. 100 kΩ
	4	Short circuit in wiring harness (with another wiring harness)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harnesses between EC1 (female) (44) – BOOST PRESS & IMT (female) (1), EC1 (female) (47) – BOOST PRESS & IMT (female) (4)		Resistance	Min. 100 kΩ
	5	Defective wiring harness connector	Connecting parts among boost pressure sensor/temperature sensor, engine wiring harness, and engine controller are suspected. Inspect them directly. • Loose connector, broken lock, broken seal • Corrosive, bent, broken, forced-in, or extended pin • Humidity in connector, entry of dirt or dust, poor insulation			
	6	Defective engine controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			EC1		Voltage	
			Between (37) and (47)	Power supply	4.75 – 5.25 V	

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Circuit diagram related to boost pressure and temperature sensors



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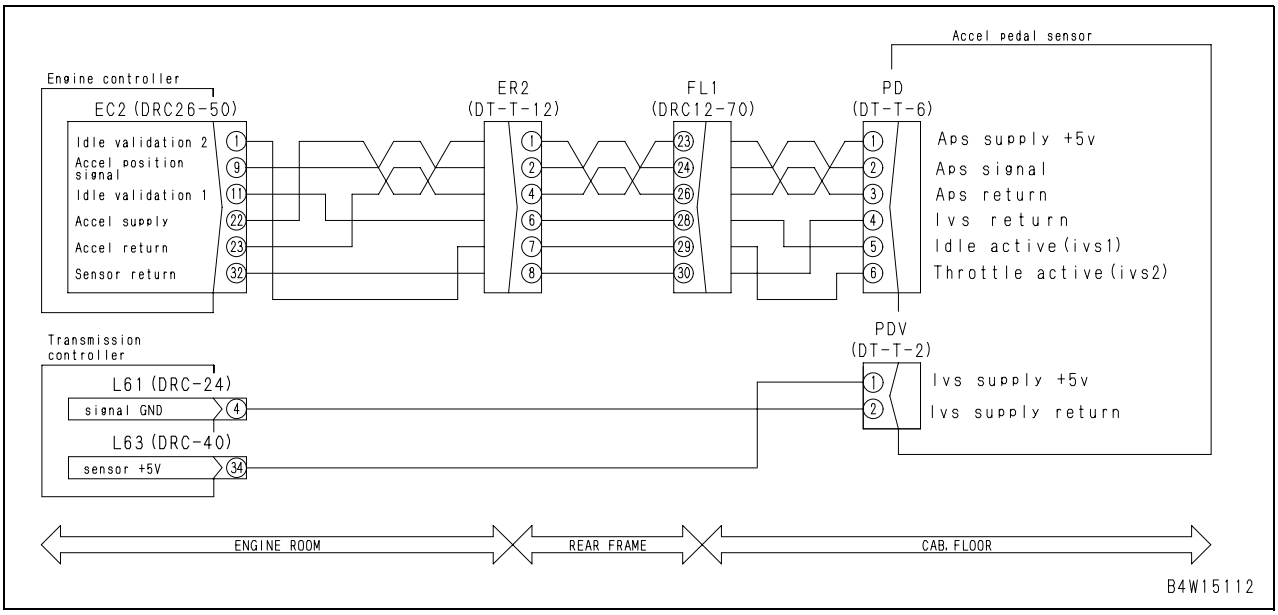
Failure code [CA131] (Throttle sensor high error)

Action code	Failure code	Trouble	Throttle sensor high error (Engine controller system)
E03	**CA131**		
Contents of trouble	• High voltage was detected in the throttle sensor signal circuit.		
Action of controller	• Runs the engine at position of throttle 0% when accelerator pedal is OFF and at 50% when it is ON. • Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• The engine does not reach full throttle.		
Related information	• The input state (accelerator pedal opening ratio) from the throttle sensor can be checked with the monitoring function (Code: 31701, THROTTLE POS). • The input state (voltage) from the throttle sensor can be checked with the monitoring function (Code: 31707, THROTTLE POS). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective throttle sensor power supply system	If failure code [**CA2185**] is indicated simultaneously, carry out troubleshooting for it first.			
	2	Defective accelerator pedal (Internal trouble)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			PD	Accelerator pedal	Voltage	
			Between (1) and (3)	All range (Power supply)	4.75 – 5.25 V	
			Between (2) and (3)	When released	0.50 – 0.80 V	
				When pressed	3.70 – 4.00 V	
			Sensor voltage is measured with wiring harness connected. Accordingly, if voltage is abnormal, check wiring harness and controller for another cause of trouble before judgment			
	3	Hot short (Short circuit with 5V, 24V circuit) in wiring harness	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			Wiring harness between EC2 (female) (9) – PD (female) (2) and chassis ground		Voltage	Max. 1 V
	4	Short circuit in wiring harness (with another wiring harness)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between EC2 (female) (9) – PD (female) (2), EC2 (female) (22) – PD (female) (1)		Resistance	Min. 100 kΩ
	5	Defective wiring harness connector	Connecting parts among axel pedal, engine unit wiring harness, and engine controller are suspected. Inspect them directly. • Loose connector, broken lock, broken seal • Corrosive, bent, broken, forced-in, or extended pin • Humidity in connector, entry of dirt or dust, poor insulation			
	6	Defective engine controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			EC2	Accelerator pedal	Voltage	
			Between (22) and (23)	All range (Power supply)	4.75 – 5.25 V	
			Between (9) and (23)	When released	0.50 – 0.80 V	
				When pressed	3.70 – 4.00 V	

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Circuit diagram related to throttle sensor



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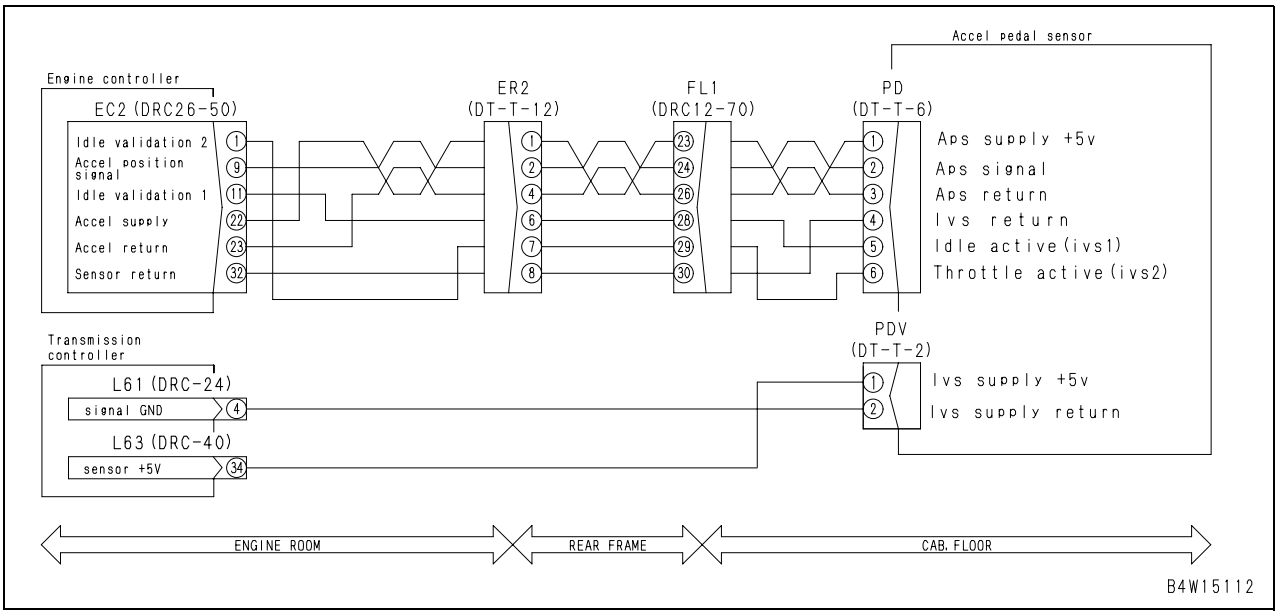
Failure code [CA132] (Throttle sensor low error)

Action code	Failure code	Trouble	Throttle sensor low error (Engine controller system)
E03	**CA132**		
Contents of trouble	• Low voltage was detected in the throttle sensor signal circuit.		
Action of controller	• Runs the engine at position of throttle 0% when accelerator pedal is OFF and at 50% when it is ON. • Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• The engine does not reach full throttle.		
Related information	• The input state (accelerator pedal opening ratio) from the throttle sensor can be checked with the monitoring function (Code: 31701, THROTTLE POS). • The input state (voltage) from the throttle sensor can be checked with the monitoring function (Code: 31707, THROTTLE POS). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective throttle sensor power supply system	If failure code [**CA2186**] is indicated simultaneously, carry out troubleshooting for it first.			
	2	Defective accelerator pedal (Internal trouble)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			PD	Accelerator pedal	Voltage	
			Between (1) and (3)	All range (Power supply)	4.75 – 5.25 V	
			Between (2) and (3)	When released	0.50 – 0.80 V	
				When pressed	3.70 – 4.00 V	
			Sensor voltage is measured with wiring harness connected. Accordingly, if voltage is abnormal, check wiring harness and controller for another cause of trouble before judgment			
	3	Ground fault in wiring harness (Short circuit with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between EC2 (female) (9) – PD (female) (2) and chassis ground		Resistance	Min. 100 kΩ
	4	Short circuit in wiring harness (with another wiring harness)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between EC2 (female) (9) – PD (female) (2), PD (female) (23) – PD (female) (3)		Resistance	Min. 100 kΩ
	5	Defective wiring harness connector	Connecting parts among axel pedal, engine unit wiring harness, and engine controller are suspected. Inspect them directly. • Loose connector, broken lock, broken seal • Corrosive, bent, broken, forced-in, or extended pin • Humidity in connector, entry of dirt or dust, poor insulation			
	6	Defective engine controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			EC2	Accelerator pedal	Voltage	
			Between (22) and (23)	All range (Power supply)	4.75 – 5.25 V	
			Between (9) and (23)	When released	0.50 – 0.80 V	
				When pressed	3.70 – 4.00 V	

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Circuit diagram related to throttle sensor



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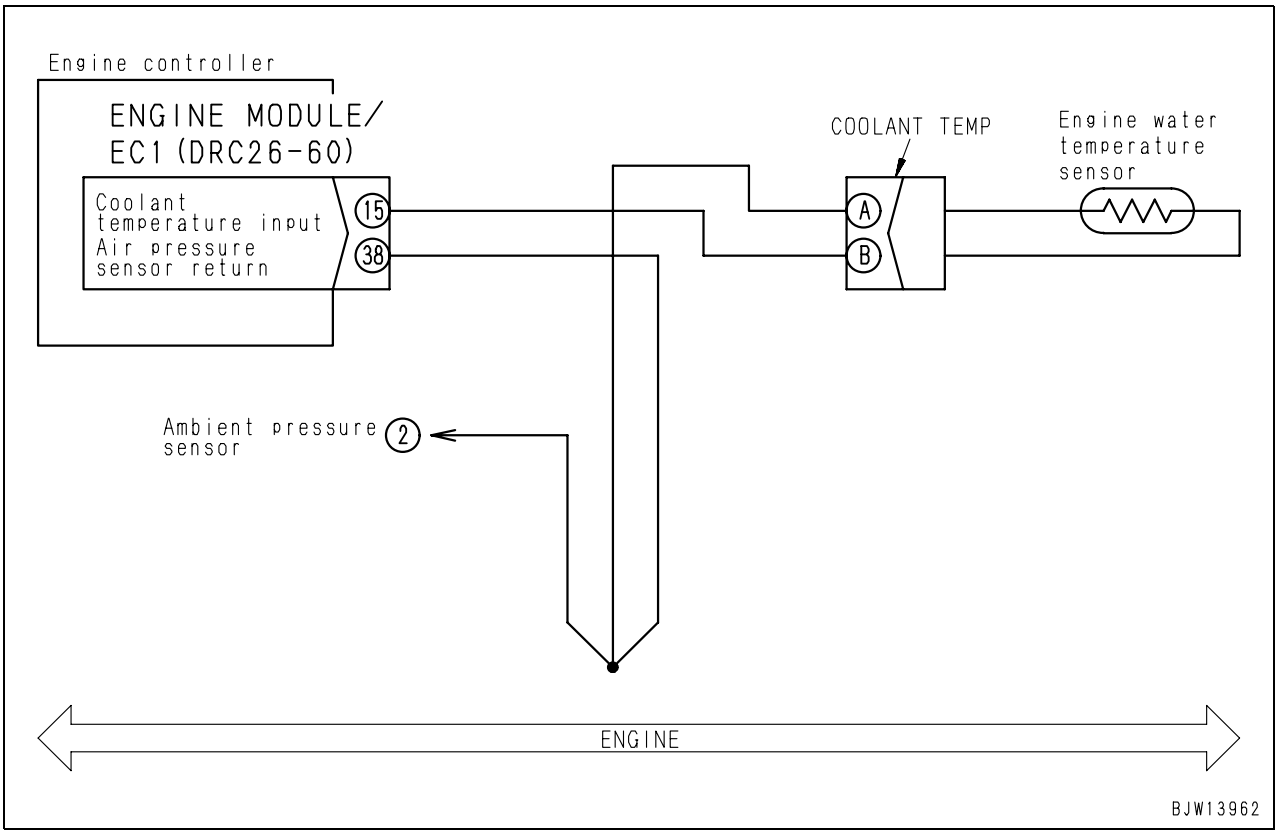
Failure code [CA144] (Coolant sensor high error)

Action code	Failure code	Trouble	Coolant sensor high error (Engine controller system)
E01	**CA144**		
Contents of trouble	• High voltage is detected in coolant temperature sensor signal circuit.		
Action of controller	• Fixes engine coolant temperature and continues operation.		
Problem that appears on machine	• Exhaust smoke becomes white. • Overheat prevention function does not function. • Engine starting performance falls during low temperature.		
Related information	• The input state (temperature) from the engine coolant temperature sensor can be checked with the monitoring function (Code: 04104, COOLANT TEMP). • The input state (voltage) from the engine coolant temperature sensor can be checked with the monitoring function (Code: 04105, COOLANT TEMP). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective coolant temperature sensor (Internal trouble)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			COOLANT TEMP (male)	Temperature	Resistance	
			Between (A) and (B)	0°C	30 – 37 kΩ	
				25°C	9.3 – 10.7 kΩ	
				50°C	3.2 – 3.8 kΩ	
				80°C	1.0 – 1.3 kΩ	
				95°C	700 – 800 Ω	
	2	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between EC1 (female) (15) – COOLANT TEMP (female) (B)		Resistance	Max. 10Ω
			Wiring harness between EC1 (female) (38) – COOLANT TEMP (female) (A)		Resistance	Max. 10Ω
	3	Short circuit in wiring harness (with another wiring harness)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness among all pins between EC1 (female) (15) – EC1 (female) (With all connectors of wiring harness disconnected)		Resistance	Min. 100 kΩ
	4	Defective wiring harness connector	Connecting parts among coolant temperature sensor, engine wiring harness, and engine controller are suspected. Inspect them directly. • Loose connector, broken lock, broken seal • Corrosive, bent, broken, forced-in, or extended pin • Humidity in connector, entry of dirt or dust, poor insulation			
	5	Defective engine controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			EC1 (female)	Temperature	Resistance	
			Between (15) and (38)	0°C	30 – 37 kΩ	
				25°C	9.3 – 10.7 kΩ	
				50°C	3.2 – 3.8 kΩ	
				80°C	1.0 – 1.3 kΩ	
				95°C	700 – 800 Ω	

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Circuit diagram related to coolant temperature sensor



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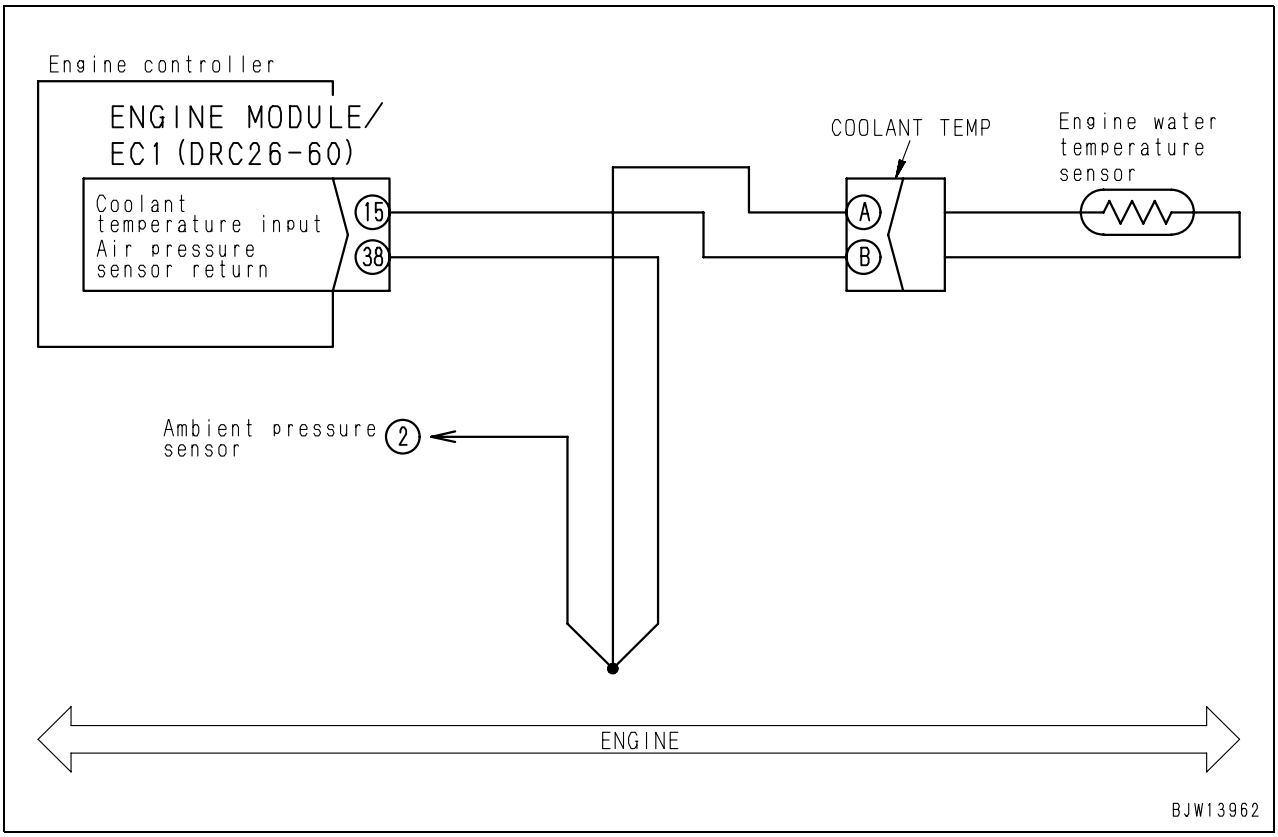
Failure code [CA145] (Coolant sensor low error)

Action code	Failure code	Trouble	Coolant sensor low error (Engine controller system)
E01	CA145		
Contents of trouble	• Low voltage is detected in coolant temperature sensor signal circuit.		
Action of controller	• Fixes engine coolant temperature and continues operation.		
Problem that appears on machine	• Exhaust smoke becomes white. • Overheat prevention function does not function. • Engine starting performance falls during low temperature.		
Related information	• The input state (temperature) from the engine coolant temperature sensor can be checked with the monitoring function (Code: 04104, COOLANT TEMP). • The input state (voltage) from the engine coolant temperature sensor can be checked with the monitoring function (Code: 04105, COOLANT TEMP). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective coolant temperature sensor (Internal trouble)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			COOLANT TEMP (male)	Temperature	Resistance	
			Between (A) and (B)	0°C	30 – 37 kΩ	
				25°C	9.3 – 10.7 kΩ	
				50°C	3.2 – 3.8 kΩ	
				80°C	1.0 – 1.3 kΩ	
				95°C	700 – 800 Ω	
			Between (B) and chassis ground	All range	Min. 100 kΩ	
	2	Ground fault in wiring harness (Short circuit with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between EC1 (female) (15) – COOLANT TEMP (female) (B) and chassis ground		Resistance	Min. 100 kΩ
	3	Short circuit in wiring harness (with another wiring harness)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness among all pins between EC1 (female) (15) – EC1 (female) (With all connectors of wiring harness disconnected)		Resistance	Min. 100 kΩ
	4	Defective wiring harness connector	Connecting parts among coolant temperature sensor, engine wiring harness, and engine controller are suspected. Inspect them directly. • Loose connector, broken lock, broken seal • Corrosive, bent, broken, forced-in, or extended pin • Humidity in connector, entry of dirt or dust, poor insulation			
	5	Defective engine controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			EC1 (female)	Temperature	Resistance	
			Between (15) and (38)	0°C	30 – 37 kΩ	
				25°C	9.3 – 10.7 kΩ	
				50°C	3.2 – 3.8 kΩ	
				80°C	1.0 – 1.3 kΩ	
				95°C	700 – 800 Ω	
			Between (15) and chassis ground	All range	Min. 100 kΩ	

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Circuit diagram related to coolant temperature sensor



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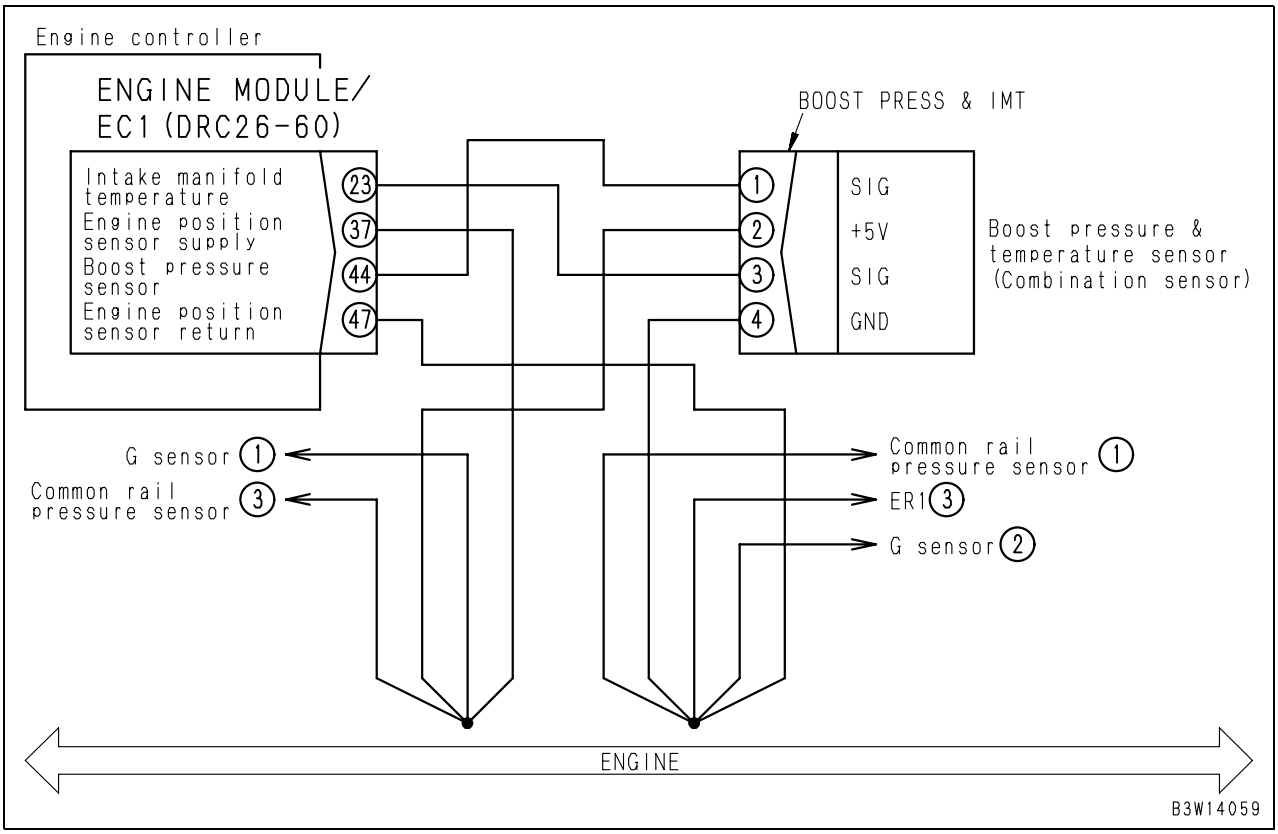
Failure code [CA153] (Charge temperature sensor high error)

Action code	Failure code	Trouble	Charge temperature sensor high error (Engine controller system)
E01	**CA153**		
Contents of trouble	• High voltage is detected in temperature signal circuit of boost pressure sensor and temperature sensor.		
Action of controller	• Fixes charge temperature and continues operation.		
Problem that appears on machine	• Exhaust smoke becomes white. • Boost temperature-based engine protection function does not function. • Engine starting performance falls during low temperature.		
Related information	• The input state (temperature) from the charge temperature sensor (boost temperature sensor) can be checked with the monitoring function (Code: 18500, CHG TEMP). • The input state (voltage) from the charge temperature sensor (boost temperature sensor) can be checked with the monitoring function (Code: 18501, CHG TEMP). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective [temperature signal circuit] of boost pressure sensor, temperature sensor (Internal trouble)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			BOOST PRESS & IMT (male)	Temperature	Resistance	
			Between (3) and (4)	0°C	29 – 36 kΩ	
				25°C	9 – 11 kΩ	
				40°C	4.9 – 5.8 kΩ	
				100°C	600 – 700 Ω	
	2	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between EC1 (female) (23) – BOOST PRESS & IMT (female) (3)		Resistance	Max. 10Ω
			Wiring harness between EC1 (female) (47) – BOOST PRESS & IMT (female) (4)		Resistance	Max. 10Ω
	3	Short circuit in wiring harness (with another wiring harness)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness among all pins between EC1 (female) (23) – EC1 (female) (With all connectors of wiring harness disconnected)		Resistance	Min. 100 kΩ
	4	Defective wiring harness connector	Connecting parts among boost pressure sensor/temperature sensor, engine wiring harness, and engine controller are suspected. Inspect them directly. • Loose connector, broken lock, broken seal • Corrosive, bent, broken, forced-in, or extended pin • Humidity in connector, entry of dirt or dust, poor insulation			
	5	Defective engine controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			EC1 (female)	Temperature	Resistance	
			Between (23) and (47)	0°C	29 – 36 kΩ	
				25°C	9 – 11 kΩ	
				40°C	4.9 – 5.8 kΩ	
				100°C	600 – 700 Ω	

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Circuit diagram related to boost pressure and temperature sensors



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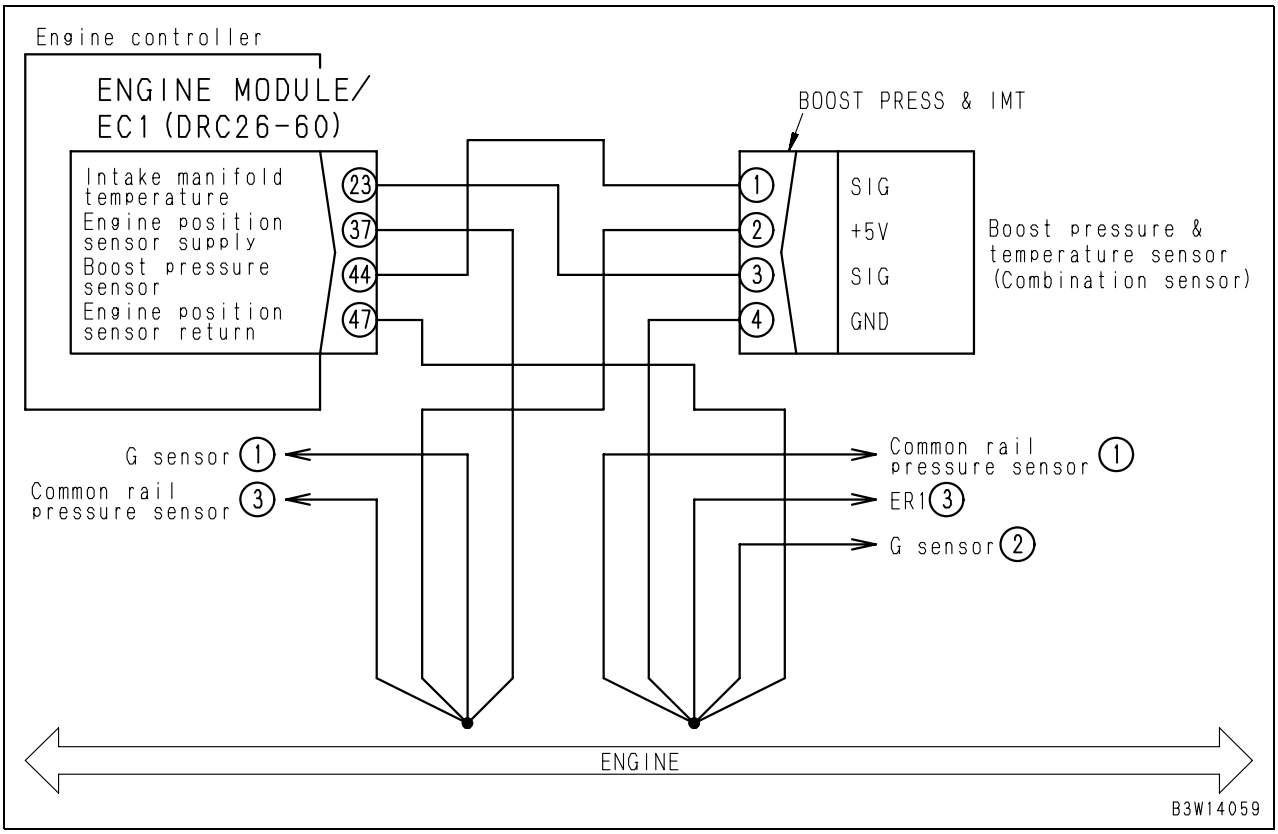
Failure code [CA154] (Charge temperature sensor low error)

Action code	Failure code	Trouble	Charge temperature sensor low error (Engine controller system)
E01	**CA154**		
Contents of trouble	• Low voltage is detected in temperature signal circuit of boost pressure sensor and temperature sensor.		
Action of controller	• Fixes charge temperature and continues operation.		
Problem that appears on machine	• Exhaust smoke becomes white. • Boost temperature-based engine protection function does not function. • Engine starting performance falls during low temperature.		
Related information	• The input state (temperature) from the charge temperature sensor (boost temperature sensor) can be checked with the monitoring function (Code: 18500, CHG TEMP). • The input state (voltage) from the charge temperature sensor (boost temperature sensor) can be checked with the monitoring function (Code: 18501, CHG TEMP). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective [temperature signal circuit] of boost pressure sensor, temperature sensor (Internal trouble)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			BOOST PRESS & IMT (male)	Temperature	Resistance	
			Between (2) and (1)	0°C	29 – 36 kΩ	
				25°C	9 – 11 kΩ	
				40°C	4.9 – 5.8 kΩ	
				100°C	600 – 700 Ω	
			Between (2) and chassis ground	All range	Min. 100 kΩ	
	2	Ground fault in wiring harness (Short circuit with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between EC1 (female) (23) – BOOST PRESS & IMT (female) (3) and chassis ground		Resistance	Min. 100 kΩ
	3	Short circuit in wiring harness (with another wiring harness)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness among all pins between EC1 (female) (23) – EC1 (female) (With all connectors of wiring harness disconnected)		Resistance	Min. 100 kΩ
	4	Defective wiring harness connector	Connecting parts among boost pressure sensor/temperature sensor, engine wiring harness, and engine controller are suspected. Inspect them directly. • Loose connector, broken lock, broken seal • Corrosive, bent, broken, forced-in, or extended pin • Humidity in connector, entry of dirt or dust, poor insulation			
	5	Defective engine controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			EC1 (female)	Temperature	Resistance	
			Between (23) and (47)	0°C	29 – 36 kΩ	
				25°C	9 – 11 kΩ	
				40°C	4.9 – 5.8 kΩ	
				100°C	600 – 700 Ω	
			Between (23) and chassis ground	All range	Min. 100 kΩ	

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Circuit diagram related to boost pressure and temperature sensors



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Failure code [CA155] (Derating of speed by abnormally high charge temperature)

Action code	Failure code	Trouble	Derating of speed by abnormally high charge temperature (Engine controller system)
E03	**CA155**		
Contents of trouble	• Temperature signal of boost pressure sensor and temperature sensor is above upper control limit.		
Action of controller	• Limits output and continues operation. • Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• Engine output drops. • Engine stops		
Related information	• The input state (temperature) from the charge temperature sensor (boost temperature sensor) can be checked with the monitoring function (Code: 18500, CHG TEMP). • The input state (voltage) from the charge temperature sensor (boost temperature sensor) can be checked with the monitoring function (Code: 18501, CHG TEMP). • Method of reproducing failure code: Start engine		

	Causes		Standard value in normal state/Remarks on troubleshooting
Possible causes and standard value in normal state	1	Drop in cooling performance of aftercooler	Cooling performance deterioration of the after cooler is suspected. Inspect the following points directly. • Loose, broken fan belt • Lack of cooling air • Clogged aftercooler fin
	2	Abnormally high temperature at turbocharger outlet	Inspect related parts directly.
	3	Defective engine controller	If causes 1 – 2 are not detected, engine controller may be defective. (Since trouble is in system, troubleshooting cannot be carried out.)

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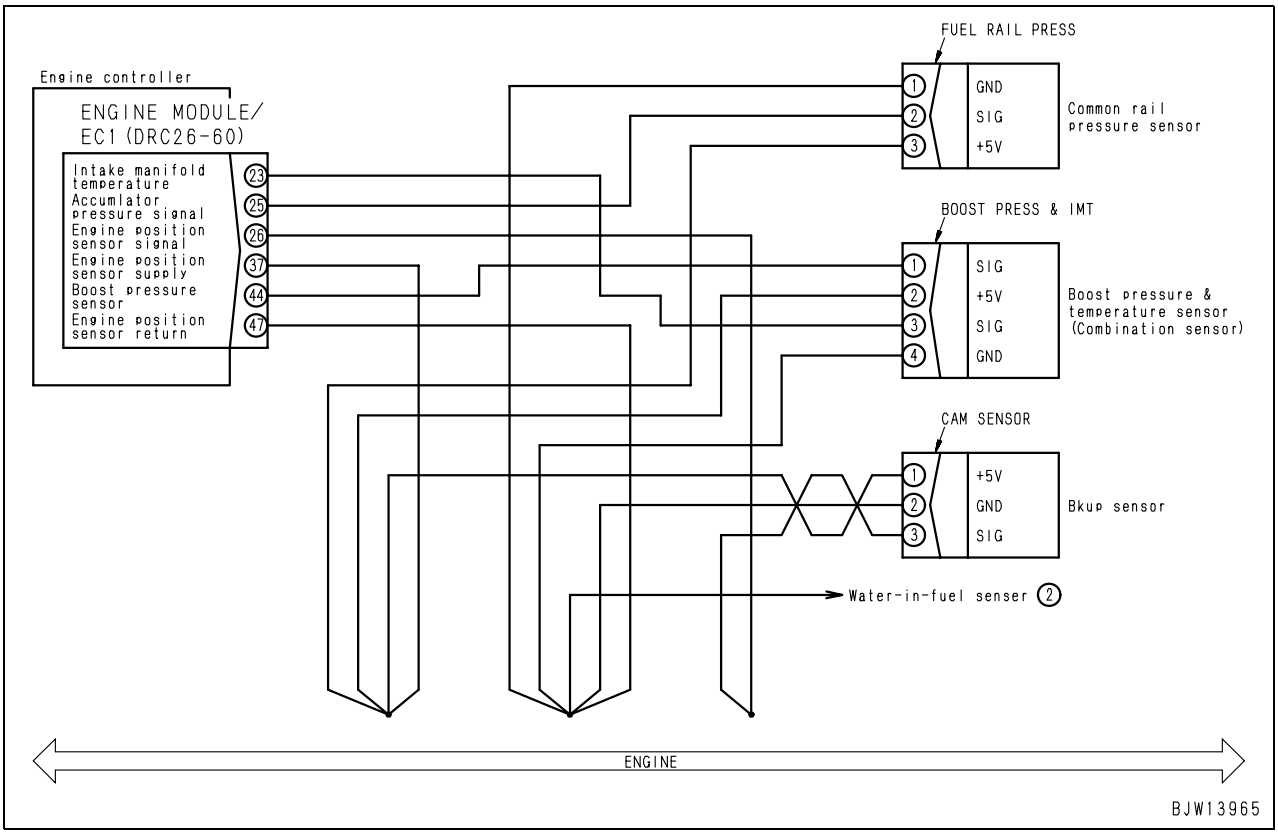
Failure code [CA187] (Sensor power supply 2 low error)

Action code	Failure code	Trouble	Sensor power supply 2 low error (Engine controller system)
E03	**CA187**		
Contents of trouble	• Low voltage is detected in sensor power supply 2 circuit.		
Action of controller	• Fixes boost pressure and continues operation. • Fixes charge temperature and continues operation. • Limits output and continues operation. • Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• Engine output drops.		
Related information	• Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective sensor or wiring harness	★ Disconnect connector with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			Disconnect devices at right in order. If mark E of failure code disappears after reproduction operation is conducted, that device or wiring harness has a defect in it.	Boost pressure, temperature sensor	BOOST PRESS & IMT
				Common rail pressure sensor	FUEL RAIL PRESS
				Bkup sensor	CAM SENSOR
				Engine wiring harness	ENGINE MODULE
	2	Defective wiring harness connector	Connecting parts among each sensor, engine wiring harness, and engine controller are suspected. Inspect them directly. • Loose connector, broken lock, broken seal • Corrosive, bent, broken, forced-in, or extended pin • Humidity in connector, entry of dirt or dust, poor insulation		
	3	Defective engine controller	If causes 1 – 2 are not detected, engine controller may be defective. (Since trouble is in system, troubleshooting cannot be carried out.)		

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Circuit diagram related to sensor power supply 2



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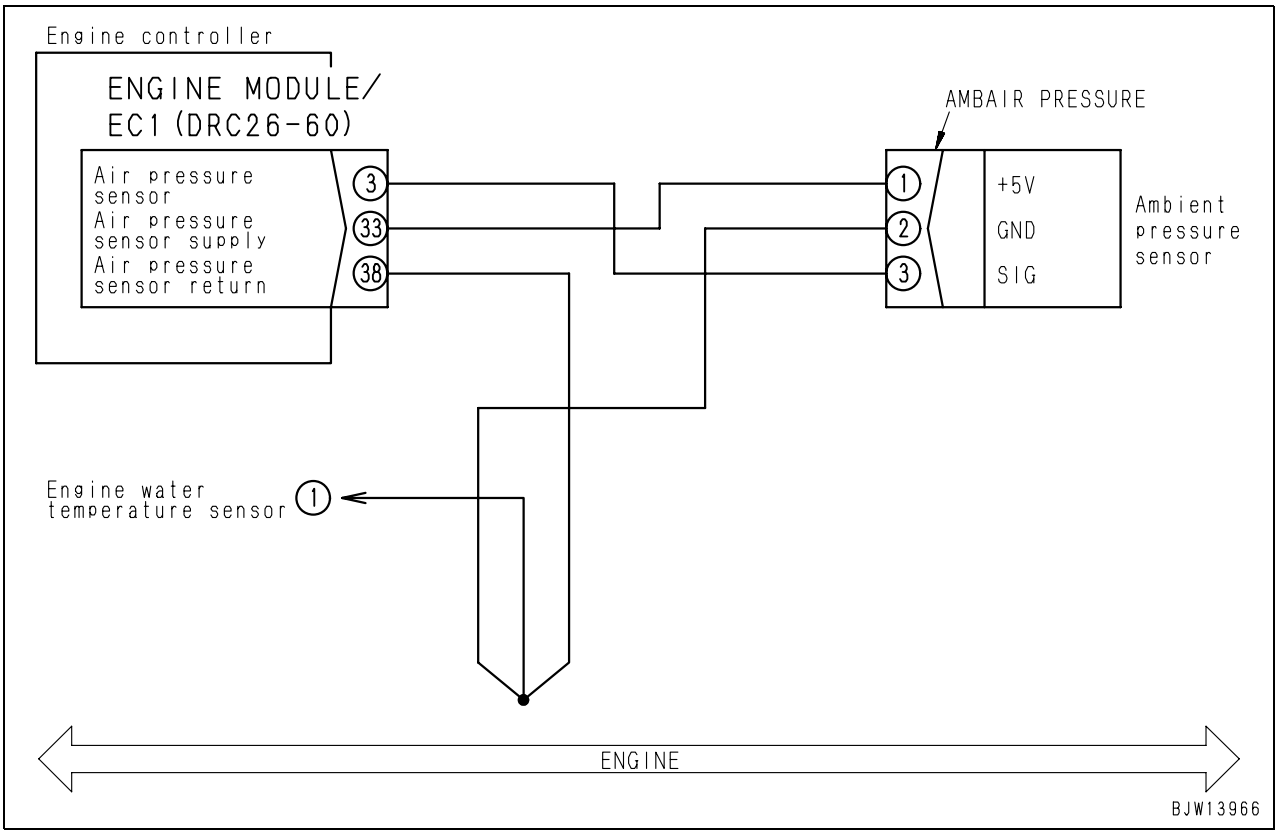
Failure code [CA221] (Atmospheric pressure sensor high error)

Action code	Failure code	Trouble	Ambient pressure sensor high error (Engine controller system)
E01	**CA221**		
Contents of trouble	• High voltage is detected in atmospheric pressure sensor.		
Action of controller	• Fixes atmospheric pressure and continues operation.		
Problem that appears on machine	• Engine does not start easily. • Engine output drops.		
Related information	• The input state (atmospheric pressure) from the atmospheric pressure sensor can be checked with the monitoring function (Code: 37400, AMBIENT PRESS). • The input state (voltage) from the atmospheric pressure sensor can be checked with the monitoring function (Code: 37402, AMBIENT PRESS). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective sensor power supply 1 system	If failure code [**CA386**] is indicated simultaneously, carry out troubleshooting for it first.			
	2	Defective atmospheric pressure sensor (Internal trouble)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			AMBAIR PRESSURE		Voltage	
			Between (1) and (2)	Power supply	4.75 – 5.25 V	
			Voltage is measured with wiring harness connected. Accordingly, if voltage is abnormal, check wiring harness and controller, too, for another cause of trouble, and then judge.			
	3	Hot short (Short circuit with 5V, 24V circuit) in wiring harness	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			Wiring harness between EC1 (female) (3) – AMBAIR PRESSURE (female) (3) and chassis ground		Voltage	Max. 1 V
	4	Short circuit in wiring harness (with another wiring harness)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between EC1 (female) (3) – AMBAIR PRESSURE (female) (3), EC1 (female) (33) – AMBAIR PRESSURE (female) (1)		Resistance	Min. 100 kΩ
	5	Defective wiring harness connector	Connecting parts among atmospheric pressure sensor, engine wiring harness, and engine controller are suspected. Inspect them directly. • Loose connector, broken lock, broken seal • Corrosive, bent, broken, forced-in, or extended pin • Humidity in connector, entry of dirt or dust, poor insulation			
	6	Defective engine controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			EC1		Voltage	
			Between (33) and (38)	Power supply	4.75 – 5.25 V	

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Circuit diagram related to atmospheric pressure sensor



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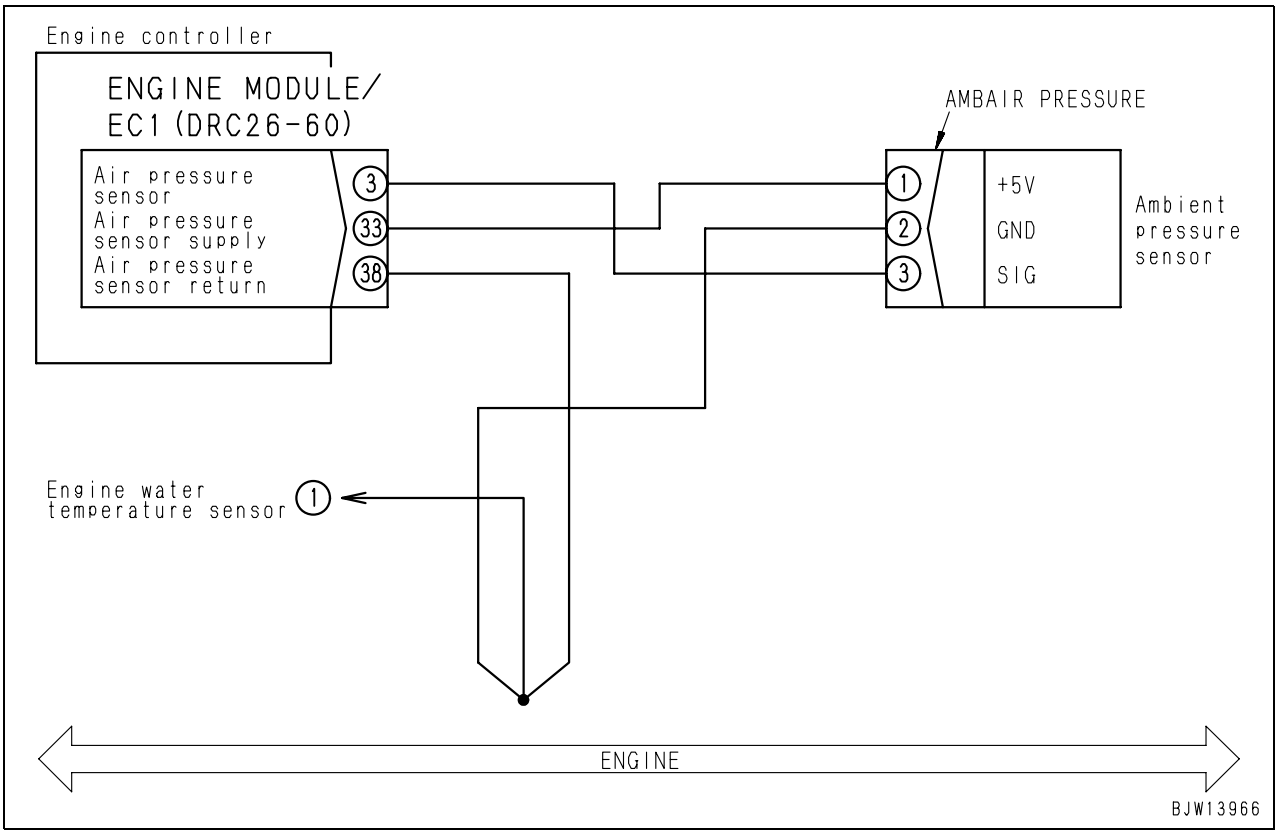
Failure code [CA222] (Atmospheric sensor low error)

Action code	Failure code	Trouble	Atmospheric sensor low error (Engine controller system)
E01	**CA222**		
Contents of trouble	• Low voltage is detected in atmospheric pressure sensor.		
Action of controller	• Fixes atmospheric pressure and continues operation.		
Problem that appears on machine	• Engine does not start easily. • Engine output drops.		
Related information	• The input state (atmospheric pressure) from the atmospheric pressure sensor can be checked with the monitoring function (Code: 37400, AMBIENT PRESS). • The input state (voltage) from the atmospheric pressure sensor can be checked with the monitoring function (Code: 37402, AMBIENT PRESS). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective sensor power supply 1 system	If failure code [**CA352**] is indicated simultaneously, carry out troubleshooting for it first.			
	2	Defective atmospheric pressure sensor (Internal trouble)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			AMBAIR PRESSURE		Voltage	
			Between (1) and (2)	Power supply	4.75 – 5.25 V	
			Voltage is measured with wiring harness connected. Accordingly, if voltage is abnormal, check wiring harness and controller, too, for another cause of trouble, and then judge.			
	3	Ground fault in wiring harness (Short circuit with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between EC1 (female) (3) – AMBAIR PRESSURE (female) (3) and chassis ground		Resistance	Min. 100 kΩ
	4	Short circuit in wiring harness (with another wiring harness)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between EC1 (female) (3) – AMBAIR PRESSURE (female) (3), EC1 (female) (38) – AMBAIR PRESSURE (female) (2)		Resistance	Min. 100 kΩ
	5	Defective wiring harness connector	Connecting parts among atmospheric pressure sensor, engine wiring harness, and engine controller are suspected. Inspect them directly. • Loose connector, broken lock, broken seal • Corrosive, bent, broken, forced-in, or extended pin • Humidity in connector, entry of dirt or dust, poor insulation			
	6	Defective engine controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			EC1		Voltage	
			Between (33) and (38)	Power supply	4.75 – 5.25 V	

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Circuit diagram related to atmospheric pressure sensor



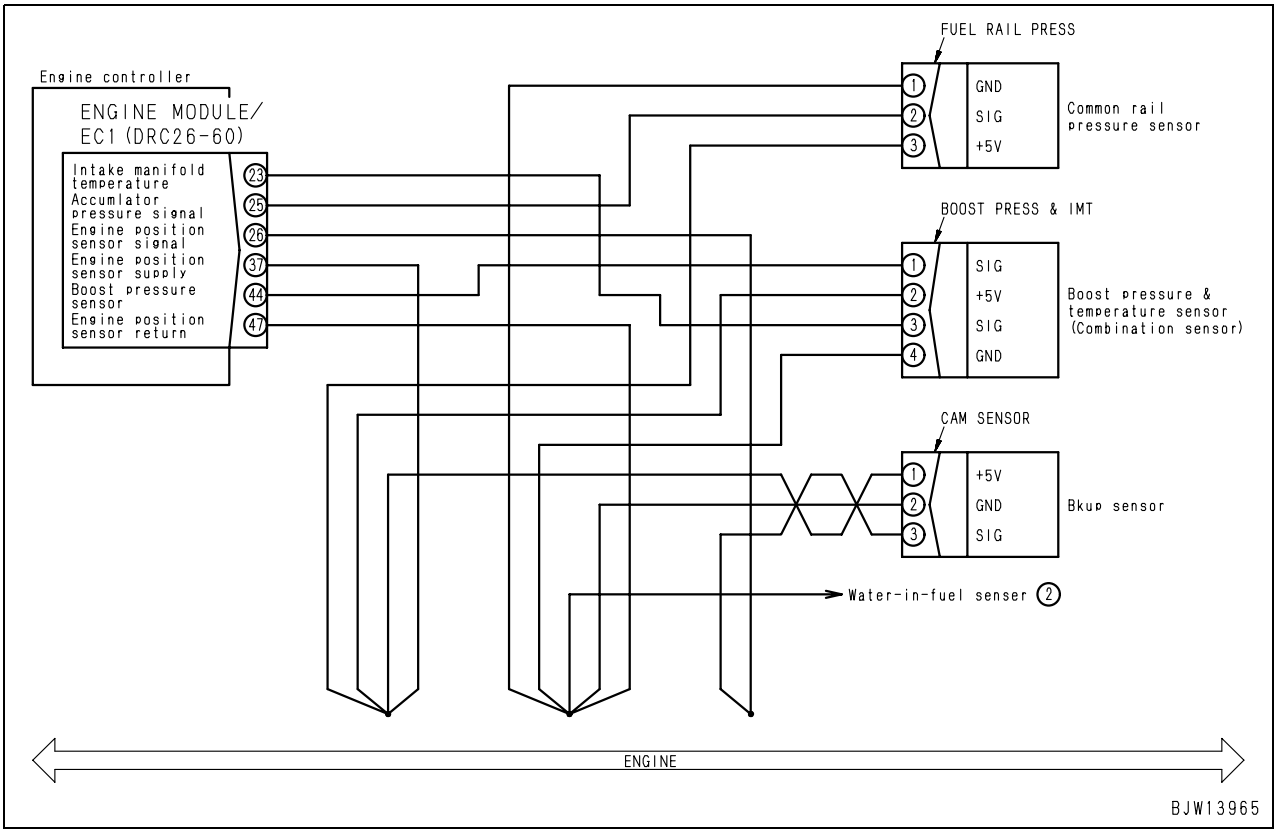
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Failure code [CA227] (Sensor power supply 2 high error)

Action code	Failure code	Trouble	Sensor power supply 2 high error (Engine controller system)
E03	**CA227**		
Contents of trouble	• High voltage is detected in sensor power supply 2 circuit.		
Action of controller	• Fixes boost pressure and continues operation. • Fixes charge temperature and continues operation. • Limits output and continues operation. • Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• Engine output drops.		
Related information	• Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting
Possible causes and standard value in normal state	1	Defective wiring harness connector	Connecting parts among each sensor, engine wiring harness, and engine controller are suspected. Inspect them directly. • Loose connector, broken lock, broken seal • Corrosive, bent, broken, forced-in, or extended pin • Humidity in connector, entry of dirt or dust, poor insulation
	2	Defective engine controller	If cause 1 is not detected, engine controller may be defective. (Since trouble is in system, troubleshooting cannot be carried out.)

Circuit diagram related to sensor power supply 2



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Failure code [CA234] (Engine overspeed)

Action code	Failure code	Trouble	Engine Overspeed (Engine controller system)
E02	**CA234**		
Contents of trouble	• Engine speed is above upper control limit.		
Action of controller	• Stops injection of injector until engine speed drops to normal level. • Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• Engine speed fluctuates.		
Related information	• Engine speed can be checked by monitoring function (Code: 01001, ENG SPEED, Code: 01002, ENG SPEED). • Method of reproducing failure code: Start engine and run at high idle.		

	Causes		Standard value in normal state/Remarks on troubleshooting
Possible causes and standard value in normal state	1	Use of improper fuel	Check fuel used directly.
	2	Improper way of use	Way of use may be improper. Teach proper way of use to operator.
	3	Defective engine speed sensor	Engine speed sensor can be defective. Carry out troubleshooting of failure codes [CA689] and [CA778]
	4	Defective engine controller	If causes 1 and 2 are not detected, engine controller may be defective. (Since trouble is in system, troubleshooting cannot be carried out.)

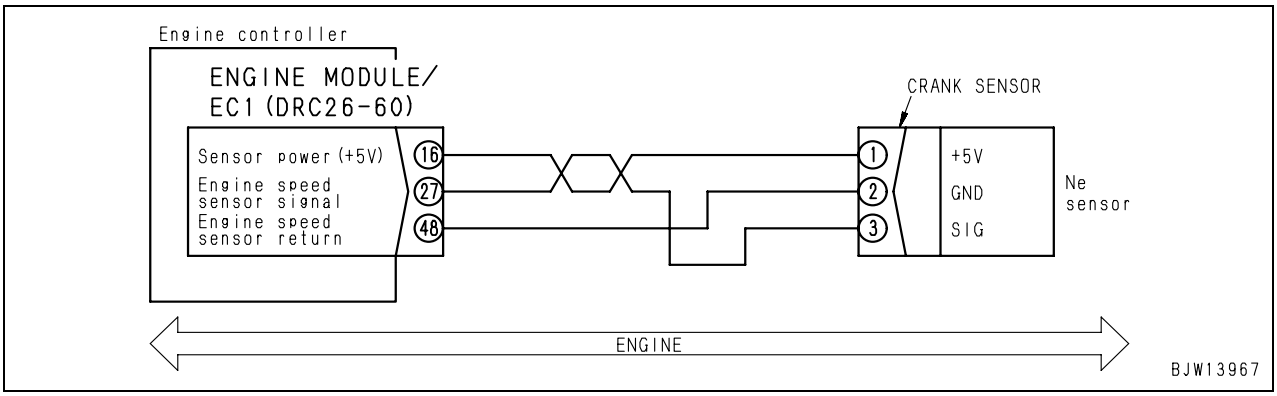
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Failure code [CA238] (Ne speed sensor power supply error)

Action code	Failure code	Trouble	Ne speed sensor supply power error (Engine controller system)
E03	**CA238**		
Contents of trouble	• Low voltage is detected in engine Ne speed sensor power supply circuit.		
Action of controller	• Controls Ne speed sensor with signals of Bkup speed sensor. • Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• Starting performance is poor. • There is hunting from engine.		
Related information	• Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state			★ Disconnect connector with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
	1	Defective sensor or wiring harness	Disconnect devices at right in order. If failure code disappears after reproduction operation is conducted, that device or wiring harness has a defect in it.	Ne speed sensor	CRANK SENSOR
				Engine wiring harness	ENGINE MODULE
	2	Defective wiring harness connector	Connecting parts among each sensor, engine wiring harness, and engine controller are suspected. Inspect them directly. • Loose connector, broken lock, broken seal • Corrosive, bent, broken, forced-in, or extended pin • Humidity in connector, entry of dirt or dust, poor insulation		

Circuit diagram related to engine Ne speed sensor



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WA430-6 Wheel loader

Form No. SEN01739-04

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WHEEL LOADER

WA430-6

Machine model	Serial number
WA430-6	65001 and up

40 Troubleshooting

Troubleshooting by failure code (Display of code), Part 3

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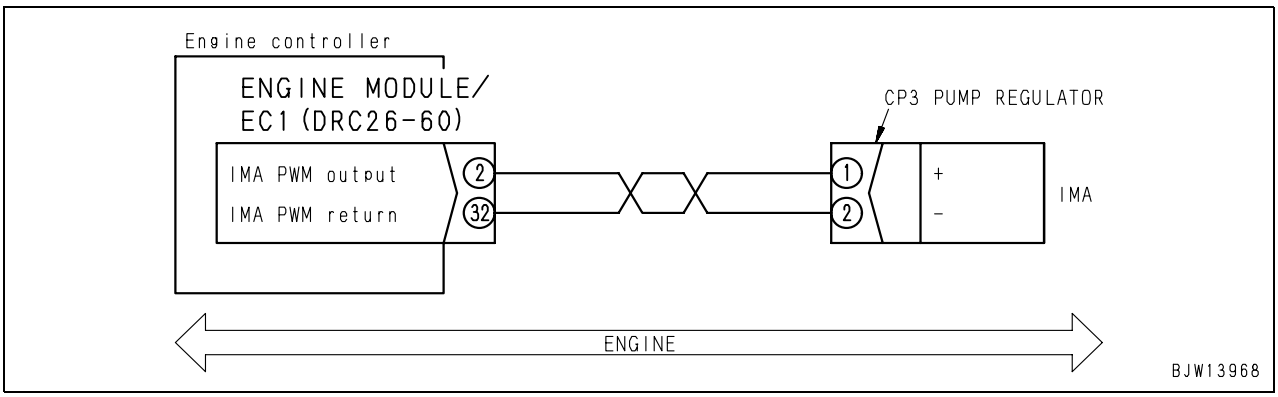
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Failure code [CA271] (IMV/PCV1 Short circuit)

Action code	Failure code	Trouble	IMV/PCV1 Short circuit (Engine controller system)
E03	**CA271**		
Contents of trouble	• There is short circuit in supply pump actuator drive circuit.		
Action of controller	• None in particular.		
Problem that appears on machine	• Engine speed does not rise from low idle. • Engine output drops. • Common rail fuel pressure is above command value.		
Related information	• Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective supply pump actuator	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			CP3 PUMP REGULATOR (male)	Resistance	
			Between (1) and chassis ground	Min. 100 kΩ	
	2	Ground fault in wiring harness (Short circuit with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between EC1 (female) (2) – CP3 PUMP REGULATOR (female) (1) and chassis ground	Resistance	Min. 100 kΩ
	3	Short circuit in wiring harness (with another wiring harness)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness among all pins between EC1 (female) (2) – EC1 (female) (With all connectors of wiring harness disconnected)	Resistance	Min. 100 kΩ
	4	Defective wiring harness connector	Connecting parts among supply pump actuator, engine wiring harness, and engine controller are suspected. Inspect them directly. • Loose connector, broken lock, broken seal • Corrosive, bent, broken, forced-in, or extended pin • Humidity in connector, entry of dirt or dust, poor insulation		
	5	Defective engine controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			EC1 (female)	Resistance	
			Between (2) and chassis ground	Min. 100 kΩ	

Circuit diagram related to supply pump actuator (metering unit)



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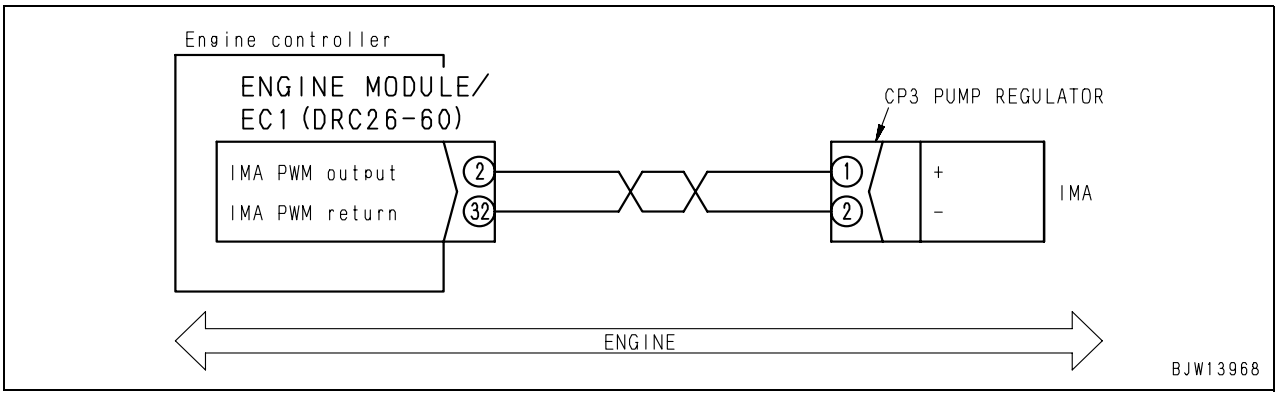
Failure code [CA272] (IMV/PCV1 Disconnection)

Action code	Failure code	Trouble	IMV/PCV1 Disconnection (Engine controller system)
E03	**CA272**		
Contents of trouble	• There is disconnection in supply pump actuator drive circuit.		
Action of controller	• Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• Engine speed runs, but in unstable condition. • Common rail fuel pressure is above command value.		
Related information	• Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective supply pump actuator	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			CP3 PUMP REGULATOR (male)	Resistance	
			Between (1) and (2)	Max. 5 Ω	
	2	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between EC1 (female) (2) – CP3 PUMP REGULATOR (female) (1)	Resistance	Max. 10 Ω
			Wiring harness between EC1 (female) (32) – CP3 PUMP REGULATOR (female) (2)	Resistance	Max. 10 Ω
	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 EC1 (female) (2) – CP3 PUMP REGULATOR (female) (1) and chassis ground	Voltage	Max. 3 V
	4	Short circuit in wiring harness (with another wiring harness)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness among all pins between EC1 (female) (2) – EC1 (female) (With all connectors of wiring harness disconnected)	Resistance	Min. 100 kΩ
	5	Defective wiring harness connector	Connecting parts among supply pump actuator, engine wiring harness, and engine controller are suspected. Inspect them directly. • Loose connector, broken lock, broken seal • Corrosive, bent, broken, forced-in, or extended pin • Humidity in connector, entry of dirt or dust, poor insulation		
	6	Defective engine controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			EC1 (female)	Resistance	
			Between (2) and (32)	Max. 5 Ω	

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Circuit diagram related to supply pump actuator (metering unit)



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Failure code [CA281] High pressure pump error

Action code	Failure code	Trouble	High pressure pump error (Engine controller system)
E03	**CA281**		
Contents of trouble	• Response of fuel force feed is poor due to high pressure pump mechanical system error.		
Action of controller	• None in particular.		
Problem that appears on machine	• Engine does not start. Engine runs, but in unstable condition. • Pressure of high-pressure fuel at front side is different from that at rear side.		
Related information	• Method of reproducing failure code: Start engine.		

	Causes		Standard value in normal state/Remarks on troubleshooting
Possible causes and standard value in normal state	1	Air in fuel circuit	Bleed air from the fuel circuit. See Testing and adjusting, "Bleeding air from fuel circuit."
	2	Defective wiring harness connector	Connecting parts among common rail pressure sensor, engine wiring harness, and engine controller are suspected. Inspect them directly. • Loose connector, broken lock, broken seal • Corrosive, bent, broken, forced-in, or extended pin • Humidity in connector, entry of dirt or dust, poor insulation
	3	Defective engine controller	If causes 1 and 2 are not detected, engine controller may be defective. (Since trouble is in system, troubleshooting cannot be carried out.)

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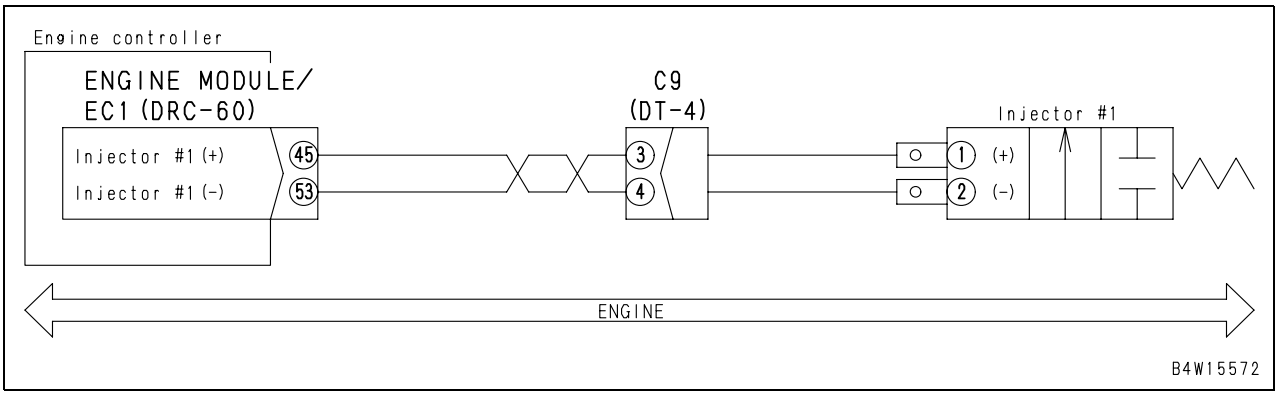
Failure code [CA322] (Injector #1 open/short error)

Action code	Failure code	Trouble	Injector #1 open/short error (Engine controller system)
E03	**CA322**		
Contents of trouble	• There is disconnection or short circuit in drive circuit of injector No. 1.		
Action of controller	• Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• There is irregular combustion or hunting. • Engine output drops.		
Related information	• Method of reproducing failure code: Start engine.		

Possible causes and standard value in normal state	Causes		Standard value in normal state/Remarks on troubleshooting		
	1	Defective injector No. 1	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			C9 (male)	Resistance	
			Between (3) and (4)	Max. 2 Ω	
			Between (3) and chassis ground	Min. 100 kΩ	
	2	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between EC1 (female) (45) – C9 (female) (3)	Resistance	Max. 2 Ω
			Wiring harness between EC1 (female) (53) – C9 (female) (4)	Resistance	Max. 2 Ω
	3	Ground fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between EC1 (female) (45) – C9 (female) (3) and chassis ground	Resistance	Max. 2 Ω
	4	Short circuit in wiring harness (with another wiring harness)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness among all pins between EC1 (female) (45) – EC1 (female) (With all connectors of wiring harness disconnected)	Resistance	Min. 100 kΩ
			Wiring harness among all pins between EC1 (female) (53) – EC1 (female) (With all connectors of wiring harness disconnected)	Resistance	Min. 100 kΩ
	5	Defective wiring harness connector	Connecting parts among injector No. 1, engine wiring harness, and engine controller are suspected. Inspect them directly. • Loose connector, broken lock, broken seal • Corrosive, bent, broken, forced-in, or extended pin • Humidity in connector, entry of dirt or dust, poor insulation		
	6	Defective other cylinder injector or harness	If other failure codes are indicated simultaneously, carry out troubleshooting for them, too.		
	7	Defective engine controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			EC1 (female)	Resistance	
			Between (45) and (53)	Max. 2 Ω	
			Between (45) and chassis ground	Min. 100 kΩ	

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Circuit diagram related to injector No. 1



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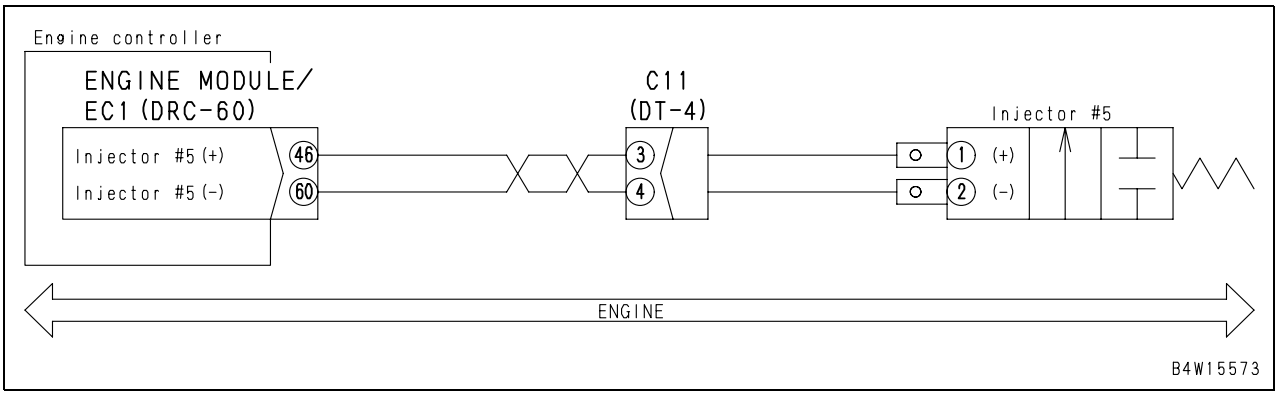
Failure code [CA323] (Injector #5 open/short error)

Action code	Failure code	Trouble	Injector #5 open/short error (Engine controller system)
E03	**CA323**		
Contents of trouble	• There is disconnection or short circuit in drive circuit of injector No. 5.		
Action of controller	• Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• There is irregular combustion or hunting. • Engine output drops.		
Related information	• Method of reproducing failure code: Start engine.		

Possible causes and standard value in normal state	Causes		Standard value in normal state/Remarks on troubleshooting		
	1	Defective injector No. 5	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			C11 (male)	Resistance	
			Between (3) and (4)	Max. 2 Ω	
			Between (3) and chassis ground	Min. 100 kΩ	
	2	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between EC1 (female) (46) – C11 (female) (3)	Resistance	Max. 2 Ω
			Wiring harness between EC1 (female) (60) – C11 (female) (4)	Resistance	Max. 2 Ω
	3	Ground fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between EC1 (female) (46) – C11 (female) (3) and chassis ground	Resistance	Max. 2 Ω
	4	Short circuit in wiring harness (with another wiring harness)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness among all pins between EC1 (female) (46) – EC1 (female) (With all connectors of wiring harness disconnected)	Resistance	Min. 100 kΩ
			Wiring harness among all pins between EC1 (female) (60) – EC1 (female) (With all connectors of wiring harness disconnected)	Resistance	Min. 100 kΩ
	5	Defective wiring harness connector	Connecting parts among injector No. 5, engine wiring harness, and engine controller are suspected. Inspect them directly. • Loose connector, broken lock, broken seal • Corrosive, bent, broken, forced-in, or extended pin • Humidity in connector, entry of dirt or dust, poor insulation		
	6	Defective other cylinder injector or harness	If other failure codes are indicated simultaneously, carry out troubleshooting for them, too.		
	7	Defective engine controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			EC1 (female)	Resistance	
			Between (46) and (60)	Max. 2 Ω	
			Between (46) and chassis ground	Min. 100 kΩ	

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Circuit diagram related to injector No. 5



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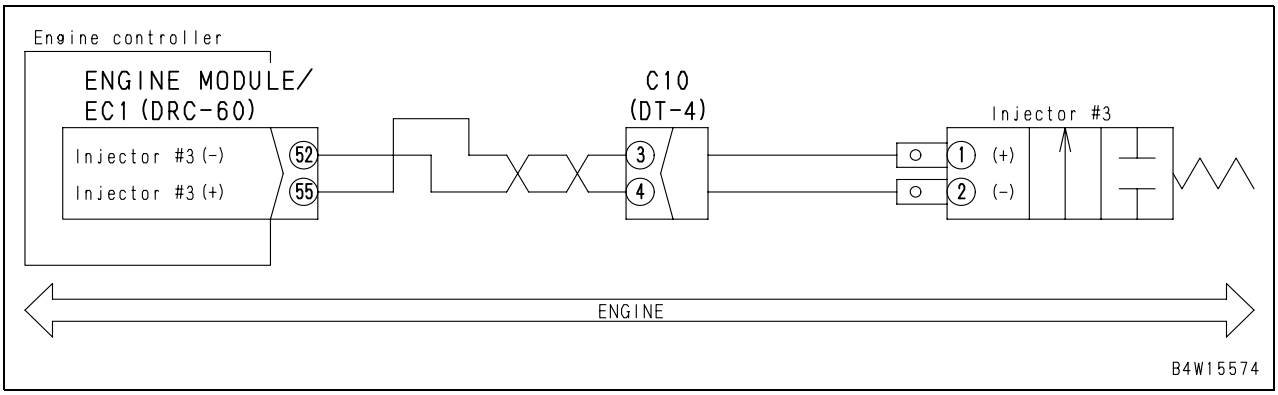
Failure code [CA324] (Injector #3 open/short error)

Action code	Failure code	Trouble	Injector #3 open/short error (Engine controller system)
E03	**CA324**		
Contents of trouble	• There is disconnection or short circuit in drive circuit of injector No. 3.		
Action of controller	• Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• There is irregular combustion or hunting. • Engine output drops.		
Related information	• Method of reproducing failure code: Start engine.		

Possible causes and standard value in normal state	Causes		Standard value in normal state/Remarks on troubleshooting		
	1	Defective injector No. 3	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			C10 (male)	Resistance	
			Between (3) and (4)	Max. 2 Ω	
			Between (3) and chassis ground	Min. 100 kΩ	
	2	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between EC1 (female) (52) – C10 (female) (4)	Resistance	Max. 2 Ω
			Wiring harness between EC1 (female) (55) – C10 (female) (3)	Resistance	Max. 2 Ω
	3	Ground fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between EC1 (female) (55) – C10 (female) (3) and chassis ground	Resistance	Max. 2 Ω
	4	Short circuit in wiring harness (with another wiring harness)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness among all pins between EC1 (female) (55) – EC1 (female) (With all connectors of wiring harness disconnected)	Resistance	Min. 100 kΩ
			Wiring harness among all pins between EC1 (female) (52) – EC1 (female) (With all connectors of wiring harness disconnected)	Resistance	Min. 100 kΩ
	5	Defective wiring harness connector	Connecting parts among injector No. 3, engine wiring harness, and engine controller are suspected. Inspect them directly. • Loose connector, broken lock, broken seal • Corrosive, bent, broken, forced-in, or extended pin • Humidity in connector, entry of dirt or dust, poor insulation		
	6	Defective other cylinder injector or harness	If other failure codes are indicated simultaneously, carry out troubleshooting for them, too.		
	7	Defective engine controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			EC1 (female)	Resistance	
			Between (55) and (52)	Max. 2 Ω	
			Between (55) and chassis ground	Min. 100 kΩ	

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Circuit diagram related to injector No. 3



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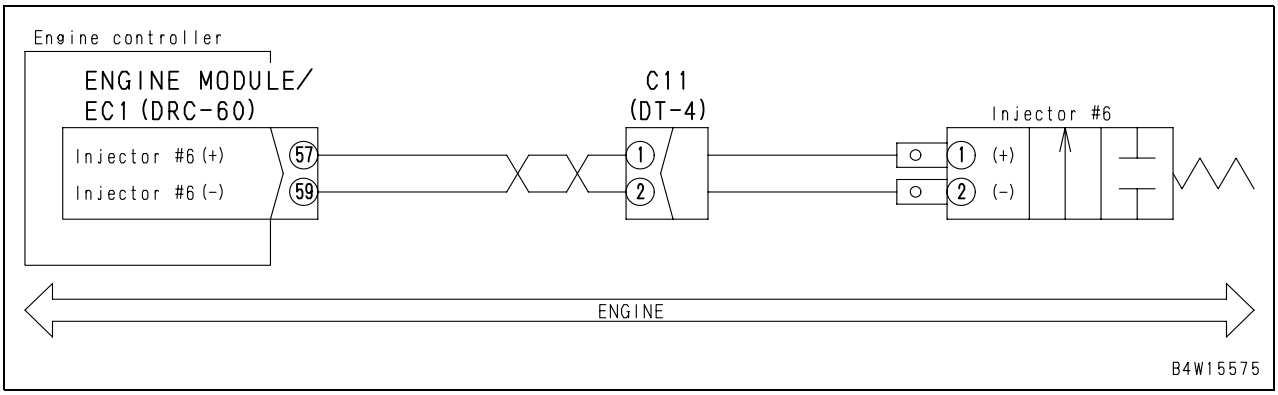
Failure code [CA325] (Injector #6 open/short error)

Action code	Failure code	Trouble	Injector #6 open/short error (Engine controller system)
E03	**CA325**		
Contents of trouble	• There is disconnection or short circuit in drive circuit of injector No. 6.		
Action of controller	• Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• There is irregular combustion or hunting. • Engine output drops.		
Related information	• Method of reproducing failure code: Start engine.		

Possible causes and standard value in normal state	Causes		Standard value in normal state/Remarks on troubleshooting		
	1	Defective injector No. 6	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			C11 (male)	Resistance	
			Between (1) and (2)	Max. 2 Ω	
			Between (1) and chassis ground	Min. 100 kΩ	
	2	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between EC1 (female) (57) – C11 (female) (1)	Resistance	Max. 2 Ω
			Wiring harness between EC1 (female) (59) – C11 (female) (2)	Resistance	Max. 2 Ω
	3	Ground fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between EC1 (female) (57) – C11 (female) (1) and chassis ground	Resistance	Max. 2 Ω
	4	Short circuit in wiring harness (with another wiring harness)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness among all pins between EC1 (female) (57) – EC1 (female) (With all connectors of wiring harness disconnected)	Resistance	Min. 100 kΩ
			Wiring harness among all pins between EC1 (female) (59) – EC1 (female) (With all connectors of wiring harness disconnected)	Resistance	Min. 100 kΩ
	5	Defective wiring harness connector	Connecting parts among injector No. 6, engine wiring harness, and engine controller are suspected. Inspect them directly. • Loose connector, broken lock, broken seal • Corrosive, bent, broken, forced-in, or extended pin • Humidity in connector, entry of dirt or dust, poor insulation		
	6	Defective other cylinder injector or harness	If other failure codes are indicated simultaneously, carry out troubleshooting for them, too.		
	7	Defective engine controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			EC1 (female)	Resistance	
			Between (57) and (59)	Max. 2 Ω	
			Between (57) and chassis ground	Min. 100 kΩ	

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Circuit diagram related to injector No. 6



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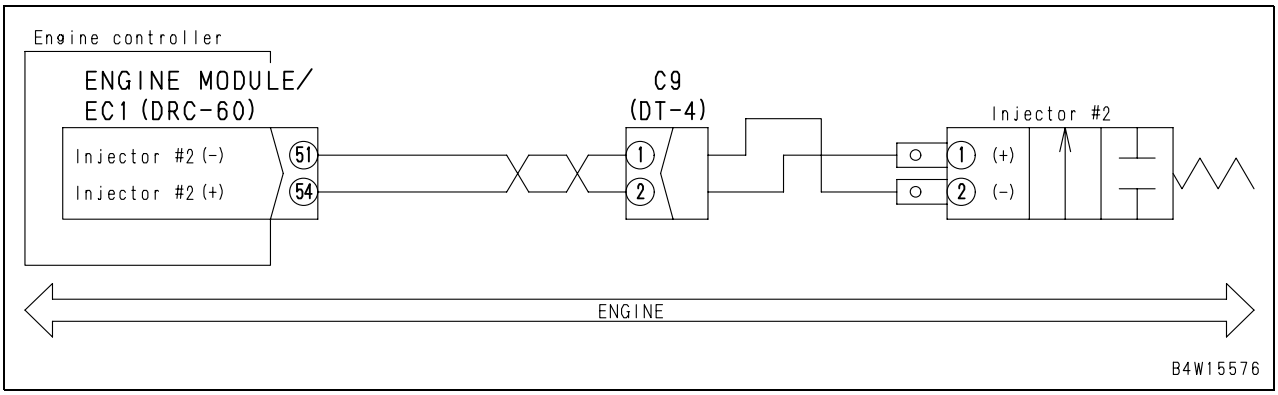
Failure code [CA331] (Injector #2 open/short error)

Action code	Failure code	Trouble	Injector #2 open/short error (Engine controller system)
E03	**CA331**		
Contents of trouble	• There is disconnection or short circuit in drive circuit of injector No. 2.		
Action of controller	• Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• There is irregular combustion or hunting. • Engine output drops.		
Related information	• Method of reproducing failure code: Start engine.		

Possible causes and standard value in normal state	Causes		Standard value in normal state/Remarks on troubleshooting		
	1	Defective injector No. 2	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			C9 (male)	Resistance	
			Between (1) and (2)	Max. 2 Ω	
			Between (2) and chassis ground	Min. 100 kΩ	
	2	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between EC1 (female) (54) – C9 (female) (2)	Resistance	Max. 2 Ω
			Wiring harness between EC1 (female) (51) – C9 (female) (1)	Resistance	Max. 2 Ω
	3	Ground fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between EC1 (female) (54) – C9 (female) (2) and chassis ground	Resistance	Max. 2 Ω
	4	Short circuit in wiring harness (with another wiring harness)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness among all pins between EC1 (female) (54) – EC1 (female) (With all connectors of wiring harness disconnected)	Resistance	Min. 100 kΩ
			Wiring harness among all pins between EC1 (female) (51) – EC1 (female) (With all connectors of wiring harness disconnected)	Resistance	Min. 100 kΩ
	5	Defective wiring harness connector	Connecting parts among injector No. 2, engine wiring harness, and engine controller are suspected. Inspect them directly. • Loose connector, broken lock, broken seal • Corrosive, bent, broken, forced-in, or extended pin • Humidity in connector, entry of dirt or dust, poor insulation		
	6	Defective other cylinder injector or harness	If other failure codes are indicated simultaneously, carry out troubleshooting for them, too.		
	7	Defective engine controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			EC1 (female)	Resistance	
			Between (54) and (51)	Max. 2 Ω	
			Between (54) and chassis ground	Min. 100 kΩ	

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Circuit diagram related to injector No. 2



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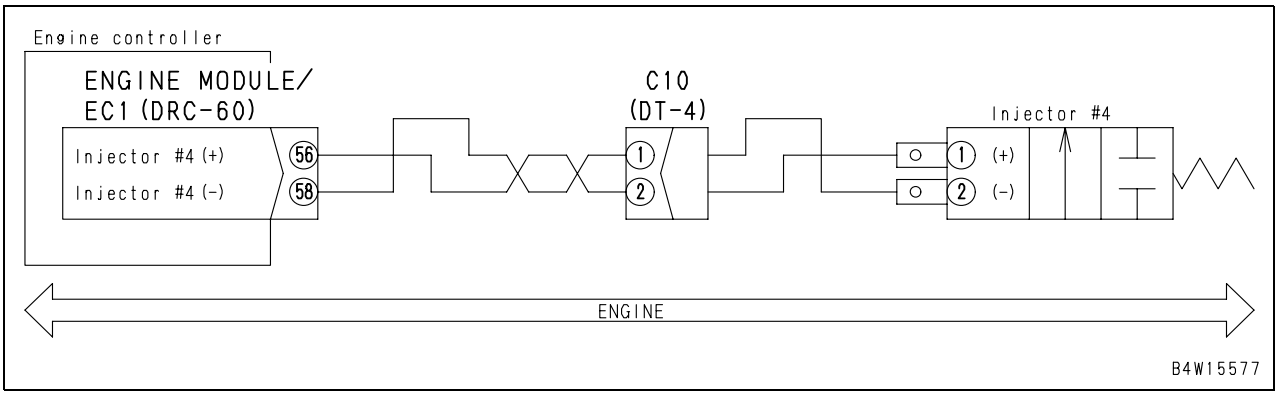
Failure code [CA332] (Injector #4 open/short error)

Action code	Failure code	Trouble	Injector #4 open/short error (Engine controller system)
E03	**CA332**		
Contents of trouble	• There is disconnection or short circuit in drive circuit of injector No. 4.		
Action of controller	• Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• There is irregular combustion or hunting. • Engine output drops.		
Related information	• Method of reproducing failure code: Start engine.		

Possible causes and standard value in normal state	Causes		Standard value in normal state/Remarks on troubleshooting		
	1	Defective injector No. 4	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			C10 (male)	Resistance	
			Between (1) and (2)	Max. 2 Ω	
			Between (2) and chassis ground	Min. 100 kΩ	
	2	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between EC1 (female) (56) – C10 (female) (2)	Resistance	Max. 2 Ω
			Wiring harness between EC1 (female) (58) – C10 (female) (1)	Resistance	Max. 2 Ω
	3	Ground fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between EC1 (female) (56) – C10 (female) (2) and chassis ground	Resistance	Max. 2 Ω
	4	Short circuit in wiring harness (with another wiring harness)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness among all pins between EC1 (female) (56) – EC1 (female) (With all connectors of wiring harness disconnected)	Resistance	Min. 100 kΩ
			Wiring harness among all pins between EC1 (female) (58) – EC1 (female) (With all connectors of wiring harness disconnected)	Resistance	Min. 100 kΩ
	5	Defective wiring harness connector	Connecting parts among injector No. 4, engine wiring harness, and engine controller are suspected. Inspect them directly. • Loose connector, broken lock, broken seal • Corrosive, bent, broken, forced-in, or extended pin • Humidity in connector, entry of dirt or dust, poor insulation		
	6	Defective other cylinder injector or harness	If other failure codes are indicated simultaneously, carry out troubleshooting for them, too.		
	7	Defective engine controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			EC1 (female)	Resistance	
			Between (56) and (58)	Max. 2 Ω	
			Between (56) and chassis ground	Min. 100 kΩ	

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Circuit diagram related to injector No. 4



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Failure code [CA342] (Calibration code inconsistency)

Action code	Failure code	Trouble	Calibration code inconsistency (Engine controller system)
E03	**CA342**		
Contents of trouble	• Matching error occurred in engine controller data.		
Action of controller	• Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• Continues the normal operation. • Engine stops or does not start.		
Related information	• Method of reproducing failure code: Turn the starting switch ON.		

Possible causes and standard value in normal state	Causes	Standard value in normal state/Remarks on troubleshooting
	Carry out troubleshooting of failure code [**CA757**].	

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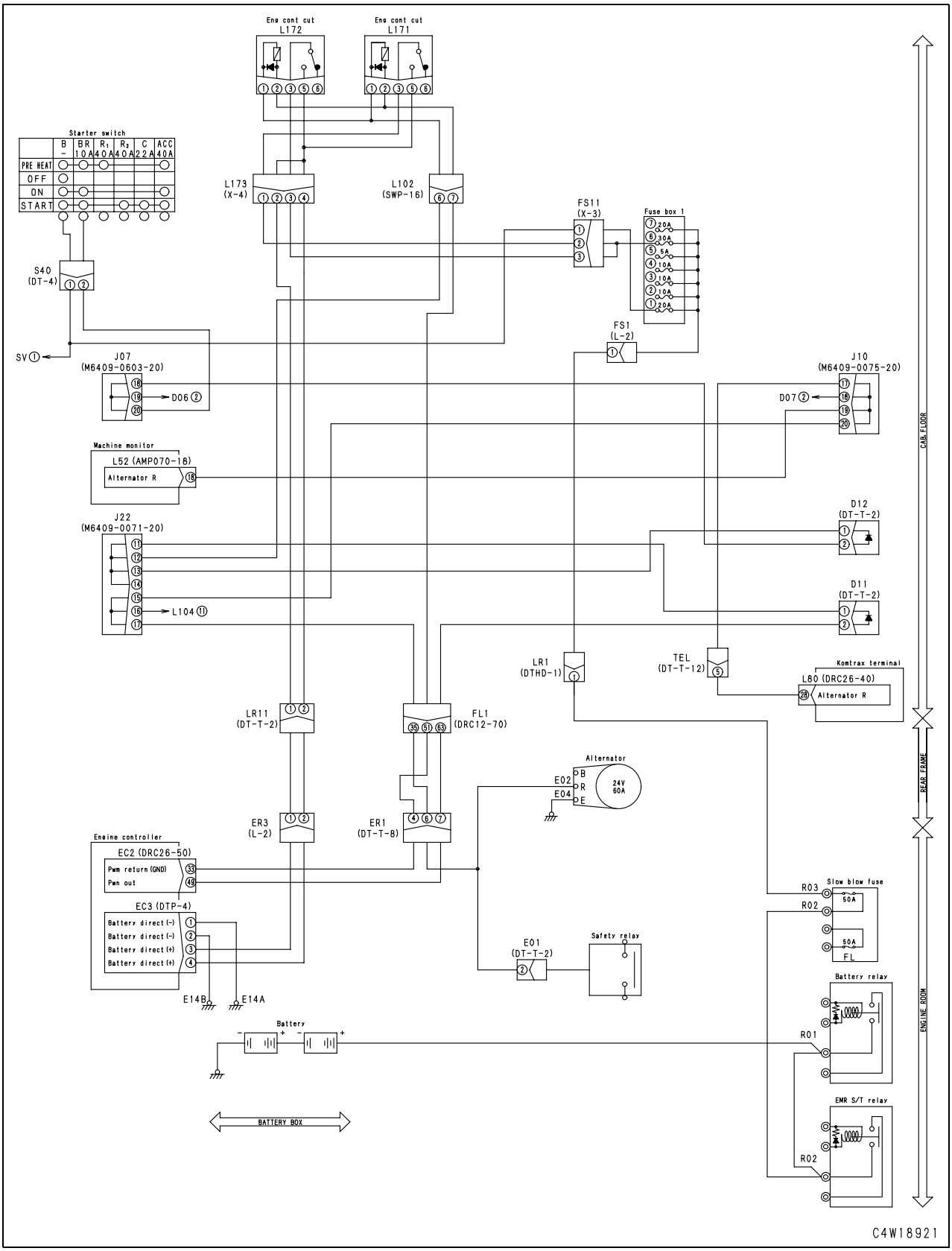
Failure code [CA351] (Injectors drive circuit error)

Action code	Failure code	Trouble	Injectors drive circuit error (Engine controller system)
E03	**CA351**		
Contents of trouble	• Abnormality occurred in injector drive power supply circuit.		
Action of controller	• Limits output and continues operation (limits common rail pressure). • Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• Exhaust smoke is black. • There is irregular combustion. • Engine output drops. • The engine does not start.		
Related information	• Method of reproducing failure code: Start engine.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defect in related system	If another code is displayed, carry out troubleshooting for it.		
	2	Defective fuse No. 6 of fuse box 1	If the fuse is broken, the circuit probably has a grounding fault, etc.		
	3	Defective engine control cut-out relay (L171) (Internal disconnection or short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			L171 (Male)	Resistance	
			Between (1) and (2)	200 – 400 Ω	
			★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			When engine control cut-out relay (L171) is replaced with a relay of the same type, if the condition becomes normal, the engine control cut-out relay 1 is defective.		
	4	Defective engine control cut-out relay (L172) (Internal disconnection or short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			L172 (male)	Resistance	
			Between (1) and (2)	200 – 400 Ω	
			★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			When engine control cut-out relay (L172) is replaced with a relay of the same type, if the condition becomes normal, the engine control cut-out relay 2 is defective.		
	5	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between fuse No. 6 of fuse box 1 – L171, L172 (female) (3)	Resistance	Max. 0.5 Ω
			Wiring harness between L171 (female) (5), L172 (female) (5) – EC3 (female) (3), (4)	Resistance	Max. 0.5 Ω
			Wiring harness between EC3 (female) (1), (2) – chassis ground	Resistance	Max. 10 Ω
	6	Defective engine controller	If causes 1 – 5 are not detected, engine controller may be defective. (Since trouble is in the system, troubleshooting cannot be carried out.)		

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Circuit diagram related to engine controller power supply



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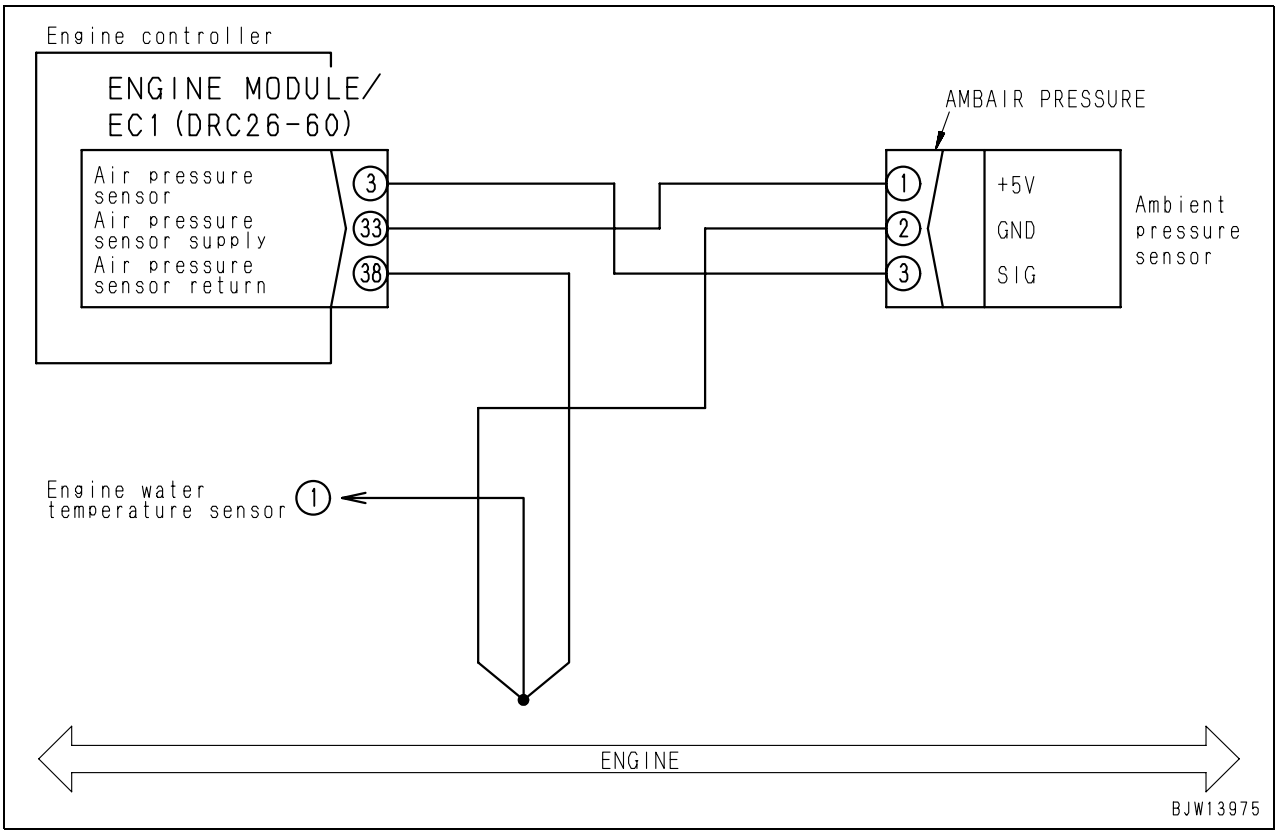
Failure code [CA352] (Sensor power supply 1 low error)

Action code	Failure code	Trouble	Sensor power supply 1 low error (Engine controller system)
E03	**CA352**		
Contents of trouble	• Low voltage is detected in sensor power supply 1 (5V) circuit.		
Action of controller	• Fixes atmospheric pressure and continues operation. • Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• Starting performance is poor. • Engine output drops.		
Related information	• Method of reproducing failure code: Turn the starting switch ON.		

<table>
<tr><td rowspan="5">Possible causes and standard value in normal state</td><td colspan="2">Causes</td><td colspan="3">Standard value in normal state/Remarks on troubleshooting</td></tr>
<tr><td rowspan="3">1</td><td rowspan="3">Defective sensor or wiring harness</td><td colspan="3">★ Disconnect connector with starting switch OFF, then turn starting switch ON and carry out troubleshooting.</td></tr>
<tr><td rowspan="2">Disconnect devices at right in order. If failure code disappears after reproduction operation is conducted, that device or wiring harness has a defect in it.</td><td>Atmospheric pressure sensor</td><td>AMBAIR PRESSURE</td></tr>
<tr><td>Engine wiring harness</td><td>EC1</td></tr>
<tr><td>2</td><td>Defective wiring harness connector</td><td colspan="3">Connecting parts among atmospheric pressure sensor, engine wiring harness, and engine controller are suspected. Inspect them directly.
• Loose connector, broken lock, broken seal
• Corrosive, bent, broken, forced-in, or extended pin
• Humidity in connector, entry of dirt or dust, poor insulation</td></tr>
<tr><td>3</td><td>Defective engine controller</td><td colspan="3">If causes 1 – 2 are not detected, engine controller may be defective. (Since trouble is in system, troubleshooting cannot be carried out.)</td></tr>
</table>

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Circuit diagram related to sensor power supply 1



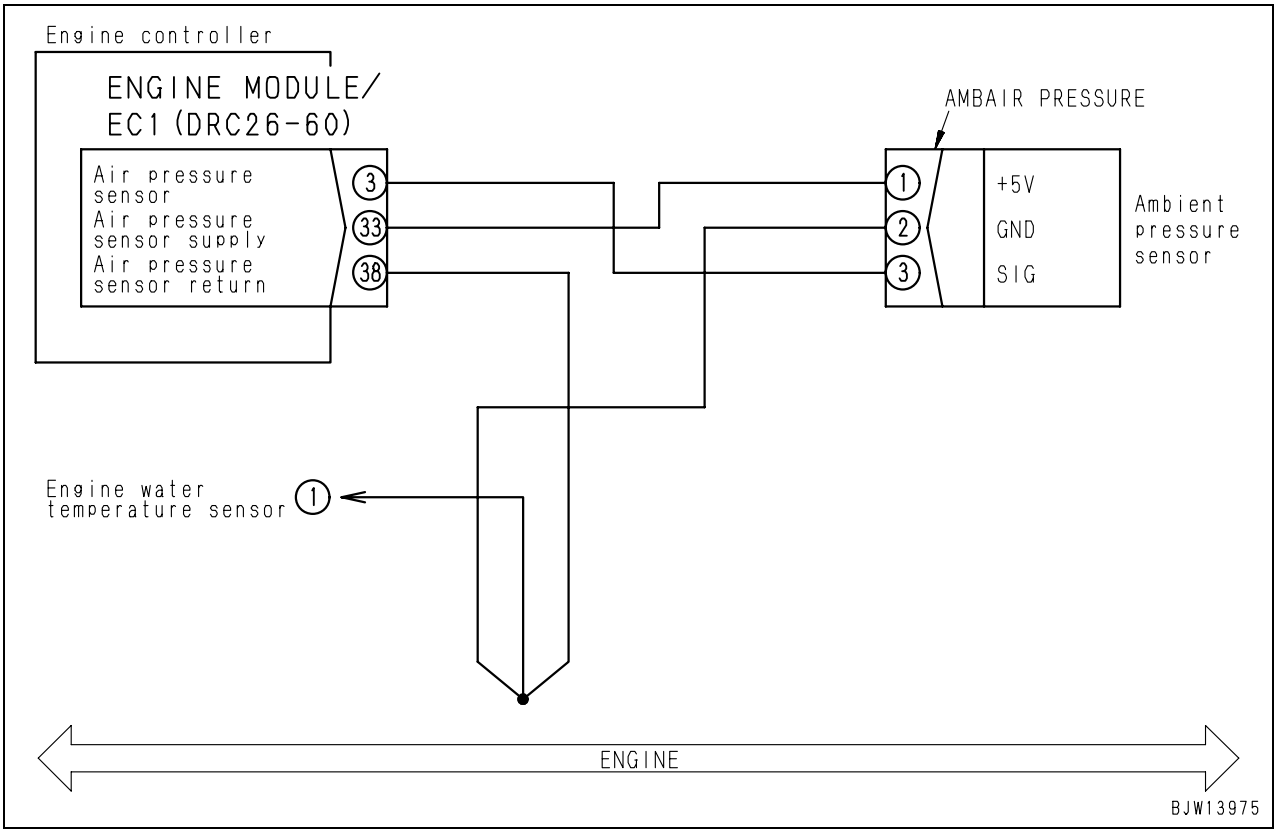
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Failure code [CA386] (Sensor power supply 1 high error)

Action code	Failure code	Trouble	Sensor power supply 1 high error (Engine controller system)
E03	**CA386**		
Contents of trouble	• High voltage is detected in sensor power supply 1 (5V) circuit.		
Action of controller	• Fixes atmospheric pressure and continues operation. • Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• Starting performance is poor. • Engine output drops.		
Related information	• Method of reproducing failure code: Turn the starting switch ON.		

Possible causes and standard value in normal state	Causes		Standard value in normal state/Remarks on troubleshooting
	1	Defective wiring harness connector	Connecting parts among atmospheric pressure sensor, engine wiring harness, and engine controller are suspected. Inspect them directly. • Loose connector, broken lock, broken seal • Corrosive, bent, broken, forced-in, or extended pin • Humidity in connector, entry of dirt or dust, poor insulation
	2	Defective engine controller	If cause 1 is not detected, engine controller may be defective. (Since trouble is in system, troubleshooting cannot be carried out.)

Circuit diagram related to sensor power supply 1



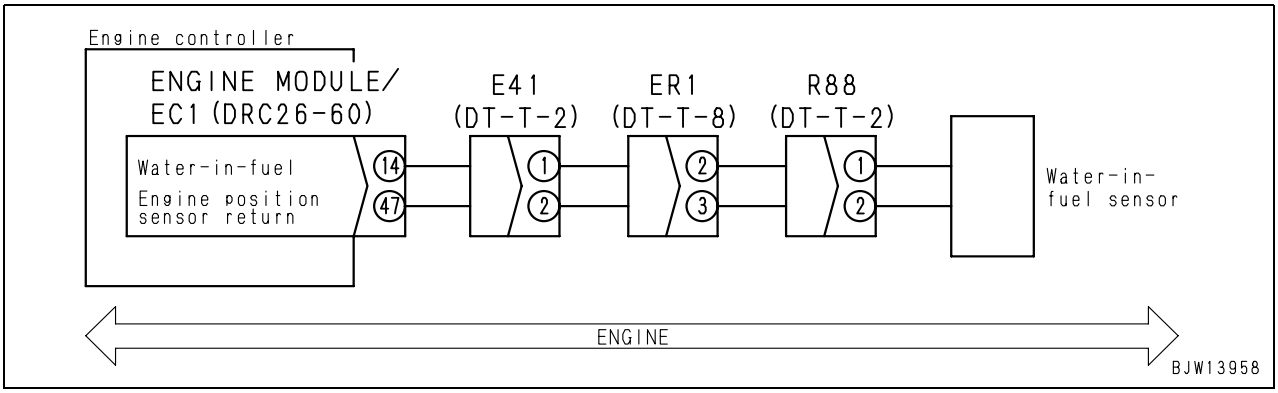
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Failure code [CA428] (Abnormally high level in water sensor)

Action code	Failure code	Trouble	Abnormally high level in water sensor (Engine controller system)
E01	**CA428**		
Contents of trouble	• High voltage occurred in fuel water sensor		
Action of controller	• None in particular.		
Problem that appears on machine	• Water separator monitor does not indicate normally.		
Related information	• Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective fuel water sensor	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			R88 (female)	Resistance	
			Between (1) and (2)	Max. 100 kΩ	
	2	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between EC1 (female) (14) – R88 (male) (1)	Resistance	Max. 10 Ω
			Wiring harness between EC1 (female) (47) – R88 (male) (2)	Resistance	Max. 10 Ω
	3	Short circuit in wiring harness (with another wiring harness)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness among all pins between EC1 (female) (14) – EC1 (female) (With all connectors of wiring harness disconnected)	Resistance	Min. 100 kΩ
	4	Defective wiring harness connector	Connecting parts among fuel water sensor, engine wiring harness, and engine controller are suspected. Inspect them directly. • Loose connector, broken lock, broken seal • Corrosive, bent, broken, forced-in, or extended pin • Humidity in connector, entry of dirt or dust, poor insulation		
	5	Defective engine controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			EC1 (female)	Resistance	
			Between (14) and (47)	Max. 100 kΩ	

Circuit diagram related to fuel water sensor



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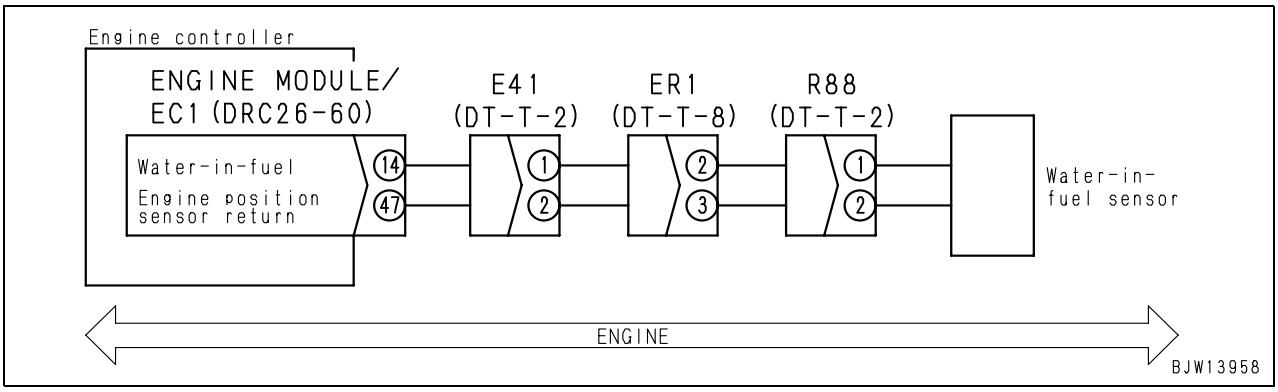
Failure code [CA429] (Abnormally low level in water sensor)

Action code	Failure code	Trouble	Abnormally low level in water sensor (Engine controller system)
E01	**CA429**		
Contents of trouble	• Low voltage occurred in fuel water sensor		
Action of controller	• None in particular.		
Problem that appears on machine	• Water separator monitor does not indicate normally.		
Related information	• Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective fuel water sensor	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			R88 (female)	Resistance		
			Between (1) and (2)	Max. 100 kΩ		
			Between (1) and chassis ground	Min. 100 kΩ		
	2	Ground fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between EC1 (female) (14) – R88 (male) (1) and chassis ground	Resistance	Min. 100 kΩ	
	3	Short circuit in wiring harness (with another wiring harness)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness among all pins between EC1 (female) (14) – EC1 (female) (With all connectors of wiring harness disconnected)	Resistance	Min. 100 kΩ	
	4	Defective wiring harness connector	Connecting parts among fuel water sensor, engine wiring harness, and engine controller are suspected. Inspect them directly. • Loose connector, broken lock, broken seal • Corrosive, bent, broken, forced-in, or extended pin • Humidity in connector, entry of dirt or dust, poor insulation			
	5	Defective engine controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			EC1 (female)	Resistance		
			Between (14) and (47)	Max. 100 kΩ		
			Between (14) and chassis ground	Min. 100 kΩ		

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Circuit diagram related to fuel water sensor



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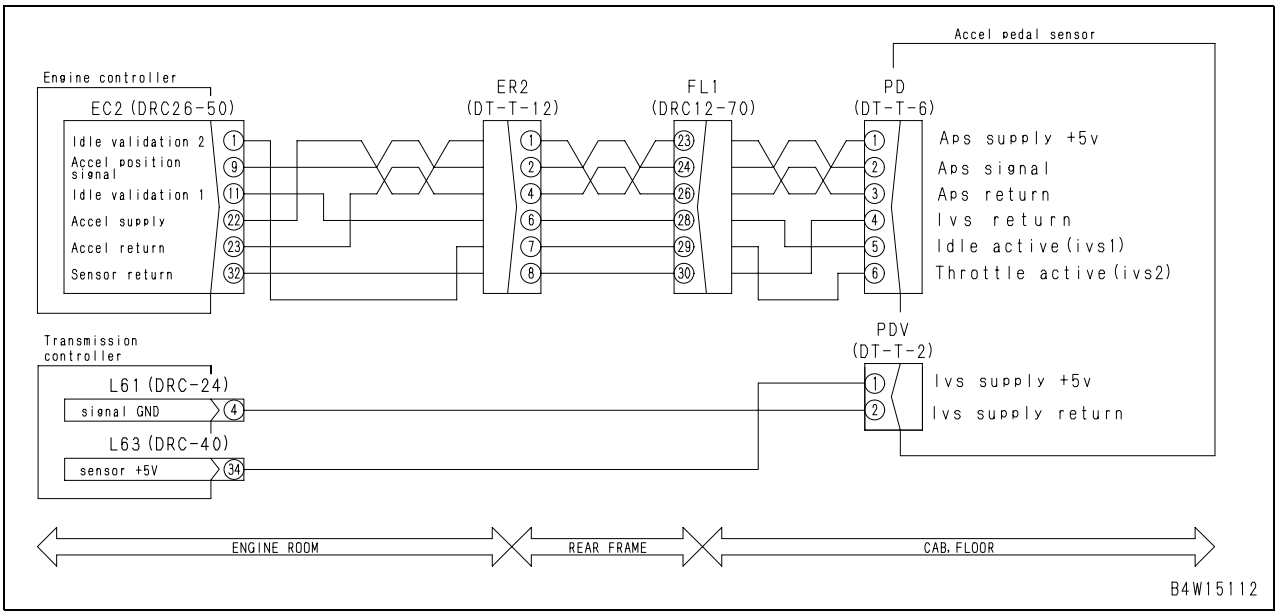
Failure code [CA431] (Idle validation switch error)

Action code	Failure code	Trouble	Idle validation switch error (Engine controller system)
E01	CA431		
Contents of trouble	• Abnormality occurred in idle validation switch circuit		
Action of controller	• Operates at position of throttle of throttle sensor.		
Problem that appears on machine	—		
Related information	• The input state (ON/OFF) from the idle validation switch 1 can be checked with the monitoring function (Code: 18300, IVS 1). • The input state (ON/OFF) from the idle validation switch 2 can be checked with the monitoring function (Code: 18301, IVS 2). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective accelerator pedal (Internal trouble)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			PD	Signal name	Voltage	
			Between (5) and (4)	Signal 1	See Fig. 1 on the next page	
			Between (6) and (4)	Signal 2		
			Sensor voltage is measured with wiring harness connected. Accordingly, if voltage is abnormal, check wiring harness and controller for another cause of trouble before judgment			
	2	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between EC2 (female) (11) – PD (female) (5)		Resistance	Max. 10 Ω
			Wiring harness between EC2 (female) (1) – PD (female) (6)		Resistance	Max. 10 Ω
			Wiring harness between EC2 (female) (32) – PD (female) (4)		Resistance	Max. 10 Ω
	3	Short circuit in wiring harness (with another wiring harness)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness among all pins between EC2 (female) (11) – EC2 (female) (PD, too, is disconnected.)		Resistance	Min. 100 kΩ
			Wiring harness among all pins between EC2 (female) (1) – EC2 (female) (PD, too, is disconnected.)		Resistance	Min. 100 kΩ
	4	Defective wiring harness connector	Connecting parts among accelerator pedal, engine unit wiring harness, and engine controller are suspected. Inspect them directly. • Loose connector, broken lock, broken seal • Corrosive, bent, broken, forced-in, or extended pin • Humidity in connector, entry of dirt or dust, poor insulation			
	5	Defective engine controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			EC2 (female)	Signal name	Voltage	
			Between (11) and (32)	Signal 1	See Fig. 1	
			Between (1) and (32)	Signal 2		

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Circuit diagram related to accelerator pedal



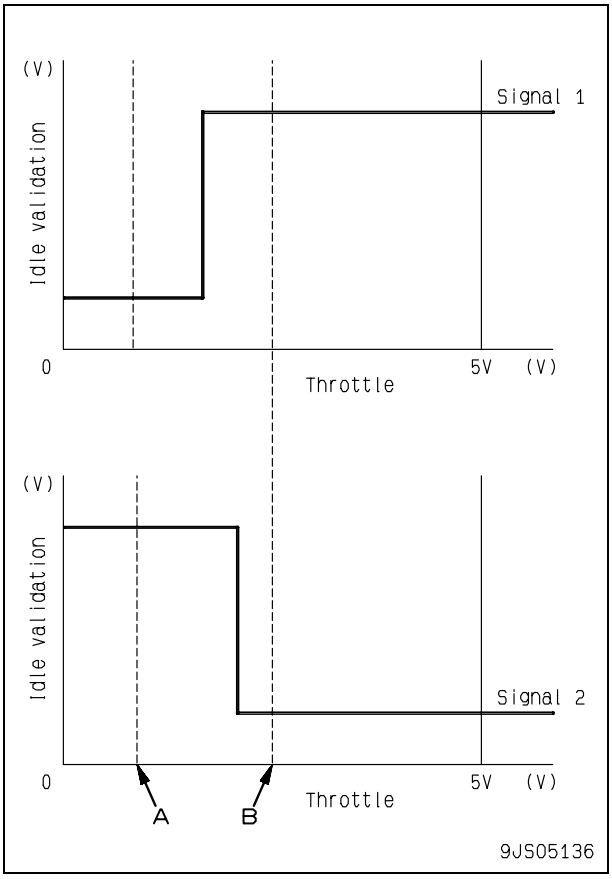


Fig. 1
Throttle: Throttle sensor signal voltage
Idle validation: Idle validation switch signal voltage
A: Voltage when pedal opened + 0.03 x (Voltage when pedal pressed – Voltage when pedal opened)
B: Voltage when pedal opened + 0.1 x (Voltage when pedal pressed – Voltage when pedal opened)

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Failure code [CA432] (Idle validation action error)

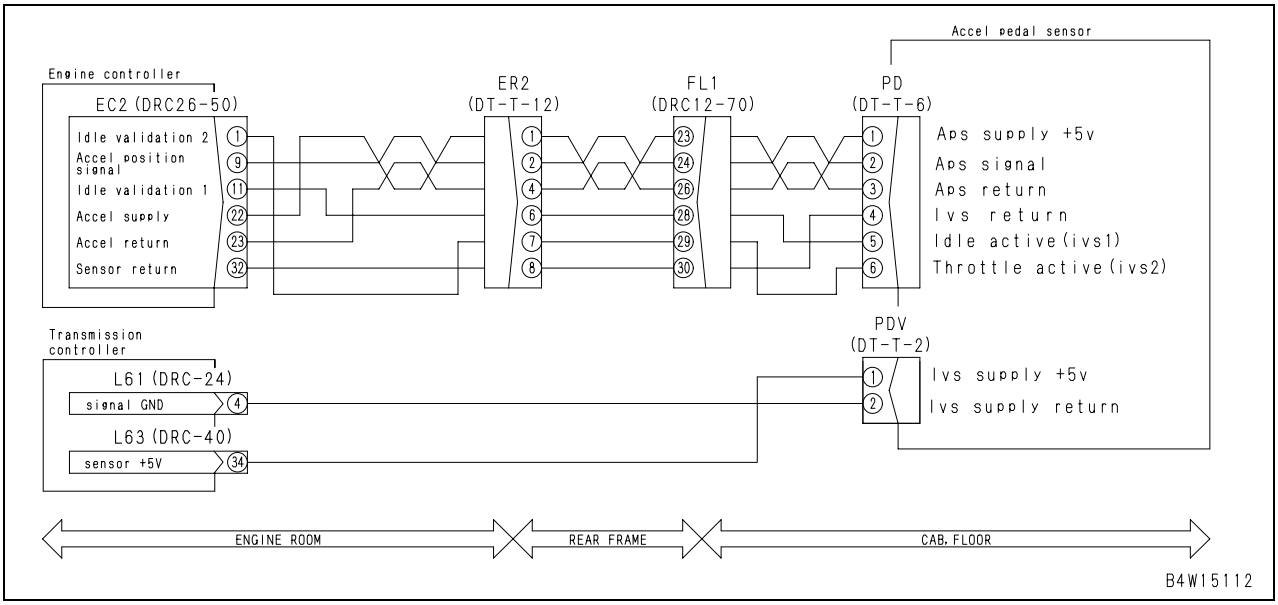
Action code	Failure code	Trouble	Idle validation action error (Engine controller system)
E03	CA432		
Contents of trouble	• Signals from the idle validation switch and throttle sensor do not agree (they are contradictory)		
Action of controller	1. When the idle validation switch recognized the accelerator pedal is OFF and the throttle sensor, on the contrary, recognized the accelerator pedal is ON: Control the opening ratio of the throttle to 0% after the accelerator pedal is OFF and then control the opening ratio of the throttle to 50% while after the accelerator pedal is ON. 2. When the idle validation switch recognized the accelerator pedal is ON and the throttle sensor, on the contrary, recognized the accelerator pedal is OFF: Control the opening ratio of the throttle to 0% (fix to the low idle). • Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• Engine speed does not rise from low idle.		
Related information	• The input state (ON/OFF) from the idle validation switch 1 can be checked with the monitoring function (Code: 18300, IVS 1). • The input state (ON/OFF) from the idle validation switch 2 can be checked with the monitoring function (Code: 18301, IVS 2). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective accelerator pedal	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			PD	Signal name	Voltage	
			Between (5) and (4)	Signal 1	See Fig. 1 on the next page	
			Between (6) and (4)	Signal 2		
			Sensor voltage is measured with wiring harness connected. Accordingly, if voltage is abnormal, check wiring harness and controller for another cause of trouble before judgment			
	2	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between EC2 (female) (22) – PD (female) (1)		Resistance	Max. 10 Ω
			Wiring harness between EC2 (female) (9) – PD (female) (2)		Resistance	Max. 10 Ω
	3	Short circuit in wiring harness (with another wiring harness)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness among all pins between EC2 (female) (22) – EC2 (female) (PD, too, is disconnected.)		Resistance	Min. 100 kΩ
			Wiring harness among all pins between EC2 (female) (9) – EC2 (female) (PD, too, is disconnected.)		Resistance	Min. 100 kΩ
	4	Defective wiring harness connector	Connecting parts among accelerator pedal, engine unit wiring harness, and engine controller are suspected. Inspect them directly. • Loose connector, broken lock, broken seal • Corrosive, bent, broken, forced-in, or extended pin • Humidity in connector, entry of dirt or dust, poor insulation			

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Possible causes and standard value in normal state	Causes		Standard value in normal state/Remarks on troubleshooting		
	5	Defective engine controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			EC2 (female)	Accelerator pedal	Voltage
			Between (11) and (32)	Signal 1	See Fig. 1
			Between (1) and (32)	Signal 2	

Circuit diagram related to accelerator pedal



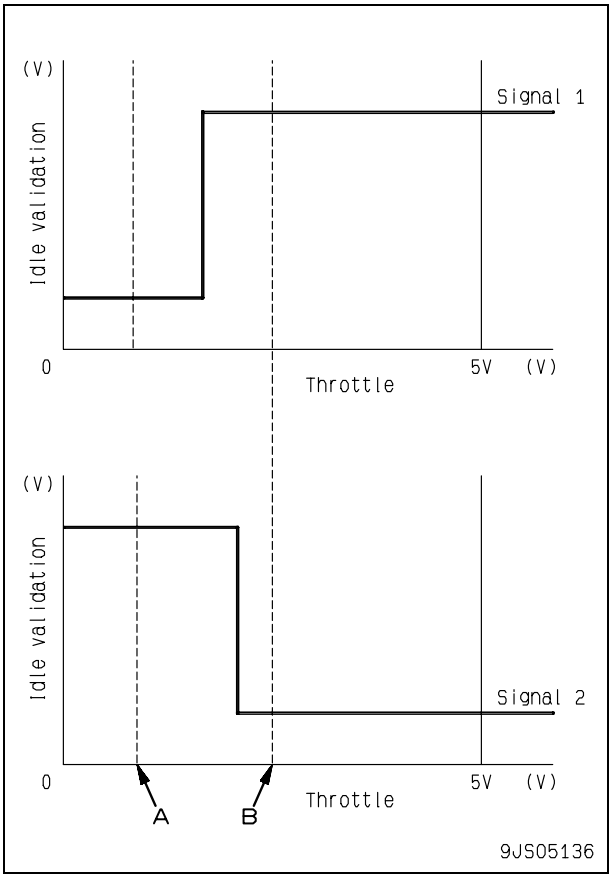


Fig. 1
Throttle: Throttle sensor signal voltage
Idle validation: Idle validation switch signal voltage
A: Voltage when pedal opened + 0.03 x (Voltage when pedal pressed – Voltage when pedal opened)
B: Voltage when pedal opened + 0.1 x (Voltage when pedal pressed – Voltage when pedal opened)

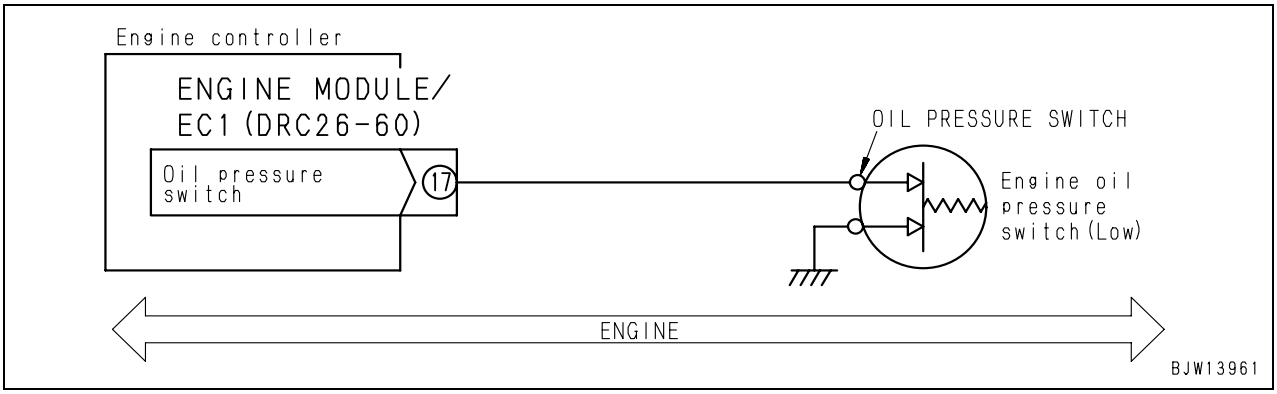
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Failure code [CA435] (Engine oil pressure switch error)

Action code	Failure code	Trouble	Engine oil pressure switch error (Engine controller system)
E01	**CA435**		
Contents of trouble	• Abnormality occurred in engine oil pressure switch signal circuit.		
Action of controller	• None in particular.		
Problem that appears on machine	• Engine oil switch-based engine protection function does not function. • Engine oil pressure monitor does not indicate normally.		
Related information	• Method of reproducing failure code: Starting switch ON or start engine.		

Possible causes and standard value in normal state	Causes		Standard value in normal state/Remarks on troubleshooting		
	1	Defective engine oil pressure switch	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			OIL PRESURE SWITCH (male)	Resistance	
			Between (1) and body	Max. 10 Ω	
	2	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between EC1 (female) (17) – OIL PRESURE SWITCH (female) (1)	Resistance	Max. 10 Ω
	3	Short circuit in wiring harness (with another wiring harness)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness among all pins between EC1 (female) (17) – EC1 (female) (With all connectors of wiring harness disconnected)	Resistance	Min. 100 kΩ
	4	Defective wiring harness connector	Connecting parts among engine oil pressure switch, engine wiring harness, and engine controller are suspected. Inspect them directly. • Loose connector, broken lock, broken seal • Corrosive, bent, broken, forced-in, or extended pin • Humidity in connector, entry of dirt or dust, poor insulation		
	5	Defective engine controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			EC1 (female)	Resistance	
			Between (17) and chassis ground	Max. 10 Ω	

Circuit diagram related to engine oil pressure switch



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Failure code [CA441] (Battery voltage low error)

Action code	Failure code	Trouble	Battery voltage low error (Engine controller system)
E03	**CA441**		
Contents of trouble	• Low voltage (Max. 6 V) occurred in controller power supply voltage circuit.		
Action of controller	• Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• Engine stops. • Starting performance is poor.		
Related information	• Method of reproducing failure code: Turn the starting switch ON.		

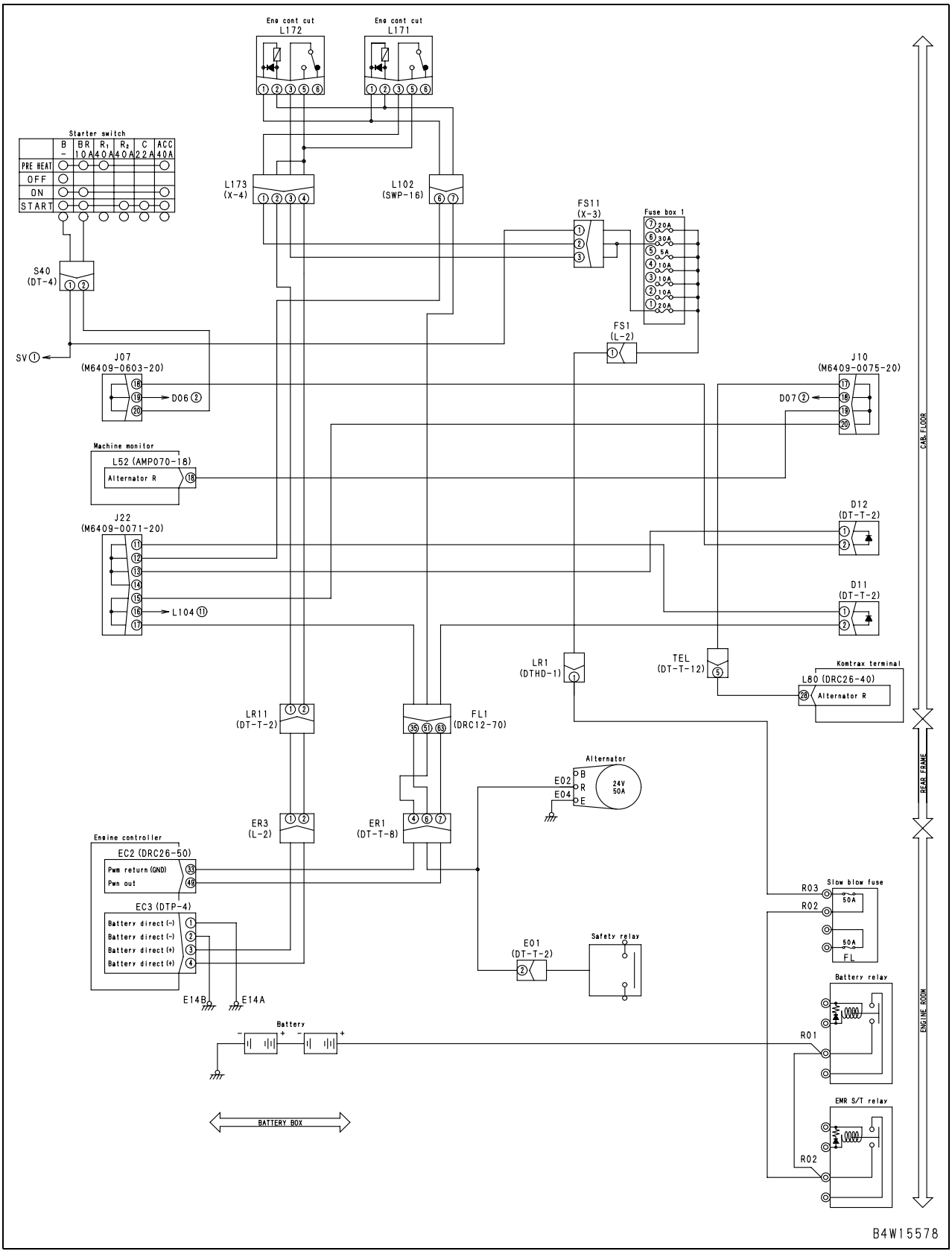
	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Loose, corroded battery terminal	Inspect battery terminal directly for loose and corrosion.			
	2	Defective battery voltage	★ Prepare with starting switch OFF, then turn starting switch OFF and START and carry out troubleshooting.			
			Battery (1 piece)	Starting switch	Voltage	
			Between (+) and (–) terminals	OFF	Min. 12 V	
				START	Min. 6.2 V	
	3	Defective fuse No. 6 of fuse box 1	If the fuse is burn, the circuit probably has a grounding fault, etc. (See cause 6.)			
	4	Defective engine control cut-out relay (L171) (Internal disconnection or short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L171 (Male)	Resistance		
			Between (1) and (2)	200 – 400 Ω		
			★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			When engine control cut-out relay (L171) is replaced with a relay of the same type, if the condition becomes normal, the engine control cut-out relay (L171) is defective.			
	5	Defective engine control cut-out relay (L172) (Internal disconnection or short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L172 (Male)	Resistance		
			Between (1) and (2)	200 – 400 Ω		
			★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			When engine control cut-out relay (L172) is replaced with a relay of the same type, if the condition becomes normal, the engine control cut-out relay (L172) is defective.			
	6	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between fuse No. 6 of fuse box 1 – L171 or L172 (female) (3)	Resistance	Max. 10 Ω	
			Wiring harness between L171 (female) (5), L172 (female) (5) – EC3 (female) (3), (4)	Resistance	Max. 10 Ω	
			Wiring harness between EC3 (female) (1), (2) – chassis ground	Resistance	Max. 10 Ω	

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Possible causes and standard value in normal state	Causes		Standard value in normal state/Remarks on troubleshooting		
	7	Ground fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between fuse No. 6 of fuse box 1 – L171, L172 (female) (3) and chassis ground	Resistance	Min. 100 kΩ
			Wiring harness between L171 (female) (5), L172 (female) (5) – EC (3), (4) and chassis ground	Resistance	Min. 100 kΩ
	8	Short circuit in wiring harness (with another wiring harness)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness among pins between EC3 (female) (3), (4) – EC3 (female) (1), (2) (With battery terminal disconnected)	Resistance	Min. 100 kΩ
			Wiring harness among all pins between EC3 (female) (3), (4) – EC2 (female) (With battery terminal disconnected)	Resistance	Min. 100 kΩ
			Wiring harness among all pins between EC3 (female) (1), (2) – EC2 (female) (With battery terminal disconnected)	Resistance	Min. 100 kΩ
	9	Defective wiring harness connector	Connecting parts among fuse No. 6 of fuse box 1, engine unit wiring harness, and engine controller are suspected. Inspect them directly. • Loose connector, broken lock, broken seal • Corrosive, bent, broken, forced-in, or extended pin • Humidity in connector, entry of dirt or dust, poor insulation		
	10	Defective engine controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			EC3	Starting switch	Voltage
			Between (3), (4) and (1), (2)	ON	Min. 24 V
				START	Min. 12 V

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Circuit diagram related to engine controller power supply



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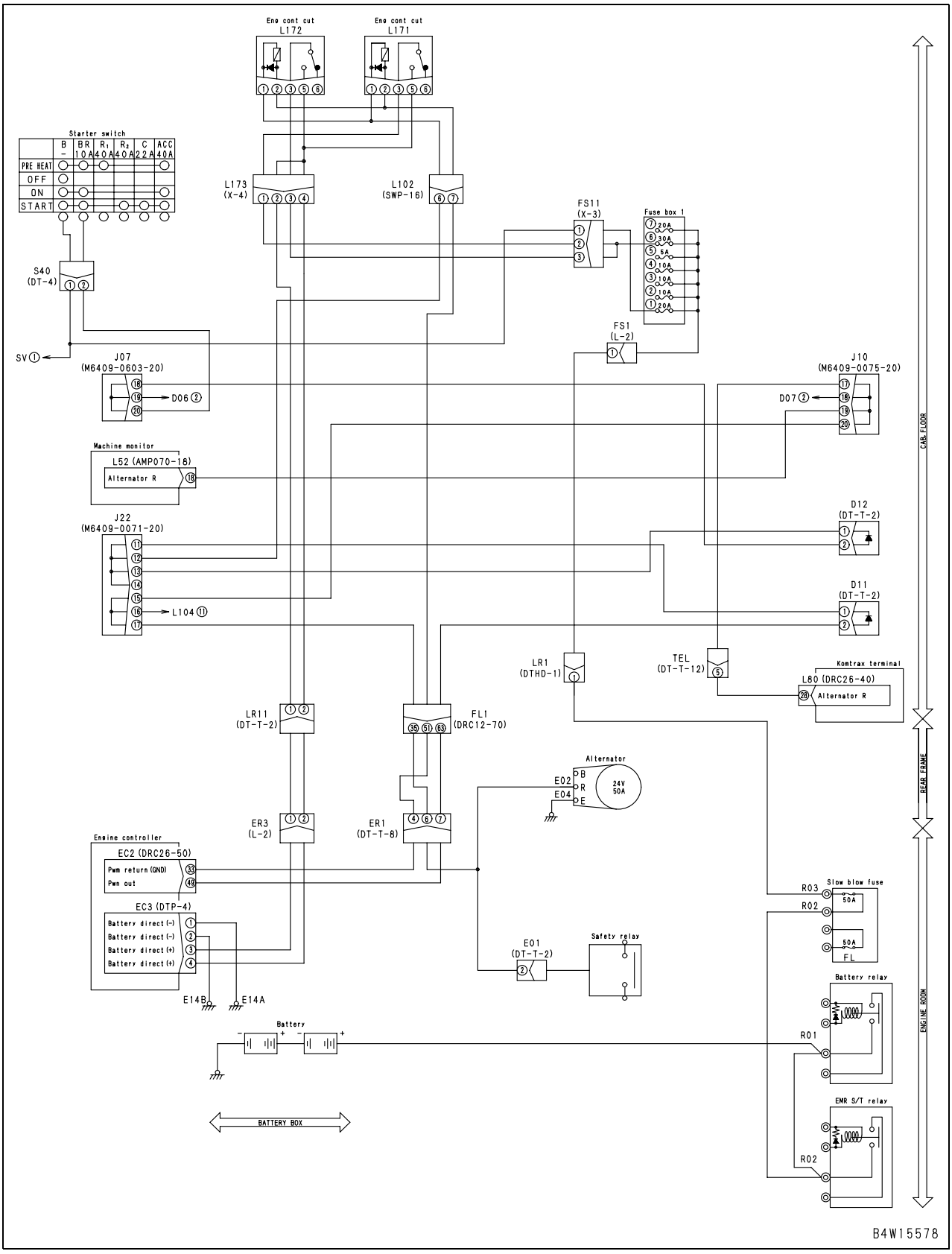
Failure code [CA442] (Battery voltage high error)

Action code	Failure code	Trouble	Battery voltage high error (Engine controller system)
E03	**CA442**		
Contents of trouble	• High voltage (min. 36V) occurred in controller power supply voltage circuit.		
Action of controller	• Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• Engine may stop.		
Related information	• Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective battery voltage	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Battery	Voltage	
			Between (+) and (–) terminals	Less than 32 V	
	2	Defective alternator	★ Prepare with starting switch OFF, then start engine and carry out troubleshooting.		
			E02	Engine speed	Voltage
			Between (1) and chassis ground	Min. medium speed	27.5 – 29.5 V
	3	Defective engine controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			EC3	Voltage	
			Between (3), (4) and (1), (2)	Less than 32 V	

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Circuit diagram related to engine controller power supply



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Failure code [CA449] Common rail pressure high error 2

Action code	Failure code	Trouble	Common rail pressure high error 2 (Engine controller system)
E03	CA449		
Contents of trouble	• Voltage (2) in common rail circuit is abnormally high.		
Action of controller	• Limits output and continues operation (limits common rail pressure). • Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• Engine sound becomes larger under no load or light load. • Engine output drops.		
Related information	• The input state (common rail pressure) from the common rail pressure sensor can be checked with the monitoring function (Code: 36400, RAIL PRESS). • The input state (voltage) from the common rail pressure sensor can be checked with the monitoring function (Code: 36402, RAIL PRESS). • Method of reproducing failure code: Start engine.		

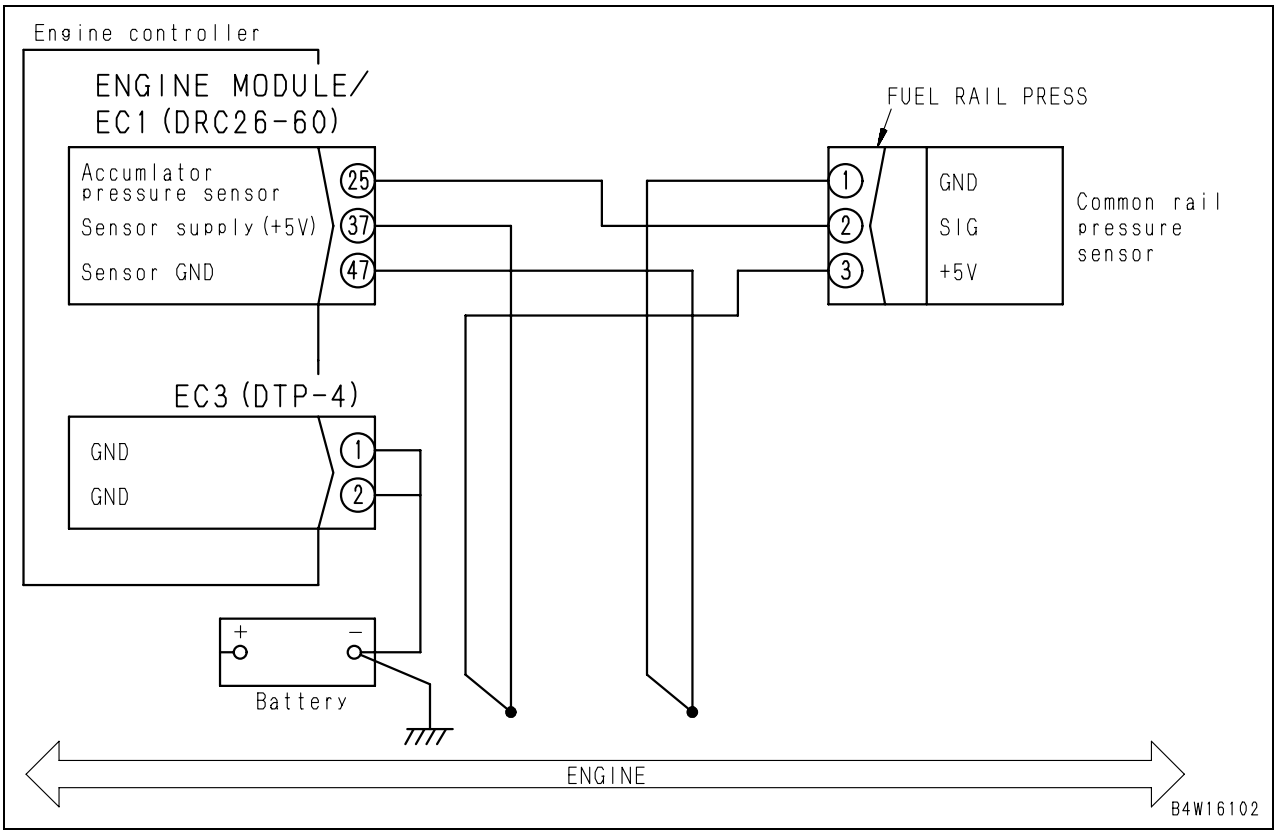
	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective related system	If another failure code is indicated, carry out troubleshooting for it, too.		
	2	Air in low-pressure circuit	Inspect it for air entry directly according to the following procedure. 1) Remove pressure pickup plug (outlet side) from fuel main filter. 2) Operate feed pump of fuel pre-fuel filter. 3) Inspect fuel and air from pressure pickup plug for leakage level. • If this error occurs during bleeding air after replacement of the fuel filter, air left in the fuel circuit is suspected. Continue engine operation at low idle approximately 3 minutes. When air is bled from the fuel circuit, engine speed becomes stable and the error indication disappears.		
	3	Defective fuel low-pressure circuit device	★ For check of pressure in fuel low-pressure circuit, see Testing and adjusting, “Testing fuel pressure.” • Measure at fuel filter outlet side.		
			Pressure in fuel low-pressure circuit	At high idle (When engine can be started)	Min. 0.48 MPa {Min. 4.9 kg/cm^2}
			★ For check of pressure in fuel low-pressure circuit, see Testing and adjusting, “Testing fuel pressure.” • Measure at fuel filter inlet and outlet sides. • Drop of fuel low-pressure circuit pressure = Fuel filter inlet pressure – Fuel filter outlet pressure		
			Drop of fuel low-pressure circuit pressure	At high idle	Max. 0.14 MPa {Max. 1.4 kg/cm^2}
			★ For check of fuel suction pressure, see Testing and adjusting, “Testing fuel pressure.” • Measure at gear pump fuel inlet side of supply pump.		
			Fuel suction circuit pressure (Gear pump side)	At high idle	Max. 33.9 kPa {Max. 254 mmHg}
			★ For check of fuel suction pressure, see Testing and adjusting, “Testing fuel pressure.” • Measure at fuel connector side.		
			Fuel suction circuit pressure (Fuel connector side)	At high idle	Max. 27.1 kPa {Max. 203 mmHg}
	4	Defective fuel cooler	★ Inspect fuel tube of fuel cooler for fuel leakage, O-ring and seal washer for damage, and check valve for clogging or damage directly.		

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<table>
<tr><td rowspan="16">Possible causes and standard value in normal state</td><td colspan="2">Causes</td><td colspan="4">Standard value in normal state/Remarks on troubleshooting</td></tr>
<tr><td rowspan="3">5</td><td rowspan="3">Defective common rail pressure sensor</td><td colspan="4">★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.</td></tr>
<tr><td>Monitoring on INSITE</td><td colspan="3">Monitoring information</td></tr>
<tr><td>Common rail pressure</td><td>Condition when engine stopped</td><td colspan="2">0 ± 0.39 MPa
{0 ± 4 kg/cm^2}</td></tr>
<tr><td>6</td><td>Defective O-ring of supply pump actuator</td><td colspan="4">★ Directly check that O-ring of supply pump actuator is not damaged.</td></tr>
<tr><td rowspan="5">7</td><td rowspan="5">Defective supply pump actuator</td><td colspan="4">★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.</td></tr>
<tr><td>Monitoring code (Machine monitor)</td><td colspan="3">Monitoring information</td></tr>
<tr><td>Code: 36400
RAIL PRESS</td><td>Condition when engine stopped</td><td colspan="2">0 ± 0.39 MPa
{0 ± 4 kg/cm^2}</td></tr>
<tr><td colspan="4">★ Prepare with starting switch OFF, then start engine and carry out troubleshooting.
• Measure after running engine at idle at least 1 minute.</td></tr>
<tr><td>Monitoring code (Machine monitor)</td><td colspan="3">Monitoring information</td></tr>
<tr><td>8</td><td>Defective wiring harness connector</td><td colspan="4">Common rail fuel pressure sensor connector or supply pump actuator is suspected. Inspect it directly.
• Loose connector, broken lock, broken seal
• Corrosive, bent, broken, forced-in, or extended pin
• Humidity in connector, entry of dirt or dust, poor insulation</td></tr>
<tr><td rowspan="3">9</td><td rowspan="3">Defective wiring harness of engine controller GND</td><td colspan="4">★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.</td></tr>
<tr><td colspan="3">EC3 (female)</td><td>Resistance</td></tr>
<tr><td colspan="3">Between (1) (2) – chassis ground</td><td>Max. 10 Ω</td></tr>
<tr><td>10</td><td>Defective supply pump</td><td colspan="4">If causes 1 – 9 are not detected, supply pump may be defective.</td></tr>
</table>

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Circuit diagram related to common rail pressure sensor and engine controller GND line



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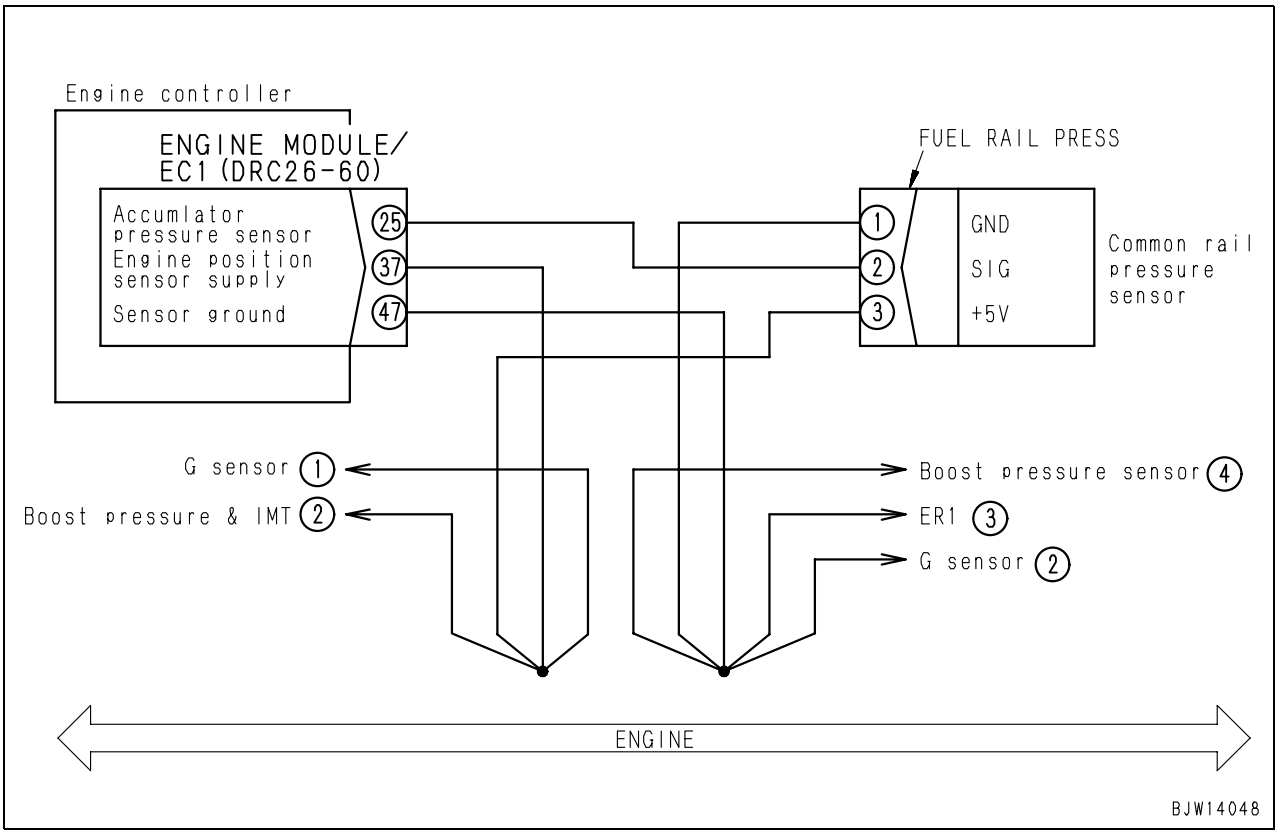
Failure code [CA451] (Common rail pressure sensor high error)

Action code	Failure code	Trouble	Common rail pressure sensor high error (Engine controller system)
E03	**CA451**		
Contents of trouble	• High voltage occurred in common rail pressure sensor.		
Action of controller	• Limits output and continues operation. • Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• The engine does not start. • Engine speed or output drops.		
Related information	• The input state (common rail pressure) from the common rail pressure sensor can be checked with the monitoring function (Code: 36400, RAIL PRESS). • The input state (voltage) from the common rail pressure sensor can be checked with the monitoring function (Code: 36402, RAIL PRESS). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective sensor power supply 2 system	If failure code [**CA227**] is indicated simultaneously, carry out troubleshooting for it first.		
	2	Defective common rail pressure sensor	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			FUEL RAIL PRESS		Voltage
			Between (3) and (1)	Power supply	4.75 – 5.25 V
			Voltage is measured with wiring harness connected. Accordingly, if voltage is abnormal, check wiring harness and controller, too, for another cause of trouble, and then judge.		
	3	Hot short (Short circuit with 5V, 24V circuit) in wiring harness	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			Wiring harness between EC1 (female) (25) – FUEL RAIL PRESS (female) (2) and chassis ground	Voltage	Max. 1 V
	4	Short circuit in wiring harness (with another wiring harness)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between EC1 (female) (25) – FUEL RAIL PRESS (female) (2), EC1 (female) (37) – FUEL RAIL PRESS (female) (3)	Resistance	Min. 100 kΩ
	5	Defective wiring harness connector	Connecting parts among common rail pressure sensor, engine wiring harness, and engine controller are suspected. Inspect them directly. • Loose connector, broken lock, broken seal • Corrosive, bent, broken, forced-in, or extended pin • Humidity in connector, entry of dirt or dust, poor insulation		
	6	Defective engine controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			EC1		Voltage
			Between (37) and (47)	Power supply	4.75 – 5.25 V

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Circuit diagram related to common rail pressure sensor



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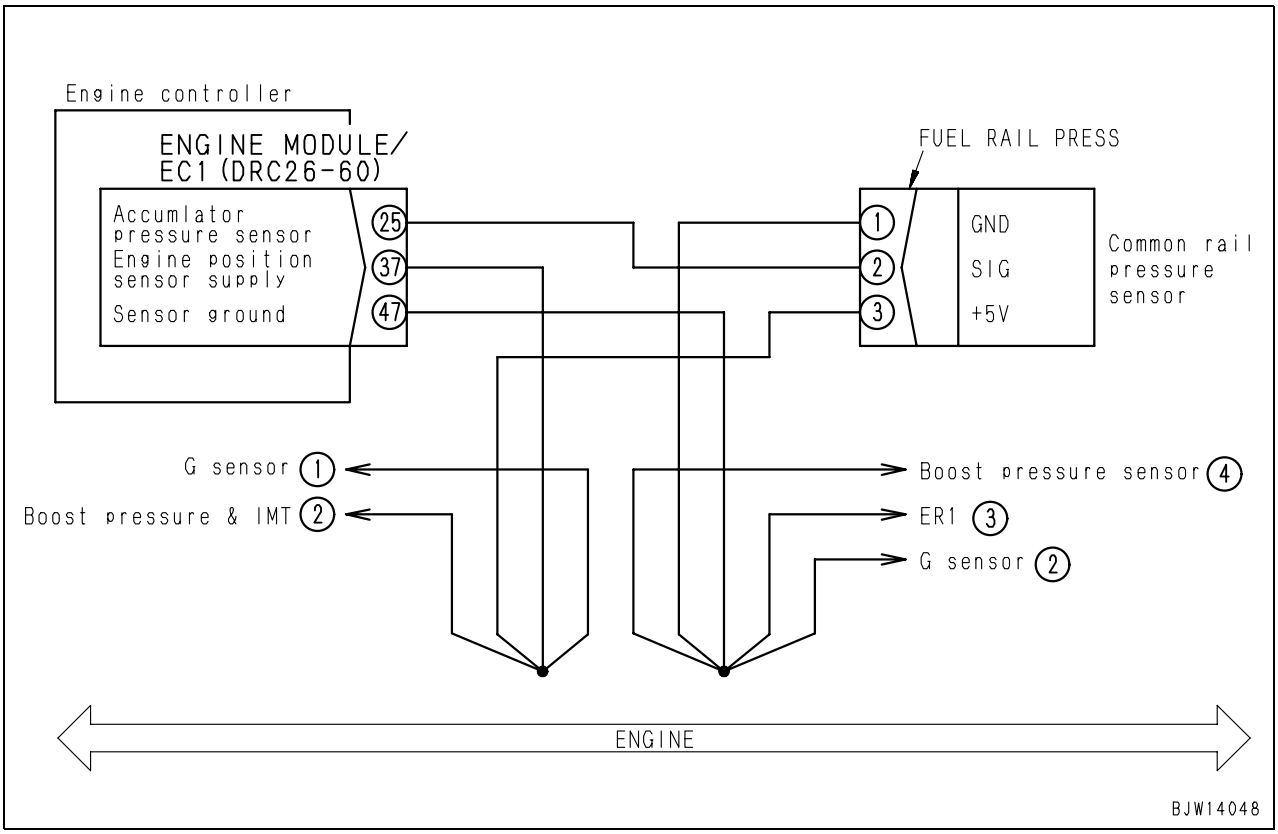
Failure code [CA452] (Common rail pressure sensor low error)

Action code	Failure code	Trouble	Common rail pressure sensor low error (Engine controller system)
E03	**CA452**		
Contents of trouble	• Low voltage occurred in common rail pressure sensor.		
Action of controller	• Limits output and continues operation. • Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• The engine does not start. • Engine speed or output drops.		
Related information	• The input state (common rail pressure) from the common rail pressure sensor can be checked with the monitoring function (Code: 36400, RAIL PRESS). • The input state (voltage) from the common rail pressure sensor can be checked with the monitoring function (Code: 36402, RAIL PRESS). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective sensor power supply 2 system	If failure code [**CA187**] is indicated simultaneously, carry out troubleshooting for it first.			
	2	Defective common rail pressure sensor	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			FUEL RAIL PRESS		Voltage	
			Between (3) and (1)	Power supply	4.75 – 5.25 V	
			Voltage is measured with wiring harness connected. Accordingly, if voltage is abnormal, check wiring harness and controller, too, for another cause of trouble, and then judge.			
	3	Ground fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			Wiring harness between EC1 (female) (25) – FUEL RAIL PRESS (female) (2) and chassis ground		Resistance	Min. 100 kΩ
	4	Short circuit in wiring harness (with another wiring harness)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between EC1 (female) (25) – FUEL RAIL PRESS (female) (2), EC1 (female) (37) – FUEL RAIL PRESS (female) (3)		Resistance	Min. 100 kΩ
	5	Defective wiring harness connector	Connecting parts among common rail pressure sensor, engine wiring harness, and engine controller are suspected. Inspect them directly. • Loose connector, broken lock, broken seal • Corrosive, bent, broken, forced-in, or extended pin • Humidity in connector, entry of dirt or dust, poor insulation			
	6	Defective engine controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			EC1		Voltage	
			Between (37) and (47)	Power supply	4.75 – 5.25 V	

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Circuit diagram related to common rail pressure sensor



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Failure code [CA488] (Derating of torque by abnormally high charge temperature)

Action code	Failure code	Trouble	Derating of torque by abnormally high charge temperature (Engine controller system)
E03	**CA488**		
Contents of trouble	• Temperature signal of boost pressure sensor and temperature sensor is above upper control limit.		
Action of controller	• Limits output and continues operation. • Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• Engine output drops.		
Related information	• The input state (boost temperature) from the boost pressure and temperature sensors can be checked with the monitoring function (Code: 18500, CHG TEMP). • The input state (boost temperature sensor voltage) from the boost pressure and temperature sensors can be checked with the monitoring function (Code: 18501, CHG TEMP). • Method of reproducing failure code: Start engine.		

	Causes		Standard value in normal state/Remarks on troubleshooting
Possible causes and standard value in normal state	1	Drop in cooling performance of aftercooler	Inspect following directly. • Loose, broken fan belt • Insufficient cooling air • Clogged aftercooler fin
	2	Abnormally high temperature at turbocharger outlet	Inspect related parts directly.
	3	Defective engine controller	If causes 1 – 2 are not detected, engine controller may be defective. (Since trouble is in system, troubleshooting cannot be carried out.)

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Failure code [CA553] (Common rail pressure high error 1)

Action code	Failure code	Trouble	Common rail pressure high error 1 (Engine controller system)
E03	**CA553**		
Contents of trouble	• Voltage (1) in common rail circuit is abnormally high.		
Action of controller	• None in particular. • Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• Engine sound becomes larger under no load or light load. • Engine output drops.		
Related information	• The input state (common rail pressure) from the common rail pressure sensor can be checked with the monitoring function (Code: 36400, RAIL PRESS). • The input state (voltage) from the common rail pressure sensor can be checked with the monitoring function (Code: 36402, RAIL PRESS). • Method of reproducing failure code: Start engine.		

	Causes		Standard value in normal state/Remarks on troubleshooting
Possible causes and standard value in normal state	1	Defect in related system	If another code is displayed, carry out troubleshooting for it, too.
	2	Defective connection of ground terminal	Inspect following directly for connection of ground terminal. • Ground terminal (battery (–)) of machine main unit. • Ground terminal of engine • Ground terminal of engine controller • Ground terminal of starting motor
	3	Broken O-ring of supply pump actuator	Inspect O-ring directly for breakage.

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Failure code [CA559] (Supply pump pressure very low error)

Action code	Failure code	Trouble	Supply pump pressure very low error (Engine controller system)
E03	CA559		
Contents of trouble	• No-pressure feed (1) occurred in common rail circuit.		
Action of controller	• Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• Engine does not start or starting performance is poor • Exhaust smoke is black. • Engine output drops.		
Related information	• The input state (common rail pressure) from the common rail pressure sensor can be checked with the monitoring function (Code: 36400, RAIL PRESS). • The input state (voltage) from the common rail pressure sensor can be checked with the monitoring function (Code: 36402, RAIL PRESS). • Method of reproducing failure code: Start engine.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Fuel leakage to outside	Inspect for fuel leakage directly (visual inspection at engine low idle).		
	2	Defective low-pressure circuit device	★ For check of pressure in fuel low-pressure circuit, see Testing and adjusting, "Testing fuel pressure." • Measure pressure at the fuel filter inlet side. • Cranking speed: Min. 150 rpm		
			Pressure in fuel low-pressure circuit	Cranking	Min. 0.14 MPa {Min. 1.4 kg/cm^2}
			★ For check of pressure in fuel low-pressure circuit, see Testing and adjusting, "Testing fuel pressure." • Measure at fuel filter outlet side.		
			Pressure in fuel low-pressure circuit	At high idle	Min. 0.48 MPa {Min. 4.9 kg/cm^2}
			★ For check of pressure in fuel low-pressure circuit, see Testing and adjusting, "Testing fuel pressure." • Measure at fuel filter inlet and outlet sides. • Drop of fuel low-pressure circuit pressure = Fuel filter inlet pressure – Fuel filter outlet pressure		
			Drop of fuel low-pressure circuit pressure	At high idle	Max. 0.14 MPa {Max. 1.4 kg/cm^2}
			★ For check of fuel suction pressure, see Testing and adjusting, "Testing fuel pressure." • Measure at gear pump fuel inlet side of supply pump.		
			Fuel suction circuit pressure (Gear pump side)	At high idle	Max. 33.9 kPa {Max. 254 mmHg}
			★ For check of fuel suction pressure, see Testing and adjusting, "Testing fuel pressure." • Measure at fuel connector side.		
			Fuel suction circuit pressure (Fuel connector side)	At high idle	Max. 27.1 kPa {Max. 203 mmHg}
	3	Defective pressure limiter	For testing of leakage from pressure limiter, see Testing and adjusting, Testing leakage from pressure limiter and return rate from injector.		
			Leakage from pressure limiter	At low idle	Max. 30 drops/min.

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<table>
<tr><td rowspan="8">Possible causes and standard value in normal state</td><td colspan="2">Causes</td><td colspan="4">Standard value in normal state/Remarks on troubleshooting</td></tr>
<tr><td rowspan="3">4</td><td rowspan="3">Defective injector (High-pressure piping in head included)</td><td colspan="4">★ For testing of return rate from injector, see Testing and adjusting, Testing leakage-from pressure limiter and return rate from injector.</td></tr>
<tr><td rowspan="2">Return rate from injector</td><td>Cranking (When starting is not available)</td><td>Max. 100 cc/ 30 sec.</td></tr>
<tr><td>At low idle (When starting is available)</td><td>Max. 300 cc/ 30 sec.</td></tr>
<tr><td rowspan="3">5</td><td rowspan="3">Defective supply pump</td><td colspan="4">★ For testing of return rate from supply pump, see Testing and adjusting, Testing leakage from pressure limiter and return rate from injector.</td></tr>
<tr><td rowspan="2">Return rate from supply pump</td><td>Cranking (When starting is not available)</td><td>Max. 200 cc/ 30 sec.</td></tr>
<tr><td>At low idle (When starting is available)</td><td>Max. 300 cc/ 30 sec.</td></tr>
<tr><td>6</td><td>Defects in supply pump plunger</td><td colspan="4">★ Remove supply pump head, and inspect plunger for damage directly.</td></tr>
<tr><td>7</td><td>Air in low-pressure circuit</td><td colspan="4">Inspect it for air entry directly according to the following procedure.
1) Remove pressure pickup plug (outlet side) from fuel main filter.
2) Operate feed pump of fuel pre-fuel filter.
3) Inspect fuel and air from pressure pickup plug for leakage level.
• If this error occurs during bleeding air after replacement of the fuel filter, air left in the fuel circuit is suspected. Continue engine operation at low idle approximately 3 minutes. When air is bled from the fuel circuit, engine speed becomes stable and the error indication disappears.</td></tr>
</table>

Note1: Check the low-pressure circuit parts for the following items.
1) Fuel level
2) Clogging of fuel tank breather
3) Sticking of check valve inside engine controller cooling plate
4) Leakage through and clogging of low-pressure fuel piping
5) Clogging of fuel prefilter
6) Clogging of fuel main filter
7) Replace the fuel filters if trouble is not cancelled even after clogging checks.

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Failure code [CA689] (Engine Ne speed sensor error)

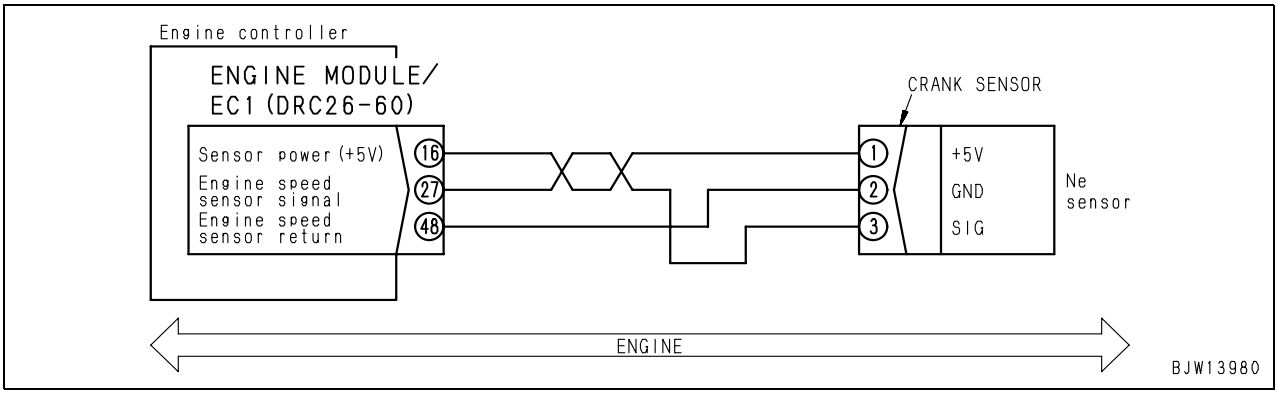
Action code	Failure code	Trouble	Engine Ne speed sensor error (Engine controller system)
E03	**CA689**		
Contents of trouble	• Abnormality occurred in signals from engine Ne speed sensor.		
Action of controller	• Controls Ne speed sensor with signals of Bkup speed sensor. • Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• There is hunting from engine. • Starting performance is poor. • Engine output drops.		
Related information	• Method of reproducing failure code: Start engine.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective Ne speed sensor power supply system	If failure code [**CA238**] is indicated simultaneously, carry out troubleshooting for it first.		
	2	Defective engine Ne speed sensor	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			CRANK SENSOR		Voltage
			Between (1) and (2)	Power supply	4.75 – 5.25 V
			Voltage is measured with wiring harness connected. Accordingly, if voltage is abnormal, check wiring harness and controller, too, for another cause of trouble, and then judge.		
	3	Broken engine Ne speed sensor or defective clearance	Inspect engine Ne speed sensor for breakage or clearance.		
	4	Broken rotation sensing flywheel	Inspect it for breakage directly.		
	5	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between EC1 (female) (27) – CRANK SENSOR (female) (3)	Resistance	Max. 10 Ω
	6	Ground fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between EC1 (female) (27) – CRANK SENSOR (female) (3) and chassis ground	Resistance	Min. 100 kΩ
	7	Hot short (Contact with 5V, 24V circuit) in wiring harness	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			Wiring harness between EC1 (female) (27) – CRANK SENSOR (female) (3) and chassis ground	Voltage	Max. 1 V
	8	Short circuit in wiring harness (with another wiring harness)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between EC1 (female) (27) – CRANK SENSOR (female) (3), EC1 (female) (16) – CRANK SENSOR (female) (1)	Resistance	Min. 100 kΩ
			Wiring harness between EC1 (female) (27) – CRANK SENSOR (female) (3), EC1 (female) (48) – CRANK SENSOR (female) (2)	Resistance	Min. 100 kΩ

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<table>
<tr><td rowspan="4">Possible causes and standard value in normal state</td><td colspan="2">Causes</td><td colspan="3">Standard value in normal state/Remarks on troubleshooting</td></tr>
<tr><td>9</td><td>Defective wiring harness connector</td><td colspan="3">Connecting parts among engine Ne speed sensor, engine wiring harness, and engine controller are suspected. Inspect them directly.
• Loose connector, broken lock, broken seal
• Corrosive, bent, broken, forced-in, or extended pin
• Humidity in connector, entry of dirt or dust, poor insulation</td></tr>
<tr><td rowspan="3">10</td><td rowspan="3">Defective engine controller</td><td colspan="3">★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.</td></tr>
<tr><td colspan="2">EC1</td><td>Voltage</td></tr>
<tr><td>Between (16) and (48)</td><td>Power supply</td><td>4.75 – 5.25 V</td></tr>
</table>

Circuit diagram related to engine Ne speed sensor



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Failure code [CA731] (Engine Bkup speed sensor phase error)

Action code	Failure code	Trouble	Engine Bkup speed sensor phase error (Engine controller system)
E03	**CA731**		
Contents of trouble	• Abnormal phase is detected in signals of engine Ne speed sensor and engine Bkup speed sensor.		
Action of controller	• Controls Ne speed sensor with signals of Bkup speed sensor. • Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• Engine does not start or is difficult to start. • Idle speed is unstable. • Exhaust smoke is black.		
Related information	• Method of reproducing failure code: Start engine.		

	Causes		Standard value in normal state/Remarks on troubleshooting
Possible causes and standard value in normal state	1	Broken engine Ne speed sensor	Inspect engine Ne speed sensor for breakage directly.
	2	Broken engine Bkup speed sensor	Inspect engine Bkup speed sensor for breakage directly.
	3	Defective/broken mount of rotation sensing flywheel on crankshaft side	Inspect it for defect or breakage according to the following procedure. 1) Set No. 1 cylinder to compression top dead center (align stamping mark). 2) If tip of Ne speed sensor is aligned with center of oblong hole of rotation sensing flywheel, it is mounted normally.
	4	Defective/broken mount of rotation sensing ring on camshaft side	Inspect it for defect or breakage according to the following procedure. 1) Set No. 1 cylinder to compression top dead center (align stamping mark). 2) Remove Bkup speed sensor. 3) If 2 grooves (1 thread) of rotation sensing ring can be seen through sensor mounting hole, it is mounted normally.
	5	Defective timing between crankshaft and camshaft	Inspect crankshaft and camshaft for timing directly.
	6	Defective connection of ground terminal	Inspect following directly for connection of ground terminal. • Ground terminal (battery (–)) of machine main unit. • Ground terminal of engine • Ground terminal of engine controller • Ground terminal of starting motor

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Failure code [CA757] (All continuous data lost error)

Action code	Failure code	Trouble	All continuous data lost error (Engine controller system)
E03	**CA757**		
Contents of trouble	• All data in engine controller are lost.		
Action of controller	• Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• Engine stops and sometimes cannot be started. • The monitoring function of the machine monitor (engine controller system) sometimes fail to work normally.		
Related information	• Method of reproducing failure code: Turn the starting switch ON.		

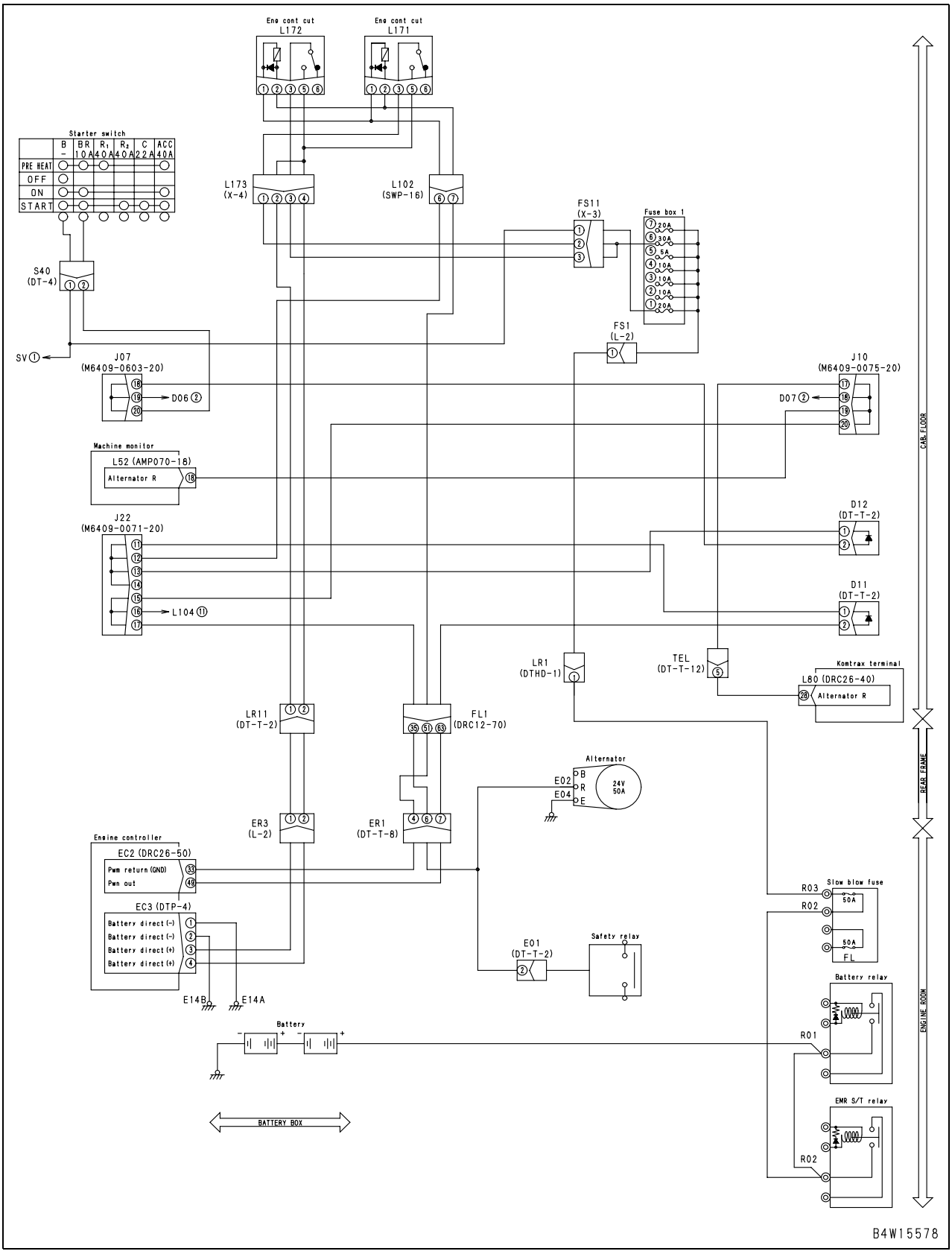
	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defect in related system	If another code is displayed, carry out troubleshooting for it.		
	2	Loose, corroded battery terminal	Inspect battery terminal directly for loose and corrosion.		
	3	Defective battery voltage	★ Prepare with starting switch OFF, then carry out troubleshooting with starting switch OFF and START.		
			Battery (1 piece)	Starting switch	Voltage
			Between (+) – (–) terminals	OFF	Min. 12 V
				START	Min. 6.2 V
	4	Defective fuse No. 6 of fuse box 1	If the fuse is broken, the circuit probably has a grounding fault, etc.		
	5	Defective engine control cut-out relay (L171) (Internal disconnection or short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			L171 (Male)	Resistance	
			Between (1) and (2)	200 – 400 Ω	
			★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			When engine control cut-out relay (L171) is replaced with a relay of the same type, if the condition becomes normal, the engine control cut-out relay (L171) is defective.		
	6	Defective engine control cut-out relay (L172) (Internal disconnection or short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			L172 (Male)	Resistance	
			Between (1) and (2)	200 – 400 Ω	
			★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			When engine control cut-out relay (L172) is replaced with a relay of the same type, if the condition becomes normal, the engine control cut-out relay (L172) is defective.		
	7	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between fuse No. 6 of fuse box 1 – L171 or L172 (female) (3)	Resistance	Max. 10Ω
			Wiring harness between L171 (female) (5), L172 (female) (5) – EC3 (female) (3), (4)	Resistance	Max. 10Ω
			Wiring harness between EC3 (female) (1), (2) – chassis ground	Resistance	Max. 10Ω

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<table>
<tr><td rowspan="4">Possible causes and standard value in normal state</td><td colspan="2">Causes</td><td colspan="3">Standard value in normal state/Remarks on troubleshooting</td></tr>
<tr><td>8</td><td>Defective wiring harness connector</td><td colspan="3">Connecting parts among fuse No. 6 of fuse box 1, engine unit wiring harness, and engine controller are suspected. Inspect them directly.
• Loose connector, broken lock, broken seal
• Corrosive, bent, broken, forced-in, or extended pin
• Humidity in connector, entry of dirt or dust, poor insulation</td></tr>
<tr><td rowspan="3">9</td><td rowspan="3">Defective engine controller</td><td colspan="3">★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.</td></tr>
<tr><td>EC3</td><td>Starting switch</td><td>Voltage</td></tr>
<tr><td rowspan="2">Between (3) and (1)</td><td>ON</td><td>Min. 24 V</td></tr>
<tr><td>START</td><td>Min. 12 V</td></tr>
</table>

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Circuit diagram related to engine controller power supply



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Failure code [CA778] (Engine Bkup speed sensor error)

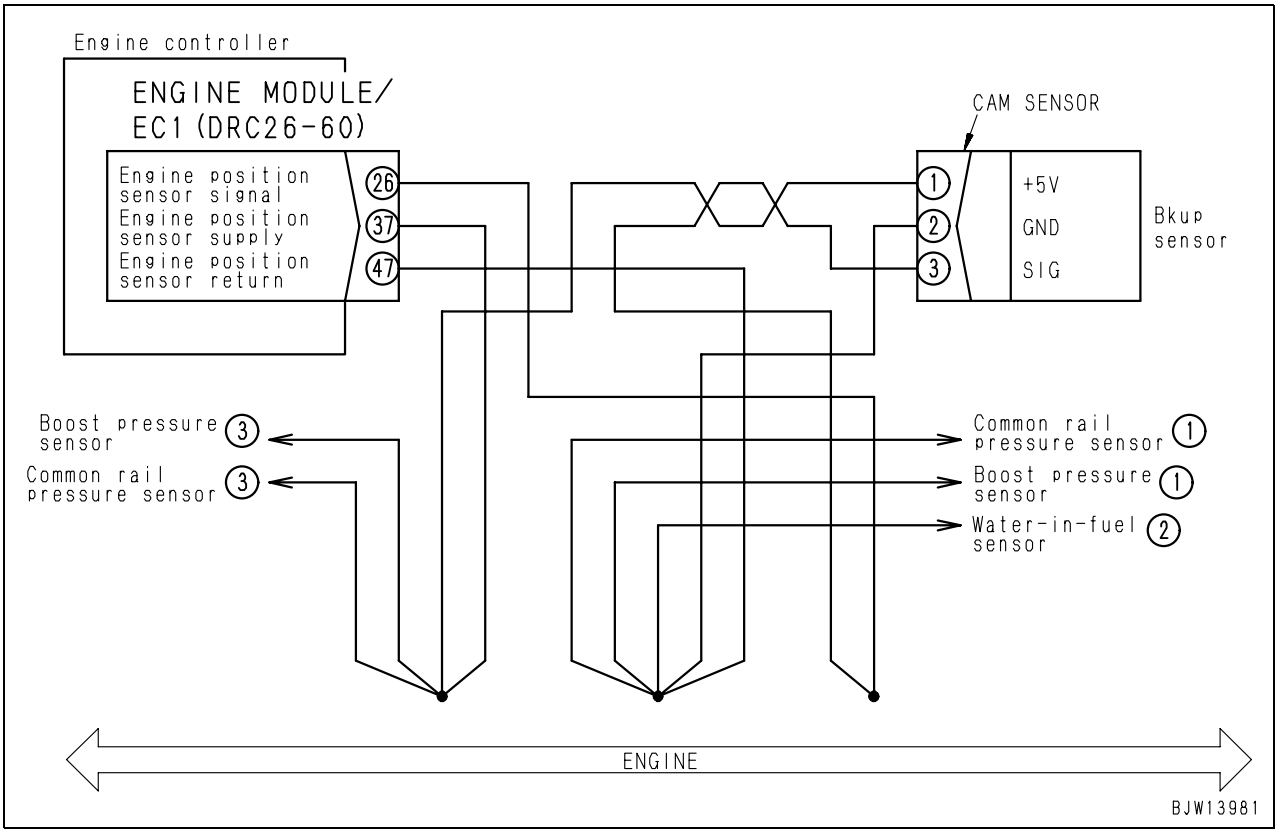
Action code	Failure code	Trouble	Engine Bkup speed sensor error (Engine controller system)
E03	**CA778**		
Contents of trouble	• Abnormality is detected in signals of engine Bkup speed sensor.		
Action of controller	• Controls Bkup speed sensor with signals of Ne speed sensor. • Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• Starting performance is poor. • Engine output lowers.		
Related information	• Method of reproducing failure code: Start engine.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective sensor power supply 2 system	If failure code [**CA187**] is indicated simultaneously, carry out troubleshooting for it first.		
	2	Defective engine Bkup speed sensor	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			CAM SENSOR		Voltage
			Between (1) and (2)	Power supply	4.75 – 5.25 V
			Voltage is measured with wiring harness connected. Accordingly, if voltage is abnormal, check wiring harness and controller, too, for another cause of trouble, and then judge.		
	3	Broken engine Bkup speed sensor or defective clearance	Inspect engine Bkup speed sensor directly for breakage or clearance.		
	4	Broken rotation sensing ring	Inspect it for breakage directly.		
	5	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between EC1 (female) (26) – CAM SENSOR (female) (3)	Resistance	Max. 10 Ω
	6	Ground fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between EC1 (female) (26) – CAM SENSOR (female) (3) and chassis ground	Resistance	Min. 100 kΩ
	7	Hot short (Contact with 5V, 24V circuit) in wiring harness	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			Wiring harness between EC1 (female) (26) – CAM SENSOR (female) (3) and chassis ground	Voltage	Max. 1 V
	8	Short circuit in wiring harness (with another wiring harness)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between EC1 (female) (26) – CAM SENSOR (female) (3), EC1 (female) (37) – CAM SENSOR (female) (1)	Resistance	Min. 100 kΩ
			Wiring harness between EC1 (female) (26) – CAM SENSOR (female) (3), EC1 (female) (47) – CAM SENSOR (female) (2)	Resistance	Min. 100 kΩ

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<table>
<tr><td rowspan="4">Possible causes and standard value in normal state</td><td colspan="2">Causes</td><td colspan="3">Standard value in normal state/Remarks on troubleshooting</td></tr>
<tr><td>9</td><td>Defective wiring harness connector</td><td colspan="3">Connecting parts among engine Bkup speed sensor, engine wiring harness, and engine controller are suspected. Inspect them directly.
• Loose connector, broken lock, broken seal
• Corrosive, bent, broken, forced-in, or extended pin
• Humidity in connector, entry of dirt or dust, poor insulation</td></tr>
<tr><td rowspan="3">10</td><td rowspan="3">Defective engine controller</td><td colspan="3">★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.</td></tr>
<tr><td colspan="2">EC1</td><td>Voltage</td></tr>
<tr><td>Between (37) and (47)</td><td>Power supply</td><td>4.75 – 5.25 V</td></tr>
</table>

Circuit diagram related to engine Bkup speed sensor



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Failure code [CA1633] (KOMNET datalink timeout error)

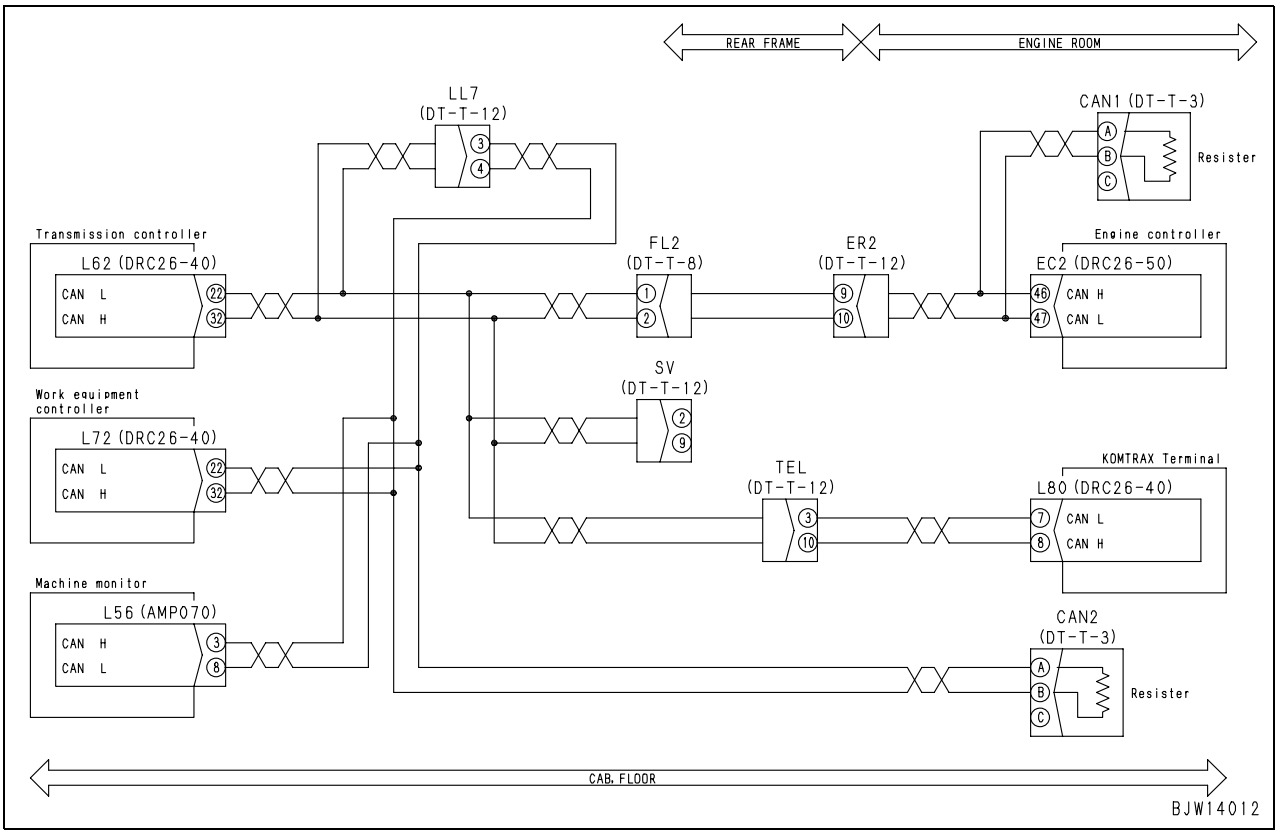
Action code	Failure code	Trouble	KOMNET datalink timeout error (Engine controller system)
E03	**CA1633**		
Contents of trouble	• Engine controller detected a communication error in the KOMNET communication circuit used for the communication between the pump controllers and machine monitor.		
Action of controller	• Continues the operation from the default mode. • Turns the centralized warning lamp and alarm buzzer ON. • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• KOMNET communication information may not be transmitted correctly to cause incorrect operation of machine. (Problem depends on failure occurrence location.)		
Related information	• Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective CAN end point resistance	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			CAN1 (male)	Resistance	
			Between (A) and (B)	110 – 140 Ω	
			★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			CAN2 (male)	Resistance	
			Between (A) and (B)	110 – 140 Ω	
	2	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between EC2 (female) (46), (47) – L62 (female) (22), (32)	Resistance	Max. 1 Ω
			Wiring harness between EC2 (female) (46), (47) – L56 (female) (3), (8)	Resistance	Max. 1 Ω
			Wiring harness between EC2 (female) (46), (47) – L72 (female) (22), (32)	Resistance	Max. 1 Ω
			Wiring harness between EC2 (female) (46), (47) – L80 (female) (7), (8)	Resistance	Max. 1 Ω
			Wiring harness between EC2 (female) (46), (47) – CAN1 (female) (A), (B)	Resistance	Max. 1 Ω
			Wiring harness between EC2 (female) (46), (47) – CAN2 (female) (A), (B)	Resistance	Max. 1 Ω

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	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	3	Ground fault in wiring harness (Short circuit with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between EC2 (female) (46), (47) – L62 (female) (22), (32) and chassis ground	Resistance	Min. 1 MΩ
			Wiring harness between EC2 (female) (46), (47) – L56 (female) (3), (8) and chassis ground	Resistance	Min. 1 MΩ
			Wiring harness between EC2 (female) (46), (47) – L72 (female) (22), (32) and chassis ground	Resistance	Min. 1 MΩ
			Wiring harness between EC2 (female) (46), (47) – L80 (female) (7), (8) and chassis ground	Resistance	Min. 1 MΩ
			Wiring harness between EC2 (female) (46), (47) – CAN1 (female) (A), (B) and chassis ground	Resistance	Min. 1 MΩ
			Wiring harness between EC2 (female) (46), (47) – CAN2 (female) (A), (B) and chassis ground	Resistance	Min. 1 MΩ
	4	Defective machine monitor, transmission controller, work equipment controller, engine controller or KOMTRAX terminal	★ If above troubleshootings 1 – 3 have not identified the cause of the trouble, failure on the machine monitor, transmission controller, work equipment controller, engine controller or KOMTRAX terminal should be suspected. (Since trouble is in system, troubleshooting cannot be carried out.)		

Circuit diagram related to CAN communication



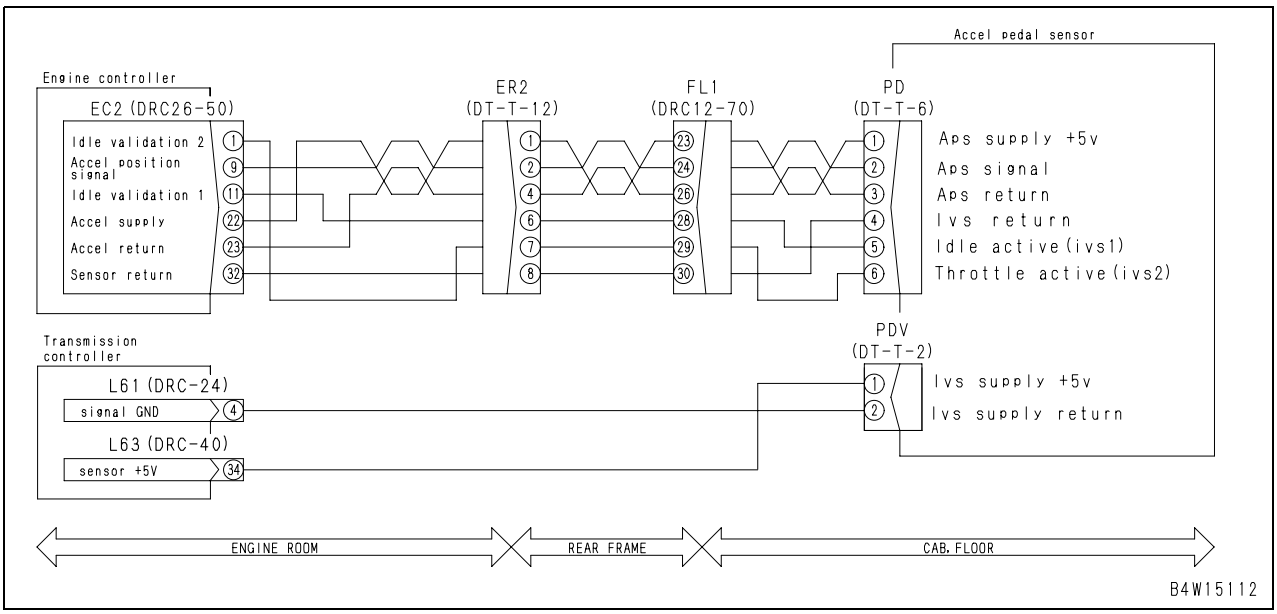
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Failure code [CA2185] (Throttle sensor power supply voltage high error)

Action code	Failure code	Trouble	Throttle sensor power supply voltage high error (Engine controller system)
E03	**CA2185**		
Contents of trouble	• High voltage (min. 5.25V) occurred in throttle sensor power supply circuit.		
Action of controller	• Runs the engine at position of throttle 0% when accelerator pedal is OFF and at 50% when it is ON. • Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• The engine does not reach full throttle.		
Related information	• Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state			★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
	1	Short circuit in wiring harness (with another wiring harness)	Wiring harness among all pins between EC2 (female) (22) – EC2 (female) (PD, too, is disconnected.)	Resistance	Min. 100 kΩ
			Between EC2 (female) (22) – EC3 (female) (3) (PD, too, is disconnected.)	Resistance	Min. 100 kΩ
	2	Defective wiring harness connector	Connecting parts among fuel control dial, engine unit wiring harness, and engine controller are suspected. Inspect them directly. • Loose connector, broken lock, broken seal • Corrosive, bent, broken, forced-in, or extended pin • Humidity in connector, entry of dirt or dust, poor insulation		
	3	Defective engine controller	If causes 1 – 2 are not detected, engine controller may be defective. (Since trouble is in system, troubleshooting cannot be carried out.)		

Circuit diagram related to accelerator pedal



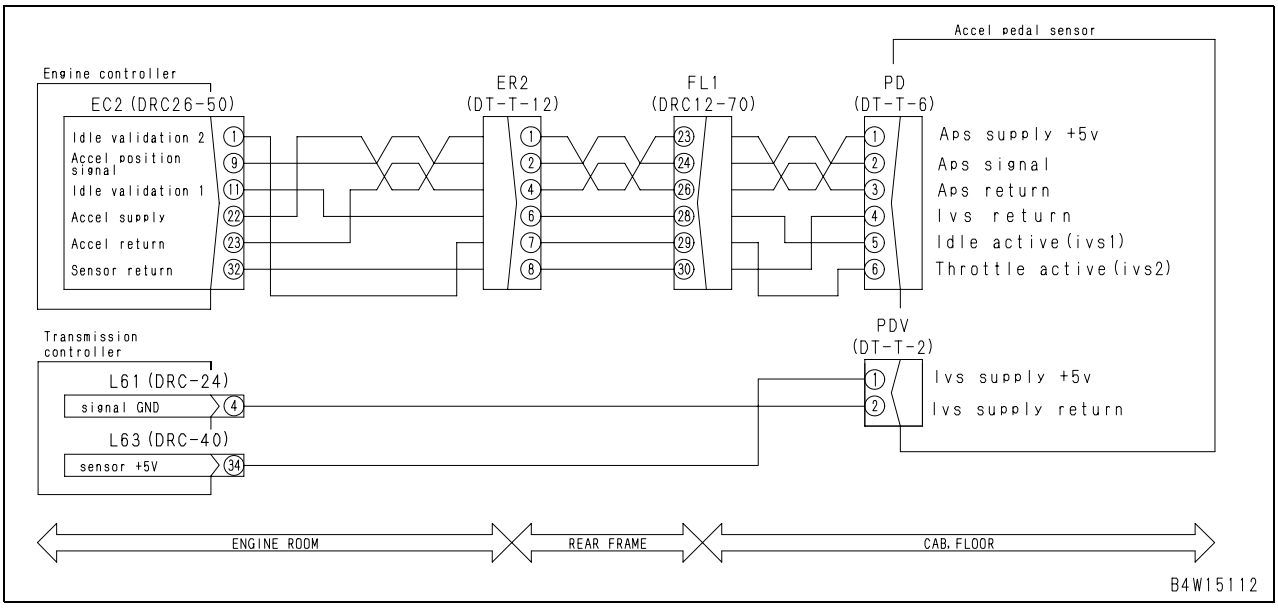
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Failure code [CA2186] (Throttle sensor power supply voltage low error)

Action code	Failure code	Trouble	Throttle sensor power supply voltage low error (Engine controller system)
E03	**CA2186**		
Contents of trouble	• Low voltage occurred in throttle sensor power supply circuit.		
Action of controller	• Runs the engine at position of throttle 0% when accelerator pedal is OFF and at 50% when it is ON. • Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• The engine does not reach full throttle.		
Related information	• Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Ground fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between EC2 (female) (22) – PD (female) (1) and chassis ground	Resistance	Min. 100 kΩ
	2	Short circuit in wiring harness (with another wiring harness)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness among all pins between EC2 (female) (9) – EC2 (female) (PD, too, is disconnected.)	Resistance	Min. 100 kΩ
	3	Defective wiring harness connector	Connecting parts among fuel control dial, engine unit wiring harness, and engine controller are suspected. Inspect them directly. • Loose connector, broken lock, broken seal • Corrosive, bent, broken, forced-in, or extended pin • Humidity in connector, entry of dirt or dust, poor insulation		
	4	Defective engine controller	If causes 1 – 3 are not detected, engine controller may be defective. (Since trouble is in system, troubleshooting cannot be carried out.)		

Circuit diagram related to accelerator pedal



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WA430-6 Wheel loader

Form No. SEN01740-05

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WHEEL LOADER

WA430-6

Machine model	Serial number
WA430-6	65001 and up

40 Troubleshooting

Troubleshooting by failure code (Display of code), Part 4

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Failure code [CA2249] (Supply pump pressure very low error 2)

Action code	Failure code	Trouble	Supply pump pressure very low error 2 (Engine controller system)
E03	**CA2249**		
Contents of trouble	• No-pressure feed (2) occurred in common rail circuit.		
Action of controller	• Limits output and continues operation. • Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• Starting performance is poor. • Exhaust smoke is black. • Engine output lowers.		
Related information	• The input state (common rail pressure) from the common rail pressure sensor can be checked with the monitoring function (Code: 36400, RAIL PRESS). • The input state (voltage) from the common rail pressure sensor can be checked with the monitoring function (Code: 36402, RAIL PRESS). • Method of reproducing failure code: Start engine		

Possible causes and standard value in normal state	Causes	Standard value in normal state/Remarks on troubleshooting
	1	Carry out troubleshooting for failure code [**CA559**].

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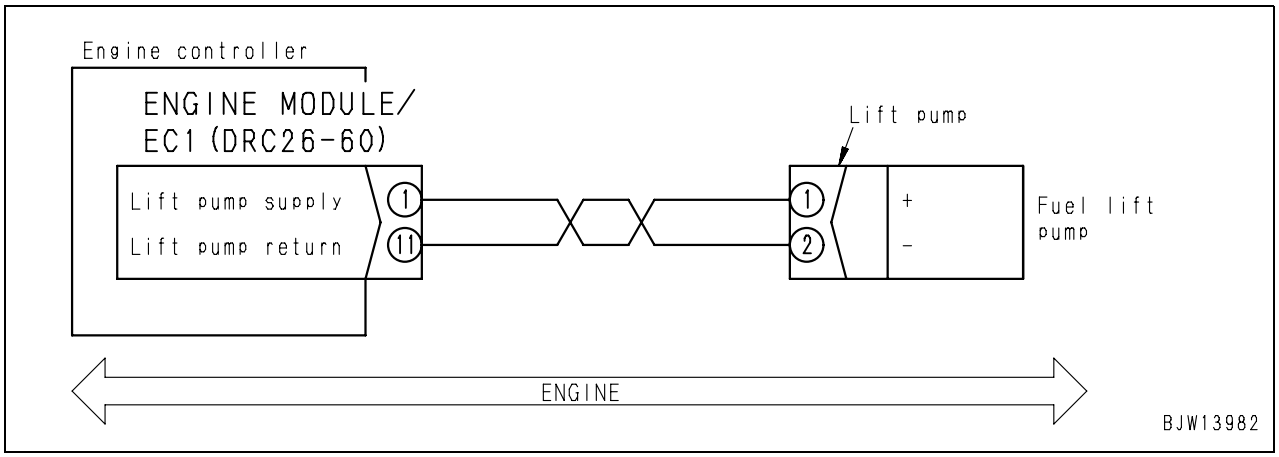
Failure code [CA2265] (Abnormally high level in electric lift pump)

Action code	Failure code	Trouble	Abnormally high level in electric lift pump
E03	**CA2265**		
Contents of trouble	• There is disconnection in electric lift pump actuator drive circuit.		
Action of controller	• None in particular.		
Problem that appears on machine	• Starting performance is poor.		
Related information	• Method of reproducing failure code: Starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective electric lift pump (Internal short circuit, disconnection)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			LIFT PUMP (female)	Resistance		
			Between (1) – (2)	Max. 20 Ω		
	2	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 EC1 (female) (1) – LIFT PUMP (female) (1)	Resistance	Max. 10 Ω	
			Wiring harness between EC1 (female) (11) – LIFT PUMP (female) (2)	Resistance	Max. 10 Ω	
	3	Hot short (Short circuit with 12 V circuit) in wiring harness	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			Wiring harness between EC1 (female) (1) – LIFT PUMP (female) (1)	Voltage	Max. 6 V	
	4	Short circuit in wiring harness (With another wiring harness)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness among all pins between EC1 (female) (1) – EC1 (female) (With all connectors of wiring harness disconnected)	Resistance	Min. 100 kΩ	
	5	Defective wiring harness connector	Connecting parts among common rail pressure sensor, engine wiring harness, and engine controller are suspected. Inspect them directly. • Loose connector, broken lock, broken seal • Corrosive, bent, broken, forced-in, or extended pin • Humidity in connector, entry of dirt or dust, poor insulation			
	6	Defective engine controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			EC1 (female)	Resistance		
			Between (1) – (11)	Max. 20 Ω		

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Circuit diagram related to electric lift pump actuator



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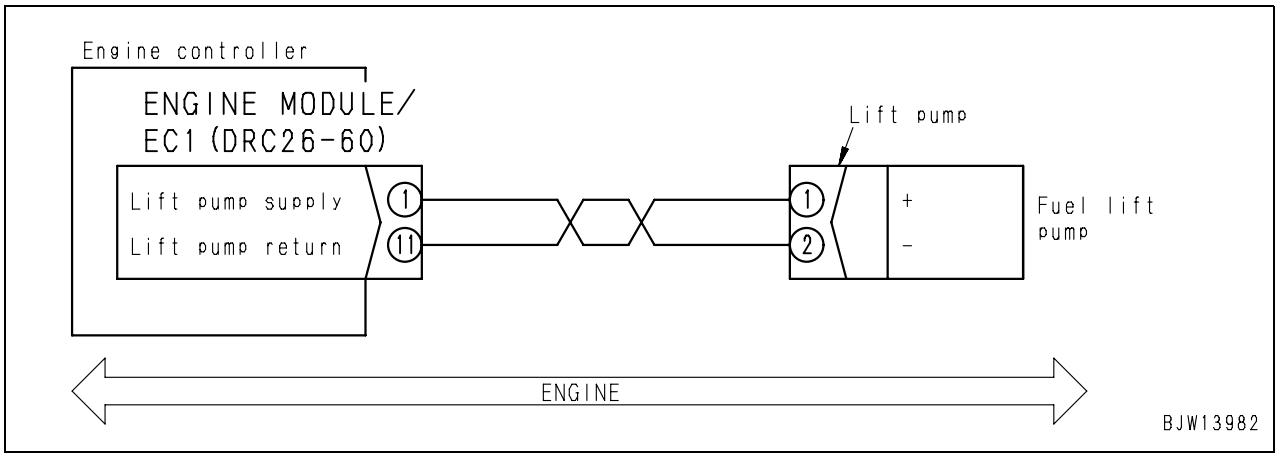
Failure code [CA2266] (Abnormally low level in electric lift pump)

Action code	Failure code	Trouble	Abnormally low level in electric lift pump
E03	**CA2266**		
Contents of trouble	• There is short circuit in electric lift pump actuator drive circuit.		
Action of controller	• None in particular.		
Problem that appears on machine	• Starting performance is poor.		
Related information	• Method of reproducing failure code: Starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective electric lift pump (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			LIFT PUMP (female)	Resistance		
			Between (1) – (2)	Max. 20 Ω		
			Between (1) – chassis ground	Min. 100 kΩ		
	2	Ground fault in wiring harness (Short circuit with GND circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between EC1 (female) (1) – LIFT PUMP (female) (1)	Resistance	Max. 100 kΩ	
	3	Hot short in wiring harness (Short circuit with 24 V circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			Wiring harness between EC1 (female) (1) – LIFT PUMP (female) (1) – chassis ground	Voltage	Max. 6 V	
	4	Short circuit in wiring harness (With another wiring harness)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness among all pins between EC1 (female) (1) – EC1 (female) (With all connectors of wiring harness disconnected)	Resistance	Min. 100 kΩ	
	5	Defective wiring harness connector	Connecting parts among common rail pressure sensor, engine wiring harness, and engine controller are suspected. Inspect them directly. • Loose connector, broken lock, broken seal • Corrosive, bent, broken, forced-in, or extended pin • Humidity in connector, entry of dirt or dust, poor insulation			
	6	Defective engine controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			EC1 (female)	Resistance		
			Between (1) – (11)	Max. 20 Ω		
			Between (1) – chassis ground	Min. 100 kΩ		

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Circuit diagram related to electric lift pump actuator



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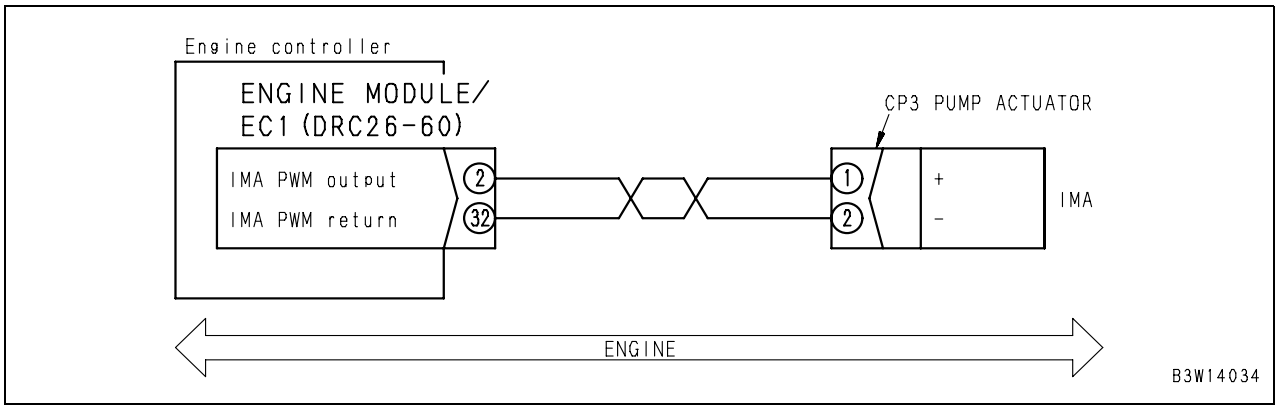
Failure code [CA2311] (Abnormality in IMV solenoid)

Action code	Failure code	Trouble	Abnormality in IMV solenoid (Engine controller system)
E03	**CA2311**		
Contents of trouble	• Resistance in supply pump actuator circuit is abnormally high or low.		
Action of controller	• Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• Engine output drops.		
Related information	• Method of reproducing failure code: Start engine		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defect in related system	If another code is displayed, carry out troubleshooting for it.		
	2	Defective supply pump actuator	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			CP3 PUMP ACTUATOR (male)	Resistance	
			Between (1) and (2)	Max. 5 Ω	
			Between (1) and chassis ground	Min. 100 kΩ	
	3	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between EC1 (female) (2) – CP3 PUMP ACTUATOR (female) (1)	Resistance	Max. 5 Ω
			Wiring harness between EC1 (female) (32) – CP3 PUMP ACTUATOR (female) (2)	Resistance	Max. 5 Ω
	4	Ground fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between EC1 (female) (2) – CP3 PUMP ACTUATOR (female) (1) and chassis ground	Resistance	Min. 100 kΩ
	5	Defective wiring harness connector	Connecting parts among supply pump actuator, engine wiring harness, and engine controller are suspected. Inspect them directly. • Loose connector, broken lock, broken seal • Corrosive, bent, broken, forced-in, or extended pin • Humidity in connector, entry of dirt or dust, poor insulation		
	6	Defective engine controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			EC1 (female)	Resistance	
			Between (2) and (32)	Max. 5 Ω	
			Between (2) and chassis ground	Min. 100 kΩ	

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Circuit diagram related to supply pump (metering unit)



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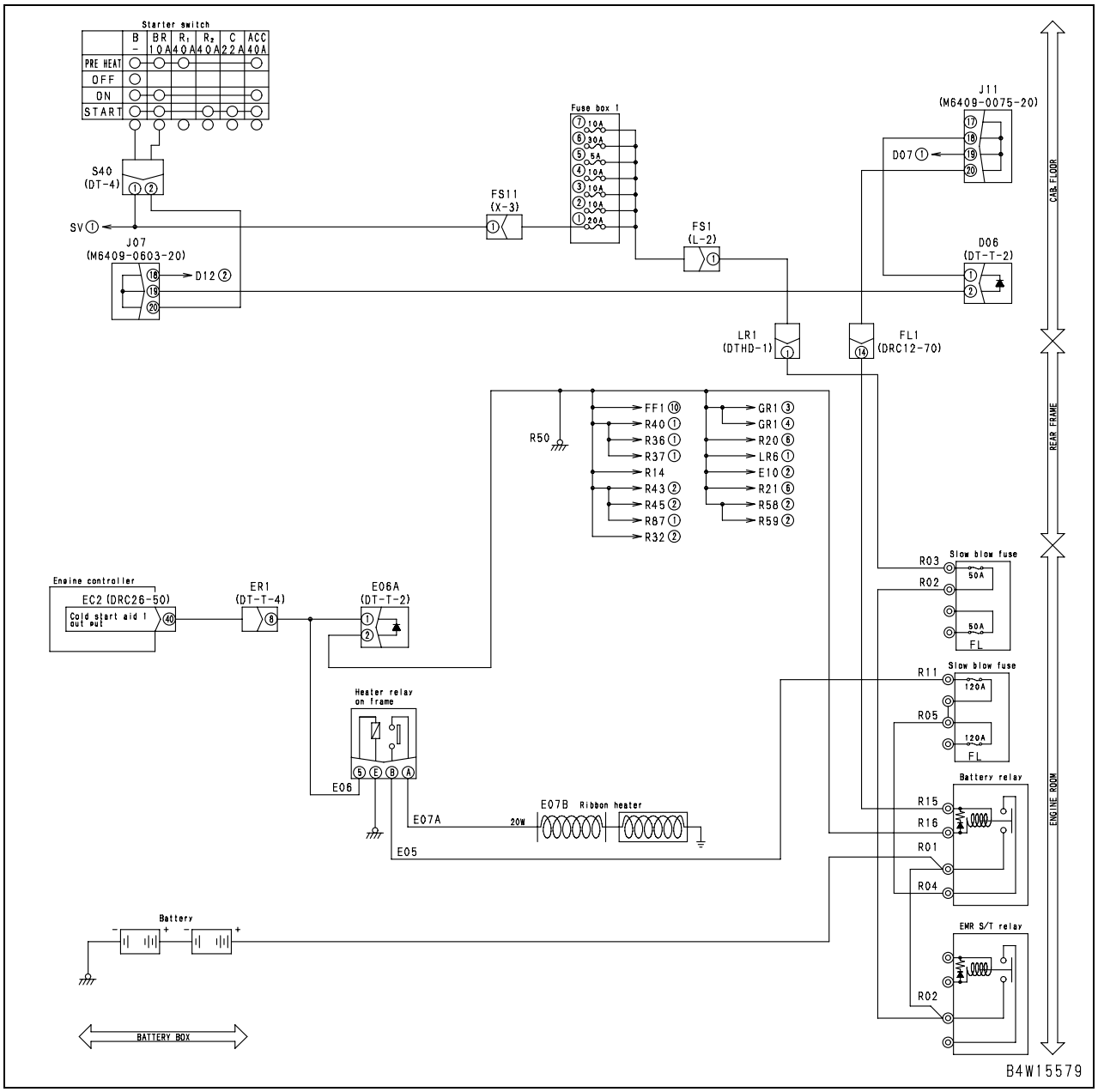
Failure code [CA2555] (Intake heater relay disconnection error)

Action code	Failure code	Trouble	Intake heater relay disconnection error (Engine controller system)
E01	**CA2555**		
Contents of trouble	• There is disconnection in intake air heater relay.		
Action of controller	• None in particular.		
Problem that appears on machine	• Intake air heater does not function. (Poor starting performance, white exhaust smoke at low temperature)		
Related information	• Method of reproducing failure code: Turn the starting switch ON when coolant temperature is –4°C or lower.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective heater relay (Internal disconnection)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON. (Test relay unit).		
			Between E06 and chassis ground	Resistance	
				300 – 600 Ω	
			★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting. (Test by replacing relay unit.)		
			When heater relay is replaced with a relay of the same type, if the condition becomes normal, the heater relay is defective.		
	2	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between EC2 (female) (40) – E06	Resistance	Max. 10 Ω
			Wiring harness between primary side of heater relay – chassis ground	Resistance	Max. 10 Ω
	3	Short circuit in wiring harness (with another wiring harness)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness among all pins between EC2 (female) (40) – EC2 (female) (E06, too, is disconnected.)	Resistance	Min. 100 kΩ
	4	Defective wiring harness connector	Connecting parts among heater relay, engine unit wiring harness, and engine controller are suspected. Inspect them directly. • Loose connector, broken lock, broken seal • Corrosive, bent, broken, forced-in, or extended pin • Humidity in connector, entry of dirt or dust, poor insulation		
	5	Defective engine controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			EC2 (female)	Resistance	
			Between (40) and chassis ground	300 – 600 Ω	

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Circuit diagram related to intake heater relay



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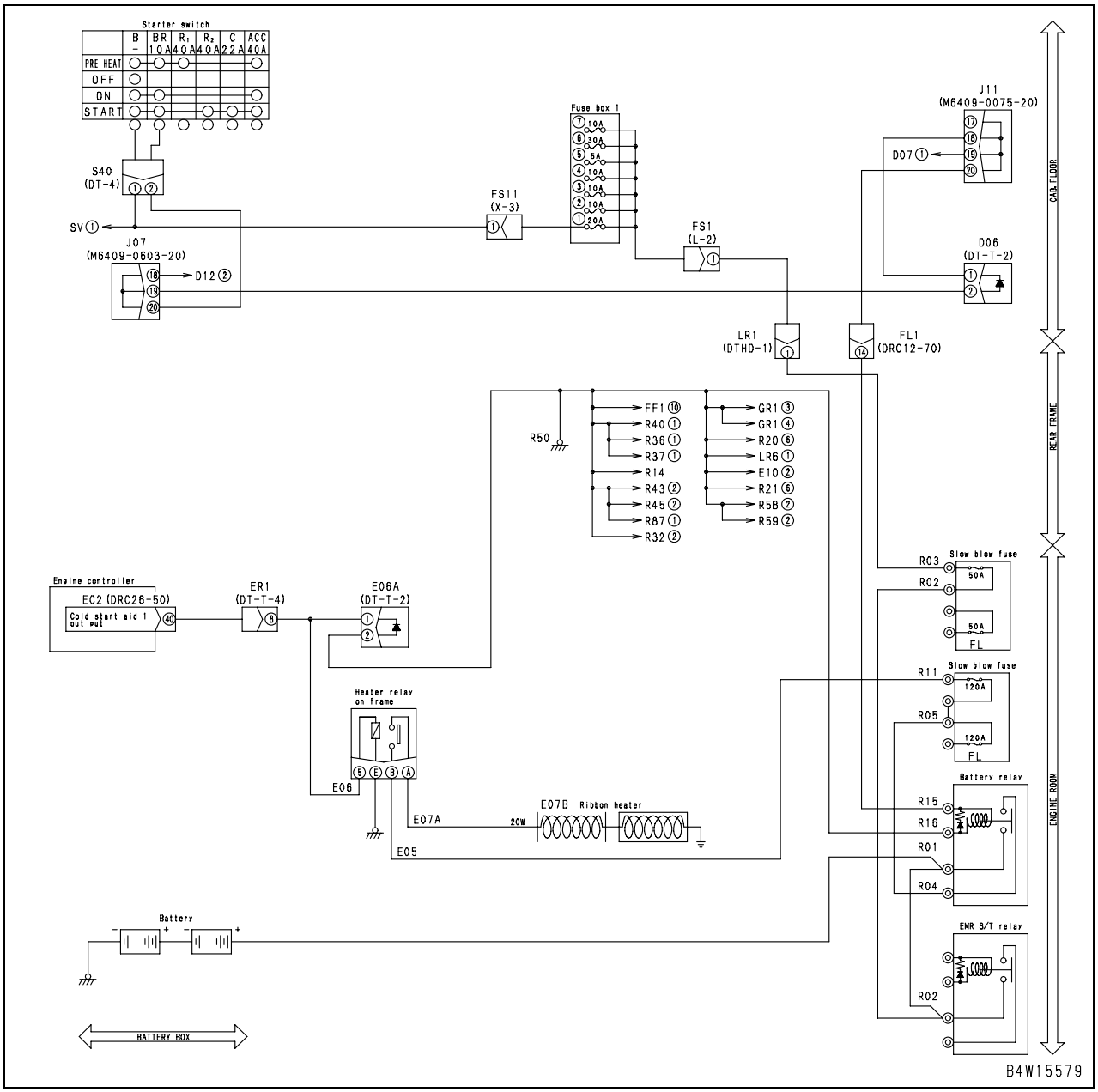
Failure code [CA2556] (Intake heater relay short circuit error)

Action code	Failure code	Trouble	Intake heater relay short circuit error (Engine controller system)
E01	**CA2556**		
Contents of trouble	• There is short circuit in intake air heater relay.		
Action of controller	• None in particular.		
Problem that appears on machine	• Intake air heater does not function. (Poor starting performance, white exhaust smoke at low temperature)		
Related information	• Method of reproducing failure code: Turn the starting switch ON when coolant temperature is –4°C or lower.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective heater relay (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON. (Test relay unit).		
			Between E06 and chassis ground	Resistance	
				300 – 600 Ω	
			★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting. (Test by replacing relay unit.)		
			When heater relay is replaced with a relay of the same type, if the condition becomes normal, the heater relay is defective.		
	2	Ground fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between EC2 (female) (40) – E06	Resistance	Min. 100 kΩ
	3	Short circuit in wiring harness (with another wiring harness)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness among all pins between EC2 (female) (40) – EC2 (female) (E06, too, is disconnected.)	Resistance	Min. 100 kΩ
	4	Defective wiring harness connector	Connecting parts among heater relay, engine unit wiring harness, and engine controller are suspected. Inspect them directly. • Loose connector, broken lock, broken seal • Corrosive, bent, broken, forced-in, or extended pin • Humidity in connector, entry of dirt or dust, poor insulation		
	5	Defective engine controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			EC2 (female)	Resistance	
			Between (40) and chassis ground	300 – 600 Ω	

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Circuit diagram related to intake heater relay



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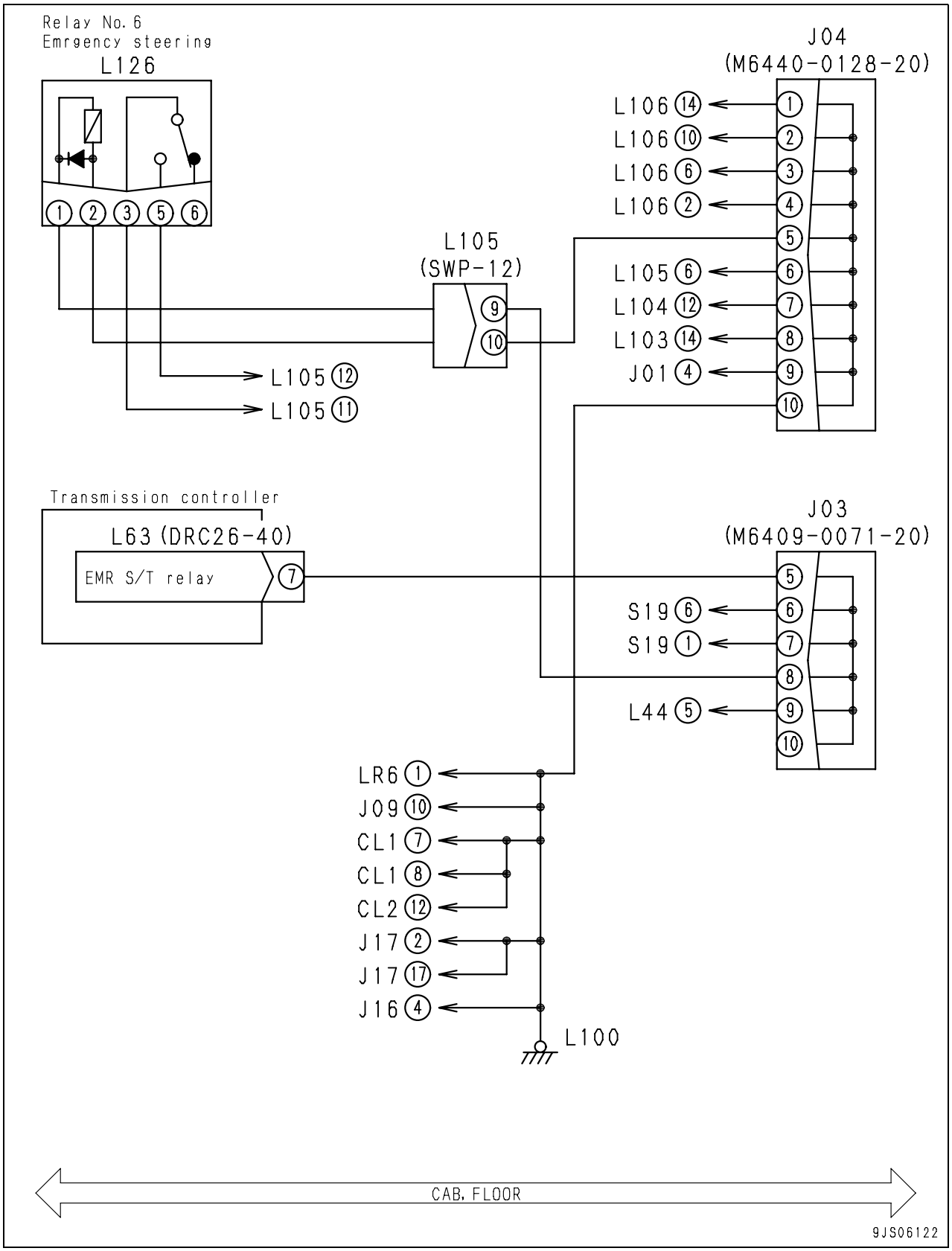
Failure code [D150KA] (Emergency steering relay: Disconnection)

Action code	Failure code	Trouble	Emergency steering relay: Disconnection (Transmission controller)
E03	**D150KA**		
Contents of trouble	• Since the emergency steering relay output system is disconnect, signals are not output to the emergency steering relay.		
Action of controller	• Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• If abnormality is detected in the steering pressure, operation of the automatic emergency steering becomes unavailable. • Self-check of the emergency steering is ended abnormally.		
Related information	• The output state (ON/OFF) to the emergency steering relay can be checked with the monitoring function (Code: 90949, D-OUT-0). • Method of reproducing failure code: Start engine, then operate the steering.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective emergency steering relay (L126) (Internal disconnection)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			When emergency steering relay (L126) is replaced with a relay of the same type, if the condition becomes normal, the emergency steering relay is defective.		
			★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			L126 (male)	Resistance	
			Between (1) and (2)	200 – 400 Ω	
	2	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between L63 (female) (7) – L126 (female) (1)	Resistance	Max. 1 Ω
			Wiring harness between L126 (female) (2) – chassis ground	Resistance	Max. 1 Ω
	3	Defective transmission controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			L63 (female)	Resistance	
			Between (7) and chassis ground	200 – 400 Ω	

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Circuit diagram related to emergency steering relay



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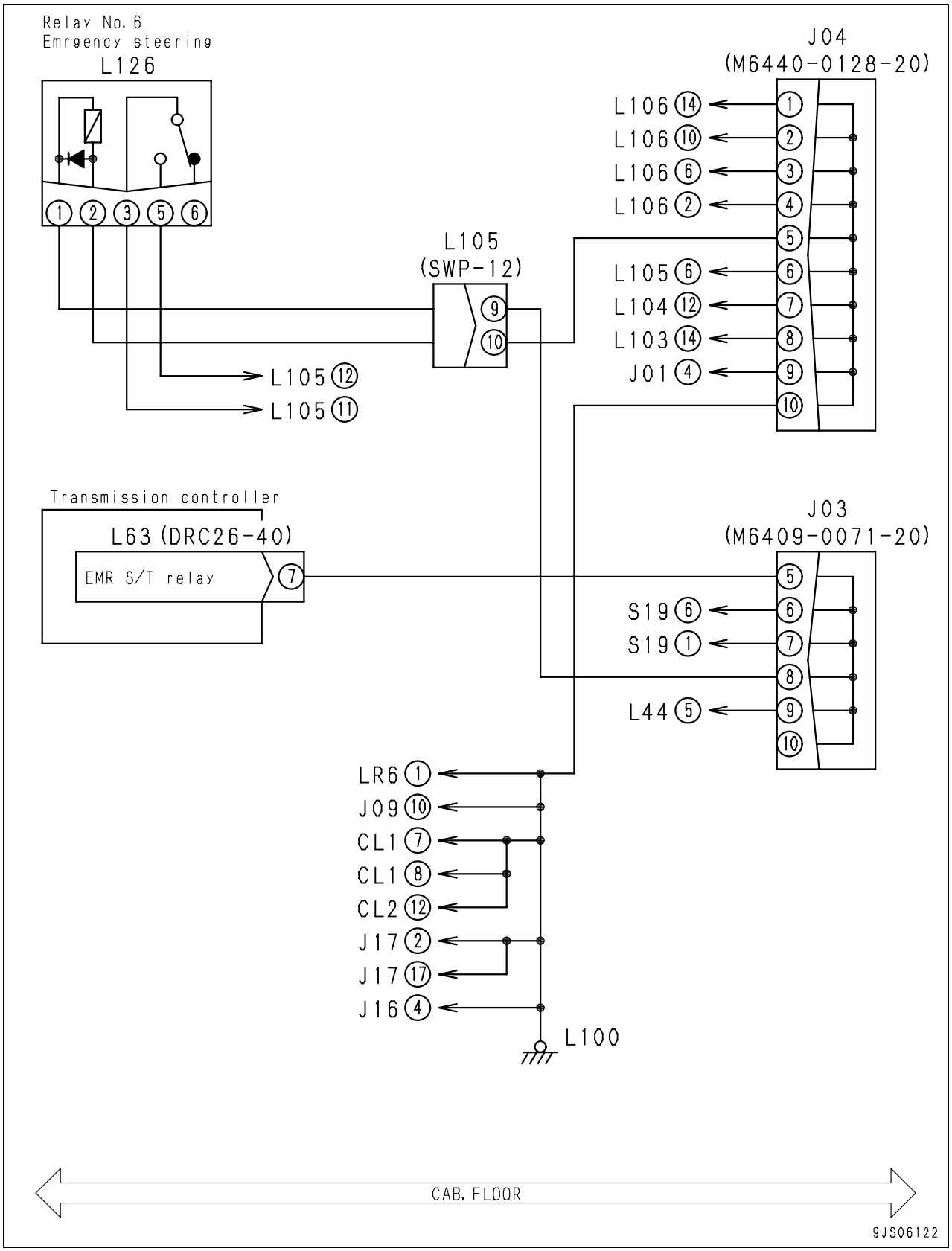
Failure code [D150KB] (Emergency steering relay: Short circuit)

Action code	Failure code	Trouble	Emergency steering relay: Short circuit (Transmission controller)
E03	**D150KB**		
Contents of trouble	• Since the emergency steering relay output system is shorted, signals are not output to the emergency steering relay.		
Action of controller	• Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• If abnormality is detected in the steering pressure, operation of the automatic emergency steering becomes unavailable. • Self-check of the emergency steering is ended abnormally.		
Related information	• The output state (ON/OFF) to the emergency steering relay can be checked with the monitoring function (Code: 90949, D-OUT-0). • Method of reproducing failure code: Start engine and then operate the steering.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective emergency steering relay (L126) (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			When emergency steering relay (L126) is replaced with a relay of the same type, if the condition becomes normal, the emergency steering relay is defective.		
			★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			L126 (male)	Resistance	
			Between (1) and (2)	200 – 400 Ω	
			Between (1), (2) and chassis ground	Min. 1 MΩ	
	2	Ground fault in wiring harness (Short circuit with GND circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between L63 (female) (7) – L126 (female) (1) and chassis ground	Resistance	Min. 1 MΩ
	3	Defective transmission controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			L63 (female)	Resistance	
			Between (7) and chassis ground	200 – 400 Ω	

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Circuit diagram related to emergency steering relay



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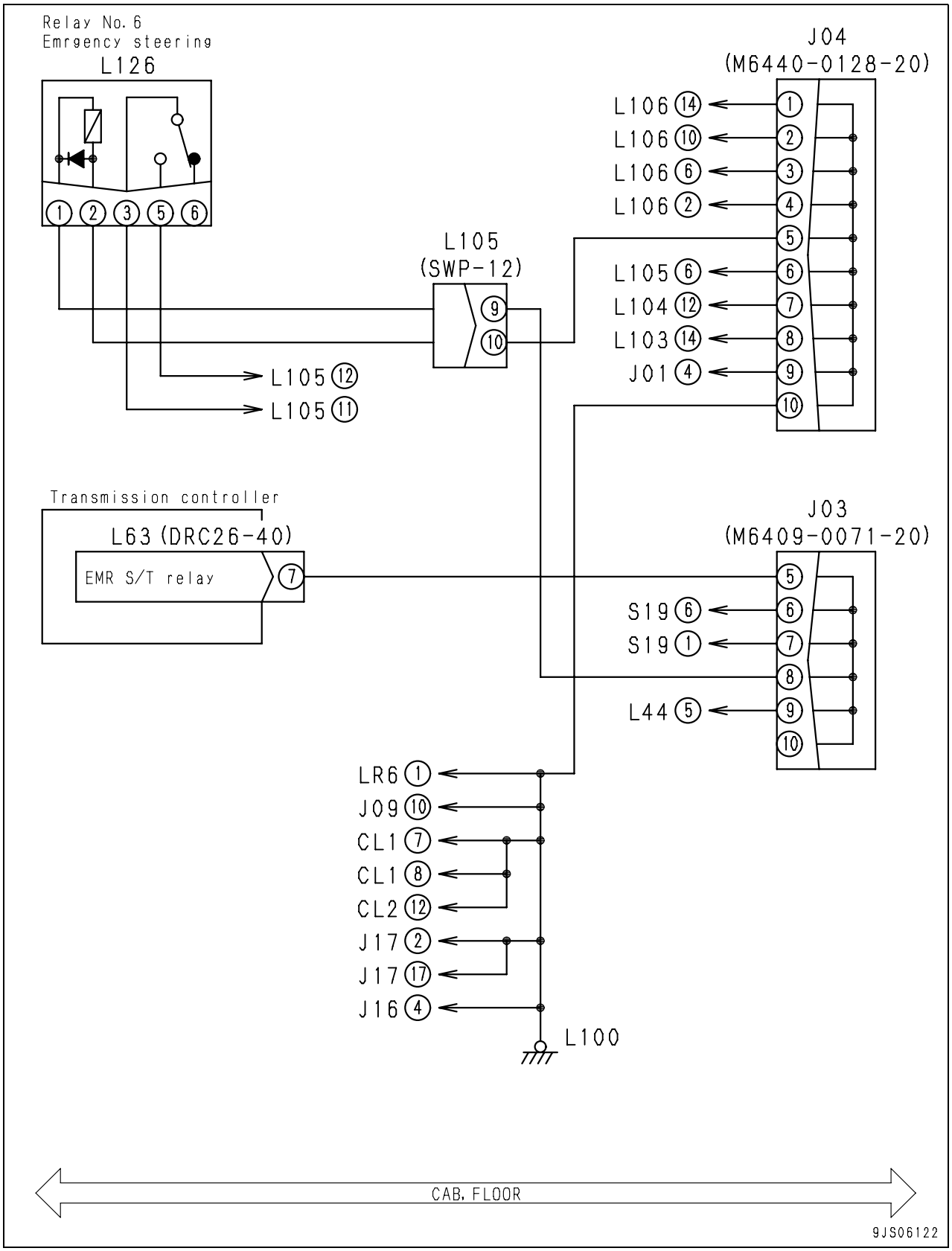
Failure code [D150KY] (Emergency steering relay: Short circuit with power supply line)

Action code	Failure code	Trouble	Emergency steering relay: Short circuit with power supply line (Transmission controller)
E03	**D150KY**		
Contents of trouble	• Since the emergency steering relay output system is shorted with the power source, signal output to the emergency steering relay is continued.		
Action of controller	• Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• The emergency steering is activated during travel (resulting in seizure of the emergency steering motor).		
Related information	• The output state (ON/OFF) to the emergency steering relay can be checked with the monitoring function (Code: 90949, D-OUT-0). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective emergency steering relay (L126) (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			When emergency steering relay (L126) is replaced with a relay of the same type, if the condition becomes normal, the emergency steering relay is defective.		
			★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			L126 (male)	Resistance	
			Between (1) and (2)	200 – 400 Ω	
			Between (1), (2) and chassis ground	Min. 1 MΩ	
	2	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			Wiring harness between L63 (female) (7) – L126 (female) (1) and chassis ground	Voltage	Max. 1 V
	3	Defective transmission controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			L63 (female)	Resistance	
			Between (7) and chassis ground	200 – 400 Ω	

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Circuit diagram related to emergency steering relay



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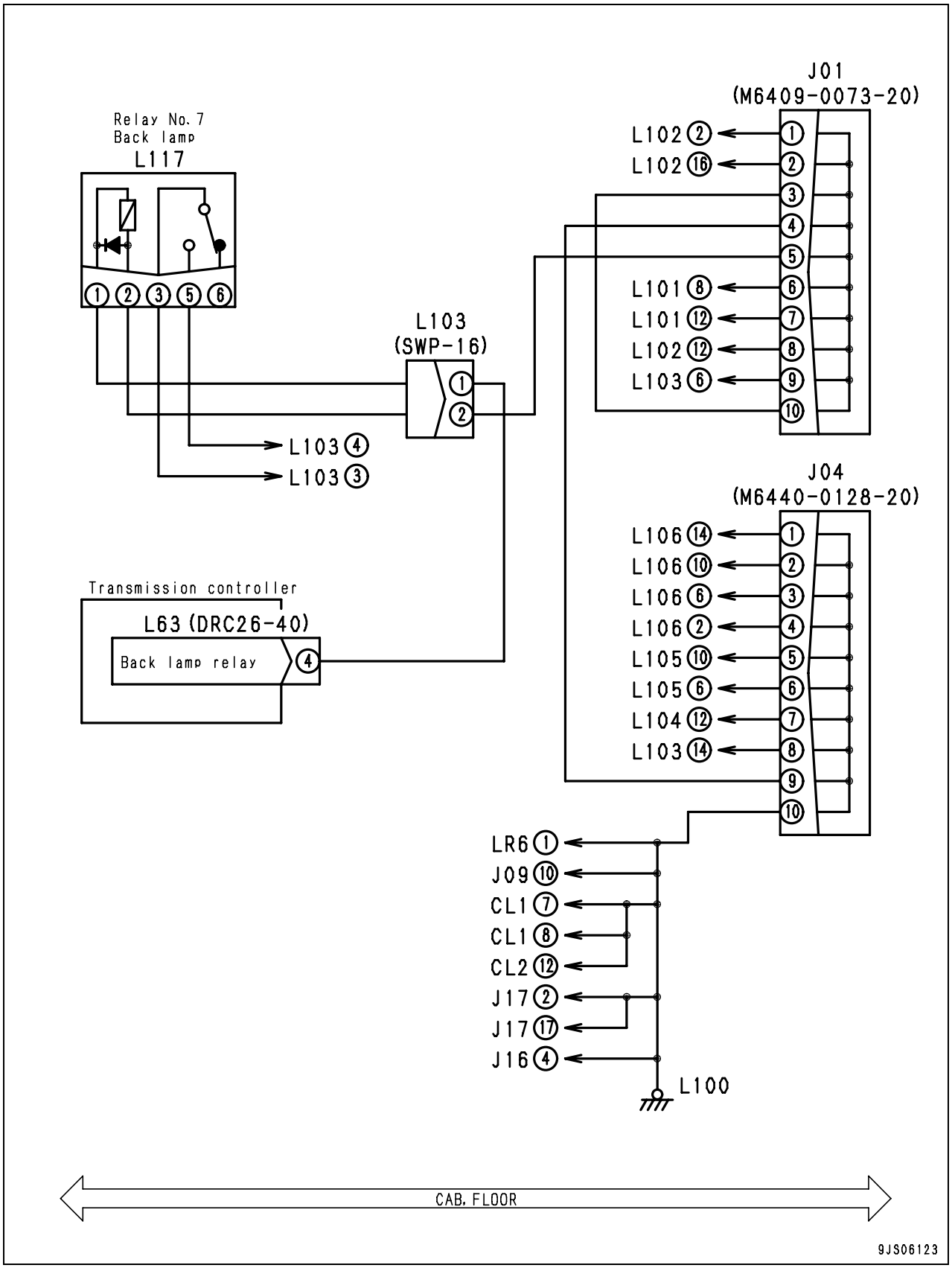
Failure code [D160KA] (Backup lamp relay: Disconnection)

Action code	Failure code	Trouble	Backup lamp relay: Disconnection (Transmission controller)
E01	**D160KA**		
Contents of trouble	• Since the backup lamp relay output system is disconnected, signals are not output to the backup lamp relay. • Since the backup lamp relay output system is shorted with the power source, signal output to the backup lamp relay is continued.		
Action of controller	• Turns the output to the backup lamp relay OFF. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• The backup lamp does not light up (disconnection). • The backup buzzer does not sound (disconnection). • The backup lamp remains turned on (hot short). • The backup buzzer sound does not stop (hot short).		
Related information	• The output state (ON/OFF) to the backup lamp relay can be checked with the monitoring function (Code: 90951, D-OUT-20). • Method of reproducing failure code: Turn the starting switch ON, and set FNR (directional) lever, joystick steering FNR (directional) switch, or right FNR (directional) switch to R (reverse).		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective backup lamp relay (L117) (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			When backup lamp relay (L117) is replaced with a relay of the same type, if the condition becomes normal, the backup lamp relay is defective.			
			★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L117 (male)		Resistance	
			Between (1) and (2)		200 – 400 Ω	
	2	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L63 (female) (4) – L117 (female) (1)		Resistance	Max. 1 Ω
			Wiring harness between L117 (female) (2) – chassis ground		Resistance	Max. 1 Ω
	3	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			Wiring harness between L63 (female) (4) – L117 (female) (1) and chassis ground		Voltage	Max. 1 V
	4	Defective transmission controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			L63	FNR (directional) lever, joystick steering FNR (directional) switch or right FNR (directional) switch	Voltage	
			Between (4) and chassis ground	R (Reverse)	20 – 30 V	
				Other than above	Max. 1 V	

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Circuit diagram related to backup lamp relay



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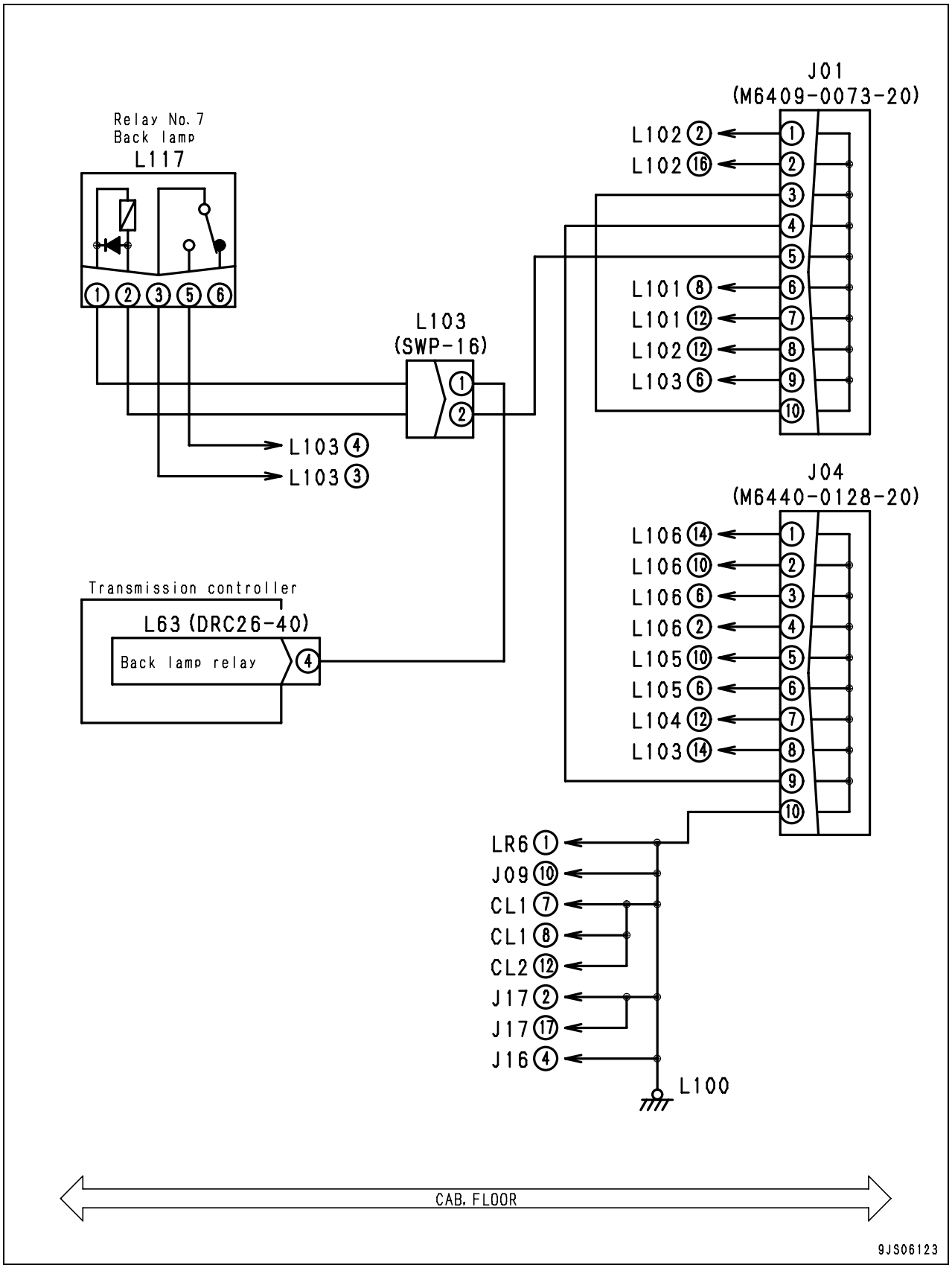
Failure code [D160KB] (Backup lamp relay: Short circuit)

Action code	Failure code	Trouble	Backup lamp relay: Short circuit (Transmission controller)
E01	**D160KB**		
Contents of trouble	• Since the backup lamp relay output system is shorted, signals are not output to the backup lamp relay.		
Action of controller	• Turns the output to the backup lamp relay OFF. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• The backup lamp does not light up. • The backup buzzer does not sound.		
Related information	• The output state (ON/OFF) to the backup lamp relay can be checked with the monitoring function (Code: 90951, D-OUT-20). • Method of reproducing failure code: Turn the starting switch ON, and set FNR (directional) lever, joystick steering FNR (directional) switch, or right FNR (directional) switch to R (reverse).		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective backup lamp relay (L117) (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			When backup lamp relay (L117) is replaced with a relay of the same type, if the condition becomes normal, the backup lamp relay is defective.		
			★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			L117 (male)	Resistance	
			Between (1) and (2)	200 – 400 Ω	
	2	Ground fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between L63 (female) (4) – L117 (female) (1) and chassis ground	Resistance	Min. 1 MΩ
	3	Defective transmission controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			L63	FNR (directional) lever, joystick steering FNR (directional) switch or right FNR (directional) switch	Voltage
			Between (4) and chassis ground	R (Reverse)	20 – 30 V
				Other than above	Max. 1 V

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Circuit diagram related to backup lamp relay



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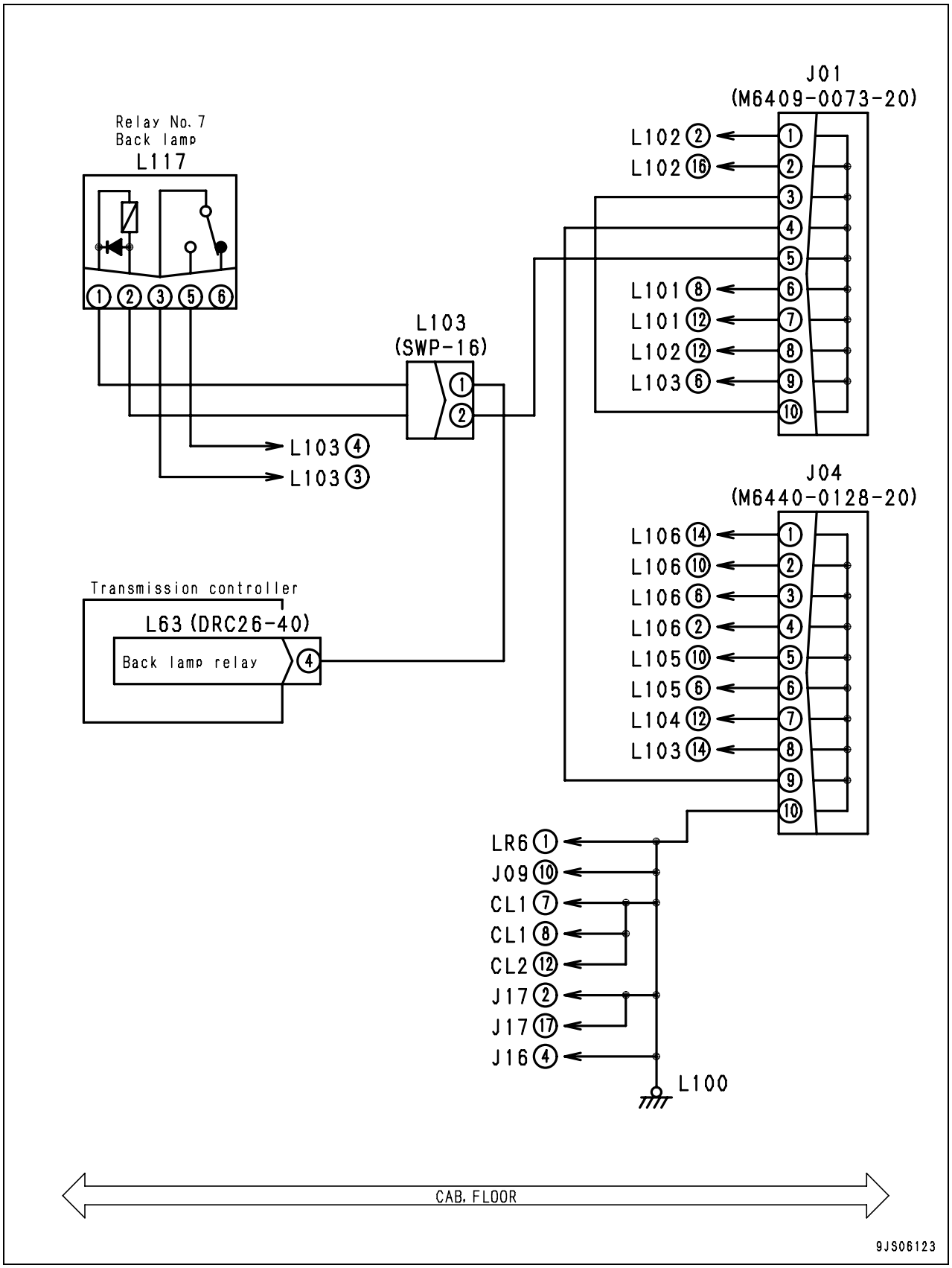
Failure code [D160KZ] (Backup lamp relay: Disconnection or short circuit)

Action code	Failure code	Trouble	Backup lamp relay: Disconnection or short circuit (Transmission controller)
E01	**D160KZ**		
Contents of trouble	• Since the backup lamp relay output system is shorted, signals are not output to the backup lamp relay.		
Action of controller	• Turns the output to the backup lamp relay OFF. • When ground fault occurred, even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• The backup lamp does not light up. • The backup buzzer does not sound.		
Related information	• The output state (ON/OFF) to the backup lamp relay can be checked with the monitoring function (Code: 90951, D-OUT-20). • Method of reproducing failure code: Turn the starting switch ON, and set FNR (directional) lever, joystick steering FNR (directional) switch, or right FNR (directional) switch to R (reverse).		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective backup lamp relay (L101) (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			When backup lamp relay (L117) is replaced with a relay of the same type, if the condition becomes normal, the backup lamp relay is defective.			
			★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L117 (male)		Resistance	
			Between (1) and (2)		200 – 400 Ω	
			Between (1), (2) and chassis ground		Min. 1 MΩ	
	2	Ground fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L63 (female) (4) – L117 (female) (1)		Resistance	Max. 1 Ω
	3	Defective transmission controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			L63	FNR (directional) lever, joystick steering FNR (directional) switch or right FNR (directional) switch	Voltage	
			Between (4) and chassis ground	R (Reverse)	20 – 30 V	
				Other than above	Max. 1 V	

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Circuit diagram related to backup lamp relay



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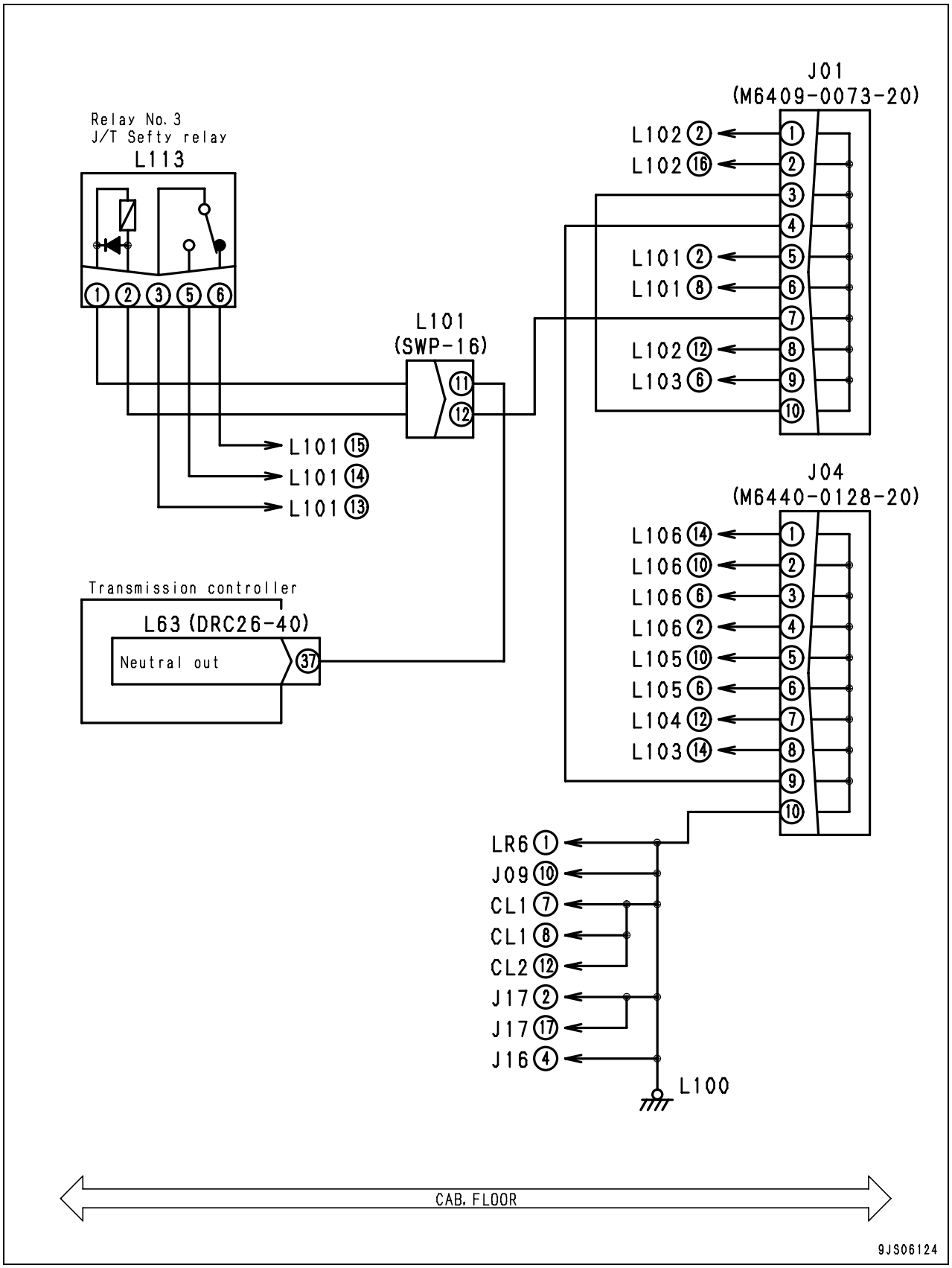
Failure code [D191KA] (Joystick steering neutral safety relay: Disconnection)

Action code	Failure code	Trouble	Joystick steering neutral safety relay: Disconnection (Transmission controller system)
E01	**D191KA**		
Contents of trouble	• Since the output system of the joystick steering neutral safety relay is disconnected, signals are not output to the neutral safety relay.		
Action of controller	• If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• While operating joystick steering, engine can be started (Steering moves immediately after engine start). • Starting of the engine is available even when the joystick steering FNR (directional) switch or right FNR (directional) switch is not set to N (neutral).		
Related information	• When the neutral position adjustment (initial setting) is not done for the joystick steering, the neutral safety relay does not work. • The output state (ON/OFF) to the neutral safety relay can be checked with the monitoring function (Code: 40954, D-OUT-20). • Only for joystick steering • Method of reproducing failure code: Turn the starting switch ON and operate the joystick steering (with the engine being stopped).		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective joystick steering neutral safety relay (L113) (Internal disconnection)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L113 (male)	Resistance		
			Between (1) and (2)	200 – 400 Ω		
	2	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L63 (female) (37) – L113 (female) (1)	Resistance	Max. 1 Ω	
			Wiring harness between L113 (female) (2) – chassis ground	Resistance	Max. 1 Ω	
	3	Defective transmission controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting. • Operate the joystick steering lever.			
			L63	Voltage		
			Between (37) and chassis ground	20 – 30 V		

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Circuit diagram related to joystick steering neutral safety relay



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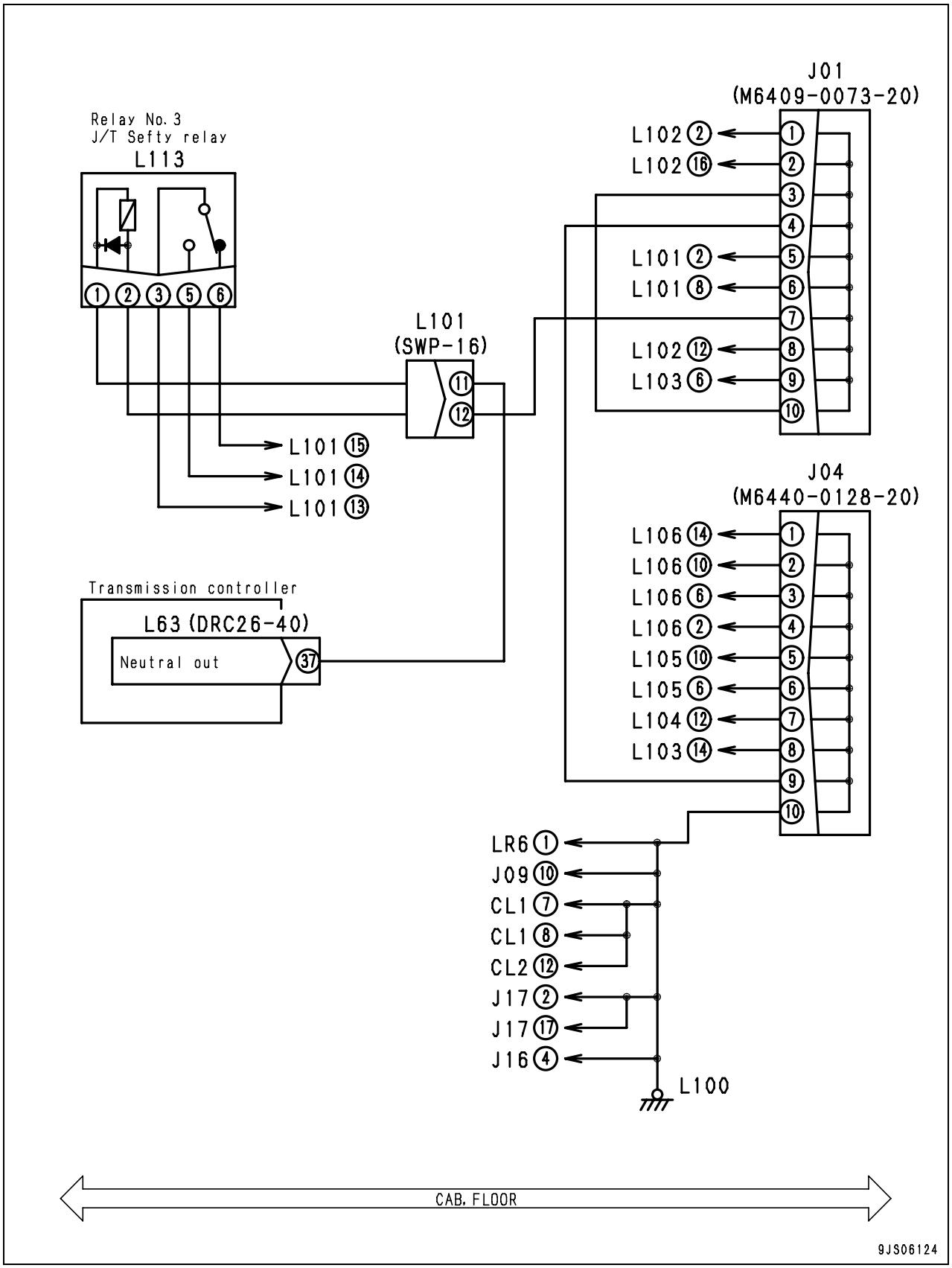
Failure code [D191KB] (Joystick steering neutral safety relay: Short circuit)

Action code	Failure code	Trouble	Joystick steering neutral safety relay: Short circuit (Transmission controller system)
E01	**D191KB**		
Contents of trouble	• Since the output system of the joystick steering neutral safety relay is shorted, signals are not output to the neutral safety relay.		
Action of controller	• Turns the output to the joystick steering neutral safety relay OFF. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• While operating joystick steering, engine can be started (Steering moves immediately after engine start). • Starting of the engine is available even when the joystick steering FNR (directional) switch or right FNR (directional) switch is not set to N (neutral).		
Related information	• When the neutral position adjustment (initial setting) is not done for the joystick steering, the neutral safety relay does not work. • As long as the failure code is turned on, the work equipment controller does not output signals to the joystick steering neutral safety relay. • The output state (ON/OFF) to the neutral safety relay can be checked with the monitoring function (Code: 40954, D-OUT-20). • Only for joystick steering • Method of reproducing failure code: Turn the starting switch ON and operate the joystick steering (with the engine being stopped).		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective joystick steering neutral safety relay (L113) (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L113 (male)	Resistance		
			Between (1) and (2)	200 – 400 Ω		
			Between (1), (2) and chassis ground	Min. 1 MΩ		
	2	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L63 (female) (37) – L113 (female) (1) and chassis ground	Resistance	Min. 1 MΩ	
	3	Defective transmission controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting. • Operate the joystick steering lever.			
			L63	Voltage		
			Between (37) and chassis ground	20 – 30 V		

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Circuit diagram related to joystick steering neutral safety relay



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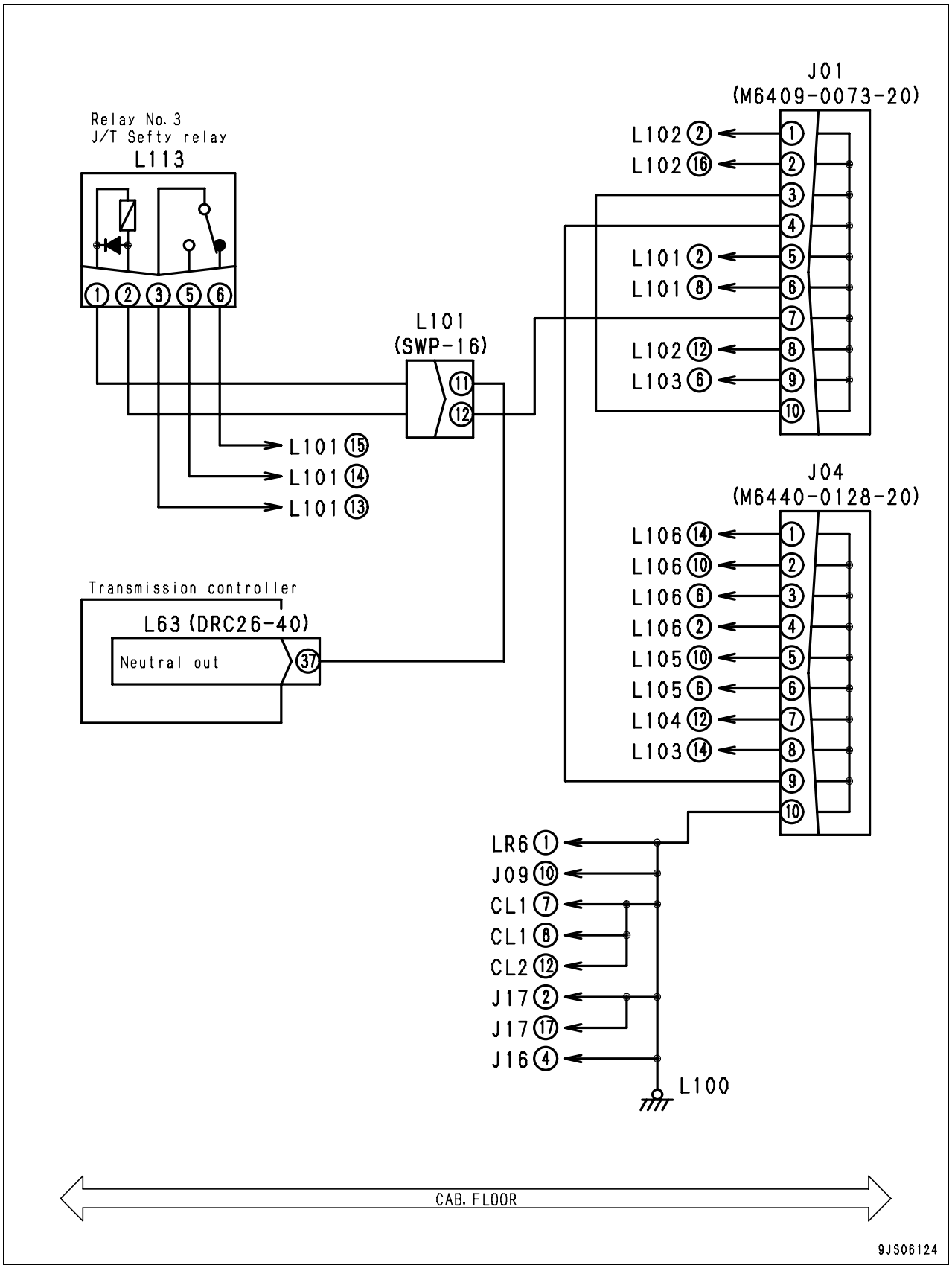
Failure code [D191KY] (Joystick steering neutral safety relay: Short circuit with power supply line)

Action code	Failure code	Trouble	Joystick steering neutral safety relay: Short circuit with power supply line (Transmission controller system)
E01	**D191KY**		
Contents of trouble	• Since the output system of the joystick steering neutral safety relay is shorted with the power source, signals are not output to the neutral safety relay.		
Action of controller	• Turns the output to the joystick steering neutral safety relay OFF. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• The engine does not start.		
Related information	• When the neutral position adjustment (initial setting) is not done for the joystick steering, the neutral safety relay does not work. • As long as the failure code is turned on, the work equipment controller does not output signals to the joystick steering neutral safety relay. • The output state (ON/OFF) to the neutral safety relay can be checked with the monitoring function (Code: 40954, D-OUT-20). • Only for joystick steering • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective joystick steering neutral safety relay (L113) (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			L113 (male)	Resistance	
			Between (1) and (2)	200 – 400 Ω	
			Between (1), (2) and chassis ground	Min. 1 MΩ	
	2	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			Wiring harness between L63 (female) (37) – L113 (female) (1) and chassis ground	Voltage	Max. 1 V
	3	Defective transmission controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting. • Operate the joystick steering lever.		
			L63	Voltage	
			Between (37) and chassis ground	20 – 30 V	

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Circuit diagram related to joystick steering neutral safety relay



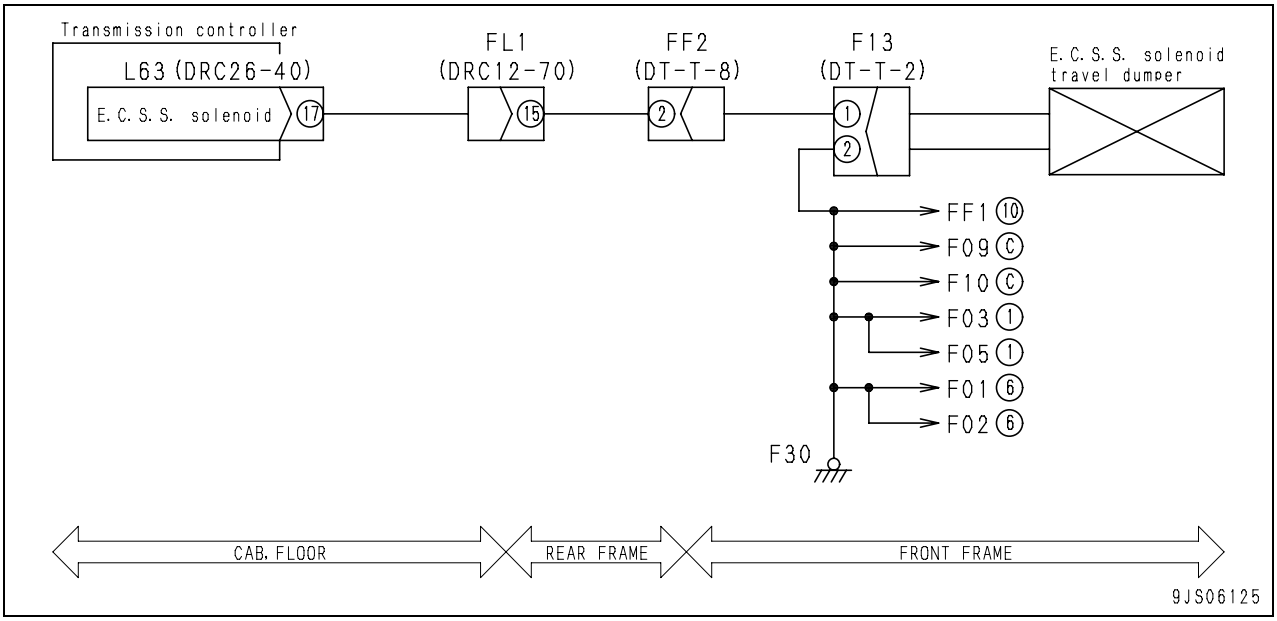
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Failure code [D192KA] (ECSS solenoid: Disconnection)

Action code	Failure code	Trouble	ECSS solenoid: Disconnection (Transmission controller)
E01	**D192KA**		
Contents of trouble	• Since the ECSS solenoid system is disconnected, no current flows when ECSS solenoid output is turned ON.		
Action of controller	• None in particular. • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• The ECSS does not operate.		
Related information	• The output state (ON/OFF) to the ECSS solenoid can be checked with the monitoring function (Code: 90949, D-OUT-1). • Applicable only to ECSS specification machines (if equipped) • Method of reproducing failure code: Turn the starting switch ON, ECSS switch ON and drive the machine at any gear speed other than 1st speed.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective ECSS solenoid (Internal disconnection)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			F13 (male)	Resistance	
			Between (1) and (2)	5 – 15 Ω	
	2	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between L63 (female) (17) – F13 (female) (1)	Resistance	Max. 1 Ω
			Wiring harness between F13 (female) (2) – chassis ground	Resistance	Max. 1 Ω
	3	Defective transmission controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			L63 (female)	Resistance	
			Wiring harness between (17) – chassis ground	5 – 15 Ω	

Circuit diagram related to ECSS solenoid



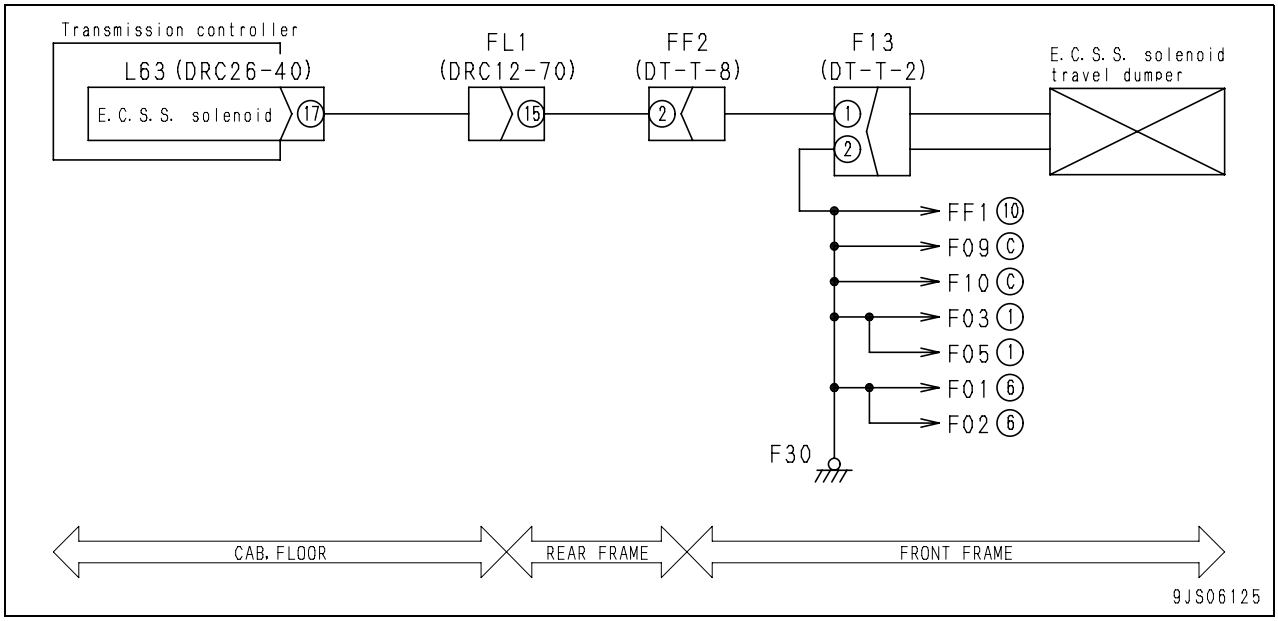
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Failure code [D192KB] (ECSS solenoid: Short circuit)

Action code	Failure code	Trouble	ECSS solenoid: Short circuit (Transmission controller)
E01	**D192KB**		
Contents of trouble	• Since the ECSS solenoid system is shorted, abnormal current flowed when ECSS solenoid output is ON		
Action of controller	• Turns the output to the ECSS solenoid OFF. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• The ECSS does not operate. • The wiring harness or controller may be burnt out.		
Related information	• The output state (ON/OFF) to the ECSS solenoid can be checked with the monitoring function (Code: 90949, D-OUT-1). • Applicable only to ECSS specification machines (if equipped) • Method of reproducing failure code: Turn the starting switch ON, ECSS switch ON and drive the machine at any gear speed other than 1st speed.		

Possible causes and standard value in normal state	Causes		Standard value in normal state/Remarks on troubleshooting			
	1	Defective ECSS solenoid (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			F13 (male)	Resistance		
			Between (1) and (2)	5 – 15 Ω		
			Between (1), (2) and chassis ground	Min. 1 MΩ		
	2	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L63 (female) (17) – F13 (female) (1) and chassis ground	Resistance	Min. 1 MΩ	
	3	Defective transmission controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L63 (female)	Resistance		
			Wiring harness between (17) – chassis ground	5 – 15 Ω		

Circuit diagram related to ECSS solenoid



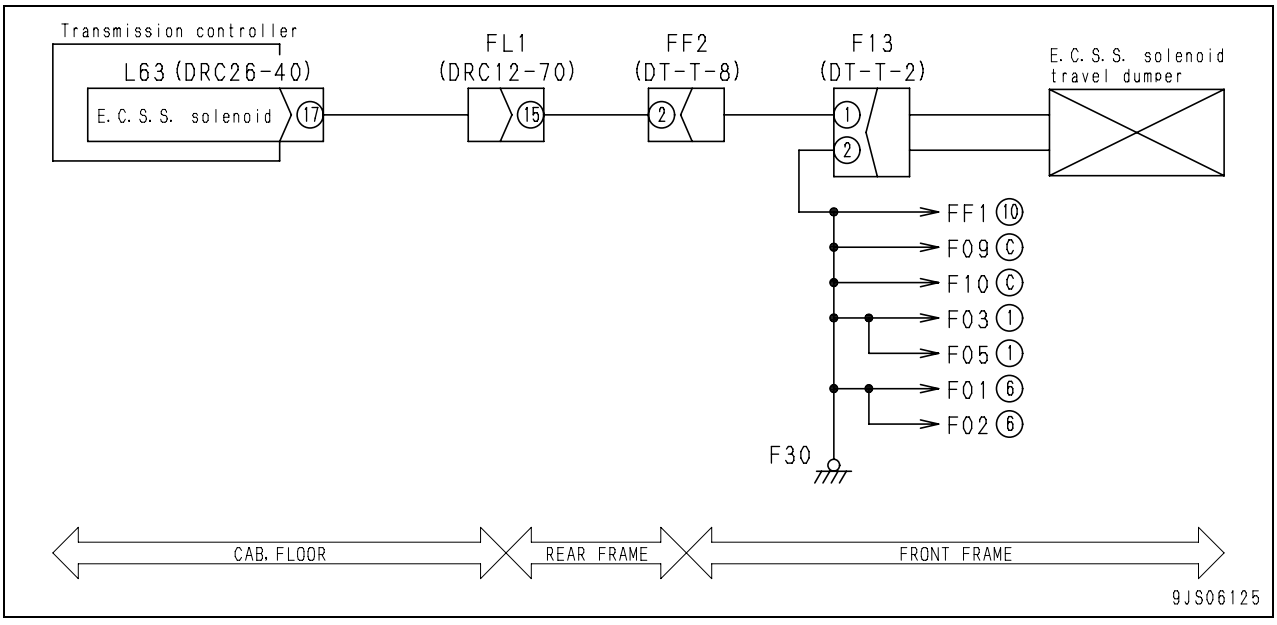
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Failure code [D192KY] (ECSS solenoid: Short circuit with power supply line)

Action code	Failure code	Trouble	ECSS solenoid: Short circuit with power supply line (Transmission controller)
E01	**D192KY**		
Contents of trouble	• Since the ECSS solenoid system is shorted with the power source, abnormal voltage was applied when ECSS solenoid output was turned OFF.		
Action of controller	• If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• The ECSS keeps operating.		
Related information	• The output state (ON/OFF) to the ECSS solenoid can be checked with the monitoring function (Code: 90949, D-OUT-1). • Applicable only to ECSS specification machines (if equipped) • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective ECSS solenoid (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			F13 (male)	Resistance	
			Between (1) and (2)	5 – 15 Ω	
			Between (1), (2) and chassis ground	Min. 1 MΩ	
	2	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			Wiring harness between L63 (female) (17) – F13 (female) (1) and chassis ground	Voltage	Max. 1 V
	3	Defective transmission controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			L63 (female)	Resistance	
			Wiring harness between (17) – chassis ground	5 – 15 Ω	

Circuit diagram related to ECSS solenoid



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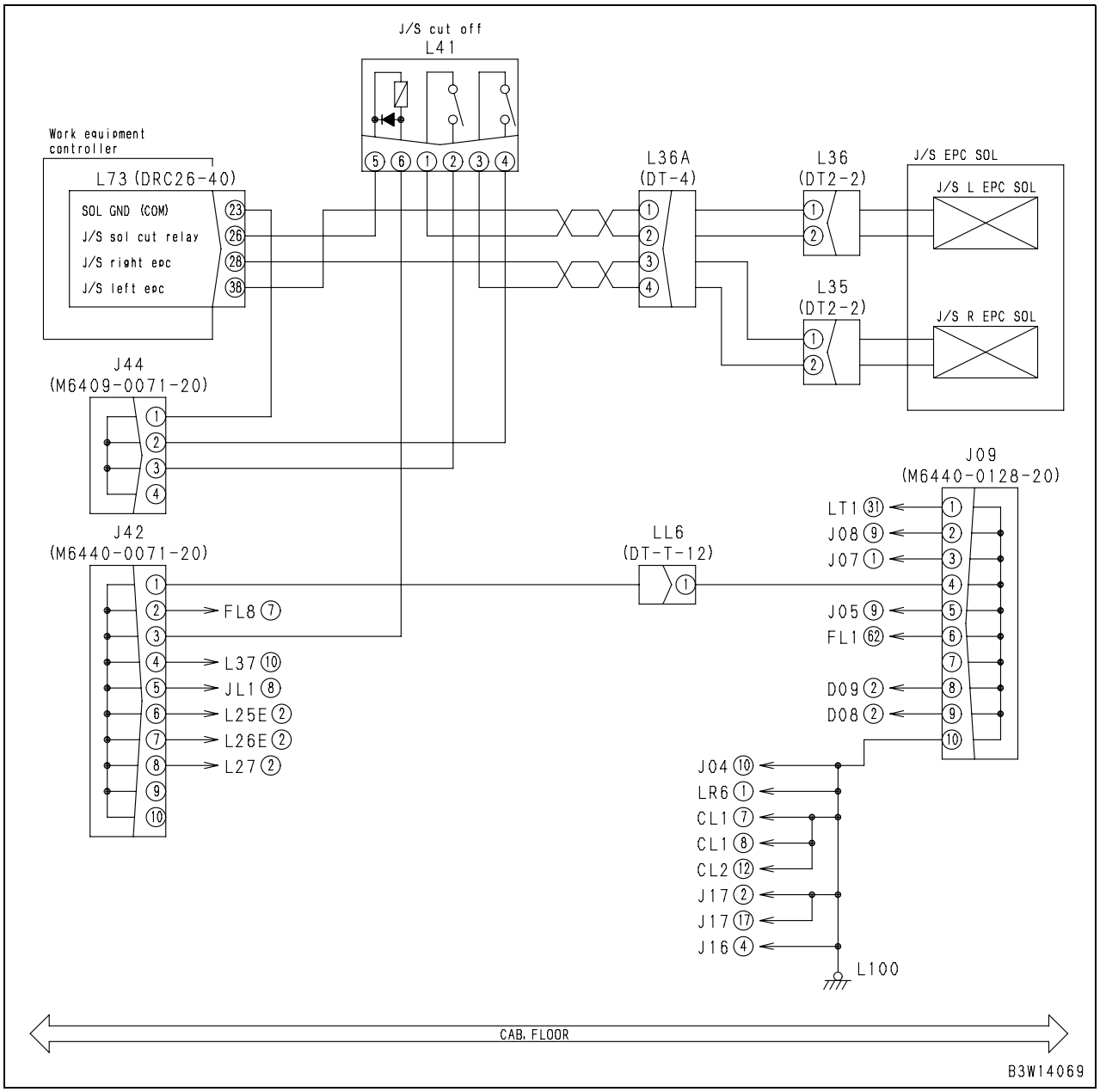
Failure code [D193KA] (Joystick steering solenoid cut relay: Disconnection)

Action code	Failure code	Trouble	Joystick steering solenoid cut relay: Disconnection (Work equipment controller system)
E03	**D193KA**		
Contents of trouble	• Since the output system of the joystick steering solenoid cut-out relay is disconnected, signals are not output to the joystick steering solenoid cut-out relay.		
Action of controller	• Stops output of signal to the joystick steering right and left solenoids. • Stops output of signal to the joystick steering cut-out relay. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• The operator cannot operate the joystick steering.		
Related information	• The output state (ON/OFF) to the joystick steering solenoid cut-out relay can be checked with the monitoring function (Code: 40953, D-OUT-8). • Only for joystick steering • Method of reproducing failure code: Turn the starting switch ON and operate the joystick steering (with the engine being stopped).		

Possible causes and standard value in normal state	Causes		Standard value in normal state/Remarks on troubleshooting			
	1	Defective joystick steering neutral cut-out relay (L41) (Internal disconnection)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L41 (male)	Resistance		
			Between (5) and (6)	200 – 400 Ω		
	2	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L73 (female) (26) – L41 (female) (5)	Resistance	Max. 1 Ω	
			Wiring harness between L41 (female) (6) – chassis ground	Resistance	Max. 1 Ω	
	3	Defective work equipment controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting. • Operate the joystick steering lever.			
			L73	Voltage		
			Between (26) and chassis ground	20 – 30 V		

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Circuit diagram related to joystick steering solenoid cut relay



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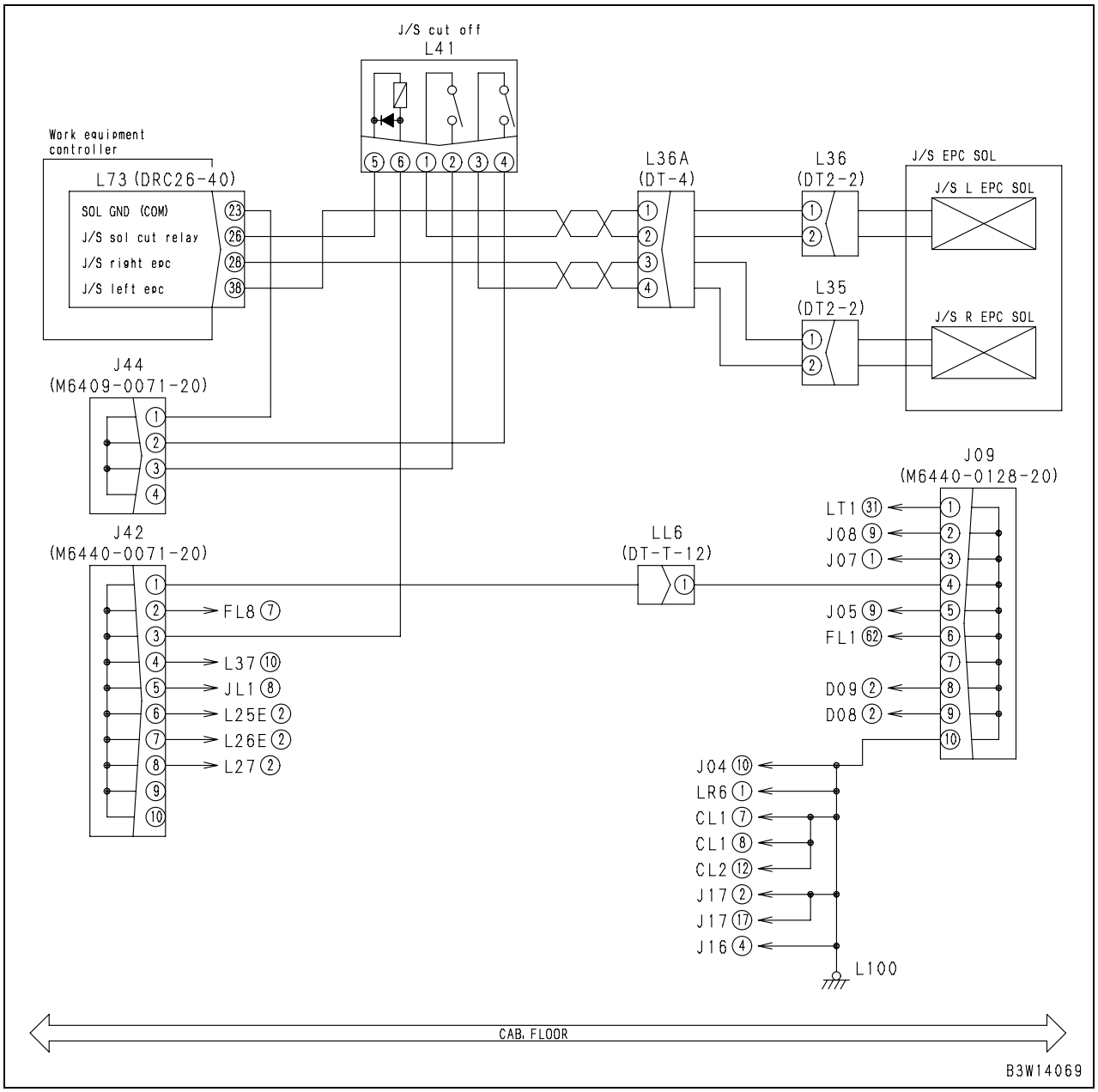
Failure code [D193KB] (Joystick steering solenoid cut relay: Short circuit)

Action code	Failure code	Trouble	Joystick steering solenoid cut relay: Short circuit (Work equipment controller system)
E03	**D193KB**		
Contents of trouble	• Since the output system of the joystick steering solenoid cut-out relay is shorted, signals are not output to the joystick steering solenoid cut-out relay.ì		
Action of controller	• Stops output of signal to the joystick steering right and left solenoids. • Stops output of signal to the joystick steering cut-out relay. • Turn the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• The operator cannot operate the joystick steering.		
Related information	• The output state (ON/OFF) to the joystick steering solenoid cut-out relay can be checked with the monitoring function (Code: 40953, D-OUT-8). • Only for joystick steering • Method of reproducing failure code: Turn the starting switch ON and operate the joystick steering (with the engine being stopped).		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective joystick steering cut-out relay (L41) (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L41 (male)	Resistance		
			Between (5) and (6)	200 – 400 Ω		
			Between (5), (6) and chassis ground	Min. 1 MΩ		
	2	Ground fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L73 (female) (26) – L41 (female) (5) and chassis ground	Resistance	Min. 1 MΩ	
	3	Defective work equipment controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting. • Operate the joystick steering lever.			
			L73	Resistance		
			Between (26) and chassis ground	20 – 30 V		

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Circuit diagram related to joystick steering solenoid cut relay



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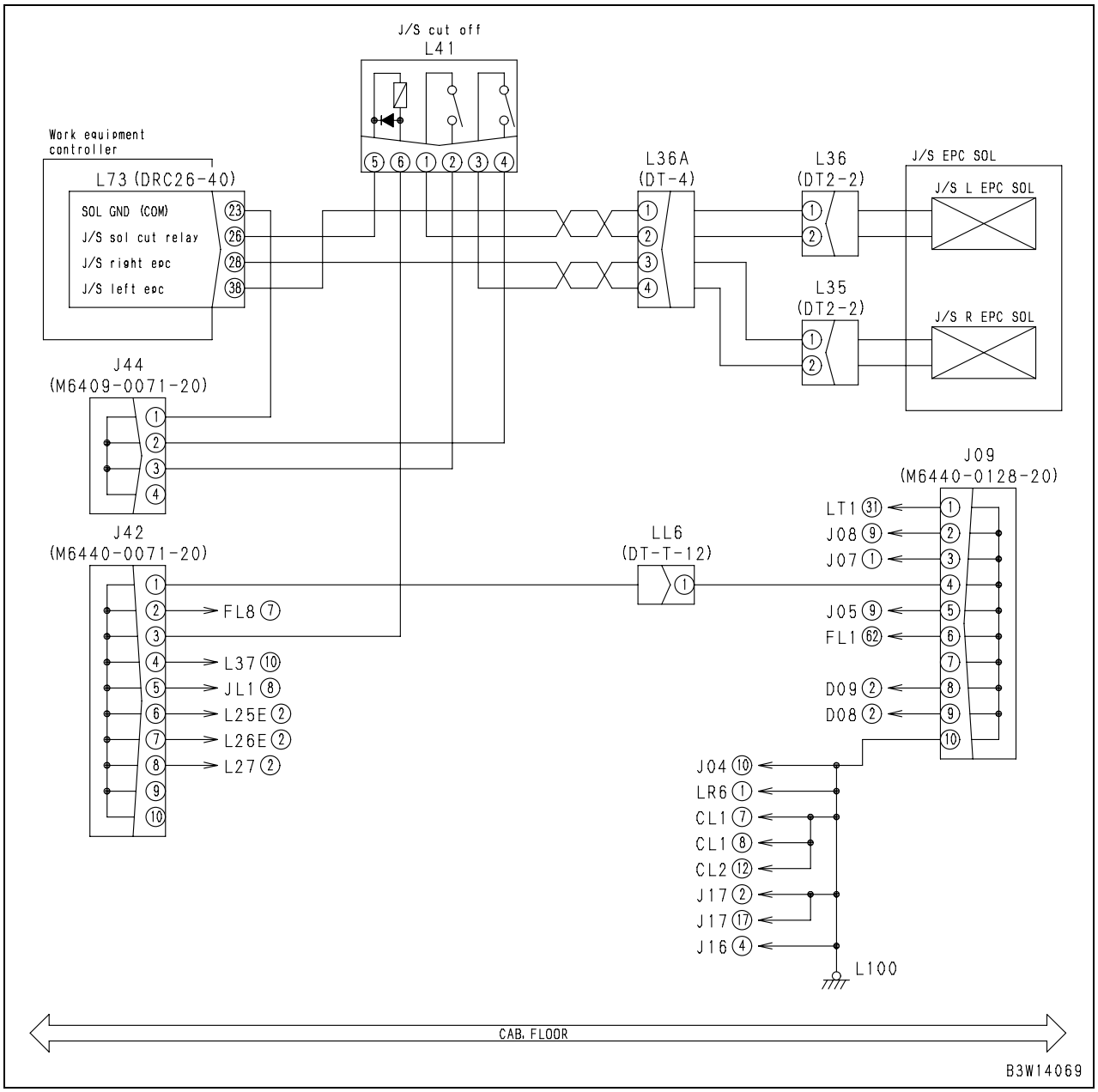
Failure code [D193KY] (Joystick steering solenoid cut relay: Short circuit with power supply line)

Action code	Failure code	Trouble	Joystick steering solenoid cut relay: Short circuit with power supply line (Work equipment controller system)
E03	**D193KY**		
Contents of trouble	• Since the output system of the joystick steering solenoid cut-out relay is shorted with the power source, signals are not output to the joystick steering solenoid cut-out relay.		
Action of controller	• Stops output of signal to the joystick steering right and left solenoids. • Stops output of signal to the joystick steering cut-out relay. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• The operator cannot operate the joystick steering.		
Related information	• The output state (ON/OFF) to the joystick steering solenoid cut-out relay can be checked with the monitoring function (Code: 40953, D-OUT-8). • Only for joystick steering • Method of reproducing failure code: Turn the starting switch ON and operate the joystick steering (with the engine being stopped).		

Possible causes and standard value in normal state	Causes		Standard value in normal state/Remarks on troubleshooting		
	1	Defective joystick steering cut-out relay (L41) (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			L41 (male)	Resistance	
			Between (5) and (6)	200 – 400 Ω	
			Between (5) (6) and chassis ground	Min. 1 MΩ	
	2	Ground fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			Wiring harness between L73 (female) (26) – L41 (female) (1) and chassis ground	Voltage	Max. 1 V
	3	Defective work equipment controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting. • Operate the joystick steering lever.		
			L73	Voltage	
			Between (26) and chassis ground	20 – 30 V	

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Circuit diagram related to joystick steering solenoid cut relay



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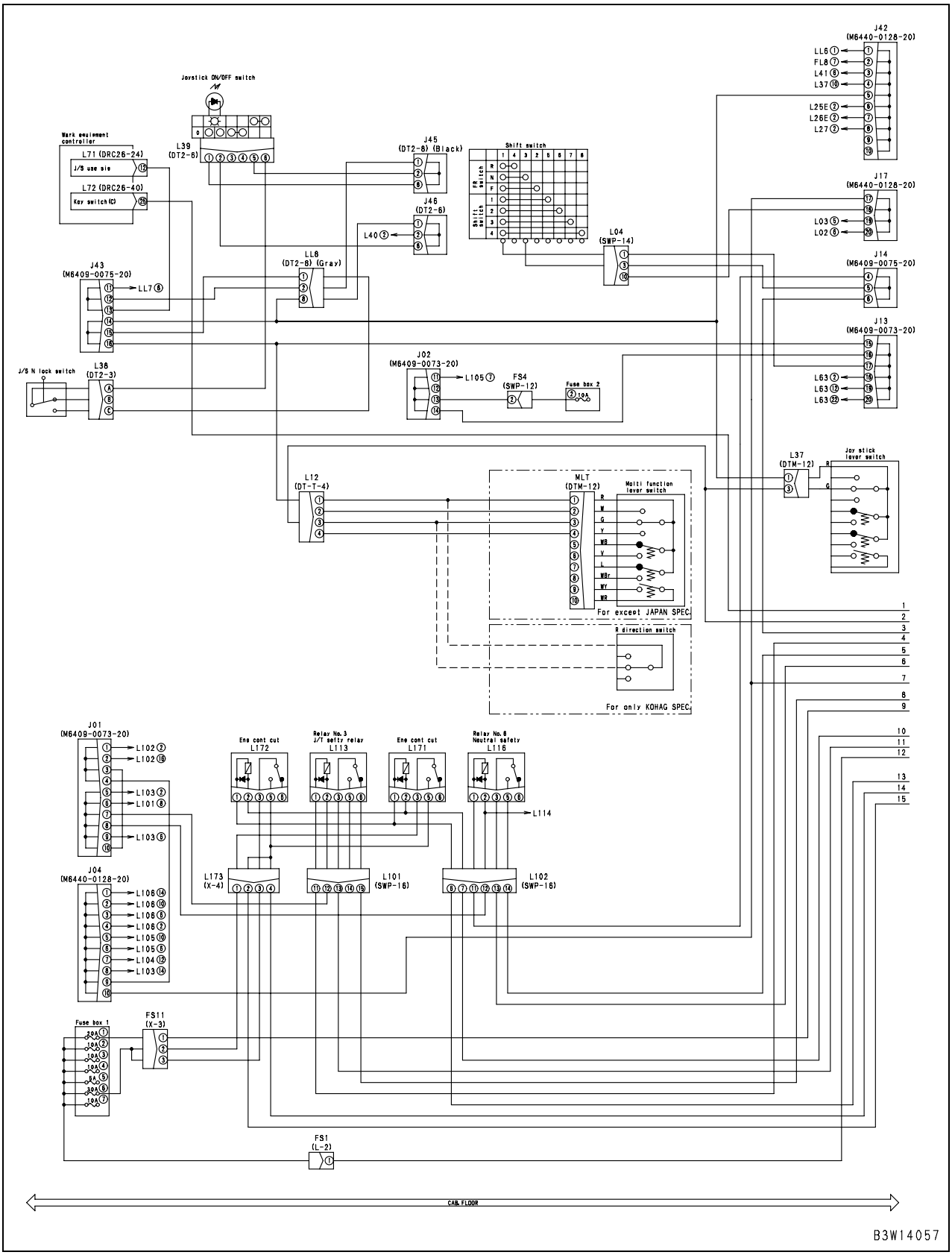
Failure code [D5ZHKA] (Terminal C signal: Disconnection)

Action code	Failure code	Trouble	Terminal C signal: Disconnection (Transmission controller)
E01	**D5ZHKA**		
Contents of trouble	• Terminal C system is disconnected or shorted with the chassis ground (Engine speed is above 500 rpm and no starting switch terminal C signal has been input.)		
Action of controller	• None in particular. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• Starting performance is poor.		
Related information	• The input state (ON/OFF) to the transmission controller from starting switch terminal C can be checked with the monitoring function (Code: 40907, D-IN-16). • Method of reproducing failure code: Set the starting switch to START position		

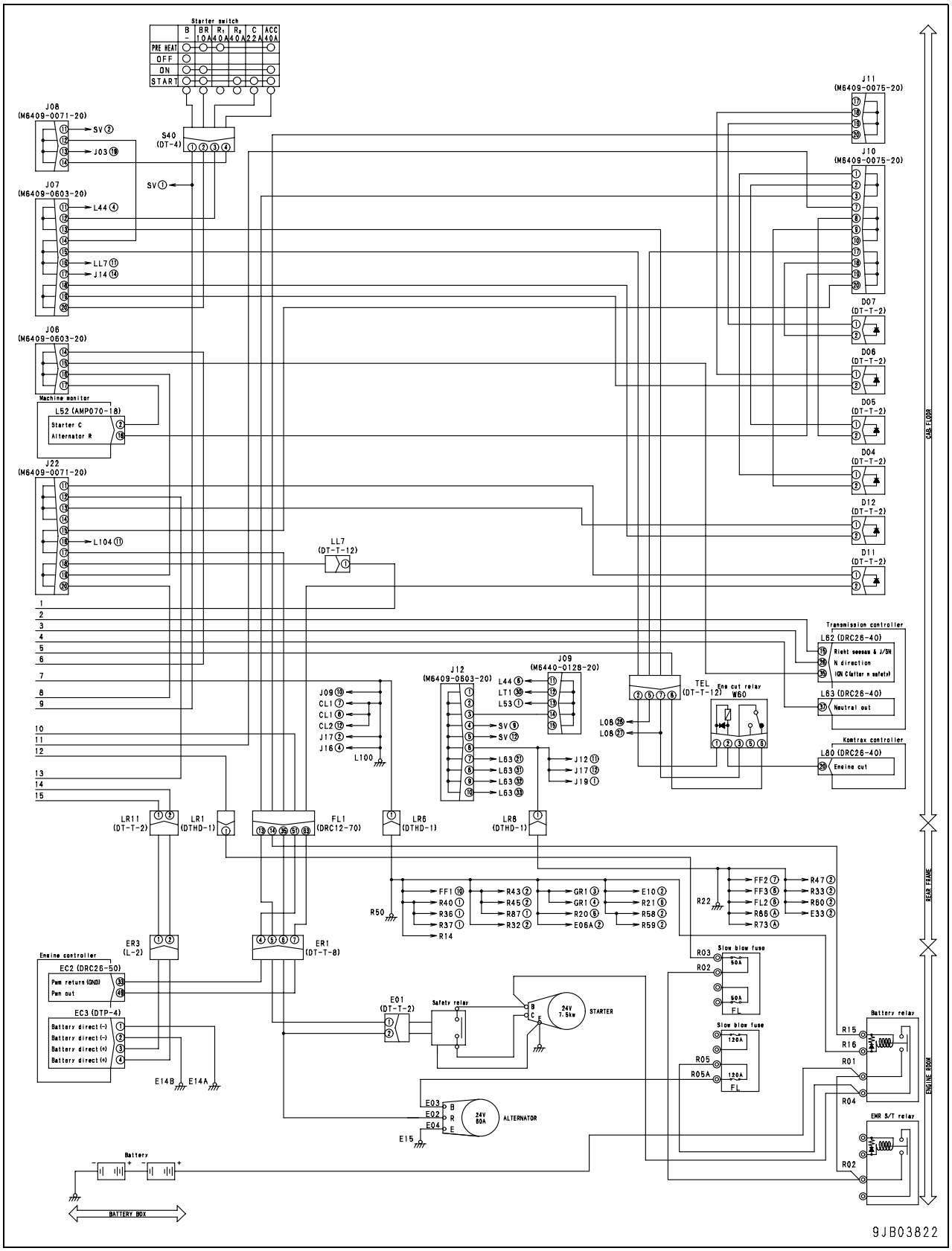
	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective fuse No. 1 of fuse box 1	If the fuse is burn, the circuit probably has a grounding fault, etc. (See cause 4.)			
	2	Defective starting switch (Internal disconnection)	★ Prepare with starting switch OFF, then turn starting switch ON, OFF or START and carry out troubleshooting.			
			S40	Starting switch	Resistance	
			Between (1) and (3)	START	Max. 1 Ω	
				OFF, ON	Min. 1 MΩ	
	3	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between S40 (female) (3) – W60 (female) (3)		Resistance	Max. 1 Ω
			Wiring harness between W60 (female) (6) – L116 (female) (5)		Resistance	Max. 1 Ω
			Wiring harness between L116 (female) (3) – L62 (female) (35)		Resistance	Max. 1 Ω
	4	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between S40 (female) (3) – W60 (female) (3), – circuit branch end and chassis ground		Resistance	Min. 1 MΩ
			Wiring harness between W60 (female) (6) – L116 (female) (5), – circuit branch end and chassis ground		Resistance	Min. 1 MΩ
			Wiring harness between L116 (female) (3) – L62 (female) (35), – circuit branch end and chassis ground		Resistance	Min. 1 MΩ
	5	Defective transmission controller	★ Prepare with starting switch OFF, then turn starting switch ON, OFF or START and carry out troubleshooting.			
			L62	Starting switch	Voltage	
			Between (35) and chassis ground	START	20 – 30 V	
				OFF, ON	Max. 1 V	

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Circuit diagram related to engine starting system (C terminal signal)



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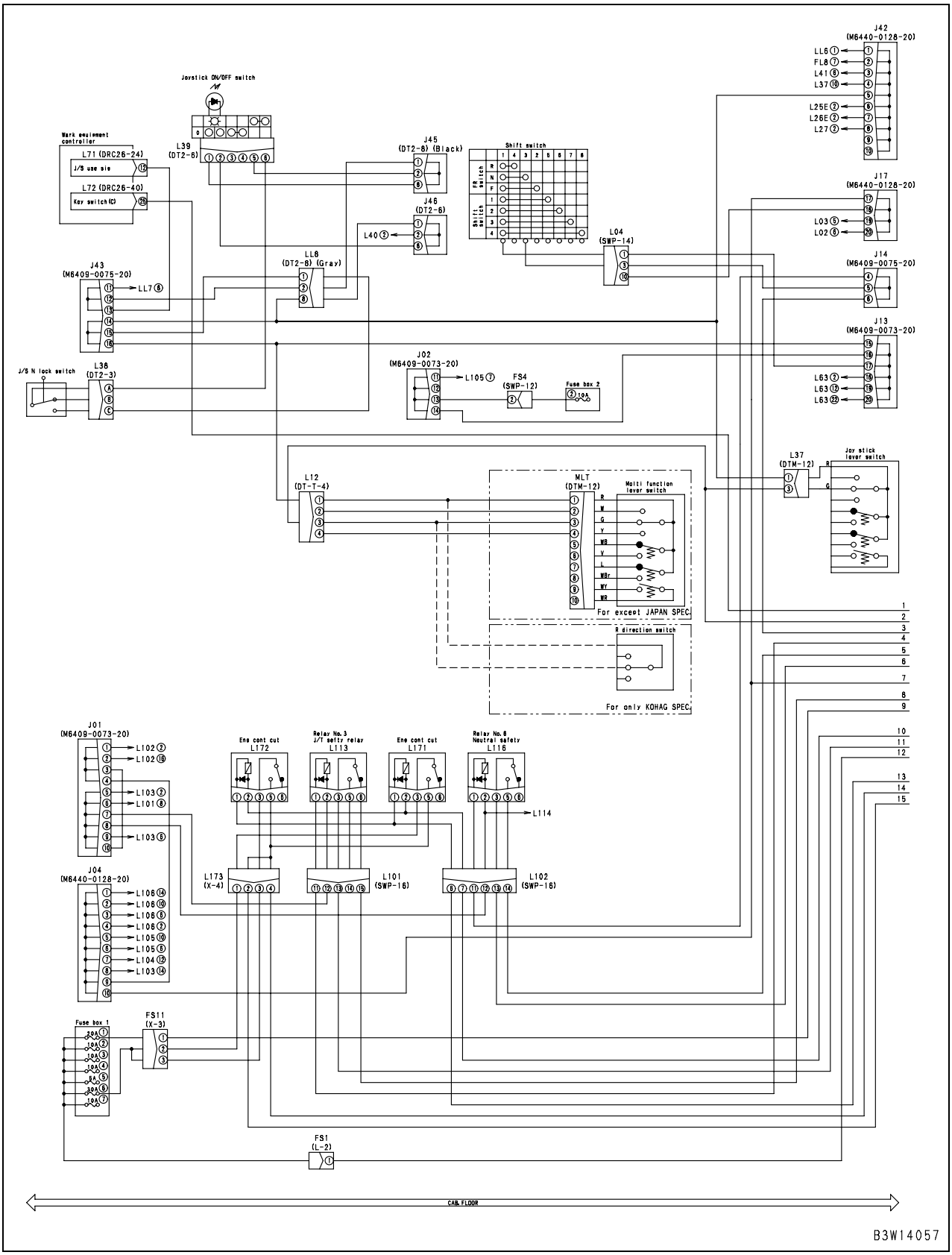
Failure code [D5ZHKB] (Terminal C signal: Short circuit)

Action code	Failure code	Trouble	Terminal C signal: Short circuit (Transmission controller)
E01	**D5ZHKB**		
Contents of trouble	• Terminal C system is shorted with the power source (Engine speed is above 500 rpm and starting switch terminal C signal has been input.).		
Action of controller	• Engine start assistance is not working. • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• Starting performance is poor		
Related information	• The input state (ON/OFF) to the transmission controller from starting switch terminal C can be checked with the monitoring function (Code: 40905, D-IN-7). • Method of reproducing failure code: Start engine		

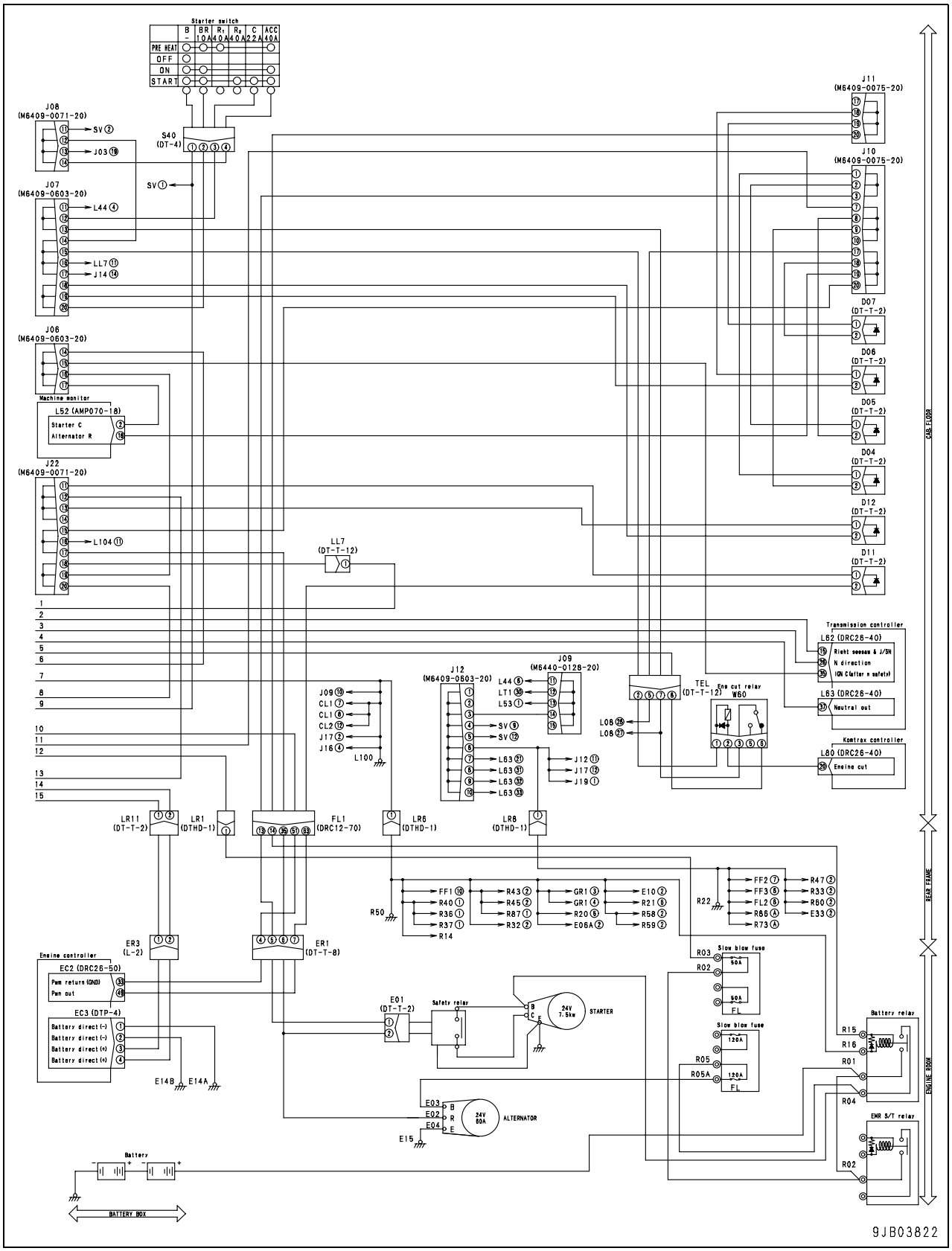
	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective starting switch (Internal disconnection)	★ Prepare with starting switch OFF, then turn starting switch ON, OFF or START and carry out troubleshooting.			
			S40	Starting switch	Resistance	
			Between (1) and (3)	START	Max. 1 Ω	
				OFF, ON	Min. 1 MΩ	
	2	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting after engine start and during engine operation.			
			Wiring harness between S40 (female) (3) – W60 (female) (3), – circuit branch end and chassis ground		Voltage	Max. 1 V
			Wiring harness between W60 (female) (6) – L116 (female) (5), – circuit branch end and chassis ground		Voltage	Max. 1 V
			Wiring harness between L116 (female) (3) – L62 (female) (35), – circuit branch end and chassis ground		Voltage	Max. 1 V
	3	Defective transmission controller	★ Prepare with starting switch OFF, then turn starting switch ON, OFF or START and carry out troubleshooting.			
			L62	Starting switch	Voltage	
			Between (35) and chassis ground	START	20 – 30 V	
				OFF, ON	Max. 1 V	

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Circuit diagram related to engine starting system (C terminal signal)



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Failure code [D5ZHKZ] (Terminal C signal: Disconnection or short circuit)

Action code	Failure code	Trouble	Terminal C signal: Disconnection or short circuit (Work equipment controller system)
E01	**D5ZHKZ**		
Contents of trouble	• Terminal C system is disconnected (Engine speed is above 500 rpm and no starting switch terminal C signal has been input.)		
Action of controller	• None in particular. • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• When joystick lever is not in neutral, engine does not start (disconnection) and alarm does not sound. After this trouble occurs, if key is turned ON, engine starts immediately. • Relieving of residual pressure on the work equipment becomes unavailable if the engine stopped (hot short).		
Related information	• The input state (ON/OFF) to the work equipment controller from starting switch terminal C can be checked with the monitoring function (Code: 40912, D-IN-17). • Method of reproducing failure code: Set the starting switch to START position		

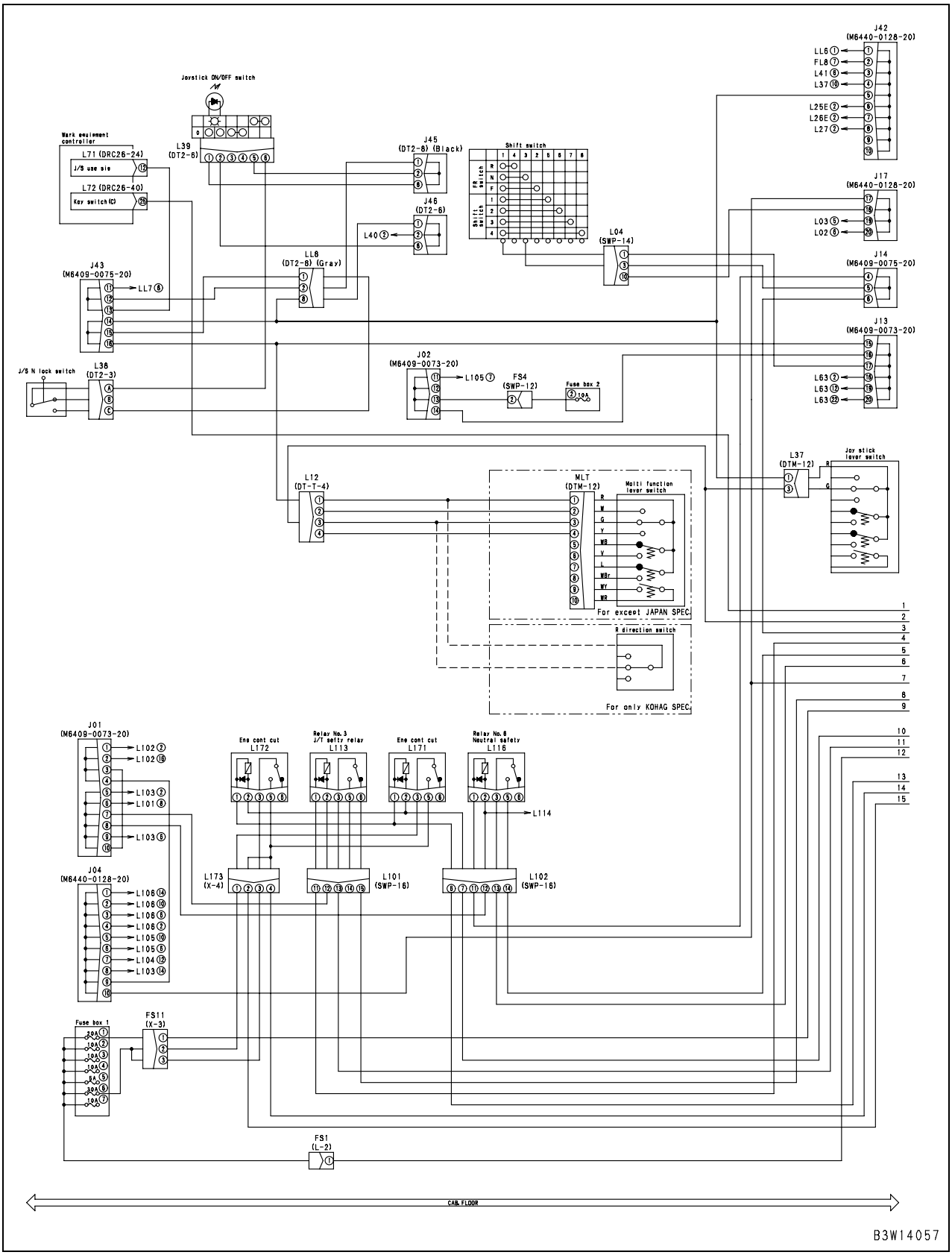
	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective fuse No. 1 of fuse box 1	If the fuse is burn, the circuit probably has a grounding fault, etc. (See cause 4.)		
	2	Defective starting switch (Internal disconnection)	★ Prepare with starting switch OFF, then turn starting switch ON, OFF or START and carry out troubleshooting.		
			S40	Starting switch	Resistance
			Between (1) and (3)	START	Max. 1 Ω
				OFF, ON	Min. 1 MΩ
	3	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between S40 (female) (3) – W60 (female) (3)	Resistance	Max. 1 Ω
			Wiring harness between W60 (female) (6) – L116 (female) (5)	Resistance	Max. 1 Ω
			Wiring harness between L116 (female) (3) – L72 (female) (25)	Resistance	Max. 1 Ω
	4	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between S40 (female) (3) – W60 (female) (3), – circuit branch end and chassis ground	Resistance	Min. 1 MΩ
			Wiring harness between W60 (female) (6) – L116 (female) (5), – circuit branch end and chassis ground	Resistance	Min. 1 MΩ
			Wiring harness between L116 (female) (3) – L72 (female) (25), – circuit branch end and chassis ground	Resistance	Min. 1 MΩ

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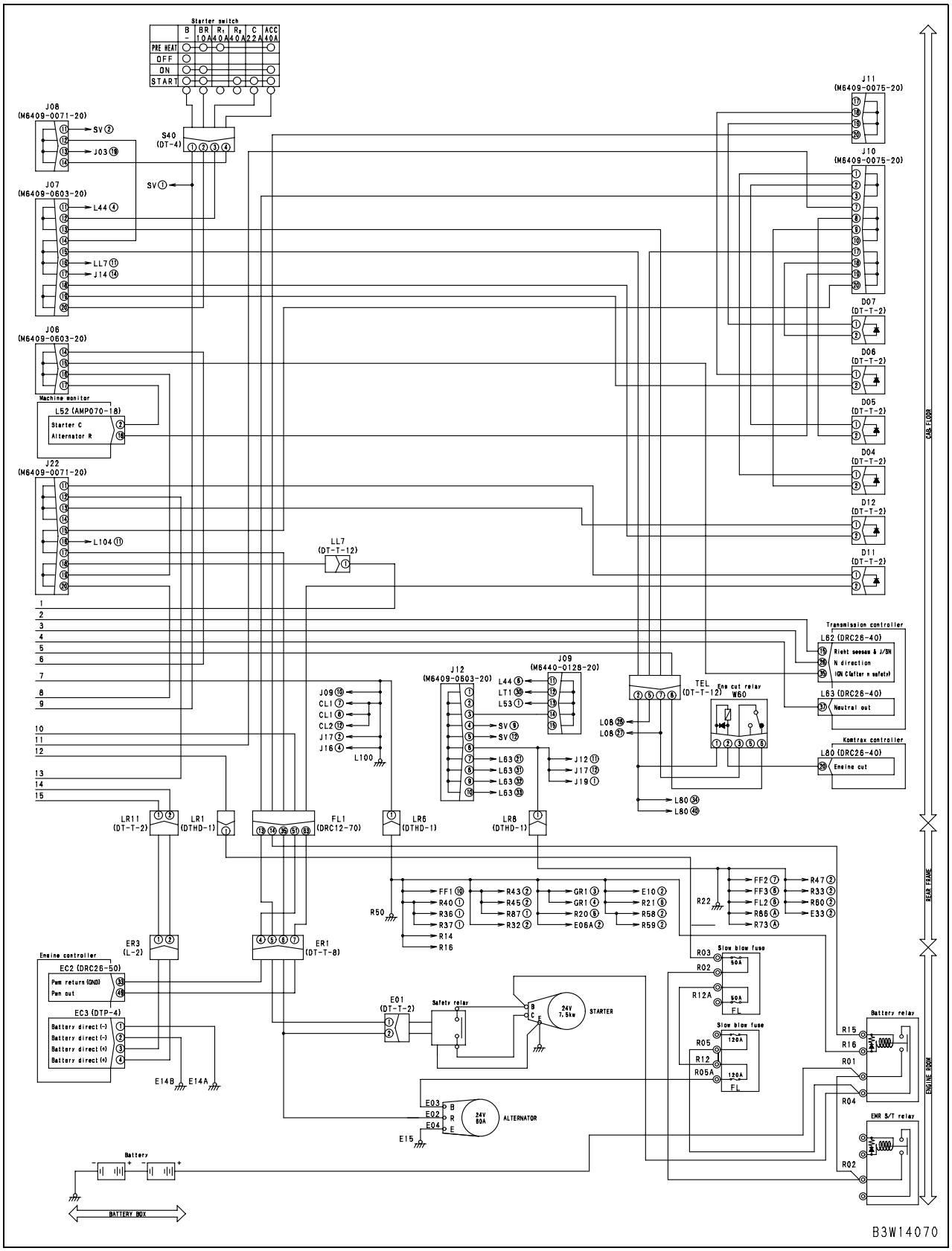
<table>
<tr><td rowspan="6">Possible causes and standard value in normal state</td><td colspan="2">Causes</td><td colspan="4">Standard value in normal state/Remarks on troubleshooting</td></tr>
<tr><td rowspan="3">5</td><td rowspan="3">Hot short in wiring harness (Contact with 24V circuit)</td><td colspan="4">★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.</td></tr>
<tr><td colspan="2">Wiring harness between S40 (female) (3) – W60 (female) (3), – circuit branch end and chassis ground</td><td>Voltage</td><td>Max. 1 V</td></tr>
<tr><td colspan="2">Wiring harness between W60 (female) (6) – L116 (female) (5), – circuit branch end and chassis ground</td><td>Voltage</td><td>Max. 1 V</td></tr>
<tr><td rowspan="3">6</td><td rowspan="3">Defective work equipment controller</td><td colspan="2">Wiring harness between L116 (female) (3) – L72 (female) (25), – circuit branch end and chassis ground</td><td>Voltage</td><td>Max. 1 V</td></tr>
<tr><td colspan="4">★ Prepare with starting switch OFF, then turn starting switch ON, OFF or START and carry out troubleshooting.</td></tr>
<tr><td>L72</td><td>Starting switch</td><td colspan="2">Voltage</td></tr>
<tr><td rowspan="2">Between (25) and chassis ground</td><td>START</td><td colspan="2">20 – 30 V</td></tr>
<tr><td>OFF, ON</td><td colspan="2">Max. 1 V</td></tr>
</table>

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Circuit diagram related to engine starting system (C terminal signal)



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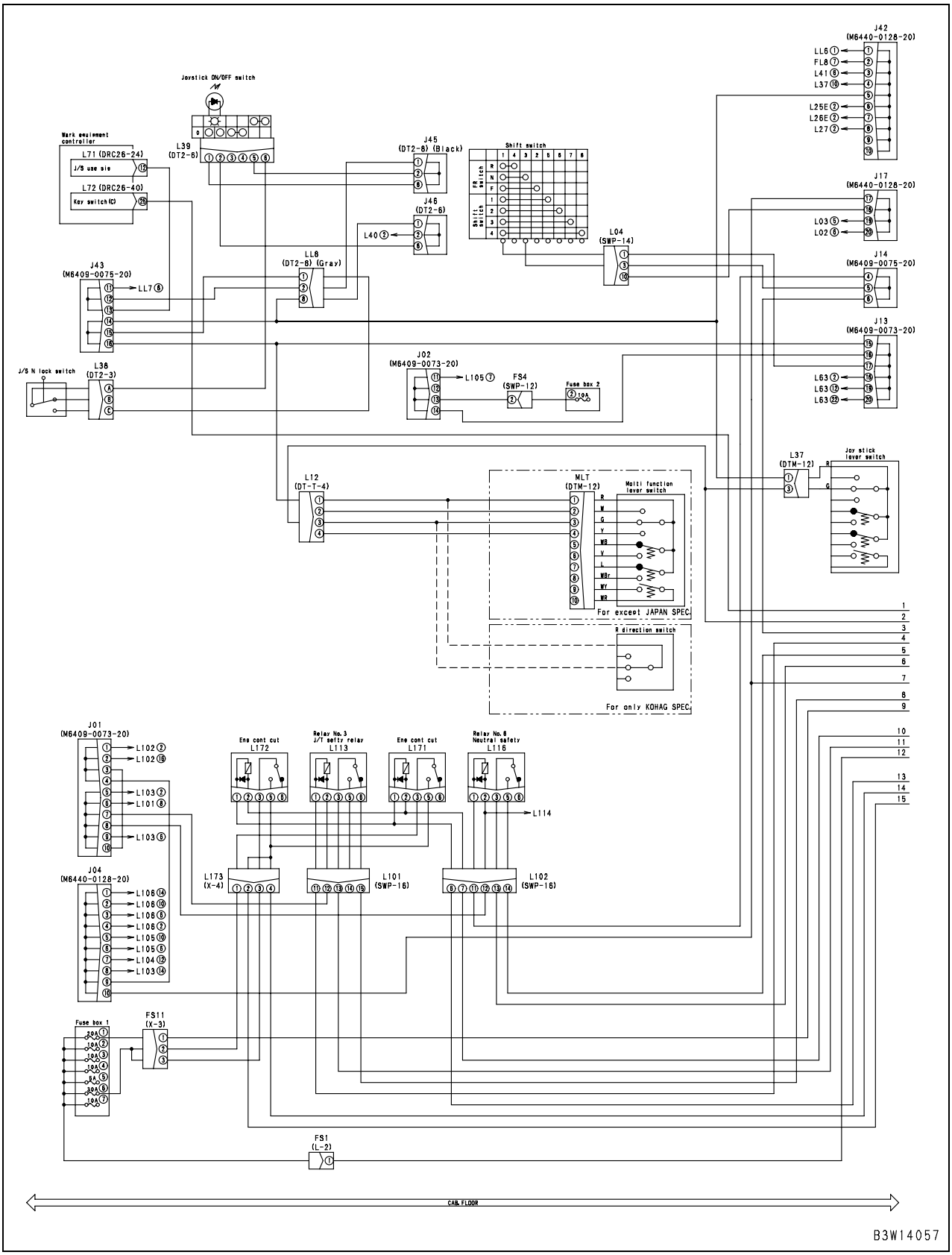
Failure code [D5ZHL6] (Terminal C signal: Signal does not match engine running or stopped state)

Action code	Failure code	Trouble	Terminal C signal: Signal does not match engine running or stopped state (Machine monitor system)
E01	**D5ZHL6**		
Contents of trouble	• Terminal C system is disconnected or shorted with the chassis ground (Engine speed is above 500 rpm and voltage is supplied to the alternator R terminal.)		
Action of controller	• None in particular. • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• The engine does not start.		
Related information	• The input state (ON/OFF) to the machine monitor from the starting switch terminal C can be checked with the monitoring function (Code: 40900, D-IN-2). • Method of reproducing failure code: Set the starting switch to START position		

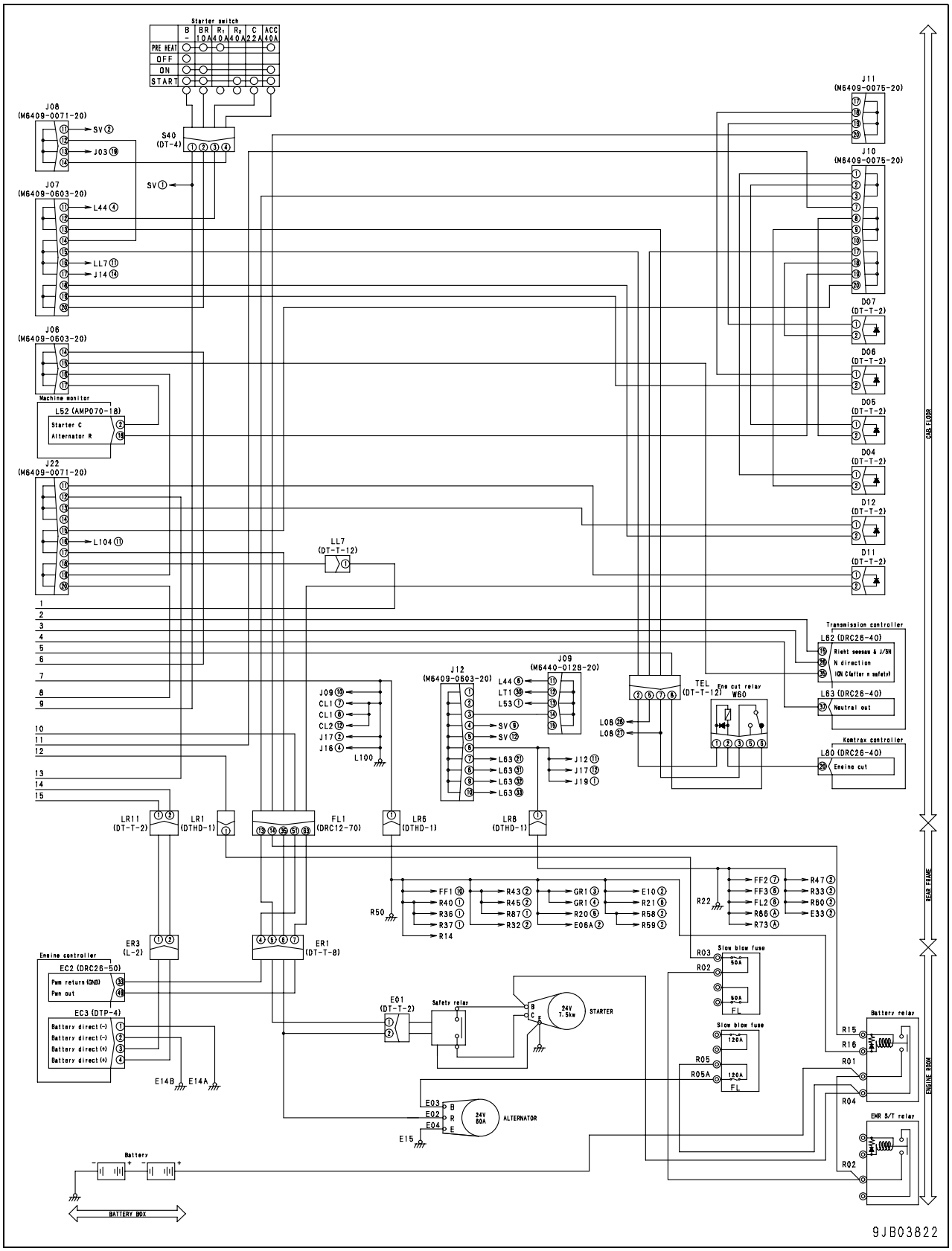
	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective starting switch (Internal disconnection)	★ Prepare with starting switch OFF, then turn starting switch ON, OFF or START and carry out troubleshooting			
			S40	Starting switch	Voltage	
			Between (3) and chassis ground	START	20 – 30 V	
				OFF, ON	Max. 1 V	
	2	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between S40 (female) (3) – W60 (female) (3)		Resistance	Max. 1 Ω
			Wiring harness between W60 (female) (6) – L116 (female) (5)		Resistance	Max. 1 Ω
			Wiring harness between L116 (female) (3) – L52 (female) (2)		Resistance	Max. 1 Ω
	3	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between S40 (female) (3) – W60 (female) (3), – circuit branch end and chassis ground		Resistance	Min. 1 MΩ
			Wiring harness between W60 (female) (6) – L116 (female) (5), – circuit branch end and chassis ground		Resistance	Min. 1 MΩ
			Wiring harness between L116 (female) (3) – L52 (female) (2), – circuit branch end and chassis ground		Resistance	Min. 1 MΩ
	4	Defective machine monitor	★ Prepare with starting switch OFF, then turn starting switch ON, OFF or START and carry out troubleshooting			
			L52	Starting switch	Voltage	
			Between (2) and chassis ground	START	20 – 30 V	
				OFF, ON	Max. 1 V	

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Circuit diagram related to engine starting system (C terminal signal)



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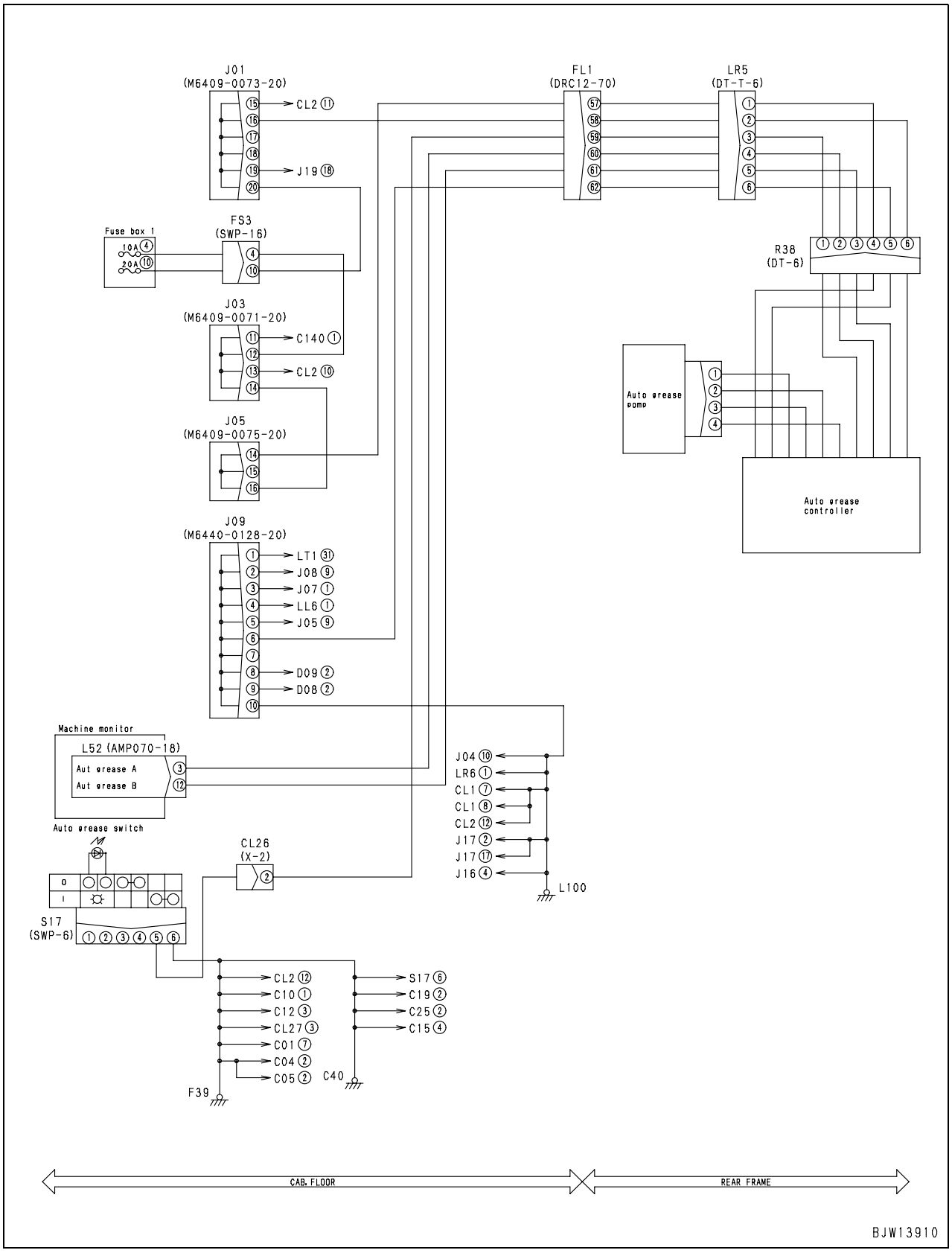
Failure code [DA80L4] (Auto grease controller: ON/OFF signals disagree)

Action code	Failure code	Trouble	Auto grease controller: ON/OFF signals disagree (Machine monitor system)
—	**DA80L4**		
Contents of trouble	• 24V signal has been input to the auto grease sensor A/B circuits at the same time.		
Action of controller	• None in particular. • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• Auto grease does not work. • Auto grease lamp goes off.		
Related information	• The input state (ON/OFF) from the auto grease controller can be checked with the monitoring function (Code: 40900, D-IN-4 and D-IN-5). • Applicable only to machines equipped with auto grease function (if equipped). • Method of reproducing failure code: Turn the starting switch and auto grease start button ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			Wiring harness between L52 (female) (3) – R38 (female) (2)		Voltage	Max. 1 V
	2	Defective auto grease controller	★ Refer to and carry out troubleshooting for auto grease system.			
	3	Defective machine monitor	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			L52	Auto grease	Voltage	Auto-grease lamp
			Between (3) and chassis ground	In operation	Max. 1 V	ON
				With empty tank	20 – 30 V	Flashing (1 Hz)
				When abnormal	Max. 1 V	Flashing (2 Hz)
					20 – 30 V	OFF
			Between (12) and chassis ground	In operation	20 – 30 V	ON
				With empty tank	Max. 1 V	Flashing (1 Hz)
				When abnormal	Max. 1 V	Flashing (2 Hz)
					20 – 30 V	OFF

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Circuit diagram related to auto grease



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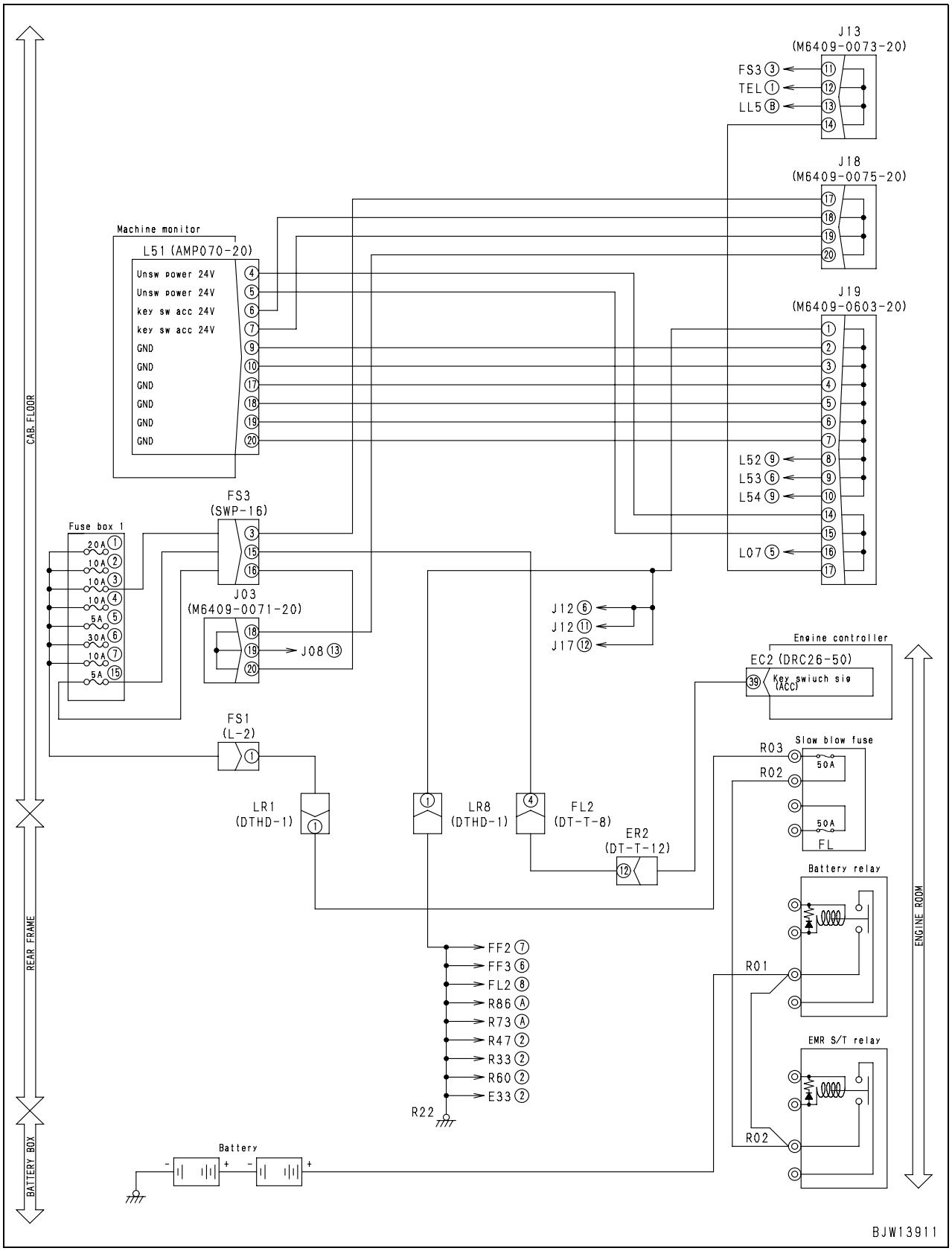
Failure code [DAF3KK] (Machine monitor: Low source voltage (input)

Action code	Failure code	Trouble	Machine monitor: Low source voltage (input) (Machine monitor system)
E03	**DAF3KK**		
Contents of trouble	• When the voltage of the switch power supply (power supply for operation) is above 17 V, the voltage of the constant power supply (power supply for the memory) is below 17 V.		
Action of controller	• Turns the centralized warning lamp and alarm buzzer ON. • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• The service meter reading is abnormal, the odometer does not advance and failure history data is not saved.		
Related information	• Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Disconnection in wiring harness (Disconnection or defective contact)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between FS1 (male) (1) – fuse No. 3 of fuse box 1	Resistance	Max. 1 Ω
			Wiring harness between fuse No. 3 of fuse box 1 – L51 (female) (4), (5)	Resistance	Max. 1 Ω
	2	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between fuse No. 3 of fuse box 1 – L51 (female) (4), (5) and chassis ground	Resistance	Min. 1 MΩ
	3	Defective machine monitor	Since trouble is in system, troubleshooting cannot be carried out. (Replace the machine monitor)		

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Circuit diagram related to machine monitor power supply



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Failure code [DAF5KP] (Machine monitor: Low output voltage)

Action code	Failure code	Trouble	Machine monitor: Low output voltage (Machine monitor system)
E01	**DAF5KP**		
Contents of trouble	• When the voltage of the switch power supply (power supply for operation) is above 17 V, the voltage of the sensor is below 5 V.		
Action of controller	• None in particular. • Even if cause of failure disappears, system does not reset itself until it is restarted.		
Problem that appears on machine	• Machine monitor does not display load.		
Related information	• Only for load meter (if equipped) • Method of reproducing failure code: Turn the starting switch ON.		

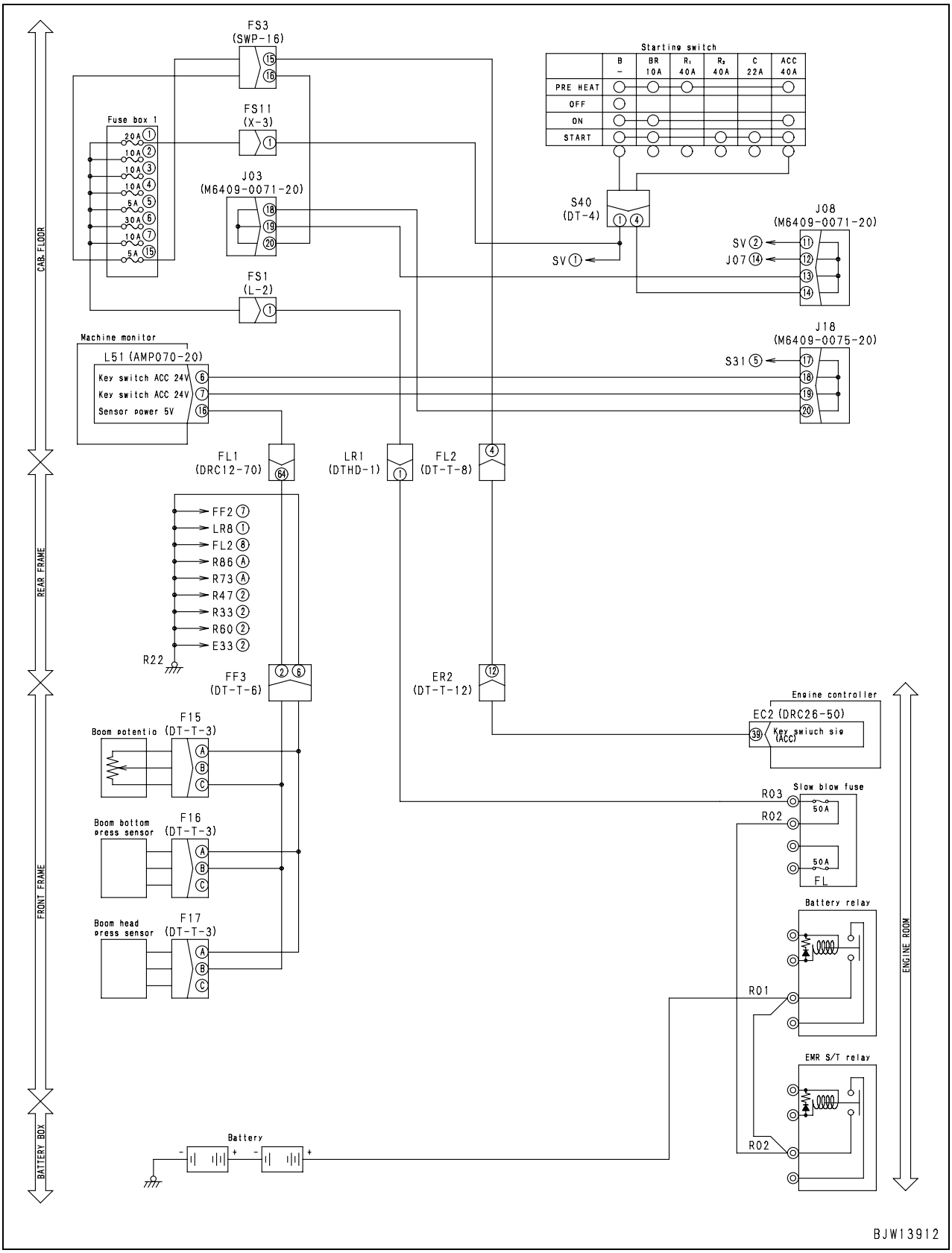
	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective lift arm angle sensor (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			F15 (male)		Resistance
			Between (C) and (A)		5 kΩ ± 20%
			Between (A), (B), (C) and chassis ground		Min. 1 MΩ
			★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			F15	Lift arm cylinder	Voltage
			Between (C) and (A)	Constant	4.85 – 5.15 V
			Between (B) and (A)	Constant	0.83 – 4.17 V
				At max. length	3.50 – 4.17 V
				At min. length	0.83 – 1.88 V
	2	Defective lift arm bottom pressure sensor (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			F16 (male)		Resistance
			Between (A), (B), (C) and chassis ground		Min. 1 MΩ
			★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			F16	Lift arm bottom pressure	Voltage
			Between (C) and (B)	Constant	4.85 – 5.15 V
			Between (C) and (A)	Constant	0.50 – 4.50 V
				When released	0.50 – 0.90 V
				When relieved	3.02 – 3.42 V

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<table>
<tr><td rowspan="15">Possible causes and standard value in normal state</td><td colspan="2">Causes</td><td colspan="5">Standard value in normal state/Remarks on troubleshooting</td></tr>
<tr><td rowspan="9">3</td><td rowspan="9">Defective lift arm head pressure sensor
(Internal short circuit)</td><td colspan="5">★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.</td></tr>
<tr><td colspan="3">F17 (male)</td><td colspan="2">Resistance</td></tr>
<tr><td colspan="3">Between (A), (B), (C) and chassis ground</td><td colspan="2">Min. 1 MΩ</td></tr>
<tr><td colspan="5">★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.</td></tr>
<tr><td>F17</td><td colspan="2">Lift arm head pressure</td><td colspan="2">Voltage</td></tr>
<tr><td>Between (C) and (B)</td><td colspan="2">Constant</td><td colspan="2">4.85 – 5.15 V</td></tr>
<tr><td rowspan="3">Between (C) and (A)</td><td colspan="2">Constant</td><td colspan="2">0.50 – 4.50 V</td></tr>
<tr><td colspan="2">When released</td><td colspan="2">0.50 – 0.90 V</td></tr>
<tr><td colspan="2">When relieved</td><td colspan="2">3.02 – 3.42 V</td></tr>
<tr><td rowspan="4">4</td><td rowspan="4">Grounding fault in wiring harness
(Contact with ground circuit)</td><td colspan="5">★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.</td></tr>
<tr><td colspan="3">Between L51 (female) (16) – F15 (female) (C) wiring harness and chassis ground</td><td>Resistance</td><td>Min. 1 MΩ</td></tr>
<tr><td colspan="3">Wiring harness between L51 (female) (16) – F16 (female) (B) and chassis ground</td><td>Resistance</td><td>Min. 1 MΩ</td></tr>
<tr><td colspan="3">Wiring harness between L51 (female) (16) – F17 (female) (B) and chassis ground</td><td>Resistance</td><td>Min. 1 MΩ</td></tr>
<tr><td rowspan="3">5</td><td rowspan="3">Defective machine monitor</td><td colspan="5">★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.</td></tr>
<tr><td>L51</td><td colspan="2">Lift arm cylinder</td><td colspan="2">Voltage</td></tr>
<tr><td>Between (16) and chassis ground</td><td colspan="2">Constant</td><td colspan="2">4.85 – 5.15 V</td></tr>
</table>

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Circuit diagram related to machine monitor 5V sensor power supply



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Failure code [DAFRKR] (CAN communication with machine monitor: Defective communication (Abnormality in target component system)

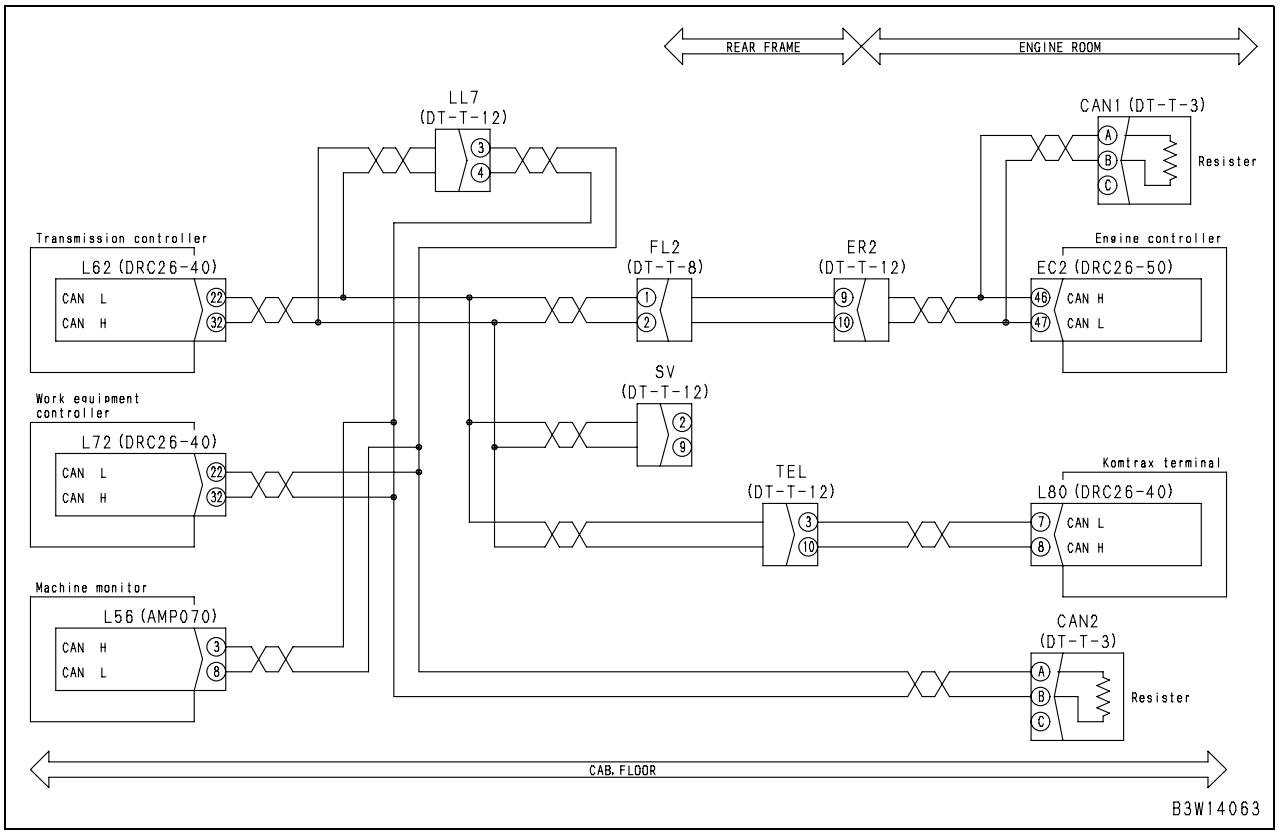
Action code	Failure code	Trouble	CAN communication with machine monitor: Defective communication (Abnormality in target component system) (Transmission controller system)
E03	**DAFRKR**		
Contents of trouble	• Transmission controller cannot get information from machine monitor.		
Action of controller	• Turns the centralized warning lamp and alarm buzzer ON. • Uses CAN information that was sent from machine monitor before the occurrence of the error. • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• The monitor does not display normally.		
Related information	• Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective CAN end point resistance	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			CAN1 (male)	Resistance	
			Between (A) and (B)	110 – 140 Ω	
			★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			CAN2 (male)	Resistance	
			Between (A) and (B)	110 – 140 Ω	
	2	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between L62 (female) (22), (32) – L56 (female) (3), (8)	Resistance	Max. 1 Ω
			Wiring harness between L62 (female) (22), (32) – L72 (female) (22), (32)	Resistance	Max. 1 Ω
			Wiring harness between L62 (female) (22), (32) – EC2 (female) (46), (47)	Resistance	Max. 1 Ω
			Wiring harness between L62 (female) (22), (32) – L80 (female) (7), (8)	Resistance	Max. 1 Ω
			Wiring harness between L62 (female) (22), (32) – CAN1 (female) (A), (B)	Resistance	Max. 1 Ω
			Wiring harness between L62 (female) (22), (32) – CAN2 (female) (A), (B)	Resistance	Max. 1 Ω

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	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	3	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between L62 (female) (22), (32) – L56 (female) (3), (8) and chassis ground	Resistance	Min. 1 MΩ
			Wiring harness between L62 (female) (22), (32) – L72 (female) (22), (32) and chassis ground	Resistance	Min. 1 MΩ
			Wiring harness between L62 (female) (22), (32) – EC2 (female) (46), (47) and chassis ground	Resistance	Min. 1 MΩ
			Wiring harness between L62 (female) (22), (32) – L80 (female) (7), (8) and chassis ground	Resistance	Min. 1 MΩ
			Wiring harness between L62 (female) (22), (32) – CAN1 (female) (A), (B) and chassis ground	Resistance	Min. 1 MΩ
			Wiring harness between L62 (female) (22), (32) – CAN2 (female) (A), (B) and chassis ground	Resistance	Min. 1 MΩ
	4	Defective machine monitor, transmission controller, work equipment controller, engine controller or KOMTRAX terminal	★ If above troubleshootings 1 – 3 have not identified the cause of the trouble, failure on the machine monitor, transmission controller, work equipment controller, engine controller or KOMTRAX terminal should be suspected. (Since trouble is in system, troubleshooting cannot be carried out.)		

Circuit diagram related to CAN communication



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WA430-6 Wheel loader

Form No. SEN01741-02

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WHEEL LOADER

WA430-6

Machine model	Serial number
WA430-6	65001 and up

40 Troubleshooting

Troubleshooting by failure code (Display of code), Part 5

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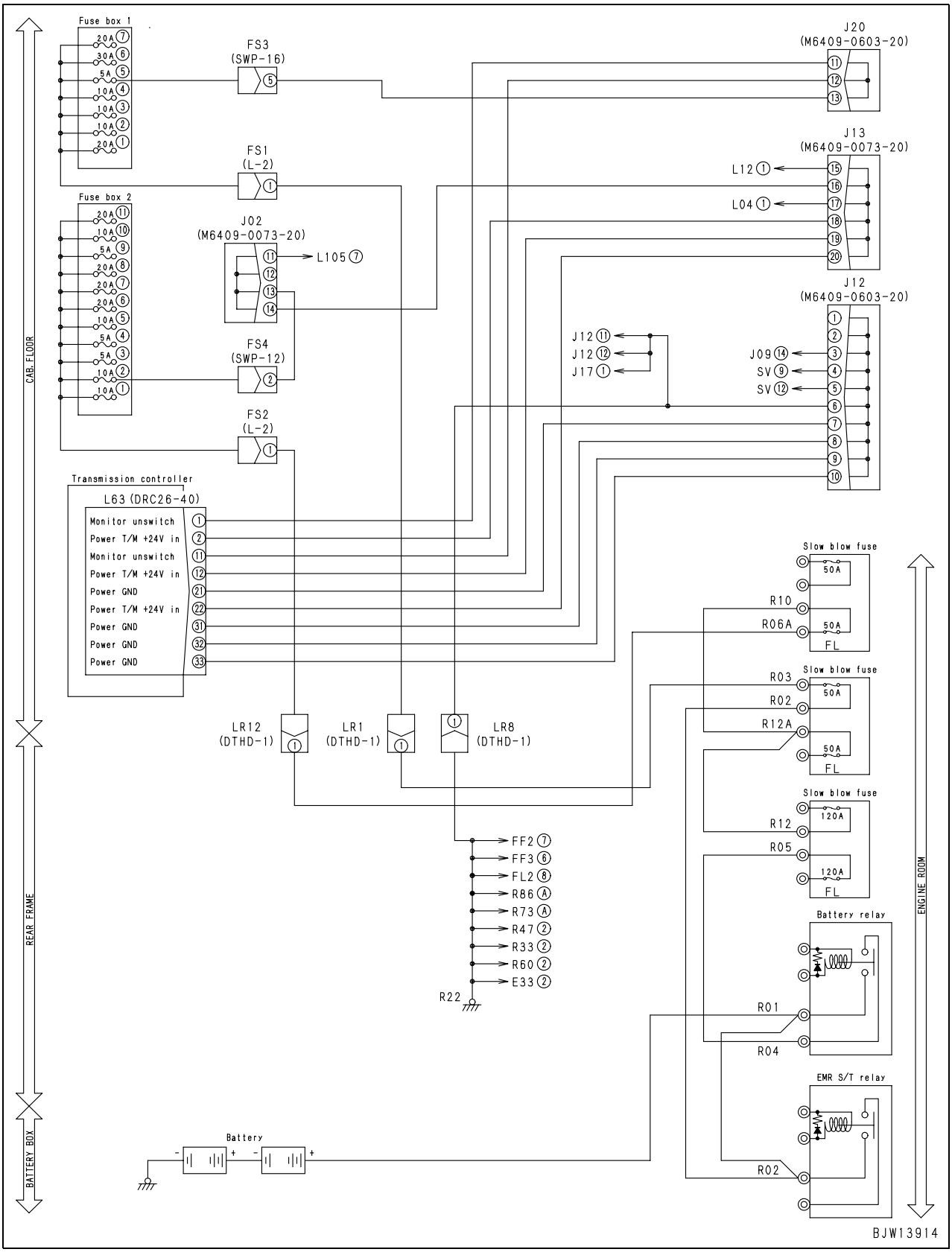
Failure code [DAQ0KK] (Transmission controller: Low source voltage)

Action code	Failure code	Trouble	Transmission controller: Low source voltage (Transmission controller)
E03	**DAQ0KK**		
Contents of trouble	• Voltage of constant power supply (battery direct power supply) of the transmission controller is low. • Voltage of constant power supply (battery direct power supply) is below 18 V and engine speed is above 500 rpm.		
Action of controller	• Cannot sense the input signals normally. • Turns the centralized warning lamp and alarm buzzer ON. • Sets all the controller output to OFF (neutral hold state). • Even if cause of failure disappears, system does not reset itself until FNR (directional) lever, joystick FNR (directional) switch or right FNR (directional) switch is set to N (Neutral).		
Problem that appears on machine	• The machine cannot move (transmission is stuck in Neutral).		
Related information	• Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective slow-blow fuse	If the slow-blow fuse is shut down, the circuit probably has a grounding fault, etc. (See cause 4.)		
	2	Defective fuse No. 5 of fuse box 1	If the fuse is burn, the circuit probably has a grounding fault, etc. (See cause 4.)		
	3	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between emergency steering relay R02 – slow-blow fuse R02	Resistance	Max. 1 Ω
			Wiring harness between slow-blow fuse R03 – fuse No. 5 of fuse box 1	Resistance	Max. 1 Ω
			Wiring harness between fuse No. 5 of fuse box 1 – L63 (female) (1), (11)	Resistance	Max. 1 Ω
	4	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between emergency steering relay R02 – slow-blow fuse R02 and chassis ground	Resistance	Min. 1 MΩ
			Wiring harness between slow-blow fuse R03 – fuse No. 5 of fuse box 1 and chassis ground	Resistance	Min. 1 MΩ
			Wiring harness between fuse No. 5 of fuse box 1 – L63 (female) (1), (11), – circuit branch end and chassis ground	Resistance	Min. 1 MΩ
	5	Defective transmission controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			L63	Voltage	
			Between (1), (11) and (21), (31), (32), (33)	20 – 30 V	

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Circuit diagram related to CAN communication



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Failure code [DAQ0KT] (Transmission controller: Abnormality in controller)

Action code	Failure code	Trouble	Transmission controller: Abnormality in controller (Transmission controller)
E01	**DAQ0KT**		
Contents of trouble	• The information in the ROM (non-volatile memory) of the transmission controller is abnormal. • The battery direct power is not available immediately after the starting switch is OFF. Thus, the ending process is not normally executed.		
Action of controller	• Sets the internal adjustment values to the default values. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• The gear shifting feeling of the transmission may become bad.		
Related information	• Method of reproducing failure code: Turn the starting switch ON.		

Possible causes and standard value in normal state	Causes		Standard value in normal state/Remarks on troubleshooting
	1	Defective transmission controller	Since trouble is in system, troubleshooting cannot be carried out. (If there is no visible trouble on the machine, it is allowed to use the transmission controller without modifying the initial setting or initial adjustment.)

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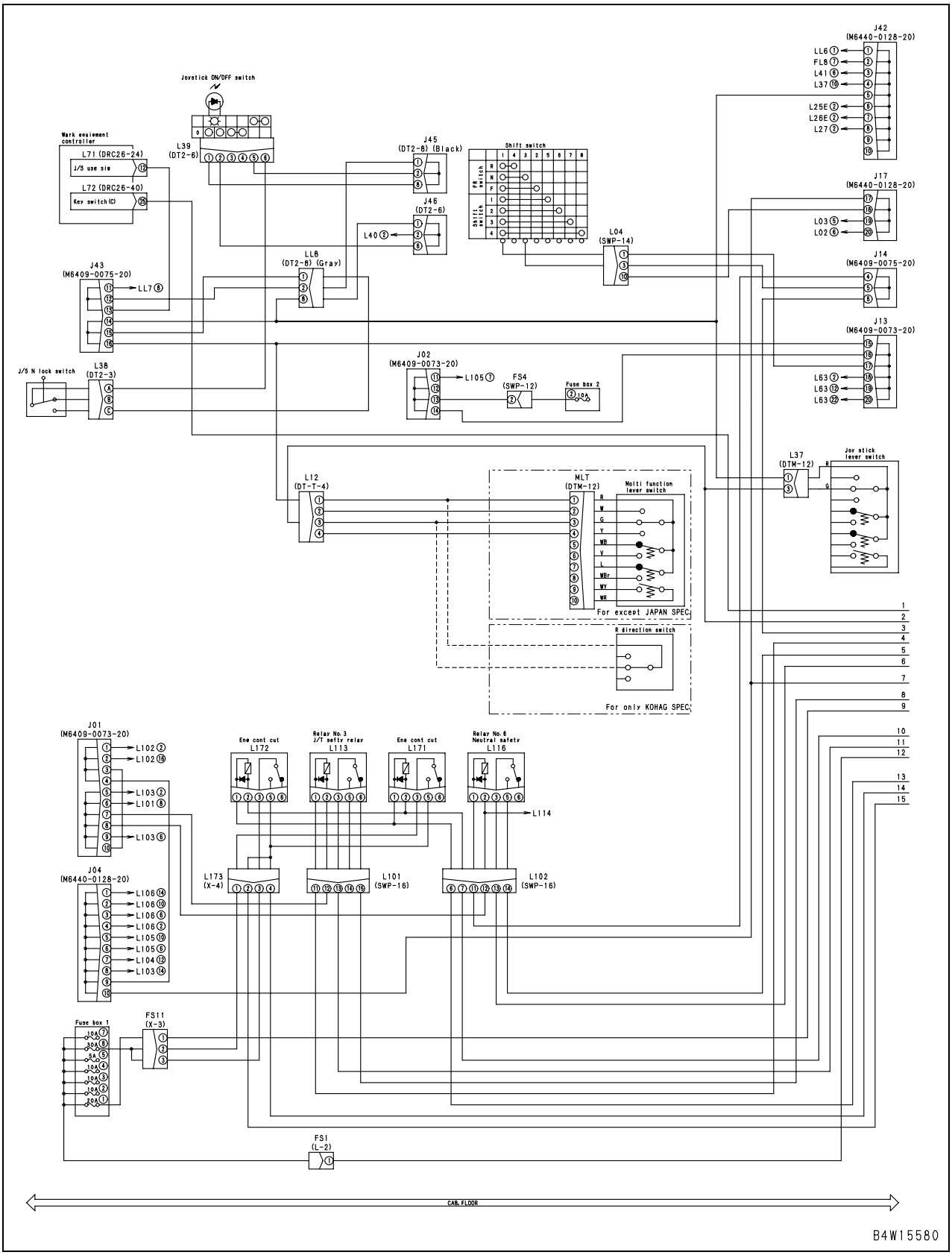
Failure code [DAQ1KA] (Terminal ACC input: Disconnection)

Action code	Failure code	Trouble	Terminal ACC input: Disconnection (Transmission controller)
E03	**DAQ1KA**		
Contents of trouble	• Terminal ACC system is disconnected.		
Action of controller	• None in particular.		
Problem that appears on machine	• When starting switch is turned ON, any item does not light up.		
Related information	• Method of reproducing failure code: Set the starting switch to ON position.		

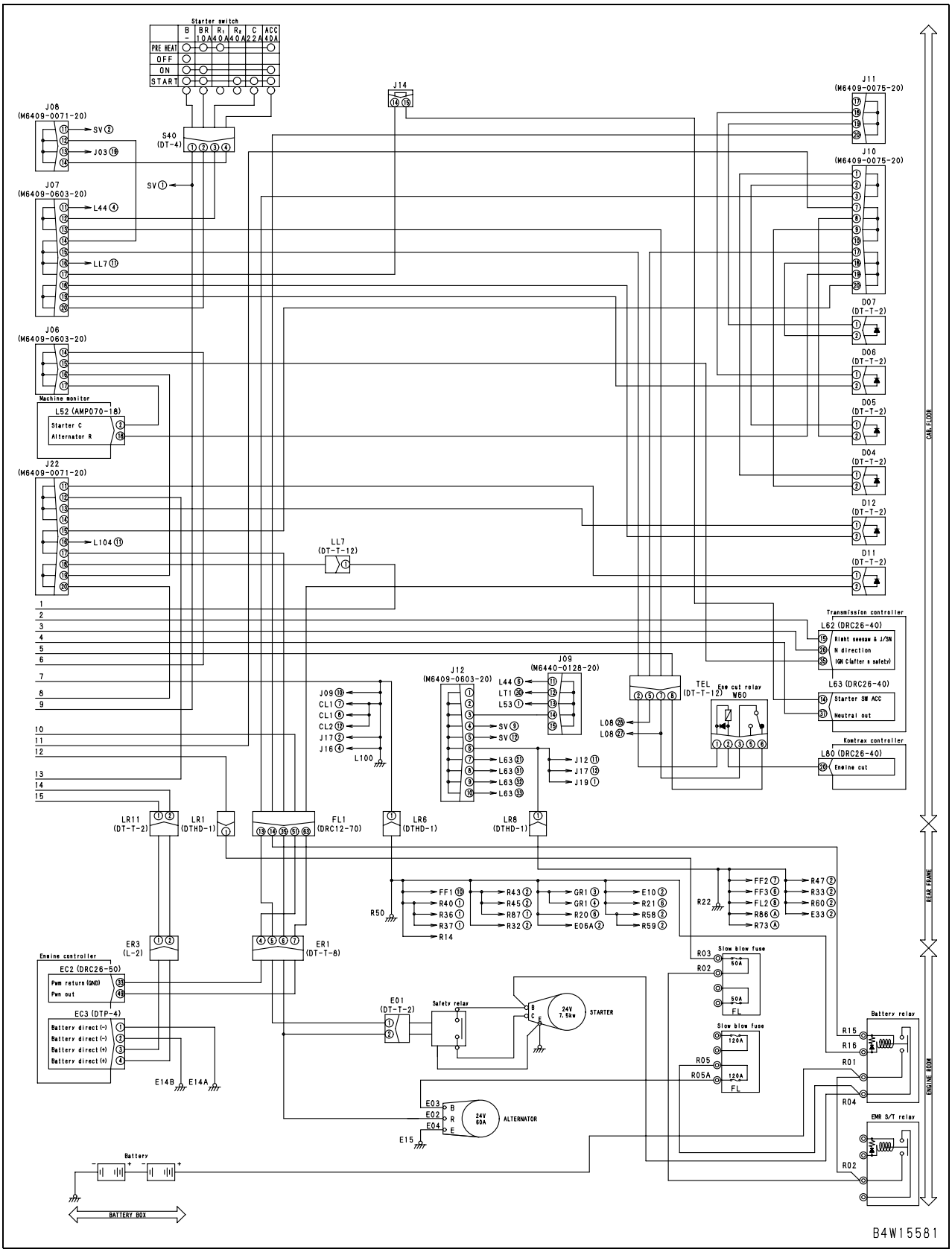
	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective fuse No. 1 of fuse box 1	If the fuse is burn, the circuit probably has a grounding fault, etc.			
	2	Defective starting switch (Internal disconnection)	★ Prepare with starting switch OFF, then turn starting switch ON, OFF or START and carry out troubleshooting.			
			S40	Starting switch	Resistance	
			Between (1) and (4)	ON, START	Max. 1 Ω	
				OFF	Min. 1 MΩ	
	3	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between battery (–) terminal and chassis ground		Resistance	Max. 1 Ω
			Wiring harness between battery (+) terminal – R01 – F01 (No.1)		Resistance	Max. 1 Ω
			Wiring harness between S40 (female) (4) – L63 (female) (14)		Resistance	Max. 1 Ω
	4	Defective transmission controller	★ Prepare with starting switch OFF, then turn starting switch ON, OFF or START and carry out troubleshooting.			
			L63	Starting switch	Voltage	
			Between (14) and chassis ground	ON, START	20 – 30 V	
				OFF	Max. 1 V	

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Circuit diagram related to engine starting system (C terminal signal)



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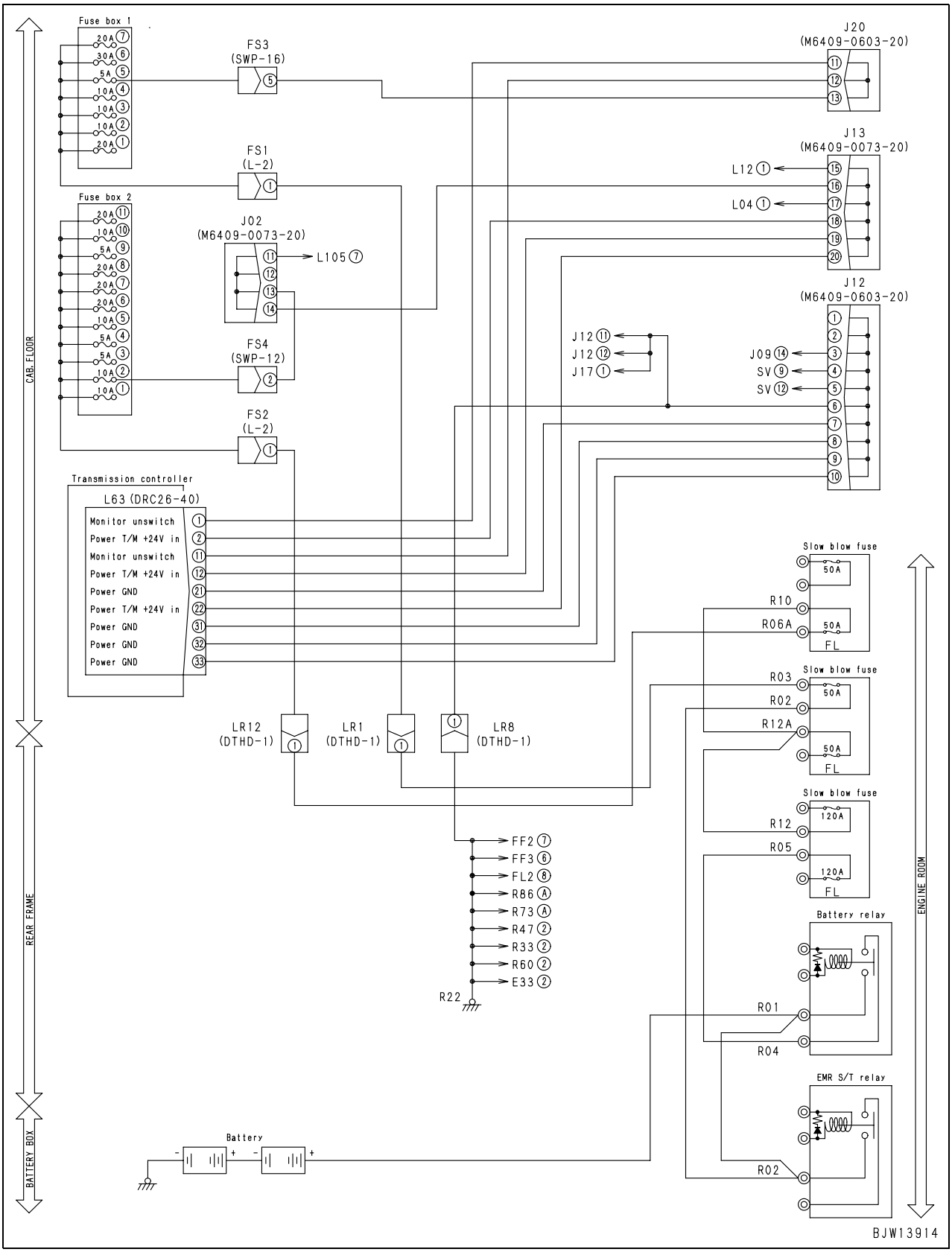
Failure code [DAQ2KK] (Transmission controller load power supply line: Low source voltage (input)

Action code	Failure code	Trouble	Transmission controller load power supply line: Low source voltage (input) (Transmission controller system)
E03	**DAQ2KK**		
Contents of trouble	• The voltage of the 24 V solenoid power supply system is low. • Detection conditions: Terminal C input is turned OFF, constant power supply (battery direct power supply) is above 20 V and solenoid power supply is below 18 V		
Action of controller	• Holds not to display failure codes that may be false detected due to lowering of 24 V solenoid source voltage. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until directional lever, joystick steering FNR (directional) switch or directional selector switch is set to N (Neutral).		
Problem that appears on machine	• The machine cannot move (transmission is stuck in Neutral). • When the current fan rotation is reverse, its rotating direction is switched to forward.		
Related information	• Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between L63(female) (2), (12), (22) – fuse No.2 of fuse box 2	Resistance	Max. 1 Ω
	2	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between L63(female) (2), (12), (22) – fuse No.2 of fuse box 2 and chassis ground	Resistance	Min. 1 MΩ
	3	Defective transmission controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			L63	Voltage	
			Between (2), (12) (22) and (21), (31), (32), (33)	20 – 30 V	

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Circuit diagram related to transmission controller power supply



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Failure code [DAQ9KQ] (Transmission controller model selection: Disagreement of model selection signals)

Action code	Failure code	Trouble	Transmission controller model selection: Disagreement of model selection signals (Machine monitor system)
E03	**DAQ9KQ**		
Contents of trouble	• The transmission controller model is mistaken for another one.		
Action of controller	• Operates on the assumption that the controller model which has been used before occurrence of the failure code is still used. • Turns the centralized warning lamp and alarm buzzer ON. • Does not display failure codes which may be false detected.		
Problem that appears on machine	• Continuing the travel in this condition can damage the transmission.		
Related information	• Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting
Possible causes and standard value in normal state	1	Improper machine monitor model selection	Set the model using the adjustment function of the service mode of the machine monitor (See Special functions of machine monitor (EMMS) in Testing and adjusting)
	2	Transmission controller part number error	Confirm the part number of the transmission controller. It must be replaced if it is not the specified controller.

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Failure code [DAQRKR] (CAN communication with transmission controller: Defective communication (Abnormality in target component system)

Action code	Failure code	Trouble	CAN communication with transmission controller: Defective communication (Abnormality in target component system) (Machine monitor system)
E03	**DAQRKR**		
Contents of trouble	• Machine monitor cannot get information from transmission controller		
Action of controller	• Uses CAN information that was sent from transmission controller before the occurrence of the error. • Turns the centralized warning lamp and alarm buzzer ON. • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• The monitor does not display normally.		
Related information	• Method of reproducing failure code: Turn the starting switch ON.		

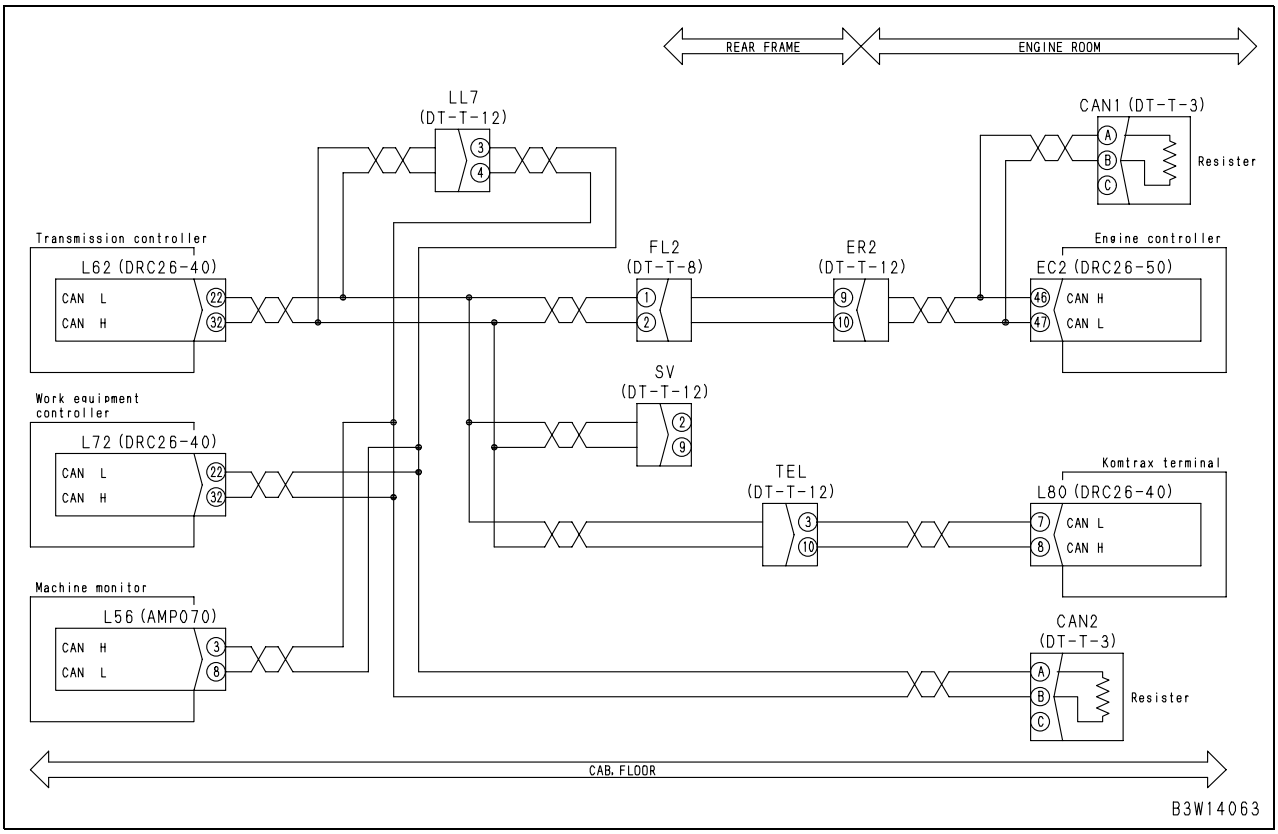
	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective CAN end point resistance	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			CAN1 (male)	Resistance		
			Between (A) and (B)	110 – 140 Ω		
			★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			CAN2 (male)	Resistance		
			Between (A) and (B)	110 – 140 Ω		
	2	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L62 (female) (22), (32) – L56 (female) (3), (8)	Resistance	Max. 1 Ω	
			Wiring harness between L62 (female) (22), (32) – L72 (female) (22), (32)	Resistance	Max. 1 Ω	
			Wiring harness between L62 (female) (22), (32) – EC2 (female) (46), (47)	Resistance	Max. 1 Ω	
			Wiring harness between L62 (female) (22), (32) – L80 (female) (7), (8)	Resistance	Max. 1 Ω	
			Wiring harness between L62 (female) (22), (32) – CAN1 (female) (A), (B)	Resistance	Max. 1 Ω	
			Wiring harness between L62 (female) (22), (32) – CAN2 (female) (A), (B)	Resistance	Max. 1 Ω	

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	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	3	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between L62 (female) (22), (32) – L56 (female) (3), (8) and chassis ground	Resistance	Min. 1 MΩ
			Wiring harness between L62 (female) (22), (32) – L72 (female) (22), (32) and chassis ground	Resistance	Min. 1 MΩ
			Wiring harness between L62 (female) (22), (32) – EC2 (female) (46), (47) and chassis ground	Resistance	Min. 1 MΩ
			Wiring harness between L62 (female) (22), (32) – L80 (female) (7), (8) and chassis ground	Resistance	Min. 1 MΩ
			Wiring harness between L62 (female) (22), (32) – CAN1 (female) (A), (B) and chassis ground	Resistance	Min. 1 MΩ
			Wiring harness between L62 (female) (22), (32) – CAN2 (female) (A), (B) and chassis ground	Resistance	Min. 1 MΩ
	4	Defective power supply circuit of transmission controller	★ Power supply circuit or grounding circuit may be defective. Confirm that there is no disconnection of the circuit or defective mating of the connector.		
	5	Defective machine monitor, transmission controller, work equipment controller, engine controller or KOMTRAX terminal	★ If above troubleshootings 1 – 4 have not identified the cause of the trouble, failure on the machine monitor, transmission controller, work equipment controller, engine controller or KOMTRAX terminal should be suspected. (Since trouble is in system, troubleshooting cannot be carried out.)		

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Circuit diagram related to CAN communication



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Failure code [DAQRMA] (Transmission controller option setting: Disagreement of option selection)

Action code	Failure code	Trouble	Transmission controller option setting: Disagreement of option selection (Machine monitor system)
E03	**DAQRMA**		
Contents of trouble	• Disagreement between the option setting done by the machine monitor and the option recognition done by the transmission controller.		
Action of controller	• The transmission controller follows the option setting being recognized by itself. • Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• The option setting does not work normally.		
Related information	• Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting
Possible causes and standard value in normal state	1	Defective option setting	Adjust the option setting using the adjustment function of the machine monitor (See Special functions of machine monitor (EMMS) in Testing and adjusting).
	2	Defective machine monitor	The machine monitor may be defective. (Since trouble is in system, troubleshooting cannot be carried out.)
	3	Defective transmission controller	The transmission controller may be defective. (Since trouble is in system, troubleshooting cannot be carried out.)

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Failure code [DB2RKR] (CAN communication with engine controller: Defective communication (Abnormality in target component system)

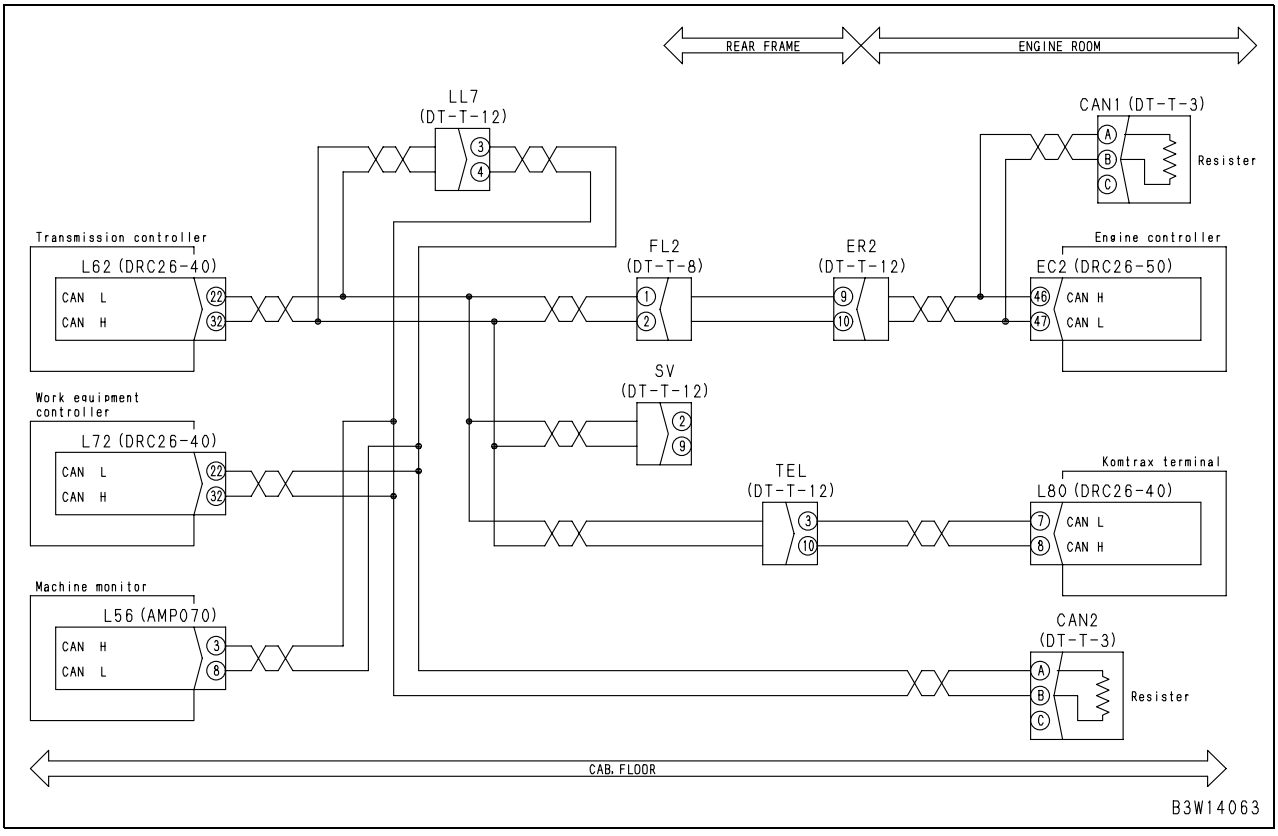
Action code	Failure code	Trouble	CAN communication with engine controller: Defective communication (Abnormality in target component system) (Transmission controller system)
E03	**DB2RKR**		
Contents of trouble	• Communication via CAN signal line between the transmission controller and engine controller is defective.		
Action of controller	• Uses CAN information that was sent from engine controller before the occurrence of the error. • Fixes the recognition value of engine speed to 2,100 rpm. • Holds recognized position of accelerator at 80%. • Turns the centralized warning lamp and alarm buzzer ON. • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• The monitor does not display normally.		
Related information	• Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective CAN end point resistance	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			CAN1 (male)	Resistance	
			Between (A) and (B)	110 – 140 Ω	
			★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			CAN2 (male)	Resistance	
			Between (A) and (B)	110 – 140 Ω	
	2	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between EC2 (female) (46), (47) – L62 (female) (22), (32)	Resistance	Max. 1 Ω
			Wiring harness between EC2 (female) (46), (47) – L56 (female) (3), (8)	Resistance	Max. 1 Ω
			Wiring harness between EC2 (female) (46), (47) – L72 (female) (22), (32)	Resistance	Max. 1 Ω
			Wiring harness between EC2 (female) (46), (47) – L80 (female) (7), (8)	Resistance	Max. 1 Ω
			Wiring harness between EC2 (female) (46), (47) – CAN1 (female) (A), (B)	Resistance	Max. 1 Ω
			Wiring harness between EC2 (female) (46), (47) – CAN2 (female) (A), (B)	Resistance	Max. 1 Ω

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	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	3	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between EC2 (female) (46), (47) – L62 (female) (22), (32) and chassis ground	Resistance	Min. 1 MΩ
			Wiring harness between EC2 (female) (46), (47) – L56 (female) (3), (8) and chassis ground	Resistance	Min. 1 MΩ
			Wiring harness between EC2 (female) (46), (47) – L72 (female) (22), (32) and chassis ground	Resistance	Min. 1 MΩ
			Wiring harness between EC2 (female) (46), (47) – L80 (female) (7), (8) and chassis ground	Resistance	Min. 1 MΩ
			Wiring harness between EC2 (female) (46), (47) – CAN1 (female) (A), (B) and chassis ground	Resistance	Min. 1 MΩ
			Wiring harness between EC2 (female) (46), (47) – CAN2 (female) (A), (B) and chassis ground	Resistance	Min. 1 MΩ
	4	Defective power supply circuit of transmission controller	★ Power supply circuit or grounding circuit may be defective. Confirm that there is no disconnection of the circuit or defective mating of the connector.		
	5	Defective machine monitor, transmission controller, work equipment controller, engine controller or KOMTRAX terminal	★ If above troubleshootings 1 – 4 have not identified the cause of the trouble, failure on the machine monitor, transmission controller, work equipment controller, engine controller or KOMTRAX terminal should be suspected. (Since trouble is in system, troubleshooting cannot be carried out.)		

Circuit diagram related to CAN communication



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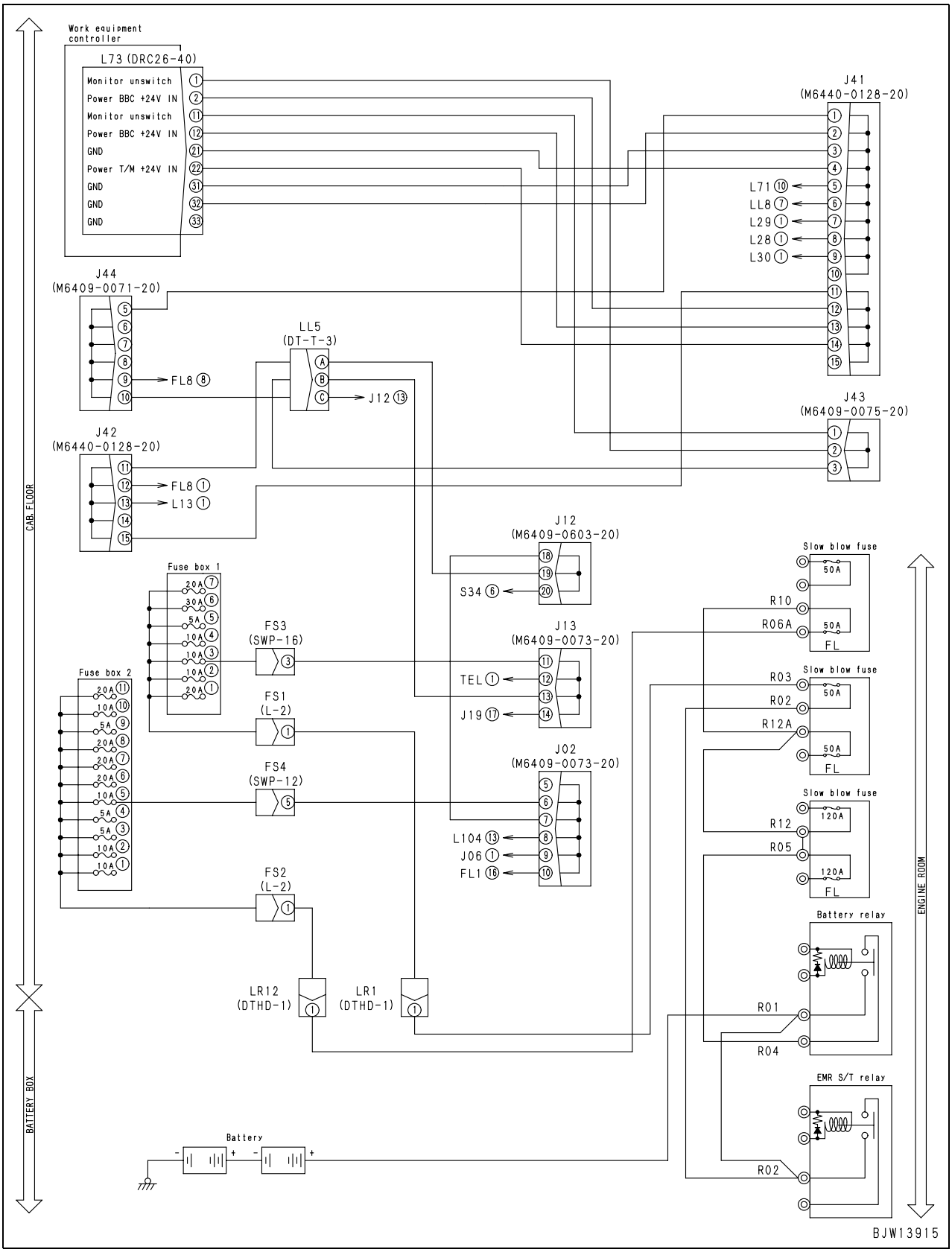
Failure code [DB90KK] Work equipment controller: Low source voltage (input)

Action code	Failure code	Trouble	Work equipment controller: Low source voltage (input) (Work equipment controller system)
E03	**DB90KK**		
Contents of trouble	• Voltage of work equipment controller UNSW power supply (battery direct power supply) is low. • Voltage of constant power supply (battery direct power supply) is 18 V or less		
Action of controller	• Does not display failure codes other than this code if voltage of constant power supply (battery direct power supply) remains under 18 V for more than 2 seconds. • Even if cause of failure disappears, system does not reset itself until the joystick steering lever and work equipment lever are once set to N (Neutral). • Turns the centralized warning lamp and alarm buzzer ON. • Cannot operate normally since it cannot sense the input signals properly.		
Problem that appears on machine	• The machine cannot operate normally.		
Related information	• Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective slow-blow fuse	If the slow-blow fuse is shut down, the circuit probably has a grounding fault, etc. (See cause 4.)		
	2	Defective fuse No. 3 of fuse box 1	If the fuse is burn, the circuit probably has a grounding fault, etc. (See cause 4.)		
	3	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between emergency steering relay R02 – slow-blow fuse R02	Resistance	Max. 1 Ω
			Wiring harness between slow-blow fuse R03 – fuse No. 3 of fuse box 1	Resistance	Max. 1 Ω
			Wiring harness between fuse No. 3 of fuse box 1 – L73 (female) (1), (11)	Resistance	Max. 1 Ω
	4	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between emergency steering relay R02 – slow-blow fuse R02 and chassis ground	Resistance	Min. 1 MΩ
			Wiring harness between slow-blow fuse R03 – fuse No. 3 of fuse box 1 and chassis ground	Resistance	Min. 1 MΩ
			Wiring harness between fuse No. 3 of fuse box 1 – L73 (female) (1), (11) and chassis ground	Resistance	Min. 1 MΩ
	5	Defective work equipment controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			L73	Voltage	
			Between (1), (11) and (21), (31), (32), (33)	20 – 30 V	

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Circuit diagram related to work equipment controller power supply



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Failure code [DB90KT] Work equipment controller: Abnormality in controller

Action code	Failure code	Trouble	Work equipment controller: Abnormality in controller (Work equipment controller system)
E01	**DB90KT**		
Contents of trouble	• The information in the ROM (non-volatile memory) of the work equipment controller system is abnormal.		
Action of controller	• Sets the internal adjustment values to the default values. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• The machine may false detect errors. • Performance degrades since the machine is controlled with improper data.		
Related information	• Method of reproducing failure code: Turn starting switch ON.		

Possible causes and standard value in normal state	Cause		Standard value in normal state/Remarks on troubleshooting
	1	Defective work equipment controller	Since trouble is in system, troubleshooting cannot be carried out. Replace the work equipment controller.

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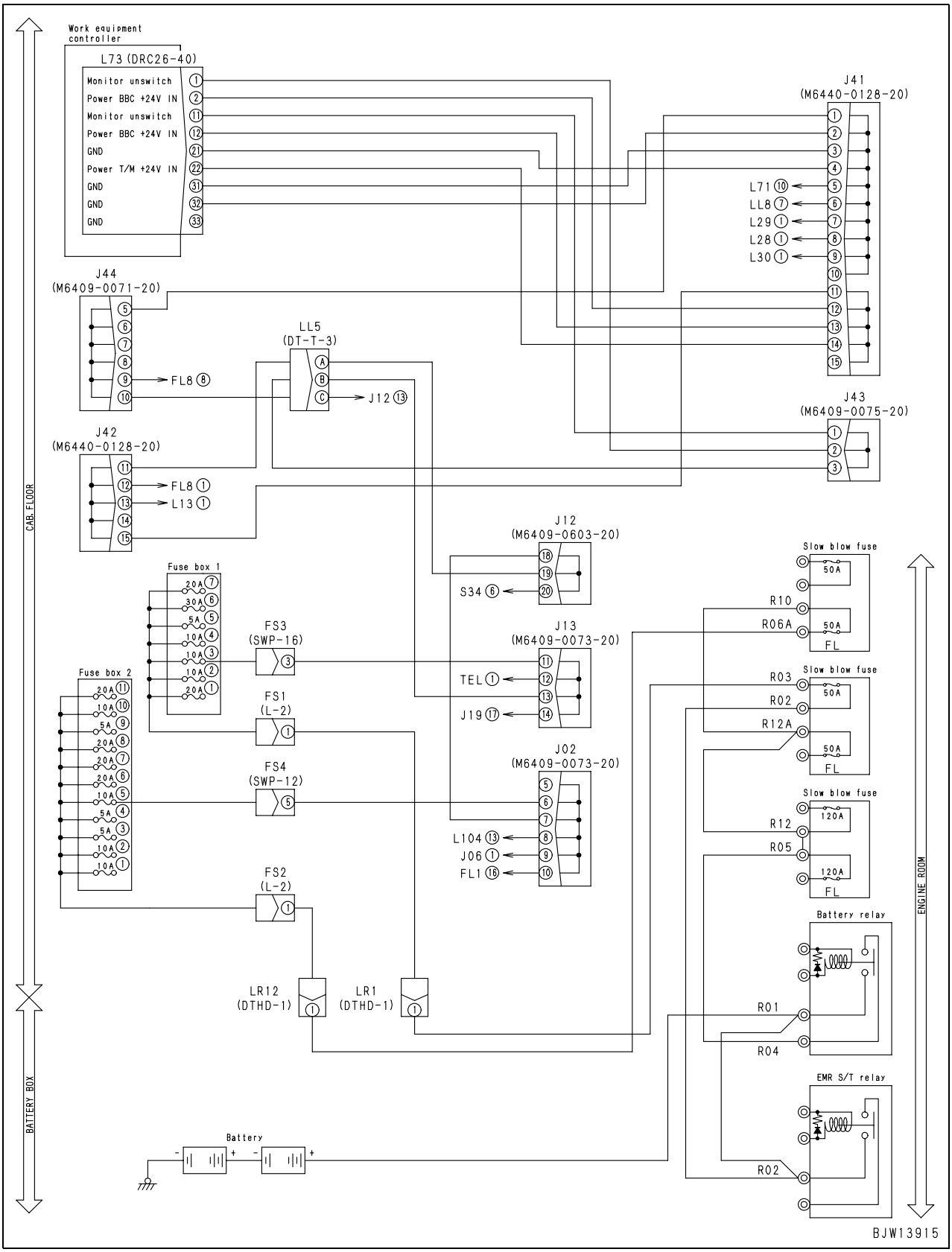
Failure code [DB92KK] Work equipment controller load power supply line: Low source voltage (input)

Action code	Failure code	Trouble	Work equipment controller load power supply line: Low source voltage (input) (Work equipment controller system)
E03	**DB92KK**		
Contents of trouble	• The voltage of the 24V solenoid power supply system is low. • Detection conditions: Terminal C input is turned OFF, constant power supply (battery direct power supply) is above 20 V and solenoid power supply is below 18 V		
Action of controller	• Cannot supply voltage to the solenoid. (If the voltage is below 18 V, all outputs are turned OFF.) • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until the joystick steering lever and work equipment lever are once set to N (Neutral).		
Problem that appears on machine	• Work equipment does not move • Machine cannot be steered with joystick lever.		
Related information	• Method of reproducing failure code: Turn the starting switch ON.		

		Causes	Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective slow-blow fuse	If the slow blow fuse is shut down, the circuit probably has a grounding fault, etc. (See cause 4.)		
	2	Defective fuse No.5 of fuse box 2	If the fuse is burn, the circuit probably has a grounding fault, etc. (See cause 4.)		
	3	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between battery R04 – slow-blow fuse R10	Resistance	Max. 1 Ω
			Wiring harness between slow-blow fuse R06A – fuse No. 5 of fuse box 2	Resistance	Max. 1 Ω
			Wiring harness between fuse No. 5 of fuse box 2 – L73 (female) (2), (12), (22)	Resistance	Max. 1 Ω
	4	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between battery relay R04 – slow-blow fuse R10 and chassis ground	Resistance	Min. 1 MΩ
			Wiring harness between slow-blow fuse R06A – fuse No. 5 of fuse box 2 and chassis ground	Resistance	Min. 1 MΩ
			Wiring harness between fuse No. 5 of fuse box 2 – L73 (female) (2), (12), (22) and chassis ground	Resistance	Min. 1 MΩ
	5	Defective work equipment controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			L73	Voltage	
			Between (2), (12), (22) and (21), (31), (32), (33)	20 – 30 V	

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Circuit diagram related to work equipment controller 24V power supply



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Failure code [DB95KX] Work equipment controller power supply output: Out of input signal range

Action code	Failure code	Trouble	Work equipment controller power supply output: Out of input signal range (Work equipment controller system)
E03	**DB95KX**		
Contents of trouble	• Nominal voltage output of 5V sensor power supply system is out of range (Outside 4.7 – 5.3 V)		
Action of controller	• Cannot sense the input signals normally due to abnormal potentiometer signal. • Turns the centralized warning lamp and alarm buzzer ON. • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• The operator cannot operate the work equipment (Machine stop entirely). • Following potentiometer error results		
Related information	• Method of reproducing failure code: Turn the starting switch ON.		

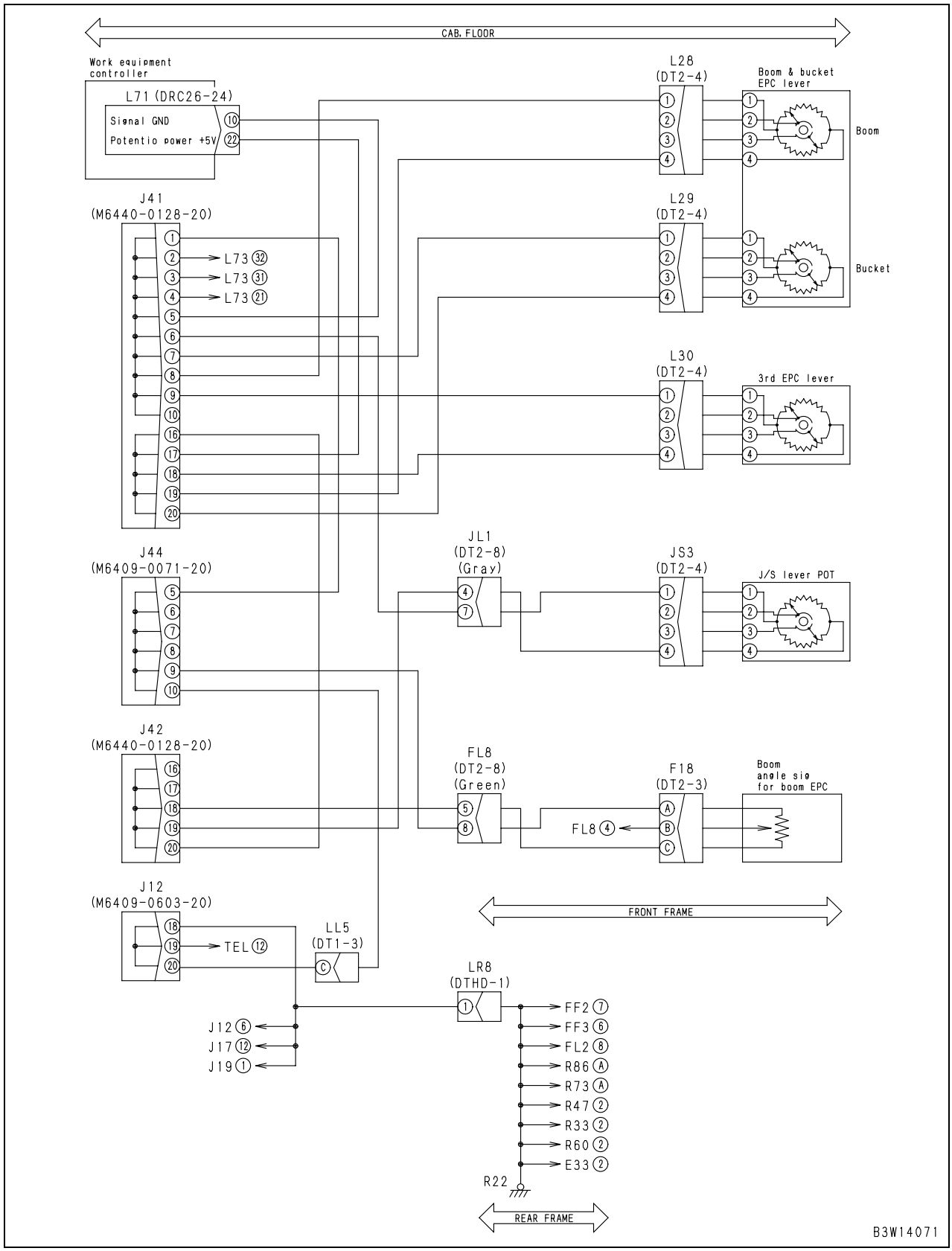
	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective joystick steering lever potentiometer (Internal disconnection or short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			JS3 (male)	Resistance	
			Between (4) and (1)	2.5 – 3.9 kΩ	
			Between (1), (4) and chassis ground	Min. 1 MΩ	
	2	Defective 3-spool valve EPC lever potentiometer (Internal disconnection or short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			L30 (male)	Resistance	
			Between (4) and (1)	2.5 – 3.9 kΩ	
			Between (1), (4) and chassis ground	Min. 1 MΩ	
	3	Defective lift arm EPC lever potentiometer (Internal disconnection or short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			L28 (male)	Resistance	
			Between (4) and (1)	2.5 – 3.9 kΩ	
			Between (1), (4) and chassis ground	Min. 1 MΩ	
	4	Defective bucket EPC lever potentiometer (Internal disconnection or short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			L29 (male)	Resistance	
			Between (4) and (1)	2.5 – 3.9 kΩ	
			Between (1), (4) and chassis ground	Min. 1 MΩ	
	5	Defective lift arm potentiometer	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			F18 (male)	Resistance	
			Between (C) and (A)	5 kΩ ± 20%	
			Between (A), (C) and chassis ground	Min. 1 MΩ	
	6	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Between L71 (female) (22) and chassis ground	Resistance	Min. 1 MΩ

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Possible causes and standard value in normal state	Causes		Standard value in normal state/Remarks on troubleshooting	
	7	Defective work equipment controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.	
			L71	Voltage
			Between (22) and (10)	4.85 – 5.15 V

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Circuit diagram related to work equipment controller 5 V power supply



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Failure code [DB99KQ] (Work equipment controller model selection: Disagreement in model selection signals)

Action code	Failure code	Trouble	Work equipment controller model selection: Disagreement in model selection signals (Machine monitor system)
E03	**DB99KQ**		
Contents of trouble	• Work equipment controller model is mistaken for another one.		
Action of controller	• Operates on the assumption that the controller model which has been used before occurrence of the failure code is still used. • Does not display failure codes which may be false detected. • Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• Work equipment does not operate normally		
Related information	• Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting
Possible causes and standard value in normal state	1	Improper machine monitor model selection	Set the model using the adjustment function of the service mode of the machine monitor (See Special functions of machine monitor (EMMS) in Testing and adjusting)
	2	Work equipment controller part number error	Confirm the part number of the work equipment controller. It must be replaced if it is not the specified controller.

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Failure code [DB9RKR] CAN communication with work equipment controller: Defective communication (Abnormality in target component system)

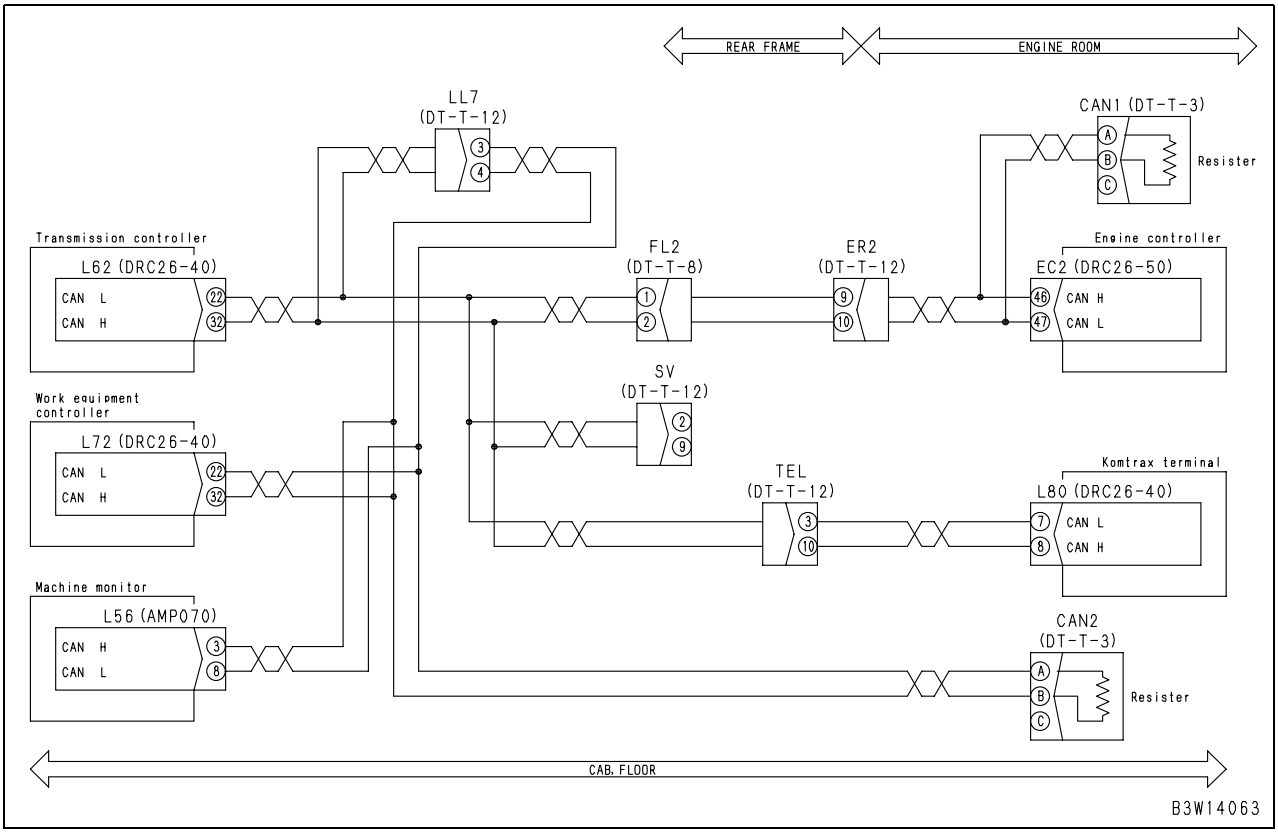
Action code	Failure code	Trouble	Can communication with work equipment controller: Defective communication (Abnormality in target component system) (Transmission controller system)
E03	**DB9RKR**		
Contents of trouble	• Machine monitor cannot get information from work equipment controller		
Action of controller	• Turns the centralized warning lamp and alarm buzzer ON. • Uses CAN information that was sent from work equipment controller before the occurrence of the error. • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• The monitor does not display normally		
Related information	• Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective CAN end point resistance	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			CAN1 (male)	Resistance		
			Between (A) and (B)	110 – 140 Ω		
			★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			CAN2 (male)	Resistance		
			Between (A) and (B)	110 – 140 Ω		
	2	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L62 (female) (22), (32) – EC2 (female) (46), (47)	Resistance	Max. 1 Ω	
			Wiring harness between L62 (female) (22), (32) – L56 (female) (3), (8)	Resistance	Max. 1 Ω	
			Wiring harness between L62 (female) (22), (32) – L72 (female) (22), (32)	Resistance	Max. 1 Ω	
			Wiring harness between L62 (female) (22), (32) – L80 (female) (7), (8)	Resistance	Max. 1 Ω	
			Wiring harness between L62 (female) (22), (32) – CAN1 (female) (A), (B)	Resistance	Max. 1 Ω	
			Wiring harness between L62 (female) (22), (32) – CAN2 (female) (A), (B)	Resistance	Max. 1 Ω	

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	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	3	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between L62 (female) (22), (32) – EC2 (female) (46), (47) and chassis ground	Resistance	Min. 1 MΩ
			Wiring harness between L62 (female) (22), (32) – L56 (female) (3), (8) and chassis ground	Resistance	Min. 1 MΩ
			Wiring harness between L62 (female) (22), (32) – L72 (female) (22), (32) and chassis ground	Resistance	Min. 1 MΩ
			Wiring harness between L62 (female) (22), (32) – L80 (female) (7), (8) and chassis ground	Resistance	Min. 1 MΩ
			Wiring harness between L62 (female) (22), (32) – CAN1 (female) (A), (B) and chassis ground	Resistance	Min. 1 MΩ
			Wiring harness between L62 (female) (22), (32) – CAN2 (female) (A), (B) and chassis ground	Resistance	Min. 1 MΩ
	4	Defective power supply circuit of work equipment controller	★ Power supply circuit or grounding circuit may be defective. Confirm that there is no disconnection of the circuit or defective mating of the connector.		
	5	Defective machine monitor, transmission controller, work equipment controller, engine controller or KOMTRAX terminal	★ If above troubleshootings 1 – 4 have not identified the cause of the trouble, failure on the machine monitor, transmission controller, work equipment controller, engine controller or KOMTRAX terminal should be suspected. (Since trouble is in system, troubleshooting cannot be carried out.)		

Circuit diagram related to CAN communication



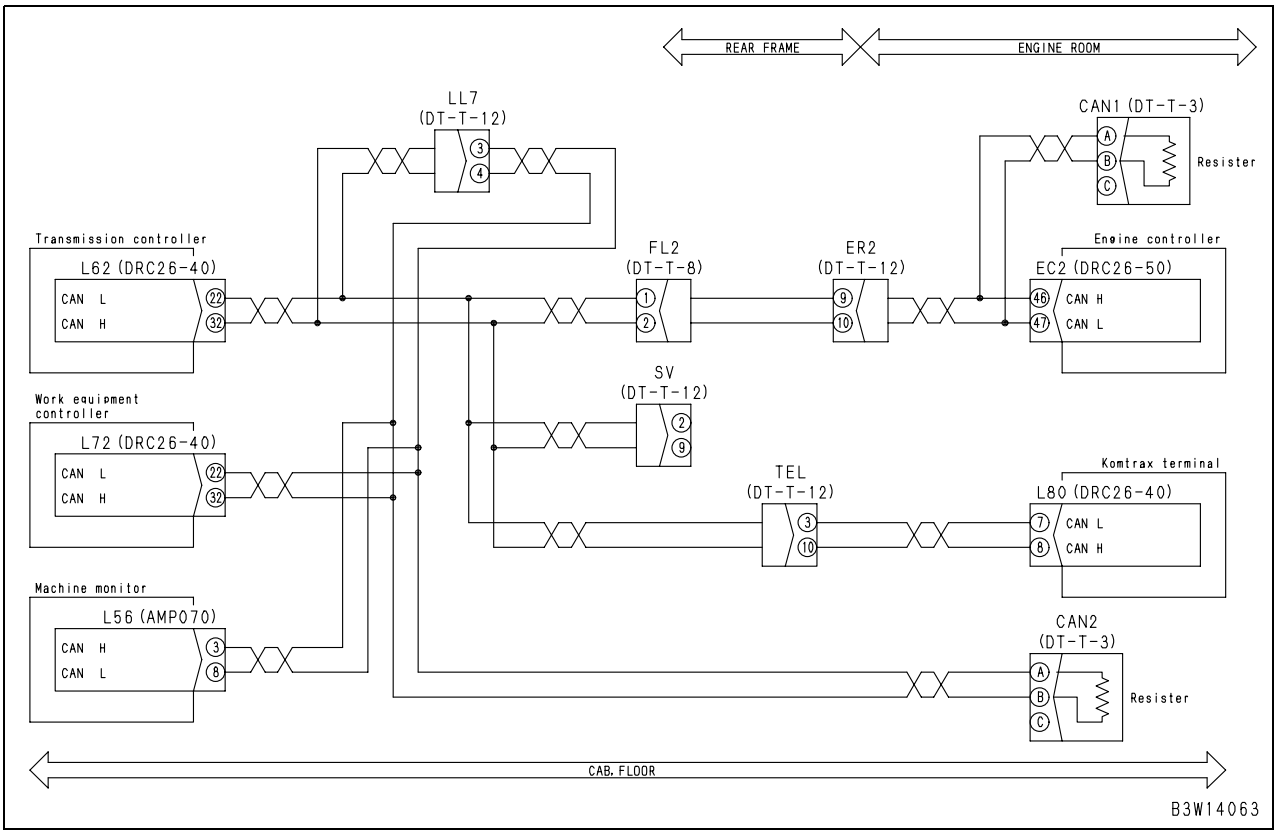
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Failure code [DB9RMA] (Work equipment controller option setting: Malfunction)

Action code	Failure code	Trouble	Work equipment controller option setting: Malfunction (Machine monitor system)
E03	**DB9RMA**		
Contents of trouble	• Disagreement between the option setting done by the machine monitor and the option recognition done by the work equipment controller.		
Action of controller	• The work equipment controller follows the option setting being recognized by itself. • Turns the centralized warning lamp and alarm buzzer ON.		
Problem that appears on machine	• The optional device does not work normally.		
Related information	• Method of reproducing failure code: Turn the starting switch ON.		

		Causes	Standard value in normal state/Remarks on troubleshooting
Possible causes and standard value in normal state	1	Defective option setting	Adjust the option setting using the adjustment function of the machine monitor (See Testing and adjusting).
	2	Defective work equipment controller	Transmission controller may be defective. (Since trouble is in system, troubleshooting cannot be carried out.)
	3	Defective machine monitor	The machine monitor may be defective. (Since trouble is in system, troubleshooting cannot be carried out.)

Circuit diagram related to CAN communication



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Failure code [DB9RMC] (CAN communication with transmission controller, engine controller and machine monitor: Defective operation)

Action code	Failure code	Trouble	CAN communication with transmission controller, engine controller and machine monitor: Defective operation (Work equipment controller system)
E03	**DB9RMC**		
Contents of trouble	• Communication via CAN signal line between the work equipment controller – transmission controller, engine controller and machine monitor is defective. • If problem is removed, system is returned to normal operating state.		
Action of controller	• Turns the centralized warning lamp and alarm buzzer. <Relevant to the transmission controller> • Judges that the travel speed is at 0 km/h. • Turns off engine start prohibition signal to neutral safety relay (Engine can be started). • Uses CAN information that was sent from transmission controller before the occurrence of the error. <Relevant to engine controller> • Judges engine speed is at 1,500 rpm. • Uses CAN information that was sent from engine controller before the occurrence of the error. <Relevant to machine monitor> • Judges that the emergency steering is not in operation. • Uses CAN information that was sent from machine monitor before the occurrence of the error.		
Problem that appears on machine	<Relevant to transmission controller> • The operator may not use semiautomatic digging occasionally or cannot use it entirely. • Joystick steering does not work (Joystick steering specification). • Starting becomes available only when the joystick steering is not at neutral, joystick steering does not respond sharply. • Work equipment speed is abnormal. <Relevant to engine controller> • Machine operates in semiautomatic digging mode but digging speed is kept constant. • Defective lift arm positioner and bucket positioner stop position (calculation of pump delivery becomes unavailable.) • Engine does not pick up smoothly (swash plate of supply pump remains at MAX). <Relevant to machine monitor> • When the emergency steering is operated, false detection of the power supply error might result. • If disconnection occurs while the emergency steering is in operation, detection of the power supply error becomes unavailable.		
Related information	• Method of reproducing failure code: Turn the starting switch ON or start the engine to resume the normal operation.		

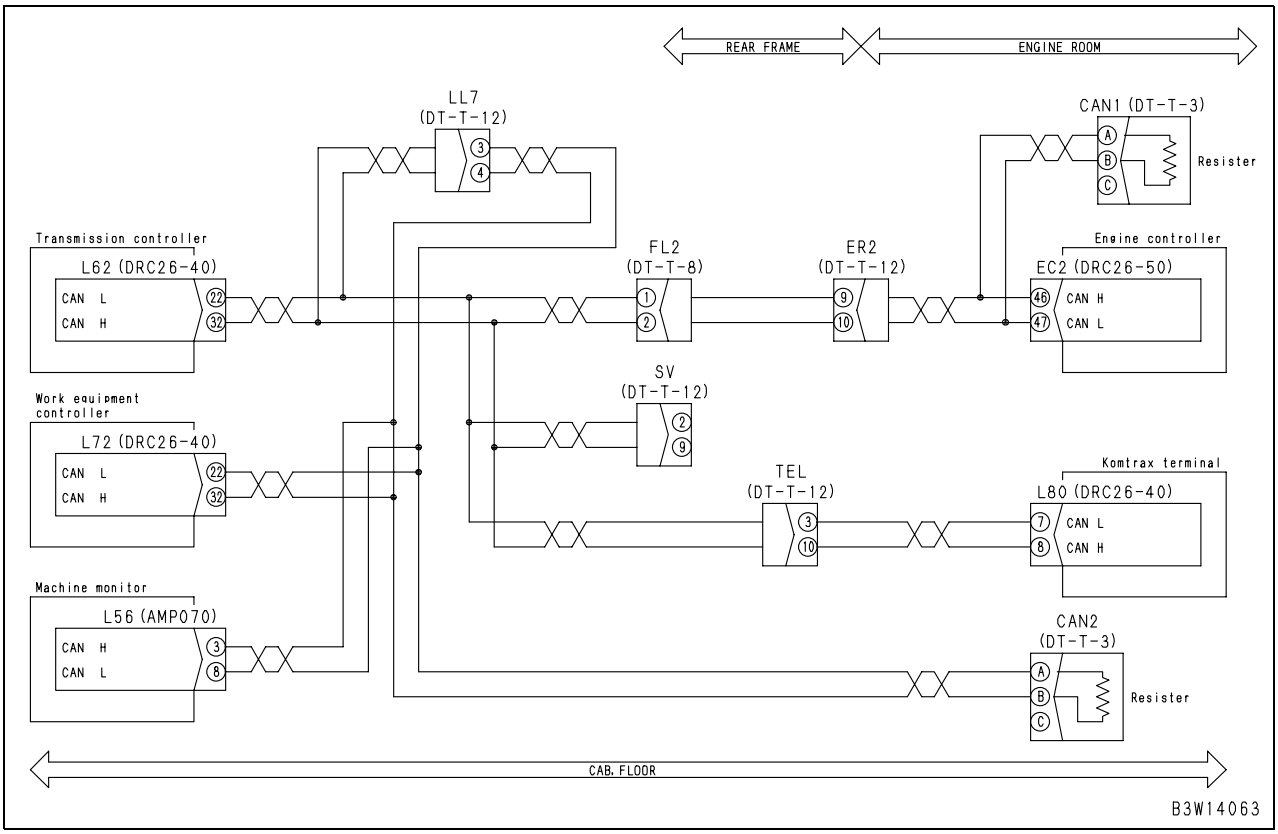
Possible causes and standard value in normal state	Causes		Standard value in normal state/Remarks on troubleshooting	
	1	Defective CAN end point resistance	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.	
			CAN1 (male)	Resistance
			Between (A) and (B)	110 – 140 Ω
			★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.	
			CAN2 (male)	Resistance
			Between (A) and (B)	110 – 140 Ω

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	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	2	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between L62 (female) (22) – L56 (female) (8) or between L62 (female) (32) – L56 (female) (3)	Resistance	Max. 1 Ω
			Wiring harness between L62 (female) (22) – L72 (female) (22) or between L62 (female) (32) – L72 (female) (32)	Resistance	Max. 1 Ω
			Wiring harness between L62 (female) (22) – EC2 (female) (47) or between L62 (female) (32) – EC2 (female) (46)	Resistance	Max. 1 Ω
			Wiring harness between L62 (female) (22) – L80 (female) (7) or between L62 (female) (32) – L80 (female) (8)	Resistance	Max. 1 Ω
			Wiring harness between L62 (female) (22) – CAN1 (female) (B) or between L62 (female) (32) – CAN1 (female) (A)	Resistance	Max. 1 Ω
			Wiring harness between L62 (female) (22) – CAN2 (female) (B) or between L62 (female) (32) – CAN2 (female) (A)	Resistance	Max. 1 Ω
	3	Ground fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between L62 (female) (22), (32) – L56 (female) (3), (8) and chassis ground	Resistance	Min. 1 MΩ
			Wiring harness between L62 (female) (22), (32) – L72 (female) (22), (32) and chassis ground	Resistance	Min. 1 MΩ
			Wiring harness between L62 (female) (22), (32) – EC2 (female) (46), (47) and chassis ground	Resistance	Min. 1 MΩ
			Wiring harness between L62 (female) (22), (32) – L80 (female) (7), (8) and chassis ground	Resistance	Min. 1 MΩ
			Wiring harness between L62 (female) (22), (32) – CAN1 (female) (A), (B) and chassis ground	Resistance	Min. 1 MΩ
			Wiring harness between L62 (female) (22), (32) – CAN2 (female) (A), (B) and chassis ground	Resistance	Min. 1 MΩ
	4	Defective machine monitor, transmission controller, work equipment controller, engine controller or KOMTRAX terminal	★ If above troubleshootings 1 – 3 have not identified the cause of the trouble, failure on the machine monitor, transmission controller, work equipment controller, engine controller or KOMTRAX terminal should be suspected. (Since trouble is in system, troubleshooting cannot be carried out.)		

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Circuit diagram related to CAN communication



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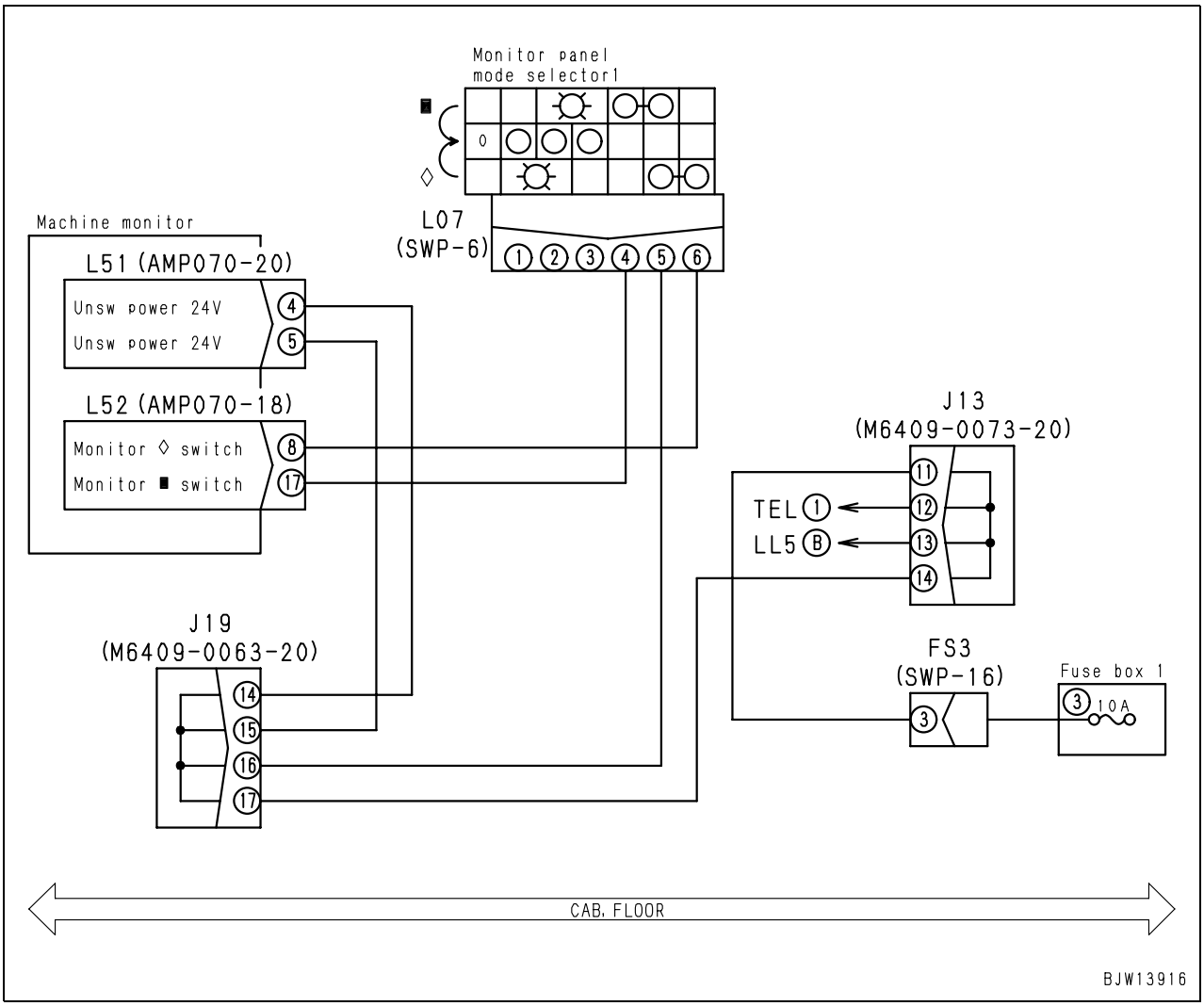
Failure code [DD15LD] ■ switch (Panel switch 1): Switch is kept pressed for long time

Action code	Failure code	Trouble	■ switch (Panel switch 1): Switch is kept pressed for long time (Machine monitor system)
E01	**DD15LD**		
Contents of trouble	• The input circuit of the machine monitor mode selector switch 1 “■” (Panel switch 1) is kept CLOSED for more than continuous 1 minute.		
Action of controller	• None in particular.		
Problem that appears on machine	• The operator cannot operate the monitor (cannot enter the service mode). • Some characters do not appear on the character display.		
Related information	• The input state (ON/OFF) from the machine monitor mode selector switch 1 “■” (Panel switch 1) can be checked with the monitoring function (Code: 40901, D-IN-15). • The operator may not be able to use the monitoring function because of the ■ switch trouble. • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective ■ switch (Panel switch 1) (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L07 (male)	■ switch (Panel switch 1)	Resistance	
			Between (4) and (5)	ON	Max. 1 Ω	
				Other than above	Min. 1 MΩ	
	2	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			Wiring harness between L52 (female) (17) – L07 (female) (4) and chassis ground		Voltage	Max. 1 V
	3	Defective machine monitor	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			L52	■ switch (Panel switch 1)	Voltage	
			Between (17) and chassis ground	ON	20 – 30 V	
				Other than above	Max. 1 V	

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Circuit diagram related to ■ switch and ◇ switch



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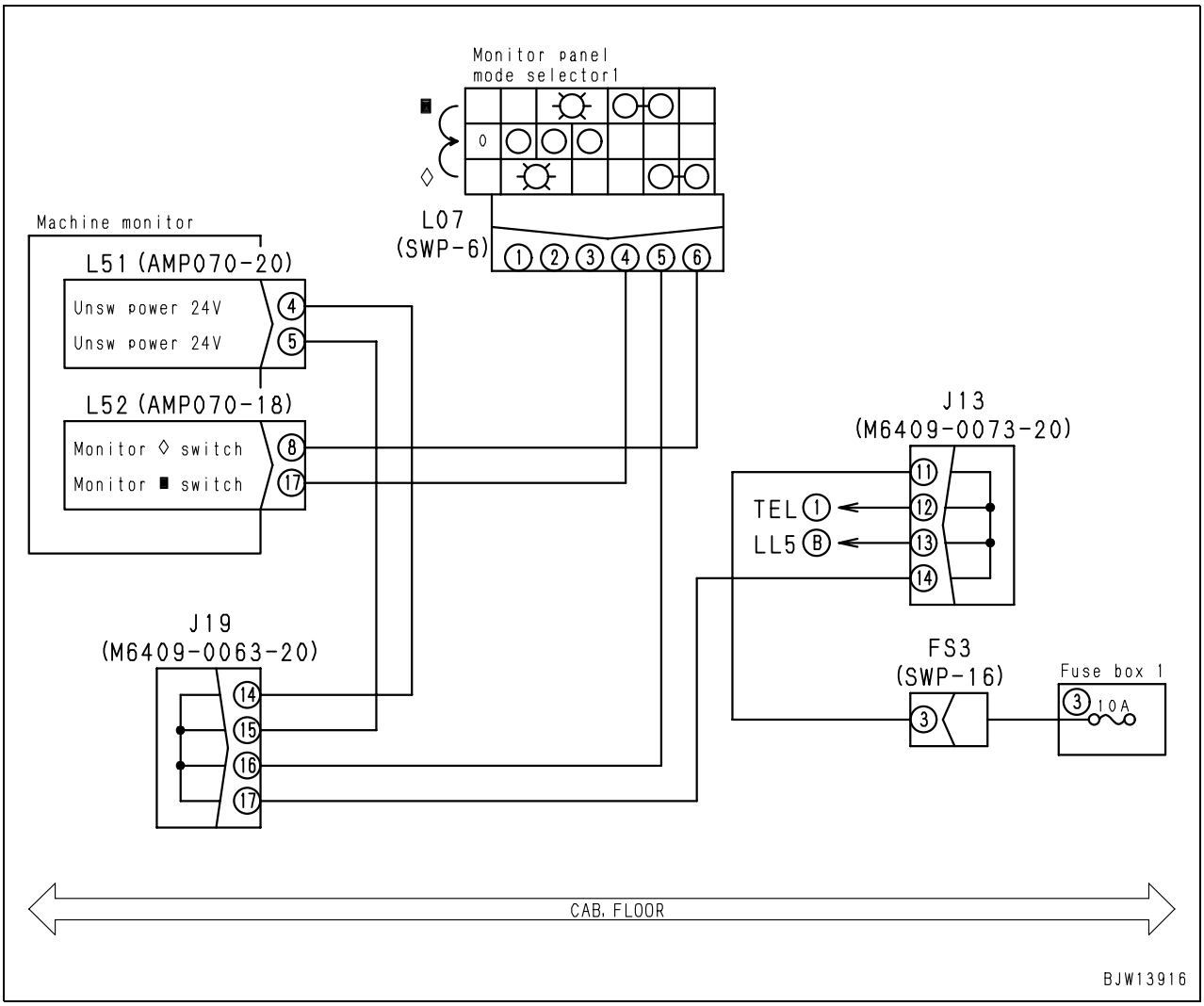
Failure code [DD16LD] ◇ switch (Panel switch 2): Switch is kept pressed for long time

Action code	Failure code	Trouble	◇ switch (Panel switch 2): Switch is kept pressed for long time (Machine monitor system)
E01	**DD16LD**		
Contents of trouble	• The input circuit of the machine monitor mode selector switch 2 "◇" (Panel switch 2) is kept CLOSED for more than continuous 1 minute.		
Action of controller	• None in particular.		
Problem that appears on machine	• The operator cannot operate the monitor (cannot turn on the service mode). • Some characters do not appear on the character display.		
Related information	• The input state (ON/OFF) from the machine monitor mode selector switch 2 "◇" (Panel switch 2) can be checked with the monitoring function (Code: 40901, D-IN-14). • The operator may not be able to use the monitoring function because of the ◇ switch trouble. • Method of reproducing failure code: Turn the starting switch ON.		

Possible causes and standard value in normal state	Causes		Standard value in normal state/Remarks on troubleshooting			
	1	Defective ◇ switch (Panel switch 2) (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L07 (male)	◇ switch (Panel switch 2)	Resistance	
			Between (5) and (6)	ON	Max. 1 Ω	
				Other than above	Min. 1 MΩ	
	2	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			Wiring harness between L52 (female) (8) – L07 (female) (6) and chassis ground		Voltage	Max. 1 V
	3	Defective machine monitor	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			L52	◇ switch (Panel switch 2)	Voltage	
			Between (8) and chassis ground	ON	20 – 30 V	
				Other than above	Max. 1 V	

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Circuit diagram related to ■ switch and ◇ switch



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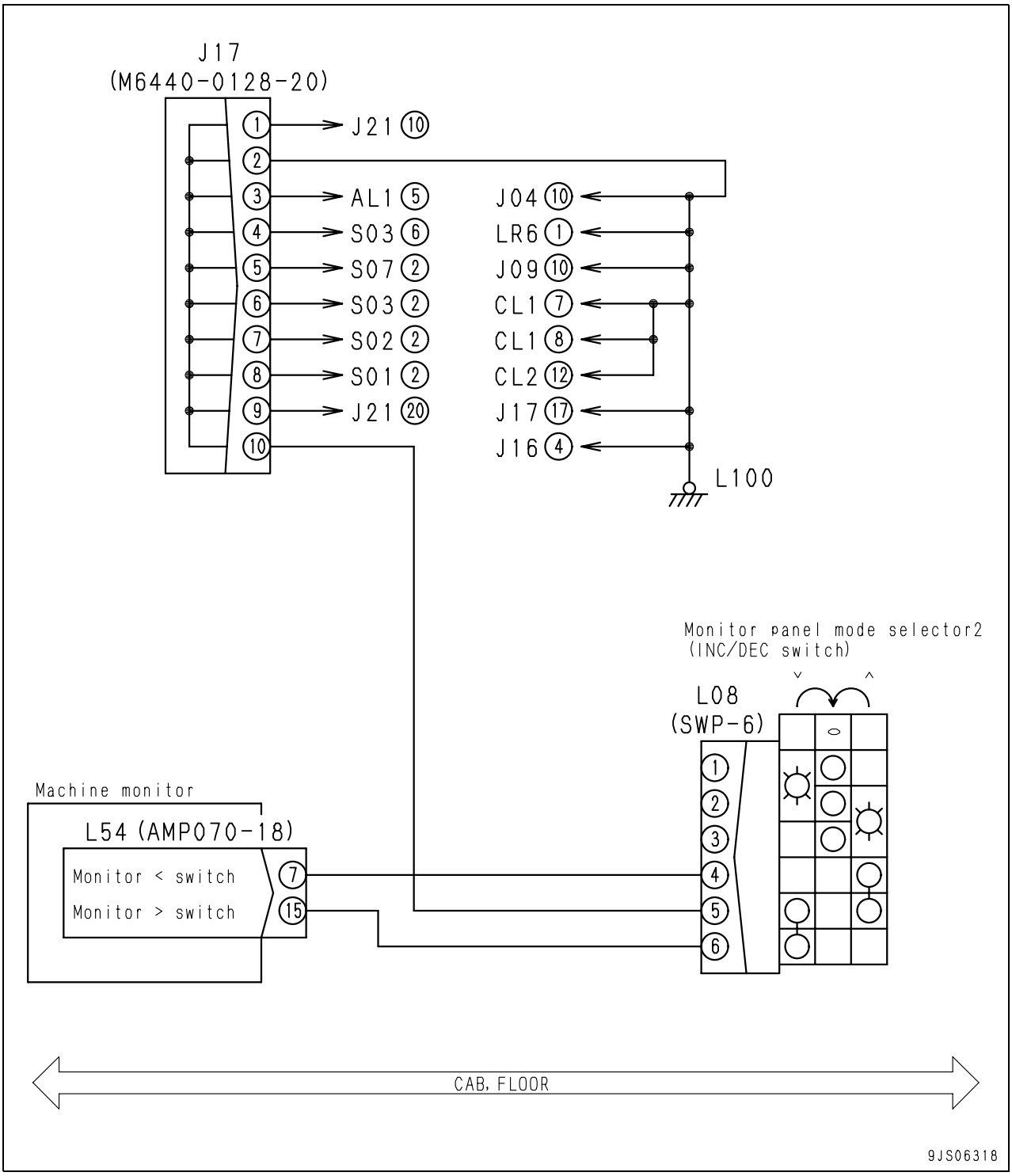
Failure code [DD17LD] < switch (Panel switch 3): Switch is kept pressed for long time

Action code	Failure code	Trouble	< switch (Panel switch 3): Switch is kept pressed for long time (Machine monitor system)
E01	**DD17LD**		
Contents of trouble	• The input circuit of the machine monitor mode selector switch 3 “<” (Panel switch 3) is kept CLOSED for more than continuous 1 minute.		
Action of controller	• None in particular.		
Problem that appears on machine	• The operator cannot operate the monitor. • Some characters do not appear on the character display.		
Related information	• The input state (ON/OFF) from the machine monitor mode selector switch 3 “<” (Panel switch 3) can be checked with the monitoring function (Code: 40904, D-IN-38). • The operator may not be able to use the monitoring function because of the “<” switch trouble. • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective < switch (Panel switch 3) (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L08 (female)	< switch (Panel switch 3)	Resistance	
			Between (4) and (5)	ON	Max. 1 Ω	
				Other than above	Min. 1 MΩ	
	2	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L54 (female) (7) – L08 (female) (4) and chassis ground		Resistance	Min. 1 MΩ
	3	Defective machine monitor	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			L54	< switch (Panel switch 3)	Voltage	
			Between (7) and chassis ground	ON	Max. 1 V	
				Other than above	20 – 30 V	

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Circuit diagram related to > switch and < switch



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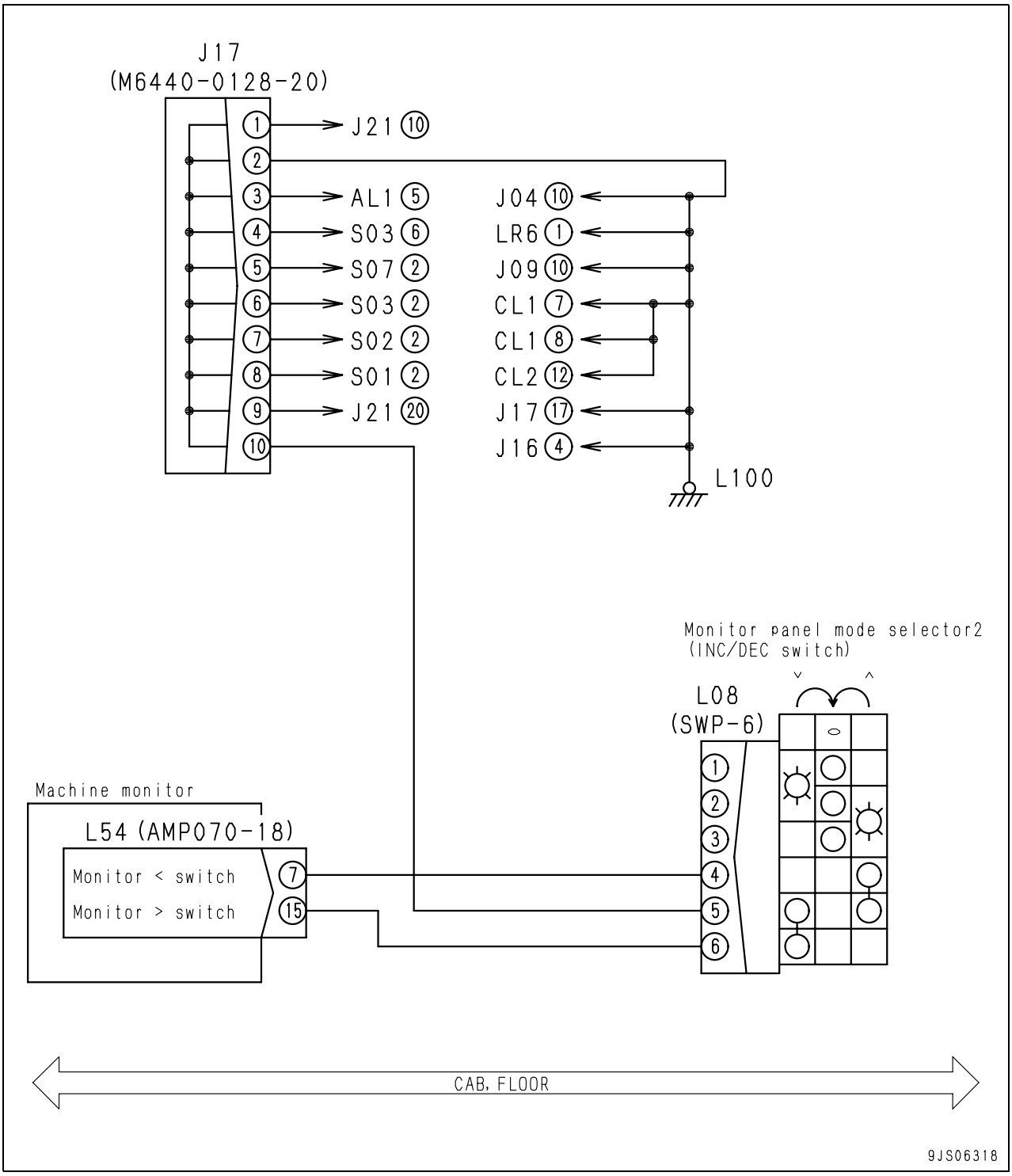
Failure code [DD18LD] > switch (Panel switch 4): Switch is kept pressed for long time

Action code	Failure code	Trouble	> switch (Panel switch 4): Switch is kept pressed for long time (Machine monitor system)
E01	**DD18LD**		
Contents of trouble	• The input circuit of the machine monitor mode selector switch 4 “>” (Panel switch 4) is kept CLOSED for more than continuous 1 minute.		
Action of controller	• None in particular.		
Problem that appears on machine	• The operator cannot operate the monitor. • Some characters do not appear on the character display.		
Related information	• The input state (ON/OFF) from the machine monitor mode selector switch 4 “>” (Panel switch 4) can be checked with the monitoring function (Code: 40904, D-IN-37). • The operator may not be able to use the monitoring function because of the > switch trouble. • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective > switch (Panel switch 4) (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L08 (female)	> switch (Panel switch 4)	Resistance	
			Between (5) and (6)	ON	Max. 1 Ω	
				Other than above	Min. 1 MΩ	
	2	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L54 (female) (15) – L08 (female) (6) and chassis ground		Resistance	Min. 1 MΩ
	3	Defective machine monitor	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			L54	> switch (Panel switch 4)	Voltage	
			Between (15) and chassis ground	ON	Max. 1 V	
				Other than above	20 – 30 V	

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Circuit diagram related to > switch and < switch



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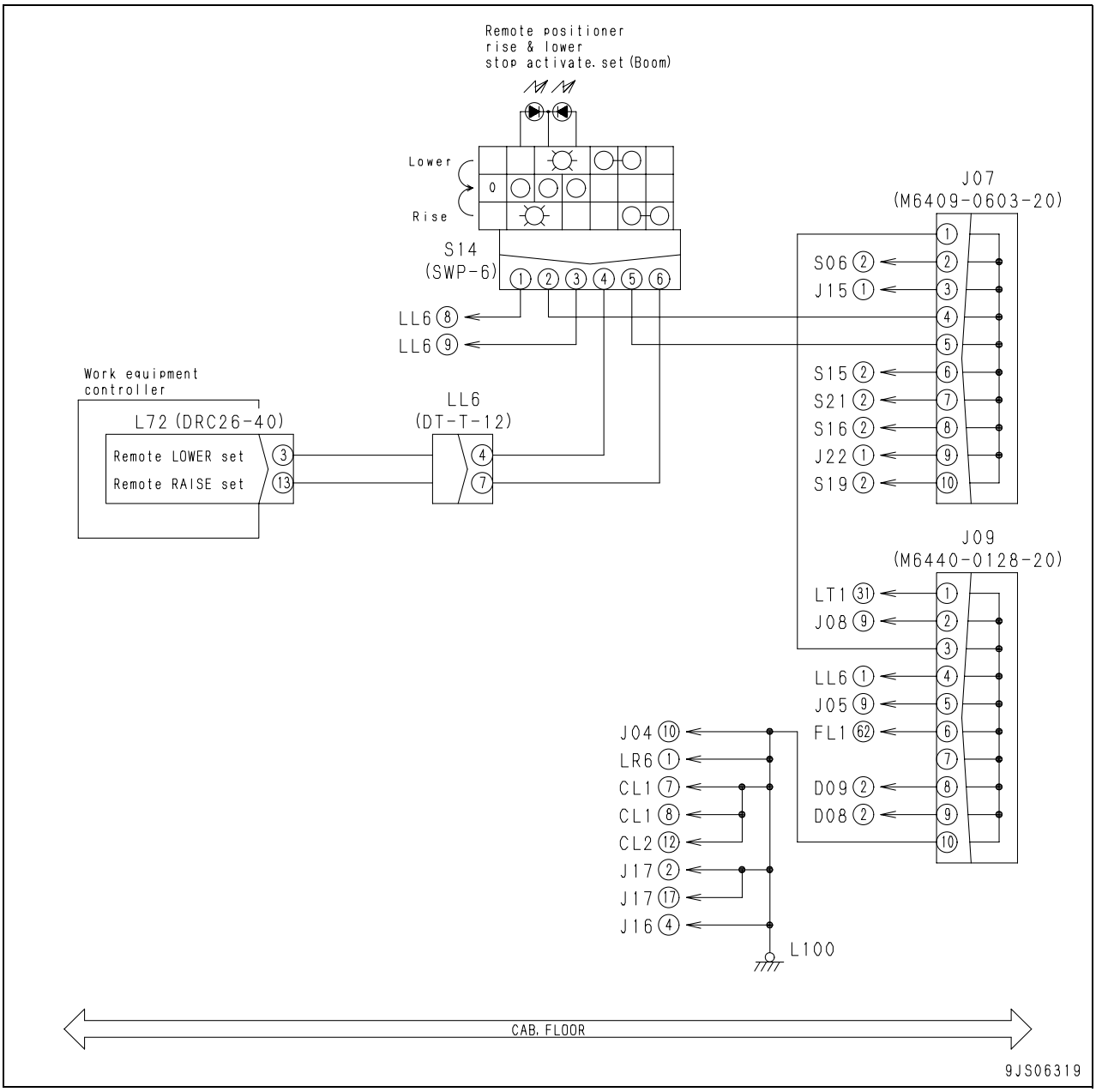
Failure code [DD1ALD] Remote positioner raise/lower set switch (raise): Switch is kept pressed for long time

Action code	Failure code	Trouble	Remote positioner raise/lower set switch (raise): Switch is kept pressed for long time (Work equipment controller system)
E01	**DD1ALD**		
Contents of trouble	• Since the remote positioner raise/lower set switch (raise) system is shorted, operator cannot set raising.		
Action of controller	• Stops setting the lift arm raise set position. • Stops the remote raise stop operation. • Turns the lift arm raise set indicator OFF. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• The operator cannot set the lift arm raise set position. • Remote positioner raise stop control is not available.		
Related information	• The input state (ON/OFF) from the remote positioner raise/lower set switch (raise) can be checked with the monitoring function (Code: 40913, D-IN-28). • Method of reproducing failure code: Turn the starting switch ON.		

Possible causes and standard value in normal state	Causes		Standard value in normal state/Remarks on troubleshooting			
	1	Defective remote positioner raise/lower set switch (raise) (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			S14 (male)	Remote positioner raise/lower set switch	Resistance	
			Between (5) and (6)	Raise	Max. 1 Ω	
				Other than above	Min. 1 MΩ	
			Between (5), (6) and chassis ground	Constant	Min. 1 MΩ	
	2	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L72 (female) (13) – S14 (female) (6) and chassis ground		Resistance	Min. 1 MΩ
	3	Defective work equipment controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			L72	Remote positioner raise/lower set switch	Voltage	
			Between (13) and chassis ground	Raise	Max. 1 V	
				Other than above	7 – 10 V	

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Circuit diagram related to remote positioner raise/lower set switch



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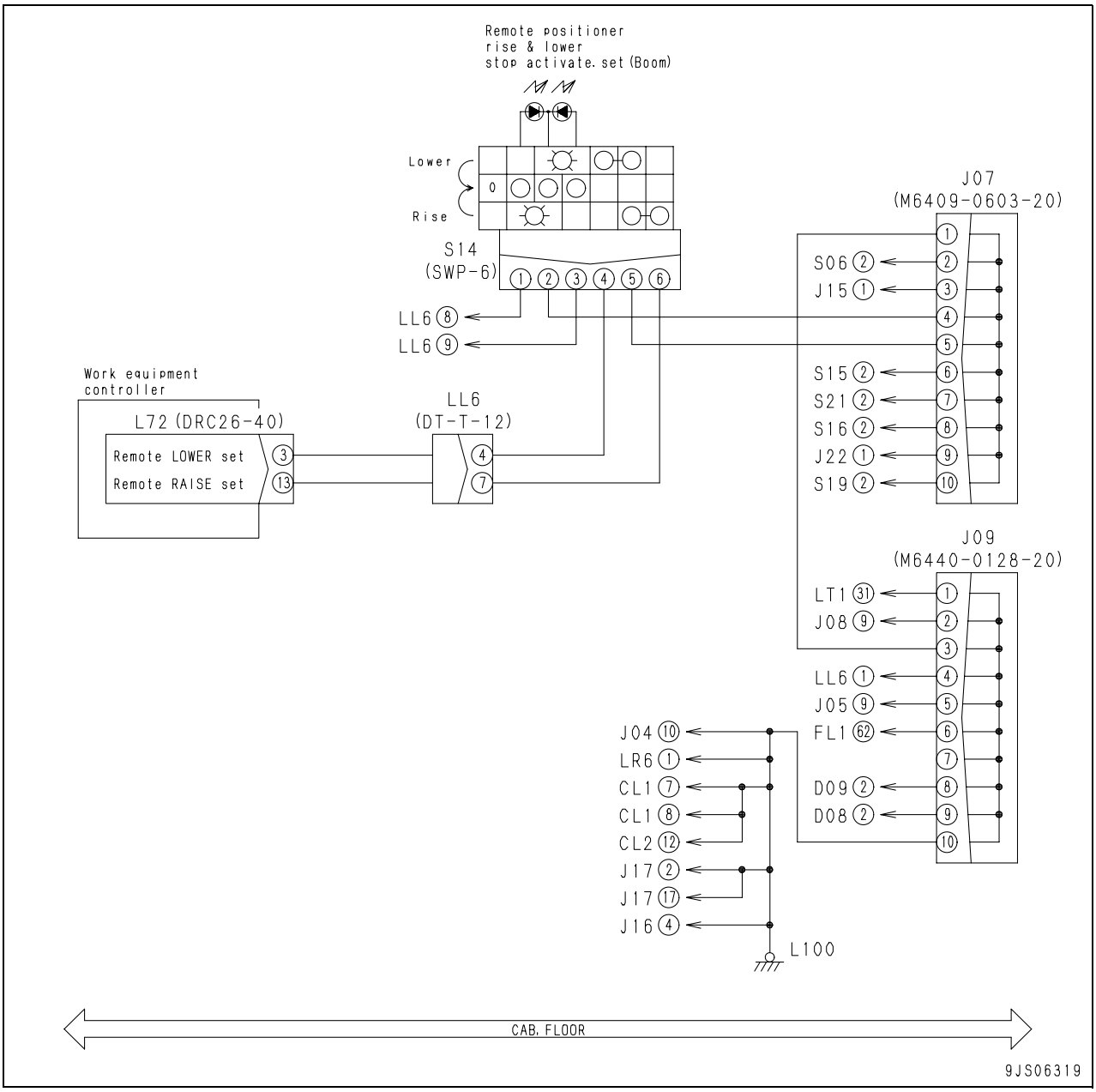
Failure code [DD1BLD] Remote positioner raise/lower set switch (lower): Switch is kept pressed for long time

Action code	Failure code	Trouble	Remote positioner raise/lower set switch (lower): Switch is kept pressed for long time (Work equipment controller system)
E01	**DD1BLD**		
Contents of trouble	• Since the remote positioner raise/lower set switch (lower) system is shorted, operator cannot set lowering.		
Action of controller	• Stops setting the lift arm lower set position. • Stops the remote lower stop operation. • Turns the lift arm lower set indicator OFF. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• The operator cannot set the lower set position. • Remote positioner lower stop control is not available.		
Related information	• The input state (ON/OFF) from the remote positioner raise/lower set switch (lower) can be checked with the monitoring function (Code: 40913, D-IN-29). • Method of reproducing failure code: Turn the starting switch ON.		

Possible causes and standard value in normal state	Causes		Standard value in normal state/Remarks on troubleshooting			
	1	Defective remote positioner raise/lower set switch (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			S14 (male)	Remote positioner raise/lower set switch	Resistance	
			Between (4) and (5)	Lower	Max. 1 Ω	
				Other than above	Min. 1 MΩ	
			Between (4), (5) and chassis ground	Constant	Min. 1 MΩ	
	2	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L72 (female) (3) – S14 (female) (4) and chassis ground		Resistance	Min. 1 MΩ
	3	Defective work equipment controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			L72	Remote positioner raise/lower set switch	Voltage	
			Between (3) and chassis ground	Lower	Max. 1 V	
				Other than above	7 – 10 V	

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Circuit diagram related to remote positioner raise/lower set switch



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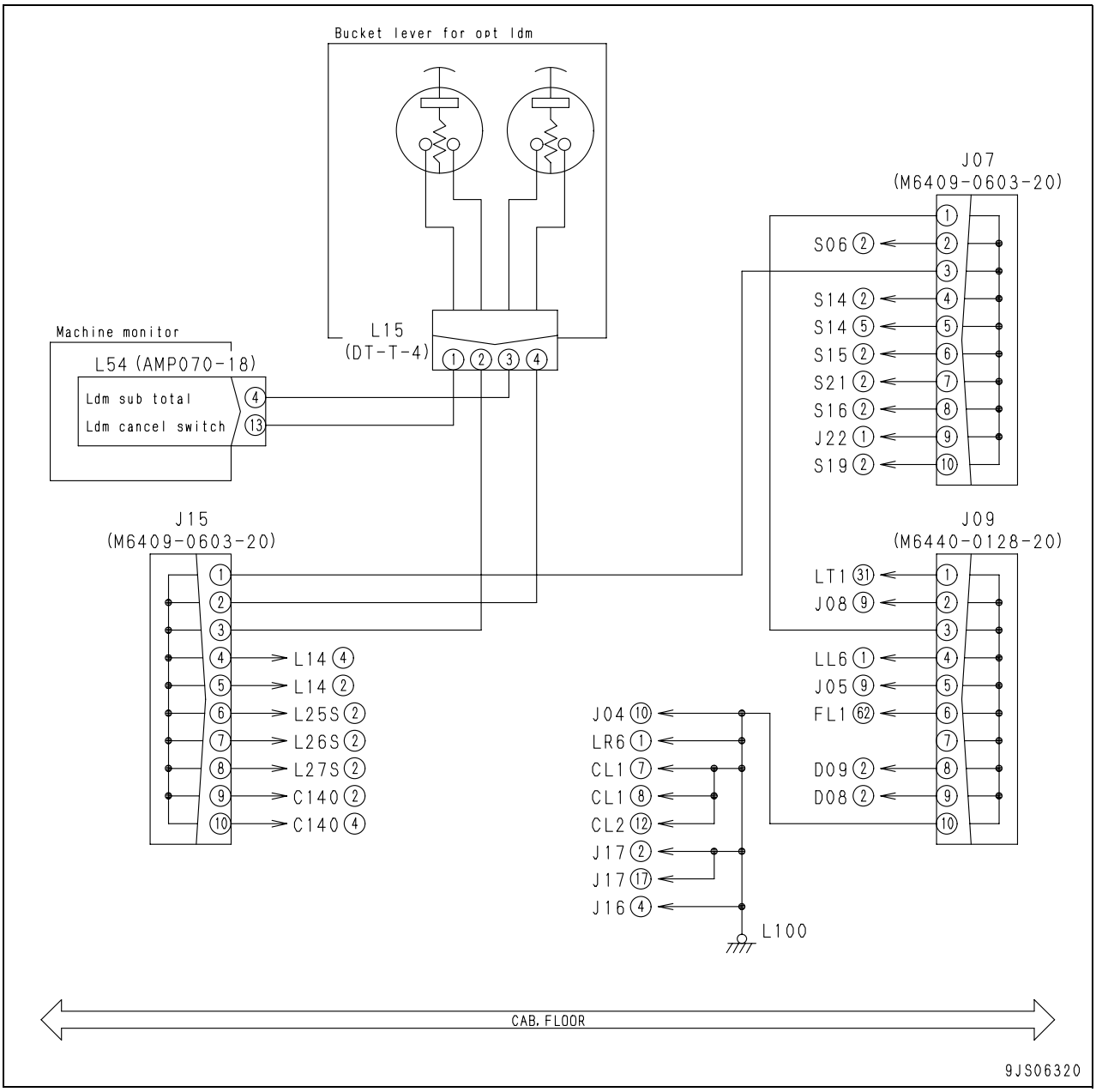
Failure code [DD1CLD] Load meter subtotal switch: Switch is kept pressed for long time

Action code	Failure code	Trouble	Load meter subtotal switch: Switch is kept pressed for long time (Machine monitor system)
E01	**DD1CLD**		
Contents of trouble	• Since the load meter subtotal switch system is shorted, the load meter subtotal switch does not function.		
Action of controller	• None in particular.		
Problem that appears on machine	• The total amount of load cannot be set to 0 on the screen. • Printer (if equipped) is not available.		
Related information	• The input state (ON/OFF) from the load meter subtotal switch can be checked with the monitoring function (Code: 40904, D-IN-32). • Only for load meter (if equipped) • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective load meter subtotal switch (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L15 (male)	Load meter subtotal switch	Resistance	
			Between (3) and (4)	ON	Max. 1 Ω	
				OFF	Min. 1 MΩ	
			Between (3), (4) and chassis ground	Constant	Min. 1 MΩ	
	2	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L54 (female) (4) – L15 (female) (3) and chassis ground		Resistance	Min. 1 MΩ
	3	Defective machine monitor	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			L54	Load meter subtotal switch	Voltage	
			Between (4) and chassis ground	ON	Max. 1 V	
				OFF	20 – 30 V	

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Circuit diagram related to load meter cancel & subtotal switch



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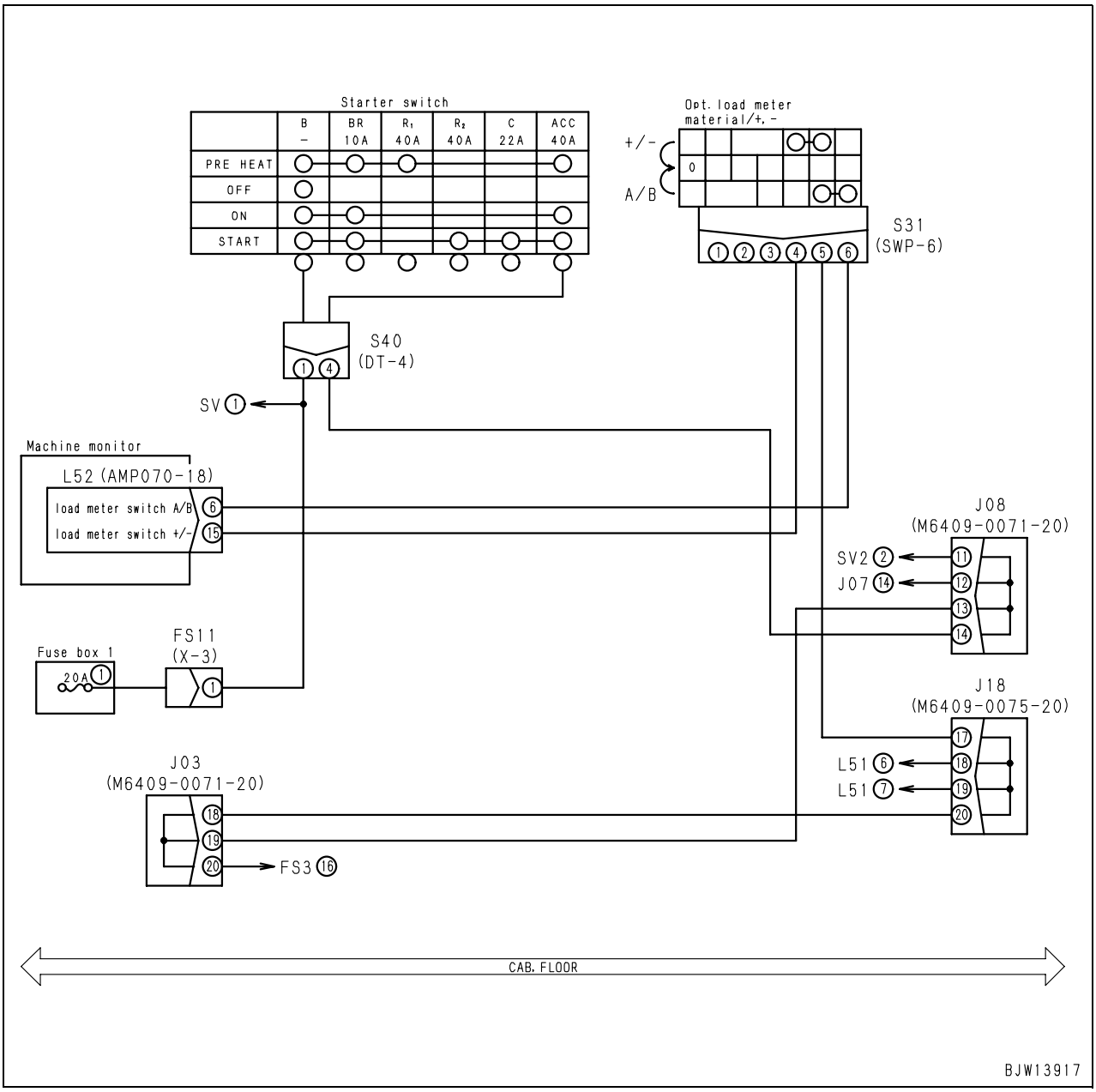
Failure code [DD1FLD] Load meter mode selector switch (A/B): Switch is kept pressed for long time

Action code	Failure code	Trouble	Load meter mode selector switch (A/B): Switch is kept pressed for long time (Machine monitor system)
E01	**DD1FLD**		
Contents of trouble	• The input circuit of the load meter mode selector switch (A/B) is kept CLOSED for more than continuous 1 minute		
Action of controller	• None in particular.		
Problem that appears on machine	• The working object cannot be changed. • Some characters do not appear on the character display.		
Related information	• The input state (ON/OFF) from the load meter mode selector switch (A/B) can be checked with the monitoring function (Code: 40901, D-IN-10). • Only for load meter (if equipped) • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective load meter mode selector switch (A/B) (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			S31 (male)	Load meter mode selector switch (A/B)	Resistance	
			Between (5) and (6)	ON	Max. 1 Ω	
				OFF	Min. 1 MΩ	
			Between (5), (6) and chassis ground	Constant	Min. 1 MΩ	
	2	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			Wiring harness between L52 (female) (6) – S31 (female) (6) and chassis ground		Voltage	Max. 1 V
	3	Defective machine monitor	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			L52	Load meter mode selector switch (A/B)	Voltage	
			Between (6) and chassis ground	ON	20 – 30 V	
				OFF	Max. 1 V	

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Circuit diagram related to load meter cancel & subtotal switch



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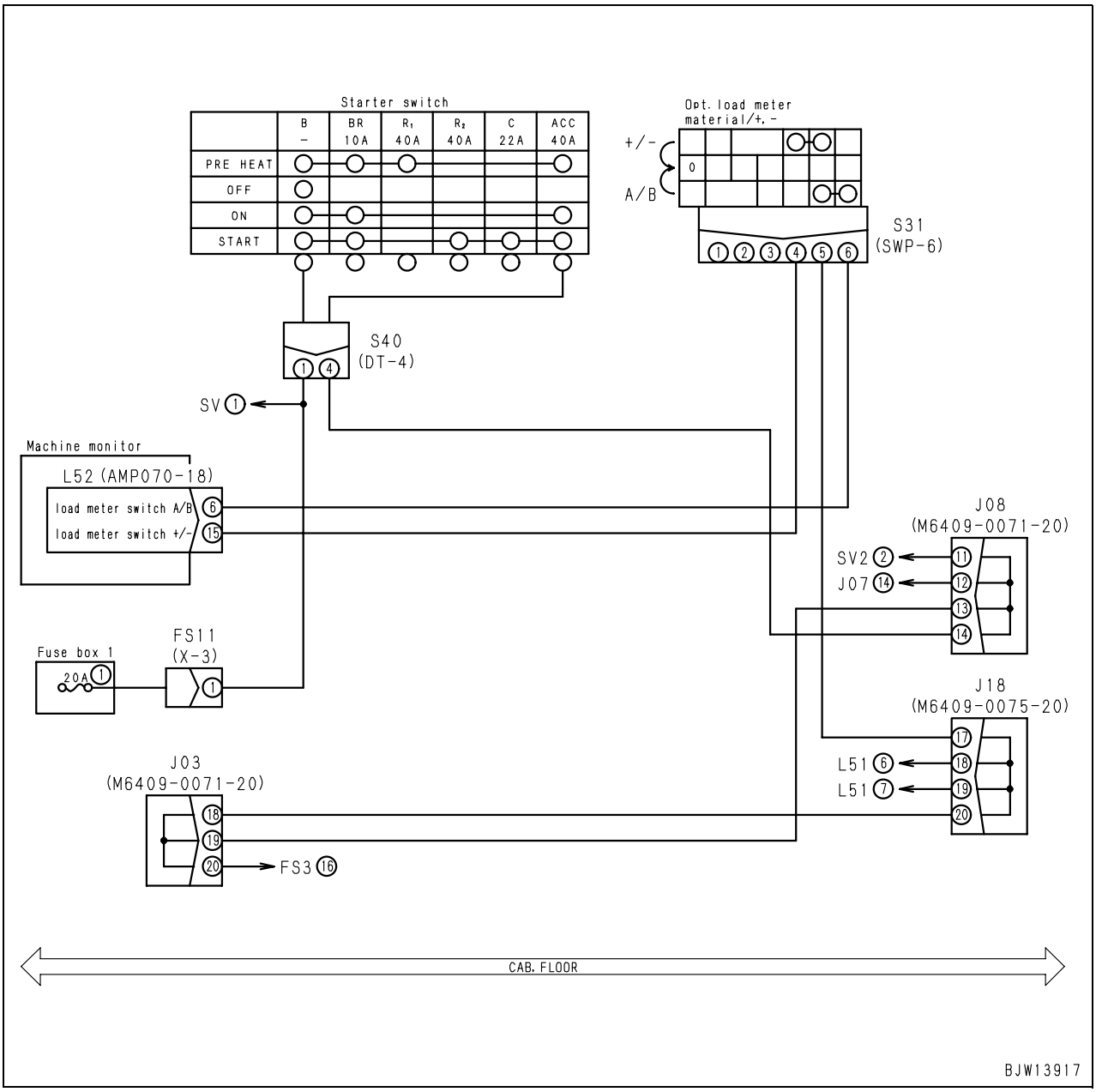
Failure code [DD1GLD] Load meter mode selector switch (+/–): Switch is kept pressed for long time

Action code	Failure code	Trouble	Load meter mode selector switch (+/–): Switch is kept pressed for long time (Machine monitor system)
E01	**DD1GLD**		
Contents of trouble	• The input circuit of the load meter mode selector switch (+/–) is kept CLOSED for more than continuous 1 minute		
Action of controller	• None in particular.		
Problem that appears on machine	• The operator cannot make settings of load meter addition mode. • Some characters do not appear on the character display.		
Related information	• The input state (ON/OFF) from the load meter mode selector switch (+/–) can be checked with the monitoring function (Code: 40901, D-IN-11). • Only for load meter (if equipped) • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective load meter mode selector switch (+/–) (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			S31 (male)	Load meter mode selector switch (+/–)	Resistance	
			Between (4) and (5)	ON	Max. 1 Ω	
				OFF	Min. 1 MΩ	
			Between (4), (5) and chassis ground	Constant	Min. 1 MΩ	
	2	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			Wiring harness between L52 (female) (15) – S31 (female) (4) and chassis ground		Voltage	Max. 1 V
	3	Defective machine monitor	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			L52	Load meter mode selector switch (+/–)	Voltage	
			Between (15) and chassis ground	ON	20 – 30 V	
				OFF	Max. 1 V	

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Circuit diagram related to load meter mode selector switch



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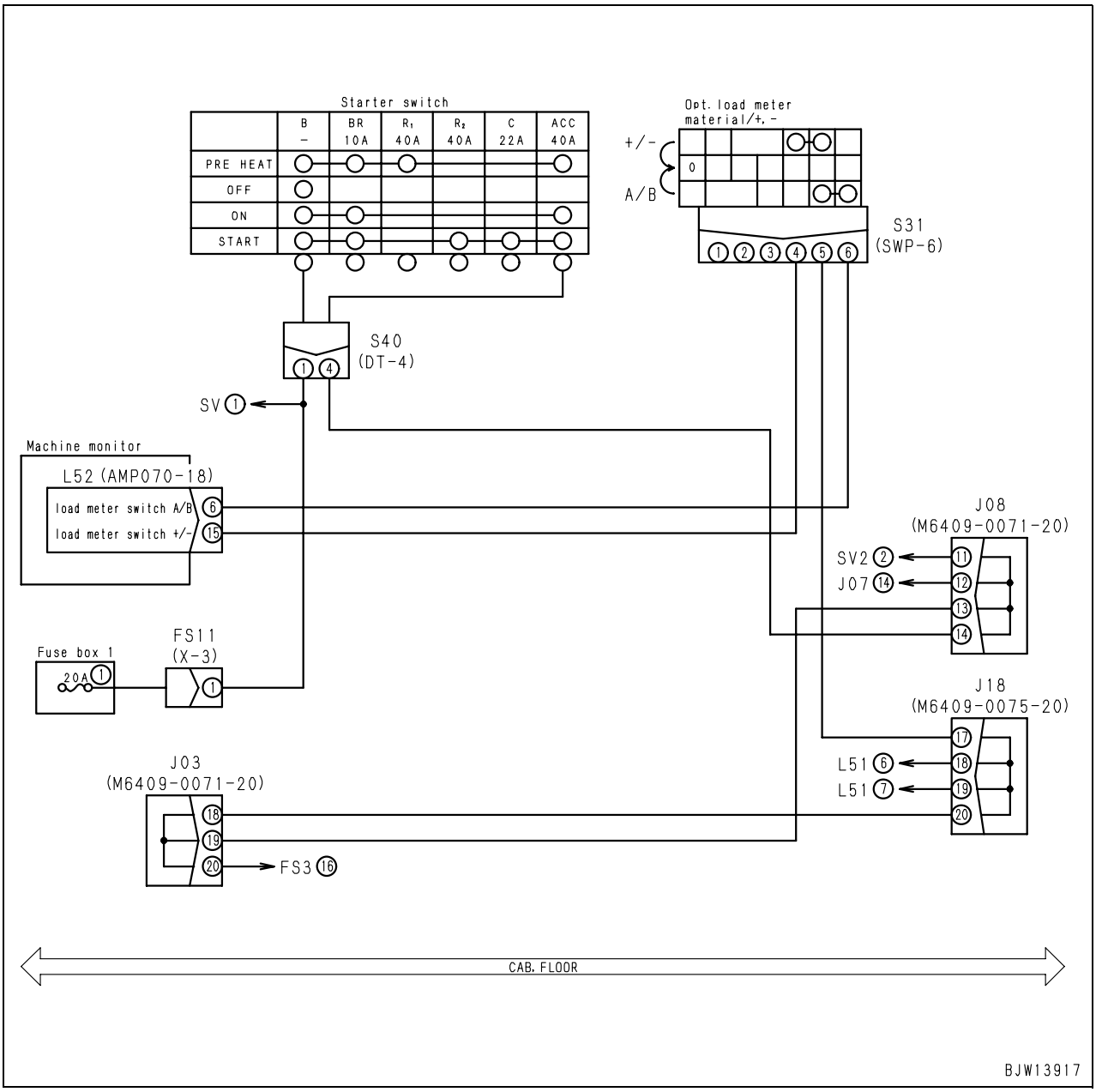
Failure code [DD1HLD] (Load meter display selector switch: Switch is kept pressed for long time)

Action code	Failure code	Trouble	Load meter display selector switch: Switch is kept pressed for long time (Machine monitor system)
E01	**DD1HLD**		
Contents of trouble	• Since the load meter display selector switch system is shorted, the load meter display selector switch does not function.		
Action of controller	• None in particular.		
Problem that appears on machine	• Unable to display cumulative data • Some characters do not appear on the character display.		
Related information	• The input state (ON/OFF) from the load meter display selector switch can be checked with the monitoring function (Code: 40902, D-IN-23). • Only for load meter (if equipped) • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective load meter display selector switch (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			S31 (male)	Load meter display selector switch	Resistance	
			Between (5) and (6)	ON	Max. 1 Ω	
				OFF	Min. 1 MΩ	
			Between (5), (6) and chassis ground	Constant	Min. 1 MΩ	
	2	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L52 (female) (15) – S31 (female) (6) and chassis ground		Resistance	Min. 1 MΩ
	3	Defective machine monitor	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			L52	Load meter display selector switch	Voltage	
			Between (15) and chassis ground	ON	Max. 1 V	
				OFF	20 – 30 V	

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Circuit diagram related to load meter display selector switch



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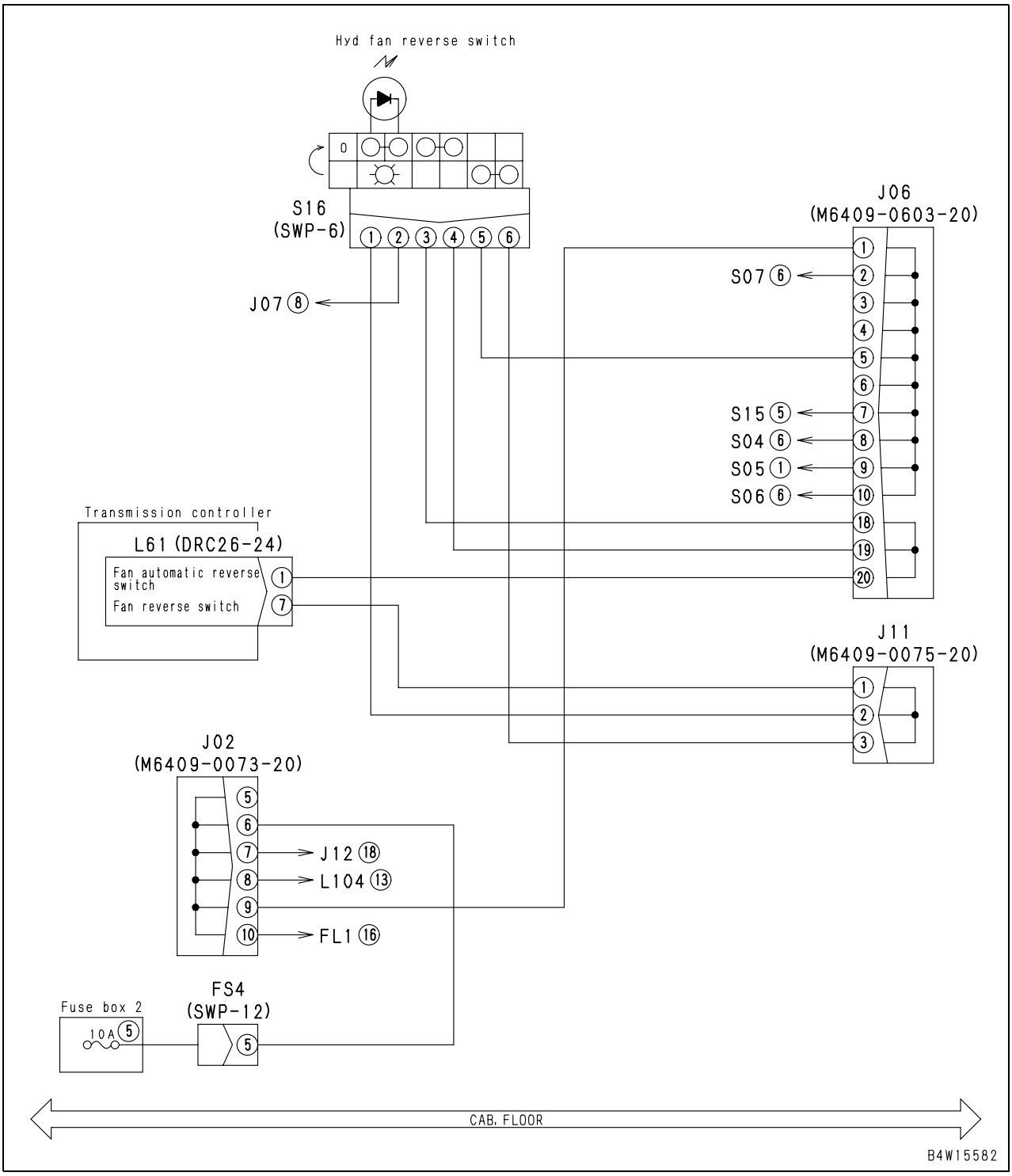
Failure code [DD1NLD] (Fan reverse switch: Switch is kept pressed for long time)

Action code	Failure code	Trouble	Fan reverse switch: Switch is kept pressed for long time (Transmission controller system)
E01	**DD1NLD**		
Contents of trouble	• Since the fan reverse switch system is shorted with the power source, the fan reverse switch remains at ON position.		
Action of controller	• None in particular.		
Problem that appears on machine	• Fan remains in the reverse rotation		
Related information	• The input state (ON/OFF) from the fan reverse switch can be checked with the monitoring function (Code: 93400, FAN REVERSE SW). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective fan reverse switch (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			S16 (male)	Fan reverse switch	Resistance	
			Between (5) and (6)	ON	Max. 1 Ω	
				OFF	Min. 1 MΩ	
			Between (5), (6) and chassis ground	Constant	Min. 1 MΩ	
	2	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			Wiring harness between L61 (female) (7) – S16 (female) (6) and chassis ground		Voltage	20 – 30 V
	3	Defective transmission controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			L61	Fan reverse switch	Voltage	
			Between (7) and chassis ground	ON	20 – 30 V	
				OFF	Max. 1 V	

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Circuit diagram related to the fan reverse switch & fan automatic reverse switch



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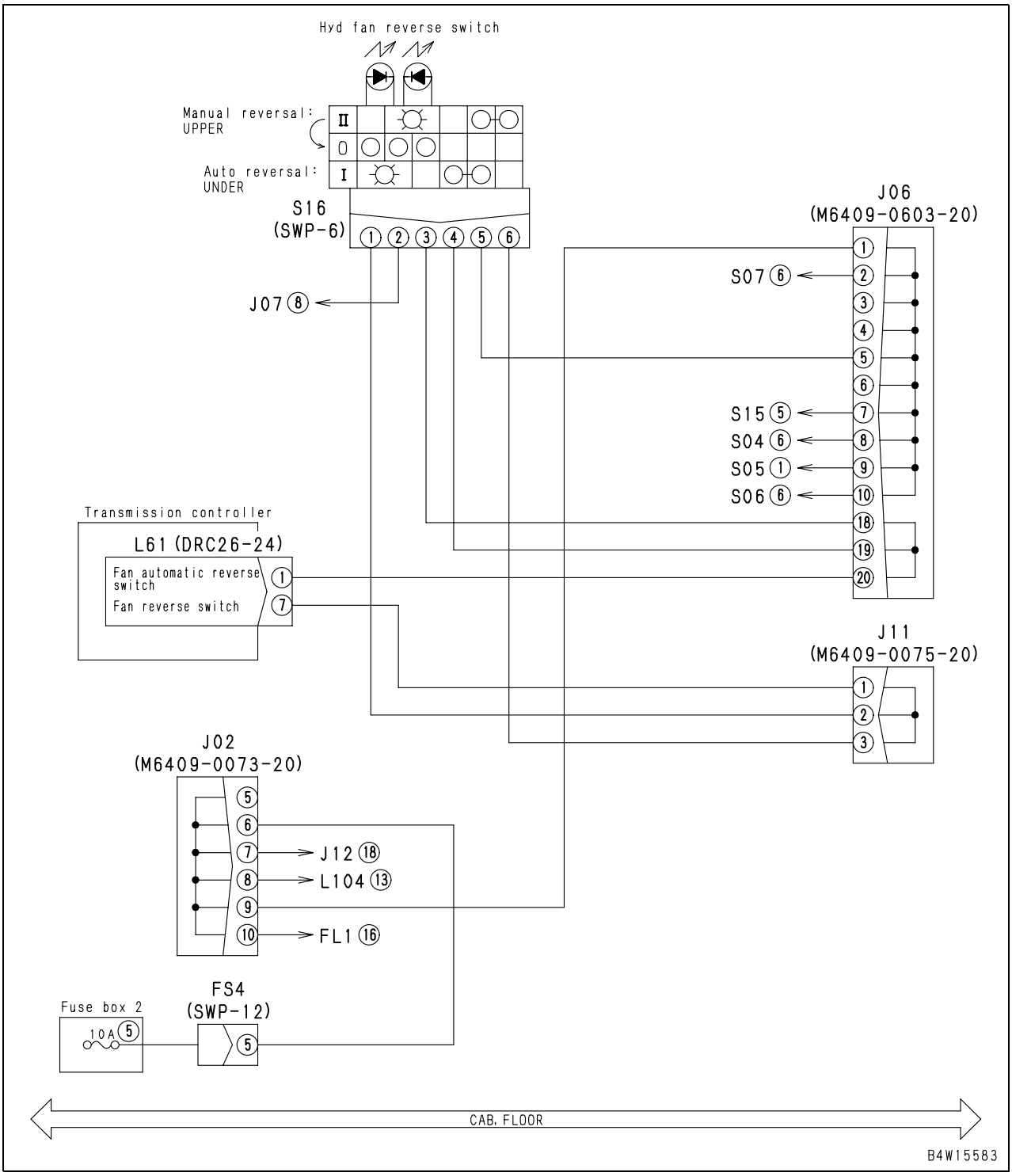
Failure code [DD1NL4] (Fan automatic reverse switch: Switch is kept pressed for long time)

Action code	Failure code	Trouble	Fan automatic reverse switch: Switch is kept pressed for long time (Transmission controller system)
E01	**DD1NL4**		
Contents of trouble	• Since the fan automatic reverse switch system is shorted with the power source, the fan automatic reverse switch function becomes unavailable.		
Action of controller	• The automatic reverse switch is OFF.		
Problem that appears on machine	• Automatic reversing of the fan becomes unavailable		
Related information	• The input state (ON/OFF) from the fan reverse switch can be checked with the monitoring function (Code: 93400, FAN REVERSE SW). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective fan automatic reverse switch (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			S16 (male)	Fan automatic reverse switch	Resistance	
			Between (3) and (4)	ON	Max. 1 Ω	
				OFF	Min. 1 MΩ	
			Between (3), (4) and chassis ground	Constant	Min. 1 MΩ	
	2	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			Wiring harness between L61 (female) (1) – S16 (female) (3) and chassis ground		Voltage	20 – 30 V
	3	Defective transmission controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			L61	Fan automatic reverse switch	Voltage	
			Between (1) and chassis ground	ON	20 – 30 V	
				OFF	Max. 1 V	

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Circuit diagram related to the fan reverse switch & fan automatic reverse switch



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Failure code [DDB6L4] (Parking brake switch (Neutralizer): ON/OFF signals disagree)

Action code	Failure code	Trouble	Parking brake switch (Neutralizer): ON/OFF signals disagree (Transmission controller system)
E03	**DDB6L4**		
Contents of trouble	• Controller outputs a failure signal when the following conditions are all met 1) Parking brake switch signal ON (neutralizer signal OPEN) 2) Parking brake released (by CAN communication from the machine monitor) 3) Hydraulic oil temperature above 25°C		
Action of controller	• Turns the centralized warning lamp and alarm buzzer ON. • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• Forward and reverse travel of the machine become unavailable. Or the parking brake indicator remains unlighted.		
Related information	• The input state (ON/OFF) from the parking indicator switch to the machine monitor can be checked with the monitoring function (Code: 40903, D-IN-26). • The input state (ON/OFF) from the parking brake switch can be checked with the monitoring function (Code: 40907, D-IN-23). • If failure code [DGH2KX] (Hydraulic oil temperature sensor: Out of input signal range) is indicated, carry out troubleshooting for it first. • If failure code [DAFRKR] (CAN communication with machine monitor: Defective communication (Abnormality in target component system)) is indicated, carry out troubleshooting for it first. • Above is sometimes detected if the emergency parking brake switch is set to ON (release side) when the parking brake switch is turned ON (parking side). • Method of reproducing failure code: Turn the starting switch ON and turn the parking brake switch ON.		

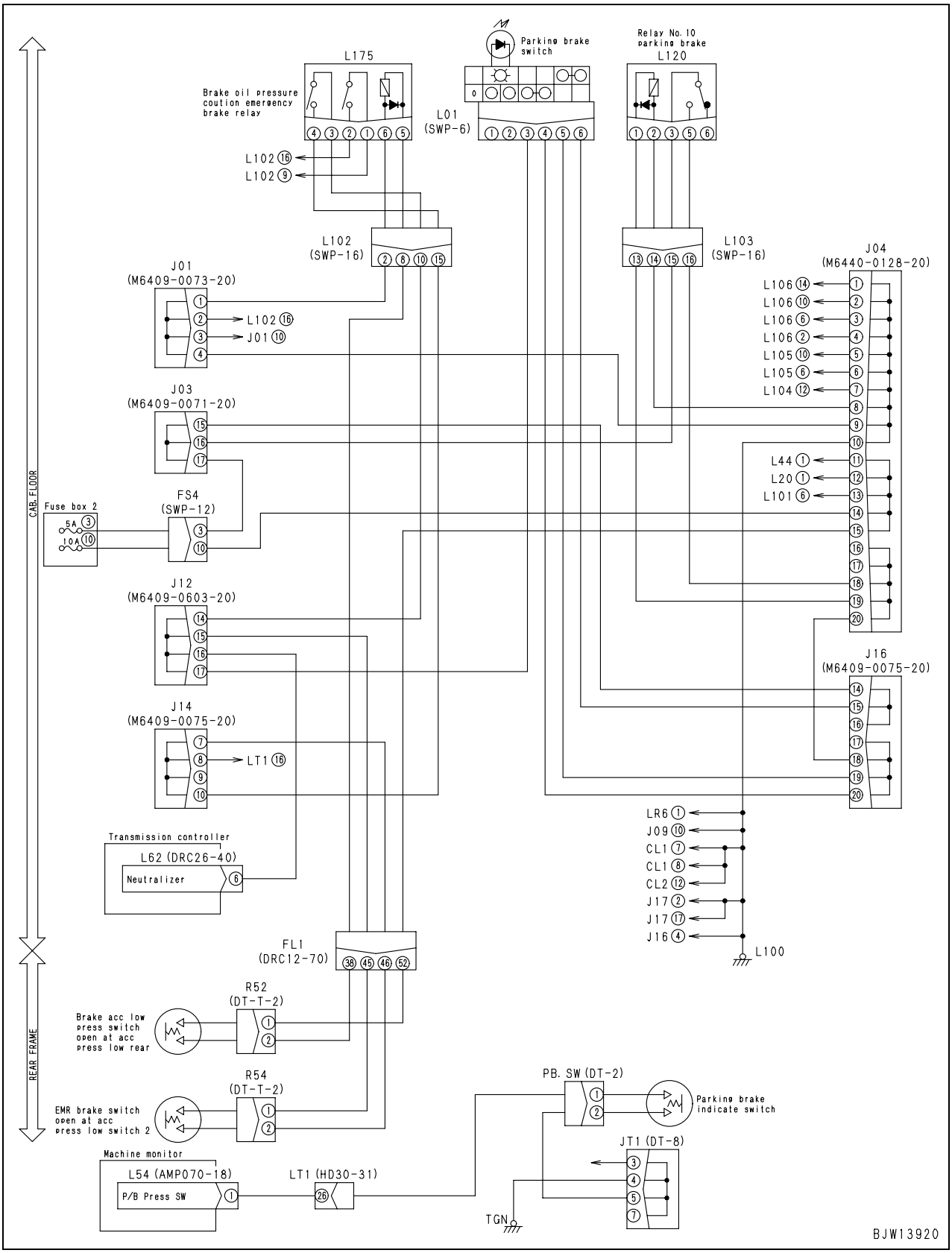
	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective parking brake indicator switch (Internal disconnection)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			PB.SW (male)	Parking brake oil pressure	Resistance
			Between (1) and (2)	When parking brake is released, Min. 0.61 MPa {Min. 6.2 kg/cm^2}	Max. 1 Ω
				When parking brake applied, Max. 0.34 MPa {Max. 3.5 kg/cm^2}	Min. 1 MΩ
	2	Defective parking brake switch (Internal disconnection)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			L01 (male)	Parking brake switch	Resistance
			Between (3) and (4)	ON	Min. 1 MΩ
				OFF	Max. 1 Ω
			Between (5) and (6)	ON	Max. 1 Ω
				OFF	Min. 1 MΩ
			Between (3) and (6)	Constant	Min. 1 MΩ

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<table>
<tr><td rowspan="6">Possible causes and standard value in normal state</td><td colspan="2">Causes</td><td colspan="4">Standard value in normal state/Remarks on troubleshooting</td></tr>
<tr><td rowspan="3">3</td><td rowspan="3">Disconnection in wiring harness (Disconnection or defective contact)</td><td colspan="4">★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.</td></tr>
<tr><td colspan="2">Wiring harness between L54 (female) (1) – PB.SW (female) (1)</td><td>Resistance</td><td>Max. 1 Ω</td></tr>
<tr><td colspan="2">Wiring harness between PB.SW (female) (2) – chassis ground</td><td>Resistance</td><td>Max. 1 Ω</td></tr>
<tr><td rowspan="3">4</td><td rowspan="3">Defective transmission controller</td><td colspan="2">Wiring harness between L01 (female) (3) – L62 (female) (6)</td><td>Resistance</td><td>Max. 1 Ω</td></tr>
<tr><td colspan="4">★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.</td></tr>
<tr><td colspan="2">L62</td><td>Parking brake switch</td><td>Voltage</td></tr>
<tr><td colspan="2" rowspan="2">Between (6) and chassis ground</td><td>ON</td><td>Max. 1 V</td></tr>
<tr><td>Turn on the starting switch and turn on the parking brake switch, then turn it off.</td><td>20 – 30 V</td></tr>
</table>

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Circuit diagram related to parking brake switch



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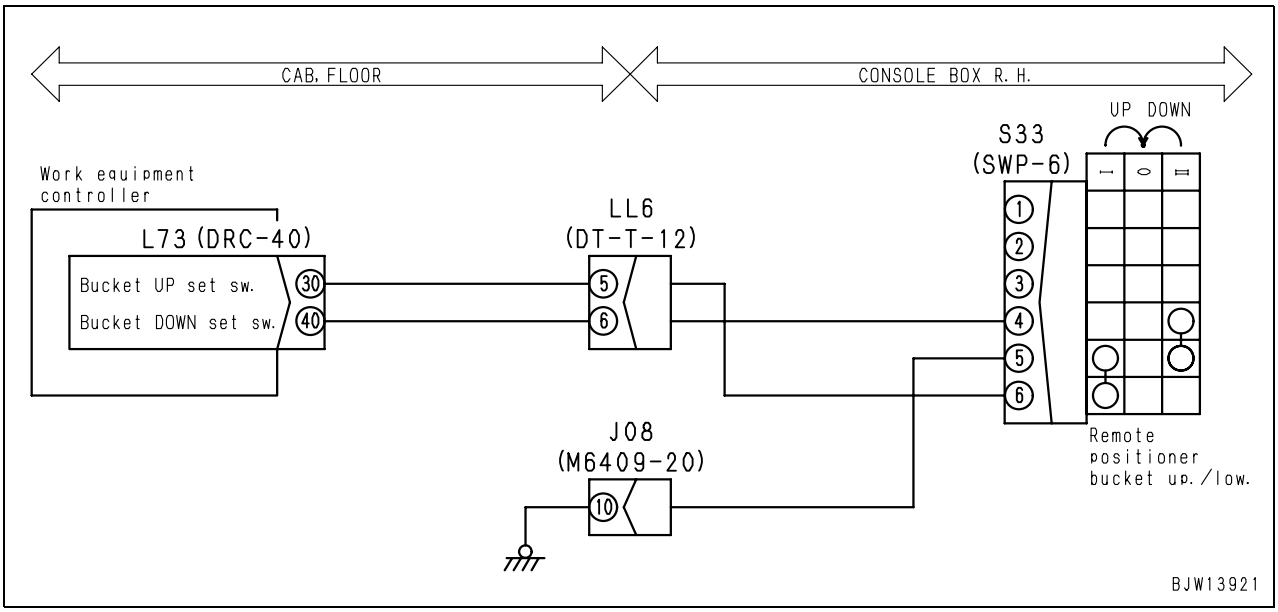
Failure code [DDD1LD] (Remote positioner bucket angle set switch: Switch is kept pressed for long time)

Action code	Failure code	Trouble	Remote positioner bucket angle set switch: Switch is kept pressed for long time (Work equipment controller system)
E01	**DDD1LD**		
Contents of trouble	• Unable to set the bucket to a specified angle due to ground fault in the remote positioner bucket angle set switch system. • Detected continuous operation for 30 seconds and longer.		
Action of controller	• Judges that remote positioner bucket angle set switch is turned ON • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• Remote positioner raise set: Setting is changed to upward by 1° (degree) and the monitor displays the changed angle. • Remote lower set: Setting is changed to downward by 1° (degree) and the monitor displays the changed angle. • Change of setting to upward or downward becomes unavailable.		
Related information	• The input state (ON/OFF) from the remote positioner bucket angle set switch can be checked with the monitoring function (Code: 40911, D-IN-10, D-IN-11). • Only for electric lever (if equipped) • Method of reproducing failure code: Turn the starting switch and remote positioner bucket angle set switch ON		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective remote positioner bucket angle set switch (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			S33 (male)	Remote positioner bucket angle set switch	Resistance	
			Between (4) and (5)	Downward ON	Max. 1 Ω	
				OFF	Min. 1 MΩ	
			Between (5) and (6)	Upward ON	Max. 1 Ω	
				OFF	Min. 1 MΩ	
			Between (4), (5), (6) and chassis ground	Constant	Min. 1 MΩ	
	2	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L73 (female) (30) – S33 (female) (6) and chassis ground		Resistance	Min. 1 MΩ
			Wiring harness between L73 (female) (40) – S33 (female) (4) and chassis ground		Resistance	Min. 1 MΩ
	3	Defective work equipment controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			L73 (female)	Remote positioner bucket angle set switch	Voltage	
			Between (40) and chassis ground	Downward ON	Max. 1 V	
				OFF	7 – 10 V	
			Between (30) and chassis ground	Upward ON	Max. 1 V	
				OFF	7 – 10 V	

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Circuit diagram related to remote positioner bucket angle set switch



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WA430-6 Wheel loader

Form No. SEN01742-03

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WHEEL LOADER

WA430-6

Machine model	Serial number
WA430-6	65001 and up

40 Troubleshooting

Troubleshooting by failure code (Display of code), Part 6

Failure code [DDE5MA] (Emergency steering drive switch: Malfunction) 4
Failure code [DDK3KA] (Right FNR switch: Disconnection) 6
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Failure code [DDK5L4] (Joystick steering shift-up/down switch: ON/OFF signals disagree) 12
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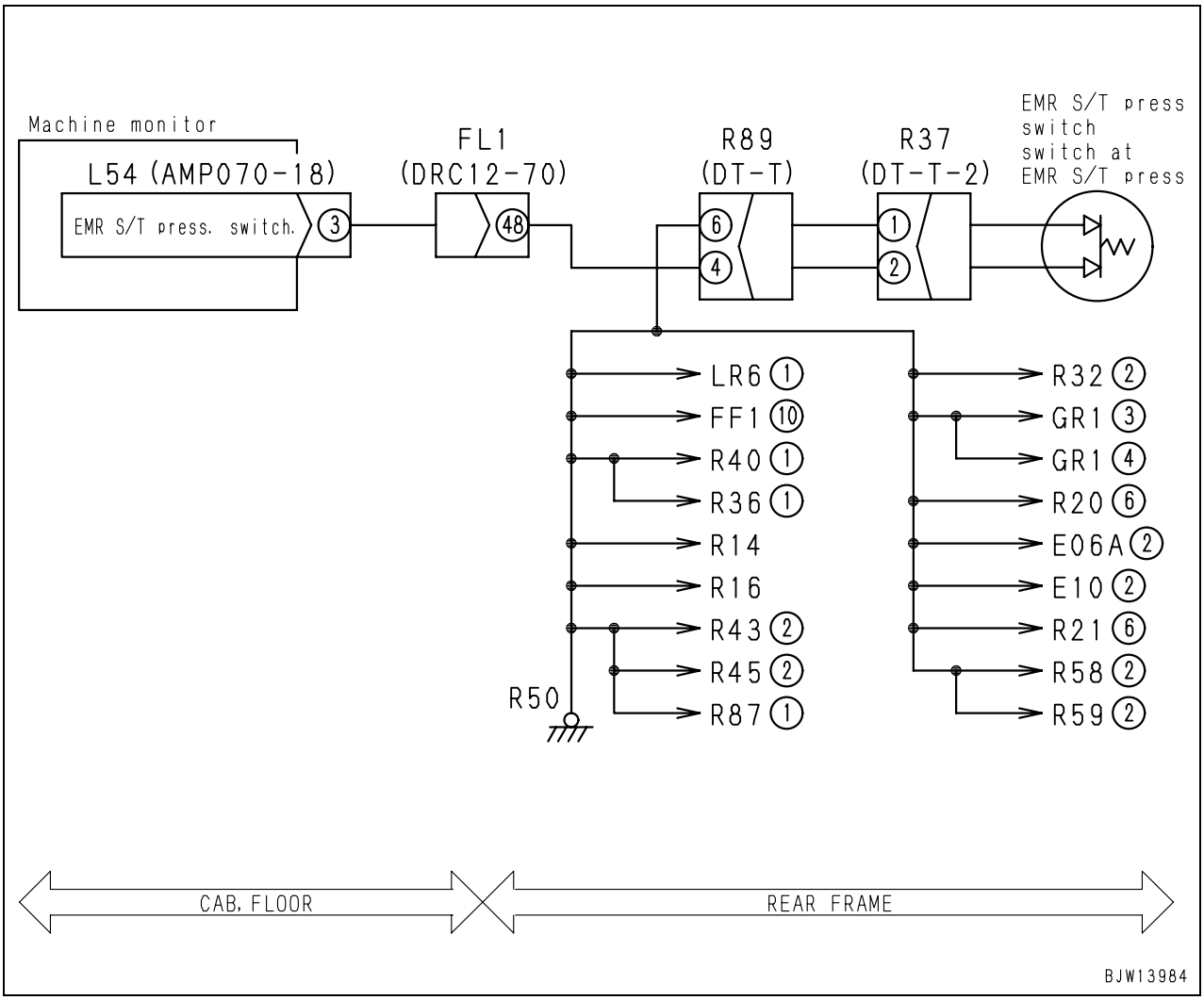
Failure code [DDE5MA] (Emergency steering drive switch: Malfunction)

Action code	Failure code	Trouble	Emergency steering drive switch: Malfunction (Machine monitor system)
E01	**DDE5MA**		
Contents of trouble	• When engine stopped, detected steering pump pressure because of ground fault in the emergency steering drive switch system.		
Action of controller	• None in particular.		
Problem that appears on machine	—		
Related information	• The input state (ON/OFF) from the emergency steering motor can be checked with the monitoring function (Code: 40903, D-IN-30). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective emergency steering drive switch (Internal trouble)	★ Prepare with starting switch OFF, then start engine and carry out troubleshooting. • Relieve the steering circuit.			
			R37 (male)	Steering relief oil pressure	Resistance	
			Between (1) and (2)	Low	Min. 1 MΩ	
				Normal	Max. 1 Ω	
			Between (1), (2) and chassis ground	Constant	Min. 1 MΩ	
	2	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L54 (female) (3) – R37 (female) (2) and chassis ground		Resistance	Min. 1 MΩ
	3	Defective machine monitor	★ Prepare with starting switch OFF, then start engine and carry out troubleshooting. • Relieve the steering circuit			
			L54	Steering relief oil pressure	Voltage	
			Between (3) and chassis ground	Low	20 – 30 V	
				Normal	Max. 1 V	

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Circuit diagram related to emergency steering drive switch



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Failure code [DDK3KA] (Right FNR switch: Disconnection)

Action code	Failure code	Trouble	Right FNR switch: Disconnection (Transmission controller system)
E03	**DDK3KA**		
Contents of trouble	• Since the right FNR (directional) switch input signal system is disconnected or shorted, the right FNR (directional) switch signal is not recognized.		
Action of controller	• Sets to neutral. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until the right FNR (directional) switch is set to N (Neutral).		
Problem that appears on machine	• Machine travel with the right FNR (directional) switch becomes unavailable. • Travel with FNR (directional) lever is available. • Shift lever position pilot lamp goes off.		
Related information	• The input signals (ON/OFF) from the right FNR (directional) switch or joystick steering FNR (directional) switch can be checked with the monitoring function (Code: 40907, D-IN-17, D-IN-18 or D-IN-19). • Only for right FNR (directional) switch (if equipped) • Method of reproducing failure code: Turn the starting switch ON, turn the directional selector ON/OFF switch ON, then operate the FNR (directional) switch.		

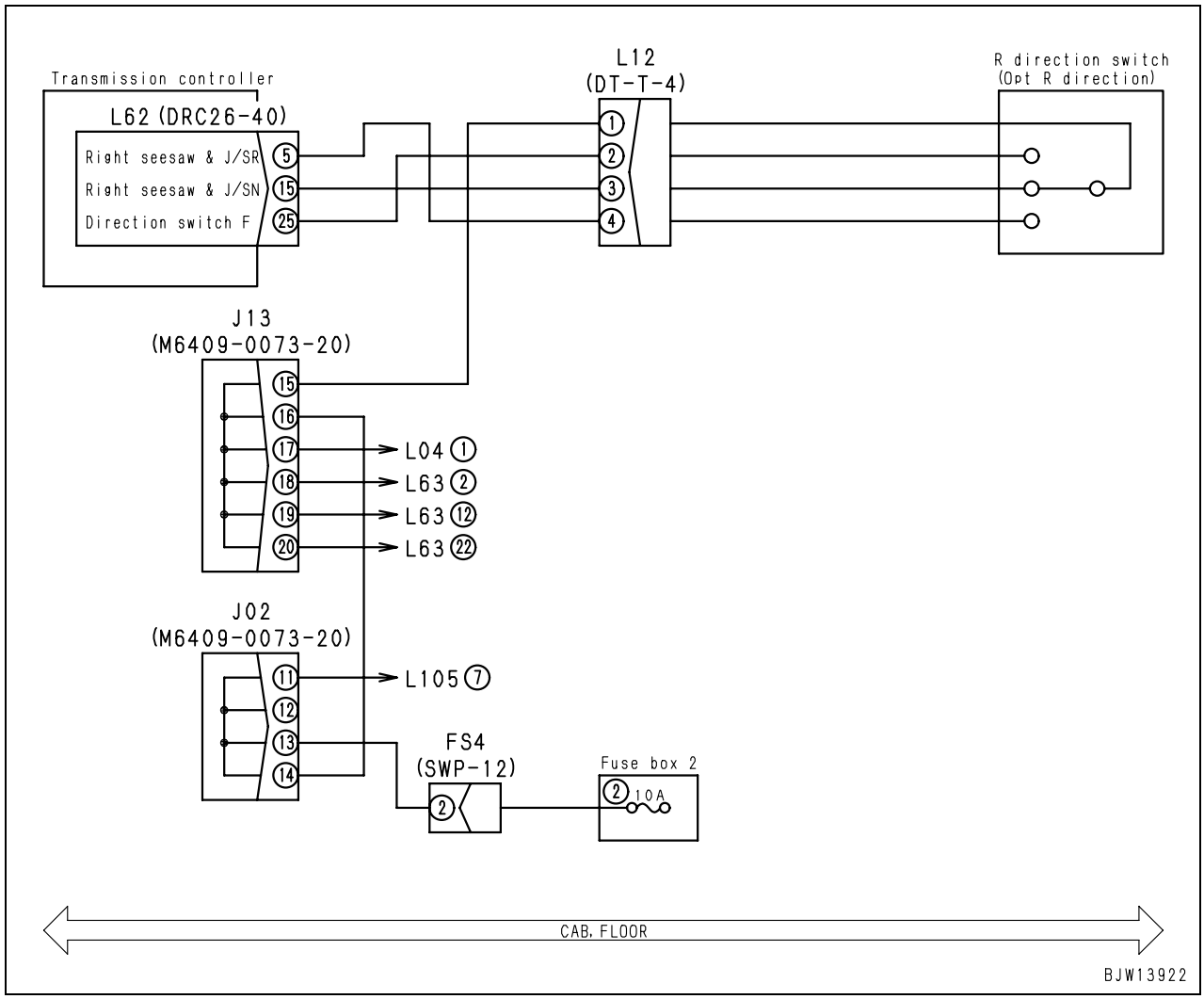
<table>
<tr><td rowspan="11">Possible causes and standard value in normal state</td><td colspan="2">Causes</td><td colspan="4">Standard value in normal state/Remarks on troubleshooting</td></tr>
<tr><td>1</td><td>Defective fuse No. 2 of fuse box 2</td><td colspan="4">If the fuse is burn, the circuit probably has a grounding fault, etc. (See cause 4.)</td></tr>
<tr><td rowspan="9">2</td><td rowspan="9">Defective right FNR (directional) switch (Internal disconnection or short circuit)</td><td colspan="4">★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.</td></tr>
<tr><td>L12 (male)</td><td>Right FNR (directional) switch</td><td colspan="2">Resistance</td></tr>
<tr><td rowspan="2">Between (1) and (2)</td><td>F (Forward)</td><td colspan="2">Max. 1 Ω</td></tr>
<tr><td>Other than above</td><td colspan="2">Min. 1 MΩ</td></tr>
<tr><td rowspan="2">Between (1) and (3)</td><td>N (Neutral)</td><td colspan="2">Max. 1 Ω</td></tr>
<tr><td>Other than above</td><td colspan="2">Min. 1 MΩ</td></tr>
<tr><td rowspan="2">Between (1) and (4)</td><td>R (Reverse)</td><td colspan="2">Max. 1 Ω</td></tr>
<tr><td>Other than above</td><td colspan="2">Min. 1 MΩ</td></tr>
<tr><td>Between (1), (2), (3), (4) and chassis ground</td><td>Constant</td><td colspan="2">Min. 1 MΩ</td></tr>
<tr><td rowspan="5">3</td><td rowspan="5">Disconnection in wiring harness (Disconnection or defective contact in connector)</td><td colspan="4">★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.</td></tr>
<tr><td colspan="2">Wiring harness between fuse No. 2 of fuse box 2 – L12 (female) (1)</td><td>Resistance</td><td>Max. 1 Ω</td></tr>
<tr><td colspan="2">Wiring harness between L62 (female) (5) – L12 (female) (4)</td><td>Resistance</td><td>Max. 1 Ω</td></tr>
<tr><td colspan="2">Wiring harness between L62 (female) (15) – L12 (female) (3)</td><td>Resistance</td><td>Max. 1 Ω</td></tr>
<tr><td colspan="2">Wiring harness between L62 (female) (25) – L12 (female) (2)</td><td>Resistance</td><td>Max. 1 Ω</td></tr>
</table>

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<table>
<tr><td rowspan="11">Possible causes and standard value in normal state</td><td colspan="2">Causes</td><td colspan="5">Standard value in normal state/Remarks on troubleshooting</td></tr>
<tr><td rowspan="5">4</td><td rowspan="5">Grounding fault in wiring harness
(Contact with ground circuit)</td><td colspan="5">★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.</td></tr>
<tr><td colspan="3">Wiring harness between fuse No. 2 of fuse box 2 – L12 (female) (1)</td><td>Resistance</td><td>Min. 1 MΩ</td></tr>
<tr><td colspan="3">Wiring harness between L62 (female) (5) – L12 (female) (4) and chassis ground</td><td>Resistance</td><td>Min. 1 MΩ</td></tr>
<tr><td colspan="3">Wiring harness between L62 (female) (15) – L12 (female) (3) and chassis ground</td><td>Resistance</td><td>Min. 1 MΩ</td></tr>
<tr><td colspan="3">Wiring harness between L62 (female) (25) – L12 (female) (2) and chassis ground</td><td>Resistance</td><td>Min. 1 MΩ</td></tr>
<tr><td rowspan="6">5</td><td rowspan="6">Defective transmission controller</td><td colspan="5">★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.
• Turn on the directional selector ON/OFF switch</td></tr>
<tr><td colspan="2">L62</td><td>Right FNR (directional) switch</td><td colspan="2">Voltage</td></tr>
<tr><td colspan="2" rowspan="2">Between (25) and chassis ground</td><td>F (Forward)</td><td colspan="2">20 – 30 V</td></tr>
<tr><td>Other than above</td><td colspan="2">Max. 1 V</td></tr>
<tr><td colspan="2" rowspan="2">Between (15) and chassis ground</td><td>N (Neutral)</td><td colspan="2">20 – 30 V</td></tr>
<tr><td>Other than above</td><td colspan="2">Max. 1 V</td></tr>
<tr><td colspan="2" rowspan="2">Between (5) and chassis ground</td><td>R (Reverse)</td><td colspan="2">20 – 30 V</td></tr>
<tr><td>Other than above</td><td colspan="2">Max. 1 V</td></tr>
</table>

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Circuit diagram related to right FNR (directional) switch



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Failure code [DDK4KA] (Joystick steering FNR switch: Disconnection)

Action code	Failure code	Trouble	Joystick steering FNR switch: Disconnection (Transmission controller system)
E03	**DDK4KA**		
Contents of trouble	• Since the input signal system of the joystick steering FNR (directional) switch is disconnected or shorted, joystick steering FNR (directional) switch signals are not input.		
Action of controller	• Sets to neutral. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until the joystick steering FNR (directional) switch is set to N (Neutral).		
Problem that appears on machine	• Machine travel with the joystick steering FNR (directional) switch becomes unavailable. • Travel with FNR (directional) lever is available. • Shift lever position pilot lamp goes off.		
Related information	• The input signals (ON/OFF) from the right FNR (directional) switch or joystick steering FNR (directional) switch can be checked with the monitoring function (Code: 40907, D-IN-17, D-IN-18 or D-IN-19). • Only for joystick steering (if equipped) • Method of reproducing failure code: Turn the starting switch ON, turn the joystick ON/OFF switch ON, then operate the joystick steering FNR (directional) switch.		

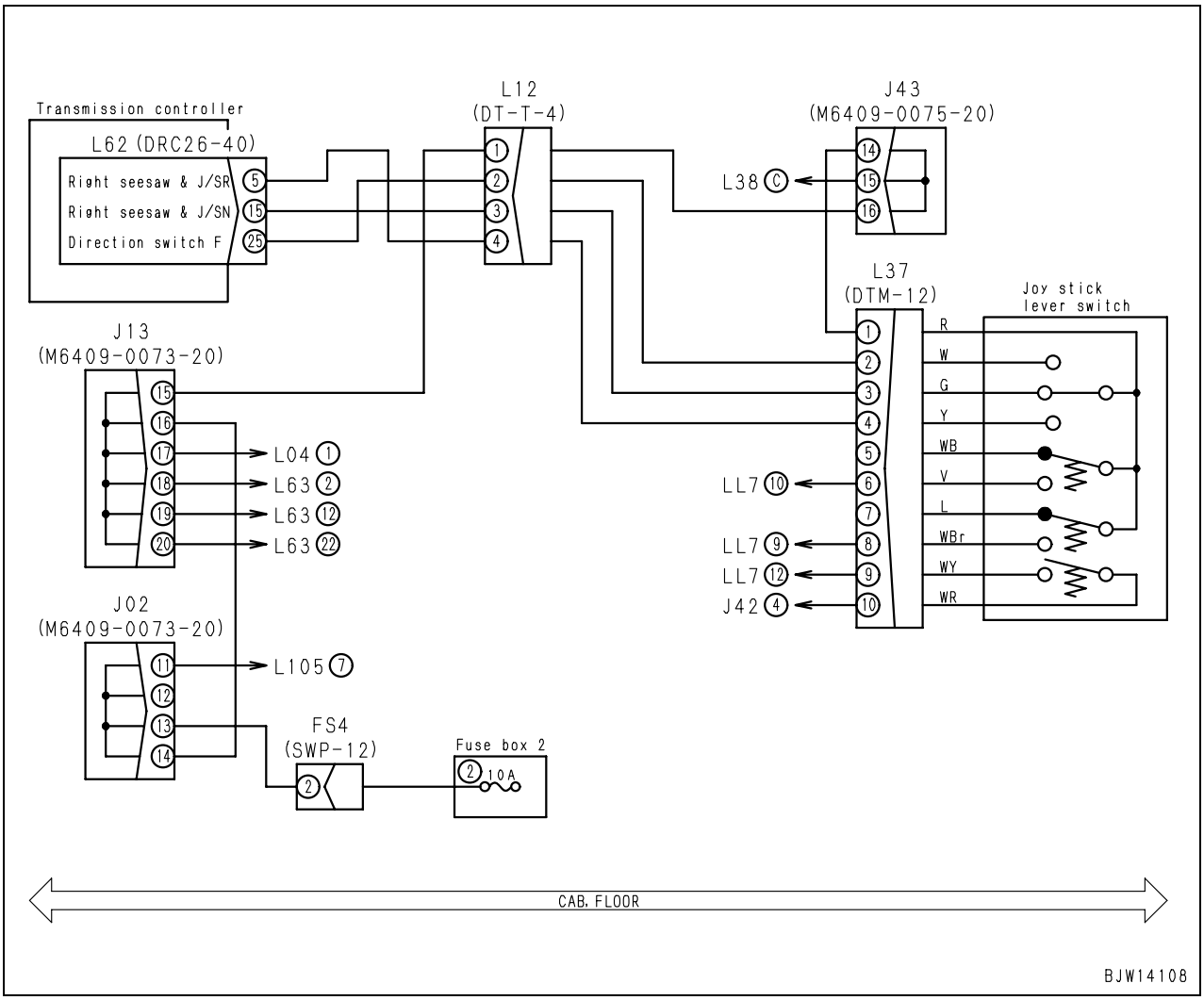
	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective fuse No.2 of fuse box 2	If the fuse is burnt, the circuit probably has a grounding fault, etc. (See cause 4.)			
	2	Defective joystick steering FNR (directional) switch (Internal disconnection or short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L37 (male)	Joystick steering FNR (directional) switch	Resistance	
			Between (1) and (2)	F (Forward)	Max. 1 Ω	
				Other than above	Min. 1 MΩ	
			Between (1) and (3)	N (Neutral)	Max. 1 Ω	
				Other than above	Min. 1 MΩ	
			Between (1) and (4)	R (Reverse)	Max. 1 Ω	
				Other than above	Min. 1 MΩ	
			Between (1), (2), (3), (4) and chassis ground	Constant	Min. 1 MΩ	
	3	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between fuse No. 2 of fuse box 2 – L37 (female) (1)		Resistance	Max. 1 Ω
			Wiring harness between L62 (female) (5) – L37 (female) (4)		Resistance	Max. 1 Ω
			Wiring harness between L62 (female) (15) – L37 (female) (3)		Resistance	Max. 1 Ω
			Wiring harness between L62 (female) (25) – L37 (female) (2)		Resistance	Max. 1 Ω

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<table>
<tr><td rowspan="11">Possible causes and standard value in normal state</td><td colspan="2">Causes</td><td colspan="5">Standard value in normal state/Remarks on troubleshooting</td></tr>
<tr><td rowspan="5">4</td><td rowspan="5">Grounding fault in wiring harness
(Contact with ground circuit)</td><td colspan="5">★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.</td></tr>
<tr><td colspan="3">Wiring harness between fuse No. 2 of fuse box 2 – L37 (female) (1) and chassis ground</td><td>Resistance</td><td>Min. 1 MΩ</td></tr>
<tr><td colspan="3">Wiring harness between L62 (female) (5) – L37 (female) (4) and chassis ground</td><td>Resistance</td><td>Min. 1 MΩ</td></tr>
<tr><td colspan="3">Wiring harness between L62 (female) (15) – L37 (female) (3) and chassis ground</td><td>Resistance</td><td>Min. 1 MΩ</td></tr>
<tr><td colspan="3">Wiring harness between L62 (female) (25) – L37 (female) (2) and chassis ground</td><td>Resistance</td><td>Min. 1 MΩ</td></tr>
<tr><td rowspan="6">5</td><td rowspan="6">Defective transmission controller</td><td colspan="5">★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.
• Turn on joystick ON/OFF switch</td></tr>
<tr><td colspan="2">L62</td><td colspan="2">Joystick steering FNR (directional) switch</td><td>Voltage</td></tr>
<tr><td colspan="2" rowspan="2">Between (25) and chassis ground</td><td colspan="2">F (Forward)</td><td>20 – 30 V</td></tr>
<tr><td colspan="2">Other than above</td><td>Max. 1 V</td></tr>
<tr><td colspan="2" rowspan="2">Between (15) and chassis ground</td><td colspan="2">N (Neutral)</td><td>20 – 30 V</td></tr>
<tr><td colspan="2">Other than above</td><td>Max. 1 V</td></tr>
<tr><td colspan="2" rowspan="2">Between (5) and chassis ground</td><td colspan="2">R (Reverse)</td><td>20 – 30 V</td></tr>
<tr><td colspan="2">Other than above</td><td>Max. 1 V</td></tr>
</table>

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Circuit diagram related to joystick steering FNR (directional) switch



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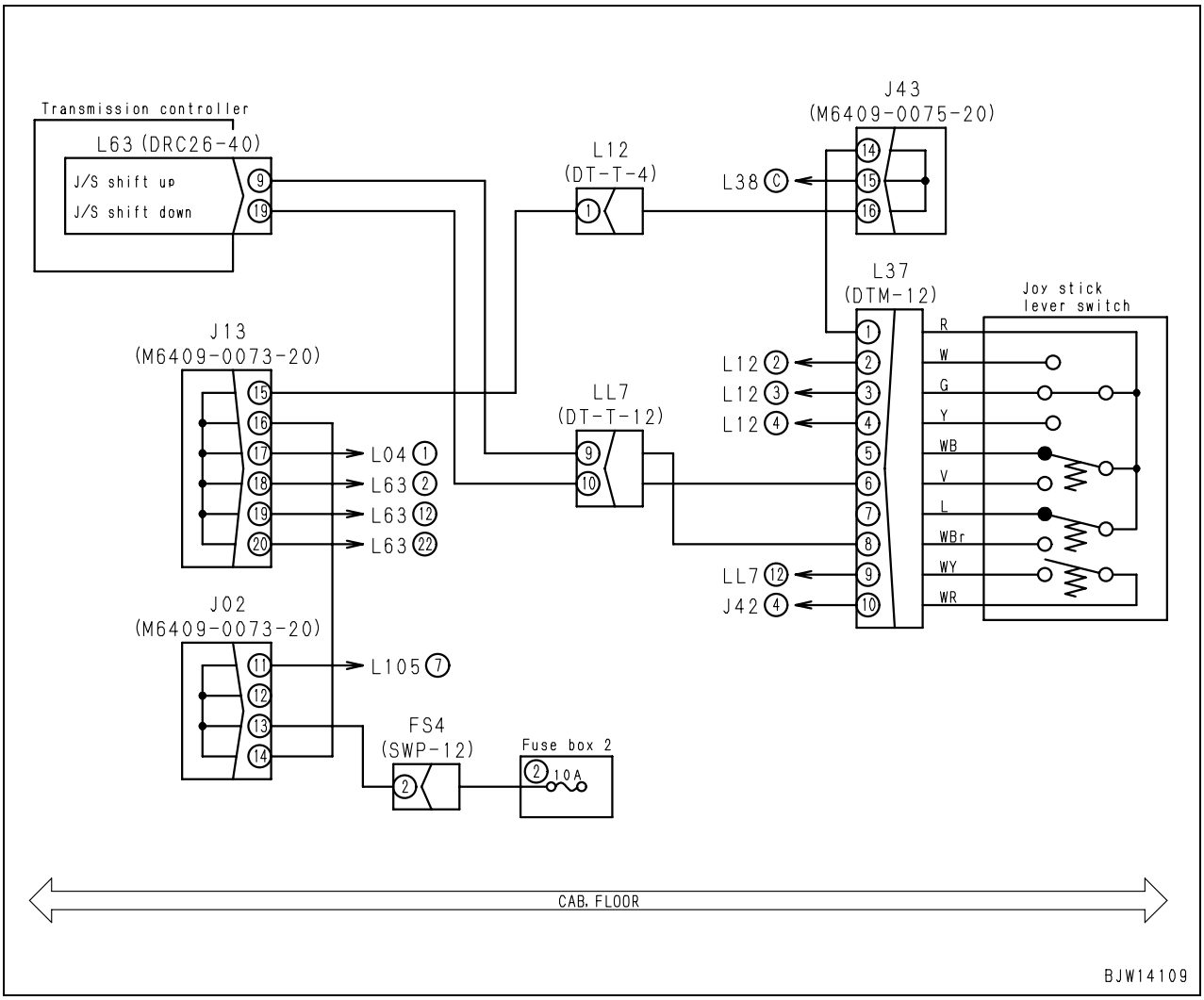
Failure code [DDK5L4] (Joystick steering shift-up/down switch: ON/OFF signals disagree)

Action code	Failure code	Trouble	Joystick steering shift-up/down switch: ON/OFF signals disagree (Transmission controller system)
E01	**DDK5L4**		
Contents of trouble	• Since the joystick steering shift up and down switch system is shorted with the power source, multiple signals are input.		
Action of controller	• Turns off the shift-up/down function of the joystick steering. • If cause of failure disappears, system resets itself.		
Problem that appears on machine	• Shift up or down from the joystick steering is disabled.		
Related information	• The input signals (ON/OFF) from the joystick steering shift-up/down switch can be checked with the monitoring function (Code: 40906, D-IN-12 or D-IN-13). • Method of reproducing failure code: Turn the starting switch ON, turn the joystick ON/OFF switch ON, then turn the joystick steering shift-up/down switch ON.		

Possible causes and standard value in normal state	Causes		Standard value in normal state/Remarks on troubleshooting			
	1	Defective joystick steering shift-up/down switch (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L37 (male)	Joystick steering shift-up/down switch	Resistance	
			Between (1) and (5)	Shift down ON	Min. 1 MΩ	
				Shift down OFF	Max. 1 Ω	
			Between (1) and (6)	Shift down ON	Max. 1 Ω	
				Shift down OFF	Min. 1 MΩ	
			Between (1) and (7)	Shift up ON	Min. 1 MΩ	
				Shift up OFF	Max. 1 Ω	
			Between (1) and (8)	Shift up ON	Max. 1 Ω	
				Shift up OFF	Min. 1 MΩ	
			Between (5), (6), (7), (8) and chassis ground	Constant	Min. 1 MΩ	
	2	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			Wiring harness between L63 (female) (9) – L37 (female) (8) and chassis ground		Resistance	Min. 1 MΩ
			Wiring harness between L63 (female) (19) – L37 (female) (6) and chassis ground		Resistance	Min. 1 MΩ
	3	Defective transmission controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting. • Turn on joystick ON/OFF switch			
			L63	Joystick steering shift-up/down switch	Resistance	
			Between (19) and chassis ground	Shift down ON	Max. 1 Ω	
				Shift down OFF	Min. 1 MΩ	
			Between (9) and chassis ground	Shift up ON	Max. 1 Ω	
				Shift up OFF	Min. 1 MΩ	

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Circuit diagram related to joystick steering shift-up/down switch



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Failure code [DDK6KA] (FNR lever switch: Disconnection)

Action code	Failure code	Trouble	FNR lever switch: Disconnection (Transmission controller system)
E03	**DDK6KA**		
Contents of trouble	• Since the FNR (directional) lever switch signal system is disconnected or shorted, all the lever signals are not input		
Action of controller	• When the joystick steering ON/OFF switch is set to OFF, set it to Neutral. • When the ON/OFF switch of right FNR switch or joystick steering ON/OFF switch is set to ON: 1) The controller operation follows the right FNR (directional) switch or joystick steering FNR (directional) switch. 2) The controller assumes that FNR (directional) lever switch is set to Neutral. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until FNR (directional) lever is set to N (Neutral).		
Problem that appears on machine	• Machine travel with the FNR (directional) lever switch is unavailable. • Travel is available with right FNR (directional) switch or joystick steering FNR (directional) switch. • Shift lever position pilot lamp goes off.		
Related information	• The input state (ON/OFF) from the FNR (directional) lever switch can be checked with the monitoring function (Code: 40907, D-IN-20, D-IN-21 or D-IN-22). • Method of reproducing failure code: Turn the starting switch ON and operate FNR (directional) lever		

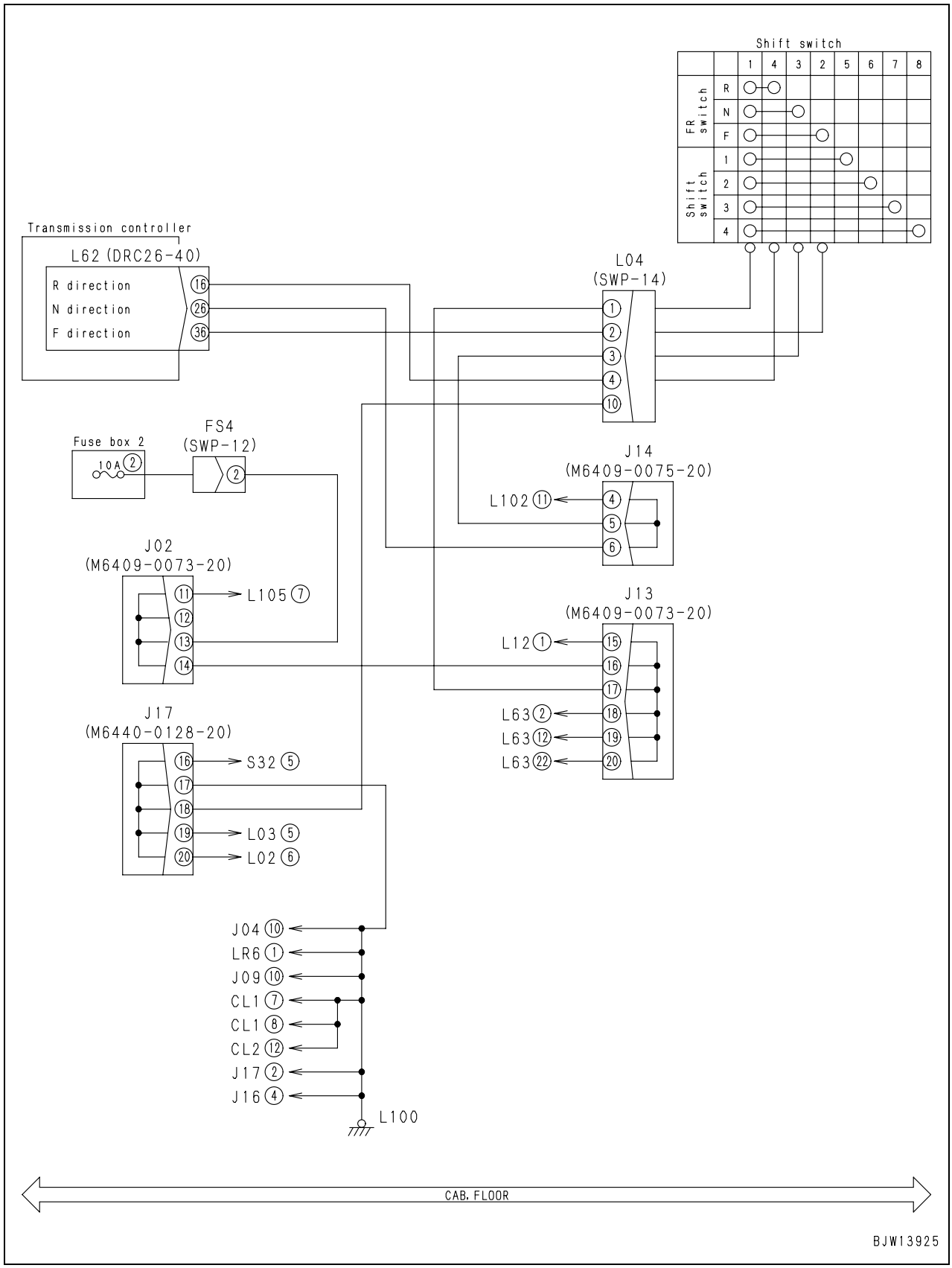
<table>
<tr><td rowspan="15">Possible causes and standard value in normal state</td><td colspan="2">Causes</td><td colspan="5">Standard value in normal state/Remarks on troubleshooting</td></tr>
<tr><td>1</td><td>Defective fuse No. 2 of fuse box 2</td><td colspan="5">If the fuse is burnt, the circuit probably has a grounding fault, etc. (See cause 4.)</td></tr>
<tr><td rowspan="8">2</td><td rowspan="8">Defective FNR (directional) lever switch (Internal disconnection or short circuit)</td><td colspan="5">★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.</td></tr>
<tr><td colspan="2">L04</td><td>FNR (directional) lever</td><td colspan="2">Voltage</td></tr>
<tr><td colspan="2">Between (1) and (10)</td><td>Constant</td><td colspan="2">20 – 30 V</td></tr>
<tr><td colspan="2" rowspan="2">Between (3) and (10)</td><td>N (Neutral)</td><td colspan="2">20 – 30 V</td></tr>
<tr><td>Other than above</td><td colspan="2">Max. 1 V</td></tr>
<tr><td colspan="2" rowspan="2">Between (2) and (10)</td><td>F (Forward)</td><td colspan="2">20 – 30 V</td></tr>
<tr><td>Other than above</td><td colspan="2">Max. 1 V</td></tr>
<tr><td colspan="2" rowspan="2">Between (4) and (10)</td><td>R (Reverse)</td><td colspan="2">20 – 30 V</td></tr>
<tr><td>Other than above</td><td colspan="2">Max. 1 V</td></tr>
<tr><td rowspan="6">3</td><td rowspan="6">Disconnection in wiring harness (Disconnection or defective contact in connector)</td><td colspan="5">★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.</td></tr>
<tr><td colspan="3">Wiring harness between fuse No. 2 of fuse box 2 – L04 (female) (1)</td><td>Resistance</td><td>Max. 1 Ω</td></tr>
<tr><td colspan="3">Wiring harness between L62 (female) (16) – L04 (female) (4)</td><td>Resistance</td><td>Max. 1 Ω</td></tr>
<tr><td colspan="3">Wiring harness between L62 (female) (26) – L04 (female) (3)</td><td>Resistance</td><td>Max. 1 Ω</td></tr>
<tr><td colspan="3">Wiring harness between L62 (female) (36) – L04 (female) (2)</td><td>Resistance</td><td>Max. 1 Ω</td></tr>
<tr><td colspan="3">Wiring harness between L04 (female) (10) – chassis ground</td><td>Resistance</td><td>Max. 1 Ω</td></tr>
</table>

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<table>
<tr><td rowspan="11">Possible causes and standard value in normal state</td><td colspan="2">Causes</td><td colspan="5">Standard value in normal state/Remarks on troubleshooting</td></tr>
<tr><td rowspan="5">4</td><td rowspan="5">Grounding fault in wiring harness
(Contact with ground circuit)</td><td colspan="5">★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.</td></tr>
<tr><td colspan="3">Wiring harness between fuse No. 2 of fuse box 2 – L04 (female) (1) and chassis ground</td><td>Resistance</td><td>Min. 1 MΩ</td></tr>
<tr><td colspan="3">Wiring harness between L62 (female) (16) – L04 (female) (4) and chassis ground</td><td>Resistance</td><td>Min. 1 MΩ</td></tr>
<tr><td colspan="3">Wiring harness between L62 (female) (26) – L04 (female) (3) and chassis ground</td><td>Resistance</td><td>Min. 1 MΩ</td></tr>
<tr><td colspan="3">Wiring harness between L62 (female) (36) – L04 (female) (2) and chassis ground</td><td>Resistance</td><td>Min. 1 MΩ</td></tr>
<tr><td rowspan="6">5</td><td rowspan="6">Defective transmission controller</td><td colspan="5">★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.</td></tr>
<tr><td colspan="2">L62</td><td>FNR (directional) lever</td><td colspan="2">Voltage</td></tr>
<tr><td colspan="2" rowspan="2">Between (26) and chassis ground</td><td>N (Neutral)</td><td colspan="2">20 – 30 V</td></tr>
<tr><td>Other than above</td><td colspan="2">Max. 1 V</td></tr>
<tr><td colspan="2" rowspan="2">Between (36) and chassis ground</td><td>F (Forward)</td><td colspan="2">20 – 30 V</td></tr>
<tr><td>Other than above</td><td colspan="2">Max. 1 V</td></tr>
<tr><td colspan="2" rowspan="2">Between (16) and chassis ground</td><td>R (Reverse)</td><td colspan="2">20 – 30 V</td></tr>
<tr><td>Other than above</td><td colspan="2">Max. 1 V</td></tr>
</table>

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Circuit diagram related to FNR (directional) lever switch



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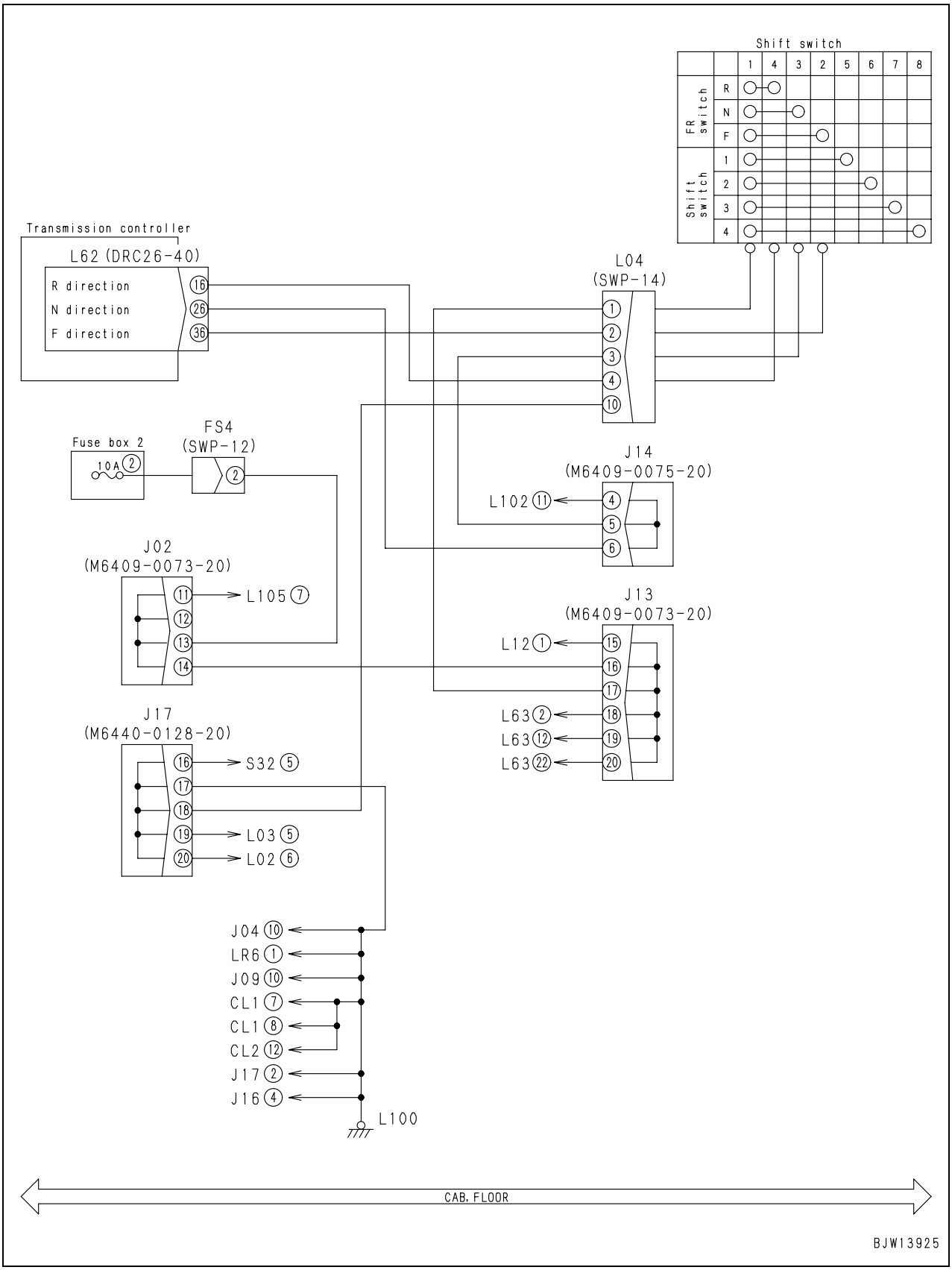
Failure code [DDK6KB] (FNR lever switch: Short circuit)

Action code	Failure code	Trouble	FNR lever switch: Short circuit (Transmission controller system)
E03	**DDK6KB**		
Contents of trouble	• Since the FNR (directional) lever switch signal system is shorted with power source, multiple FNR (directional) lever switch signals are input.		
Action of controller	• Sets to neutral. • Turns the centralized warning lamp and alarm buzzer ON. • As the ON/OFF switch of right FNR switch or joystick steering ON/OFF switch is switched ON → OFF → ON, the controller operation follows the right FNR (directional) switch or joystick steering FNR (directional) switch. • Even if cause of failure disappears, system does not reset itself until FNR (directional) lever is set to N (Neutral).		
Problem that appears on machine	• Machine travel with the FNR (directional) lever switch is unavailable. • Multiple shift lever position pilot lamps light up. • Travel is enabled by using right FNR (directional) switch or joystick steering FNR (directional) switch after setting the shift to neutral.		
Related information	• The input state (ON/OFF) from the FNR (directional) lever switch can be checked with the monitoring function (Code: 40907, D-IN-20, D-IN-21 or D-IN-22). • Only for steering wheel (Standard) • Method of reproducing failure code: Turn the starting switch ON and operate FNR (directional) lever		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective FNR (directional) lever switch (Internal short circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			L04	FNR (directional) lever	Voltage	
			Between (1) and (10)	Constant	20 – 30 V	
			Between (3) and (10)	F (Forward)	20 – 30 V	
				Other than above	Max. 1 V	
			Between (2) and (10)	N (Neutral)	20 – 30 V	
				Other than above	Max. 1 V	
			Between (4) and chassis ground	R (Reverse)	20 – 30 V	
				Other than above	Max. 1 V	
	2	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L62 (female) (16) – L04 (female) (4)		Voltage	Max. 1 V
			Wiring harness between L62 (female) (26) – L04 (female) (3)		Voltage	Max. 1 V
			Wiring harness between L62 (female) (36) – L04 (female) (2)		Voltage	Max. 1 V
	3	Defective transmission controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			L62	FNR (directional) lever	Voltage	
			Between (26) and chassis ground	N (Neutral)	20 – 30 V	
				Other than above	Max. 1 V	
			Between (36) and chassis ground	F (Forward)	20 – 30 V	
				Other than above	Max. 1 V	
			Between (16) and chassis ground	R (Reverse)	20 – 30 V	
				Other than above	Max. 1 V	

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Circuit diagram related to FNR (directional) lever switch



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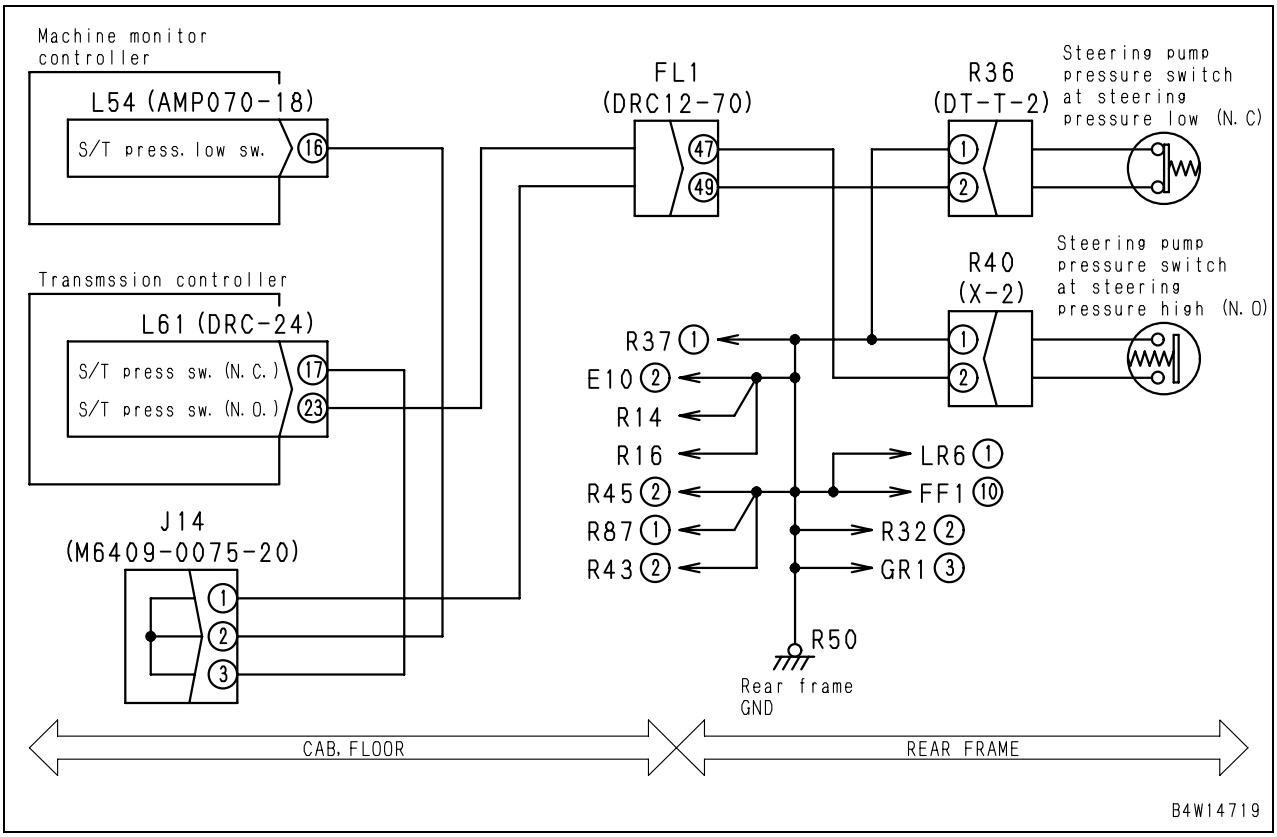
Failure code [DDS5KA] (Steering pressure switch: Disconnected)

Action code	Failure code	Trouble	Steering pressure switch disconnected (Transmission controller system)
E03	**DDS5KA**		
Contents of trouble	• Both N.C and N.O signals of the steering pressure switch are open simultaneously.		
Action of controller	• Turns electric emergency motor relay output OFF.		
Problem that appears on machine	• The auto emergency steering does not operate (However, the emergency steering can be operated manually). • Self-check of the emergency steering does not work.		
Related information	• Operate the emergency steering manually if the steering pressure is zero. • Can be checked with the monitoring function (Code: 40905, D-IN-0 or D-IN-1).		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective steering pressure switch	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Between R36 (male) (2) – (1)	Engine stopped	Resistance	Max. 1 Ω
				Open to atmosphere (Reference)	Resistance	Max. 1 Ω
				Engine started	Resistance	Min. 1 MΩ
			Between R40 (male) (2) – (1)	Engine stopped	Resistance	Min. 1 MΩ
				Open to atmosphere (Reference)	Resistance	Min. 1 MΩ
				Engine started	Resistance	Max. 1 Ω
	2	Wiring harness discontinuity (Disconnection or defective contact)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L61 (female) (17) – R36 (female) (2)		Resistance	Max. 1 Ω
			Wiring harness between L61 (female) (23) – R40 (female) (2)		Resistance	Max. 1 Ω
			Wiring harness between R36 (female) (1) – chassis ground		Resistance	Max. 1 Ω
			Wiring harness between R40 (female) (1) – chassis ground		Resistance	Max. 1 Ω
	3	Defective transmission and fan pump motor controller	★ Prepare with starting switch OFF, then turn startin switch ON and carry out troubleshooting.			
			Between L61 (17) – chassis ground	Engine stopped	Voltage	Max. 1 V
				Engine started	Voltage	20 – 30 V
			Between L61 (23) – chassis ground	Engine stopped	Voltage	20 – 30 V
				Engine started	Voltage	Max. 1 V

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Related circuit diagram



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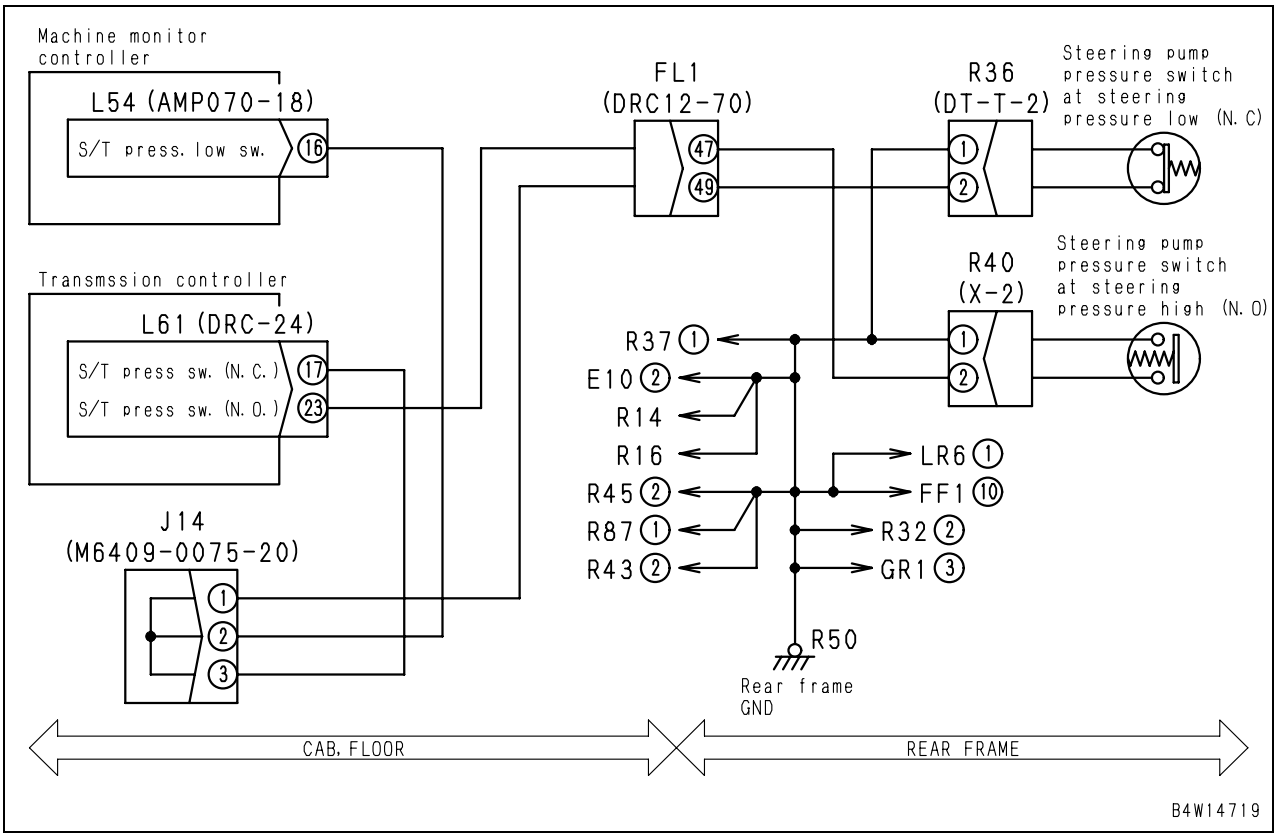
Failure code [DDS5KB] (Steering pressure switch: Short-circuit)

Action code	Failure code	Trouble	Steering pressure switch short-circuit (Transmission controller system)
E03	**DDS5KB**		
Contents of trouble	• Both N.C and N.O signals of the steering pressure switch is closed simultaneously.		
Action of controller	• Turns electric emergency motor relay output OFF.		
Problem that appears on machine	• The auto emergency steering does not operate (However, the emergency steering can be operated manually). • Self-check of the emergency steering does not work.		
Related information	• Operate the emergency steering manually if the steering pressure is zero. • Can be checked with the monitoring function (Code: 40905, D-IN-0 or D-IN-1).		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective steering pressure switch	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Between R36 (male) (2) – (1)	Engine stopped	Resistance	Max. 1 Ω
				Open to atmosphere (Reference)	Resistance	Max. 1 Ω
				Engine started	Resistance	Min. 1 MΩ
			Between R40 (male) (2) – (1)	Engine stopped	Resistance	Min. 1 MΩ
				Open to atmosphere (Reference)	Resistance	Min. 1 MΩ
				Engine started	Resistance	Max. 1 Ω
	2	Short circuit in wiring harness (With another wiring harness)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L61 (female) (17) – R36 (female) (2) and between L61 (female) (23) – R40 (female) (2)		Resistance	Min. 1 MΩ
			Wiring harness between L61 (female) (23) – R40 (female) (2) and between L54 (female) (16) – R36 (female) (27)		Resistance	Min. 1 MΩ
	3	Defective transmission and fan pump motor controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			Between L61 (17) – chassis ground	Engine stopped	Voltage	Max. 1 V
				Engine started	Voltage	20 – 30 V
			Between L61 (23) – chassis ground	Engine stopped	Voltage	20 – 30 V
				Engine started	Voltage	Max. 1 V

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Related circuit diagram



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Failure code [DDS5L6] (Steering: Low oil pressure)

Action code	Failure code	Trouble	Steering: Low oil pressure (Machine monitor system)
E03	**DDS5L6**		
Contents of trouble	• Steering pump pressure is lower than normal range.		
Action of controller	• Judges the steering pump pressure is absent. • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• Response to turning operation is low.		
Related information	• The input state (oil pressure) from the steering pump pressure sensor can be checked with the monitoring function (Code: 95300, S/T OIL PRESS). • The input state (voltage) from the steering pump pressure sensor can be checked with the monitoring function (Code: 95301, S/T OIL PRESS). • Method of reproducing failure code: Start engine.		

Possible causes and standard value in normal state	Causes		Standard value in normal state/Remarks on troubleshooting
	1	Referring to [H-9] (Response to turning operation is low) in troubleshooting for hydraulic and mechanical system (H mode), perform troubleshooting.	
	If no abnormality is detected by above troubleshooting, perform troubleshooting for [DHT8KA] and [DHT8KB].		

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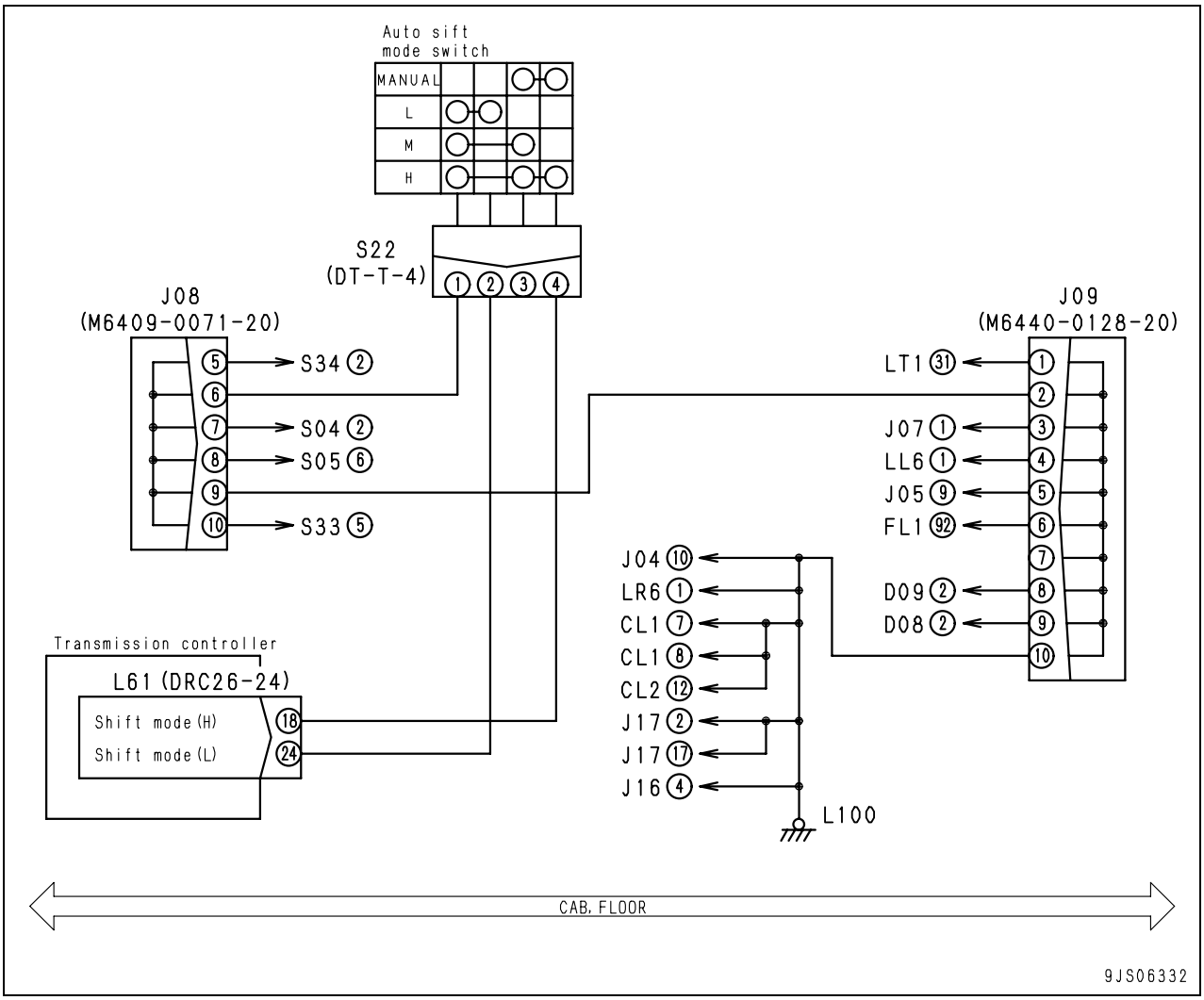
Failure code [DDT0L4] (Shift mode selector switch: ON/OFF signals disagree)

Action code	Failure code	Trouble	Shift mode selector switch: ON/OFF signals disagree (Transmission controller system)
E01	**DDT0L4**		
Contents of trouble	• The signals input from the transmission manual/auto shift selector switch are combined in an impossible manner.		
Action of controller	• Selects the manual shift mode. • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• The position of the transmission manual/auto shift selector switch does not match the shift mode during auto shift.		
Related information	• The input state (H/L) from the transmission manual/auto shift selector switch can be checked with the monitoring function (Code: 40905, D-IN-4 or D-IN-5). • The operator can check the current shift mode with the automatic shift pilot lamp. • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective transmission manual/auto shift selector switch (Internal defect)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			S22 (male)	Shift mode	Resistance	
			Between (1) and (2)	Manual shift	Min. 1 MΩ	
				Auto (L)	Max. 1 Ω	
				Auto (H)	Min. 1 MΩ	
			Between (1) and (4)	Manual shift	Min. 1 MΩ	
				Auto (L)	Min. 1 MΩ	
				Auto (H)	Max. 1 Ω	
			Between (3) and (4)	Manual shift	Max. 1 Ω	
				Auto (L)	Min. 1 MΩ	
				Auto (H)	Max. 1 Ω	
	2	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L61 (female) (24) – S22 (female) (2)		Resistance	Max. 1 Ω
	3	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L61 (female) (18) – S22 (female) (4) and chassis ground		Resistance	Min. 1 MΩ
	4	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			Wiring harness between L61 (female) (24) – S22 (female) (2) and chassis ground		Voltage	Max. 1 V
	5	Defective transmission controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			L61	Shift mode	Voltage	
			Between (18) and chassis ground	Manual shift	Max. 1 V	
				Auto (L)	Max. 1 V	
				Auto (H)	20 – 30 V	
			Between (24) and chassis ground	Manual shift	Max. 1 V	
				Auto (L)	20 – 30 V	
				Auto (H)	Max. 1 V	

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Circuit diagram related to transmission manual/auto shift selector switch.



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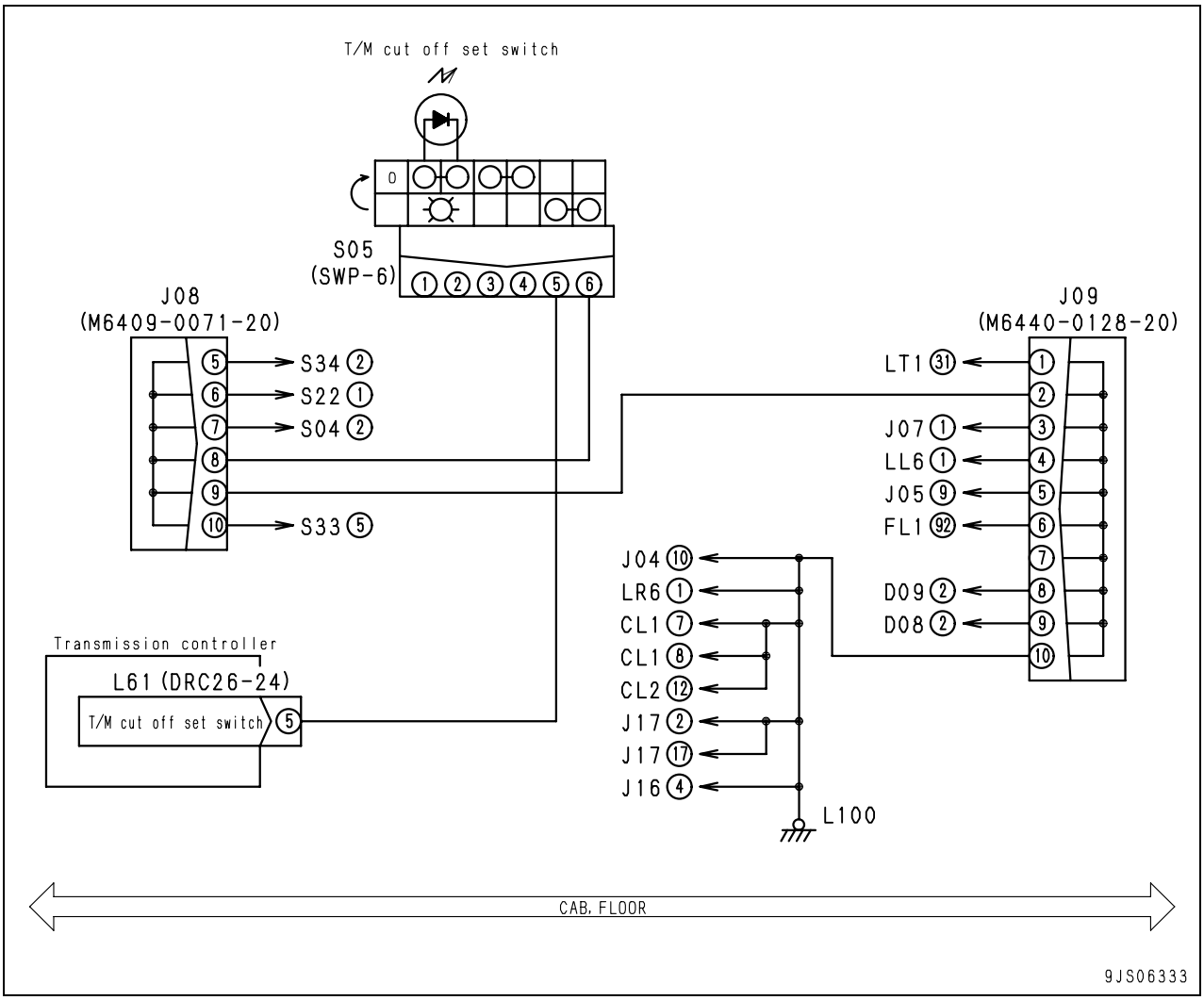
Failure code [DDT4LD] (Transmission cut-off set switch: Switch is kept pressed for long time)

Action code	Failure code	Trouble	Transmission cut-off set switch: Switch is kept pressed for long time (Transmission controller system)
E01	**DDT4LD**		
Contents of trouble	• Since the transmission cut-off set switch system is shorted, normal transmission cut-off becomes unavailable.		
Action of controller	• If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• The transmission is cut off at an unintended position.		
Related information	• The input state (ON/OFF) from the transmission cut-off set switch can be checked with the monitoring function (Code: 40906, D-IN-9). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective transmission cut-off set switch (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			S05 (male)	Transmission cut-off set switch	Resistance	
			Between (5) and (6)	ON	Max. 1 Ω	
				OFF	Min. 1 MΩ	
			Between (5), (6) and chassis ground	Constant	Min. 1 MΩ	
	2	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L61 (female) (5) – S05 (female) (5) and chassis ground		Resistance	Min. 1 MΩ
	3	Defective transmission controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			L61 (female)	Transmission cut-off set switch	Resistance	
			Between (5) and chassis ground	ON	Max. 1 Ω	
				OFF	Min. 1 MΩ	

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Circuit diagram related to transmission cut-off set switch



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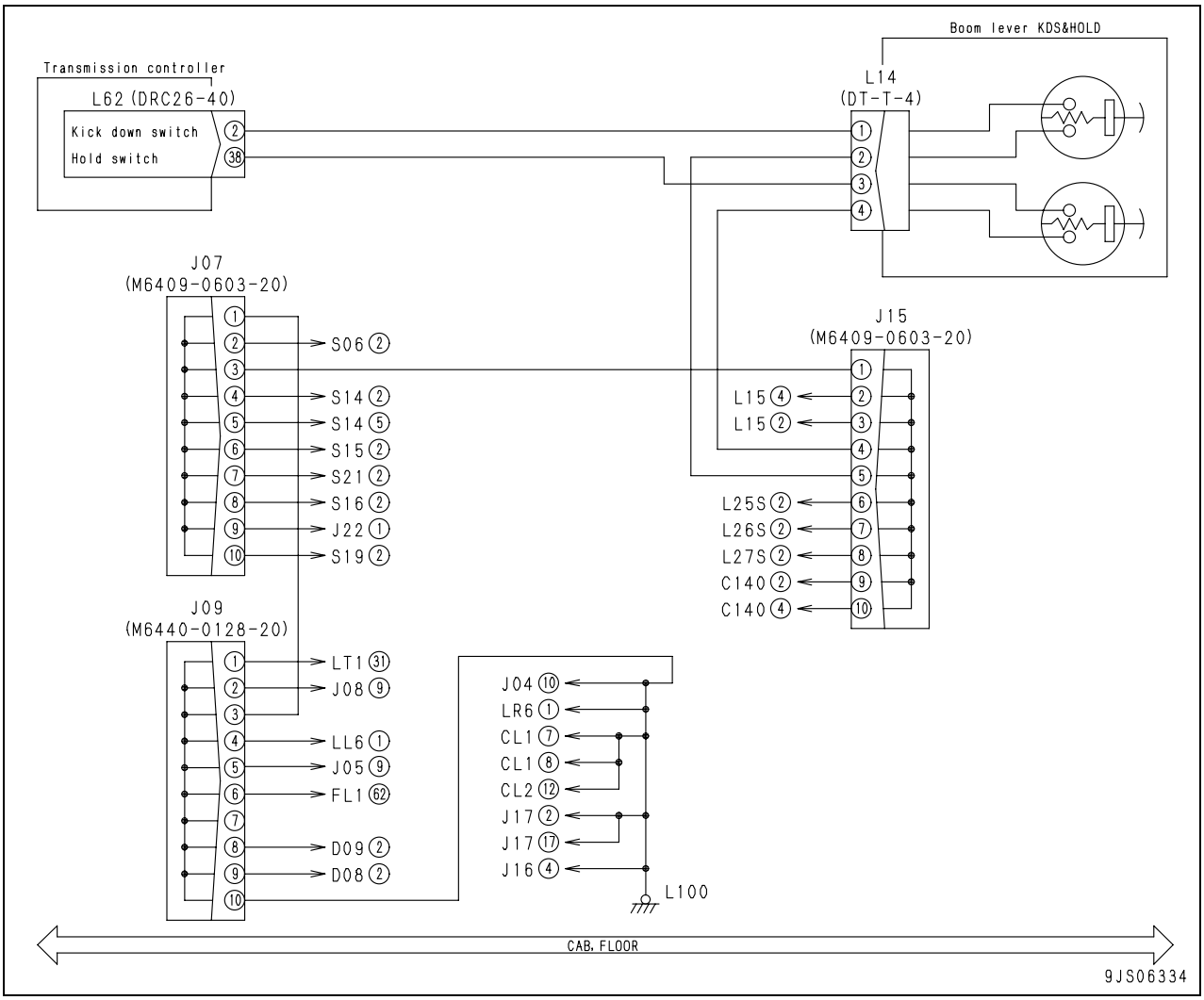
Failure code [DDW9LD] (Kick-down switch: Switch is kept pressed for long time)

Action code	Failure code	Trouble	Kick-down switch: Switch is kept pressed for long time (Transmission controller system)
E01	**DDW9LD**		
Contents of trouble	• Since the kick-down switch system is shorted, kick-down becomes unavailable.		
Action of controller	• Implements kick-down once at occurrence of the ground fault. After that, kick-down control is not executed. • If cause of failure disappears, system resets itself.		
Problem that appears on machine	• When ground fault occurs, turns the kick-down ON once. • No kick down is executed after that.		
Related information	• The input state (ON/OFF) from the kick-down switch can be checked with the monitoring function (Code: 40908, D-IN-30). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective kick-down switch (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L14 (male)	Kick-down switch	Resistance	
			Between (1) and (2)	ON	Max. 1 Ω	
				OFF	Min. 1 MΩ	
			Between (1), (2) and chassis ground	Constant	Min. 1 MΩ	
	2	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L62 (female) (2) – L14 (female) (1) and chassis ground		Resistance	Min. 1 MΩ
	3	Defective transmission controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			L62	Kick-down switch	Voltage	
			Between (2) and chassis ground	ON	20 – 30 V	
				OFF	Max. 1 V	

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Circuit diagram related to kick-down switch and hold switch



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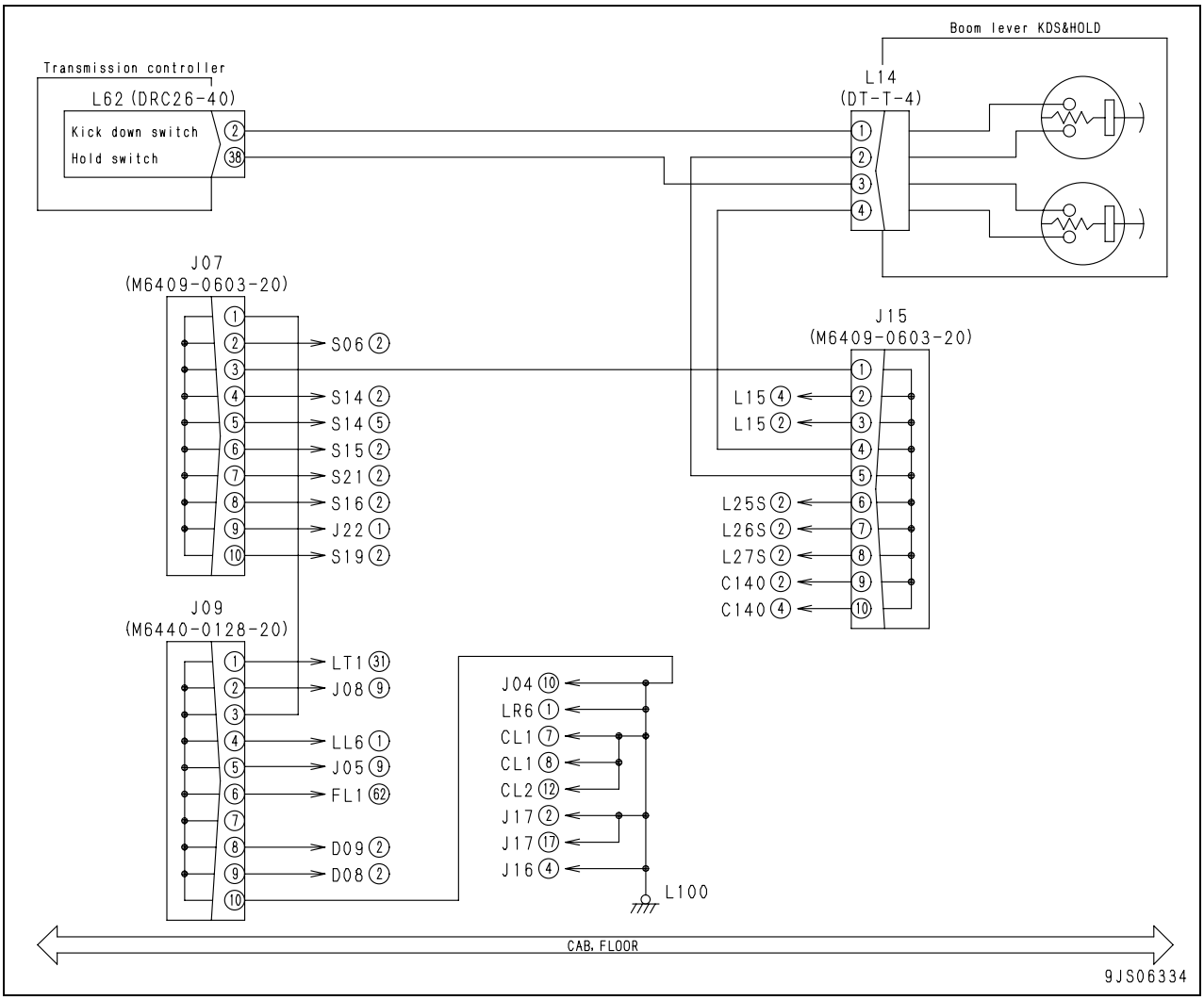
Failure code [DDWLLD] (Hold switch: Switch is kept pressed for long time)

Action code	Failure code	Trouble	Hold switch: Switch is kept pressed for long time (Transmission controller system)
E01	**DDWLLD**		
Contents of trouble	• Since the hold switch system is shorted, holding of signals becomes unavailable.		
Action of controller	• Holds once when a grounding fault occurs, then does not control holding. • If cause of failure disappears, system resets itself.		
Problem that appears on machine	• When ground fault occurs, turns the hold switch once.		
Related information	• The input state (ON/OFF) from the hold switch can be checked with the monitoring function (Code: 40908, D-IN-31). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective hold switch (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L14 (male)	Hold switch	Resistance	
			Between (3) and (4)	ON	Max. 1 Ω	
				OFF	Min. 1 MΩ	
			Between (3), (4) and chassis ground	Constant	Min. 1 MΩ	
	2	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L62 (female) (38) – L14 (female) (3) and chassis ground		Resistance	Min. 1 MΩ
	3	Defective transmission controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			L62	Hold switch	Voltage	
			Between (38) and chassis ground	OFF	20 – 30 V	
				ON	Max. 1 V	

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Circuit diagram related to kick-down switch and hold switch



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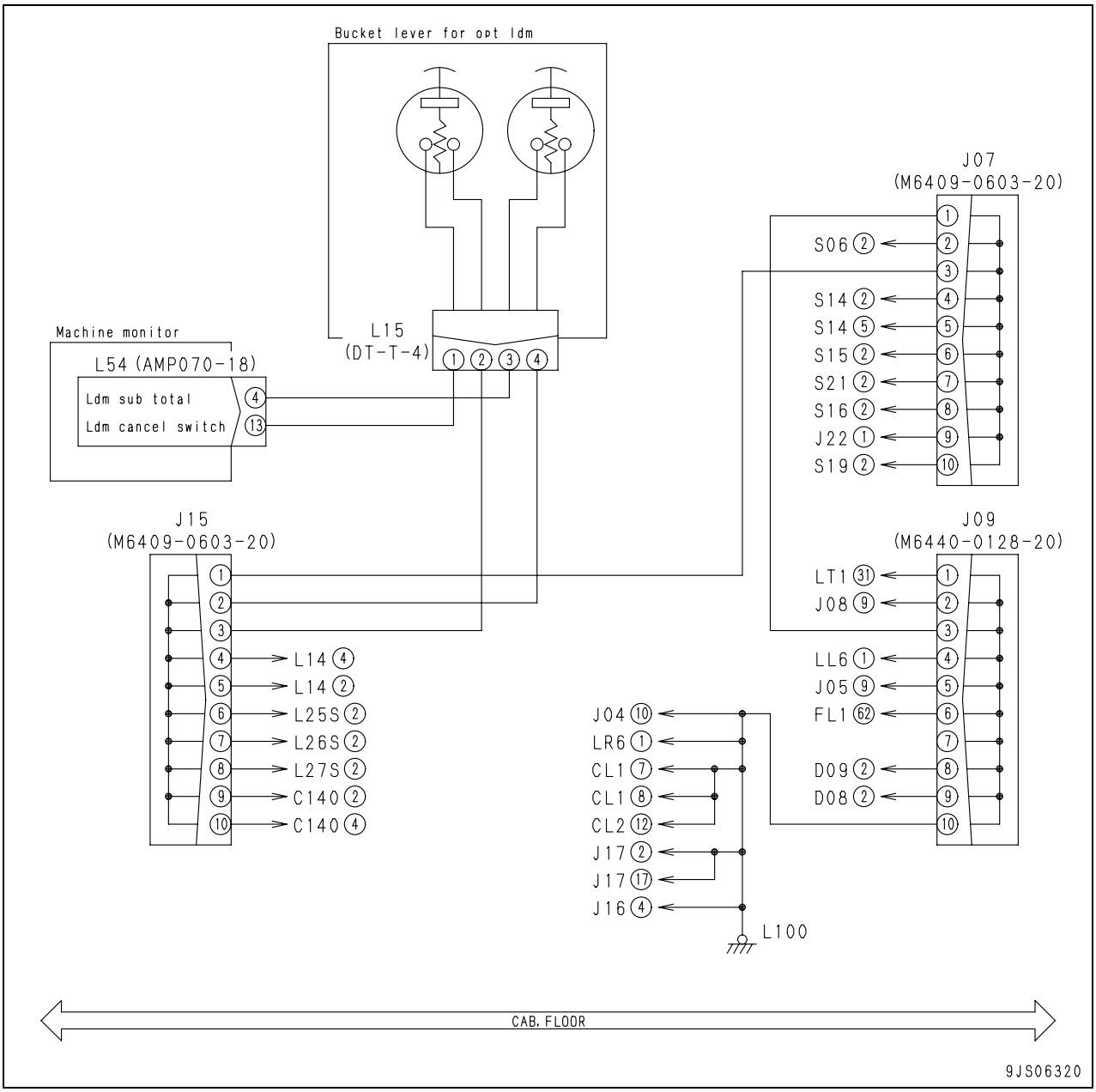
Failure code [DDY0LD] (Load meter cancel switch: Switch is kept pressed for long time)

Action code	Failure code	Trouble	Load meter cancel switch: Switch is kept pressed for long time (Machine monitor system)
E01	**DDY0LD**		
Contents of trouble	• The load meter cancel switch is shorted and load meter cancel switch does not function.		
Action of controller	• None in particular.		
Problem that appears on machine	• Cancellation of calculated load becomes unavailable		
Related information	• The input state (ON/OFF) from the load meter cancel switch can be checked with the monitoring function (Code: 40904, D-IN-33). • Only for load meter (if equipped). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective load meter cancel switch (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L15 (male)	Load meter cancel switch	Resistance	
			Between (1) and (2)	ON	Max. 1 Ω	
				OFF	Min. 1 MΩ	
			Between (1), (2) and chassis ground	Constant	Min. 1 MΩ	
	2	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L54 (female) (13) – L15 (female) (1) and chassis ground		Resistance	Min. 1 MΩ
	3	Defective machine monitor	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			L54	Load meter cancel switch	Voltage	
			Between (13) and chassis ground	ON	Max. 1 V	
				OFF	20 – 30 V	

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Circuit diagram related to load meter cancel & subtotal switch



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Failure code [DF10KA] (Transmission shift lever switch: Disconnected)

Action code	Failure code	Trouble	Transmission shift lever switch: Disconnected (Transmission controller system)
E01	**DF10KA**		
Contents of trouble	• Since the transmission shift lever switch input signal system is disconnected or shorted, the signal is not input.		
Action of controller	• Fixes to the shift range before the abnormality occurred • If cause of failure disappears, system resets itself.		
Problem that appears on machine	• The transmission is not set to the selected gear speed. • Shift indicator displays the shift range before the abnormality occurred.		
Related information	• The input state (ON/OFF) from each shift switch can be checked with the monitoring function (Code: 40906, D-IN-8, D-IN-9, D-IN-10 or D-IN-11) • Method of reproducing failure code: Turn the starting switch ON and operate shift lever		

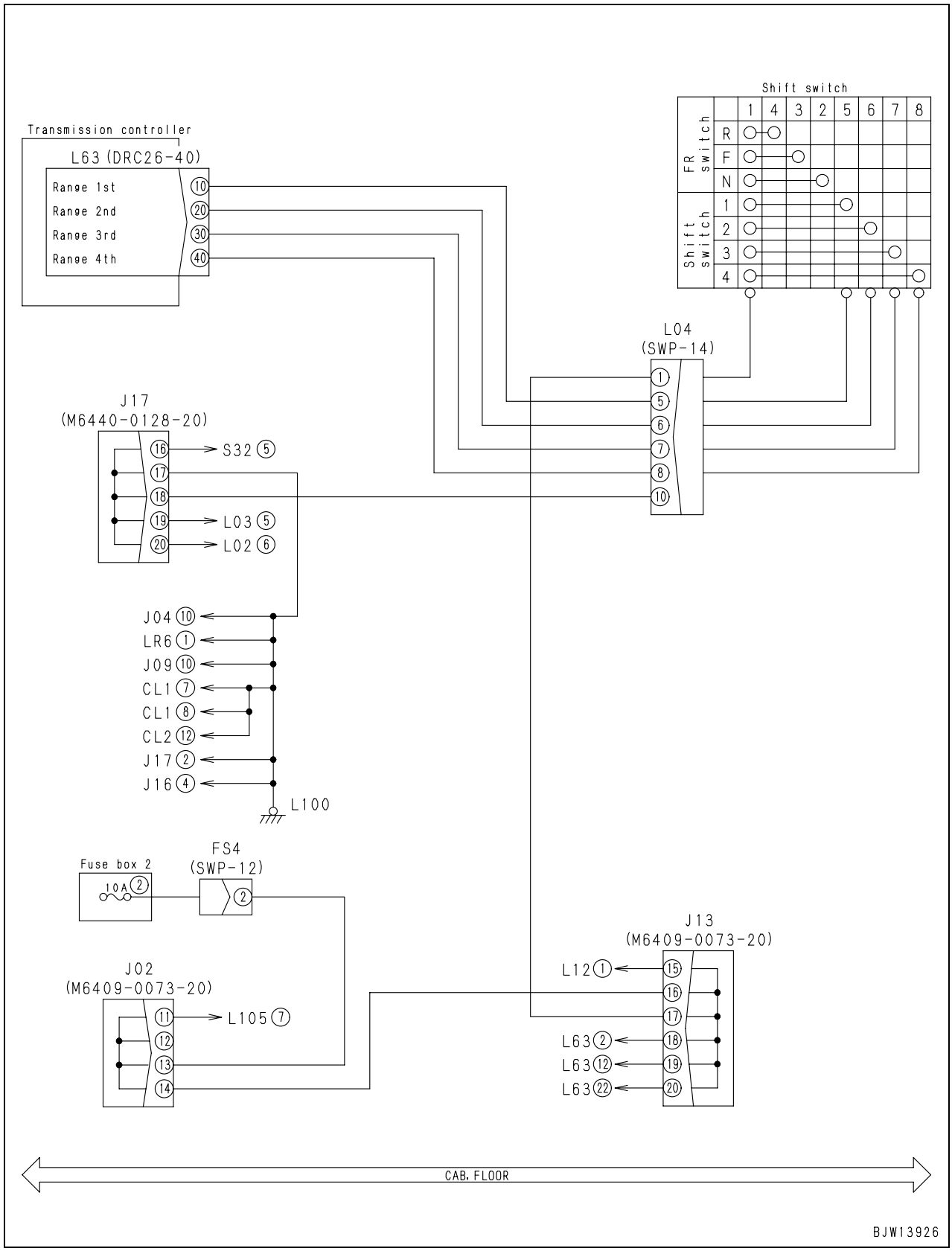
	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective transmission shift lever switch (Internal disconnection)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			L04	Shift range	Voltage	
			Between (1) and (10)	Constant	20 – 30 V	
			Between (5) and (10)	1st (1st speed)	20 – 30 V	
				Other than above	Max. 1 V	
			Between (6) and (10)	2nd (2nd speed)	20 – 30 V	
				Other than above	Max. 1 V	
			Between (7) and (10)	3rd (3rd speed)	20 – 30 V	
				Other than above	Max. 1 V	
			Between (8) and (10)	4th (4th speed)	20 – 30 V	
				Other than above	Max. 1 V	
	2	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between fuse No. 2 of fuse box 2 – L04 (female) (1)		Resistance	Max. 1 Ω
			Wiring harness between L63 (female) (10) – L04 (female) (5)		Resistance	Max. 1 Ω
			Wiring harness between L63 (female) (20) – L04 (female) (6)		Resistance	Max. 1 Ω
			Wiring harness between L63 (female) (30) – L04 (female) (7)		Resistance	Max. 1 Ω
			Wiring harness between L63 (female) (40) – L04 (female) (8)		Resistance	Max. 1 Ω
			Wiring harness between L04 (female) (10) – chassis ground		Resistance	Max. 1 Ω

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<table>
<tr><td rowspan="12">Possible causes and standard value in normal state</td><td colspan="2">Causes</td><td colspan="5">Standard value in normal state/Remarks on troubleshooting</td></tr>
<tr><td rowspan="5">3</td><td rowspan="5">Grounding fault in wiring harness
(Contact with ground circuit)</td><td colspan="5">★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.</td></tr>
<tr><td colspan="3">Wiring harness between fuse No. 2 of fuse box 2 – L04 (female) (1) and chassis ground</td><td>Resistance</td><td>Min. 1 MΩ</td></tr>
<tr><td colspan="3">Wiring harness between L63 (female) (10) – L04 (female) (5) and chassis ground</td><td>Resistance</td><td>Min. 1 MΩ</td></tr>
<tr><td colspan="3">Wiring harness between L63 (female) (20) – L04 (female) (6) and chassis ground</td><td>Resistance</td><td>Min. 1 MΩ</td></tr>
<tr><td colspan="3">Wiring harness between L63 (female) (30) – L04 (female) (7) and chassis ground</td><td>Resistance</td><td>Min. 1 MΩ</td></tr>
<tr><td rowspan="7">4</td><td rowspan="7">Defective transmission controller</td><td colspan="5">★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.</td></tr>
<tr><td>L63</td><td colspan="2">Shift range</td><td colspan="2">Voltage</td></tr>
<tr><td rowspan="2">Between (10) and chassis ground</td><td colspan="2">1st (1st speed)</td><td colspan="2">20 – 30 V</td></tr>
<tr><td colspan="2">Other than above</td><td colspan="2">Max. 1 V</td></tr>
<tr><td rowspan="2">Between (20) and chassis ground</td><td colspan="2">2nd (2nd speed)</td><td colspan="2">20 – 30 V</td></tr>
<tr><td colspan="2">Other than above</td><td colspan="2">Max. 1 V</td></tr>
<tr><td rowspan="2">Between (30) and chassis ground</td><td colspan="2">3rd (3rd speed)</td><td colspan="2">20 – 30 V</td></tr>
<tr><td colspan="2">Other than above</td><td colspan="2">Max. 1 V</td></tr>
<tr><td rowspan="2">Between (40) and chassis ground</td><td colspan="2">4th (4th speed)</td><td colspan="2">20 – 30 V</td></tr>
<tr><td colspan="2">Other than above</td><td colspan="2">Max. 1 V</td></tr>
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Circuit diagram related to transmission shift lever switch



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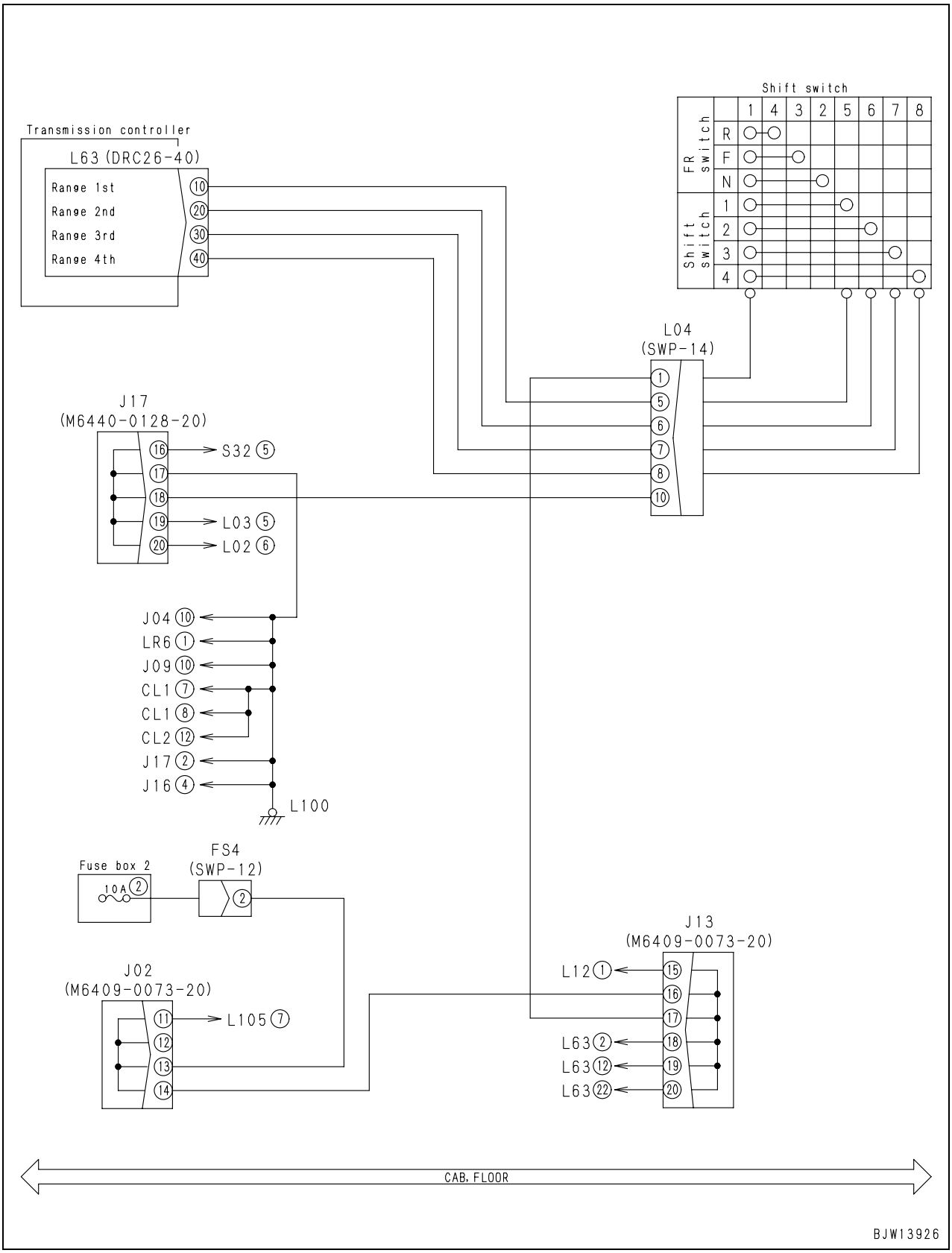
Failure code [DF10KB] (Transmission shift lever switch: Short circuit)

Action code	Failure code	Trouble	Transmission shift lever switch: Short circuit (Transmission controller system)
E01	**DF10KB**		
Contents of trouble	• Since the transmission shift lever switch input signal system is shorted with the power source, multiple transmission shift lever switch signals are input.		
Action of controller	• Uses the shift range input to the higher gear speed • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• Specified gear speed is not available (1st speed or 2nd speed not selectable from the transmission shift lever) • Shift indicator indicates the shift range input to the higher gear speed.		
Related information	• The input state (ON/OFF) from each shift switch can be checked with the monitoring function (Code: 40906, D-IN-8, D-IN-9, D-IN-10 or D-IN-11) • Method of reproducing failure code: Turn the starting switch ON and operate shift lever		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective transmission shift lever switch (Internal short circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			L04	Shift range	Voltage	
			Between (5) and (10)	1st (1st speed)	20 – 30 V	
				Other than above	Max. 1 V	
			Between (6) and (10)	2nd (2nd speed)	20 – 30 V	
				Other than above	Max. 1 V	
			Between (7) and (10)	3rd (3rd speed)	20 – 30 V	
				Other than above	Max. 1 V	
			Between (8) and (10)	4th (4th speed)	20 – 30 V	
				Other than above	Max. 1 V	
	2	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L63 (female) (10) – L04 (female) (5) and chassis ground		Voltage	Max. 1 V
			Wiring harness between L63 (female) (20) – L04 (female) (6) and chassis ground		Voltage	Max. 1 V
			Wiring harness between L63 (female) (30) – L04 (female) (7) and chassis ground		Voltage	Max. 1 V
			Wiring harness between L63 (female) (40) – L04 (female) (8) and chassis ground		Voltage	Max. 1 V
	3	Defective transmission controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			L63	Shift range	Voltage	
			Between (10) and chassis ground	1st (1st speed)	20 – 30 V	
				Other than above	Max. 1 V	
			Between (20) and chassis ground	2nd (2nd speed)	20 – 30 V	
				Other than above	Max. 1 V	
			Between (30) and chassis ground	3rd (3rd speed)	20 – 30 V	
				Other than above	Max. 1 V	
			Between (40) and chassis ground	4th (4th speed)	20 – 30 V	
				Other than above	Max. 1 V	

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Circuit diagram related to transmission shift lever switch



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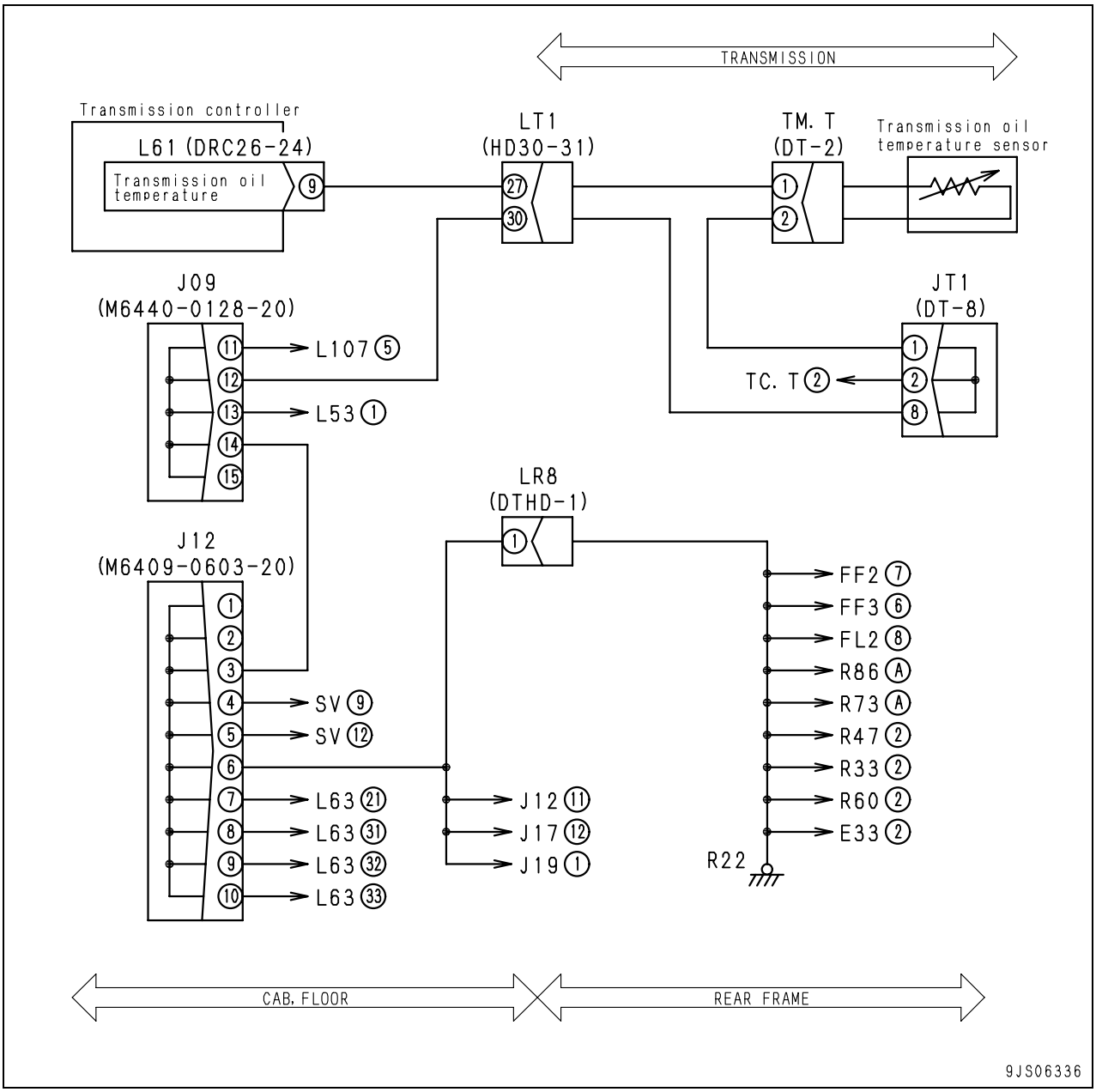
Failure code [DGF1KA] (Transmission oil temperature sensor: Disconnected)

Action code	Failure code	Trouble	Transmission oil temperature sensor: Disconnected (Transmission controller system)
E01	**DGF1KA**		
Contents of trouble	• Since the transmission oil temperature sensor signal system is disconnected, the signal level is higher than normal range (Transmission oil temperature sensor signal voltage: Min. 4.56 V (Max. 15°C)) and the torque converter oil temperature sensor signal voltage: Min. 3.7 V (Max. 5.5°C).		
Action of controller	• Cannot judge the transmission oil temperature normally. • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• Gear shifting shocks can result.		
Related information	• The input state (oil temperature) from the transmission oil temperature sensor can be checked with the monitoring function (Code: 93600 T/M OIL TEMP). • The input state (voltage) from the transmission oil temperature sensor can be checked with the monitoring function (Code: 93601, T/M OIL TEMP). • The input state (oil temperature) from the torque converter oil temperature sensor can be checked with the monitoring function (Code: 40100, TC OIL TEMP). • The input state (voltage) from the torque converter oil temperature sensor can be checked with the monitoring function (Code: 40101, TC OIL TEMP). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective transmission oil temperature sensor (Internal disconnection or short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			TM.T (male)	Transmission oil temperature	Resistance	
			Between (1) and (2)	25°C (Normal temperature)	35 – 50 kΩ	
				100°C	3.1 – 4.5 kΩ	
	2	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L61 (female) (9) – TM.T (female) (1)		Resistance	Max. 1 Ω
			Wiring harness between TM.T (female) (2) – chassis ground		Resistance	Max. 1 Ω
	3	Defective transmission controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L61 (female)	Transmission oil temperature	Resistance	
			Between (9) and chassis ground	25°C (Normal temperature)	35 – 50 kΩ	
				100°C	3.1 – 4.5 kΩ	

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Circuit diagram related to transmission oil temperature sensor



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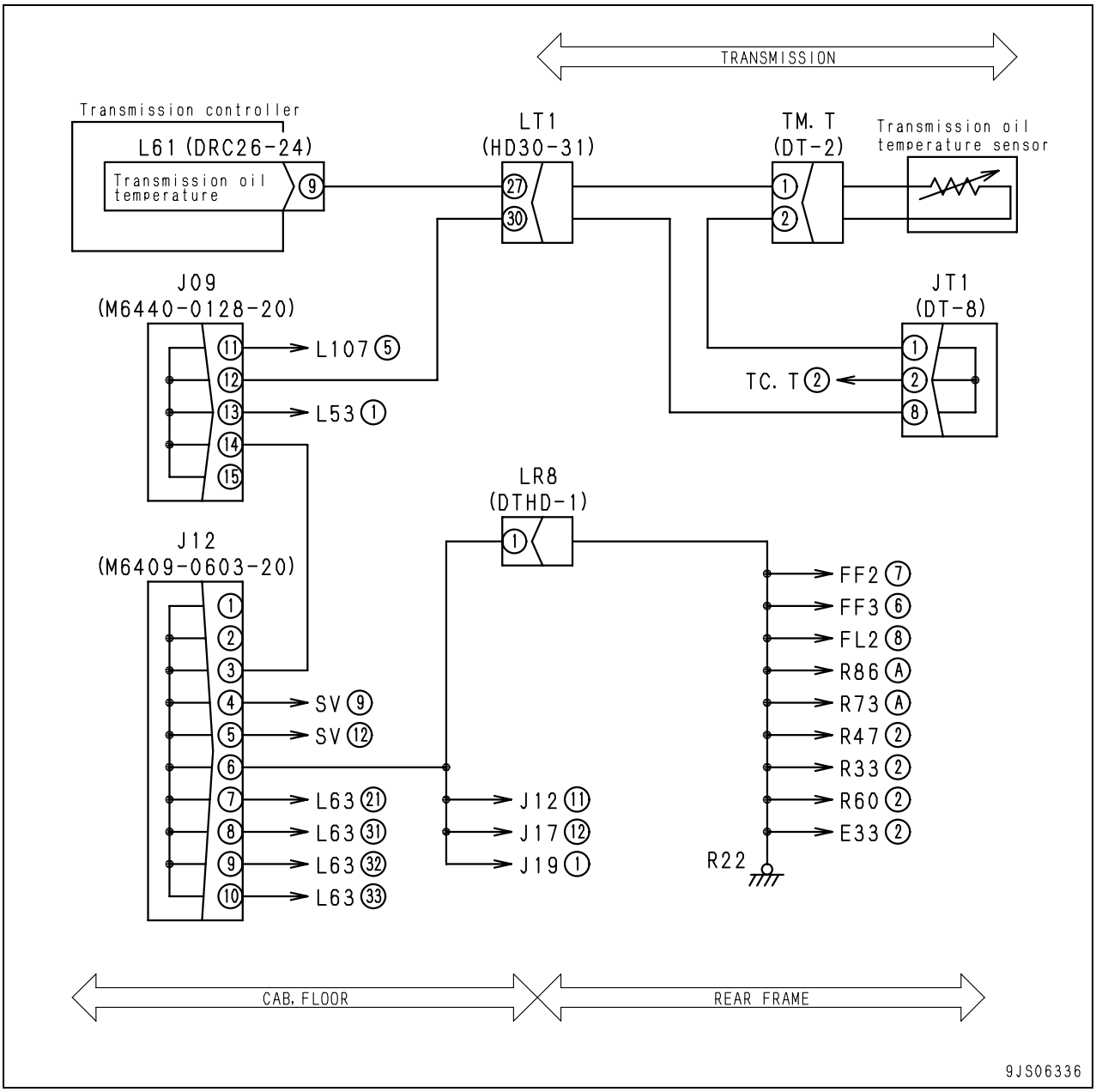
Failure code [DGF1KB] (Transmission oil temperature sensor: Short circuit)

Action code	Failure code	Trouble	Transmission oil temperature sensor: Short circuit (Transmission controller system)
E01	**DGF1KB**		
Contents of trouble	• Due to grounding fault in transmission oil temperature sensor signal system, the signal level is lower than normal range (Transmission oil temperature sensor signal voltage: Max. 0.97 V (Min. 150°C))		
Action of controller	• Cannot judge the transmission oil temperature normally. • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• Gear shifting shocks can result.		
Related information	• The input state (oil temperature) from the transmission oil temperature sensor can be checked with the monitoring function (Code: 93600, T/M OIL TEMP). • The input state (voltage) from the transmission oil temperature sensor can be checked with the monitoring function (Code: 93601, T/M OIL TEMP). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective transmission oil temperature sensor (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			TM.T (male)	Transmission oil temperature	Resistance	
			Between (1) and (2)	25°C (Normal temperature)	35 – 50 kΩ	
				100°C	3.1 – 4.5 kΩ	
	2	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L61 (female) (9) – TM.T (female) (1) and chassis ground		Resistance	Min. 1 MΩ
	3	Defective transmission controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L61 (female)	Transmission oil temperature	Resistance	
			Between (9) and chassis ground	25°C (Normal temperature)	35 – 50 kΩ	
				100°C	3.1 – 4.5 kΩ	

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Circuit diagram related to transmission oil temperature sensor



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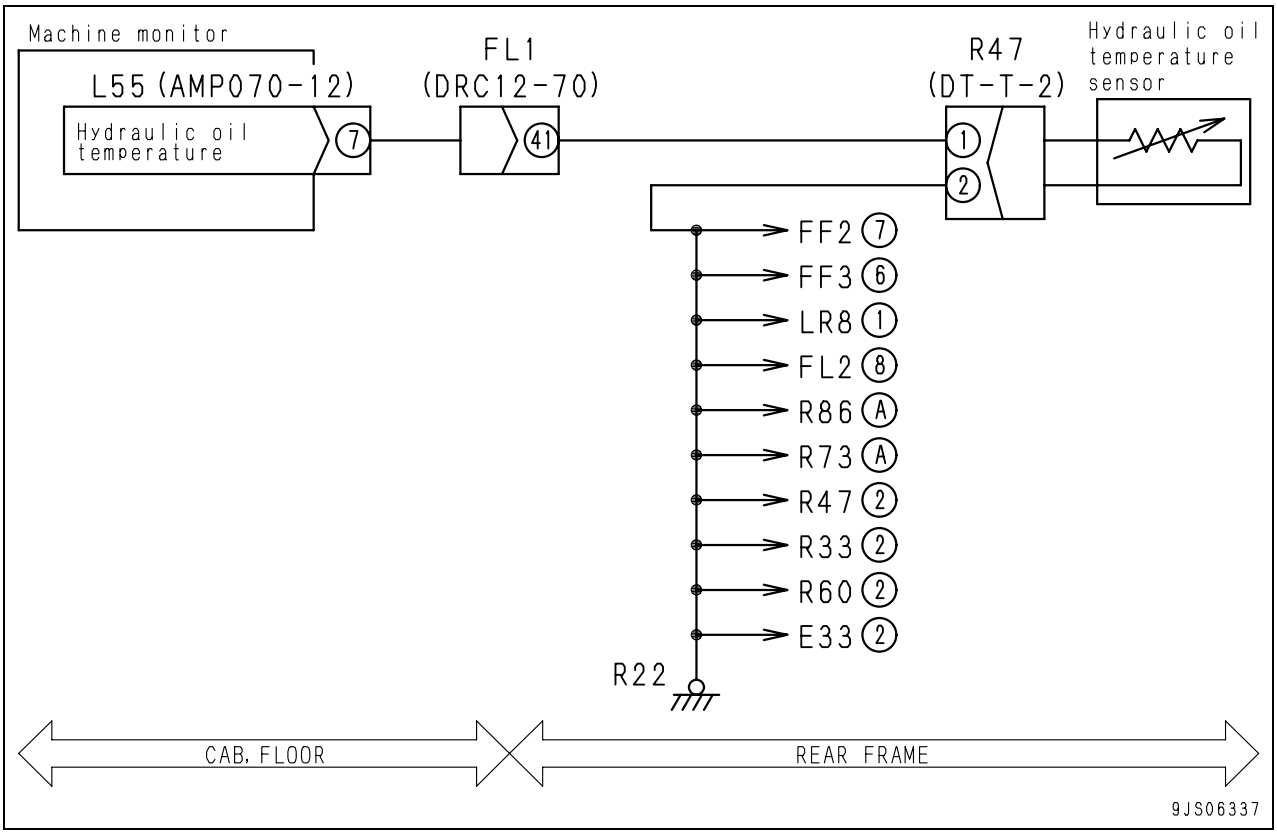
Failure code [DGH2KX] (Hydraulic oil temperature sensor: Out of input signal range)

Action code	Failure code	Trouble	Hydraulic oil temperature sensor: Out of input signal range (Machine monitor system)
E01	**DGH2KX**		
Contents of trouble	• Due to grounding fault in hydraulic oil temperature sensor signal system, the signal level is lower than normal range (Hydraulic oil temperature sensor signal voltage: Max. 0.97 V (Min. 150°C))		
Action of controller	• If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• The hydraulic oil temperature gauge reads MAX position.		
Related information	• The input state (oil temperature) from the hydraulic oil temperature sensor can be checked with the monitoring function (Code: 04401, HYD TEMP). • The input state (voltage) from the hydraulic oil temperature sensor can be checked with the monitoring function (Code: 04404, HYD TEMP). • Method of reproducing failure code: Turn the starting switch ON.		

Possible causes and standard value in normal state	Causes		Standard value in normal state/Remarks on troubleshooting			
	1	Defective hydraulic oil temperature sensor (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			R47 (male)	Hydraulic oil temperature	Resistance	
			Between (1) and (2)	25°C (Normal temperature)	35 – 50 kΩ	
				100°C	3.1 – 4.5 kΩ	
	2	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L55 (female) (7) – R47 (female) (1) and chassis ground		Resistance	Min. 1 MΩ
	3	Defective machine monitor	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L55 (female)	Hydraulic oil temperature	Resistance	
			Between (7) and chassis ground	25°C (Normal temperature)	35 – 50 kΩ	
				100°C	3.1 – 4.5 kΩ	

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Circuit diagram related to hydraulic oil temperature sensor



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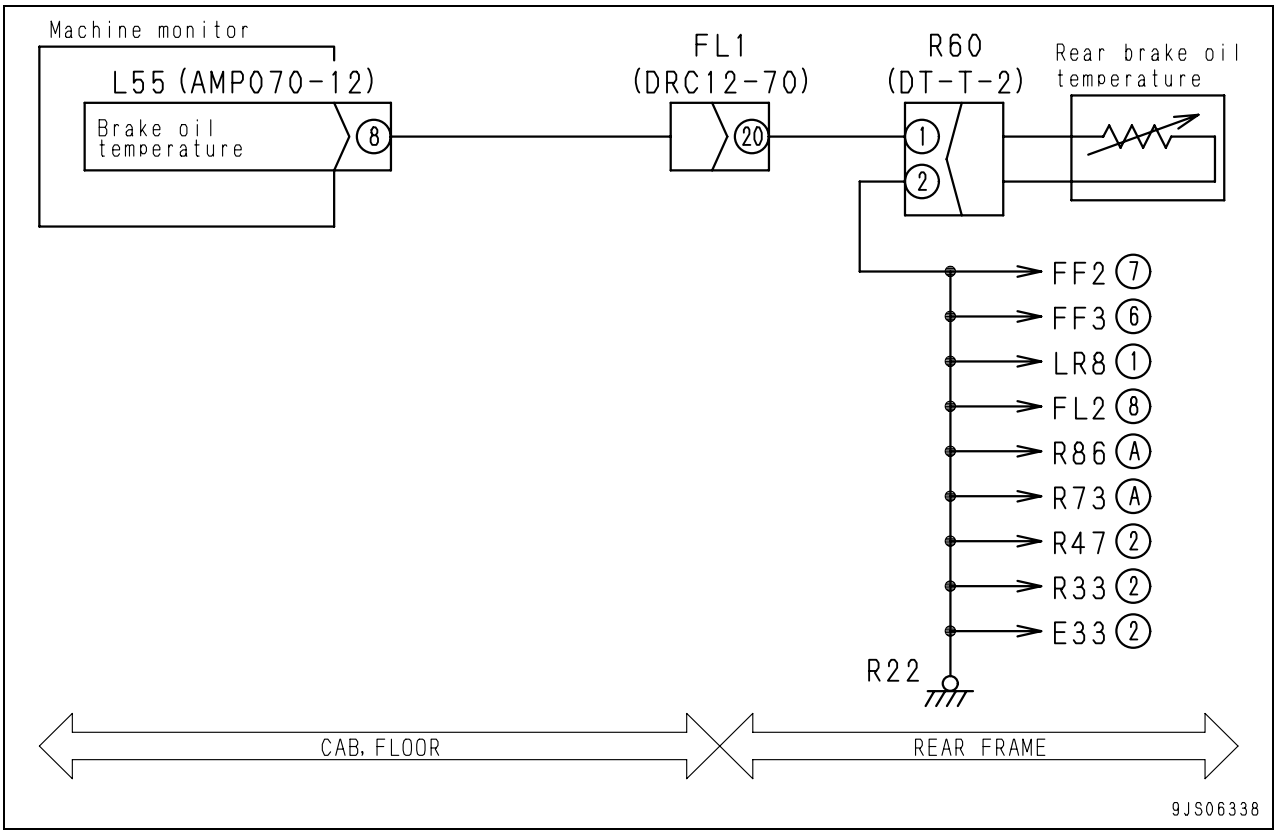
Failure code [DGR2KA] (Rear brake oil temperature sensor: Disconnected)

Action code	Failure code	Trouble	Rear brake oil temperature sensor: Disconnected (Machine monitor system)
E01	**DGR2KA**		
Contents of trouble	• Disconnection in the rear brake oil temperature sensor signal system		
Action of controller	• If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	—		
Related information	• The input state (oil temperature) from the rear brake oil temperature sensor can be checked with the monitoring function (Code: 30202, R BRAKE OIL). • The input state (voltage) from the rear brake oil temperature sensor can be checked with the monitoring function (Code: 30205, R BRAKE OIL). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective rear brake oil temperature sensor (Internal disconnection)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			R60 (male)	Rear brake oil temperature	Resistance	
			Between (1) and (2)	25°C (Normal temperature)	35 – 50 kΩ	
				100°C	3.1 – 4.5 kΩ	
	2	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L55 (female) (8) – R60 (female) (1)		Resistance	Max. 1 Ω
			Wiring harness between R60 (female) (2) – chassis ground		Resistance	Max. 1 Ω
	3	Defective machine monitor	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L55 (female)	Rear brake oil temperature	Resistance	
			Between (8) and chassis ground	25°C (Normal temperature)	35 – 50 kΩ	
				100°C	3.1 – 4.5 kΩ	

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Circuit diagram related to rear brake oil temperature sensor



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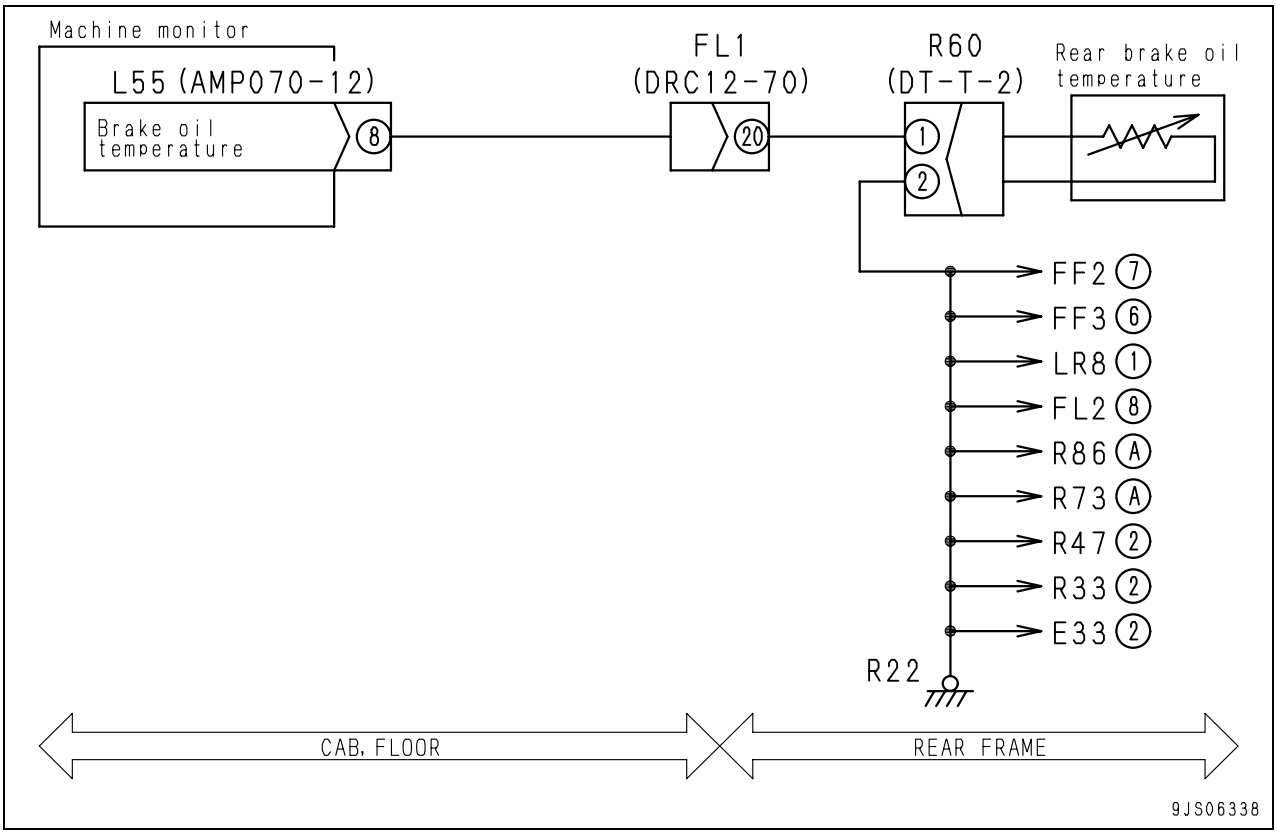
Failure code [DGR2KX] (Rear brake oil temperature sensor: Out of input signal range)

Action code	Failure code	Trouble	Rear brake oil temperature sensor: Out of input signal range (Machine monitor system)
E01	**DGR2KX**		
Contents of trouble	• Due to grounding fault in the rear brake oil temperature sensor signal system, the signal level is lower than normal range (Rear brake oil temperature sensor signal voltage: Max. 0.97 V (Min. 150°C))		
Action of controller	• If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	—		
Related information	• The input state (oil temperature) from the rear brake oil temperature sensor can be checked with the monitoring function (Code: 30202, R BRAKE OIL). • The input state (voltage) from the rear brake oil temperature sensor can be checked with the monitoring function (Code: 30205, R BRAKE OIL). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective rear brake oil temperature sensor (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			R60 (male)	Rear brake oil temperature	Resistance	
			Between (1) and (2)	25°C (Normal temperature)	35 – 50 kΩ	
				100°C	3.1 – 4.5 kΩ	
	2	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L55 (female) (8) – R60 (female) (1) and chassis ground		Resistance	Min. 1 MΩ
	3	Defective machine monitor	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L55 (female)	Rear brake oil temperature	Resistance	
			Between (8) and chassis ground	25°C (Normal temperature)	35 – 50 kΩ	
				100°C	3.1 – 4.5 kΩ	

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Circuit diagram related to rear brake oil temperature sensor



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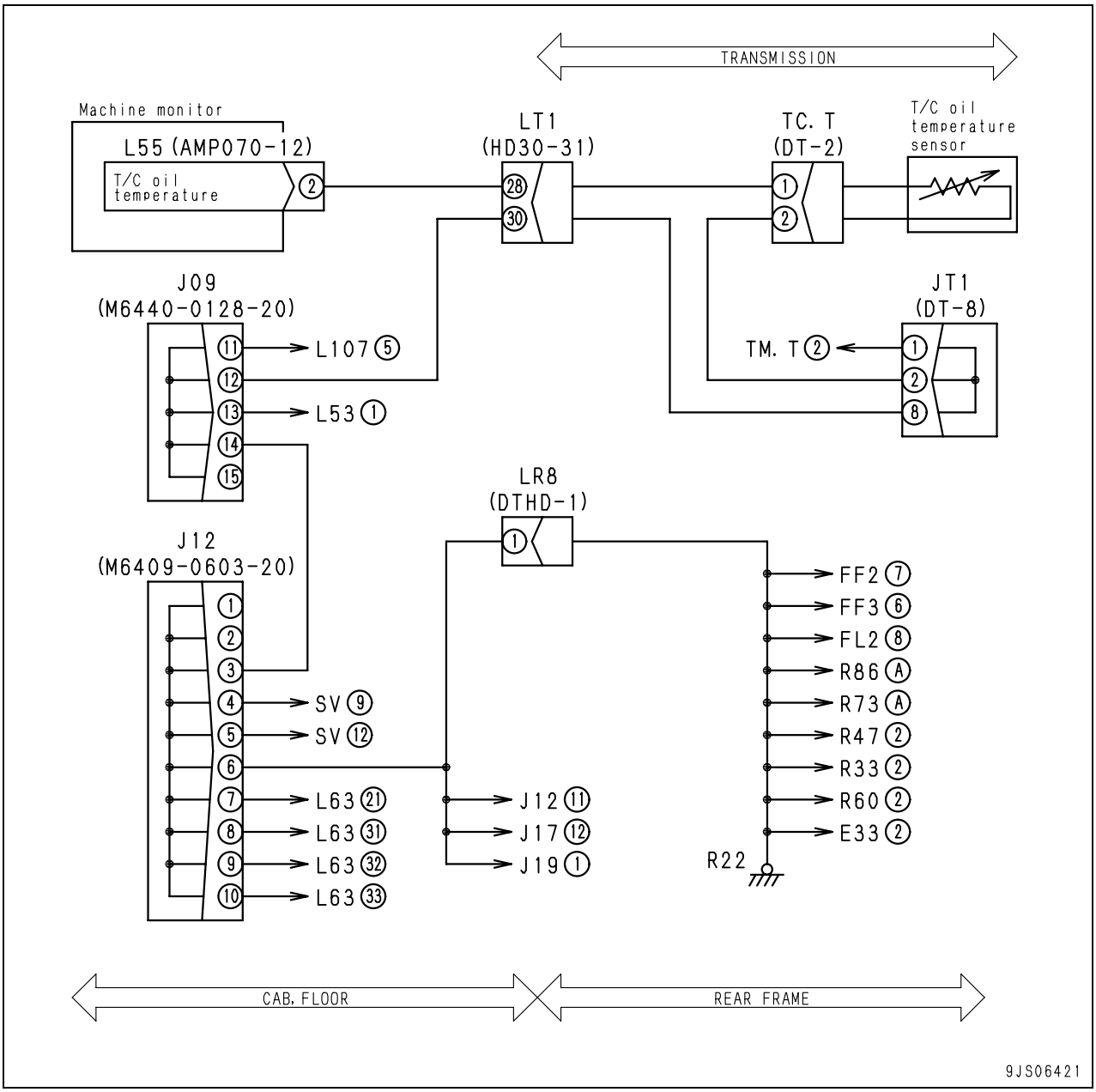
Failure code [DGT1KX] (Torque converter oil temperature sensor: Out of input signal range)

Action code	Failure code	Trouble	Torque converter oil temperature sensor: Out of input signal range (Machine monitor system)
E01	**DGT1KX**		
Contents of trouble	• Due to grounding fault in the torque converter oil temperature sensor signal system, the signal level is lower than normal range (Transmission oil temperature signal voltage: Max. 0.97 V (Min. 150°C))		
Action of controller	• If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• The torque converter oil temperature gauge reads MAX position		
Related information	• The input state (oil temperature) from the torque converter oil temperature sensor can be checked with the monitoring function (Code: 40100, TC OIL TEMP). • The input state (voltage) from the torque converter oil temperature sensor can be checked with the monitoring function (Code: 40101, TC OIL TEMP). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective torque converter oil temperature sensor (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			TC.T (male)	Torque converter oil temperature	Resistance	
			Between (1) and (2)	25°C (Normal temperature)	35 – 50 kΩ	
				100°C	3.1 – 4.5 kΩ	
	2	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L55 (female) (2) – TC.T (female) (1) and chassis ground		Resistance	Max. 1 Ω
	3	Defective machine monitor	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L55 (female)	Torque converter oil temperature	Resistance	
			Between (2) and chassis ground	25°C (Normal temperature)	35 – 50 kΩ	
				100°C	3.1 – 4.5 kΩ	

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Circuit diagram related to torque converter oil temperature sensor



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WA430-6 Wheel loader

Form No. SEN01743-03

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WHEEL LOADER

WA430-6

Machine model	Serial number
WA430-6	65001 and up

40 Troubleshooting

Troubleshooting by failure code (Display of code), Part 7

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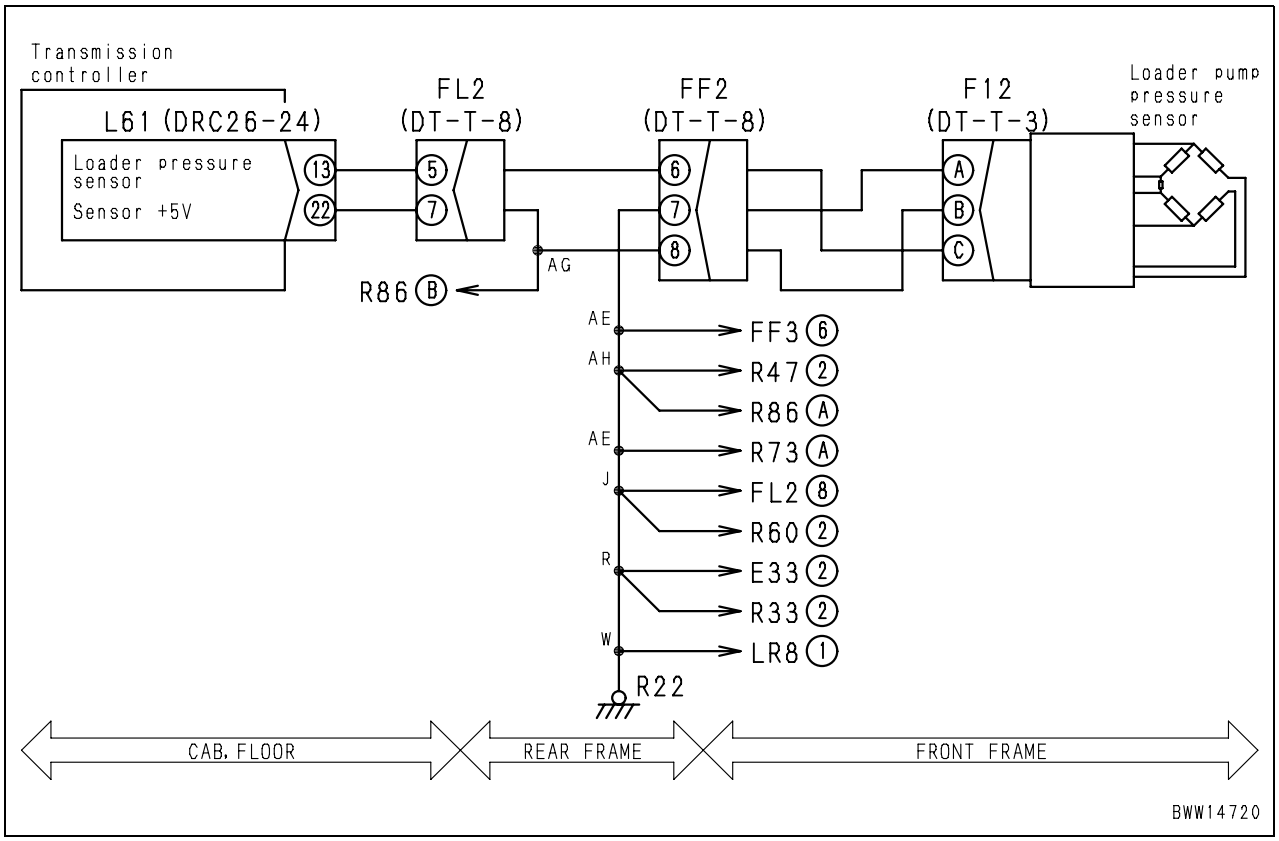
Failure code [DH21KA] (Loader pump pressure sensor: Disconnection)

Action code	Failure code	Trouble	Loader pump pressure sensor: Disconnection (Transmission controller system)
E01	**DH21KA**		
Contents of trouble	• Loader pump pressure signal voltage is lower than normal range because of disconnection or ground fault in loader pump pressure sensor system. (Work equipment pump pressure sensor signal voltage: Max. 0.3 V)		
Action of controller	• Lets loader pump pressure to be 0 MPa {0 kg/cm^2} and continues operation. • If cause of failure disappears, system resets itself.		
Problem that appears on machine	• When oil is relieved, cut-off operation is not turned ON.		
Related information	• Input state (Oil pressure) from loader pump pressure sensor can be checked with monitoring function (Code: 95200, PUMP PRESS). • Input state (Voltage) from loader pump pressure sensor can be checked with monitoring function (Code: 95201, PUMP PRESS). • Method of reproducing failure code: Start engine + Tilt bucket to relieve oil).		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective loader pump pressure sensor (Internal disconnection or short circuit)	★ Prepare with starting switch OFF, then turn starting switch START and carry out troubleshooting.			
			F12	Loader pump pressure	Voltage	
			Between (B) and (A)	Always	4.75 – 5.25 V	
			Between (C) and (A)	Always	0.50 – 4.5 V	
				When in neutral	0.5 – 0.9 V	
				When bucket is tilted to relieve oil	3.06 – 3.46 V	
			Sensor voltage is measured with wiring harness connected. Accordingly, if voltage is abnormal, check wiring harness and controller, too, for another cause of trouble, and then judge.			
	2	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L61 (female) (13) – F12 (female) (C)		Resistance	Max. 1 Ω
	3	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L61 (female) (13) – F12 (female) (C) and chassis ground		Resistance	Min. 1 MΩ
			Wiring harness between L61 (female) (22) – F12 (female) (B) and chassis ground		Resistance	Min. 1 MΩ
	4	Defective transmission controller	★ Prepare with starting switch OFF, then start engine, tilt bucket, and carry out troubleshooting.			
			L61	Loader pump pressure	Voltage	
			Between (13) and chassis ground	Always	0.50 – 4.5 V	
				When in neutral	0.5 – 0.9 V	
				When bucket is tilted to relieve oil	3.06 – 3.46 V	

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Related circuit diagram



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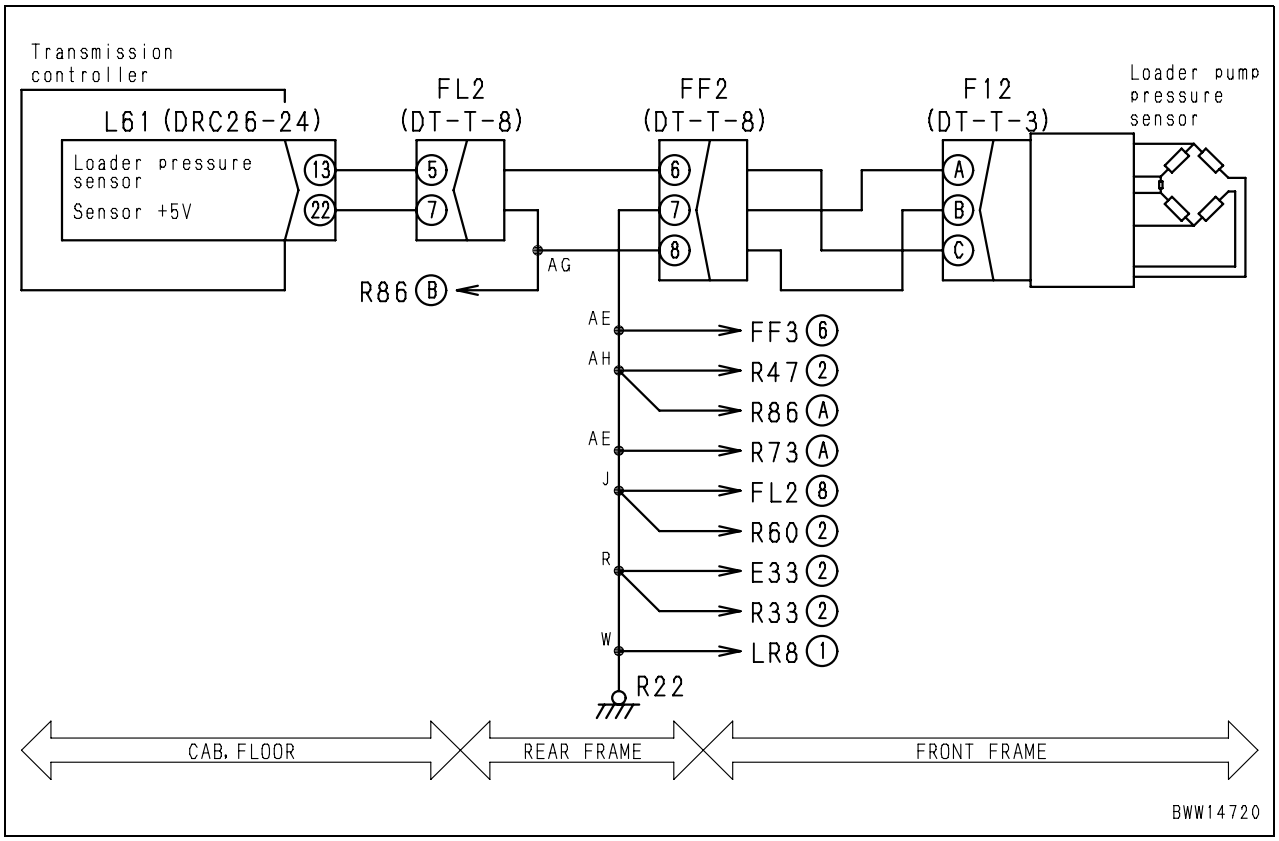
Failure code [DH21KB] (Loader pump pressure sensor: Power supply line short)

Action code	Failure code	Trouble	Loader pump pressure sensor: Power supply line short (Transmission controller system)
E01	**DH21KB**		
Contents of trouble	• Loader pump pressure signal is higher than normal range because of hot short in loader pump pressure sensor system. (Loader pump pressure sensor signal voltage: Min. 4.7 V)		
Action of controller	• Lets loader pump pressure to be 0 MPa {0 kg/cm^2} and continues operation. • If cause of failure disappears, system resets itself.		
Problem that appears on machine	• When oil is relieved, cut-off operation is not turned ON.		
Related information	• Input state (Oil pressure) from loader pump pressure sensor can be checked with monitoring function (Code: 95200, PUMP PRESS). • Input state (Voltage) from loader pump pressure sensor can be checked with monitoring function (Code: 95201, PUMP PRESS). • Method of reproducing failure code: Start engine + Tilt bucket to relieve oil).		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective loader pump pressure sensor (Internal disconnection or short circuit)	★ Prepare with starting switch OFF, then turn starting switch START and carry out troubleshooting.			
			F12	Loader pump pressure	Voltage	
			Between (B) and (A)	Always	4.75 – 5.25 V	
			Between (C) and (A)	Always	0.50 – 4.5 V	
				When in neutral	0.5 – 0.9 V	
				When bucket is tilted to relieve oil	3.06 – 3.46 V	
			Sensor voltage is measured with wiring harness connected. Accordingly, if voltage is abnormal, check wiring harness and controller, too, for another cause of trouble, and then judge.			
	2	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L61 (female) (13) – F12 (female) (C) and chassis ground		Resistance	Min. 1 MΩ
	3	Defective transmission controller	★ Prepare with starting switch OFF, then start engine, tilt bucket, and carry out troubleshooting.			
			L61	Loader pump pressure	Voltage	
			Between (13) and chassis ground	Always	0.50 – 4.5 V	
				When in neutral	0.5 – 0.9 V	
				When bucket is tilted to relieve oil	3.06 – 3.46 V	

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Related circuit diagram



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Failure code [DHPCKX] (Lift arm cylinder bottom pressure sensor: Out of input signal range)

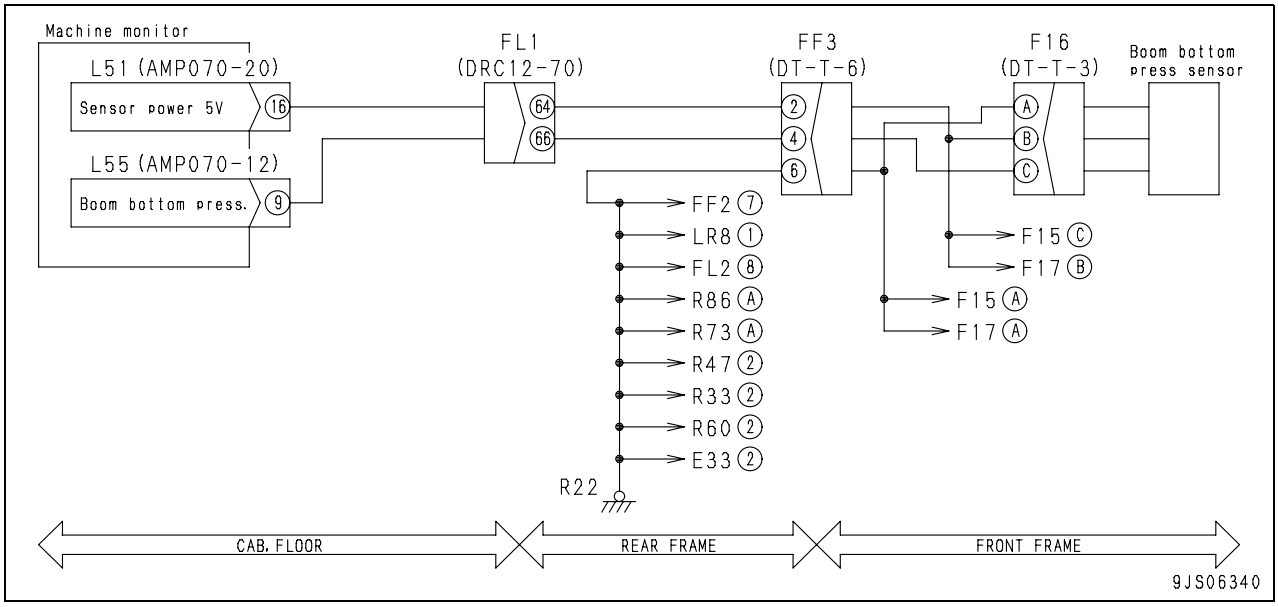
Action code	Failure code	Trouble	Lift arm cylinder bottom pressure sensor: Out of input signal range (Machine monitor system)
E01	**DHPCKX**		
Contents of trouble	• Due to disconnection or grounding fault in the lift arm cylinder bottom pressure sensor signal, the lift arm cylinder bottom pressure sensor voltage is lower than normal range (Lift arm bottom pressure sensor signal voltage: Below 0.3 V) • Due to hot short circuit in the lift arm cylinder bottom pressure sensor signal, the lift arm cylinder bottom pressure sensor voltage is higher than normal range (Lift arm cylinder bottom pressure sensor signal voltage: Min. 4.7 V)		
Action of controller	• If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• Machine monitor does not display load.		
Related information	• The input state (oil pressure) from the lift arm cylinder bottom pressure sensor can be checked with the monitoring function (Code: 40400, BOOM BTM PRESS). • The input state (voltage) from the lift arm cylinder bottom pressure sensor can be checked with the monitoring function (Code: 40402, BOOM BTM PRESS). • Only for load meter (if equipped) • Method of reproducing failure code: Start engine and perform lift arm lever operation		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective lift arm cylinder bottom pressure sensor (Internal disconnection or short circuit)	Check that the failure code does not display when the lift arm cylinder bottom pressure sensor is replaced.			
			★ Prepare with starting switch OFF, then start engine, raise the lift arm and carry out troubleshooting.			
			F16	Lift arm	Voltage	
			Between (B) and (A)	Constant	4.85 – 5.15 V	
			Between (C) and (A)	Constant	0.50 – 4.50 V	
				Neutral	0.50 – 0.90 V	
				Lift arm bottom relief	3.02 – 3.42 V	
	2	Disconnection in wiring harness (Disconnection in wiring harness or defective contact)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L51 (female) (16) – F16 (female) (B)		Resistance	Max. 1 Ω
			Wiring harness between L55 (female) (9) – F16 (female) (C)		Resistance	Max. 1 Ω
			Wiring harness between F16 (female) (A) – chassis ground		Resistance	Max. 1 Ω
	3	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L51 (female) (16) – F16 (female) (B), – circuit branch end and chassis ground		Resistance	Min. 1 MΩ
			Wiring harness between L55 (female) (9) – F16 (female) (C), – circuit branch end and chassis ground		Resistance	Min. 1 MΩ

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<table>
<tr><td rowspan="6">Possible causes and standard value in normal state</td><td colspan="2">Causes</td><td colspan="4">Standard value in normal state/Remarks on troubleshooting</td></tr>
<tr><td rowspan="3">4</td><td rowspan="3">Hot short in wiring harness (Contact with 24V circuit)</td><td colspan="4">★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.</td></tr>
<tr><td colspan="2">Wiring harness between L51 (female) (16) – F16 (female) (B), – circuit branch end and chassis ground</td><td>Voltage</td><td>Max. 1 V</td></tr>
<tr><td colspan="2">Wiring harness between L55 (female) (9) – F16 (female) (C), – circuit branch end and chassis ground</td><td>Voltage</td><td>Max. 1 V</td></tr>
<tr><td rowspan="3">5</td><td rowspan="3">Defective machine monitor</td><td colspan="4">★ Prepare with starting switch OFF, then start engine, raise the lift arm and carry out troubleshooting.</td></tr>
<tr><td>L51, L55</td><td>Lift arm</td><td colspan="2">Voltage</td></tr>
<tr><td>Between L51 (16) and chassis ground</td><td>Constant</td><td colspan="2">4.85 – 5.15 V</td></tr>
<tr><td rowspan="3">Between L55 (9) and chassis ground</td><td>Constant</td><td colspan="2">0.50 – 4.50 V</td></tr>
<tr><td>Neutral</td><td colspan="2">0.50 – 0.90 V</td></tr>
<tr><td>Lift arm bottom relief</td><td colspan="2">3.02 – 3.42 V</td></tr>
</table>

Circuit diagram related to lift arm cylinder bottom pressure sensor



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Failure code [DHPDKX] (Lift arm cylinder head pressure sensor: Out of input signal range)

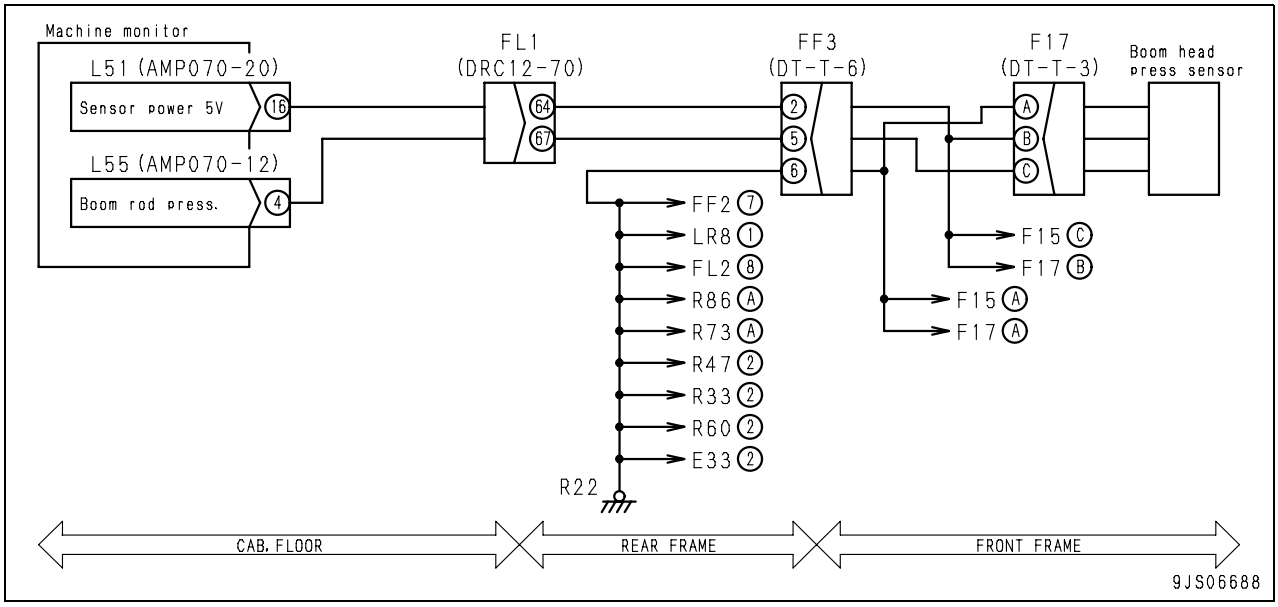
Action code	Failure code	Trouble	Lift arm cylinder head pressure sensor: Out of input signal range (Machine monitor system)
E01	**DHPDKX**		
Contents of trouble	• Due to disconnection or grounding fault in the lift arm cylinder head pressure sensor signal, the lift arm cylinder head pressure sensor voltage is lower than normal range (Lift arm cylinder head pressure sensor signal voltage: Below 0.3 V) • Due to hot short circuit in the lift arm cylinder head pressure sensor signal, the lift arm cylinder head pressure sensor voltage is higher than normal range (Lift arm cylinder head pressure sensor signal voltage: Min. 4.7 V)		
Action of controller	• If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• Machine monitor does not display load.		
Related information	• The input state (oil pressure) from the lift arm cylinder head pressure sensor can be checked with the monitoring function (Code: 40500, BOOM HEAD PRESS). • The input state (voltage) from the lift arm cylinder head pressure sensor can be checked with the monitoring function (Code: 40501, BOOM HEAD PRESS). • Only for load meter (if equipped) • Method of reproducing failure code: Start engine and perform lift arm lever operation		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective lift arm cylinder head pressure sensor (Internal disconnection or short circuit)	Check that the failure code does not display when the lift arm cylinder bottom pressure sensor is replaced.			
			★ Prepare with starting switch OFF, then start engine, lower the lift arm and carry out troubleshooting.			
			F17	Lift arm	Voltage	
			Between (B) and (A)	Constant	4.85 – 5.15 V	
			Between (C) and (A)	Constant	0.50 – 4.50 V	
				Neutral	0.50 – 0.90 V	
				Lift arm head relief	3.02 – 3.42 V	
	2	Disconnection in wiring harness (Disconnection in wiring harness or defective contact)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L51 (female) (16) – F17 (female) (B)		Resistance	Max. 1 Ω
			Wiring harness between L55 (female) (4) – F17 (female) (C)		Resistance	Max. 1 Ω
			Wiring harness between F17 (female) (A) – chassis ground		Resistance	Max. 1 Ω
	3	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L51 (female) (16) – F17 (female) (B), – circuit branch end and chassis ground		Resistance	Min. 1 MΩ
			Wiring harness between L55 (female) (4) – F17 (female) (C), – circuit branch end and chassis ground		Resistance	Min. 1 MΩ

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<table>
<tr><td rowspan="6">Possible causes and standard value in normal state</td><td colspan="2">Causes</td><td colspan="4">Standard value in normal state/Remarks on troubleshooting</td></tr>
<tr><td rowspan="2">4</td><td rowspan="2">Hot short in wiring harness (Contact with 24V circuit)</td><td colspan="4">★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.</td></tr>
<tr><td colspan="2">Wiring harness between L51 (female) (16) – F17 (female) (B), – circuit branch end and chassis ground</td><td>Voltage</td><td>Max. 1 V</td></tr>
<tr><td colspan="2">Wiring harness between L55 (female) (4) – F17 (female) (C), – circuit branch end and chassis ground</td><td>Voltage</td><td>Max. 1 V</td></tr>
<tr><td rowspan="3">5</td><td rowspan="3">Defective machine monitor</td><td colspan="4">★ Prepare with starting switch OFF, then start engine, raise the lift arm and carry out troubleshooting.</td></tr>
<tr><td>L51, L55</td><td>Lift arm</td><td colspan="2">Voltage</td></tr>
<tr><td>Between L51 (16) and chassis ground</td><td>Constant</td><td colspan="2">4.85 – 5.15 V</td></tr>
<tr><td rowspan="3">Between L55 (4) and chassis ground</td><td>Constant</td><td colspan="2">0.50 – 4.50 V</td></tr>
<tr><td>Neutral</td><td colspan="2">0.50 – 0.90 V</td></tr>
<tr><td>Lift arm head relief</td><td colspan="2">3.02 – 3.42 V</td></tr>
</table>

Circuit diagram related to lift arm cylinder head pressure sensor



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Failure code [DHT1KX] (Transmission cut-off pressure sensor: Out of input signal range)

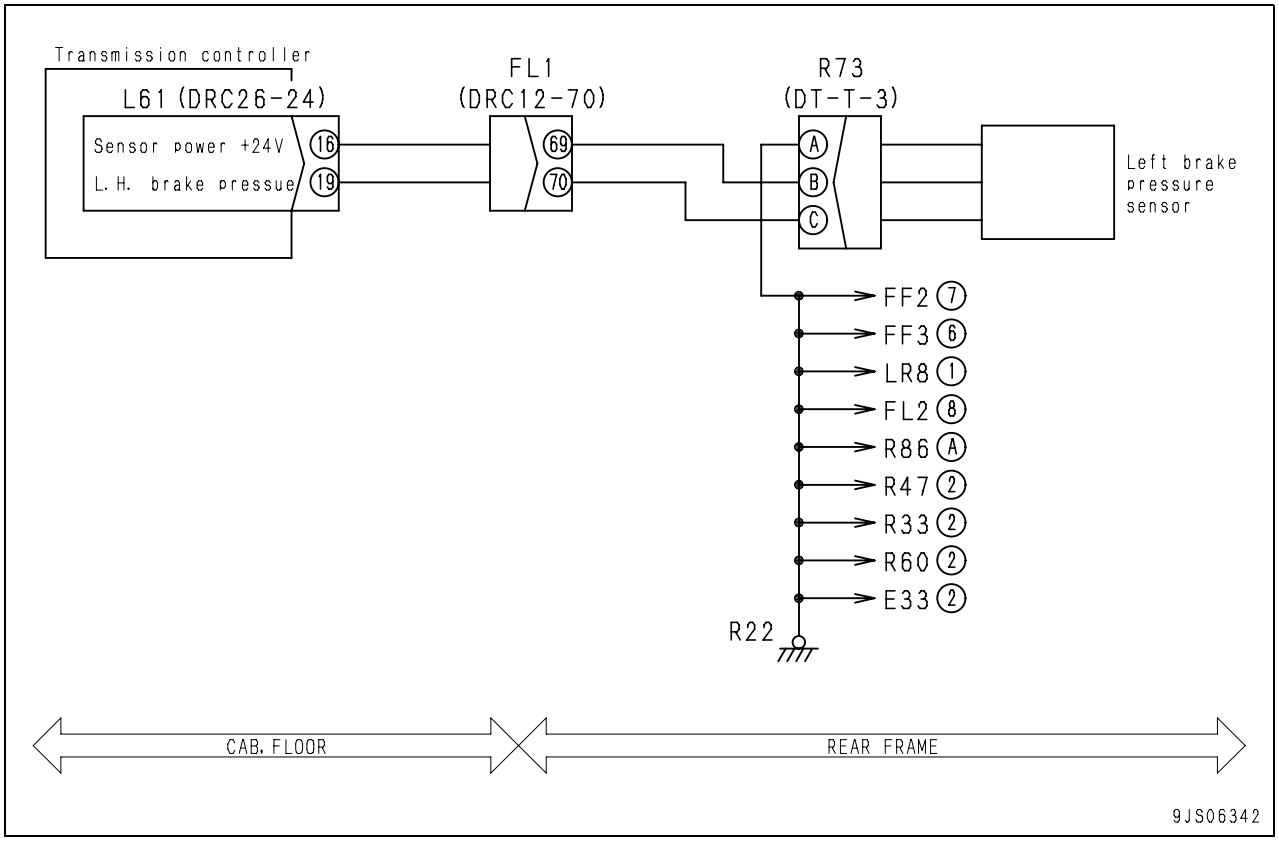
Action code	Failure code	Trouble	Transmission cut-off pressure sensor: Out of input signal range (Transmission controller system)
E01	**DHT1KX**		
Contents of trouble	• Due to grounding fault in transmission cut-off (left brake) pressure sensor signal system, the signal level is lower than normal range.		
Action of controller	• Turns off the transmission cut-off function • Does not allow changing the transmission cut-off set • Even if cause of failure disappears, system does not reset itself until FNR (directional) lever, joystick steering FNR (directional) switch or right FNR (directional) switch is set to N (Neutral). Or the transmission cut-off switch must be turned off.		
Problem that appears on machine	• The transmission cut-off indicator goes off. • The transmission cut-off does not work.		
Related information	• Input voltage of the transmission cut-off pressure sensor is max. 0.3 V. • The input state (oil pressure) from the transmission cut-off pressure sensor can be checked with the monitoring function (Code: 41201, T/M CUT OFF P). • The input state (voltage) from the transmission cut-off pressure sensor can be checked with the monitoring function (Code: 41202, T/M CUT OFF P). • Method of reproducing failure code: Turn the starting switch and the transmission cut-off switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective transmission cut-off pressure sensor (Internal short circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting. • Transmission cut-off switch is ON.			
			R73	Brake	Voltage	
			Between (C) and (A)	When brake is released	0.9 – 1.1 V	
				When the left brake pedal is pressed down	1.1 – 5.1 V	
				When the right brake pedal is pressed down	1.1 – 5.1 V	
				Other than above	0.9 – 5.1 V	
	2	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L61 (female) (19) – R73 (female) (C) and chassis ground		Resistance	Min. 1 MΩ
	3	Defective transmission controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L61	Brake	Voltage	
			Between (19) and chassis ground	When brake is released	0.9 – 1.1 V	
				When the left brake pedal is pressed down	1.1 – 5.1 V	
				When the right brake pedal is pressed down	1.1 – 5.1 V	
				Other than above	0.9 – 5.1 V	

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Possible causes and standard value in normal state	Causes		Standard value in normal state/Remarks on troubleshooting		
	4	Disconnection of harness (Disconnection of harness, defective contact or improper mating of connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Between L61 (female) (16) and R73 (female) (B)	Resis-tance	Max. 1 Ω
			Between L61 (female) (19) and R73 (female) (C)	Resis-tance	Max. 1 Ω
			Between R73 (female) (A) and R22	Resis-tance	Max. 1 Ω

Circuit diagram related to transmission cut-off pressure sensor



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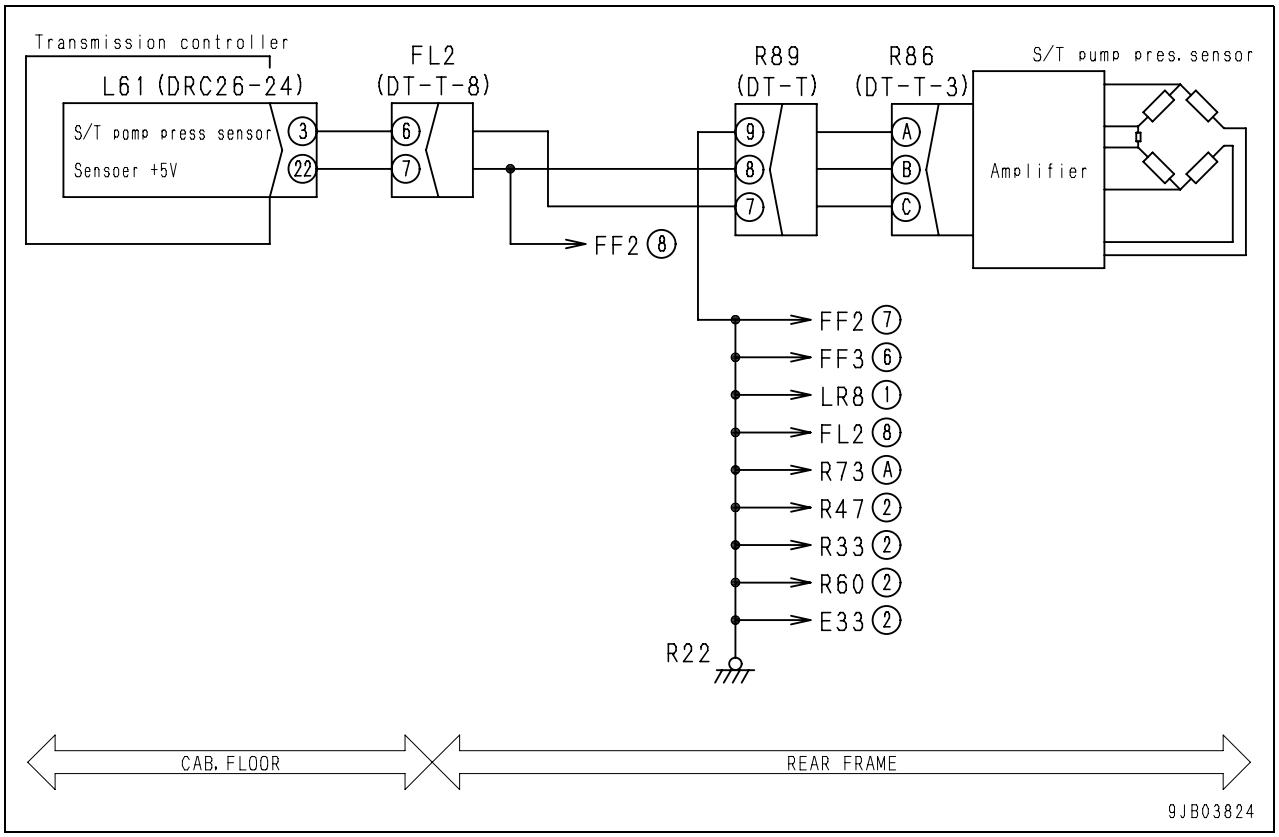
Failure code [DHT8KA] (Steering pump pressure sensor: Disconnection)

Action code	Failure code	Trouble	Steering pump pressure sensor: Disconnection (Transmission controller system)
E01	**DHT8KA**		
Contents of trouble	• Due to disconnection or ground fault in steering pump pressure sensor system, the signal level is lower than normal range. (Steering pump pressure sensor signal voltage: Max. 0.3 V)		
Action of controller	• Judges the steering pump pressure is absent • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• Engine does not pickup smoothly at low speed.		
Related information	• The input state (oil pressure) from the steering pump pressure sensor can be checked with the monitoring function (Code: 95300, S/T OIL PRESS). • The input state (voltage) from the steering pump pressure sensor can be checked with the monitoring function (Code: 95301, S/T OIL PRESS). • Method of reproducing failure code: Start engine.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective steering pump pressure sensor (Internal disconnection or short circuit)	★ Prepare with starting switch OFF, then start engine and carry out troubleshooting.			
			R86	Steering pump pressure	Voltage	
			Between (B) and (A)	Constant	4.75 – 5.25 V	
			Between (C) and (A)	Constant	0.50 – 4.50 V	
				When steering is in neutral	0.50 – 0.90 V	
				When steering is relieved	3.02 – 3.42 V	
			Sensor voltage is measured with wiring harness connected. Accordingly, if voltage is abnormal, check wiring harness and controller, too, for another cause of trouble, and then judge.			
	2	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L61 (female) (3) – R86 (female) (C)		Resistance	Max. 1 Ω
	3	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L61 (female) (3) – R86 (female) (C) and chassis ground		Resistance	Min. 1 MΩ
	4	Defective transmission controller	★ Prepare with starting switch OFF, then start engine and carry out troubleshooting.			
			L61	Steering pump pressure	Voltage	
			Between (3) and chassis ground	Constant	0.50 – 4.50 V	
				When steering is in neutral	0.50 – 0.90 V	
				When steering is relieved	3.02 – 3.42 V	

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Circuit diagram related to steering pump pressure sensor



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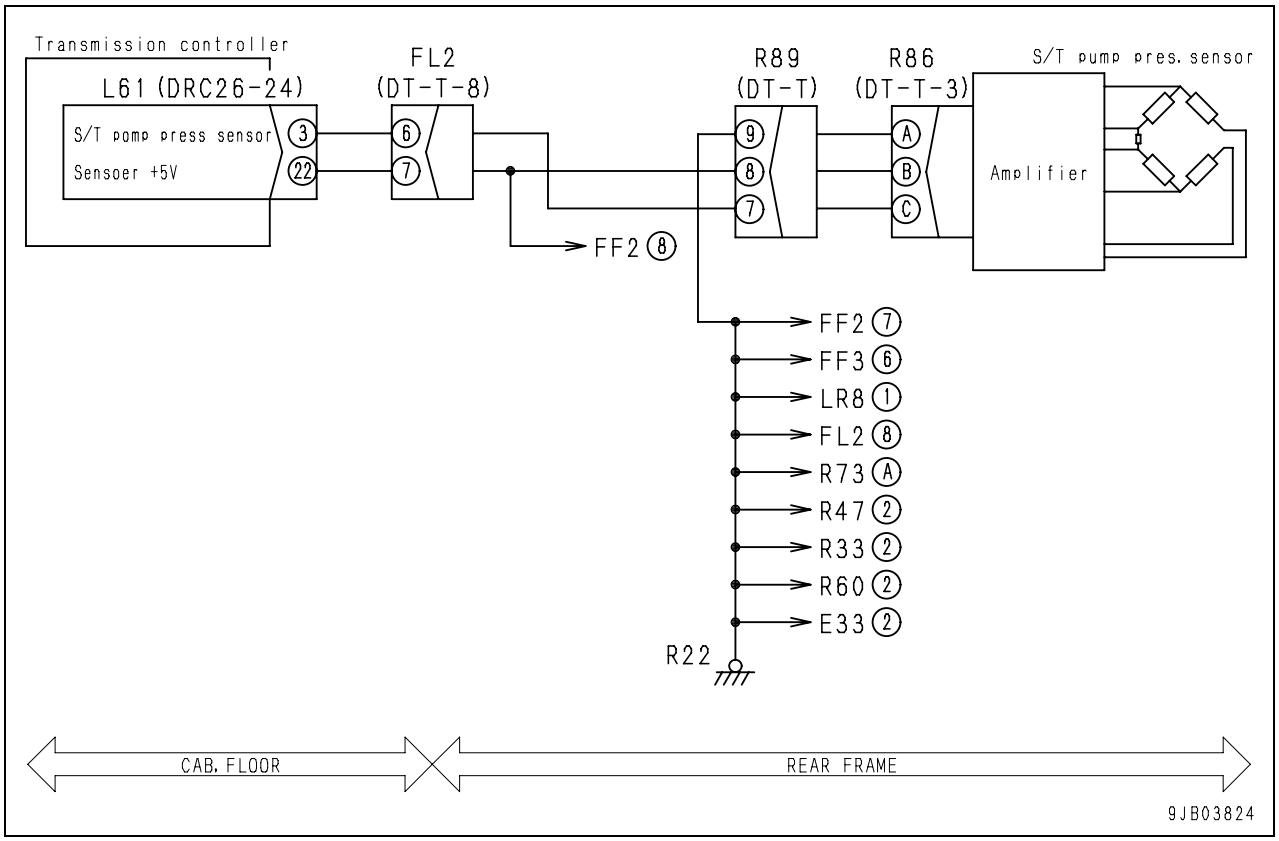
Failure code [DHT8KB] (Steering pump pressure sensor: Short circuit)

Action code	Failure code	Trouble	Steering pump pressure sensor: Short circuit (Transmission controller system)
E01	**DHT8KB**		
Contents of trouble	• Due to hot short circuit in the steering pump pressure sensor signal system, the signal level is higher than normal range. (Steering pump pressure sensor signal voltage: Min. 4.7 V)		
Action of controller	• Judges the steering pump pressure is absent. • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• Engine does not pickup smoothly at low speed.		
Related information	• The input state (oil pressure) from the steering pump pressure sensor can be checked with the monitoring function (Code: 95300, S/T OIL PRESS). • The input state (voltage) from the steering pump pressure sensor can be checked with the monitoring function (Code: 95301, S/T OIL PRESS). • Method of reproducing failure code: Start engine.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective steering pump oil pressure sensor (Internal disconnection or short circuit)	★ Prepare with starting switch OFF, then start engine and carry out troubleshooting.			
			R86	Steering pump pressure	Voltage	
			Between (B) and (A)	Constant	4.75 – 5.25 V	
			Between (C) and (A)	Constant	0.50 – 4.50 V	
				When steering is in neutral	0.50 – 0.90 V	
				When steering is relieved	3.02 – 3.42 V	
			Sensor voltage is measured with wiring harness connected. Accordingly, if voltage is abnormal, check wiring harness and controller, too, for another cause of trouble, and then judge.			
	2	Hot short in wiring harness (Contact with 24 V circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L61 (female) (3) – R86 (female) (C) and chassis ground		Resistance	Min. 1 MΩ
	3	Defective transmission controller	★ Prepare with starting switch OFF, then start engine and carry out troubleshooting.			
			L61	Steering pump pressure	Voltage	
			Between (3) and chassis ground	Constant	0.50 – 4.50 V	
				When steering is in neutral	0.50 – 0.90 V	
				When steering is relieved	3.02 – 3.42 V	

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Circuit diagram related to steering pump pressure sensor



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Failure code [DK59KA] (Lift arm EPC lever potentiometer (Main): Disconnection)

Action code	Failure code	Trouble	Lift arm EPC lever potentiometer (Main): Disconnection (Work equipment controller system)
E03	**DK59KA**		
Contents of trouble	• Due to disconnection or grounding fault in the lift arm EPC lever potentiometer (Main) system, the signal voltage is lower than normal range (Lift arm EPC lever potentiometer (Main) signal voltage: Max. 0.3 V)		
Action of controller	• If the lift arm EPC lever potentiometer (Sub) is normal, the Sub potentiometer is in control. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until lift arm EPC lever is set to N (Neutral).		
Problem that appears on machine	• If disconnection occurs, lift arm lowers (floats) but returns to normal operation in 0.5 seconds.		
Related information	• The input state (voltage) from the lift arm EPC lever potentiometer (Main) can be checked with the monitoring function (Code: 42000, BOOM POT1). • The input state (voltage) from the lift arm EPC lever potentiometer (Sub) can be checked with the monitoring function (Code: 42001, BOOM POT2). • Method of reproducing failure code: Turn the starting switch ON and operate lift arm lever		

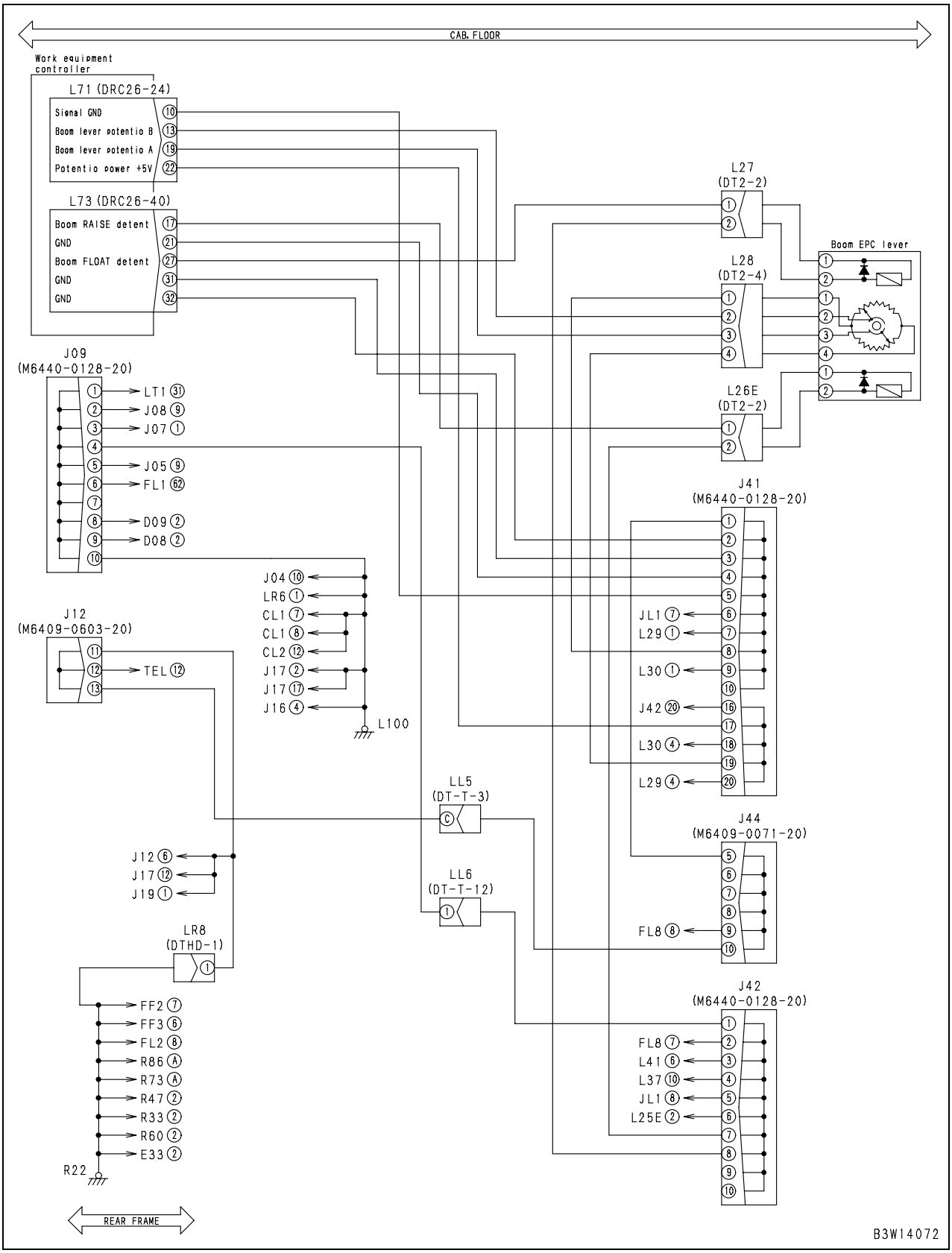
<table>
<tr><td rowspan="16">Possible causes and standard value in normal state</td><td colspan="2">Causes</td><td colspan="4">Standard value in normal state/Remarks on troubleshooting</td></tr>
<tr><td rowspan="9">1</td><td rowspan="9">Defective lift arm EPC lever potentiometer
(Internal disconnection or short circuit)</td><td colspan="4">★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.</td></tr>
<tr><td colspan="2">L28 (male)</td><td colspan="2">Resistance</td></tr>
<tr><td colspan="2">Between (1) and (4)</td><td colspan="2">3.2 ± 0.64 kΩ</td></tr>
<tr><td colspan="2">Between (1), (2), (3), (4) and chassis ground</td><td colspan="2">Min. 1 MΩ</td></tr>
<tr><td colspan="4">★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.
• Work equipment lock lever: Free</td></tr>
<tr><td>L28</td><td>Lift arm EPC lever</td><td colspan="2">Voltage</td></tr>
<tr><td>Between (4) and (1)</td><td>Constant</td><td colspan="2">4.85 – 5.15 V</td></tr>
<tr><td rowspan="4">Between (3) and (1)</td><td>Lever in neutral</td><td colspan="2">2.40 – 2.60 V</td></tr>
<tr><td>Raise operation (Before detent)</td><td colspan="2">3.69 – 4.09 V</td></tr>
<tr><td>Raise operation (Detent position)</td><td colspan="2">3.95 – 4.35 V</td></tr>
<tr><td>Lower operation (Before detent)</td><td colspan="2">0.91 – 1.31 V</td></tr>
<tr><td rowspan="6">2</td><td rowspan="6">Disconnection in wiring harness
(Disconnection in wiring harness or defective contact)</td><td colspan="4">★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.</td></tr>
<tr><td colspan="2">Wiring harness between L71 (female) (19) – L28 (female) (3)</td><td>Resistance</td><td>Max. 1 Ω</td></tr>
<tr><td colspan="2">Wiring harness between L71 (female) (22) – L28 (female) (4)</td><td>Resistance</td><td>Max. 1 Ω</td></tr>
<tr><td colspan="2">Wiring harness between L28 (female) (1) – chassis ground</td><td>Resistance</td><td>Max. 1 Ω</td></tr>
</table>

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<table>
<tr><td rowspan="7">Possible causes and standard value in normal state</td><td colspan="2">Causes</td><td colspan="5">Standard value in normal state/Remarks on troubleshooting</td></tr>
<tr><td rowspan="2">3</td><td rowspan="2">Grounding fault in wiring harness
(Contact with ground circuit)</td><td colspan="5">★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.</td></tr>
<tr><td colspan="3">Wiring harness between L71 (female) (19) – L28 (female) (3) and chassis ground</td><td>Resistance</td><td>Min. 1 MΩ</td></tr>
<tr><td colspan="3">Wiring harness between L71 (female) (22) – L28 (female) (4), – circuit branch end and chassis ground</td><td>Resistance</td><td>Min. 1 MΩ</td></tr>
<tr><td rowspan="6">4</td><td rowspan="6">Defective work equipment controller</td><td colspan="5">★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.
• Work equipment lock lever: Free</td></tr>
<tr><td>L71</td><td colspan="2">Lift arm EPC lever</td><td colspan="2">Voltage</td></tr>
<tr><td>Between (22) and (10)</td><td colspan="2">Constant</td><td colspan="2">4.85 – 5.15 V</td></tr>
<tr><td rowspan="4">Between (19) and (10)</td><td colspan="2">Lever at neutral</td><td colspan="2">2.40 – 2.60 V</td></tr>
<tr><td colspan="2">Raise operation (Before detent)</td><td colspan="2">3.69 – 4.09 V</td></tr>
<tr><td colspan="2">Raise operation (Detent position)</td><td colspan="2">3.95 – 4.35 V</td></tr>
<tr><td colspan="2">Lower operation (Before detent)</td><td colspan="2">0.91 – 1.31 V</td></tr>
<tr><td colspan="2">Float operation</td><td colspan="2">0.65 – 1.05 V</td></tr>
</table>

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Circuit diagram related to lift arm EPC lever potentiometer



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Failure code [DK59KY] (Lift arm EPC lever potentiometer (Main): Short circuit with power supply line)

Action code	Failure code	Trouble	Lift arm EPC lever potentiometer (Main): Short circuit with the power supply line (Work equipment controller system)
E03	**DK59KY**		
Contents of trouble	• Due to hot short circuit in the lift arm EPC lever potentiometer (Main) system, the signal voltage is higher than normal range (Lift arm EPC lever potentiometer (Main) signal voltage: Min. 4.7 V).		
Action of controller	• If the lift arm EPC lever potentiometer (Sub) is normal, the Sub potentiometer is in control. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until lift arm EPC lever is set to N (Neutral).		
Problem that appears on machine	—		
Related information	• The input state (voltage) from the lift arm EPC lever potentiometer (Main) can be checked with the monitoring function (Code: 42000, BOOM POT1). • The input state (voltage) from the lift arm EPC lever potentiometer (Sub) can be checked with the monitoring function (Code: 42001, BOOM POT2). • Method of reproducing failure code: Turn the starting switch ON and operate lift arm lever		

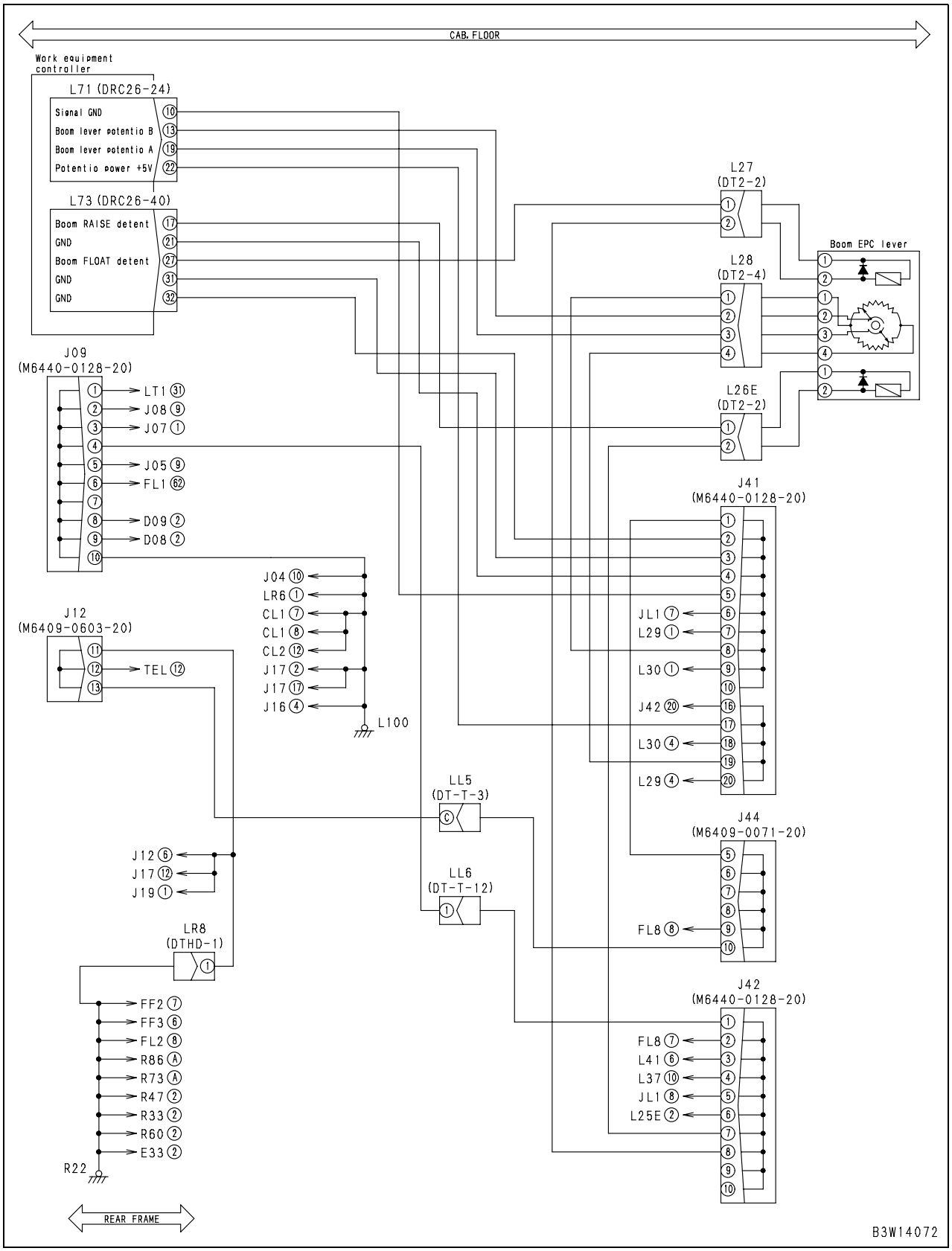
	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective lift arm EPC lever potentiometer (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L28 (male)	Resistance		
			Between (1) and (4)	3.2 ± 0.64 kΩ		
			Between (1), (2), (3), (4) and chassis ground	Min. 1 MΩ		
			★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting. • Work equipment lock lever: Free			
			L28	Lift arm EPC lever	Voltage	
			Between (4) and (1)	Constant	4.85 – 5.15 V	
			Between (3) and (1)	Lever at neutral	2.40 – 2.60 V	
				Raise operation (Before detent)	3.69 – 4.09 V	
				Raise operation (Detent position)	3.91 – 4.31 V	
				Lower operation (Before detent)	0.91 – 1.31 V	
				Float operation	0.69 – 1.09 V	
	2	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			Wiring harness between L71 (female) (19) – L28 (female) (3) and chassis ground		Voltage	Max. 1 V
			Wiring harness between L71 (female) (22) – L28 (female) (4), – circuit branch end and chassis ground		Voltage	Max. 1 V

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<table>
<tr><td rowspan="8">Possible causes and standard value in normal state</td><td colspan="2">Causes</td><td colspan="3">Standard value in normal state/Remarks on troubleshooting</td></tr>
<tr><td rowspan="7">3</td><td rowspan="7">Defective work equipment controller</td><td colspan="3">★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.
• Work equipment lock lever: Free</td></tr>
<tr><td>L71</td><td>Lift arm EPC lever</td><td>Voltage</td></tr>
<tr><td>Between (22) and (10)</td><td>Constant</td><td>4.85 – 5.15 V</td></tr>
<tr><td rowspan="5">Between (19) and (10)</td><td>Lever at neutral</td><td>2.40 – 2.60 V</td></tr>
<tr><td>Raise operation (Before detent)</td><td>3.69 – 4.09 V</td></tr>
<tr><td>Raise operation (Detent position)</td><td>3.91 – 4.31 V</td></tr>
<tr><td>Lower operation (Before detent)</td><td>0.91 – 1.31 V</td></tr>
<tr><td>Float operation</td><td>0.69 – 1.09 V</td></tr>
</table>

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Circuit diagram related to lift arm EPC lever potentiometer



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Failure code [DK59L8] (Lift arm EPC lever potentiometer (Main): Analog signals disagree)

Action code	Failure code	Trouble	Lift arm EPC lever potentiometer (Main): Analog signals disagree (Work equipment controller system)
E03	**DK59L8**		
Contents of trouble	• Lift arm EPC lever potentiometer (Main & Sub) input signals disagree with each other. (Lift arm EPC lever potentiometer signal voltage (sum of Main and Sub): Max. 4.7 V) or (Lift arm EPC lever potentiometer signal voltage (sum of Main and Sub): Min. 5.3 V)		
Action of controller	• Operates with either Main or Sub potentiometer, whichever detecting a position within neutrality ±5%, as the regular potentiometer. • Turns the output OFF if both Main and Sub potentiometers should fail to detect a position within neutrality ±5%. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until lift arm EPC lever is set to N (Neutral).		
Problem that appears on machine	• If either Main or Sub potentiometer is abnormal, machine operates normally after the lever is set to neutral. • If both Main and Sub potentiometers are abnormal, lift arm does not move.		
Related information	• The input state (voltage) from the lift arm EPC lever potentiometer (Main) can be checked with the monitoring function (Code: 42000, BOOM POT1). • The input state (voltage) from the lift arm EPC lever potentiometer (Sub) can be checked with the monitoring function (Code: 42001, BOOM POT2). • Method of reproducing failure code: Turn the starting switch ON and operate lift arm lever		

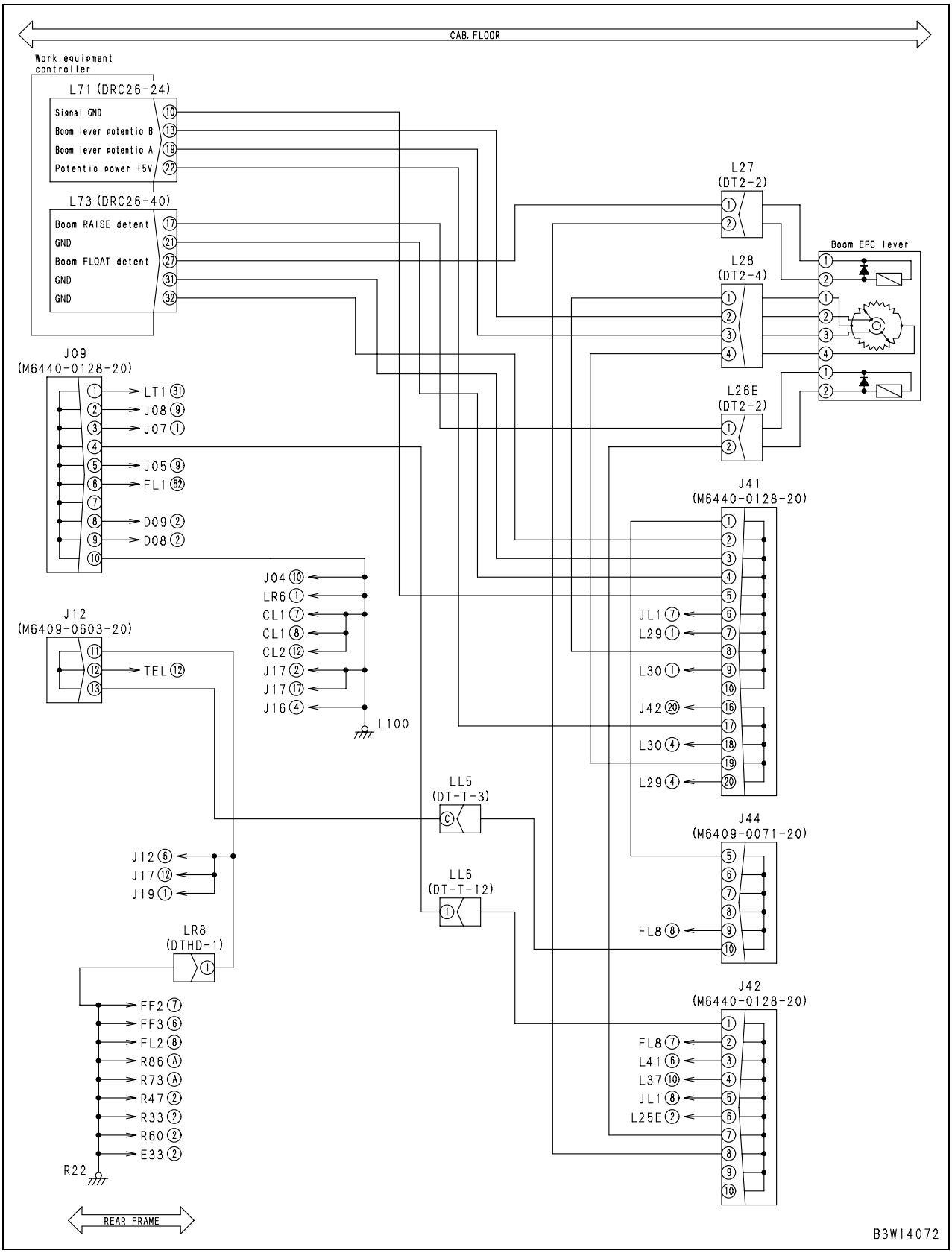
	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective lift arm EPC lever potentiometer (Internal disconnection or short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			L28 (male)	Resistance	
			Between (1) and (4)	3.2 ± 0.64 kΩ	
			Between (1), (2), (3), (4) and chassis ground	Min. 1 MΩ	
			★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting. • Work equipment lock lever: Free		
			L28	Lift arm EPC lever	Voltage
			Between (4) and (1)	Constant	4.85 – 5.15 V
			Between (3) and (1)	Lever at neutral	2.40 – 2.60 V
				Raise operation (Before detent)	3.69 – 4.09 V
				Raise operation (Detent position)	3.91 – 4.31 V
				Float operation	0.91 – 1.31 V
				Lower operation (Before detent)	0.69 – 1.09 V
			Between (2) and (1)	Lever at neutral	2.40 – 2.60 V
				Raise operation (Before detent)	0.91 – 1.31 V
				Raise operation (Detent position)	0.69 – 1.09 V
				Lower operation (Before detent)	3.69 – 4.09 V
				Float operation	3.91 – 4.31 V

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	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	2	Disconnection in wiring harness (Disconnection in wiring harness or defective contact)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between L71 (female) (13) – L28 (female) (2)	Resistance	Max. 1 Ω
			Wiring harness between L71 (female) (19) – L28 (female) (3)	Resistance	Max. 1 Ω
			Wiring harness between L71 (female) (22) – L28 (female) (4)	Resistance	Max. 1 Ω
			Wiring harness between L28 (female) (1) – chassis ground	Resistance	Max. 1 Ω
	3	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between L71 (female) (13) – L28 (female) (2)	Resistance	Min. 1 MΩ
			Wiring harness between L71 (female) (19) – L28 (female) (3)	Resistance	Min. 1 MΩ
			Wiring harness between L71 (female) (22) – L28 (female) (4), – circuit branch end	Resistance	Min. 1 MΩ
	4	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			Wiring harness between L71 (female) (13) – L28 (female) (2)	Voltage	Max. 1 V
			Wiring harness between L71 (female) (19) – L28 (female) (3)	Voltage	Max. 1 V
			Wiring harness between L71 (female) (22) – L28 (female) (4), – circuit branch end	Voltage	Max. 1 V
	5	Defective work equipment controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting. • Work equipment lock lever: Free		
			L71	Lift arm EPC lever	Voltage
			Between (22) and (10)	Constant	4.85 – 5.15 V
			Between (13) and (10)	Lever at neutral	2.40 – 2.60 V
				Raise operation (Before detent)	0.91 – 1.31 V
				Raise operation (Detent position)	0.69 – 1.09 V
				Float operation	3.69 – 4.09 V
				Lower operation (Before detent)	3.91 – 4.31 V
			Between (19) and (10)	Lever at neutral	2.40 – 2.60 V
				Raise operation (Before detent)	3.69 – 4.09 V
				Raise operation (Detent position)	3.91 – 4.31 V
				Lower operation (Before detent)	0.91 – 1.31 V
				Float operation	0.69 – 1.09 V

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Circuit diagram related to lift arm EPC lever potentiometer



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Failure code [DK5AKA] (Lift arm EPC lever potentiometer (Sub): Disconnection)

Action code	Failure code	Trouble	Lift arm EPC lever potentiometer (Sub): Disconnection (Work equipment controller system)
E03	**DK5AKA**		
Contents of trouble	• Due to disconnection or grounding fault in the lift arm EPC lever potentiometer (Sub) system, the signal voltage is lower than normal range (Lift arm EPC lever potentiometer (Sub) signal voltage: Max. 0.3 V).		
Action of controller	• If the lift arm EPC lever potentiometer (Main) is normal, the Main potentiometer is in control. • Turns the centralized warning lamp and the alarm buzzer ON. • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	—		
Related information	• The input state (voltage) from the lift arm EPC lever potentiometer (Main) can be checked with the monitoring function (Code: 42000, BOOM POT1). • The input state (voltage) from the lift arm EPC lever potentiometer (Sub) can be checked with the monitoring function (Code: 42001, BOOM POT2). • Method of reproducing failure code: Turn the starting switch ON and operate lift arm lever		

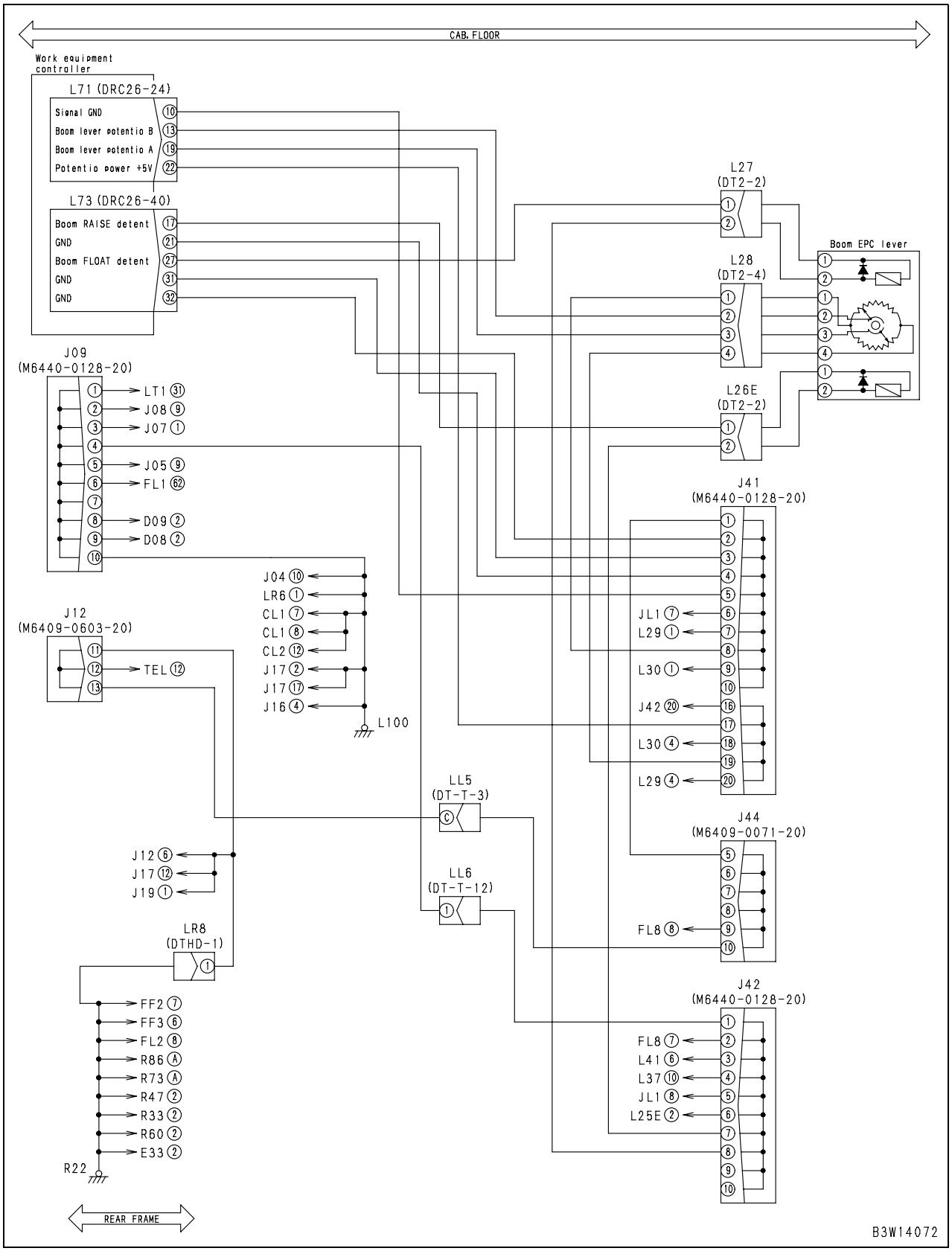
<table>
<tr><td rowspan="15">Possible causes and standard value in normal state</td><td colspan="2">Causes</td><td colspan="5">Standard value in normal state/Remarks on troubleshooting</td></tr>
<tr><td rowspan="9">1</td><td rowspan="9">Defective lift arm EPC lever potentiometer (Internal disconnection or short circuit)</td><td colspan="5">★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.</td></tr>
<tr><td colspan="3">L28 (male)</td><td colspan="2">Resistance</td></tr>
<tr><td colspan="3">Between (1) and (4)</td><td colspan="2">3.2 ± 0.64 kΩ</td></tr>
<tr><td colspan="3">Between (1), (2), (3), (4) and chassis ground</td><td colspan="2">Min. 1 MΩ</td></tr>
<tr><td colspan="5">★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.
• Work equipment lock lever: Free</td></tr>
<tr><td>L28</td><td colspan="2">Lift arm EPC lever</td><td colspan="2">Voltage</td></tr>
<tr><td>Between (4) and (1)</td><td colspan="2">Constant</td><td colspan="2">4.85 – 5.15 V</td></tr>
<tr><td rowspan="4">Between (2) and (1)</td><td colspan="2">Lever at neutral</td><td colspan="2">2.40 – 2.60 V</td></tr>
<tr><td colspan="2">Raise operation (Before detent)</td><td colspan="2">0.91 – 1.31 V</td></tr>
<tr><td colspan="2">Raise operation (Detent position)</td><td colspan="2">0.69 – 1.09 V</td></tr>
<tr><td colspan="2">Lower operation (Before detent)</td><td colspan="2">3.69 – 4.09 V</td></tr>
<tr><td rowspan="5">2</td><td rowspan="5">Disconnection in wiring harness (Disconnection in wiring harness or defective contact)</td><td colspan="5">★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.</td></tr>
<tr><td colspan="3">Wiring harness between L71 (female) (13) – L28 (female) (2)</td><td>Resistance</td><td>Max. 1 Ω</td></tr>
<tr><td colspan="3">Wiring harness between L71 (female) (22) – L28 (female) (4)</td><td>Resistance</td><td>Max. 1 Ω</td></tr>
<tr><td colspan="3">Wiring harness between L28 (female) (1) – chassis ground</td><td>Resistance</td><td>Max. 1 Ω</td></tr>
</table>

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<table>
<tr><td rowspan="8">Possible causes and standard value in normal state</td><td colspan="2">Causes</td><td colspan="4">Standard value in normal state/Remarks on troubleshooting</td></tr>
<tr><td rowspan="2">3</td><td rowspan="2">Grounding fault in wiring harness
(Contact with ground circuit)</td><td colspan="4">★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.</td></tr>
<tr><td colspan="2">Wiring harness between L71 (female) (13) – L28 (female) (2) and chassis ground</td><td>Resistance</td><td>Min. 1 MΩ</td></tr>
<tr><td colspan="2">Wiring harness between L71 (female) (22) – L28 (female) (4), – circuit branch end and chassis ground</td><td>Resistance</td><td>Min. 1 MΩ</td></tr>
<tr><td rowspan="5">4</td><td rowspan="5">Defective work equipment controller</td><td colspan="4">★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.
• Work equipment lock lever: Free</td></tr>
<tr><td>L71</td><td colspan="2">Lift arm EPC lever</td><td>Voltage</td></tr>
<tr><td>Between (22) and (10)</td><td colspan="2">Constant</td><td>4.85 – 5.15 V</td></tr>
<tr><td rowspan="4">Between (13) and (10)</td><td colspan="2">Lever at neutral</td><td>2.40 – 2.60 V</td></tr>
<tr><td colspan="2">Raise operation (Before detent)</td><td>0.91 – 1.31 V</td></tr>
<tr><td colspan="2">Raise operation (Detent position)</td><td>0.69 – 1.09 V</td></tr>
<tr><td colspan="2">Lower operation (Before detent)</td><td>3.69 – 4.09 V</td></tr>
<tr><td colspan="2">Float operation</td><td>3.91 – 4.31 V</td></tr>
</table>

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Circuit diagram related to lift arm EPC lever potentiometer



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Failure code [DK5AKY] (Lift arm EPC lever potentiometer (Sub): Short circuit with power supply line)

Action code	Failure code	Trouble	Lift arm EPC lever potentiometer (Sub): Short circuit with the power supply line (Work equipment controller system)
E03	**DK5AKY**		
Contents of trouble	• Due to hot short circuit in the lift arm EPC lever potentiometer (Sub) system, the signal voltage is higher than normal range (Lift arm EPC lever potentiometer (Sub) signal voltage: Min. 4.7 V).		
Action of controller	• If the lift arm EPC lever potentiometer (Main) is normal, the Main potentiometer is in control. • Turns the centralized warning lamp and the alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until lift arm EPC lever is set to N (Neutral).		
Problem that appears on machine	—		
Related information	• The input state (voltage) from the lift arm EPC lever potentiometer (Main) can be checked with the monitoring function (Code: 42000, BOOM POT1). • The input state (voltage) from the lift arm EPC lever potentiometer (Sub) can be checked with the monitoring function (Code: 42001, BOOM POT2). • Method of reproducing failure code: Turn the starting switch ON and operate lift arm lever		

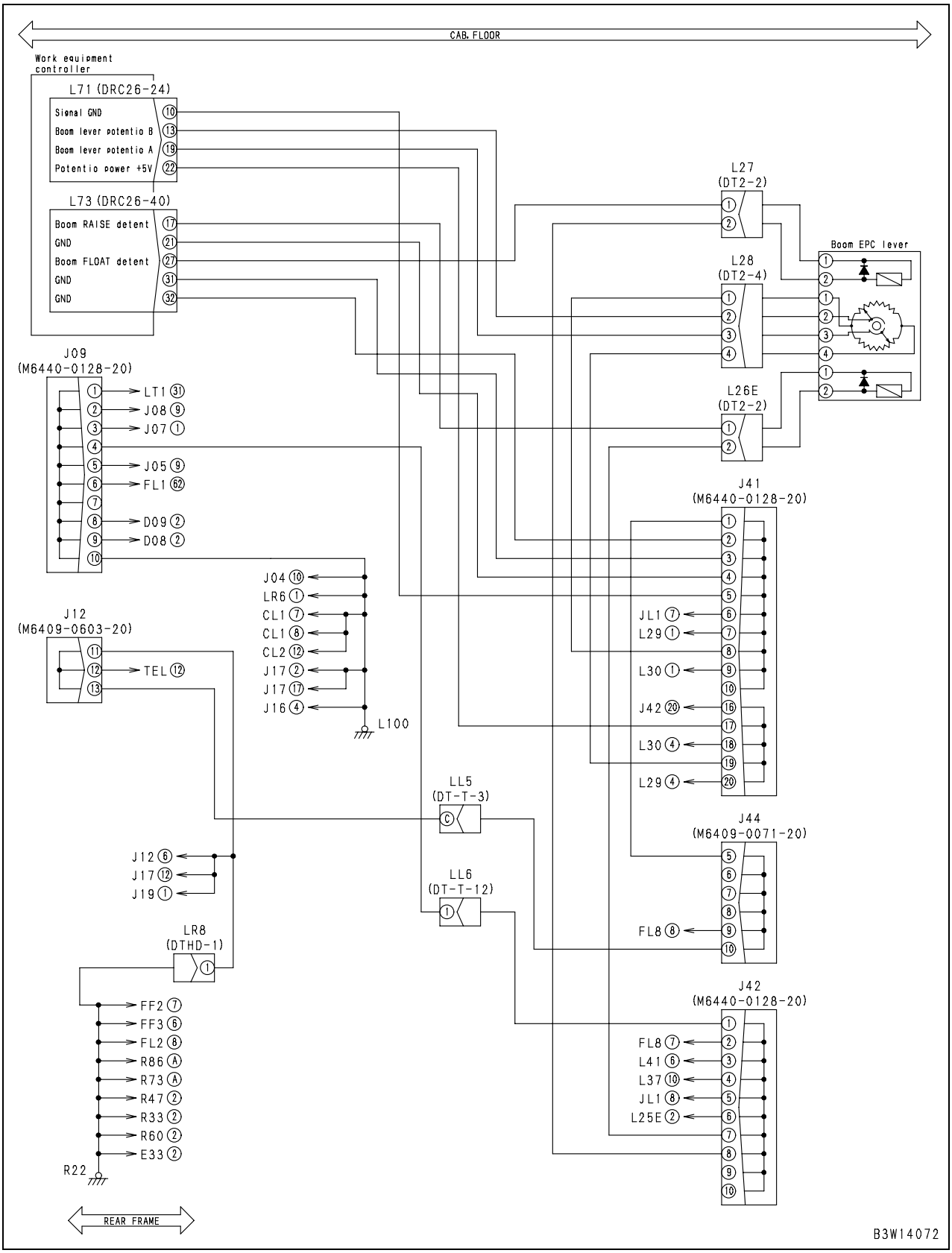
	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective lift arm EPC lever potentiometer (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L28 (male)		Resistance	
			Between (1) and (4)		3.2 ± 0.64 kΩ	
			Between (1), (2), (3), (4) and chassis ground		Min. 1 MΩ	
			★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting. • Work equipment lock lever: Free			
			L28	Lift arm EPC lever	Voltage	
			Between (4) and (1)	Constant	4.85 – 5.15 V	
			Between (2) and (1)	Lever at neutral	2.40 – 2.60 V	
				Raise operation (Before detent)	0.91 – 1.31 V	
				Raise operation (Detent position)	0.69 – 1.09 V	
				Lower operation (Before detent)	3.69 – 4.09 V	
				Float operation	3.91 – 4.31 V	
	2	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			Wiring harness between L71 (female) (13) – L28 (female) (2) and chassis ground		Voltage	Max. 1 V
			Wiring harness between L71 (female) (22) – L28 (female) (4), – circuit branch end and chassis ground		Voltage	Max. 1 V

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<table>
<tr><td rowspan="9">Possible causes and standard value in normal state</td><td colspan="2">Causes</td><td colspan="3">Standard value in normal state/Remarks on troubleshooting</td></tr>
<tr><td rowspan="8">3</td><td rowspan="8">Defective work equipment controller</td><td colspan="3">★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.
• Work equipment lock lever: Free</td></tr>
<tr><td>L71</td><td>Lift arm EPC lever</td><td>Voltage</td></tr>
<tr><td>Between (22) and (10)</td><td>Constant</td><td>4.85 – 5.15 V</td></tr>
<tr><td rowspan="5">Between (13) and (10)</td><td>Lever at neutral</td><td>2.40 – 2.60 V</td></tr>
<tr><td>Raise operation (Before detent)</td><td>0.91 – 1.31 V</td></tr>
<tr><td>Raise operation (Detent position)</td><td>0.69 – 1.09 V</td></tr>
<tr><td>Lower operation (Before detent)</td><td>3.69 – 4.09 V</td></tr>
<tr><td>Float operation</td><td>3.91 – 4.31 V</td></tr>
</table>

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Circuit diagram related to lift arm EPC lever potentiometer



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Failure code [DK5BKA] (Bucket EPC lever potentiometer (Main): Disconnection)

Action code	Failure code	Trouble	Bucket EPC lever potentiometer (Main): Disconnection (Work equipment controller system)
E03	**DK5BKA**		
Contents of trouble	• Due to disconnection or grounding fault in the bucket EPC lever potentiometer (Main) system, the signal voltage is lower than normal range (Bucket EPC lever potentiometer (Main) signal voltage: Max. 0.3 V)		
Action of controller	• If the bucket EPC lever potentiometer (Sub) is normal, the Sub potentiometer is in control. • Turns on the centralized warning lamp the and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until bucket EPC lever is set to N (Neutral).		
Problem that appears on machine	—		
Related information	• The input state (voltage) from the bucket EPC lever potentiometer (Main) can be checked with the monitoring function (Code: 42002, BUCKET POT1). • The input state (voltage) from the bucket EPC lever potentiometer (Sub) can be checked with the monitoring function (Code: 42003, BUCKET POT2). • Method of reproducing failure code: Turn the starting switch ON and operate bucket lever		

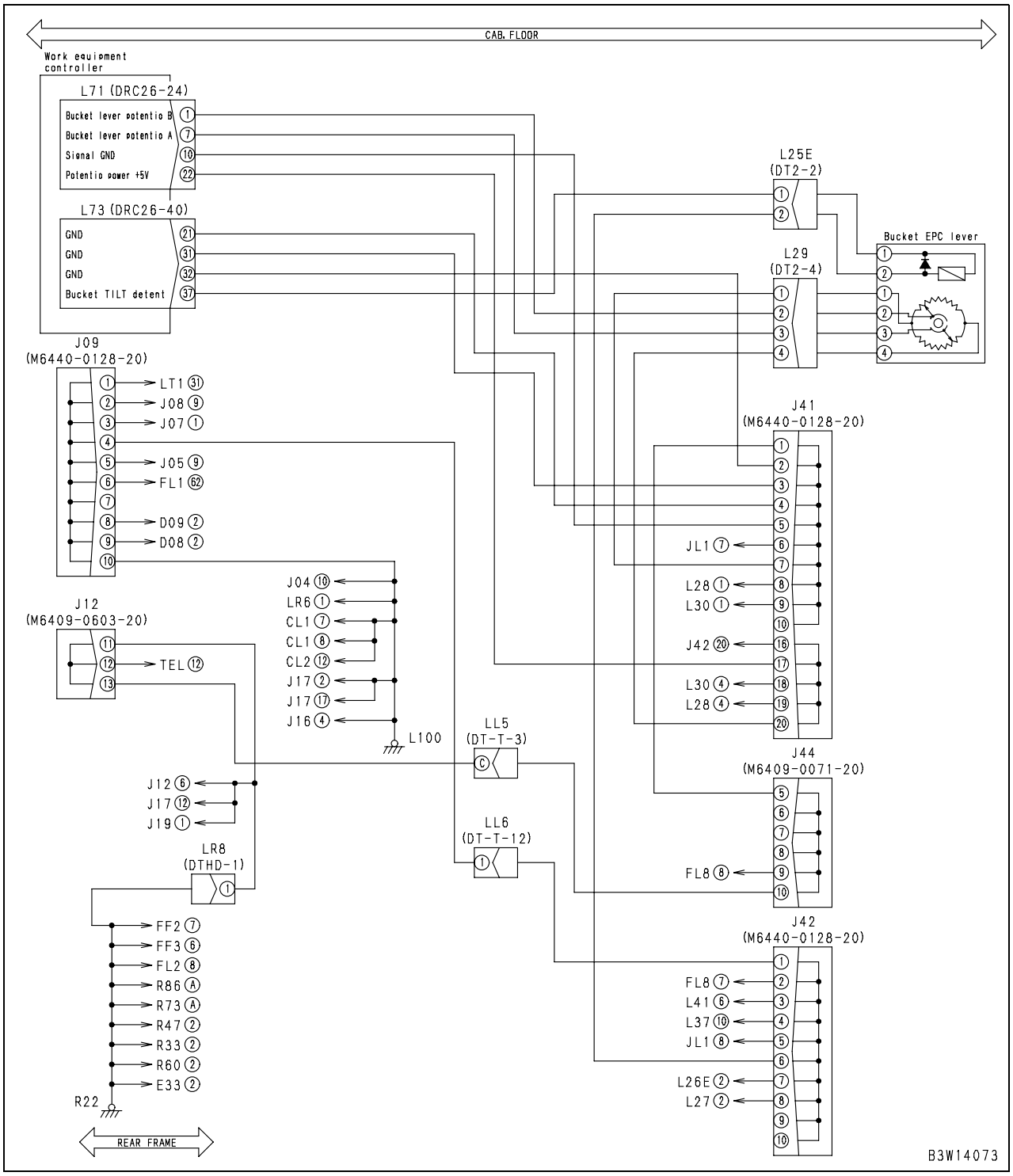
<table>
<tr><td rowspan="13">Possible causes and standard value in normal state</td><td colspan="2">Causes</td><td colspan="5">Standard value in normal state/Remarks on troubleshooting</td></tr>
<tr><td rowspan="11">1</td><td rowspan="11">Defective bucket EPC lever potentiometer
(Internal disconnection or short circuit)</td><td colspan="5">★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.</td></tr>
<tr><td colspan="3">L29 (male)</td><td colspan="2">Resistance</td></tr>
<tr><td colspan="3">Between (1) and (4)</td><td colspan="2">3.2 ± 0.64 kΩ</td></tr>
<tr><td colspan="3">Between (1), (2), (3), (4) and chassis ground</td><td colspan="2">Min. 1 MΩ</td></tr>
<tr><td colspan="5">★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.
• Work equipment lock lever: Free</td></tr>
<tr><td>L29</td><td colspan="2">Bucket EPC lever</td><td colspan="2">Voltage</td></tr>
<tr><td>Between (4) and (1)</td><td colspan="2">Constant</td><td colspan="2">4.85 – 5.15 V</td></tr>
<tr><td rowspan="3">Between (3) and (1)</td><td colspan="2">Lever at neutral</td><td colspan="2">2.40 – 2.60 V</td></tr>
<tr><td colspan="2">Tilt operation (Before detent)</td><td colspan="2">3.69 – 4.09 V</td></tr>
<tr><td colspan="2">Tilt operation (Detent position)</td><td colspan="2">3.91 – 4.31 V</td></tr>
<tr><td colspan="2">Full dump operation</td><td colspan="2">0.69 – 1.09 V</td></tr>
<tr><td rowspan="4">2</td><td rowspan="4">Disconnection in wiring harness
(Disconnection in wiring harness or defective contact)</td><td colspan="5">★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.</td></tr>
<tr><td colspan="3">Wiring harness between L71 (female) (7) – L29 (female) (3)</td><td>Resistance</td><td>Max. 1 Ω</td></tr>
<tr><td colspan="3">Wiring harness between L71 (female) (22) – L29 (female) (4)</td><td>Resistance</td><td>Max. 1 Ω</td></tr>
<tr><td colspan="3">Wiring harness between L29 (female) (1) – chassis ground</td><td>Resistance</td><td>Max. 1 Ω</td></tr>
</table>

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<table>
<tr><td rowspan="8">Possible causes and standard value in normal state</td><td colspan="2">Causes</td><td colspan="4">Standard value in normal state/Remarks on troubleshooting</td></tr>
<tr><td rowspan="3">3</td><td rowspan="3">Grounding fault in wiring harness
(Contact with ground circuit)</td><td colspan="4">★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.</td></tr>
<tr><td colspan="2">Wiring harness between L71 (female) (7) – L29 (female) (3)</td><td>Resistance</td><td>Min. 1 MΩ</td></tr>
<tr><td colspan="2">Wiring harness between L71 (female) (22) – L29 (female) (4), – circuit branch end and chassis ground</td><td>Resistance</td><td>Min. 1 MΩ</td></tr>
<tr><td rowspan="5">4</td><td rowspan="5">Defective work equipment controller</td><td colspan="4">★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.
• Work equipment lock lever: Free</td></tr>
<tr><td>L71</td><td>Bucket EPC lever</td><td colspan="2">Voltage</td></tr>
<tr><td>Between (22) and (10)</td><td>Constant</td><td colspan="2">4.85 – 5.15 V</td></tr>
<tr><td rowspan="3">Between (7) and (10)</td><td>Lever at neutral</td><td colspan="2">2.40 – 2.60 V</td></tr>
<tr><td>Tilt operation (Before detent)</td><td colspan="2">3.69 – 4.09 V</td></tr>
<tr><td>Tilt operation (Detent position)</td><td colspan="2">3.91 – 4.31 V</td></tr>
<tr><td colspan="2"></td><td>Full dump operation</td><td colspan="2">0.69 – 1.09 V</td></tr>
</table>

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Circuit diagram related to bucket EPC lever potentiometer



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Failure code [DK5BKY] (Bucket EPC lever potentiometer (Main): Short circuit with power supply line)

Action code	Failure code	Trouble	Bucket EPC lever potentiometer (Main): Short circuit with the power supply line (Work equipment controller system)
E03	**DK5BKY**		
Contents of trouble	• Due to hot short circuit in the bucket EPC lever potentiometer (Main) system, the signal voltage is higher than normal range (Bucket EPC lever potentiometer (Main) signal voltage: Min. 4.7 V)		
Action of controller	• If the bucket EPC lever potentiometer (Sub) is normal, the Sub potentiometer is in control. • Turns on the centralized warning lamp and the alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until bucket EPC lever is set to N (Neutral).		
Problem that appears on machine	—		
Related information	• The input state (voltage) from the bucket EPC lever potentiometer (Main) can be checked with the monitoring function (Code: 42002, BUCKET POT1). • The input state (voltage) from the bucket EPC lever potentiometer (Sub) can be checked with the monitoring function (Code: 42003, BUCKET POT2). • Method of reproducing failure code: Turn the starting switch ON and operate bucket lever		

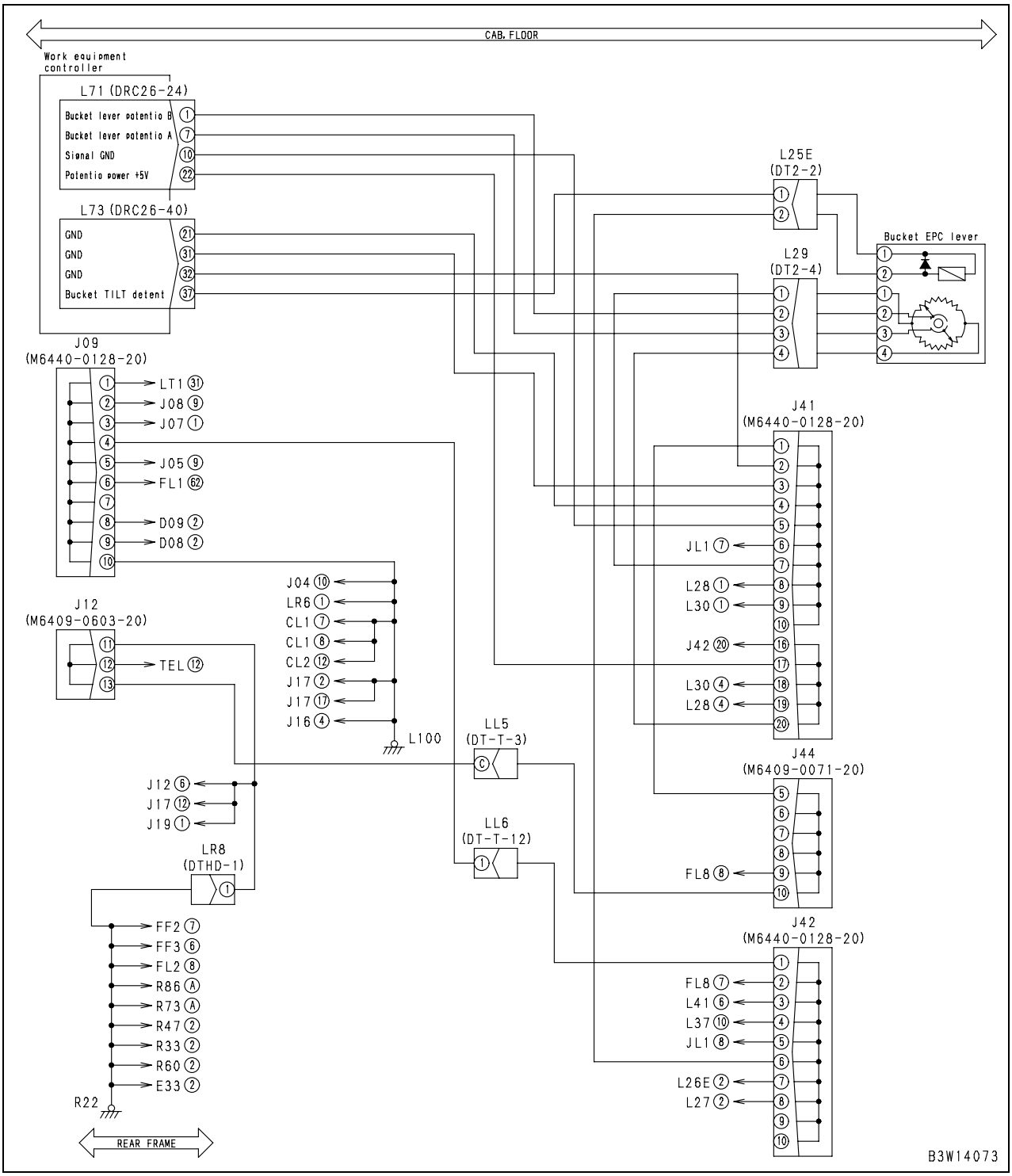
	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective bucket EPC lever potentiometer (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L29 (male)		Resistance	
			Between (1) and (4)		3.2 ± 0.64 kΩ	
			Between (1), (2), (3), (4) and chassis ground		Min. 1 MΩ	
			★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting. • Work equipment lock lever: Free			
			L29	Bucket EPC lever	Voltage	
			Between (4) and (1)	Constant	4.85 – 5.15 V	
			Between (3) and (1)	Lever at neutral	2.40 – 2.60 V	
				Tilt operation (Before detent)	3.69 – 4.09 V	
				Tilt operation (Detent position)	3.91 – 4.31 V	
				Full dump operation	0.69 – 1.09 V	
	2	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			Wiring harness between L71 (female) (7) – L29 (female) (3)		Voltage	Max. 1 V
			Wiring harness between L71 (female) (22) – L29 (female) (4), – circuit branch end and chassis ground		Voltage	Max. 1 V

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<table>
<tr><td rowspan="7">Possible causes and standard value in normal state</td><td colspan="2">Causes</td><td colspan="3">Standard value in normal state/Remarks on troubleshooting</td></tr>
<tr><td rowspan="6">3</td><td rowspan="6">Defective work equipment controller</td><td colspan="3">★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.
• Work equipment lock lever: Free</td></tr>
<tr><td>L71</td><td>Bucket EPC lever</td><td>Voltage</td></tr>
<tr><td>Between (22) and (10)</td><td>Constant</td><td>4.85 – 5.15 V</td></tr>
<tr><td rowspan="4">Between (7) and (10)</td><td>Lever at neutral</td><td>2.40 – 2.60 V</td></tr>
<tr><td>Tilt operation (Before detent)</td><td>3.69 – 4.09 V</td></tr>
<tr><td>Tilt operation (Detent position)</td><td>3.91 – 4.31 V</td></tr>
<tr><td>Full dump operation</td><td>0.69 – 1.09 V</td></tr>
</table>

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Circuit diagram related to bucket EPC lever potentiometer



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Failure code [DK5BL8] (Bucket EPC lever potentiometer (Main): Analog signals disagree)

Action code	Failure code	Trouble	Bucket EPC lever potentiometer (Main): Analog signals disagree (Work equipment controller system)
E03	**DK5BL8**		
Contents of trouble	• Bucket EPC lever potentiometer (Main & Sub) input signals disagree with each other. (Bucket EPC lever potentiometer signal voltage (sum of Main and Sub): Max. 4.7 V) or (Bucket EPC lever potentiometer signal voltage (sum of Main and Sub): Min. 5.3 V)		
Action of controller	• Operates with either Main or Sub potentiometer, whichever detecting a position within neutrality ±5%, as the regular potentiometer. • Turns the output OFF if both Main and Sub potentiometers should fail to detect a position within neutrality ±5%. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until bucket EPC lever is set to N (Neutral).		
Problem that appears on machine	• If either Main or Sub potentiometer is abnormal, machine operates normally after the lever is set to neutral. • If both Main and Sub potentiometers are abnormal, bucket does not move.		
Related information	• The input state (voltage) from the bucket EPC lever potentiometer (Main) can be checked with the monitoring function (Code: 42002, BUCKET POT1). • The input state (voltage) from the bucket EPC lever potentiometer (Sub) can be checked with the monitoring function (Code: 42003, BUCKET POT2). • Method of reproducing failure code: Turn the starting switch ON and operate bucket lever		

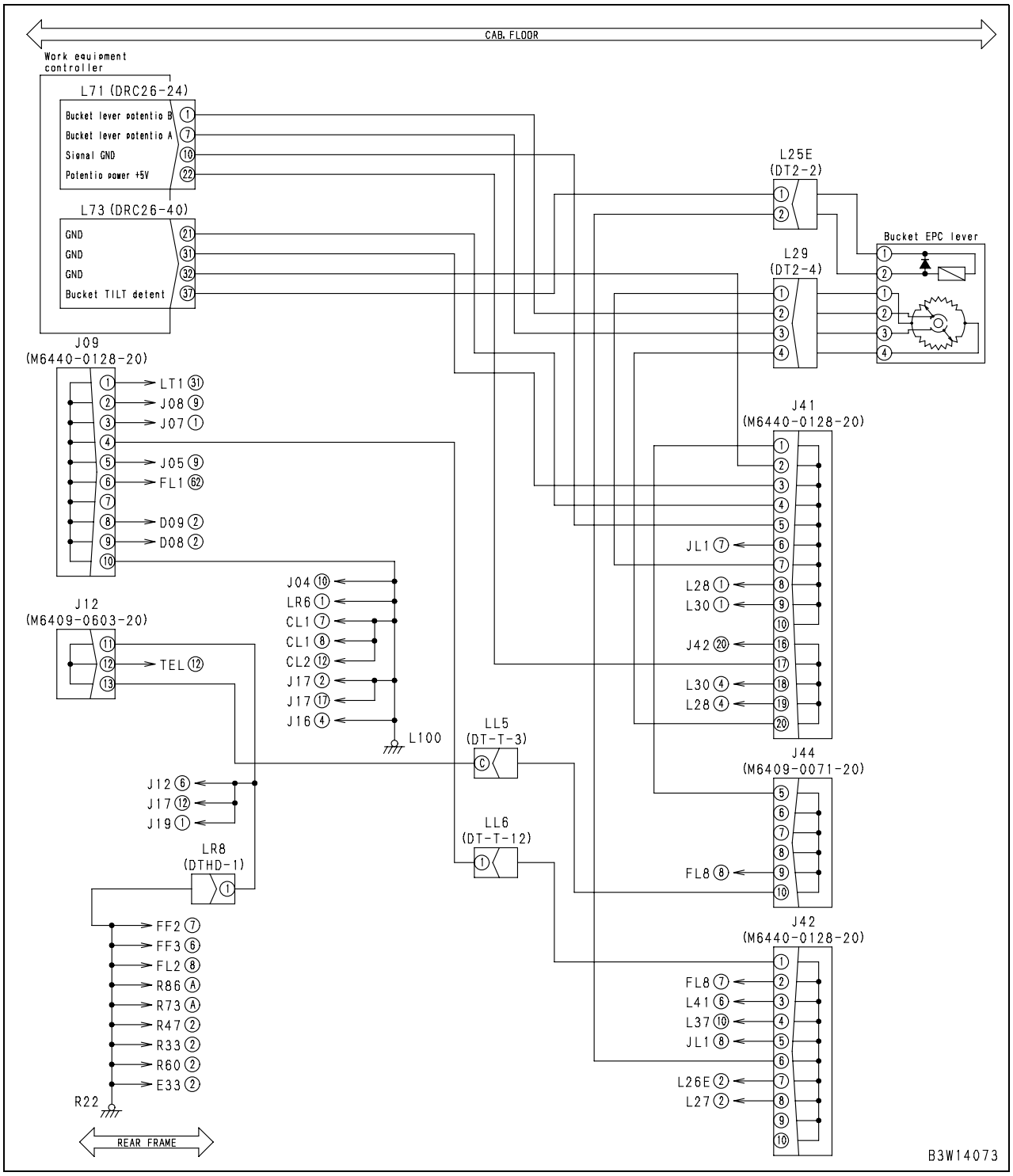
	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective bucket EPC lever potentiometer (Internal disconnection or short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			L29 (male)	Resistance	
			Between (1) and (4)	3.2 ± 0.64 kΩ	
			Between (1), (2), (3), (4) and chassis ground	Min. 1 MΩ	
			★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting. • Work equipment lock lever: Free		
			L29	Bucket EPC lever	Voltage
			Between (4) and (1)	Constant	4.85 – 5.15 V
			Between (3) and (1)	Lever at neutral	2.40 – 2.60 V
				Tilt operation (Before detent)	3.69 – 4.09 V
				Tilt operation (Detent position)	3.91 – 4.31 V
				Full dump operation	0.69 – 1.09 V
			Between (2) and (1)	Lever at neutral	2.40 – 2.60 V
				Tilt operation (Before detent)	0.91 – 1.31 V
				Tilt operation (Detent position)	0.69 – 1.09 V
				Full dump operation	3.91 – 4.31 V

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	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	2	Disconnection in wiring harness (Disconnection in wiring harness or defective contact)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L71 (female) (1) – L29 (female) (2)		Resistance	Max. 1 Ω
			Wiring harness between L71 (female) (7) – L29 (female) (3)		Resistance	Max. 1 Ω
			Wiring harness between L29 (female) (1) – chassis ground		Resistance	Max. 1 Ω
			Wiring harness between L71 (female) (22) – L29 (female) (4)		Resistance	Max. 1 Ω
	3	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L71 (female) (1) – L29 (female) (2) and chassis ground		Resistance	Min. 1 MΩ
			Wiring harness between L71 (female) (7) – L29 (female) (3) and chassis ground		Resistance	Min. 1 MΩ
			Wiring harness between L71 (female) (22) – L29 (female) (4), – circuit branch end and chassis ground		Resistance	Min. 1 MΩ
	4	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			Wiring harness between L71 (female) (1) – L29 (female) (2) and chassis ground		Voltage	Max. 1 V
			Wiring harness between L71 (female) (7) – L29 (female) (3) and chassis ground		Voltage	Max. 1 V
			Wiring harness between L71 (female) (22) – L29 (female) (4), – circuit branch end and chassis ground		Voltage	Max. 1 V
	5	Defective work equipment controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting. • Work equipment lock lever: Free			
			L71	Bucket EPC lever	Voltage	
			Between (22) and (10)	Constant	4.85 – 5.15 V	
			Between (7) and (10)	Lever at neutral	2.40 – 2.60 V	
				Tilt operation (Before detent)	3.69 – 4.09 V	
				Tilt operation (Detent position)	3.91 – 4.31 V	
				Full dump operation	0.69 – 1.09 V	
			Between (1) and (10)	Lever at neutral	2.40 – 2.60 V	
				Tilt operation (Before detent)	0.91 – 1.31 V	
				Tilt operation (Detent position)	0.69 – 1.09 V	
				Full dump operation	3.91 – 4.31 V	

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Circuit diagram related to bucket EPC lever potentiometer



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Failure code [DK5CKA] (Bucket EPC lever potentiometer (Sub): Disconnection)

Action code	Failure code	Trouble	Bucket EPC lever potentiometer (Sub): Disconnection (Work equipment controller system)
E03	**DK5CKA**		
Contents of trouble	• Due to disconnection or grounding fault in the bucket EPC lever potentiometer (Sub) system, the signal voltage is lower than normal range (Bucket EPC lever potentiometer (Sub) signal voltage: Max. 0.3 V).		
Action of controller	• If the bucket EPC lever potentiometer (Main) is normal, the Main potentiometer is in control. • Turns the centralized warning lamp and alarm buzzer ON. • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	—		
Related information	• The input state (voltage) from the bucket EPC lever potentiometer (Main) can be checked with the monitoring function (Code: 42002, BUCKET POT1). • The input state (voltage) from the bucket EPC lever potentiometer (Sub) can be checked with the monitoring function (Code: 42003, BUCKET POT2). • Method of reproducing failure code: Turn the starting switch ON and operate bucket lever		

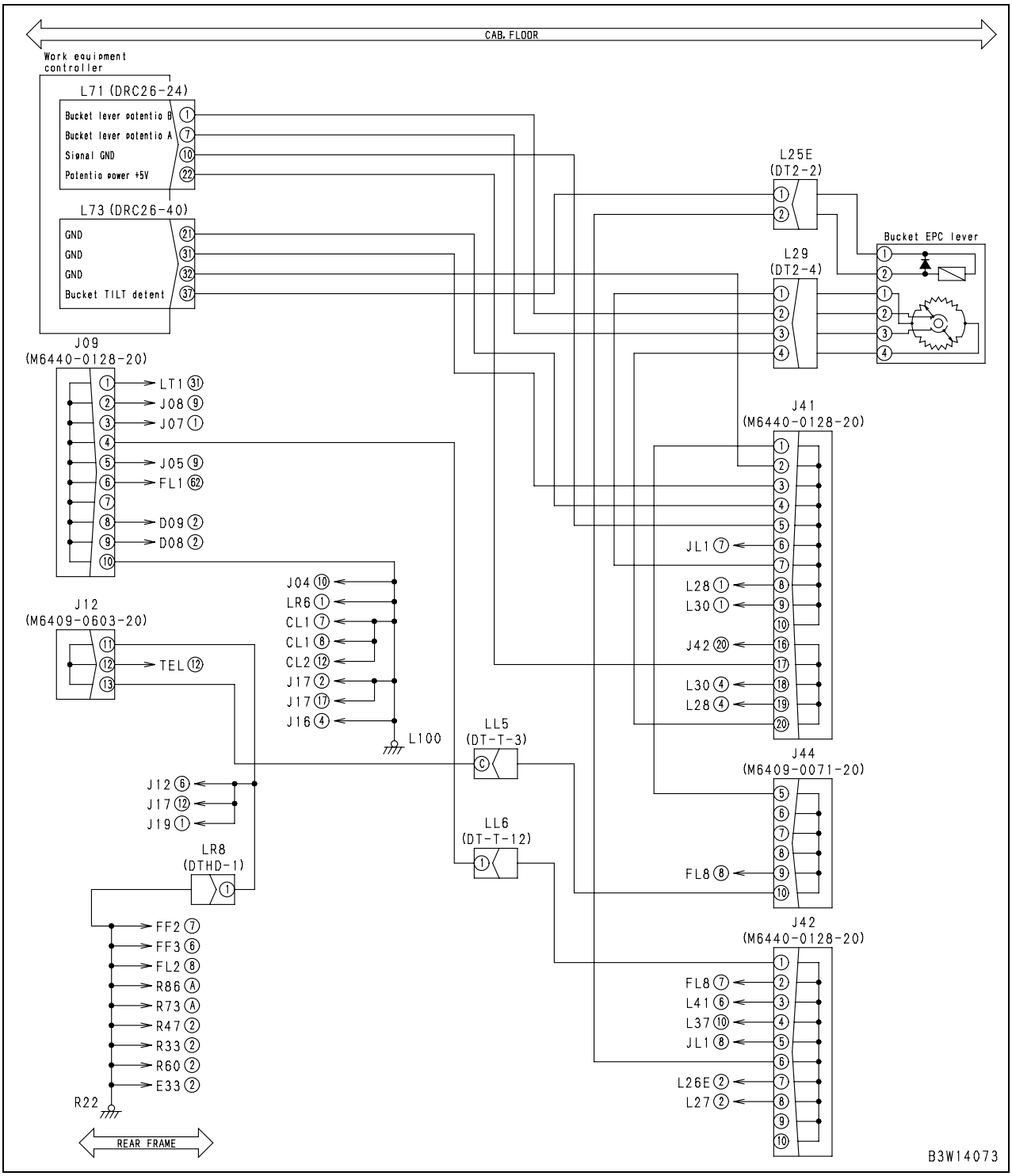
<table>
<tr><td rowspan="20">Possible causes and standard value in normal state</td><td colspan="2">Causes</td><td colspan="4">Standard value in normal state/Remarks on troubleshooting</td></tr>
<tr><td rowspan="10">1</td><td rowspan="10">Defective bucket EPC lever potentiometer
(Internal disconnection or short circuit)</td><td colspan="4">★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.</td></tr>
<tr><td colspan="2">L29 (male)</td><td colspan="2">Resistance</td></tr>
<tr><td colspan="2">Between (1) and (4)</td><td colspan="2">3.2 ± 0.64 kΩ</td></tr>
<tr><td colspan="2">Between (1), (2), (3), (4) and chassis ground</td><td colspan="2">Min. 1 MΩ</td></tr>
<tr><td colspan="4">★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.
• Work equipment lock lever: Free</td></tr>
<tr><td>L29</td><td>Bucket EPC lever</td><td colspan="2">Voltage</td></tr>
<tr><td>Between (4) and (1)</td><td>Constant</td><td colspan="2">4.85 – 5.15 V</td></tr>
<tr><td rowspan="3">Between (2) and (1)</td><td>Lever at neutral</td><td colspan="2">2.40 – 2.60 V</td></tr>
<tr><td>Tilt operation (Before detent)</td><td colspan="2">0.91 – 1.31 V</td></tr>
<tr><td>Tilt operation (Detent position)</td><td colspan="2">0.69 – 1.09 V</td></tr>
<tr><td>Full dump operation</td><td colspan="2">3.91 – 4.31 V</td></tr>
<tr><td rowspan="4">2</td><td rowspan="4">Disconnection in wiring harness
(Disconnection in wiring harness or defective contact)</td><td colspan="4">★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.</td></tr>
<tr><td colspan="2">Wiring harness between L71 (female) (1) – L29 (female) (2)</td><td>Resistance</td><td>Max. 1 Ω</td></tr>
<tr><td colspan="2">Wiring harness between L71 (female) (22) – L29 (female) (4)</td><td>Resistance</td><td>Max. 1 Ω</td></tr>
<tr><td colspan="2">Wiring harness between L29 (female) (1) – chassis ground</td><td>Resistance</td><td>Max. 1 Ω</td></tr>
<tr><td rowspan="3">3</td><td rowspan="3">Grounding fault in wiring harness
(Contact with ground circuit)</td><td colspan="4">★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.</td></tr>
<tr><td colspan="2">Wiring harness between L71 (female) (1) – L29 (female) (2) and chassis ground</td><td>Resistance</td><td>Min. 1 MΩ</td></tr>
<tr><td colspan="2">Wiring harness between L71 (female) (22) – L29 (female) (4), – circuit branch end and chassis ground</td><td>Resistance</td><td>Min. 1 MΩ</td></tr>
</table>

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<table>
<tr><td rowspan="7">Possible causes and standard value in normal state</td><td colspan="2">Causes</td><td colspan="3">Standard value in normal state/Remarks on troubleshooting</td></tr>
<tr><td rowspan="6">4</td><td rowspan="6">Defective work equipment controller</td><td colspan="3">★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.
• Work equipment lock lever: Free</td></tr>
<tr><td>L71</td><td>Bucket EPC lever</td><td>Voltage</td></tr>
<tr><td>Between (22) and (10)</td><td>Constant</td><td>4.85 – 5.15 V</td></tr>
<tr><td rowspan="4">Between (1) and (10)</td><td>Lever at neutral</td><td>2.40 – 2.60 V</td></tr>
<tr><td>Tilt operation (Before detent)</td><td>0.91 – 1.31 V</td></tr>
<tr><td>Tilt operation (Detent position)</td><td>0.69 – 1.09 V</td></tr>
<tr><td>Full dump operation</td><td>3.91 – 4.31 V</td></tr>
</table>

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Circuit diagram related to bucket EPC lever potentiometer



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Failure code [DK5CKY] (Bucket EPC lever potentiometer (Sub): Short circuit with power supply line)

Action code	Failure code	Trouble	Bucket EPC lever potentiometer (Sub): Short circuit with the power supply line (Work equipment controller system)
E03	**DK5CKY**		
Contents of trouble	• Due to hot short circuit in the bucket EPC lever potentiometer (Sub) system, the signal voltage is higher than normal range (Bucket EPC lever potentiometer (Sub) signal voltage: Min. 4.7 V).		
Action of controller	• If the bucket EPC lever potentiometer (Main) is normal, the Main potentiometer is in control. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until bucket EPC lever is set to N (Neutral).		
Problem that appears on machine	—		
Related information	• The input state (voltage) from the bucket EPC lever potentiometer (Main) can be checked with the monitoring function (Code: 42002, BUCKET POT1). • The input state (voltage) from the bucket EPC lever potentiometer (Sub) can be checked with the monitoring function (Code: 42003, BUCKET POT2). • Method of reproducing failure code: Turn the starting switch ON and operate bucket lever		

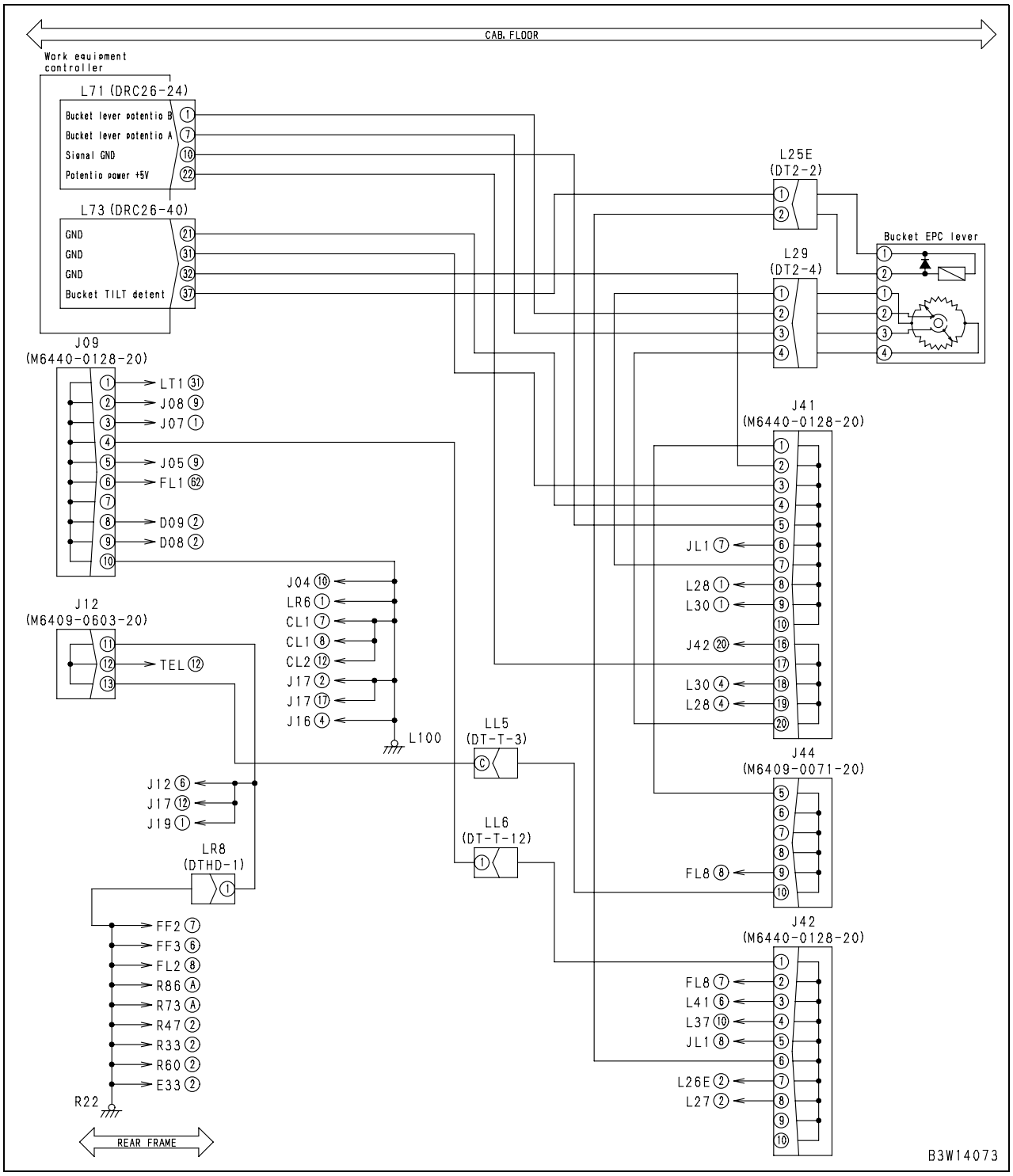
<table>
<tr><td rowspan="15">Possible causes and standard value in normal state</td><td colspan="2">Causes</td><td colspan="5">Standard value in normal state/Remarks on troubleshooting</td></tr>
<tr><td rowspan="11">1</td><td rowspan="11">Defective bucket EPC lever potentiometer (Internal short circuit)</td><td colspan="5">★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.</td></tr>
<tr><td colspan="3">L29 (male)</td><td colspan="2">Resistance</td></tr>
<tr><td colspan="3">Between (1) and (4)</td><td colspan="2">3.2 ± 0.64 kΩ</td></tr>
<tr><td colspan="3">Between (1), (2), (3), (4) and chassis ground</td><td colspan="2">Min. 1 MΩ</td></tr>
<tr><td colspan="5">★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.
• Work equipment lock lever: Free</td></tr>
<tr><td>L29</td><td>Bucket EPC lever</td><td colspan="3">Voltage</td></tr>
<tr><td>Between (4) and (1)</td><td>Constant</td><td colspan="3">4.85 – 5.15 V</td></tr>
<tr><td rowspan="3">Between (2) and (1)</td><td>Lever at neutral</td><td colspan="3">2.40 – 2.60 V</td></tr>
<tr><td>Tilt operation (Before detent)</td><td colspan="3">0.91 – 1.31 V</td></tr>
<tr><td>Tilt operation (Detent position)</td><td colspan="3">0.69 – 1.09 V</td></tr>
<tr><td>Full dump operation</td><td colspan="3">3.91 – 4.31 V</td></tr>
<tr><td rowspan="3">2</td><td rowspan="3">Hot short in wiring harness (Contact with 24V circuit)</td><td colspan="5">★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.</td></tr>
<tr><td colspan="3">Wiring harness between L71 (female) (1) – L29 (female) (2) and chassis ground</td><td>Voltage</td><td>Max. 1 V</td></tr>
<tr><td colspan="3">Wiring harness between L71 (female) (22) – L29 (female) (4), – circuit branch end and chassis ground</td><td>Voltage</td><td>Max. 1 V</td></tr>
</table>

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<table>
<tr><td rowspan="8">Possible causes and standard value in normal state</td><td colspan="2">Causes</td><td colspan="3">Standard value in normal state/Remarks on troubleshooting</td></tr>
<tr><td rowspan="7">3</td><td rowspan="7">Defective work equipment controller</td><td colspan="3">★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.
• Work equipment lock lever: Free</td></tr>
<tr><td>L71</td><td>Bucket EPC lever</td><td>Voltage</td></tr>
<tr><td>Between (22) and (10)</td><td>Constant</td><td>4.85 – 5.15 V</td></tr>
<tr><td rowspan="4">Between (1) and (10)</td><td>Lever at neutral</td><td>2.40 – 2.60 V</td></tr>
<tr><td>Tilt operation (Before detent)</td><td>0.91 – 1.31 V</td></tr>
<tr><td>Tilt operation (Detent position)</td><td>0.69 – 1.09 V</td></tr>
<tr><td>Full dump operation</td><td>3.91 – 4.31 V</td></tr>
</table>

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Circuit diagram related to bucket EPC lever potentiometer



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WA430-6 Wheel loader

Form No. SEN01744-02

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WHEEL LOADER

WA430-6

Machine Model	Serial Number
WA430-6	65001 and up

40 Troubleshooting

Troubleshooting by failure code (Display of code), Part 8

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Failure code [DK5FKA] (Joystick steering EPC lever potentiometer (Main): Disconnection)

Action code	Failure code	Trouble	Joystick steering EPC lever potentiometer (Main): Disconnection (Work equipment controller system)
E03	**DK5FKA**		
Contents of trouble	• Due to disconnection or grounding fault in the joystick steering EPC lever potentiometer (Main) system, the signal voltage is lower than normal range (Joystick steering EPC lever potentiometer (Main) signal voltage: Max. 0.3 V)		
Action of controller	• If the joystick steering EPC lever potentiometer (Sub) is normal, the Sub potentiometer is in control. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until the joystick steering EPC lever is set to N (Neutral).		
Problem that appears on machine	• If disconnection occurs, machine turns to left but returns to normal operation in 0.5 seconds.		
Related information	• When the joystick steering ON/OFF switch is set to OFF, this failure code is not displayed. • The input state (voltage) from the joystick steering EPC lever potentiometer (Main) can be checked with the monitoring function (Code: 42004, J/S POT1). • The input state (voltage) from the joystick steering EPC lever potentiometer (Sub) can be checked with the monitoring function (Code: 42005, J/S POT2). • Method of reproducing failure code: Turn the starting switch ON and operate joystick steering lever		

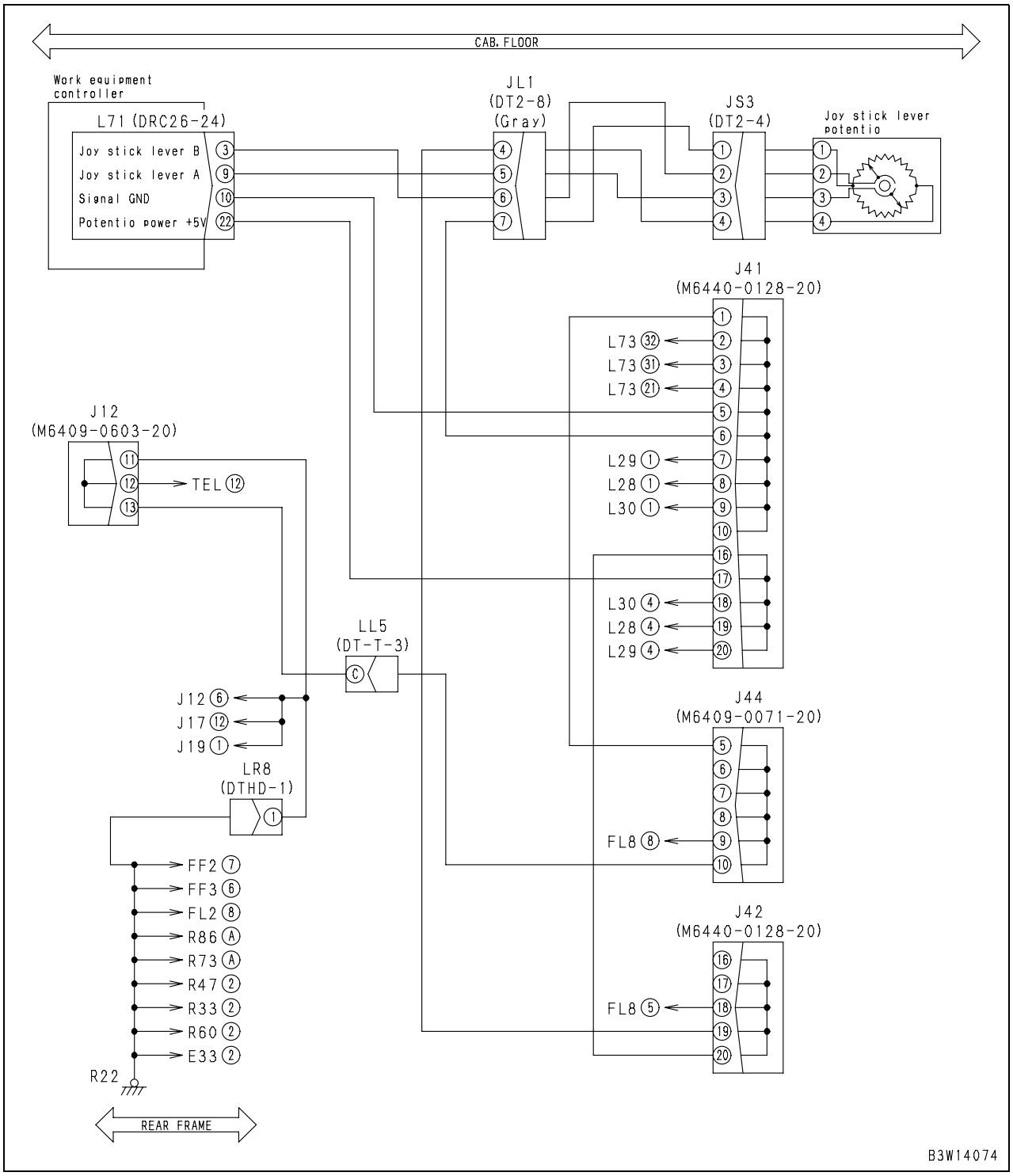
	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective joystick steering EPC lever potentiometer (Internal disconnection or short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			JS3 (male)		Resistance	
			Between (1) and (4)		3.2 ± 0.64 kΩ	
			Between (1), (2), (3) or (4) and chassis ground		Min. 1 MΩ	
			★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			JS3	Joystick steering EPC lever	Voltage	
			Between (4) and (1)	Constant	4.85 – 5.15 V	
			Between (3) and (1)	Lever at neutral	2.40 – 2.60 V	
				Left turning	1.14 – 1.54 V	
				Right turning	3.46 – 3.86 V	
	2	Disconnection in wiring harness (Disconnection in wiring harness or defective contact)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L71 (female) (9) – JS3 (female) (3)		Resistance	Max. 1 Ω
			Wiring harness between L71 (female) (22) – JS3 (female) (4)		Resistance	Max. 1 Ω
			Wiring harness between JS3 (female) (1) – chassis ground		Resistance	Max. 1 Ω
	3	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L71 (female) (9) – JS3 (female) (3) and chassis ground		Resistance	Min. 1 MΩ
			Wiring harness between L71 (female) (22) – JS3 (female) (4) and chassis ground		Resistance	Min. 1 MΩ

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Possible causes and standard value in normal state	Causes		Standard value in normal state/Remarks on troubleshooting		
	4	Defective work equipment controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			L71	Joystick steering EPC lever	Voltage
			Between (22) and (10)	Constant	4.85 – 5.15 V
			Between (9) and (10)	Lever at neutral	2.40 – 2.60 V
				Left turning	1.14 – 1.54 V
				Right turning	3.46 – 3.86 V

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Circuit diagram related to joystick steering EPC lever potentiometer



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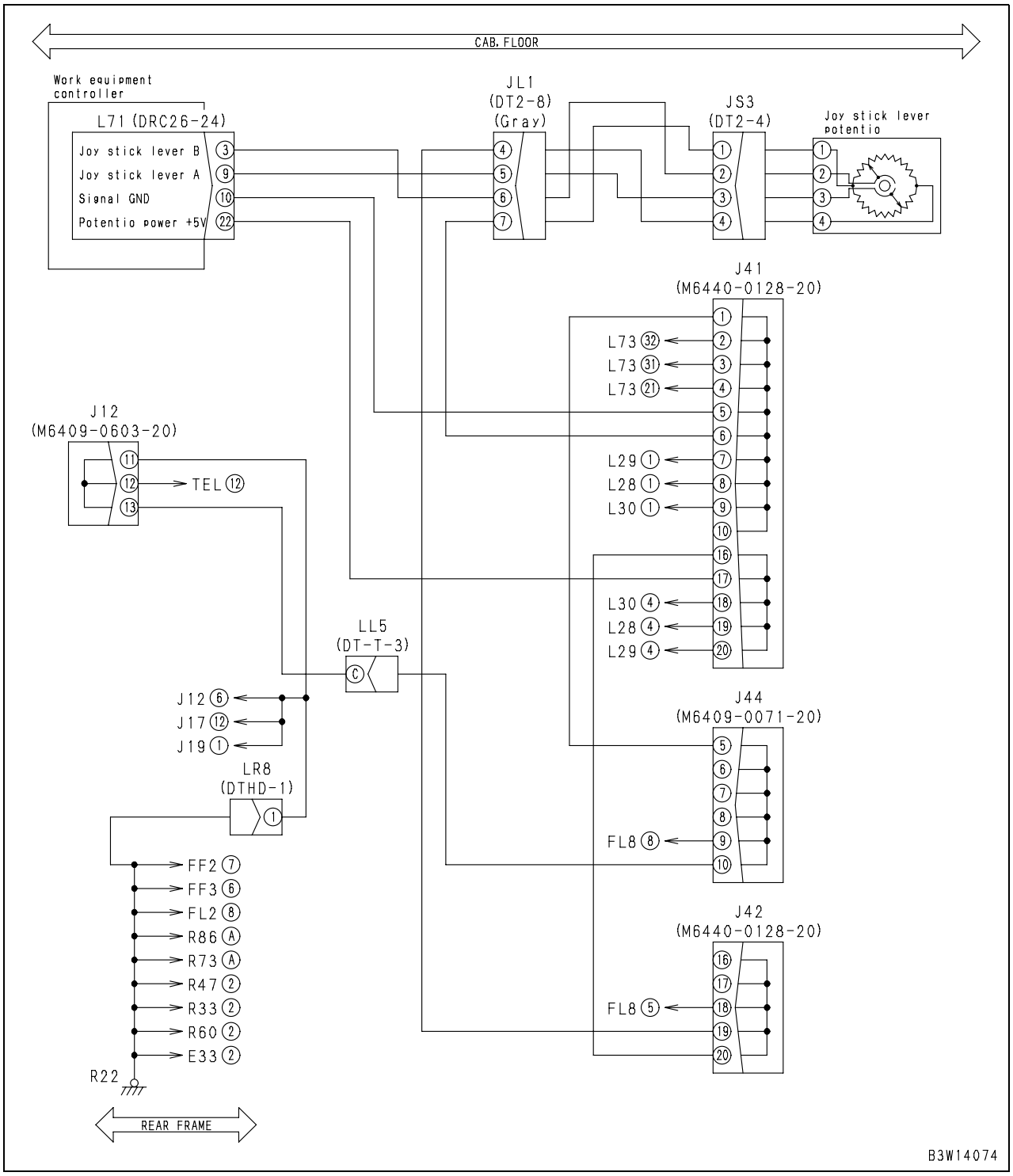
Failure code [DK5FKY] (Joystick steering EPC lever potentiometer (Main): Short circuit with power supply line)

Action code	Failure code	Trouble	Joystick steering EPC lever potentiometer (Main): Short circuit with the power supply line (Work equipment controller system)
E03	**DK5FKY**		
Contents of trouble	• Due to hot short circuit in the joystick steering EPC lever potentiometer (Main) system, the signal voltage is higher than normal range. (Joystick steering EPC lever potentiometer (Main) signal voltage: Max. 4.7 V)		
Action of controller	• If the joystick steering EPC lever potentiometer (Sub) is normal, the Sub potentiometer is in control. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until the joystick steering EPC lever is set to N (Neutral).		
Problem that appears on machine	• If disconnection occurs, machine turns to right but returns to normal operation in 0.5 seconds.		
Related information	• When the joystick steering ON/OFF switch is set to OFF, this failure code is not displayed. • The input state (voltage) from the joystick steering EPC lever potentiometer (Main) can be checked with the monitoring function (Code: 42004, J/S POT1). • The input state (voltage) from the joystick steering EPC lever potentiometer (Sub) can be checked with the monitoring function (Code: 42005, J/S POT2). • Method of reproducing failure code: Turn the starting switch ON and operate joystick steering lever		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective joystick steering EPC lever potentiometer (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			JS3 (male)		Resistance	
			Between (1) and (4)		3.2 ± 0.64 kΩ	
			Between (1), (2), (3) or (4) and chassis ground		Min. 1 MΩ	
			★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			JS3	Joystick steering EPC lever	Voltage	
			Between (4) and (1)	Constant	4.85 – 5.15 V	
			Between (3) and (1)	Lever at neutral	2.40 – 2.60 V	
				Left turning	1.14 – 1.54 V	
				Right turning	3.46 – 3.86 V	
	2	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			Wiring harness between L71 (female) (9) – JS3 (female) (3) and chassis ground		Voltage	Max. 1 V
			Wiring harness between L71 (female) (22) – JS3 (female) (4) and chassis ground		Voltage	Max. 1 V
	3	Defective work equipment controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			L71	Joystick steering EPC lever	Voltage	
			(22) – (10)	Constant	4.85 – 5.15 V	
			Between (9) and (10)	Lever at neutral	2.40 – 2.60 V	
				Left turning	1.14 – 1.54 V	
				Right turning	3.46 – 3.86 V	

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Circuit diagram related to joystick steering EPC lever potentiometer



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Failure code [DK5GKA] (Joystick steering EPC lever potentiometer (Sub): Disconnection)

Action code	Failure code	Trouble	Joystick steering EPC lever potentiometer (Sub): Disconnection (Work equipment controller system)
E03	**DK5GKA**		
Contents of trouble	• Due to disconnection or grounding fault in the joystick steering EPC lever potentiometer (Sub) system, the signal voltage is lower than normal range (Joystick steering EPC lever potentiometer (Sub) signal voltage: Max. 0.3 V)		
Action of controller	• If the joystick steering EPC lever potentiometer (Main) is normal, the Main potentiometer is in control. • Turns the centralized warning lamp and alarm buzzer ON. • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	—		
Related information	• When the joystick steering ON/OFF switch is set to OFF, this failure code is not displayed. • The input state (voltage) from the joystick steering EPC lever potentiometer (Main) can be checked with the monitoring function (Code: 42004, J/S POT1). • The input state (voltage) from the joystick steering EPC lever potentiometer (Sub) can be checked with the monitoring function (Code: 42005, J/S POT2). • Method of reproducing failure code: Turn the starting switch ON and operate joystick steering lever		

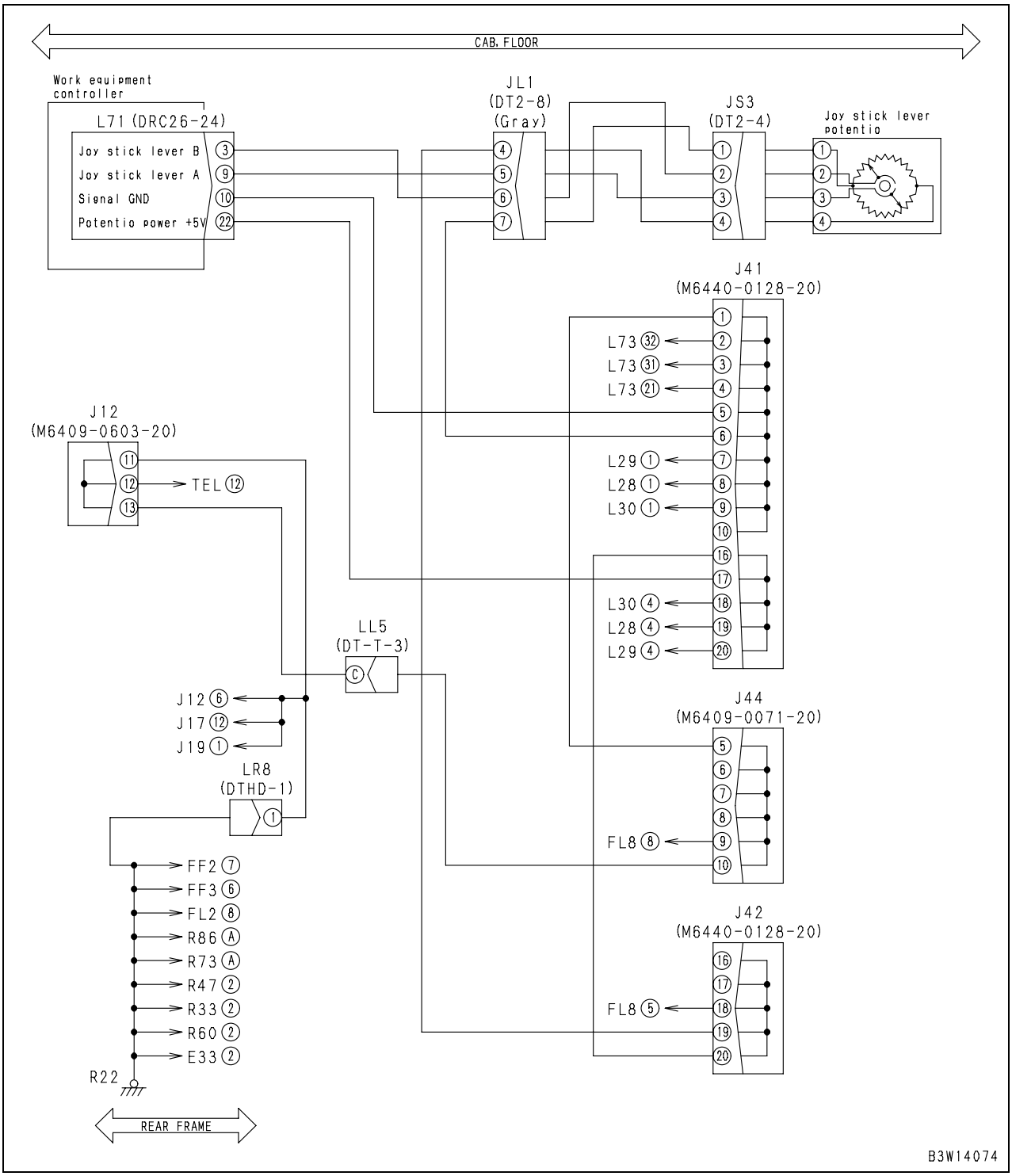
	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective joystick steering EPC lever potentiometer (Internal disconnection or short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			JS3 (male)		Resistance	
			Between (1) and (4)		3.2 ± 0.64 kΩ	
			Between (1), (2), (3) or (4) and chassis ground		Min. 1 MΩ	
			★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			JS3	Joystick steering EPC lever	Voltage	
			Between (4) and (1)	Constant	4.85 – 5.15 V	
			Between (2) and (1)	Lever at neutral	2.40 – 2.60 V	
				Left turning	3.46 – 3.86 V	
				Right turning	1.14 – 1.54 V	
	2	Disconnection in wiring harness (Disconnection in wiring harness or defective contact)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L71 (female) (3) – JS3 (female) (2)		Resistance	Max. 1 Ω
			Wiring harness between L71 (female) (22) – JS3 (female) (4)		Resistance	Max. 1 Ω
			Wiring harness between L34 (female) (1) – chassis ground		Resistance	Max. 1 Ω
	3	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L71 (female) (3) – JS3 (female) (2) and chassis ground		Resistance	Min. 1 MΩ
			Wiring harness between L71 (female) (22) – JS3 (female) (4) and chassis ground		Resistance	Min. 1 MΩ

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<table>
<tr><td rowspan="6">Possible causes and standard value in normal state</td><td colspan="2">Causes</td><td colspan="3">Standard value in normal state/Remarks on troubleshooting</td></tr>
<tr><td rowspan="5">4</td><td rowspan="5">Defective work equipment controller</td><td colspan="3">★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.</td></tr>
<tr><td>L71</td><td>Joystick steering EPC lever</td><td>Voltage</td></tr>
<tr><td>Between (22) and (10)</td><td>Constant</td><td>4.85 – 5.15 V</td></tr>
<tr><td rowspan="3">Between (3) and (10)</td><td>Lever at neutral</td><td>2.40 – 2.60 V</td></tr>
<tr><td>Left turning</td><td>3.46 – 3.86 V</td></tr>
<tr><td>Right turning</td><td>1.14 – 1.54 V</td></tr>
</table>

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Circuit diagram related to joystick steering EPC lever potentiometer



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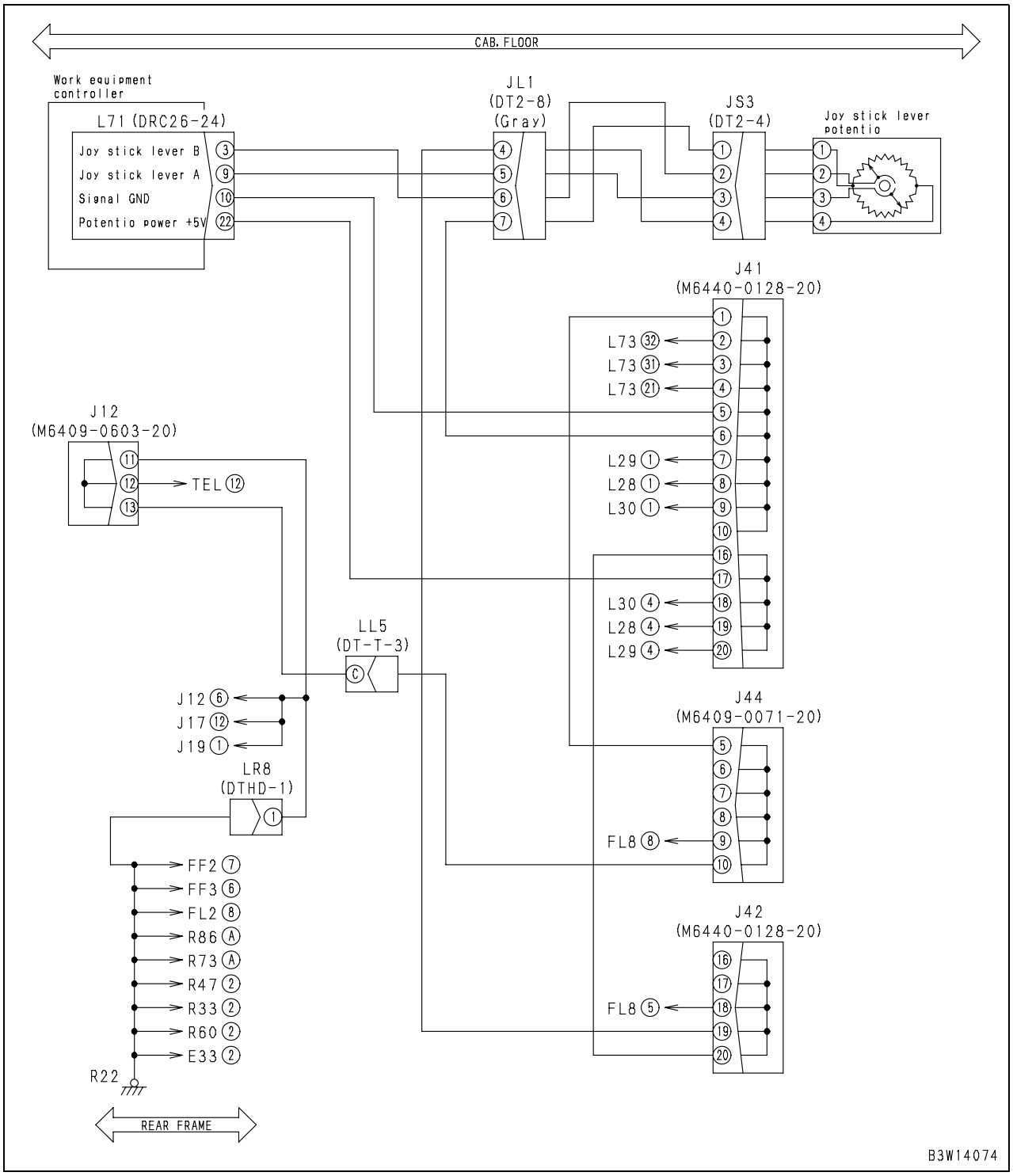
Failure code [DK5GKY] (Joystick steering EPC lever potentiometer (Sub): Short circuit with power supply line)

Action code	Failure code	Trouble	Joystick steering EPC lever potentiometer (Sub): Short circuit with power supply line (Work equipment controller system)
E03	**DK5GKY**		
Contents of trouble	• Due to hot short circuit in the joystick steering EPC lever potentiometer (Sub) system, the signal voltage is higher than normal range. (Joystick steering EPC lever potentiometer (Sub) signal voltage: Min. 4.7 V)		
Action of controller	• If the joystick steering EPC lever potentiometer (Main) is normal, the Main potentiometer is in control. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until the joystick steering EPC lever is set to N (Neutral).		
Problem that appears on machine	—		
Related information	• When the joystick steering ON/OFF switch is set to OFF, this failure code is not displayed. • The input state (voltage) from the joystick steering EPC lever potentiometer (Main) can be checked with the monitoring function (Code: 42004, J/S POT1). • The input state (voltage) from the joystick steering EPC lever potentiometer (Sub) can be checked with the monitoring function (Code: 42005, J/S POT2). • Method of reproducing failure code: Turn the starting switch ON and operate joystick steering lever		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective joystick steering EPC lever potentiometer (Internal disconnection or short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			JS3 (male)		Resistance	
			Between (1) and (4)		3.2 ± 0.64 kΩ	
			Between (1), (2), (3) or (4) and chassis ground		Min. 1 MΩ	
			★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			JS3	Joystick steering EPC lever	Voltage	
			Between (4) and (1)	Constant	4.85 – 5.15 V	
			Between (2) and (1)	Lever at neutral	2.40 – 2.60 V	
				Left turning	3.46 – 3.86 V	
				Right turning	1.14 – 1.54 V	
	2	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			Wiring harness between L71 (female) (3) – JS3 (female) (2) and chassis ground		Voltage	Max. 1 V
			Wiring harness between L71 (female) (22) – JS3 (female) (4) and chassis ground		Voltage	Max. 1 V
	3	Defective work equipment controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			L71	Joystick steering EPC lever	Voltage	
			Between (22) and (10)	Constant	4.85 – 5.15 V	
			Between (3) and (10)	Lever at neutral	2.40 – 2.60 V	
				Left turning	3.46 – 3.86 V	
				Right turning	1.14 – 1.54 V	

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Circuit diagram related to joystick steering EPC lever potentiometer



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Failure code [DK5FL8] (Joystick steering EPC lever potentiometer (Main): Analog signals disagree)

Action code	Failure code	Trouble	Joystick steering EPC lever potentiometer (Main): Analog signals disagree (Work equipment controller system)
E03	**DK5FL8**		
Contents of trouble	• Joystick steering EPC lever potentiometer (Main & Sub) input signals disagree with each other. (Joystick steering EPC lever potentiometer signal voltage (both Main and Sub): Max. 4.7 V) or (Joystick steering EPC lever potentiometer signal voltage (both Main and Sub): Min 5.3 V)		
Action of controller	• Operates with either Main or Sub potentiometer, whichever detecting a position within neutrality ±5%, as the regular potentiometer. • Turns the output OFF if both Main and Sub potentiometers should fail to detect a position within neutrality ±5%. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until the joystick steering EPC lever is set to N (Neutral).		
Problem that appears on machine	• If either Main or Sub potentiometer is abnormal, machine operates normally after the joystick steering EPC lever is set to neutral. • If both Main and Sub potentiometers are abnormal, steering cylinder does not move.		
Related information	• When the joystick steering ON/OFF switch is set to OFF, this failure code is not displayed. • The input state (voltage) from the joystick steering EPC lever potentiometer (Main) can be checked with the monitoring function (Code: 42004, J/S POT1). • The input state (voltage) from the joystick steering EPC lever potentiometer (Sub) can be checked with the monitoring function (Code: 42005, J/S POT2). • Method of reproducing failure code: Turn the starting switch ON and operate joystick steering lever		

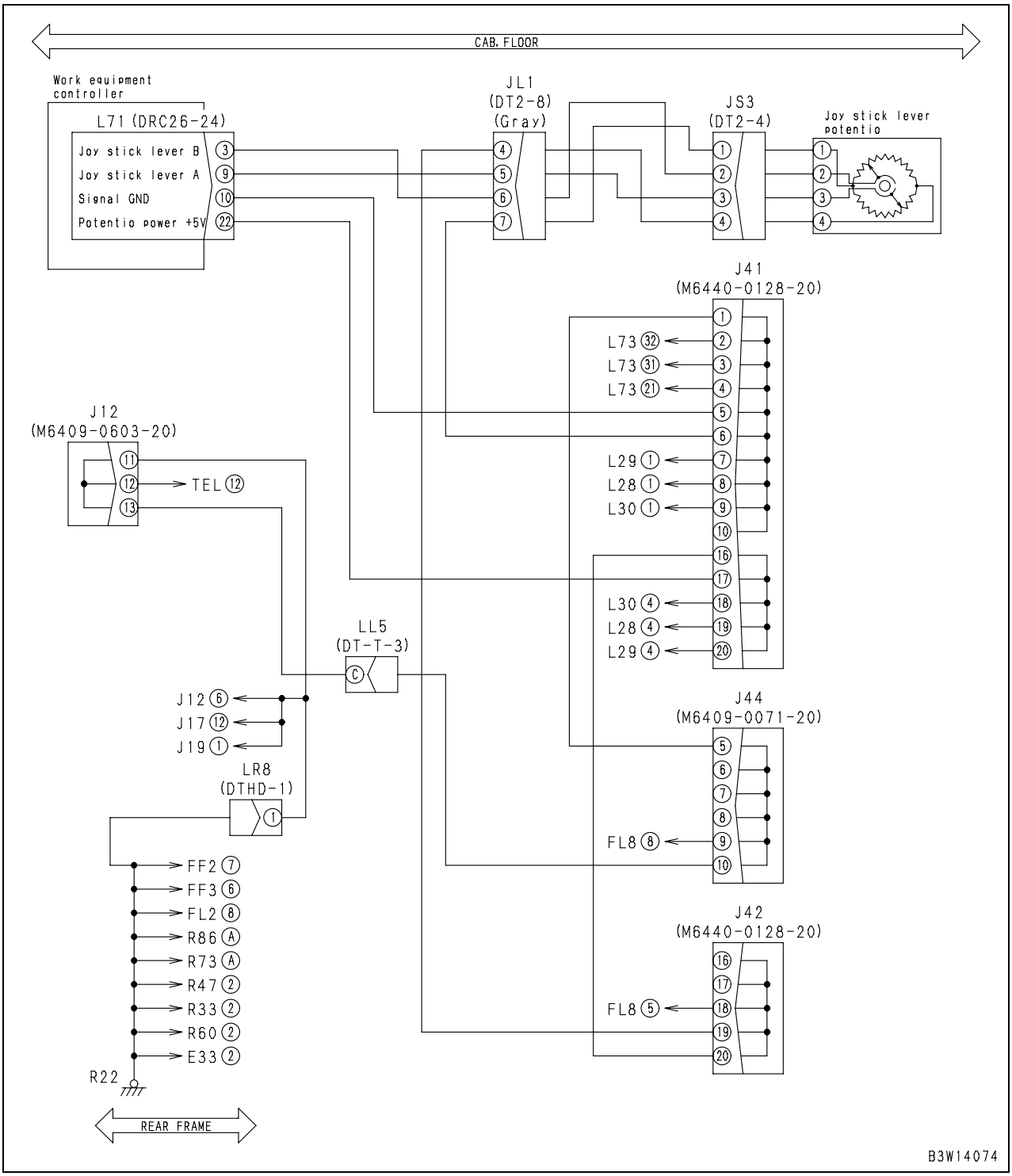
	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective joystick steering EPC lever potentiometer (Internal disconnection or short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			JS3 (male)		Resistance	
			Between (1) and (4)		3.2 ± 0.64 kΩ	
			Between (1), (2), (3) or (4) and chassis ground		Min. 1 MΩ	
			★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			JS3	Joystick steering EPC lever	Voltage	
			Between (4) and (1)	Constant	4.85 – 5.15 V	
			Between (3) and (1)	Lever at neutral	2.40 – 2.60 V	
				Left turning	1.14 – 1.54 V	
				Right turning	3.46 – 3.86 V	
			Between (2) and (1)	Lever at neutral	2.40 – 2.60 V	
				Left turning	3.46 – 3.86 V	
				Right turning	1.14 – 1.54 V	
	2	Disconnection in wiring harness (Disconnection in wiring harness or defective contact)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L71 (female) (3) – JS3 (female) (2)		Resistance	Max. 1 Ω
			Wiring harness between L71 (female) (9) – JS3 (female) (3)		Resistance	Max. 1 Ω
			Wiring harness between L71 (female) (22) – JS3 (female) (4)		Resistance	Max. 1 Ω
			Wiring harness between JS3 (female) (1) – chassis ground		Resistance	Max. 1 Ω

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	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	3	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L71 (female) (3) – JS3 (female) (2) and chassis ground		Resistance	Min. 1 MΩ
			Wiring harness between L71 (female) (9) – JS3 (female) (3) and chassis ground		Resistance	Min. 1 MΩ
			Wiring harness between L71 (female) (22) – JS3 (female) (4) and chassis ground		Resistance	Min. 1 MΩ
	4	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			Wiring harness between L71 (female) (3) – JS3 (female) (2) and chassis ground		Voltage	Max. 1 V
			Wiring harness between L71 (female) (9) – JS3 (female) (3) and chassis ground		Voltage	Max. 1 V
			Wiring harness between L71 (female) (22) – JS3 (female) (4) and chassis ground		Voltage	Max. 1 V
	5	Defective work equipment controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			L71	Joystick steering EPC lever	Voltage	
			Between (22) and (10)	Constant	4.85 – 5.15 V	
			Between (9) and (10)	Lever at neutral	2.40 – 2.60 V	
				Left turning	1.14 – 1.54 V	
				Right turning	3.46 – 3.86 V	
			Between (3) and (10)	Lever at neutral	2.40 – 2.60 V	
				Left turning	3.46 – 3.86 V	
				Right turning	1.14 – 1.54 V	

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Circuit diagram related to joystick steering EPC lever potentiometer



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Failure code [DKA0KA] (Lift arm angle sensor: Disconnection)

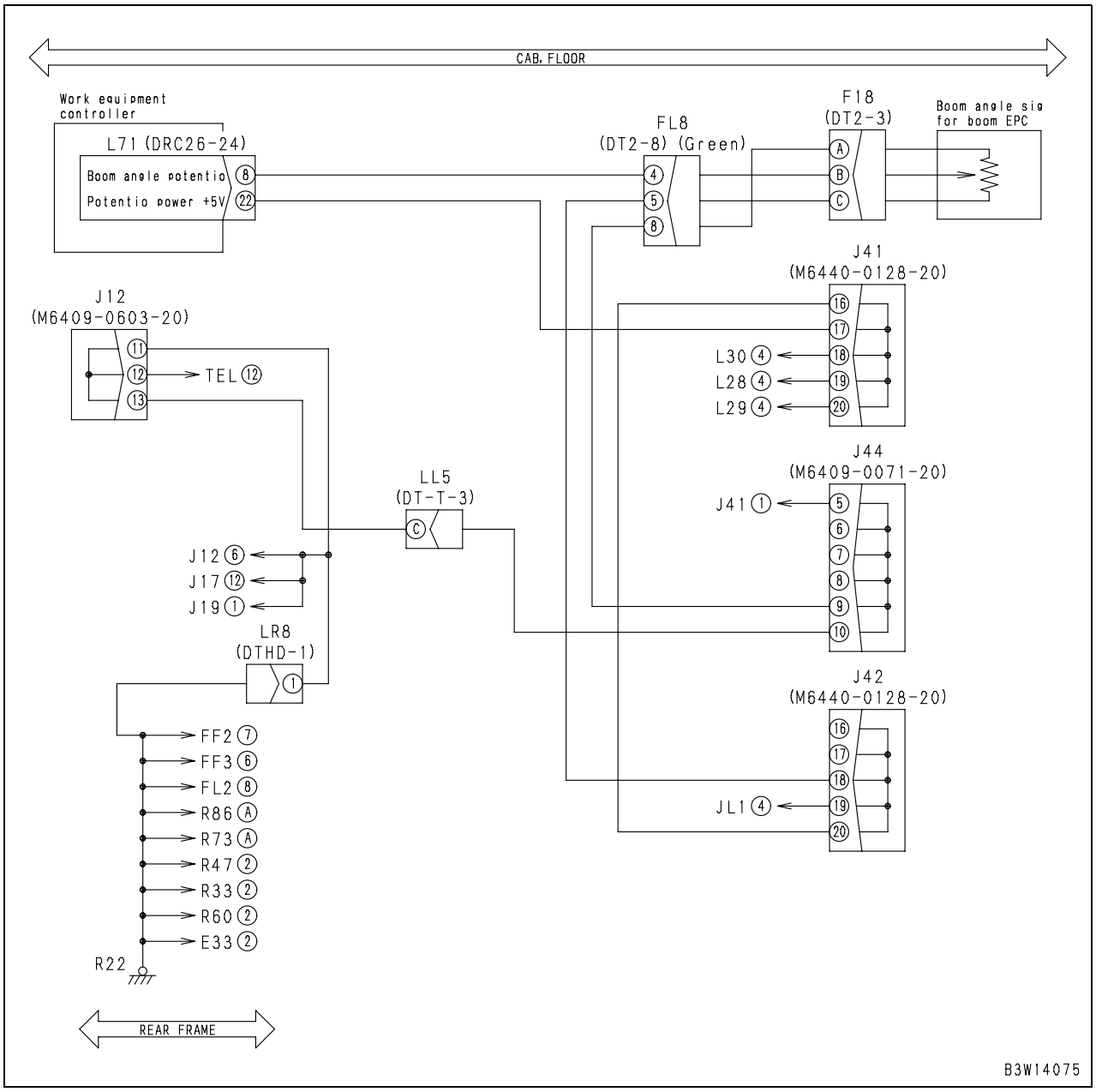
Action code	Failure code	Trouble	Lift arm angle sensor: Disconnection (Work equipment controller system)
E01	**DKA0KA**		
Contents of trouble	• Due to disconnection or ground fault in lift arm angle sensor system, the signal voltage is lower than normal range (Lift arm angle sensor signal: Max. 0.3 V).		
Action of controller	• Judges that lift arm is at the lowest position. • Resets the remote positioner function. • Resets semi auto digging function. • No PC control while the lift arm is rising. • When the remote positioner down setting is ON, turns OFF the lift arm float detent, and when the remote positioner down setting is OFF, usually operates the lift arm float detent. • Turns the lift arm up detent OFF • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• Remote positioner malfunction (operation is not stopped) • Malfunctioning in semi-auto digging operation (operation is stopped) • No PC control while the lift arm is rising		
Related information	• The input state (angle) from the lift arm angle sensor can be checked with the monitoring function (Code: 06002, BOOM ANG). • The input state (voltage) from the lift arm angle sensor can be checked with the monitoring function (Code: 06005, BOOM ANG). • If failure code [DAF5KP] (Machine monitor: Low output voltage) is displayed, carry out troubleshooting for it first. • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective lift arm angle sensor (Internal disconnection or short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			F18 (male)		Resistance	
			Between (A) and (C)		5 kΩ ± 20%	
			Between (A), (B), (C) and chassis ground		Min. 1 MΩ	
			★ Prepare with starting switch OFF, then start engine and carry out troubleshooting.			
			F18	Lift arm position	Voltage	
			Between (C) and (A)	Constant	4.85 – 5.15 V	
			Between (B) and (A)	Constant	0.83 – 4.17 V	
				Up stroke end	3.50 – 4.17 V	
				Lower stroke end	0.83 – 1.88 V	
	2	Disconnection in wiring harness (Disconnection in wiring harness or defective contact)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between F18 (female) (A) – chassis ground		Resistance	Max. 1 Ω
			Wiring harness between F18 (female) (B) – L71 (female) (8)		Resistance	Max. 1 Ω
			Wiring harness between F18 (female) (C) – L71 (female) (22)		Resistance	Max. 1 Ω
	3	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between F18 (female) (B) – L71 (female) (8) and chassis ground		Resistance	Min. 1 MΩ
			Wiring harness between F18 (female) (C) – L71 (female) (22), – circuit branch end and chassis ground		Resistance	Min. 1 MΩ

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Possible causes and standard value in normal state	Causes		Standard value in normal state/Remarks on troubleshooting		
			★ Prepare with starting switch OFF, then start engine and carry out troubleshooting.		
	4	Defective work equipment controller	L71	Lift arm position	Voltage
			Between (8) and chassis ground	Constant	0.83 – 4.17 V
				Up stroke end	3.50 – 4.17 V
				Lower stroke end	0.83 – 1.88 V

Circuit diagram related to lift arm angle sensor



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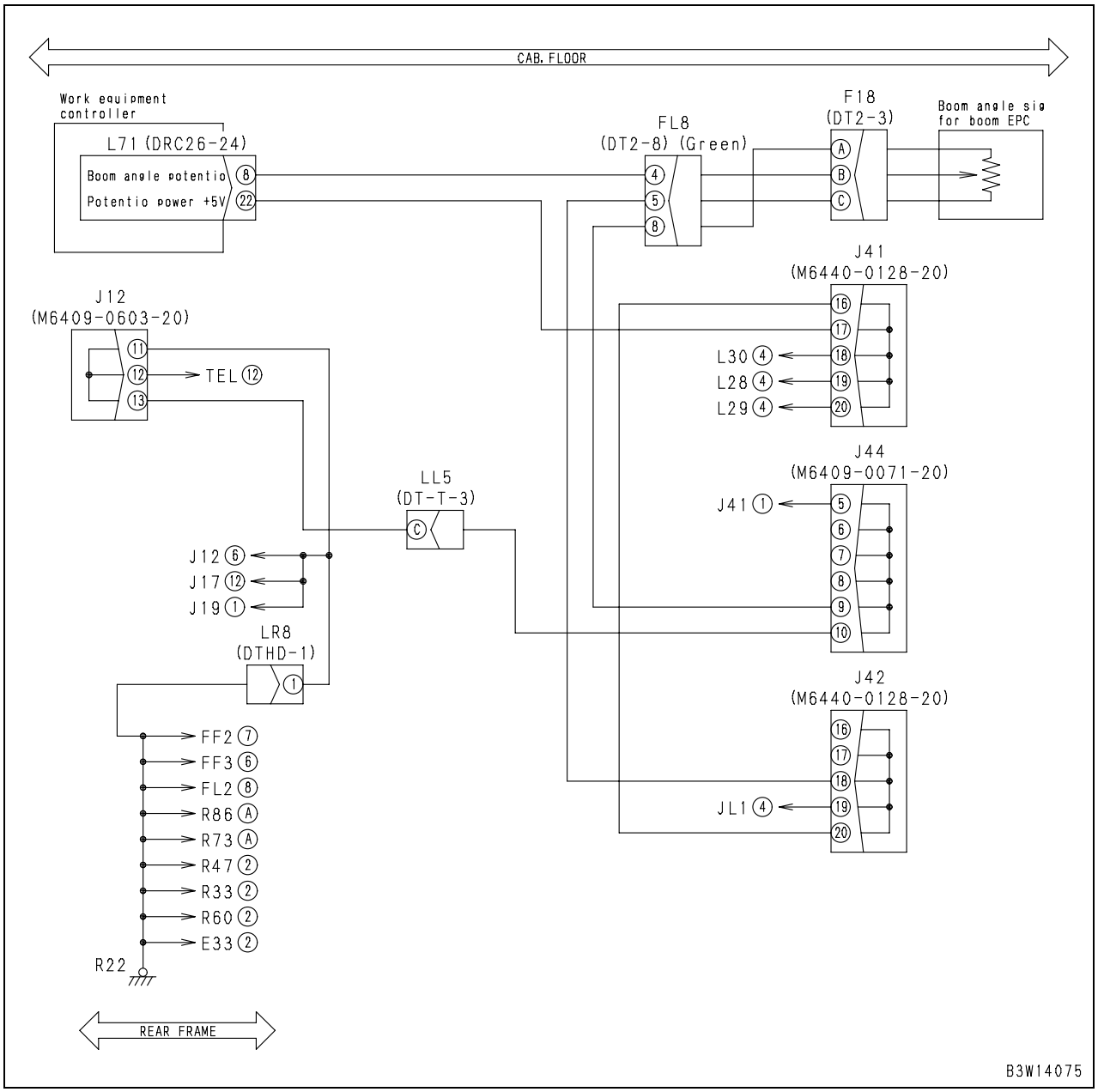
Failure code [DKA0KY] (Lift arm angle sensor: Short circuit with power supply line)

Action code	Failure code	Trouble	Lift arm angle sensor: Short circuit with power supply line (Work equipment controller system)
E01	**DKA0KY**		
Contents of trouble	• Due to hot short circuit in the lift arm angle sensor system, the signal voltage is higher than normal range (Lift arm angle sensor signal: Min. 4.7 V).		
Action of controller	• Judges that lift arm is at the highest position. • Resets the remote positioner function. • Resets semi auto digging function. • No PC control while the lift arm is rising. • When the remote positioner down setting is ON, turns OFF the lift arm float detent, and when the remote positioner down setting is OFF, usually operates the lift arm float detent. • Turns the lift arm up detent OFF • Even if cause of failure disappears, system does not reset itself until lift arm lever is set to N (Neutral).		
Problem that appears on machine	• Remote positioner malfunction • Faulty semi-auto digging operation • No PC control while the lift arm is rising		
Related information	• The input state (angle) from the lift arm angle sensor can be checked with the monitoring function (Code: 06002, BOOM ANG). • The input state (voltage) from the lift arm angle sensor can be checked with the monitoring function (Code: 06005, BOOM ANG). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective lift arm angle sensor (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			F18 (male)	Resistance	
			Between (A) and (C)	5 kΩ ± 20%	
			Between (A), (B), (C) and chassis ground	Min. 1 MΩ	
			★ Prepare with starting switch OFF, then start engine and carry out troubleshooting.		
			F18	Lift arm position	Voltage
			Between (C) and (A)	Constant	4.85 – 5.15 V
			Between (B) and (A)	Constant	0.83 – 4.17 V
				Up stroke end	3.50 – 4.17 V
				Lower stroke end	0.83 – 1.88 V
	2	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			Wiring harness between F18 (female) (B) – L71 (female) (8) and chassis ground	Voltage	Max. 1 V
			Wiring harness between F18 (female) (C) – L71 (female) (22), – circuit branch end and chassis ground	Voltage	Max. 1 V
	3	Defective work equipment controller	★ Prepare with starting switch OFF, then start engine and carry out troubleshooting.		
			L71	Lift arm position	Voltage
			Between (8) and chassis ground	Constant	0.83 – 4.17 V
				Up stroke end	3.50 – 4.17 V
				Lower stroke end	0.83 – 1.88 V

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Circuit diagram related to lift arm angle sensor



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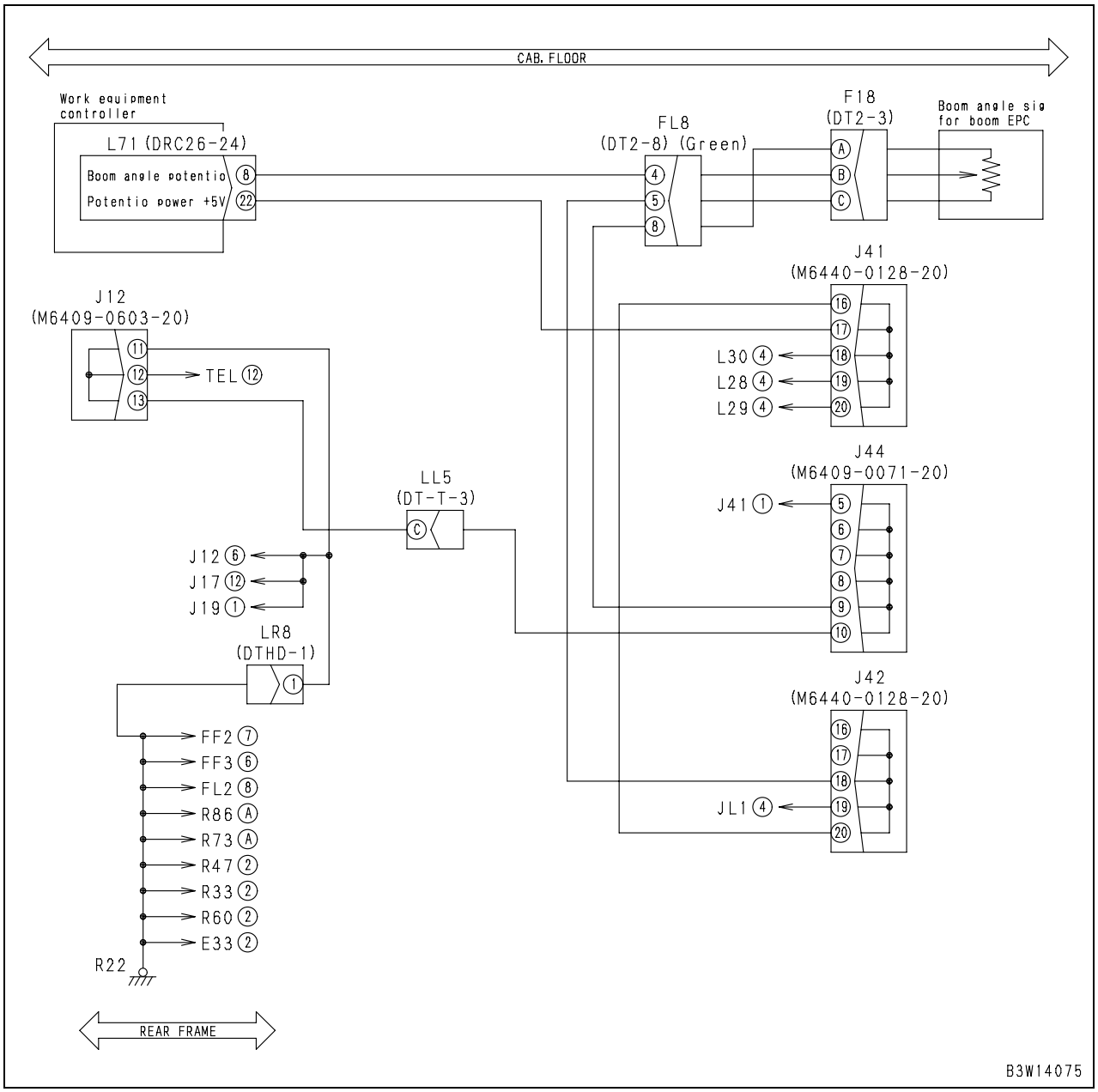
Failure code [DKA0L0] (Lift arm angle sensor: Double meshing)

Action code	Failure code	Trouble	Lift arm angle sensor: Double meshing (Work equipment controller system)
E01	**DKA0L0**		
Contents of trouble	• Due to lift arm angle sensor dislocation, lift arm angle is not detectable correctly. (Lift arm angle upper limit +5° and above or lift arm angle lower limit +5° or above)		
Action of controller	• Resets the remote positioner function. • Resets semi auto digging function. • No PC control while the lift arm is rising. • When the remote positioner down setting is ON, turns OFF the lift arm float detent, and when the remote positioner down setting is OFF, usually operates the lift arm float detent. • Turns the lift arm up detent OFF • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• Remote positioner malfunction (operation is not stopped) • Malfunctioning in semiautomatic digging operation (operation is stopped) • No PC control while the lift arm is rising		
Related information	• This failure code is sometimes displayed if the initial setting of the lift arm angle sensor was not appropriate. • The input state (angle) from the lift arm angle sensor can be checked with the monitoring function (Code: 06002, BOOM ANG). • The input state (voltage) from the lift arm angle sensor can be checked with the monitoring function (Code: 06005, BOOM ANG). • Method of reproducing failure code: Start engine and set the lift arm to up or down stroke end		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective lift arm angle sensor adjustment	★ Adjustment of lift arm angle sensor may be defective. Check it directly (see Testing and adjusting).		
	2	Defective lift arm angle sensor (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			F18 (male)	Resistance	
			Between (A) and (C)	5 kΩ ± 20%	
			Between (A), (B), (C) and chassis ground	Min. 1 MΩ	
			★ Prepare with starting switch OFF, then start engine and carry out troubleshooting.		
			F18	Lift arm position	Voltage
			Between (C) and (A)	Constant	4.85 – 5.15 V
			Between (B) and (A)	Constant	0.83 – 4.17 V
				Up stroke end	3.50 – 4.17 V
				Lower stroke end	0.83 – 1.88 V
	3	Defective work equipment controller	★ Prepare with starting switch OFF, then start engine and carry out troubleshooting.		
			L71	Lift arm position	Voltage
			Between (8) and chassis ground	Constant	0.83 – 4.17 V
				Up stroke end	3.50 – 4.17 V
				Lower stroke end	0.83 – 1.88 V

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Circuit diagram related to lift arm angle sensor



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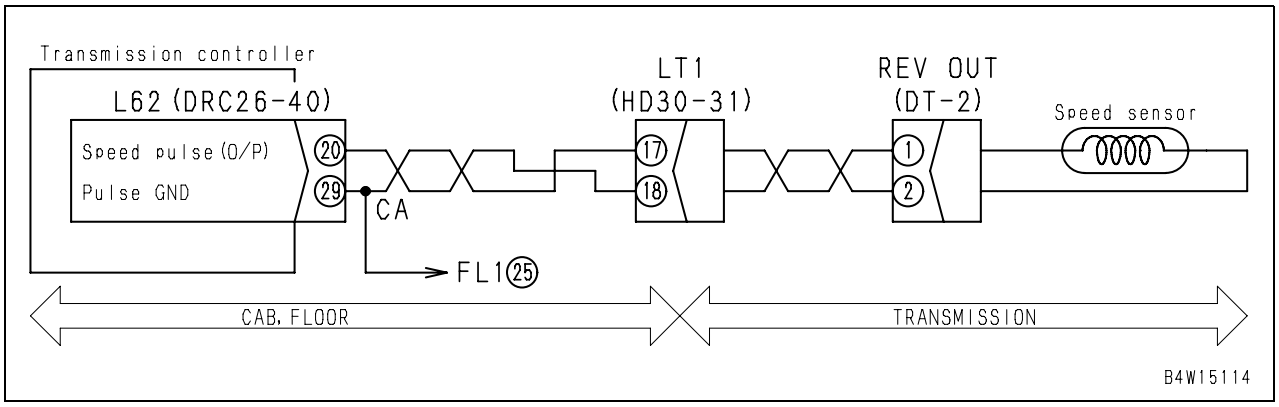
Failure code [DLT3KA] (Transmission output shaft speed sensor: Disconnection)

Action code	Failure code	Trouble	Transmission output shaft speed sensor: Disconnection (Transmission controller system)
E03	**DLT3KA**		
Contents of trouble	• Due to disconnection in the transmission output shaft speed sensor system, the signal voltage is outside the lower limit. • This failure code appears under the following conditions. 1) Disconnection detection input voltage is max. 1.5 V 2) Pulse has not been input		
Action of controller	• In the auto-shift mode, changes the shift mode to the manual mode. • In the auto-shift mode, changes the mode for transmitting signal to the machine monitor to the manual mode. • When the manual shift mode is turned on, normal control is carried out. • Releases the lockup clutch (if equipped). • When the 1st speed is set, the controller constantly turns on the torque derating function. • Maintains the travel speed that had been set prior to the failure. • Turns the centralized warning lamp and alarm buzzer ON. • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• The auto-shift mode is not turned on (the manual shift mode is selected) • Lockup becomes unavailable • Travel speed derating function is unavailable • Transmission protection function is unavailable • When the 1st speed is set, digging torque is reduced. • Gear shifting shocks are made. • The auto-shift pilot lamp goes off.		
Related information	• The input state (speed) from the transmission output shaft speed sensor can be checked with the monitoring function (Code: 31400, T/M SPEED OUT). • Method of reproducing failure code: Start engine and move the machine		

Possible causes and standard value in normal state	Causes		Standard value in normal state/Remarks on troubleshooting			
	1	Defective adjustment of transmission output shaft speed sensor	★ The transmission output shaft speed sensor adjustment may be defective. Check it directly (see Testing and adjusting, Adjusting transmission speed sensor).			
	2	Defective transmission output shaft speed sensor (Internal disconnection)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			REV OUT (male)	Resistance		
			Between (1) and (2)	500 – 1,000 Ω		
	3	Disconnection in wiring harness (Disconnection in wiring harness or detective contact)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L62 (female) (20) – REV OUT (female) (2)	Resistance	Max. 1 Ω	
			Wiring harness between L62 (female) (29) – REV OUT (female) (1)	Resistance	Max. 1 Ω	
	4	Defective transmission controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L62	Resistance		
			Between (20) and (29)	500 – 1,000 Ω		

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Circuit diagram related to transmission output shaft speed sensor



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Failure code [DLT3LC] (Transmission output shaft speed sensor: Out of input signal range)

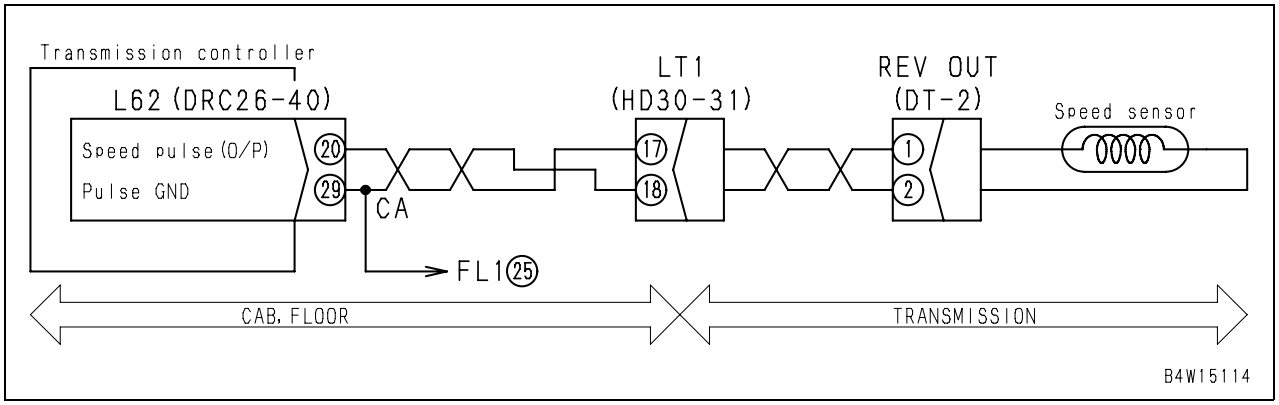
Action code	Failure code	Trouble	Transmission output shaft speed sensor: Out of input signal range (Transmission controller system)
E03	**DLT3LC**		
Contents of trouble	• Due to ground fault in the transmission output shaft speed sensor system, the signal voltage is lower than the normal range. • Failure detection condition 1) If the current travel speed – 15 km/h or above – were changed (reduced) by 5 km/h or more and the pulse is 10 msec or above, the travel speed immediately preceding the change is maintained. (If pulse update of the transmission output shaft speed sensor is continued 50 msec or more and the travel speed pulse input voltage below 1.5 V is detected 5 times or more, the currently held preceding travel speed is canceled.) 2) When the output is not set to N, an error is turned on if the immediately preceding travel speed is held for more than 10 seconds.		
Action of controller	• In the auto-shift mode, changes the shift mode to the manual mode. • In the auto-shift mode, changes the mode for transmitting signal to the machine monitor to the manual mode. • When the manual shift mode is turned on, normal control is carried out. • Controls the operation by determining the output shaft speed from the input shaft speed and the gear speed reduction ratio. • Resets the torque converter lockup. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• The auto-shift mode is not turned on (the manual shift mode is selected) • Torque converter lockup becomes unavailable. • Travel speed derating function is unavailable • Transmission protection function is unavailable • When the 1st speed is set, digging torque goes low. • Gear shifting shocks are made.		
Related information	• The input state (speed) from the transmission output shaft speed sensor can be checked with the monitoring function (Code: 31400, T/M SPEED OUT). • Method of reproducing failure code: Start engine and move the machine		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective adjustment of transmission output shaft speed sensor	★ The transmission output shaft speed sensor adjustment may be defective. Check it directly (see Testing and adjusting, Adjusting transmission speed sensor).			
	2	Defective transmission output shaft speed sensor (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			REV OUT (male)	Resistance		
			Between (1) and (2)	500 – 1,000 Ω		
			Between (1), (2) and chassis ground	Min. 1 MΩ		
	3	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L62 (female) (20) – REV OUT (female) (2) and chassis ground	Resistance	Min. 1 MΩ	
	4	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			Wiring harness between L62 (female) (20) – REV OUT (female) (2) and chassis ground	Voltage	Max. 1 V	

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Possible causes and standard value in normal state	Causes		Standard value in normal state/Remarks on troubleshooting	
	5	Defective transmission controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.	
			L62	Resistance
			Between (20) and (29)	500 – 1,000 Ω
			Between (20), (29) and chassis ground	Min. 1 MΩ

Circuit diagram related to transmission output shaft speed sensor



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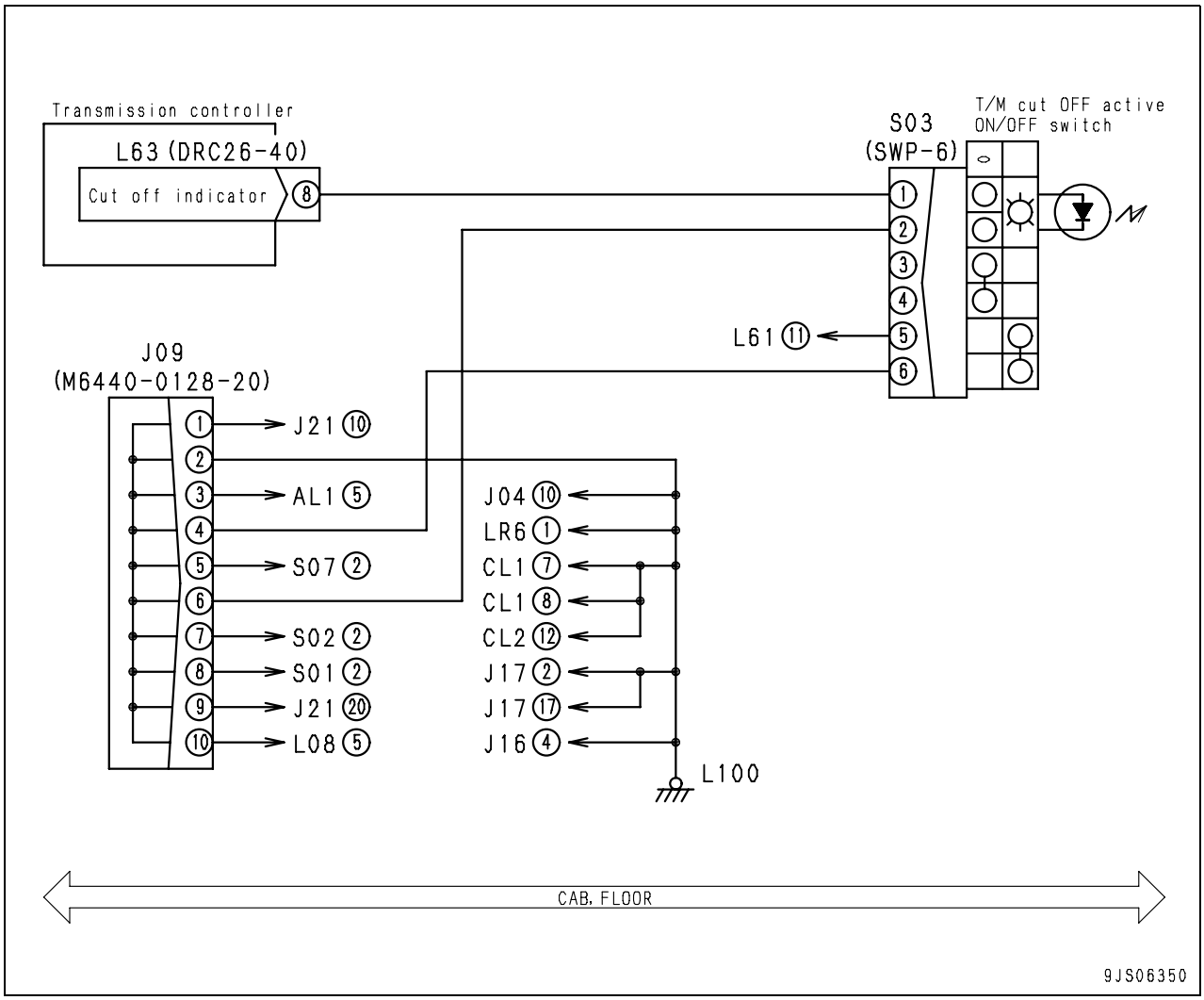
Failure code [DT20KB] (Transmission cut-off indicator lamp: Short circuit)

Action code	Failure code	Trouble	Transmission cut-off indicator lamp: Short circuit (Transmission controller system)
E01	**DT20KB**		
Contents of trouble	• Since the transmission cut-off indicator lamp system is shorted, output signals are not entered to the indicator lamp.		
Action of controller	• Turns off the transmission cut-off indicator lamp. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• Transmission cut-off indicator lamp does not light up.		
Related information	• Method of reproducing failure code: Start engine and turn transmission cut-off switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective transmission cut-off indicator lamp (LED) (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			S03 (male)		Resistance	
			Between (2) and (1)		Min. 1 MΩ (No continuity)	
			Between (1), (2) and chassis ground		Min. 1 MΩ	
	2	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L63 (female) (8) – S03 (female) (1) and chassis ground		Resis-tance	Min. 1 MΩ
	3	Defective transmission controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			L63	Transmission cut-off switch	Voltage	
			Between (8) and chassis ground	ON	Max. 1 V	
				OFF	20 – 30 V	

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Circuit diagram related to transmission cut-off indicator lamp



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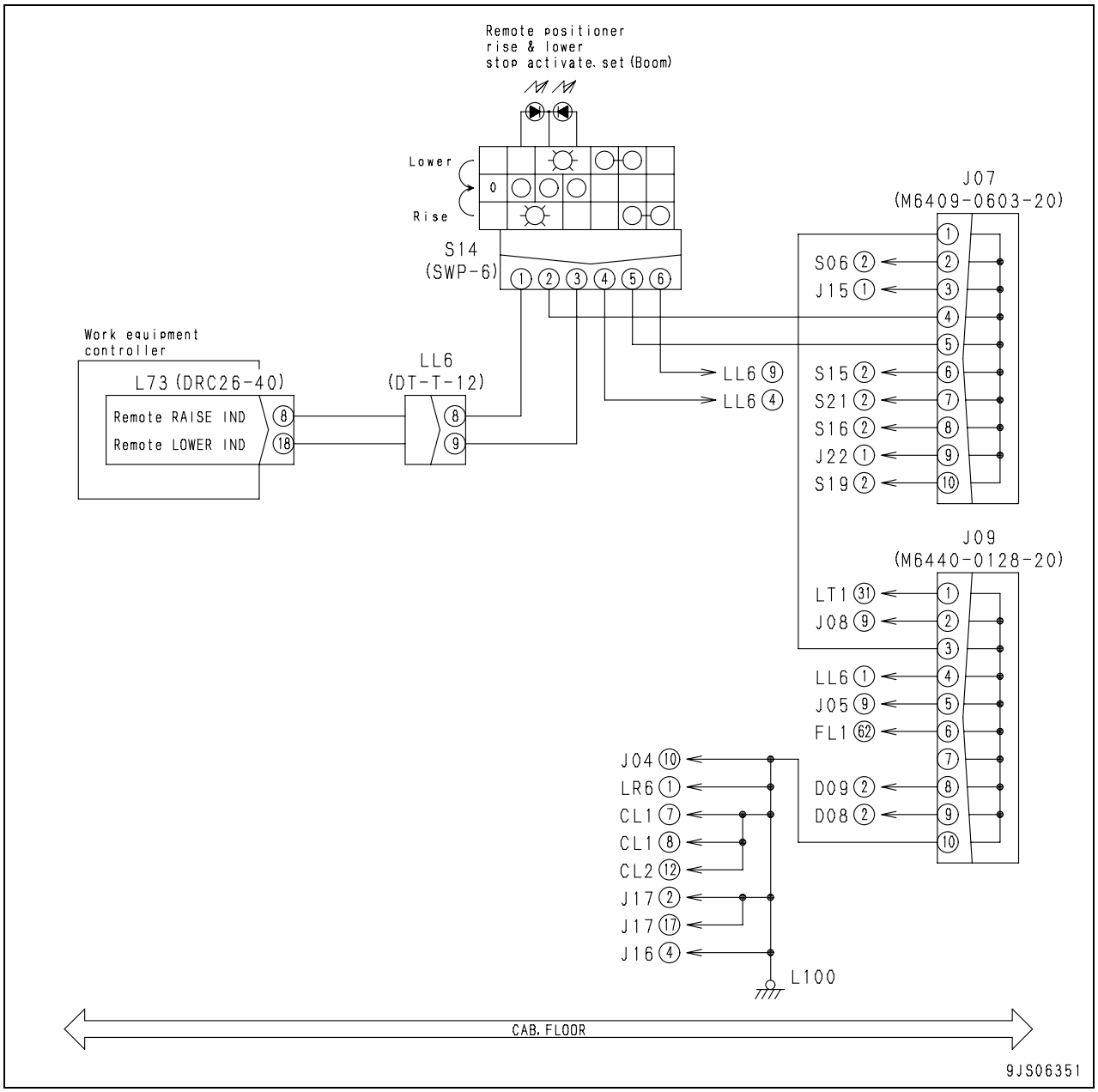
Failure code [DUM1KB] (Remote positioner raise set indicator lamp: Short circuit)

Action code	Failure code	Trouble	Remote positioner raise set indicator lamp: Short circuit (Work equipment controller system)
—	**DUM1KB**		
Contents of trouble	• Since the remote positioner raise set indicator lamp system is shorted, output signal are not entered to the indicator lamp.		
Action of controller	• Turns off the remote positioner raise set indicator output. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• Remote positioner raise set indicator lamp does not light up.		
Related information	• The output state (ON/OFF) to the remote positioner raise set indicator lamp can be checked with the monitoring function (Code: 40954, D-OUT-18). • Method of reproducing failure code: Start engine		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective remote positioner raise set indicator lamp (LED) (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON. • See Testing and adjusting, Diode inspection procedure.			
			S14 (male)		Resistance	
			Between (2) and (1)		Min. 1 MΩ (No continuity)	
			Between (1), (2) and chassis ground		Min. 1 MΩ	
	2	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L73 (female) (8) – S14 (female) (1) and chassis ground		Resistance	Min. 1 MΩ
	3	Defective work equipment controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			L73	Remote positioner raise	Voltage	
			Between (8) and chassis ground	When used	20 – 30 V	
				When not used.	Max. 1 V	

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Circuit diagram related to remote positioner raise/lower set indicator lamp



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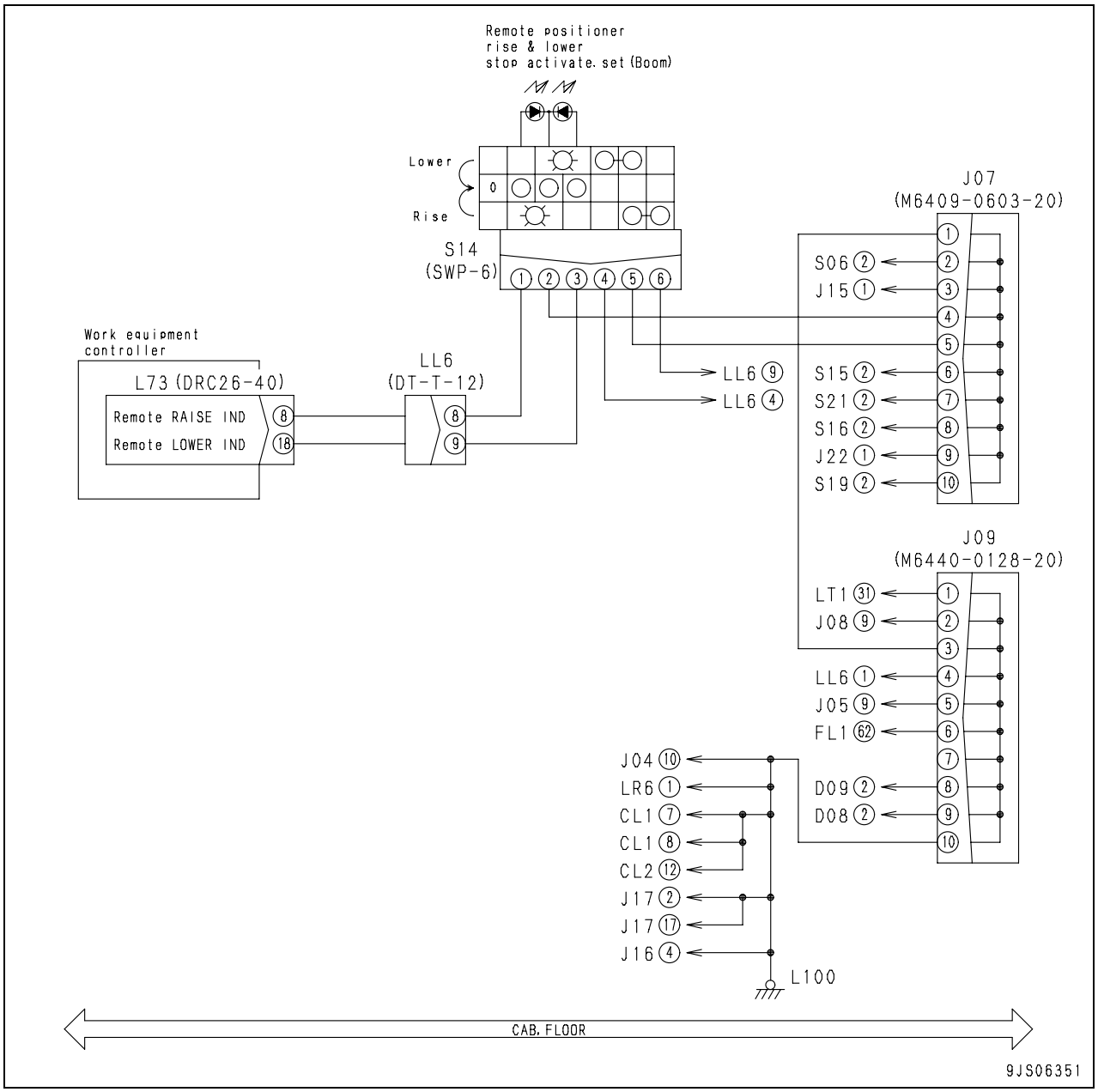
Failure code [DUM2KB] (Remote positioner lower set indicator lamp: Short circuit)

Action code	Failure code	Trouble	Remote positioner lower set indicator lamp: Short circuit (Work equipment controller system)
—	**DUM2KB**		
Contents of trouble	• Since the remote positioner lower set indicator lamp system is shorted, output signals are not entered to the indicator lamp.		
Action of controller	• Turns off the remote positioner lower set indicator output. • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• Remote positioner lower set indicator lamp does not light up.		
Related information	• The output state (ON/OFF) to the remote positioner lower set indicator lamp can be checked with the monitoring function (Code: 40954, D-OUT-19). • Method of reproducing failure code: Start engine		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective remote positioner lower set indicator lamp (LED) (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON. • See Testing and adjusting, Diode inspection procedure.			
			S14 (male)		Resistance	
			Between (2) and (3)		Min. 1 MΩ (No continuity)	
			Between (2), (3) and chassis ground		Min. 1 MΩ	
	2	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L73 (female) (18) – S14 (female) (3) and chassis ground		Resistance	Min. 1 MΩ
	3	Defective work equipment controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			L73	Remote positioner lower	Voltage	
			Between (18) and chassis ground	When used	20 – 30 V	
				When not used.	Max. 1 V	

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Circuit diagram related to remote positioner raise/lower set indicator lamp



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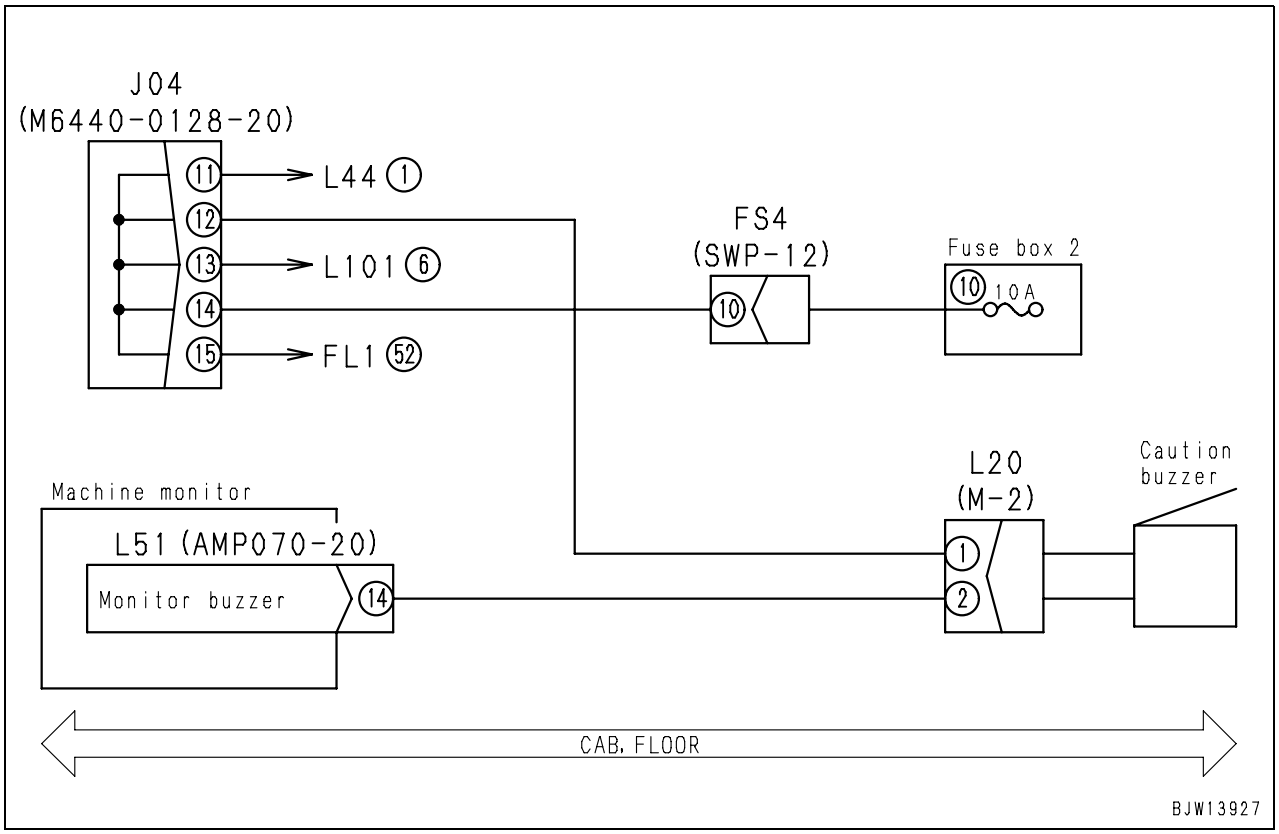
Failure code [DV00KB] (Alarm buzzer: Short circuit)

Action code	Failure code	Trouble	Alarm buzzer: Short circuit (Machine monitor system)
E01	**DV00KB**		
Contents of trouble	• The alarm buzzer output circuit is shorted with the power source.		
Action of controller	• Stops alarm buzzer output. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• Alarm buzzer does not sound.		
Related information	• The output state (ON/OFF) to the alarm buzzer can be checked with the monitoring function (Code: 40952, D-OUT-0). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			Wiring harness between L51 (female) (14) – L20 (female) (2) and chassis ground	Voltage	Max. 1 V
	2	Defective alarm buzzer (Internal short circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting. • Remove the buzzer, then connect +24 V to L20 (male) (1) and GND to L20 (male) (2).		
			Alarm buzzer sounds	Alarm buzzer is normal	
			Alarm buzzer does not sound	Defective alarm buzzer	
	3	Defective machine monitor	• When above 1) and 2) are normal, failure on the machine monitor can be suspected.		

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Circuit diagram related to alarm buzzer



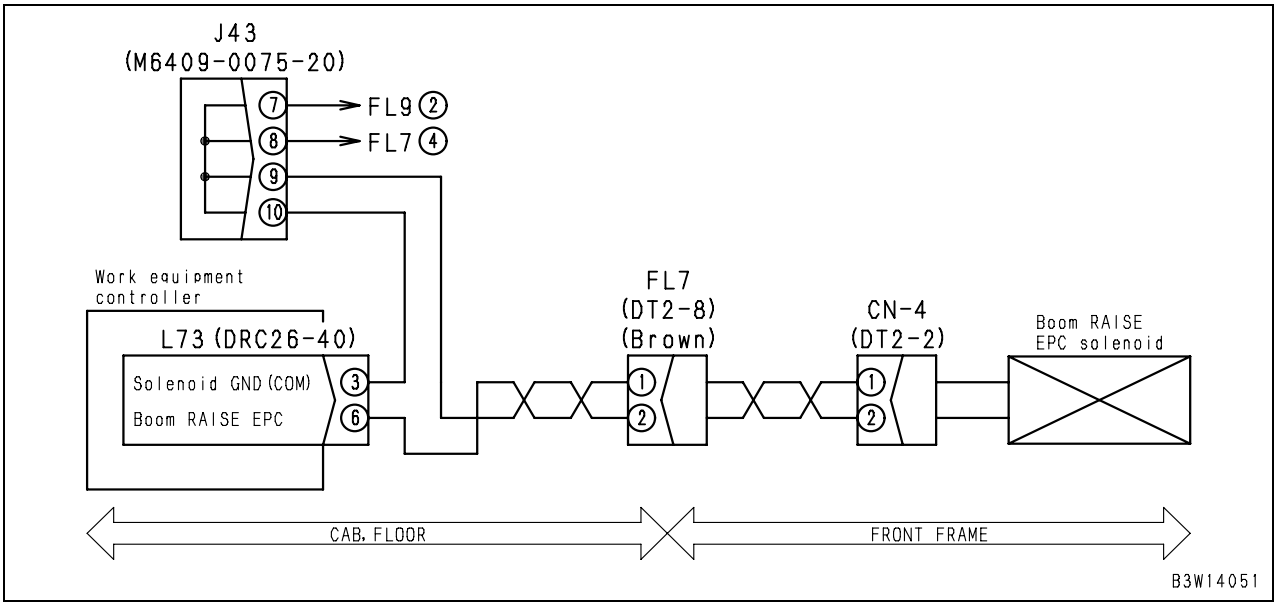
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Failure code [DW4PKA] (Lift arm raise EPC solenoid: Disconnection)

Action code	Failure code	Trouble	Lift arm raise EPC solenoid: Disconnection (Work equipment controller system)
E03	**DW4PKA**		
Contents of trouble	• Since the lift arm raise EPC solenoid output signal system is disconnected, no current flows when the lift arm raise EPC solenoid output is ON.		
Action of controller	• Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• Lift arm does not rise		
Related information	• The output state (current value) to the lift arm raise EPC solenoid can be checked with the monitoring function (Code: 41900, RAISE EPC DIR). • Method of reproducing failure code: Engine started + lift arm raise		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective lift arm raise EPC solenoid (Internal disconnection)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			CN-4 (male)	Resistance		
			Between (1) and (2)	5 – 15 Ω		
	2	Disconnection in wiring harness (Disconnection in wiring harness or defective contact)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L73 (female) (6) – CN-4 (female) (1)	Resistance	Max. 1 Ω	
			Wiring harness between L73 (female) (3) – CN-4 (female) (2)	Resistance	Max. 1 Ω	
	3	Defective work equipment controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L73 (female)	Resistance		
			Between (6) and (3)	5 – 15 Ω		

Circuit diagram related to lift arm raise EPC solenoid



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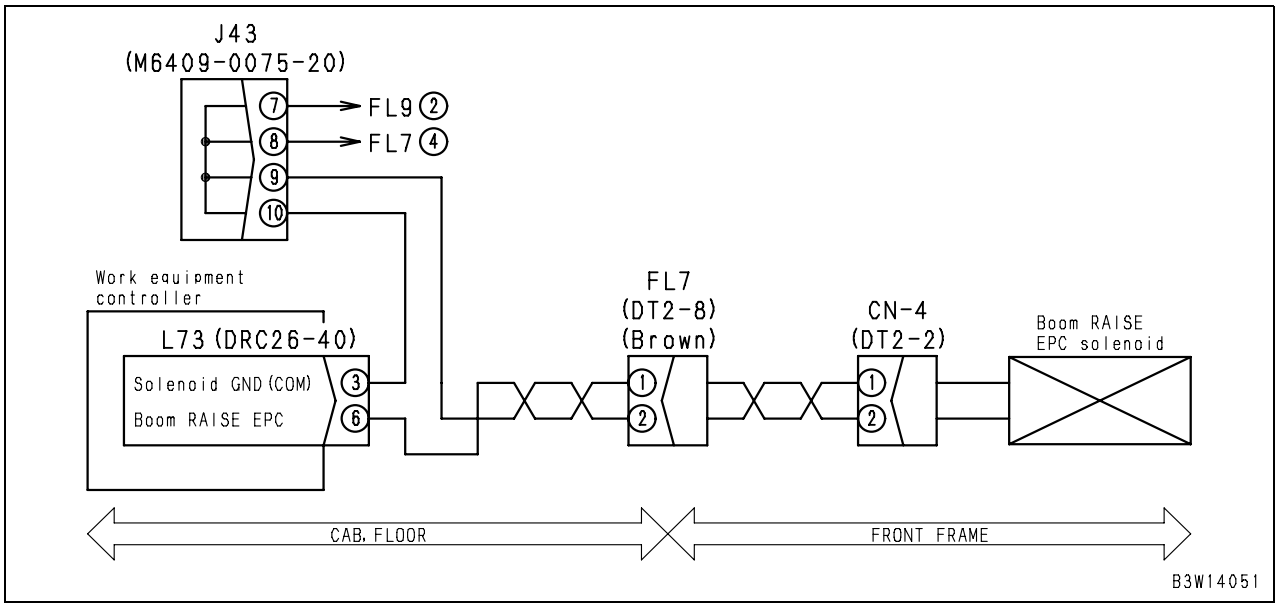
Failure code [DW4PKB] (Lift arm raise EPC solenoid: Short circuit)

Action code	Failure code	Trouble	Lift arm raise EPC solenoid: Short circuit (Work equipment controller system)
E03	**DW4PKB**		
Contents of trouble	• Since the lift arm raise EPC solenoid signal system is shorted, abnormal current flows when the lift arm raise EPC solenoid output is turned ON.		
Action of controller	• Stops outputting the signal to the lift arm raise EPC solenoid. • Stops outputting the signal to the lift arm raise detent. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• Lift arm does not rise		
Related information	• The output state (current value) to the lift arm raise EPC solenoid can be checked with the monitoring function (Code: 41900, RAISE EPC DIR). • Method of reproducing failure code: Engine started + lift arm raise		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective lift arm raise EPC solenoid (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			CN-4 (male)	Resistance		
			Between (1) and (2)	5 – 15 Ω		
			Between (1), (2) and chassis ground	Min. 1 MΩ		
	2	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L73 (female) (6) – CN-4 (female) (1) and chassis ground	Resistance	Min. 1 MΩ	
	3	Defective work equipment controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L73 (female)	Resistance		
			Between (6) and (3)	5 – 15 Ω		
			Between (6), (3) and chassis ground	Min. 1 MΩ		

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Circuit diagram related to lift arm raise EPC solenoid



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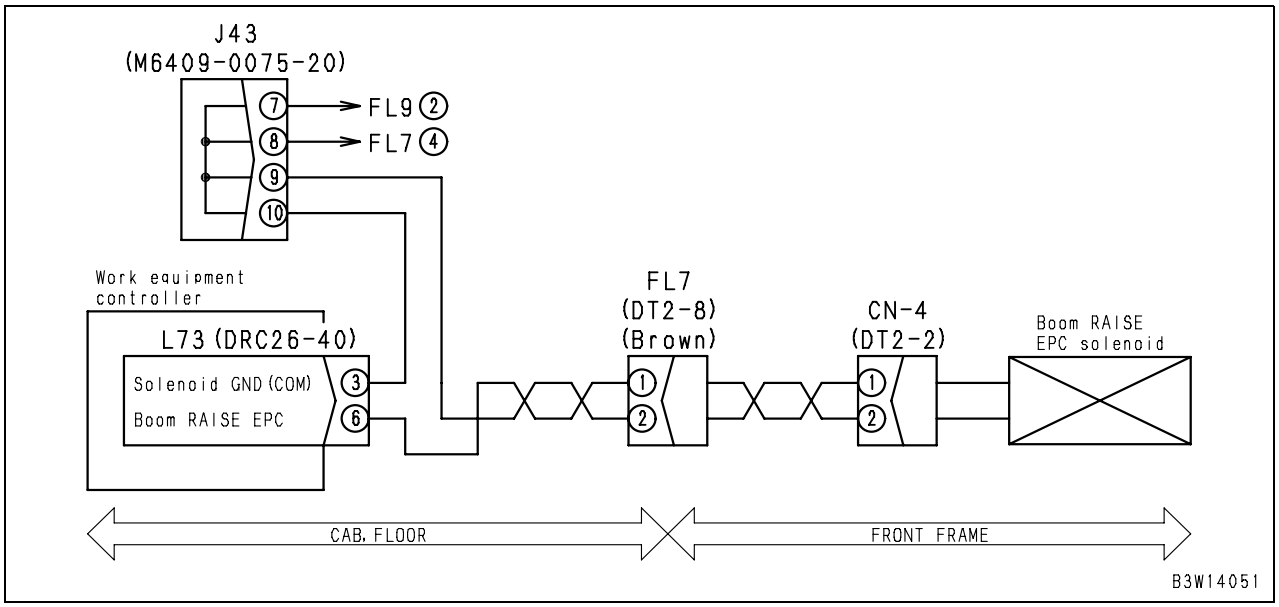
Failure code [DW4PKY] (Lift arm raise EPC solenoid: Short circuit with power supply line)

Action code	Failure code	Trouble	Lift arm raise EPC solenoid: Short circuit with power supply line (Work equipment controller system)
E03	**DW4PKY**		
Contents of trouble	• Since the lift arm raise EPC solenoid signal system is shorted with the power source, abnormal voltage is applied when the lift arm raise EPC solenoid output is OFF.		
Action of controller	• Turns the output to the work equipment neutral lock solenoid ON. • Stops outputting the signal to the lift arm raise/lower, bucket tilt/dump, 3-spool valve (attachment) extract/retract EPC solenoid. • Stops outputting the signal to all work equipment detent. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• When the work equipment neutral lock solenoid is turned ON, all the work equipment do not work. • The lift arm raise EPC solenoid may be burnt out.		
Related information	• The output state (current value) to the lift arm raise EPC solenoid can be checked with the monitoring function (Code: 41900, RAISE EPC DIR). • The output state (current value) to the lift arm lower EPC solenoid can be checked with the monitoring function (Code: 41901, LOWER EPC DIR). • The output state (current value) to the bucket tilt EPC solenoid can be checked with the monitoring function (Code: 41902, TILT EPC DIR). • The output state (current value) to the bucket dump EPC solenoid can be checked with the monitoring function (Code: 41903, DUMP EPC DIR). • The output state (current value) to the 3-spool valve (attachment) extend EPC solenoid can be checked with the monitoring function (Code: 41906, 3RD EPC1 DIR). • The output state (current value) to the 3-spool valve (attachment) retract EPC solenoid can be checked with the monitoring function (Code: 41907, 3RD EPC2 DIR). • Method of reproducing failure code: Start engine		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective lift arm raise EPC solenoid (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			CN-4 (male)	Resistance	
			Between (1) and (2)	5 – 15 Ω	
			Between (1), (2) and chassis ground	Min. 1 MΩ	
	2	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			Wiring harness between L73 (female) (6) – CN-4 (female) (1) and chassis ground	Voltage	Max. 1 V
	3	Defective work equipment controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			L73 (female)	Resistance	
			Between (6) and (3)	5 – 15 Ω	
			Between (6), (3) and chassis ground	Min. 1 MΩ	

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Circuit diagram related to lift arm raise EPC solenoid



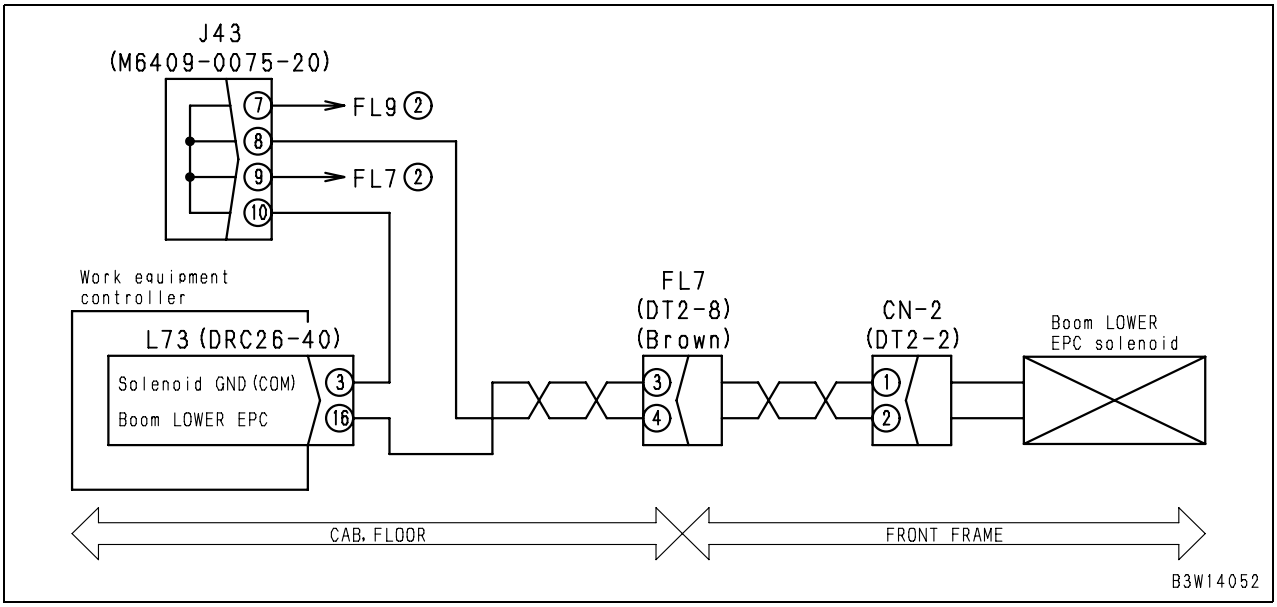
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Failure code [DW4QKA] (Lift arm lower EPC solenoid: Disconnection)

Action code	Failure code	Trouble	Lift arm lower EPC solenoid: Disconnection (Work equipment controller system)
E03	**DW4QKA**		
Contents of trouble	• Since the lift arm lower EPC solenoid output signal system is disconnected, no current flows when the lift arm lower EPC solenoid output is ON.		
Action of controller	• Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF once.		
Problem that appears on machine	• Lift arm does not lower.		
Related information	• The output state (current value) to the lift arm lower EPC solenoid can be checked with the monitoring function (Code: 41901, LOWER EPC DIR). • Method of reproducing failure code: Start engine and lower the lift arm.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective lift arm lower EPC solenoid (Internal disconnection)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			CN-2 (male)	Resistance	
			Between (1) and (2)	5 – 15 Ω	
	2	Disconnection in wiring harness (Disconnection in wiring harness or defective contact)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between L73 (female) (16) – CN-2 (female) (1)	Resistance	Max. 1 Ω
			Wiring harness between L73 (female) (3) – CN-2 (female) (2)	Resistance	Max. 1 Ω
	3	Defective work equipment controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			L73 (female)	Resistance	
			Between (16) and (3)	5 – 15 Ω	

Circuit diagram related to lift arm lower EPC solenoid



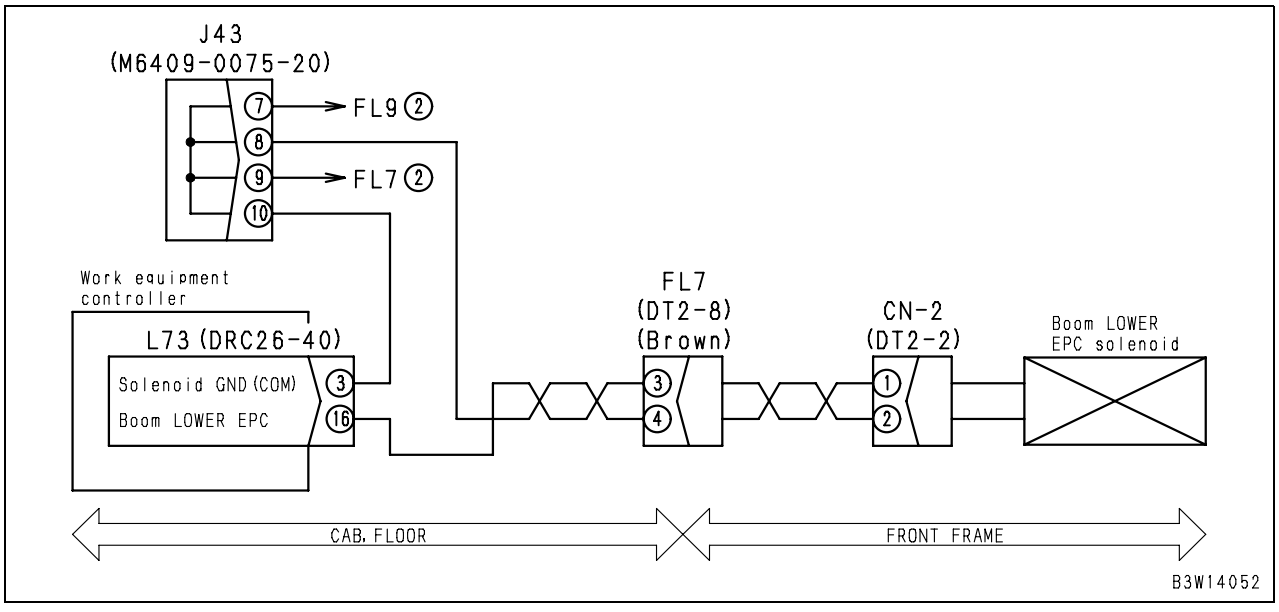
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Failure code [DW4QKB] (Lift arm lower EPC solenoid: Short circuit)

Action code	Failure code	Trouble	Lift arm lower EPC solenoid: Short circuit (Work equipment controller system)
E03	**DW4QKB**		
Contents of trouble	• Since the lift arm lower EPC solenoid signal system is shorted, abnormal current flows when the lift arm lower EPC solenoid output is ON.		
Action of controller	• Stops outputting the signal to the lift arm lower EPC solenoid. • Stops outputting the signal to the lift arm float magnet detent. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• Lift arm does not lower.		
Related information	• The output state (current value) to the lift arm lower EPC solenoid can be checked with the monitoring function (Code: 41901, LOWER EPC DIR). • Method of reproducing failure code: Start engine and lower the lift arm.		

Possible causes and standard value in normal state	Causes		Standard value in normal state/Remarks on troubleshooting			
	1	Defective lift arm lower EPC solenoid (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			CN-2 (male)	Resistance		
			Between (1) and (2)	5 – 15 Ω		
			Between (1), (2) and chassis ground	Min. 1 MΩ		
	2	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L73 (female) (16) – CN-2 (female) (1) and chassis ground	Resistance	Min. 1 MΩ	
	3	Defective work equipment controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L73 (female)	Resistance		
			Between (16) and (3)	5 – 15 Ω		
			Between (16), (3) and chassis ground	Min. 1 MΩ		

Circuit diagram related to lift arm lower EPC solenoid



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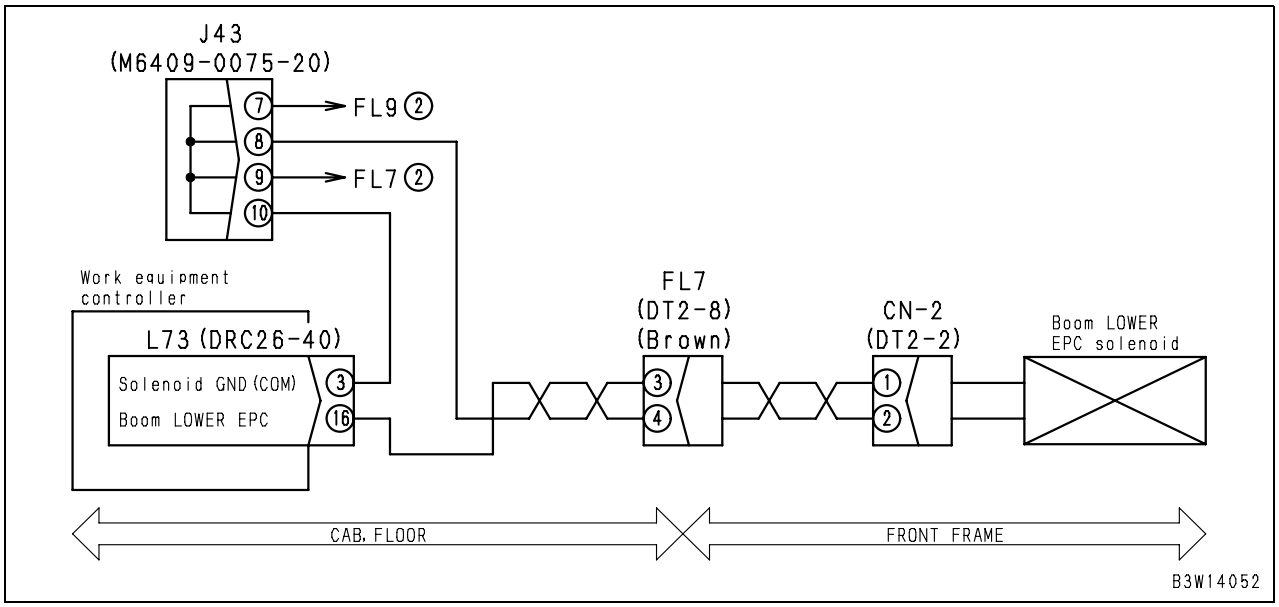
Failure code [DW4QKY] (Lift arm lower EPC solenoid: Short circuit with power supply line)

Action code	Failure code	Trouble	Lift arm lower EPC solenoid: Short circuit with power supply line (Work equipment controller system)
E03	**DW4QKY**		
Contents of trouble	• Since the lift arm lower EPC solenoid signal system is shorted with the power source, abnormal voltage is applied when the lift arm lower EPC solenoid output is OFF.		
Action of controller	• Turns the output to the work equipment neutral lock solenoid ON. • Stops outputting the signal to the lift arm raise/lower, bucket tilt/dump, 3-spool valve (attachment) extract/retract EPC solenoid. • Stops outputting the signal to all work equipment detent. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• When the work equipment neutral lock solenoid is turned ON, all the work equipment do not work. • The lift arm lower EPC solenoid may be burnt out.		
Related information	• The output state (current value) to the lift arm raise EPC solenoid can be checked with the monitoring function (Code: 41900, RAISE EPC DIR). • The output state (current value) to the lift arm lower EPC solenoid can be checked with the monitoring function (Code: 41901, LOWER EPC DIR). • The output state (current value) to the bucket tilt EPC solenoid can be checked with the monitoring function (Code: 41902, TILT EPC DIR). • The output state (current value) to the bucket dump EPC solenoid can be checked with the monitoring function (Code: 41903, DUMP EPC DIR). • The output state (current value) to the 3-spool valve (attachment) extend EPC solenoid can be checked with the monitoring function (Code: 41906, 3RD EPC1 DIR). • The output state (current value) to the 3-spool valve (attachment) retract EPC solenoid can be checked with the monitoring function (Code: 41907, 3RD EPC2 DIR). • Method of reproducing failure code: Start engine		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective lift arm lower EPC solenoid (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			CN-2 (male)	Resistance	
			Between (1) and (2)	5 – 15 Ω	
			Between (1), (2) and chassis ground	Min. 1 MΩ	
	2	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			Wiring harness between L73 (female) (16) – CN-2 (female) (1) and chassis ground	Voltage	Max. 1 V
	3	Defective work equipment controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			L73 (female)	Resistance	
			Between (16) and (3)	5 – 15 Ω	
			Between (16), (3) and chassis ground	Min. 1 MΩ	

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Circuit diagram related to lift arm lower EPC solenoid



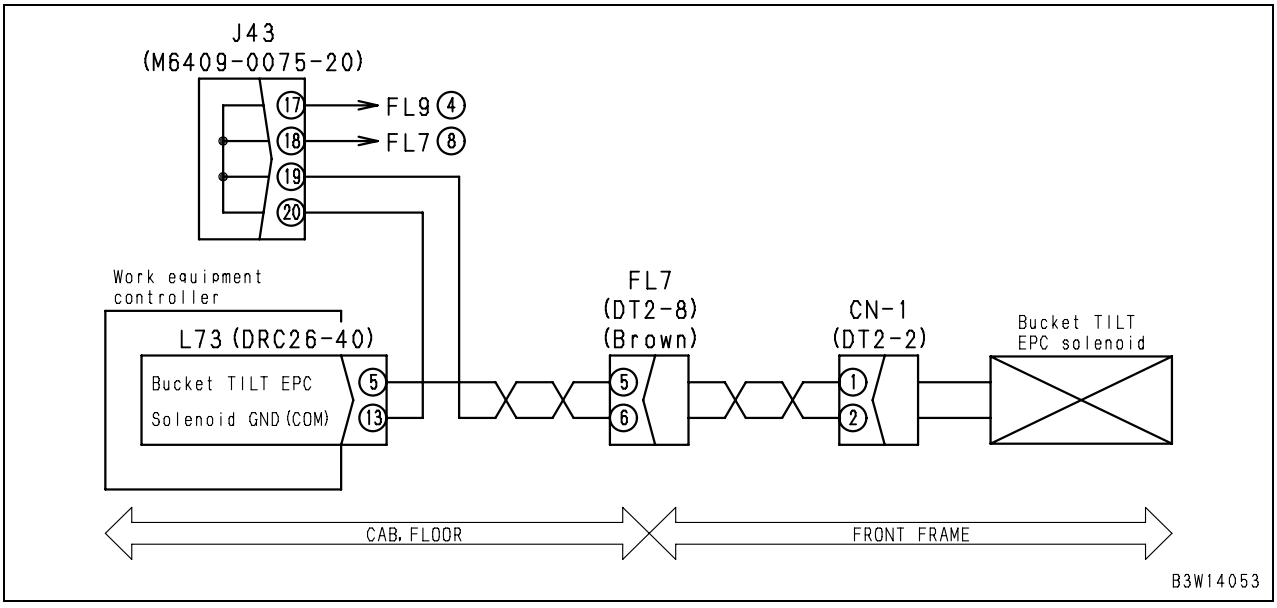
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Failure code [DW4RKA] (Bucket tilt EPC solenoid: Disconnection)

Action code	Failure code	Trouble	Bucket tilt EPC solenoid: Disconnection (Work equipment controller system)
E03	**DW4RKA**		
Contents of trouble	• Since the bucket tilt EPC solenoid output signal output signal system is disconnected, no current flows when the bucket tilt EPC solenoid output is ON.		
Action of controller	• Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• Bucket does not tilt.		
Related information	• The output state (current value) to the bucket tilt EPC solenoid can be checked with the monitoring function (Code: 41902, TILT EPC DIR). • Method of reproducing failure code: Start engine and tilt the bucket.		

Possible causes and standard value in normal state		Causes	Standard value in normal state/Remarks on troubleshooting		
	1	Defective bucket tilt EPC solenoid (Internal disconnection)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			CN-1 (male)	Resistance	
			Between (1) and (2)	5 – 15 Ω	
	2	Disconnection in wiring harness (Disconnection in wiring harness or defective contact)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between L73 (female) (5) – CN-1 (female) (1)	Resistance	Max. 1 Ω
			Wiring harness between L73 (female) (13) – CN-1 (female) (2)	Resistance	Max. 1 Ω
	3	Defective work equipment controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			L73 (female)	Resistance	
			Between (5) and (13)	5 – 15 Ω	

Circuit diagram related to bucket tilt EPC solenoid



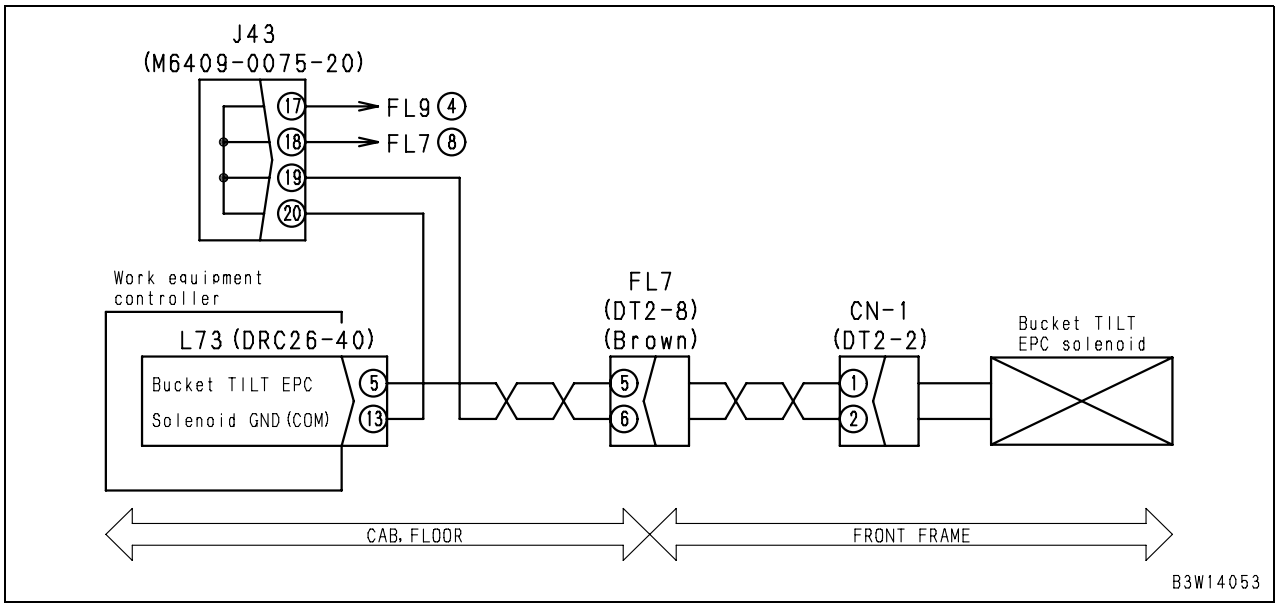
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Failure code [DW4RKB] (Bucket tilt EPC solenoid: Short circuit)

Action code	Failure code	Trouble	Bucket tilt EPC solenoid: Short circuit (Work equipment controller system)
E03	**DW4RKB**		
Contents of trouble	• Since the bucket tilt EPC solenoid signal system is shorted, abnormal current flows when the bucket tilt EPC solenoid output is ON.		
Action of controller	• Stops outputting the signal to the bucket tilt EPC solenoid. • Stops outputting the signal to the bucket tilt detent. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• Bucket does not tilt.		
Related information	• The output state (current value) to the bucket tilt EPC solenoid can be checked with the monitoring function (Code: 41902, TILT EPC DIR). • Method of reproducing failure code: Start engine and tilt the bucket.		

Possible causes and standard value in normal state	Causes		Standard value in normal state/Remarks on troubleshooting			
	1	Defective bucket tilt EPC solenoid (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			CN-1 (male)	Resistance		
			Between (1) and (2)	5 – 15 Ω		
			Between (1), (2) and chassis ground	Min. 1 MΩ		
	2	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L73 (female) (5) – CN-1 (female) (1) and chassis ground	Resistance	Min. 1 MΩ	
	3	Defective work equipment controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L73 (female)	Resistance		
			Between (5) and (13)	5 – 15 Ω		
			Between (5), (13) and chassis ground	Min. 1 MΩ		

Circuit diagram related to bucket tilt EPC solenoid



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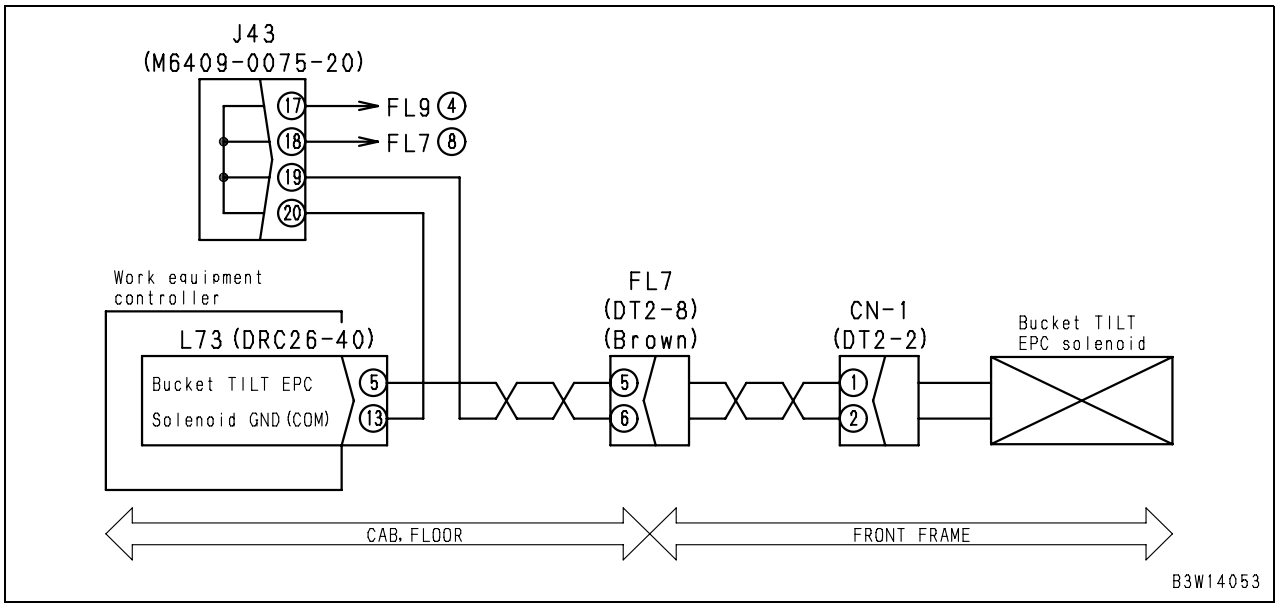
Failure code [DW4RKY] (Bucket tilt EPC solenoid: Short circuit with power supply line)

Action code	Failure code	Trouble	Bucket tilt EPC solenoid: Short circuit with power supply line (Work equipment controller system)
E03	**DW4RKY**		
Contents of trouble	• Since the bucket tilt EPC solenoid signal system is shorted with the power source, abnormal voltage is applied when the bucket tilt EPC solenoid output is OFF.		
Action of controller	• Turns the output to the work equipment neutral lock solenoid ON. • Stops outputting the signal to the lift arm raise/lower, bucket tilt/dump, 3-spool valve (attachment) extract/retract EPC solenoid. • Stops outputting the signal to all work equipment detent. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• When the work equipment neutral lock solenoid is turned ON, all the work equipment do not work. • The bucket tilt EPC solenoid may be burnt out.		
Related information	• The output state (current value) to the lift arm raise EPC solenoid can be checked with the monitoring function (Code: 41900, RAISE EPC DIR). • The output state (current value) to the lift arm lower EPC solenoid can be checked with the monitoring function (Code: 41901, LOWER EPC DIR). • The output state (current value) to the bucket tilt EPC solenoid can be checked with the monitoring function (Code: 41902, TILT EPC DIR). • The output state (current value) to the bucket dump EPC solenoid can be checked with the monitoring function (Code: 41903, DUMP EPC DIR). • The output state (current value) to the 3-spool valve (attachment) extend EPC solenoid can be checked with the monitoring function (Code: 41906, 3RD EPC1 DIR). • The output state (current value) to the 3-spool valve (attachment) retract EPC solenoid can be checked with the monitoring function (Code: 41907, 3RD EPC2 DIR). • Method of reproducing failure code: Start engine		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective bucket tilt EPC solenoid (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			CN-1 (male)	Resistance	
			Between (1) and (2)	5 – 15 Ω	
			Between (1), (2) and chassis ground	Min. 1 MΩ	
	2	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			Wiring harness between L73 (female) (5) – CN-1 (female) (1) and chassis ground	Voltage	Max. 1 V
	3	Defective work equipment controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			L73 (female)	Resistance	
			Between (5) and (13)	5 – 15 Ω	
			Between (5), (13) and chassis ground	Min. 1 MΩ	

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Circuit diagram related to bucket tilt EPC solenoid



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WA430-6 Wheel loader

Form No. SEN01745-02

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WHEEL LOADER

WA430-6

Machine Model	Serial Number
WA430-6	65001 and up

40 Troubleshooting

Troubleshooting by failure code (Display of code), Part 9

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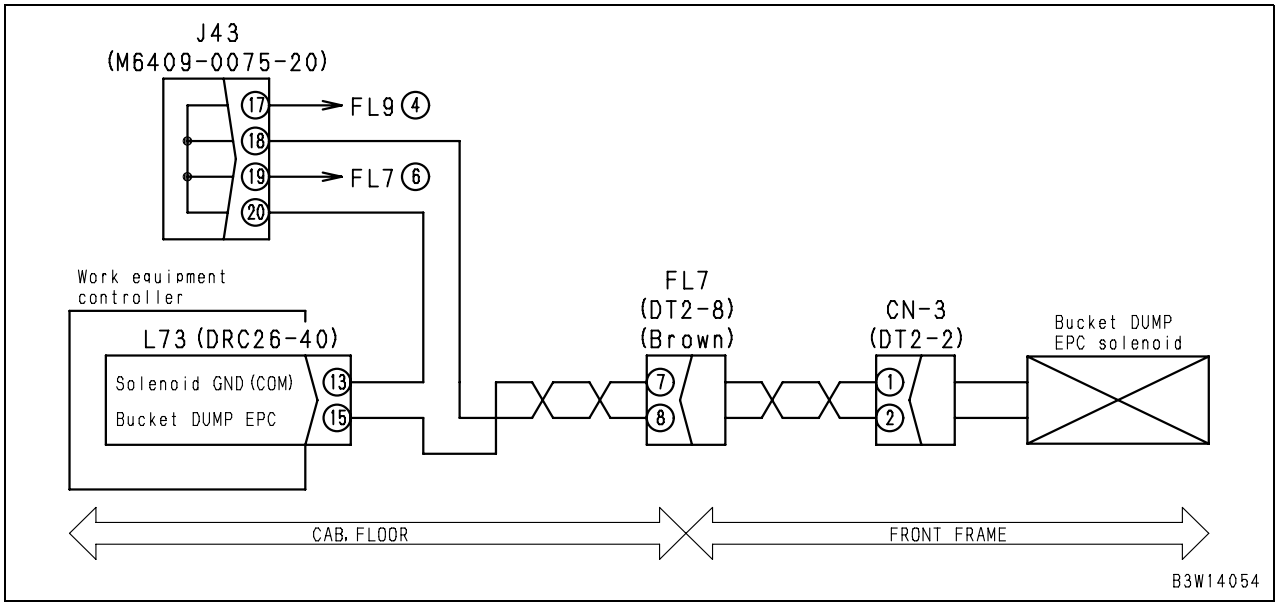
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Failure code [DW4SKA] (Bucket dump EPC solenoid: Disconnection)

Action code	Failure code	Trouble	Bucket dump EPC solenoid: Disconnection (Work equipment controller system)
E03	**DW4SKA**		
Contents of trouble	• Since the bucket dump EPC solenoid output signal system is disconnected, no current flows when the bucket dump EPC solenoid output is ON.		
Action of controller	• Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• Bucket does not dump.		
Related information	• The output state (current value) to the bucket dump EPC solenoid can be checked with the monitoring function (Code: 41903, DUMP EPC DIR). • Method of reproducing failure code: Start engine and dump the bucket.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective bucket dump EPC solenoid (Internal disconnection)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			CN-3 (male)	Resistance	
			Between (1) and (2)	5 – 15 Ω	
	2	Disconnection in wiring harness (Disconnection in wiring harness or defective contact)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between L73 (female) (13) – CN-3 (female) (2)	Resistance	Max. 1 Ω
			Wiring harness between L73 (female) (15) – CN-3 (female) (1)	Resistance	Max. 1 Ω
	3	Defective work equipment controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			L73 (female)	Resistance	
			Between (15) and (13)	5 – 15 Ω	

Circuit diagram related to bucket dump EPC solenoid



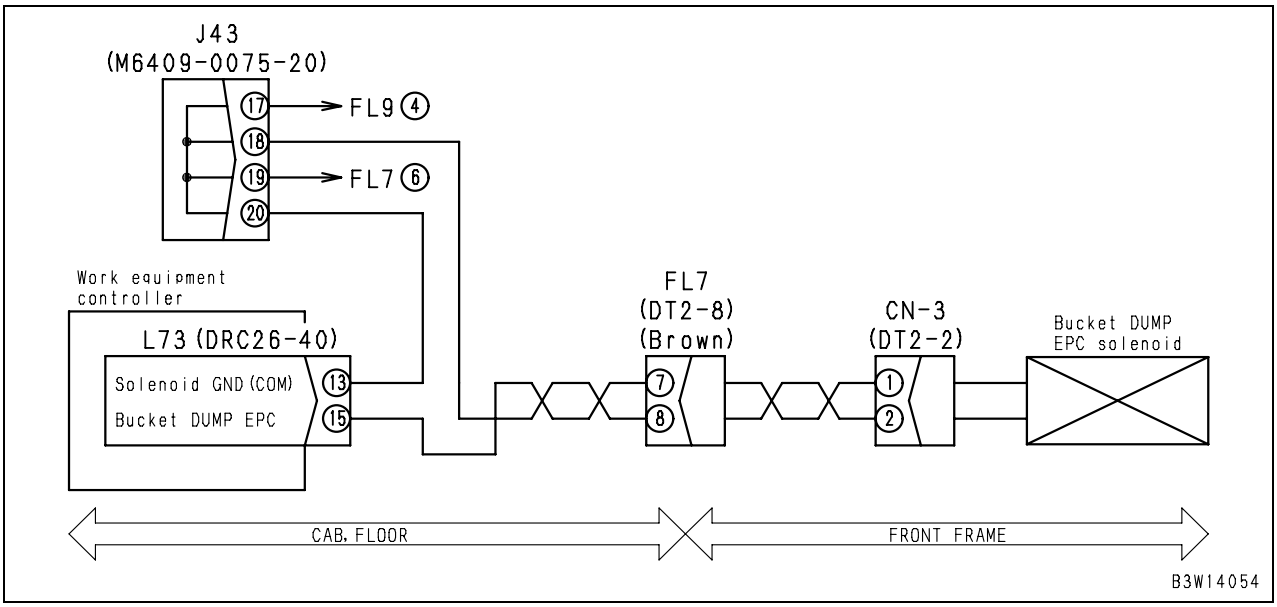
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Failure code [DW4SKB] (Bucket dump EPC solenoid: Short circuit)

Action code	Failure code	Trouble	Bucket dump EPC solenoid: Short circuit (Work equipment controller system)
E03	**DW4SKB**		
Contents of trouble	• Since the bucket dump EPC solenoid signal system is shorted, abnormal current flows when the bucket dump EPC solenoid output is ON.		
Action of controller	• Stops outputting the signal to the bucket dump EPC solenoid. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• Bucket does not dump. • The wiring harness or controller may be burnt out.		
Related information	• The output state (current value) to the bucket dump EPC solenoid can be checked with the monitoring function (Code: 41903, DUMP EPC DIR). • Method of reproducing failure code: Start engine and dump the bucket.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective bucket dump EPC solenoid (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			CN-3 (male)	Resistance		
			Between (1) and (2)	5 – 15 Ω		
			Between (1), (2) and chassis ground	Min. 1 MΩ		
	2	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L73 (female) (15) – CN-3 (female) (1) and chassis ground	Resistance	Min. 1 MΩ	
	3	Defective work equipment controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L73 (female)	Resistance		
			Between (15) and (13)	5 – 15 Ω		
			Between (15), (13) and chassis ground	Min. 1 MΩ		

Circuit diagram related to bucket dump EPC solenoid



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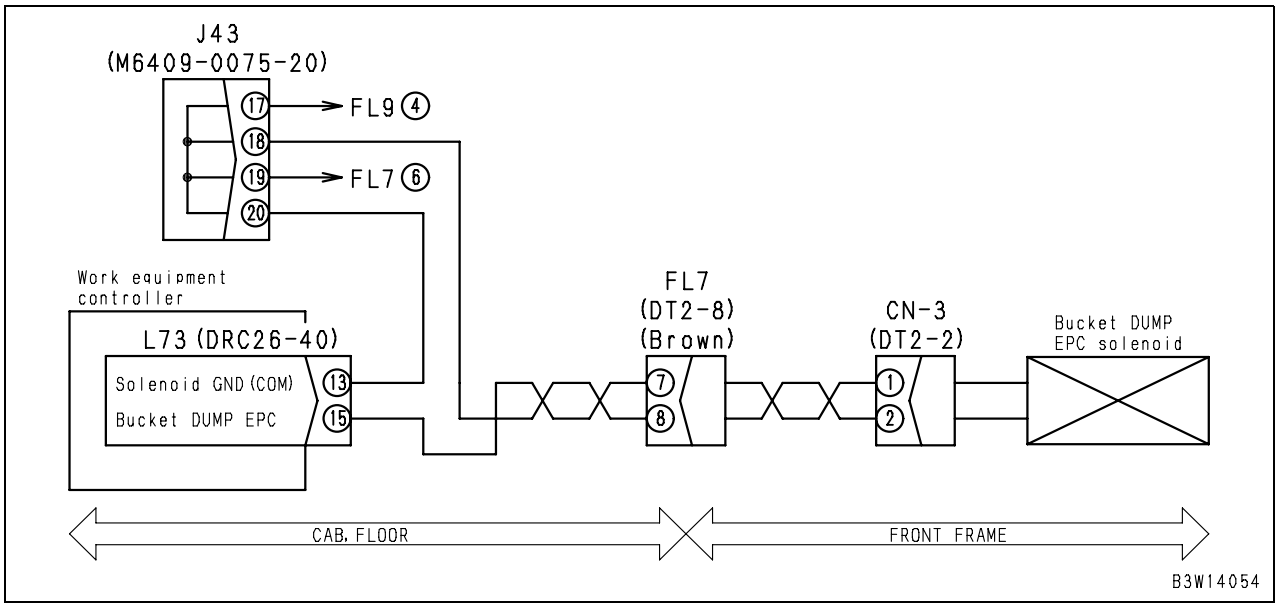
Failure code [DW4SKY] (Bucket dump EPC solenoid: Short circuit with power supply line)

Action code	Failure code	Trouble	Bucket dump EPC solenoid: Short circuit with power supply line (Work equipment controller system)
E03	**DW4SKY**		
Contents of trouble	• Since the bucket dump EPC solenoid signal system is shorted with the power source, abnormal voltage is applied when the bucket dump EPC solenoid output is OFF.		
Action of controller	• Turns the output to the work equipment neutral lock solenoid ON. • Stops outputting the signal to the lift arm raise/lower, bucket tilt/dump, 3-spool valve (attachment) extract/retract EPC solenoid. • Stops outputting the signal to all work equipment detent. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• When the work equipment neutral lock solenoid is turned ON, all the work equipment do not work. • The bucket dump EPC solenoid may be burnt out.		
Related information	• The output state (current value) to the lift arm raise EPC solenoid can be checked with the monitoring function (Code: 41900, RAISE EPC DIR). • The output state (current value) to the lift arm lower EPC solenoid can be checked with the monitoring function (Code: 41901, LOWER EPC DIR). • The output state (current value) to the bucket tilt EPC solenoid can be checked with the monitoring function (Code: 41902, TILT EPC DIR). • The output state (current value) to the bucket dump EPC solenoid can be checked with the monitoring function (Code: 41903, DUMP EPC DIR). • The output state (current value) to the 3-spool valve (attachment) extend EPC solenoid can be checked with the monitoring function (Code: 41906, 3RD EPC1 DIR). • The output state (current value) to the 3-spool valve (attachment) retract EPC solenoid can be checked with the monitoring function (Code: 41907, 3RD EPC2 DIR). • Method of reproducing failure code: Start engine		

Possible causes and standard value in normal state	Causes		Standard value in normal state/Remarks on troubleshooting		
	1	Defective bucket dump EPC solenoid (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			CN-3 (male)	Resistance	
			Between (1) and (2)	5 – 15 Ω	
			Between (1), (2) and chassis ground	Min. 1 MΩ	
	2	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			Wiring harness between L73 (female) (15) – CN-3 (female) (1) and chassis ground	Voltage	Max. 1 V
	3	Defective work equipment controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			L73 (female)	Resistance	
			Between (15) and (13)	5 – 15 Ω	
			Between (15), (13) and chassis ground	Min. 1 MΩ	

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Circuit diagram related to bucket dump EPC solenoid



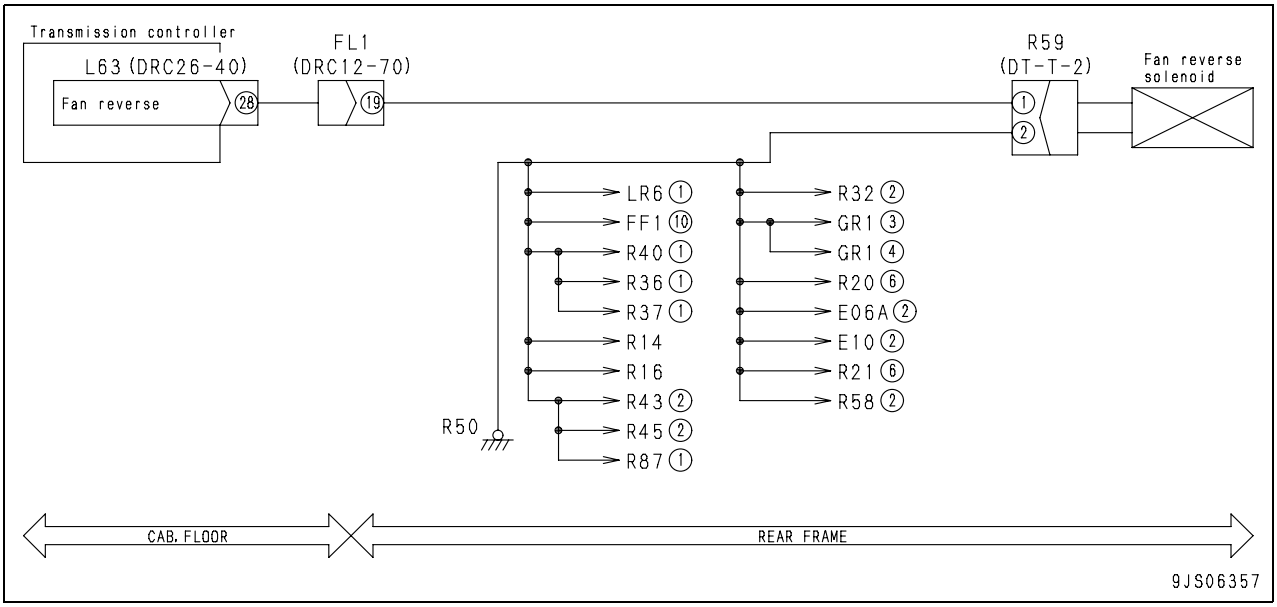
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Failure code [DW7BKA] (Fan reverse solenoid: Disconnection)

Action code	Failure code	Trouble	Fan reverse solenoid: Disconnection (Transmission controller system)
E01	**DW7BKA**		
Contents of trouble	• Since the fan reverse solenoid system is disconnected, no current flows when the fan reverse solenoid output is ON.		
Action of controller	• Disables the automatic fan reverse function (OPT). • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• The automatic fan reverse function is disabled in the case of automatic fan reverse function (OPT) specification.		
Related information	• The output state (ON/OFF) to the fan reverse solenoid can be checked with the monitoring function (Code: 40949, D-OUT-4). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective fan reverse solenoid (Internal disconnection)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			R59 (male)	Resistance	
			Between (1) and (2)	35 – 45 Ω	
	2	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between L63 (female) (28) – R59 (female) (1)	Resistance	Max. 1 Ω
			Wiring harness between R59 (female) (2) – chassis ground	Resistance	Max. 1 Ω
	3	Defective transmission controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			R59 (female)	Resistance	
			Between (28) and chassis ground	35 – 45 Ω	

Circuit diagram related to fan reverse solenoid



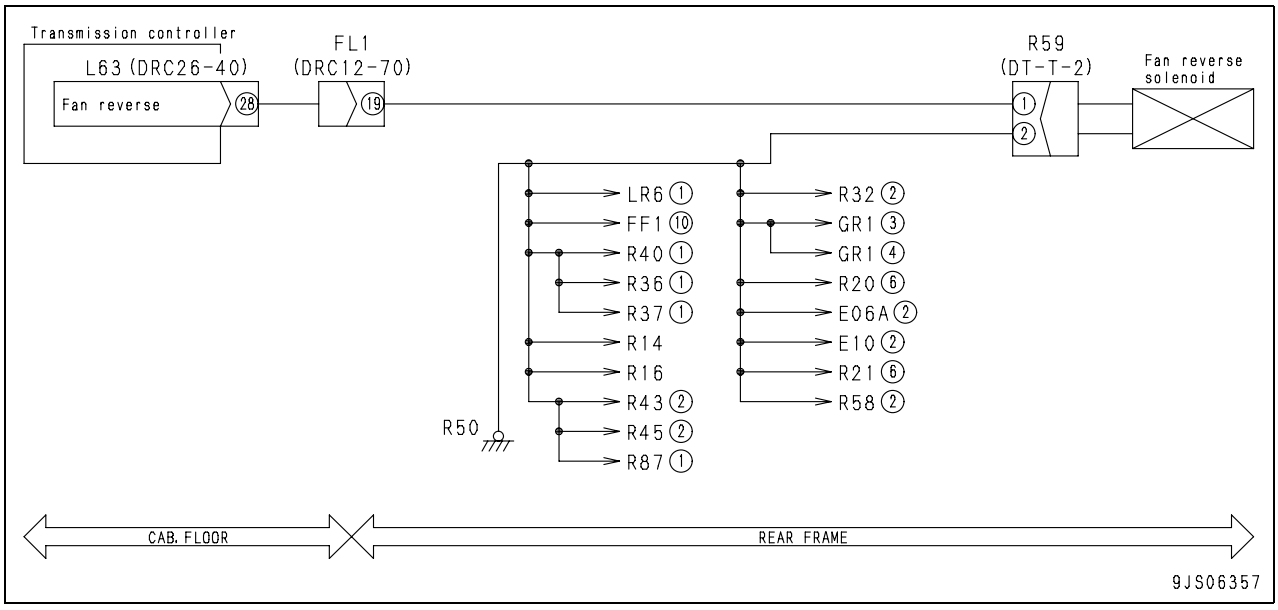
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Failure code [DW7BKB] (Fan reverse solenoid: Short circuit)

Action code	Failure code	Trouble	Fan reverse solenoid: Short circuit (Transmission controller system)
E01	**DW7BKB**		
Contents of trouble	• Since the fan reverse solenoid system is shorted, abnormal current flows when the fan reverse solenoid output is turned on.		
Action of controller	• Turns the output to the fan reverse solenoid OFF. • Disables the automatic fan reverse function (OPT). • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• The fan cannot turn in reverse by operating the fan reverse switch. • The automatic fan reverse function is disabled in the case of automatic fan reverse function (OPT) specification.		
Related information	• The output state (ON/OFF) to the fan reverse solenoid can be checked with the monitoring function (Code: 40949, D-OUT-4). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective fan reverse solenoid (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			R59 (male)	Resistance		
			Between (1) and (2)	35 – 45 Ω		
			Between (1), (2) and chassis ground	Min. 1 MΩ		
	2	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L63 (female) (28) – R59 (female) (1) and chassis ground	Resistance	Min. 1 MΩ	
	3	Defective transmission controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L63 (female)	Resistance		
			Between (28) and chassis ground	35 – 45 Ω		

Circuit diagram related to fan reverse solenoid



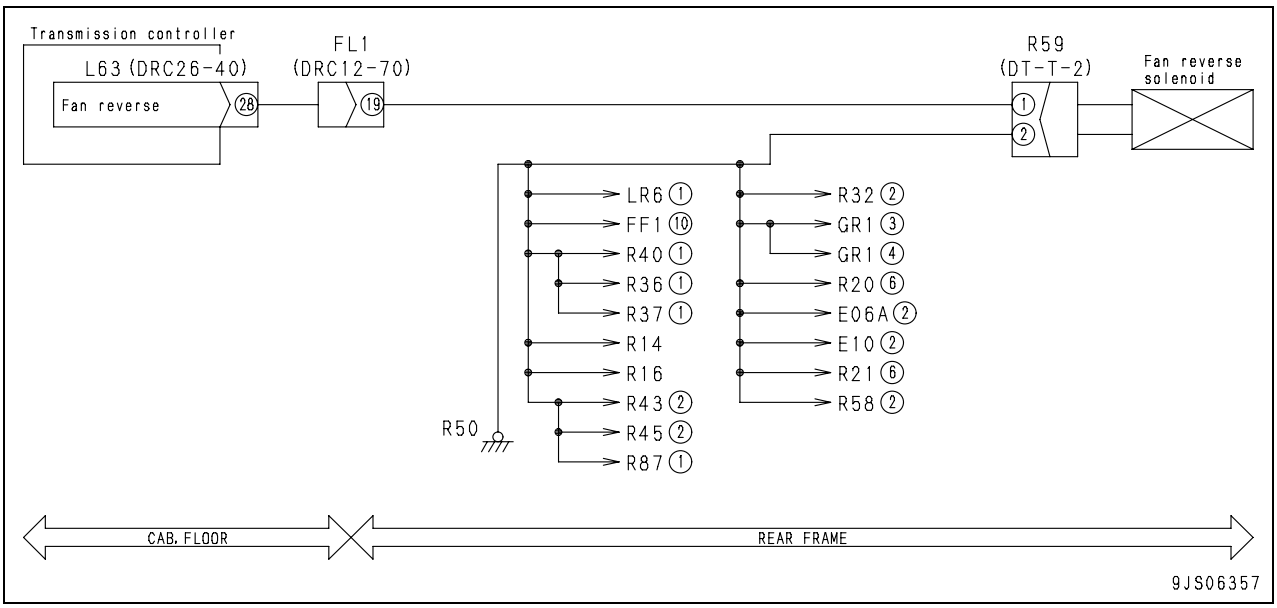
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Failure code [DW7BKY] (Fan reverse solenoid: Short circuit with power supply line)

Action code	Failure code	Trouble	Fan reverse solenoid: Short circuit with power supply line (Transmission controller system)
E01	**DW7BKY**		
Contents of trouble	• Since the fan reverse solenoid system is shorted with the power source, abnormal voltage is applied when the fan reverse switch output is OFF.		
Action of controller	• Disables the automatic fan reverse function (OPT). • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• The automatic fan reverse function is disabled in the case of automatic fan reverse function (OPT) specification. • Forward rotation of the fan becomes unavailable. • Overheating can result.		
Related information	• The output state (ON/OFF) to the fan reverse solenoid can be checked with the monitoring function (Code: 40949, D-OUT-4). • Method of reproducing failure code: Turn the starting switch ON.		

Possible causes and standard value in normal state	Causes		Standard value in normal state/Remarks on troubleshooting		
	1	Defective fan reverse solenoid (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			R59 (male)	Resistance	
			Between (1) and (2)	35 – 45 Ω	
			Between (1), (2) and chassis ground	Min. 1 MΩ	
	2	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			Wiring harness between L63 (female) (28) – R59 (female) (1) and chassis ground	Voltage	Max. 1 V
	3	Defective transmission controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			L63 (female)	Resistance	
			Between (28) and chassis ground	35 – 45 Ω	

Circuit diagram related to fan reverse solenoid



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Failure code [DW7DKA] (Hydraulic drive fan neutral solenoid: Disconnection)

Action code	Failure code	Trouble	Hydraulic drive fan neutral solenoid: Disconnection (Transmission controller system)
E01	**DW7DKA**		
Contents of trouble	• An error was detected on the hydraulic drive fan neutral solenoid.		
Action of controller	• None in particular.		
Problem that appears on machine	—		
Related information	• Setting of the hydraulic drive fan neutral solenoid is not available on WA430-6.		

Possible causes and standard value in normal state	Causes	Standard value in normal state/Remarks on troubleshooting
	1	Defective optional setting is suspected. Referring to “10. Optional device selecting function” in “Special functions of machine monitor (EMMS)” in “Testing and adjusting”, check that AUTO RE FAN is set to “None”.

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Failure code [DW7DKB] (Hydraulic drive fan neutral solenoid: Short circuit)

Action code	Failure code	Trouble	Hydraulic drive fan neutral solenoid: Short circuit (Transmission controller system)
E01	**DW7DKB**		
Contents of trouble	• An error was detected on the hydraulic drive fan neutral solenoid.		
Action of controller	• None in particular.		
Problem that appears on machine	—		
Related information	• Setting of the hydraulic drive fan neutral solenoid is not available on WA430-6.		

Possible causes and standard value in normal state	Causes		Standard value in normal state/Remarks on troubleshooting
	1	Defective optional setting is suspected. Referring to “10. Optional device selecting function” in “Special functions of machine monitor (EMMS)” in “Testing and adjusting”, check that AUTO RE FAN is set to “None”.	

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Failure code [DW7DKY] (Hydraulic drive fan neutral solenoid: Short circuit with power supply line)

Action code	Failure code	Trouble	Hydraulic drive fan neutral solenoid: Short circuit with power supply line (Transmission controller system)
E01	**DW7DKY**		
Contents of trouble	• An error was detected on the hydraulic drive fan neutral solenoid.		
Action of controller	• None in particular.		
Problem that appears on machine	—		
Related information	• Setting of the hydraulic drive fan neutral solenoid is not available on WA430-6.		

Possible causes and standard value in normal state	Causes	Standard value in normal state/Remarks on troubleshooting
	1	Defective optional setting is suspected. Referring to “10. Optional device selecting function” in “Special functions of machine monitor (EMMS)” in “Testing and adjusting”, check that AUTO RE FAN is set to “None”.

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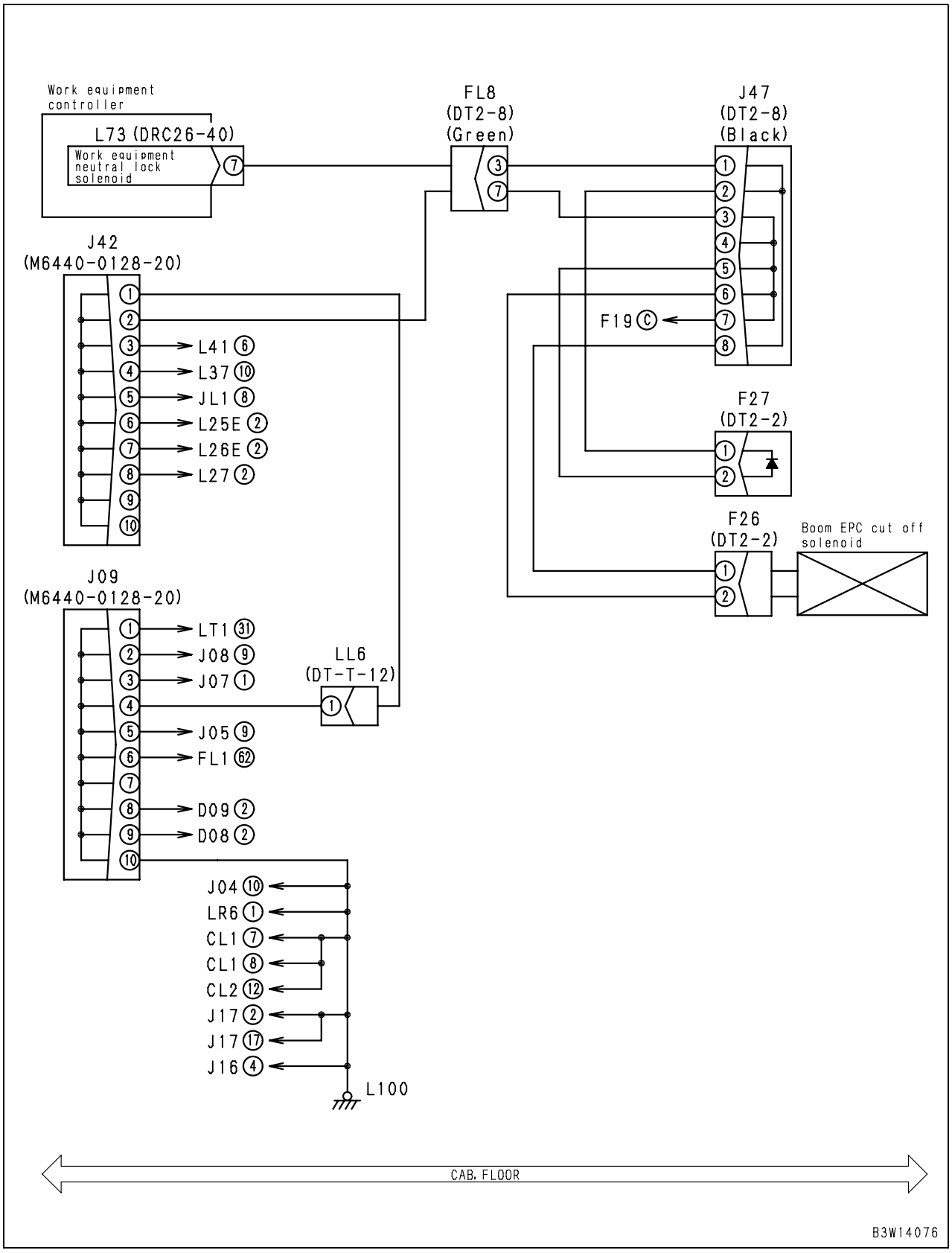
Failure code [DWM1KA] (Work equipment neutral lock solenoid: Disconnection)

Action code	Failure code	Trouble	Work equipment neutral lock solenoid: Disconnection (Work equipment controller system)
E01	**DWM1KA**		
Contents of trouble	• Since the work equipment neutral lock solenoid system is disconnected, no current flows when the work equipment neutral lock solenoid output is ON.		
Action of controller	• Stops outputting the signal to the work equipment solenoid according to an input signal from the work equipment lock lever. • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• Each work equipment solenoid lock normally works according to an input signal from the work equipment lock lever.		
Related information	• The output state (ON/OFF) to the work equipment neutral lock solenoid can be checked with the monitoring function (Code: 40952, D-OUT-0). • Method of reproducing failure code: Turn the starting switch ON and move the work equipment lock lever to the LOCK position		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective work equipment neutral lock solenoid (Internal disconnection)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			F26 (male)	Resistance		
			Between (1) and (2)	35 – 45 Ω		
	2	Disconnection in wiring harness (Disconnection in wiring harness or defective contact)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L73 (female) (7) – F26 (female) (1)	Resistance	Max. 1 Ω	
			Wiring harness between F26 (female) (2) – chassis ground	Resistance	Max. 1 Ω	
	3	Defective work equipment controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L73 (female)	Resistance		
			Between (7) and chassis ground	35 – 45 Ω		

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Circuit diagram related to work equipment neutral lock solenoid



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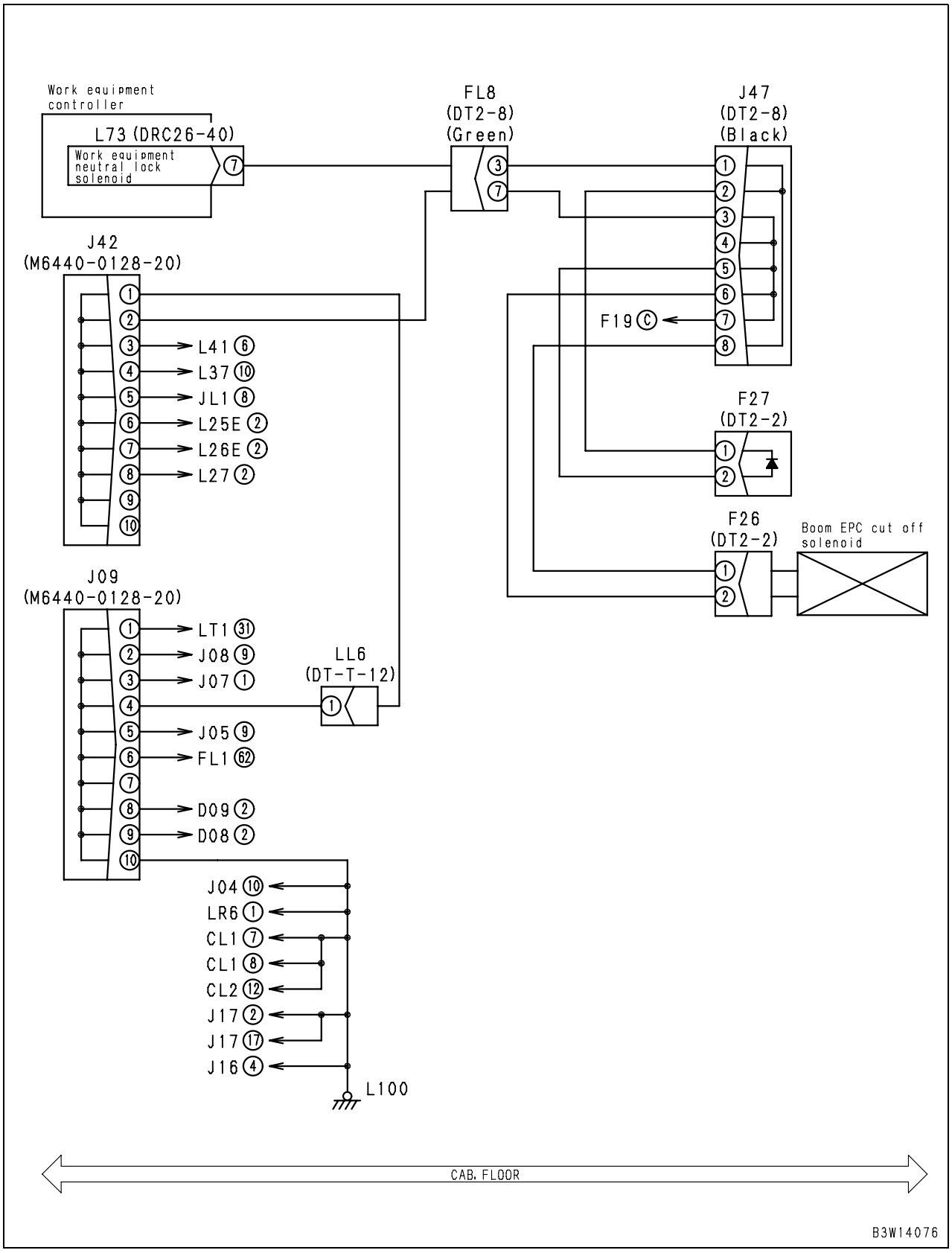
Failure code [DWM1KB] (Work equipment neutral lock solenoid: Short circuit)

Action code	Failure code	Trouble	Work equipment neutral lock solenoid: Short circuit (Work equipment controller system)
E01	**DWM1KB**		
Contents of trouble	• Since the work equipment neutral lock solenoid system is shorted, abnormal current flows when the work equipment neutral lock solenoid output is turned on.		
Action of controller	• Turns off the output to the work equipment neutral lock solenoid. • Stops outputting the signal to the work equipment solenoid according to an input signal from the work equipment lock lever. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• Each work equipment solenoid lock normally works according to an input signal from the work equipment lock lever. • The wiring harness or controller may be burnt out.		
Related information	• The output state (ON/OFF) to the work equipment neutral lock solenoid can be checked with the monitoring function (Code: 40952, D-OUT-0). • Method of reproducing failure code: Turn the starting switch ON and move the work equipment lock lever to the LOCK position		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective work equipment neutral lock solenoid (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			F26 (male)		Resistance	
			Between (1) and (2)		35 – 45 Ω	
			Between (1), (2) and chassis ground		Min. 1 MΩ	
	2	Defective diode (F27) (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			F27 (male)	Diode range	Continuity	
			Between (2) and (1)	Measured from (2) side	Continue	
			Between (1) and (2)	Measured from (1) side	Continuity absent	
	3	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L73 (female) (7) – F26 (female) (1) and chassis ground		Resistance	Min. 1 MΩ
	4	Defective work equipment controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L73 (female)		Resistance	
			Between (7) and chassis ground		35 – 45 Ω	

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Circuit diagram related to work equipment neutral lock solenoid



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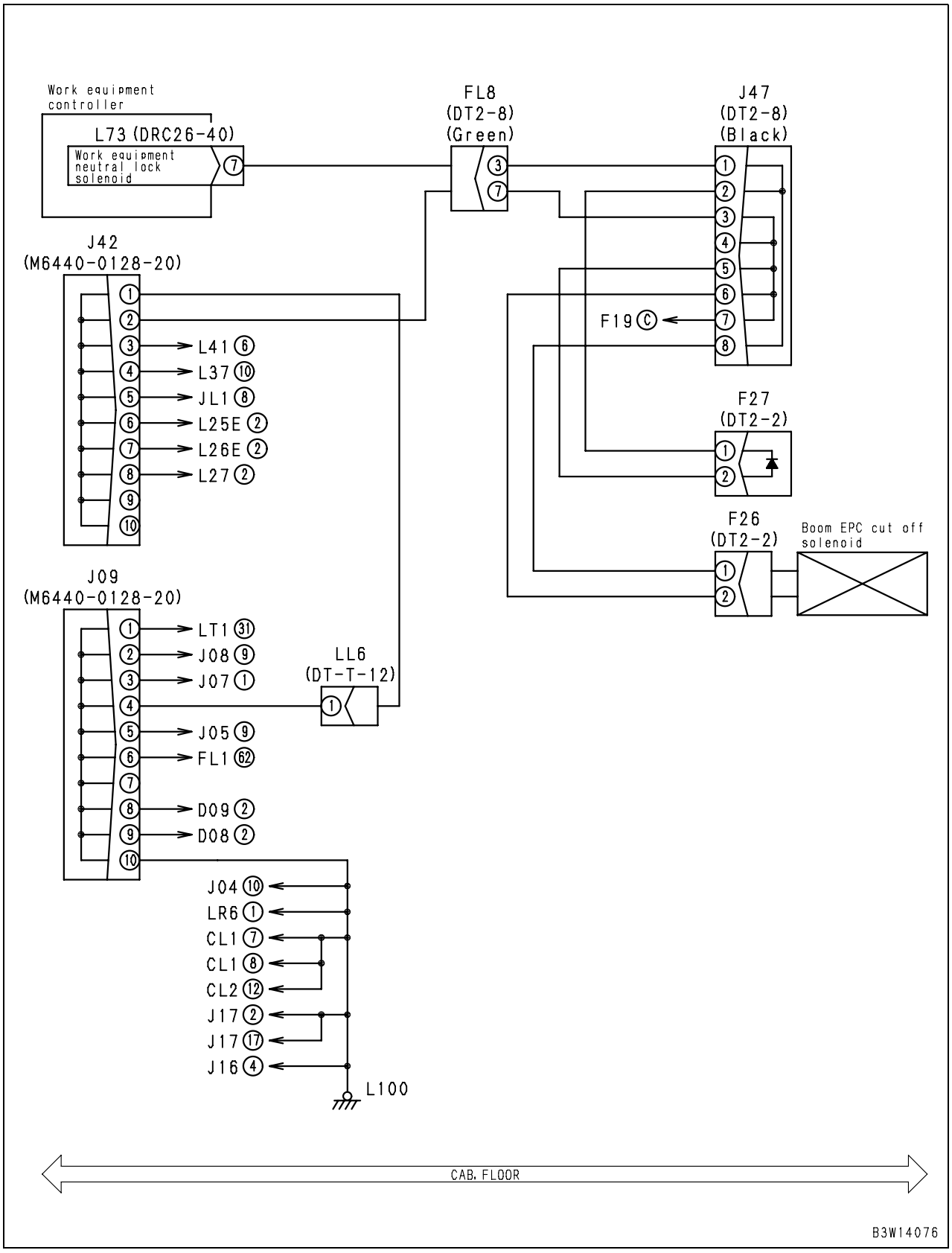
Failure code [DWM1KY] (Work equipment neutral lock solenoid: Short circuit with power supply line)

Action code	Failure code	Trouble	Work equipment neutral lock solenoid: Short circuit with power supply line (Work equipment controller system)
E01	**DWM1KY**		
Contents of trouble	• Since the work equipment neutral lock solenoid system is shorted with power source, abnormal voltage is applied when the work equipment neutral lock solenoid output is OFF.		
Action of controller	• Turns off the output to the work equipment neutral lock solenoid. • Stops outputting the signal to the work equipment solenoid according to an input signal from the work equipment lock lever. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• All work equipment do not move.		
Related information	• Removing (disconnecting) the connector of the work equipment neutral lock solenoid enables operating the work equipment. • The output state (ON/OFF) to the work equipment neutral lock solenoid can be checked with the monitoring function (Code: 40952, D-OUT-0). • Method of reproducing failure code: Turn the starting switch ON.		

<table>
<tr><td rowspan="15">Possible causes and standard value in normal state</td><td colspan="2">Causes</td><td colspan="4">Standard value in normal state/Remarks on troubleshooting</td></tr>
<tr><td rowspan="4">1</td><td rowspan="4">Defective work equipment neutral lock solenoid (Internal short circuit)</td><td colspan="4">★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.</td></tr>
<tr><td colspan="2">F26 (male)</td><td colspan="2">Resistance</td></tr>
<tr><td colspan="2">Between (1) and (2)</td><td colspan="2">35 – 45 Ω</td></tr>
<tr><td colspan="2">Between (1), (2) and chassis ground</td><td colspan="2">Min. 1 MΩ</td></tr>
<tr><td rowspan="4">2</td><td rowspan="4">Defective diode (F27) (Internal short circuit)</td><td colspan="4">★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.</td></tr>
<tr><td>F27 (male)</td><td>Diode range</td><td colspan="2">Continuity</td></tr>
<tr><td>Between (2) and (1)</td><td>Measured from (2) side</td><td colspan="2">Continue</td></tr>
<tr><td>Between (1) and (2)</td><td>Measured from (1) side</td><td colspan="2">No continuity</td></tr>
<tr><td rowspan="2">3</td><td rowspan="2">Hot short in wiring harness (Contact with 24V circuit)</td><td colspan="4">★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.</td></tr>
<tr><td colspan="2">Wiring harness between L73 (female) (7) – F26 (female) (1) and chassis ground</td><td>Voltage</td><td>Max. 1 V</td></tr>
<tr><td rowspan="3">4</td><td rowspan="3">Defective work equipment controller</td><td colspan="4">★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.</td></tr>
<tr><td colspan="2">L73 (female)</td><td colspan="2">Resistance</td></tr>
<tr><td colspan="2">Between (7) and chassis ground</td><td colspan="2">35 – 45 Ω</td></tr>
</table>

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Circuit diagram related to work equipment neutral lock solenoid



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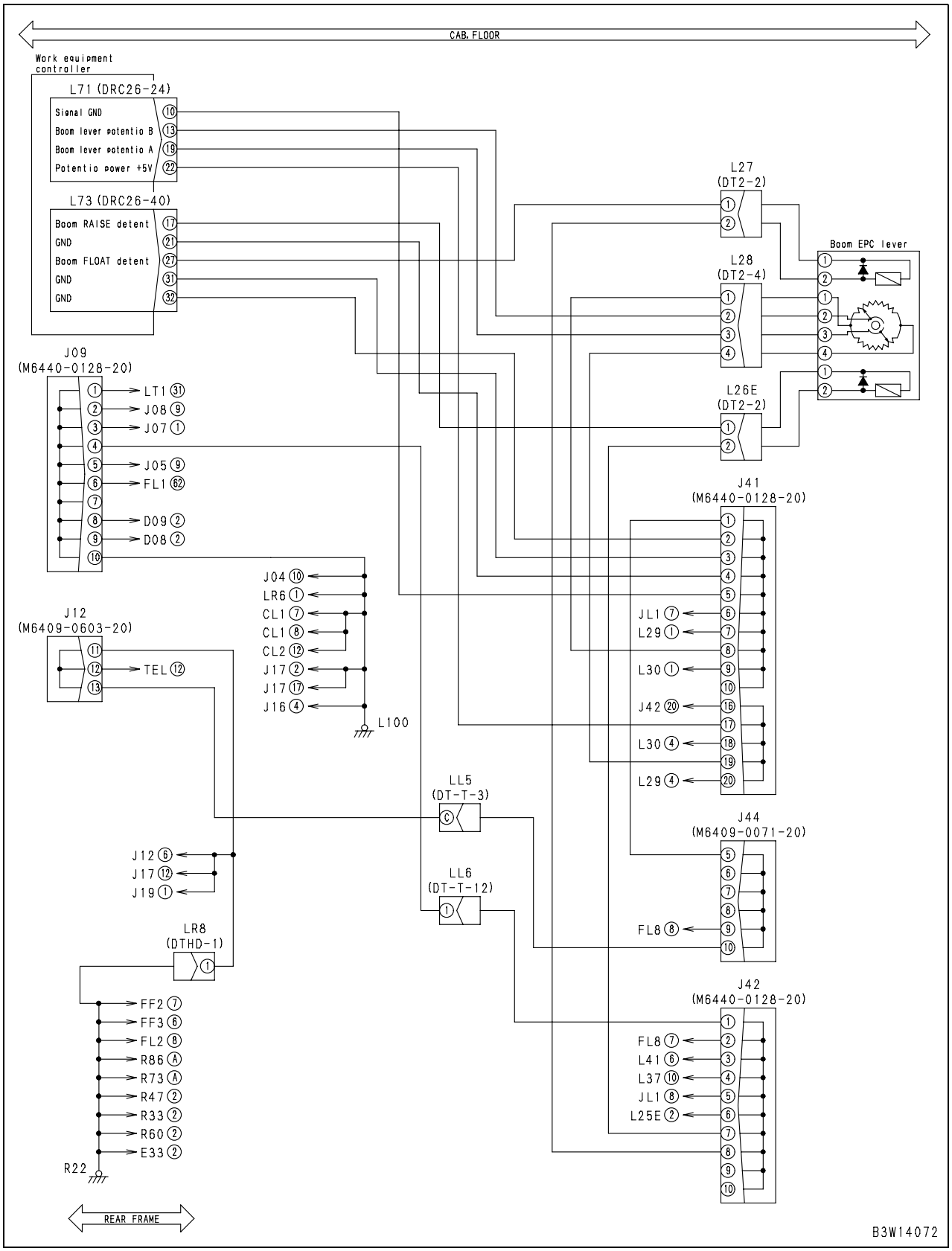
Failure code [DWN6KA] (Lift arm raise magnet detent solenoid: Disconnection)

Action code	Failure code	Trouble	Lift arm raise magnet detent solenoid: Disconnection (Work equipment controller system)
E01	**DWN6KA**		
Contents of trouble	• Since the lift arm raise magnet detent solenoid power supply system is disconnected, no current flows when the lift arm raise magnet detent solenoid output is ON.		
Action of controller	• Keeps normal output condition to the lift arm raise magnet detent solenoid. • Stops outputting the signal to the remote positioner raise stop lamp. • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• The lift arm remote positioner raise does not function. • Holding the lift arm at the raise detent position becomes unavailable.		
Related information	• The output state (ON/OFF) to the lift arm raise magnet detent solenoid can be checked with the monitoring function (Code: 40952, D-OUT-1). • Method of reproducing failure code: Engine started + lift arm raise detent		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective lift arm raise magnet detent solenoid (Internal disconnection)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L26E (male)	Resistance		
			Between (1) and (2)	35 – 45 Ω		
	2	Disconnection in wiring harness (Disconnection or defective contact)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L73 (female) (17) – L26E (female) (1)	Resistance	Max. 1 Ω	
			Wiring harness between L26E (female) (2) – chassis ground	Resistance	Max. 1 Ω	
	3	Defective work equipment controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			L73	Lift arm lever	Voltage	
			Between (17) and chassis ground	Neutral	Max. 1 V	
				Raise detent operation	20 – 30 V	

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Circuit diagram related to lift arm EPC lever



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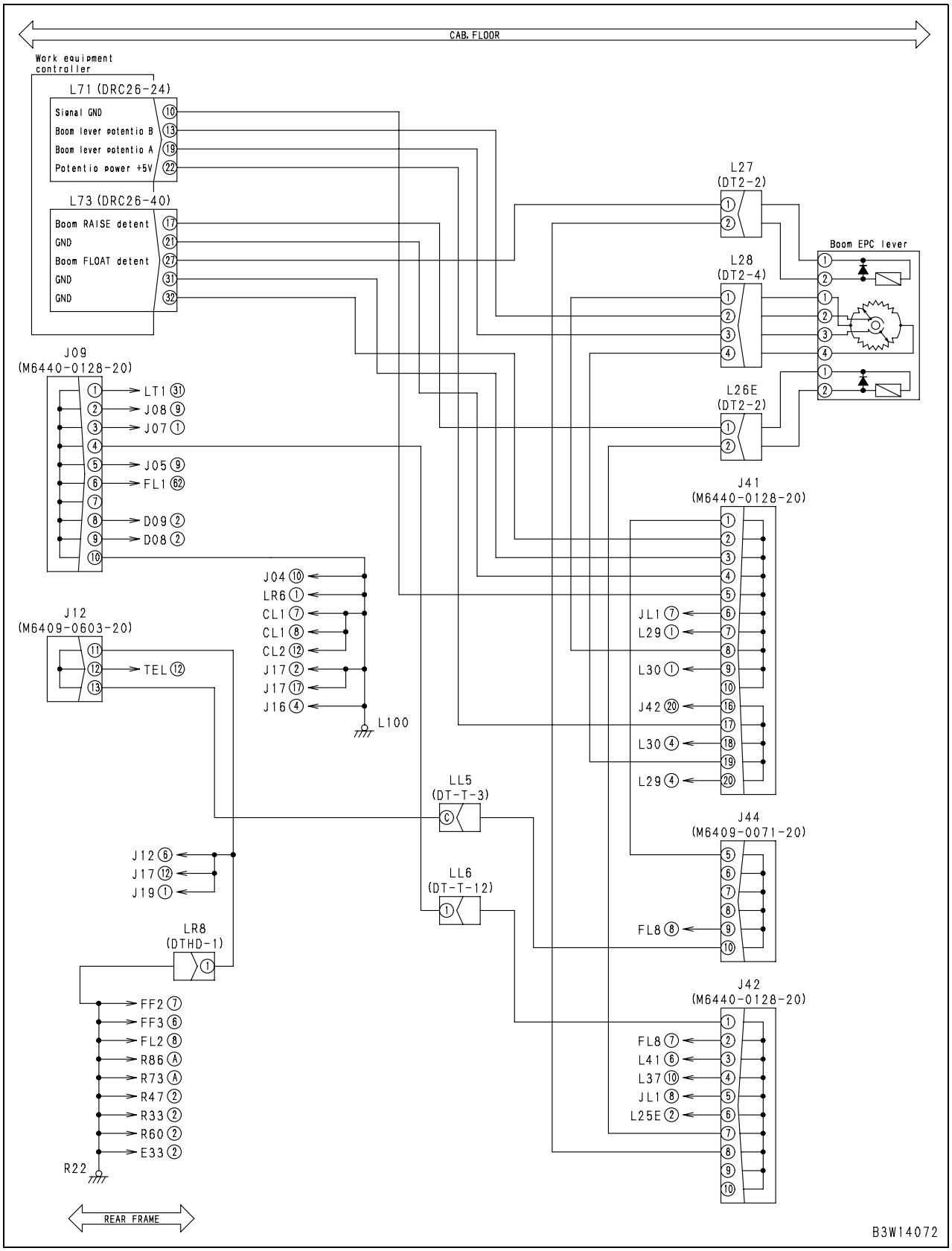
Failure code [DWN6KB] (Lift arm raise magnet detent solenoid: Short circuit)

Action code	Failure code	Trouble	Lift arm raise magnet detent solenoid: Short circuit (Work equipment controller system)
E01	**DWN6KB**		
Contents of trouble	• Since the lift arm raise magnet detent solenoid power supply system is shorted, abnormal current flows when the lift arm raise magnet detent solenoid output is ON.		
Action of controller	• Stops outputting the signal to the lift arm raise magnet detent solenoid. • Stops outputting the signal to the remote positioner raise stop lamp to stop raise stop control. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• The lift arm remote positioner raise does not function. • Holding the lift arm at the raise detent position becomes unavailable.		
Related information	• The output state (ON/OFF) to the lift arm raise magnet detent solenoid can be checked with the monitoring function (Code: 40952, D-OUT-1). • Method of reproducing failure code: Engine started + lift arm raise detent		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective lift arm raise magnet detent solenoid (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L26E (male)		Resistance	
			Between (1) and (2)		35 – 45 Ω	
			Between (1), (2) and chassis ground		Min. 1 MΩ	
	2	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L73 (female) (17) – L26E (female) (1) and chassis ground		Resistance	Min. 1 MΩ
	3	Defective work equipment controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			L73	Lift arm lever	Voltage	
			Between (17) and chassis ground	Neutral	Max. 1 V	
				Raise detent operation	20 – 30 V	

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Circuit diagram related to lift arm EPC lever



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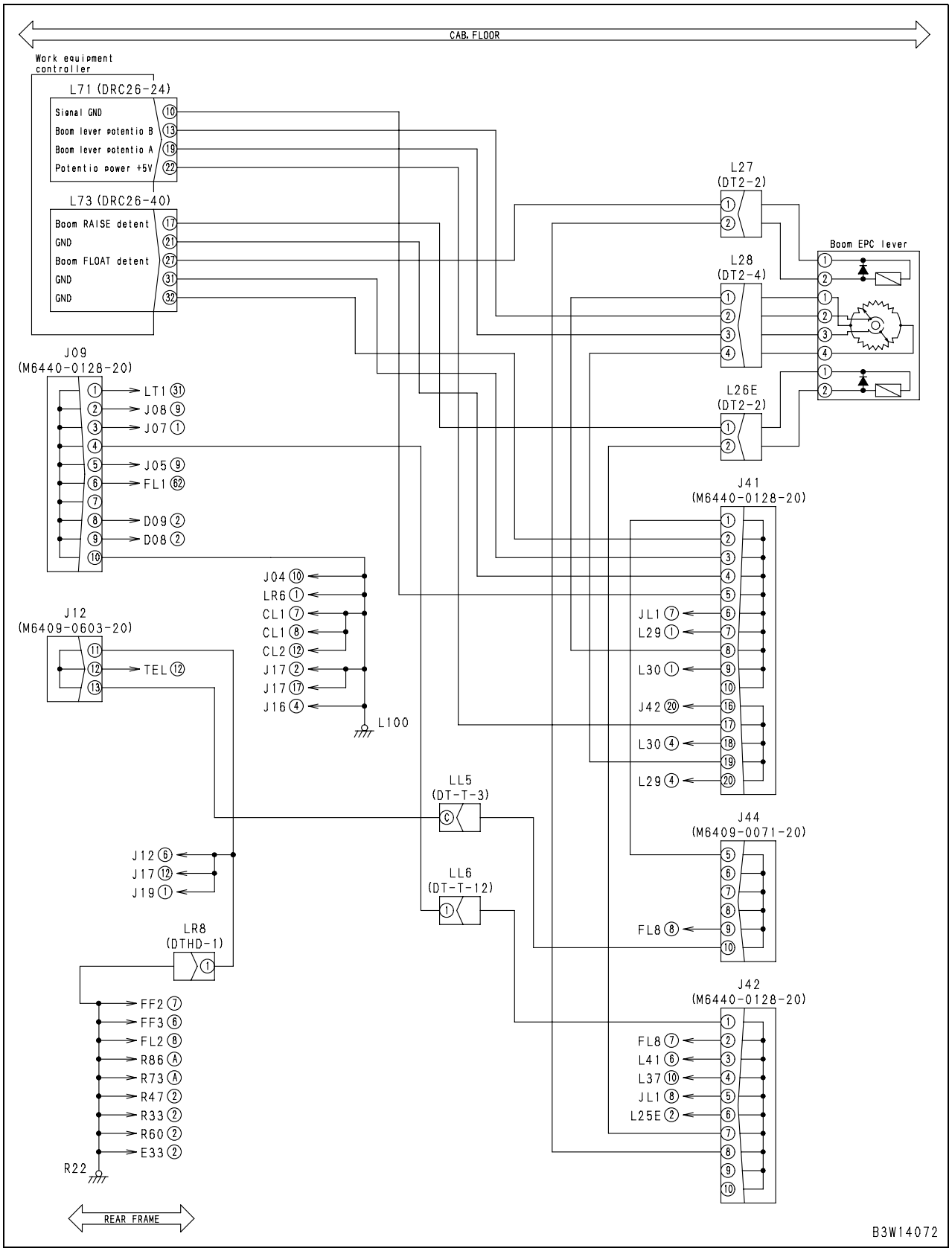
Failure code [DWN6KY] (Lift arm raise magnet detent solenoid: Short circuit with power supply line)

Action code	Failure code	Trouble	Lift arm raise magnet detent solenoid: Short circuit with power supply line (Work equipment controller system)
E01	**DWN6KY**		
Contents of trouble	• Since the lift arm raise magnet detent solenoid power supply system is shorted with the power source, abnormal voltage is applied when the lift arm raise magnet detent solenoid output is ON.		
Action of controller	• Stops outputting the signal to the lift arm raise magnet detent solenoid. • Stops outputting the signal to the remote positioner raise stop lamp to stop raise stop control. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• If you perform lift arm raise detent operation, detent condition is not automatically released (can be manually released). • If you do not perform lift arm detent operation, return of the left arm lever to neutral is affected by the suction power of the magnet (lever control is deteriorated).		
Related information	• The output state (ON/OFF) to the lift arm raise magnet detent solenoid can be checked with the monitoring function (Code: 40952, D-OUT-1). • Method of reproducing failure code: Start engine		

Possible causes and standard value in normal state	Causes		Standard value in normal state/Remarks on troubleshooting			
	1	Defective lift arm raise magnet detent solenoid (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L26E (male)		Resistance	
			Between (1) and (2)		35 – 45 Ω	
			Between (1), (2) and chassis ground		Min. 1 MΩ	
	2	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			Wiring harness between L73 (female) (17) – L26E (female) (1) and chassis ground		Voltage	Max. 1 V
	3	Defective work equipment controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			L73	Lift arm lever	Voltage	
			Between (17) and chassis ground	Neutral	Max. 1 V	
				Raise detent operation	20 – 30 V	

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Circuit diagram related to lift arm EPC lever



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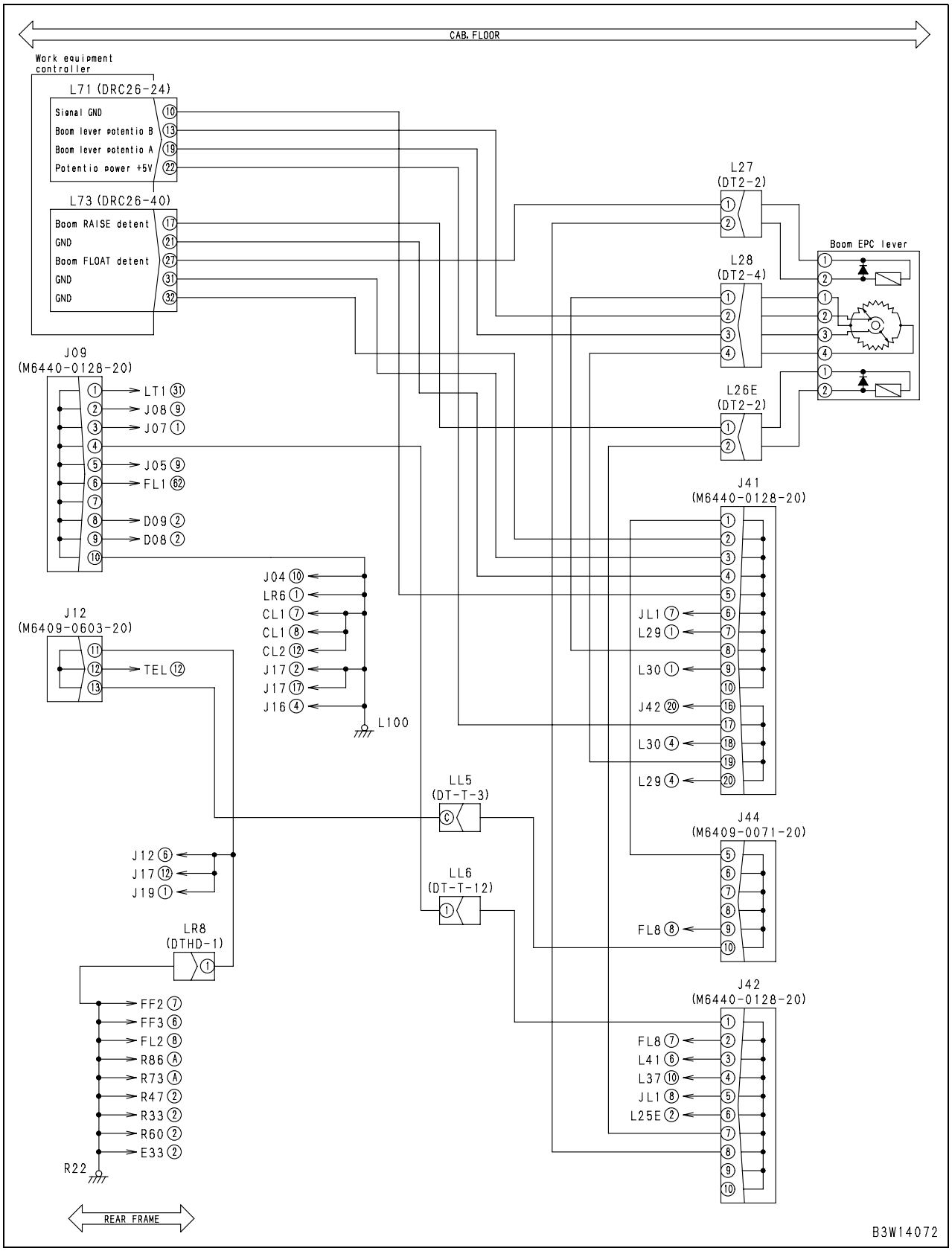
Failure code [DWN7KA] (Lift arm float magnet detent solenoid: Disconnection)

Action code	Failure code	Trouble	Lift arm float magnet detent solenoid: Disconnection (Work equipment controller system)
E01	**DWN7KA**		
Contents of trouble	• Since the lift arm float magnet detent solenoid power supply system is disconnected, no current flows when the lift arm float magnet detent solenoid output is ON.		
Action of controller	• Keeps normal output condition to the lift arm float magnet detent solenoid. • Stops outputting the signal to the remote positioner lower stop lamp. • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• The lift arm remote positioner lower does not function. • Holding the lift arm at the float detent position becomes unavailable.		
Related information	• The output state (ON/OFF) to the lift arm float magnet detent solenoid can be checked with the monitoring function (Code: 40952, D-OUT-2). • Method of reproducing failure code: Start engine and perform lift arm float detent operation.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective lift arm float magnet detent solenoid (Internal disconnection)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L27 (male)		Resistance	
			Between (1) and (2)		35 – 45 Ω	
	2	Disconnection in wiring harness (Disconnection or defective contact)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L73 (female) (27) – L27 (female) (1)		Resistance	Max. 1 Ω
			Wiring harness between L27 (female) (2) – chassis ground		Resistance	Max. 1 Ω
	3	Defective work equipment controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			L73	Lift arm lever	Voltage	
			Between (27) and chassis ground	Neutral	Max. 1 V	
				Float detent operation	20 – 30 V	

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Circuit diagram related to lift arm EPC lever



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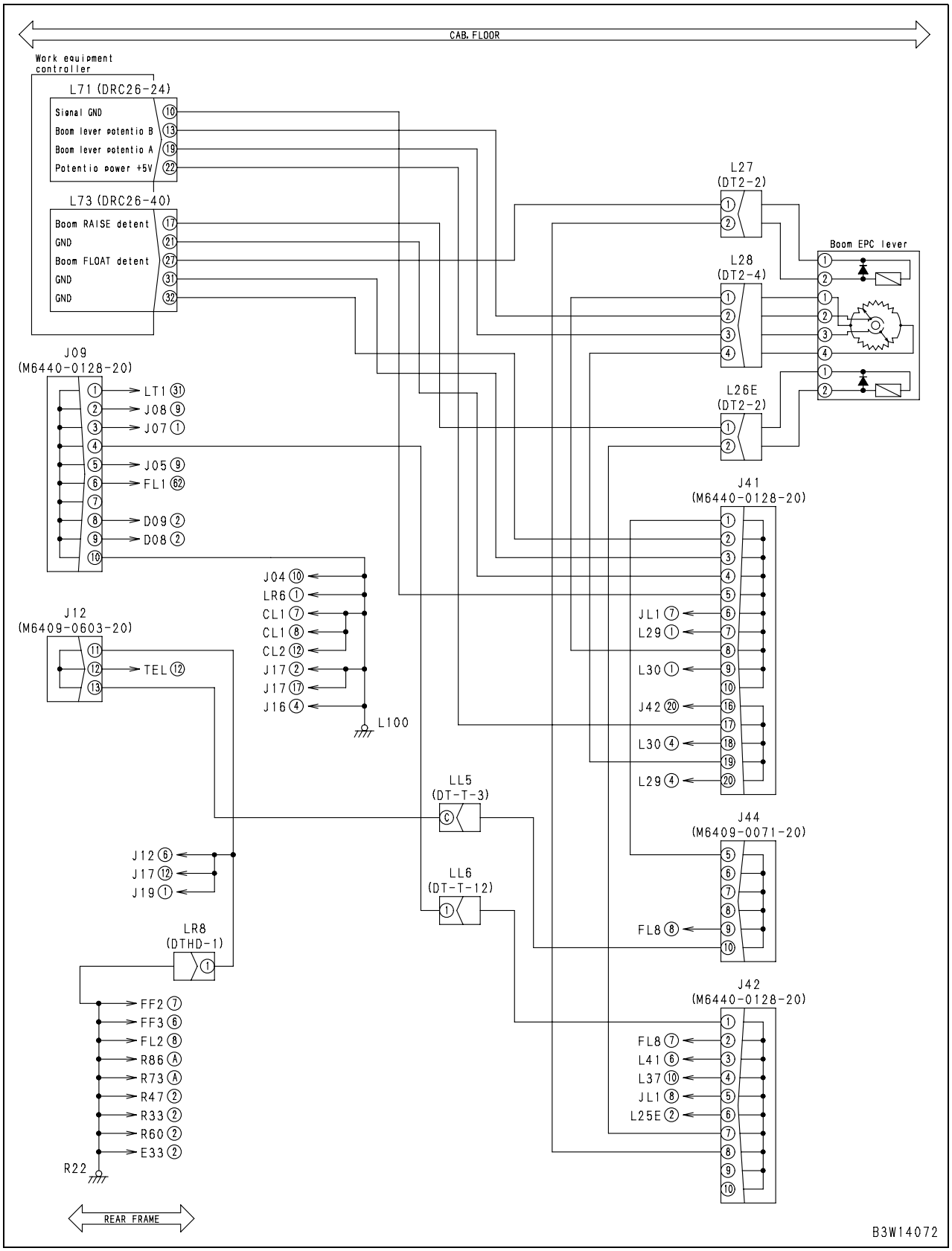
Failure code [DWN7KB] (Lift arm float magnet detent solenoid: Short circuit)

Action code	Failure code	Trouble	Lift arm float magnet detent solenoid: Short circuit (Work equipment controller system)
E01	**DWN7KB**		
Contents of trouble	• Since the lift arm float magnet detent solenoid power supply system is shorted, abnormal current flows when the lift arm float magnet detent solenoid output is turned on.		
Action of controller	• Stops outputting the signal to the lift arm float magnet detent solenoid. • Stops outputting the signal to the remote positioner lower stop lamp. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• The lift arm remote positioner lower does not function. • Holding the lift arm at the float detent position becomes unavailable.		
Related information	• The output state (ON/OFF) to the lift arm float magnet detent solenoid can be checked with the monitoring function (Code: 40952, D-OUT-2). • Method of reproducing failure code: Start engine and perform lift arm float detent operation.		

Possible causes and standard value in normal state	Causes		Standard value in normal state/Remarks on troubleshooting			
	1	Defective lift arm float magnet detent solenoid (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L27 (male)		Resistance	
			Between (1) and (2)		35 – 45 Ω	
			Between (1), (2) and chassis ground		Min. 1 MΩ	
	2	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L73 (female) (27) – L27 (female) (1) and chassis ground		Resistance	Min. 1 MΩ
	3	Defective work equipment controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			L73	Lift arm lever	Voltage	
			Between (27) and chassis ground	Neutral	Max. 1 V	
				Float detent operation	20 – 30 V	

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Circuit diagram related to lift arm EPC lever



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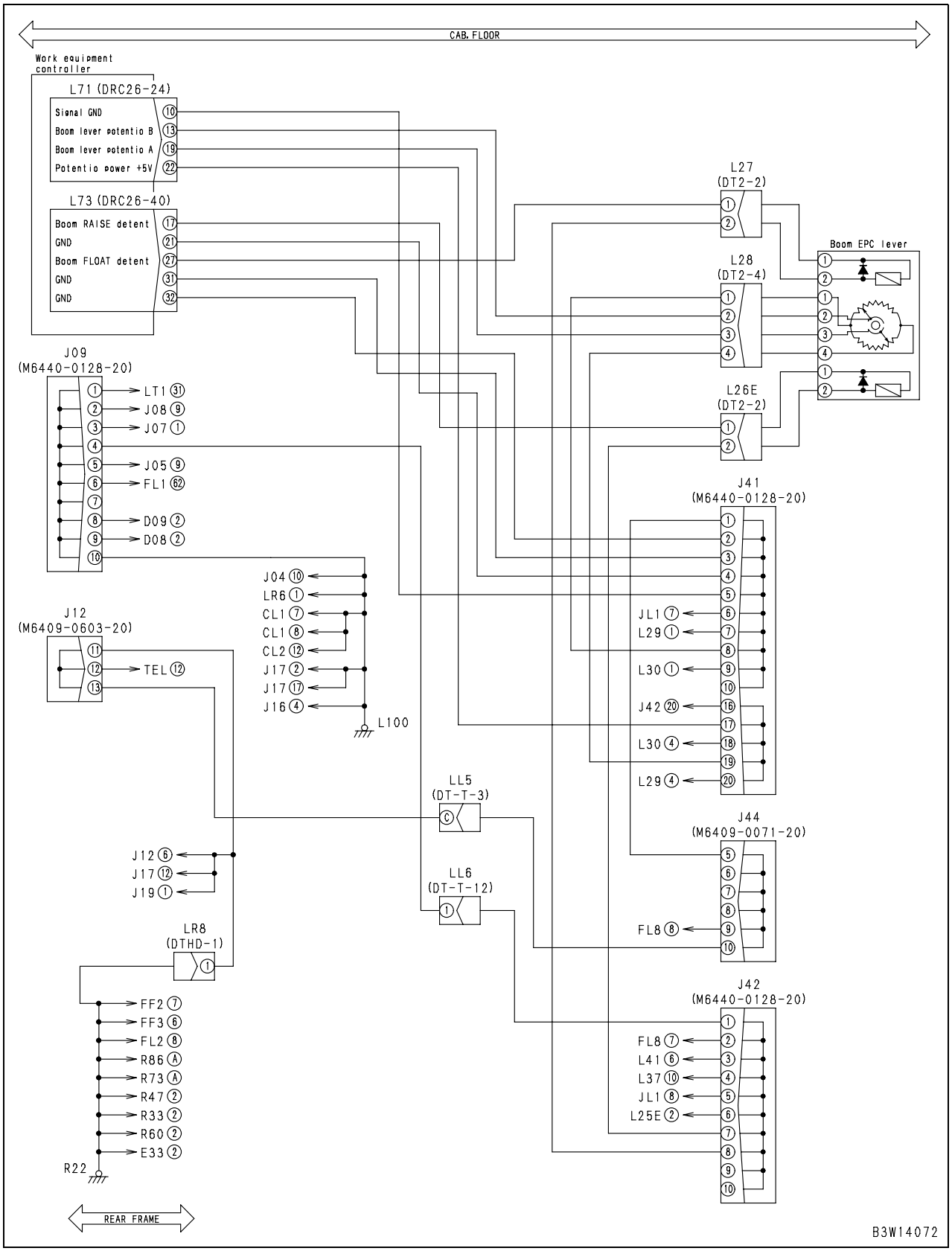
Failure code [DWN7KY] (Lift arm float magnet detent solenoid: Short circuit with power supply line)

Action code	Failure code	Trouble	Lift arm float magnet detent solenoid: Short circuit with power supply line (Work equipment controller system)
E01	**DWN7KY**		
Contents of trouble	• Since the lift arm float magnet detent solenoid power supply system is shorted with the power source, abnormal voltage is applied when the lift arm float magnet detent solenoid output is OFF.		
Action of controller	• Stops outputting the signal to the lift arm float magnet detent solenoid. • Stops outputting the signal to the remote positioner lower stop lamp to stop lower stop control. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• If you perform lift arm float detent operation, detent condition is not automatically released (can be manually released). • If you do not perform lift arm detent operation, return of the left arm lever to neutral is affected by the suction power of the magnet (lever control is deteriorated).		
Related information	• The output state (ON/OFF) to the lift arm float magnet detent solenoid can be checked with the monitoring function (Code: 40952, D-OUT-2). • Method of reproducing failure code: Start engine		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective lift arm float magnet detent solenoid (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L27 (male)		Resistance	
			Between (1) and (2)		35 – 45 Ω	
			Between (1), (2) and chassis ground		Min. 1 MΩ	
	2	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			Wiring harness between L73 (female) (27) – L27 (female) (1) and chassis ground		Voltage	Max. 1 V
	3	Defective work equipment controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			L73	Lift arm lever	Voltage	
			Between (27) and chassis ground	Neutral	Max. 1 V	
				Float detent operation	20 – 30 V	

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Circuit diagram related to lift arm EPC lever



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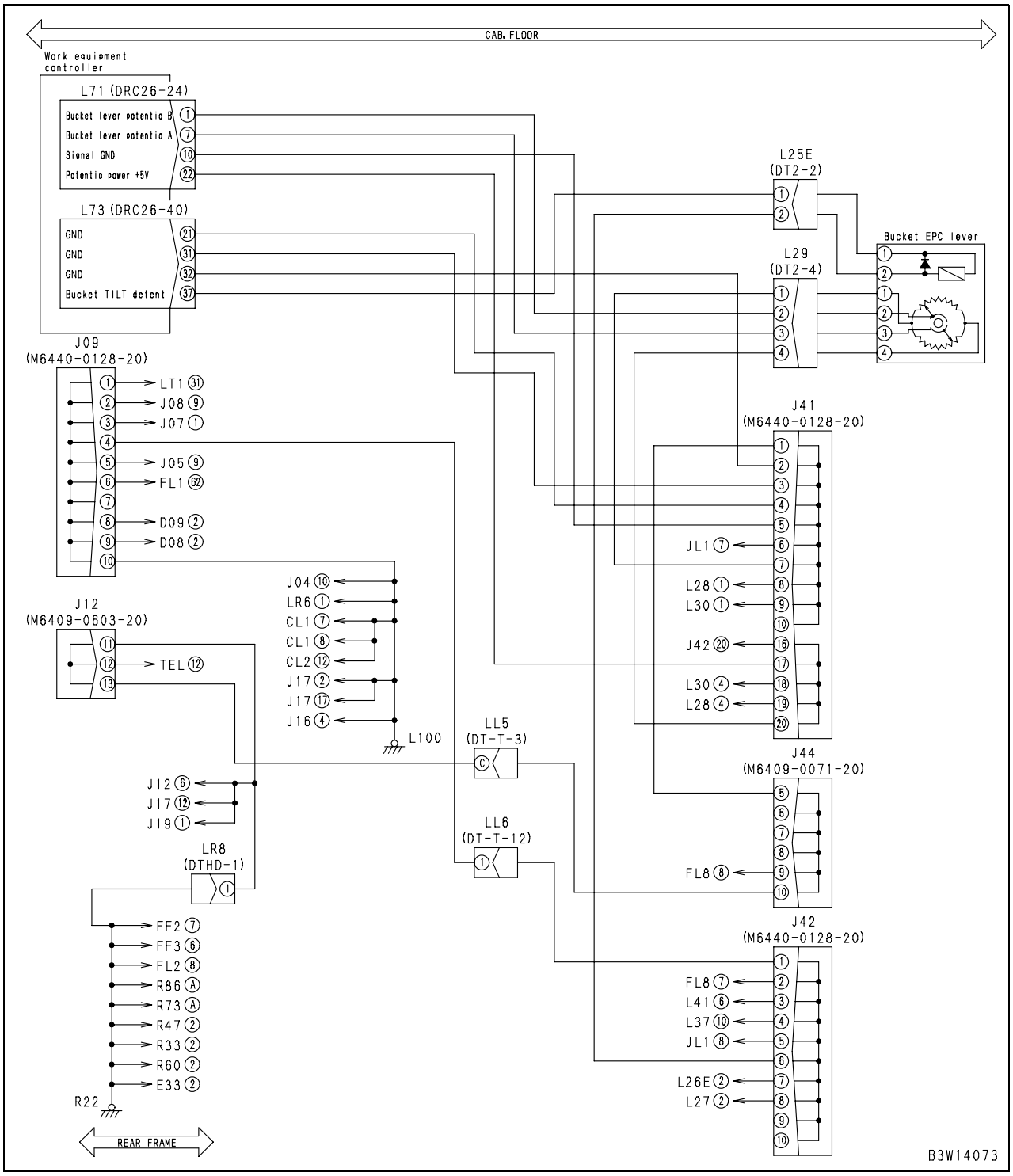
Failure code [DWN8KA] (Bucket tilt magnet detent solenoid: Disconnection)

Action code	Failure code	Trouble	Bucket tilt magnet detent solenoid: Disconnection (Work equipment controller system)
E01	**DWN8KA**		
Contents of trouble	• Since the bucket tilt magnet detent solenoid power supply system is disconnected, no current flows when the bucket tilt magnet detent solenoid output is ON.		
Action of controller	• Keeps normal output condition to the bucket tilt magnet detent solenoid. • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• Bucket leveler does not work. • Holding the bucket at the tilt detent position becomes unavailable.		
Related information	• The output state (ON/OFF) to the bucket tilt magnet detent solenoid can be checked with the monitoring function (Code: 40952, D-OUT-3). • Method of reproducing failure code: Engine started + bucket tilt detent		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective bucket tilt magnet detent solenoid (Internal disconnection)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L25E (male)		Resistance	
			Between (1) and (2)		35 – 45 Ω	
	2	Disconnection in wiring harness (Disconnection or defective contact)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L73 (female) (37) – L25E (female) (1)		Resistance	Max. 1 Ω
			Wiring harness between L25E (female) (2) – chassis ground		Resistance	Max. 1 Ω
	3	Defective work equipment controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			L73	Bucket lever	Voltage	
			Between (37) and chassis ground	Neutral	Max. 1 V	
				Bucket detent operation	20 – 30 V	

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Circuit diagram related to bucket EPC lever



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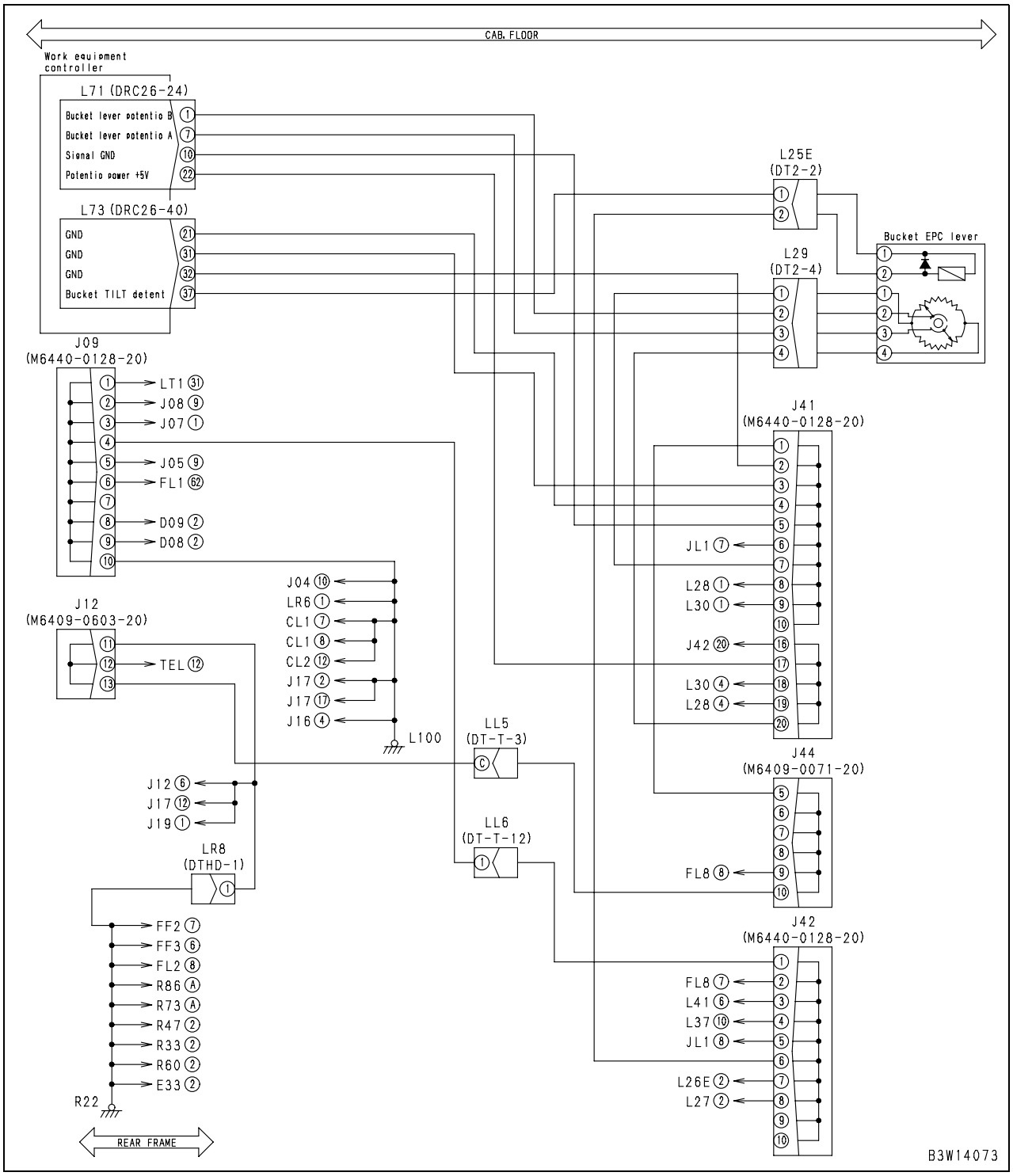
Failure code [DWN8KB] (Bucket tilt magnet detent solenoid: Short circuit)

Action code	Failure code	Trouble	Bucket tilt magnet detent solenoid: Short circuit (Work equipment controller system)
E01	**DWN8KB**		
Contents of trouble	• Since the bucket tilt magnet detent solenoid power supply system is shorted, abnormal current flows when the bucket tilt magnet detent solenoid output is ON.		
Action of controller	• Stops outputting the signal to the bucket tilt magnet detent solenoid. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• Bucket leveler does not work. • Holding the bucket at the tilt detent position becomes unavailable.		
Related information	• The output state (ON/OFF) to the bucket tilt magnet detent solenoid can be checked with the monitoring function (Code: 40952, D-OUT-3). • Method of reproducing failure code: Engine started + bucket tilt detent		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective bucket tilt magnet detent solenoid (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L25E (male)		Resistance	
			Between (1) and (2)		35 – 45 Ω	
			Between (1), (2) and chassis ground		Min. 1 MΩ	
	2	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L73 (female) (37) – L25E (female) (1) and chassis ground		Resistance	Min. 1 MΩ
	3	Defective work equipment controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			L73	Bucket lever	Voltage	
			Between (37) and chassis ground	Neutral	Max. 1 V	
				Bucket detent operation	20 – 30 V	

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Circuit diagram related to bucket EPC lever



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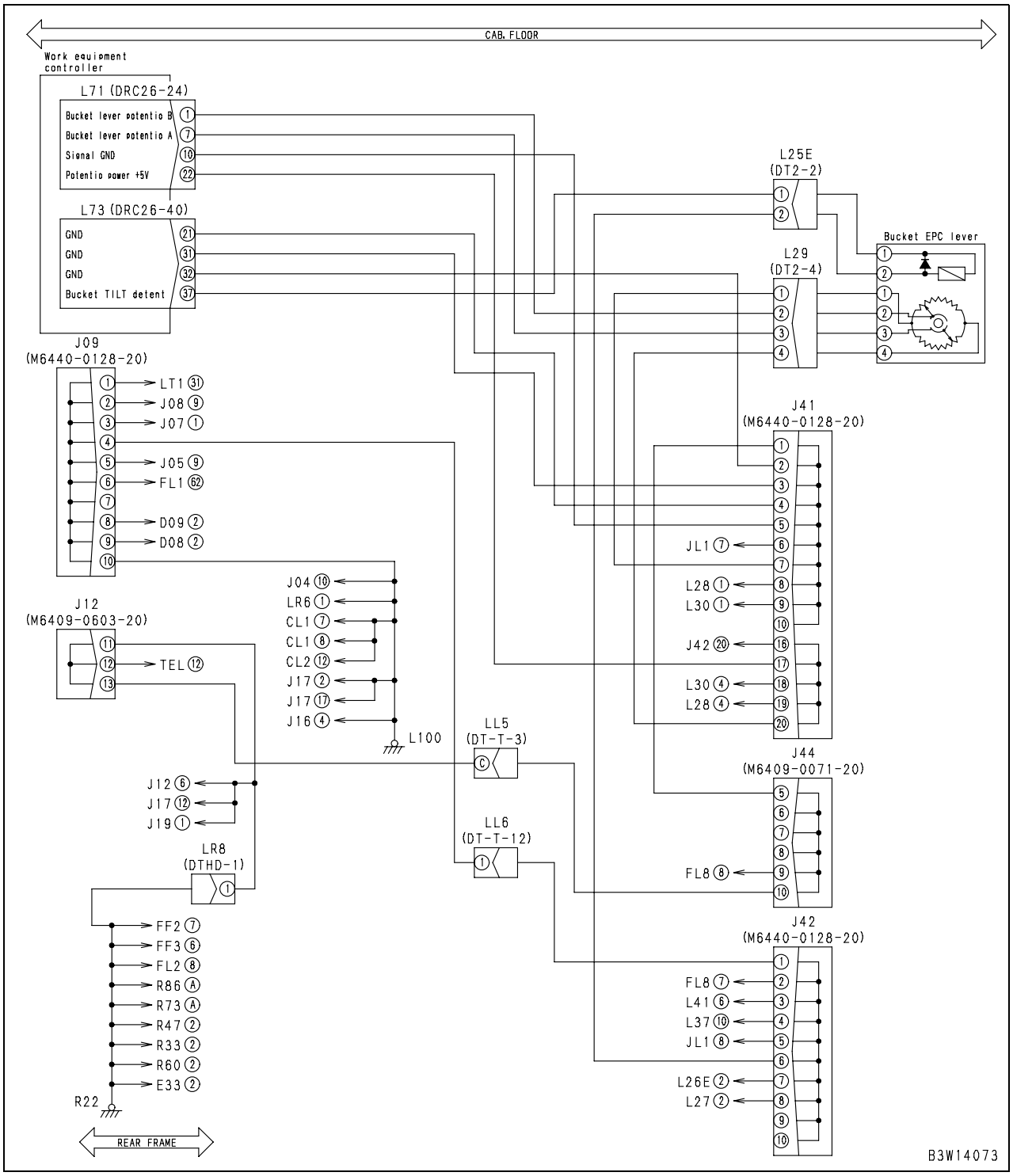
Failure code [DWN8KY] (Bucket tilt magnet detent solenoid: Shorted with the power source)

Action code	Failure code	Trouble	Bucket tilt magnet detent solenoid: Shorted with the power source (Work equipment controller system)
E01	**DWN8KY**		
Contents of trouble	• Since the bucket tilt magnet detent solenoid power supply system is shorted with the power source, abnormal voltage is applied when the bucket tilt magnet detent solenoid output is ON.		
Action of controller	• Stops outputting the signal to the bucket tilt magnet detent solenoid. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• If you perform bucket tilt detent operation, detent condition is not automatically released (can be manually released). • If you do not perform bucket detent operation, return of the bucket lever to neutral is affected by the suction power of the magnet (lever control is deteriorated).		
Related information	• The output state (ON/OFF) to the bucket tilt magnet detent solenoid can be checked with the monitoring function (Code: 40952, D-OUT-3). • Method of reproducing failure code: Start engine		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective bucket tilt magnet detent solenoid (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L25E (male)		Resistance	
			Between (1) and (2)		35 – 45 Ω	
			Between (1), (2) and chassis ground		Min. 1 MΩ	
	2	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			Wiring harness between L73 (female) (37) – L25E (female) (1) and chassis ground		Voltage	Max. 1 V
	3	Defective work equipment controller	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			L73	Bucket lever	Voltage	
			Between (37) and chassis ground	Neutral	Max. 1 V	
				Bucket detent operation	20 – 30 V	

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Circuit diagram related to bucket EPC lever



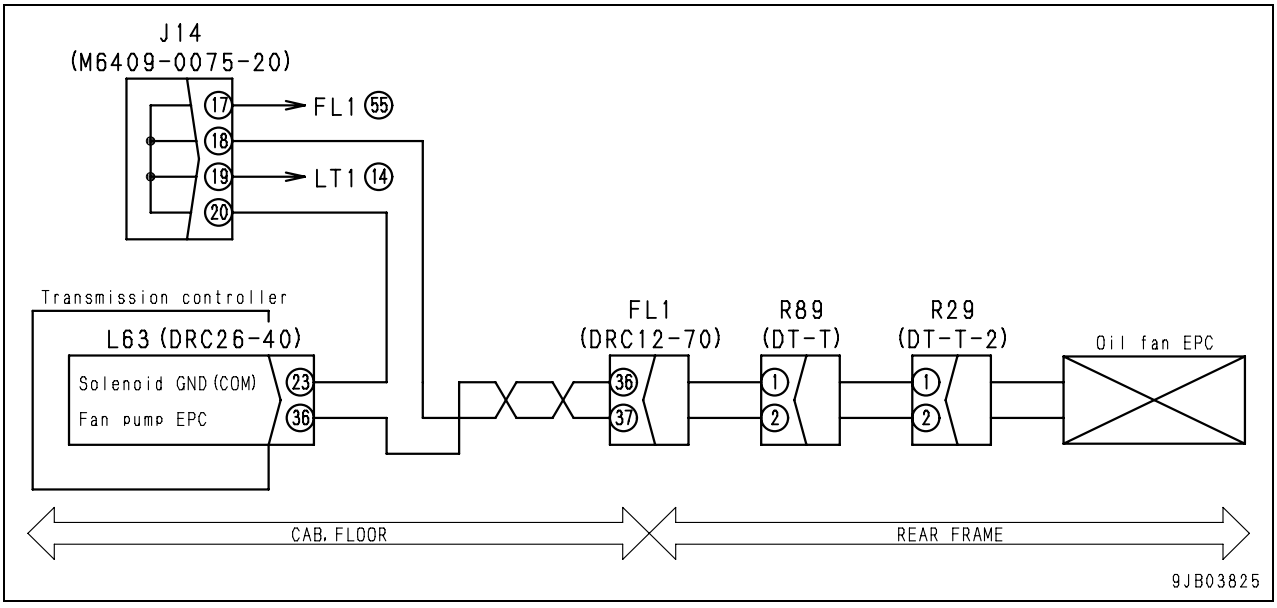
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Failure code [DX16KA] (Fan pump EPC solenoid: Disconnection)

Action code	Failure code	Trouble	Fan pump EPC solenoid: Disconnection (Transmission controller system)
E01	**DX16KA**		
Contents of trouble	• Since the fan pump EPC solenoid system is disconnected, no current flows when the fan pump EPC solenoid output is ON.		
Action of controller	• Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• The fan speed is set to the maximum.		
Related information	• The output state (current) to the fan pump EPC solenoid can be checked with the monitoring function (Code: 41400, FAN EPC DIR). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective fan pump EPC solenoid (Internal disconnection)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			R29 (male)	Resistance	
			Between (1) and (2)	5 – 10 Ω	
	2	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between L63 (female) (23) – R29 (female) (2)	Resistance	Max. 1 Ω
			Wiring harness between L63 (female) (36) – R29 (female) (1)	Resistance	Max. 1 Ω
	3	Defective transmission controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			L63 (female)	Resistance	
			Between (36) and (23)	5 – 10 Ω	

Circuit diagram related to fan pump EPC solenoid



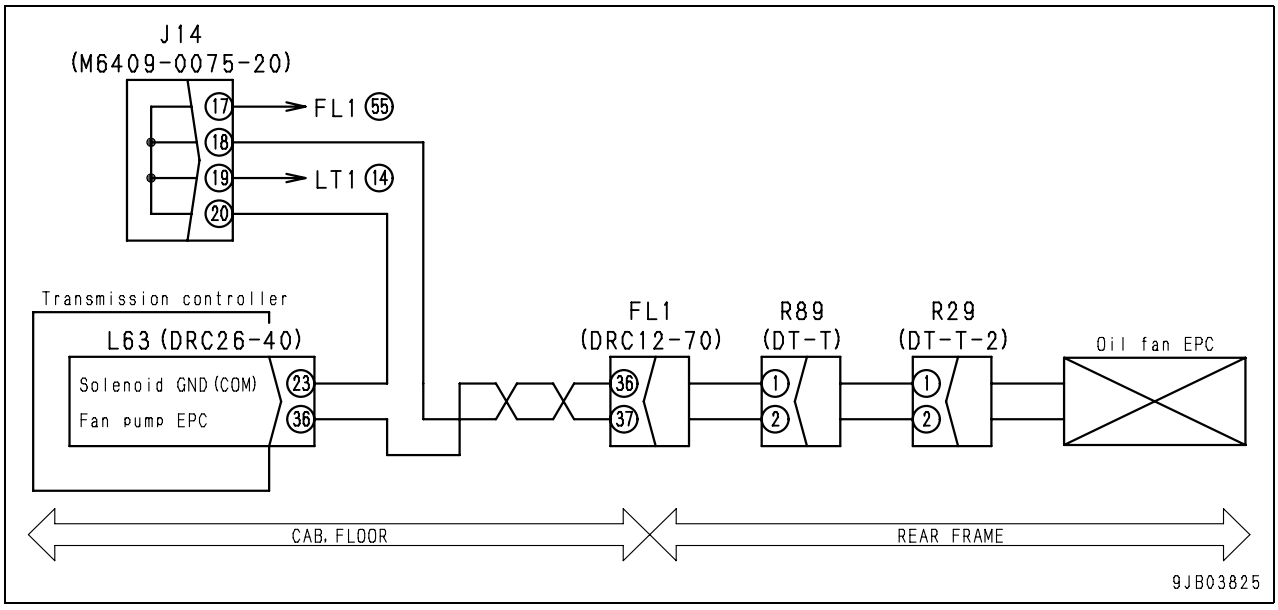
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Failure code [DX16KB] (Fan pump EPC solenoid: Short circuit)

Action code	Failure code	Trouble	Fan pump EPC solenoid: Short circuit (Transmission controller system)
E01	**DX16KB**		
Contents of trouble	• Since the fan pump EPC solenoid system is shorted, abnormal current flows when the fan pump EPC solenoid output is ON.		
Action of controller	• Turns the output to the fan pump EPC solenoid OFF. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• The fan speed is set to the maximum.		
Related information	• The output state (current) to the fan pump EPC solenoid can be checked with the monitoring function (Code: 41400 FAN EPC DIR). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective fan pump EPC solenoid (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			R29 (male)	Resistance		
			Between (1) and (2)	5 – 10 Ω		
			Between (1), (2) and chassis ground	Min. 1 MΩ		
	2	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L63 (female) (36) – R29 (female) (1) and chassis ground	Resistance	Min. 1 MΩ	
	3	Defective transmission controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L63 (female)	Resistance		
			Between (36) and (23)	5 – 10 Ω		
			Between (36), (23) and chassis ground	Min. 1 MΩ		

Circuit diagram related to fan pump EPC solenoid



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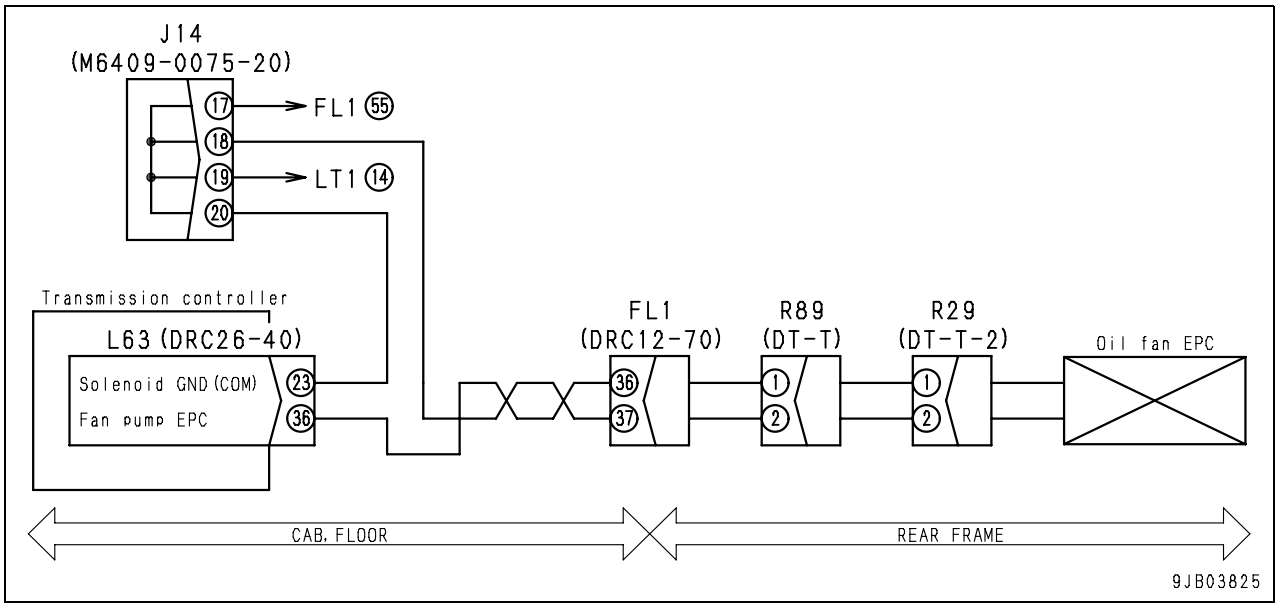
Failure code [DX16KY] (Fan pump EPC solenoid: Short circuit with power supply line)

Action code	Failure code	Trouble	Fan pump EPC solenoid: Short circuit with power supply line (Transmission controller system)
E01	**DX16KY**		
Contents of trouble	• Since the fan pump EPC solenoid system is shorted with the power source, abnormal voltage is applied when the fan pump EPC solenoid output is OFF.		
Action of controller	• Turns the output to the fan pump EPC solenoid OFF. • If problem is removed, system is returned to normal operating state.		
Problem that appears on machine	• The fan speed is minimized.		
Related information	• The output state (current) to the fan pump EPC solenoid can be checked with the monitoring function (Code: 41400, FAN EPC DIR). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective fan pump EPC solenoid (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			R29 (male)	Resistance	
			Between (1) and (2)	5 – 10 Ω	
			Between (1), (2) and chassis ground	Min. 1 MΩ	
	2	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			Wiring harness between L63 (female) (36) – R29 (female) (1) and chassis ground	Voltage	Max. 1 V
	3	Defective transmission controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			L63 (female)	Resistance	
			Between (36) and (23)	5 – 10 Ω	
			Between (36), (23) and chassis ground	Min. 1 MΩ	

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Circuit diagram related to fan pump EPC solenoid



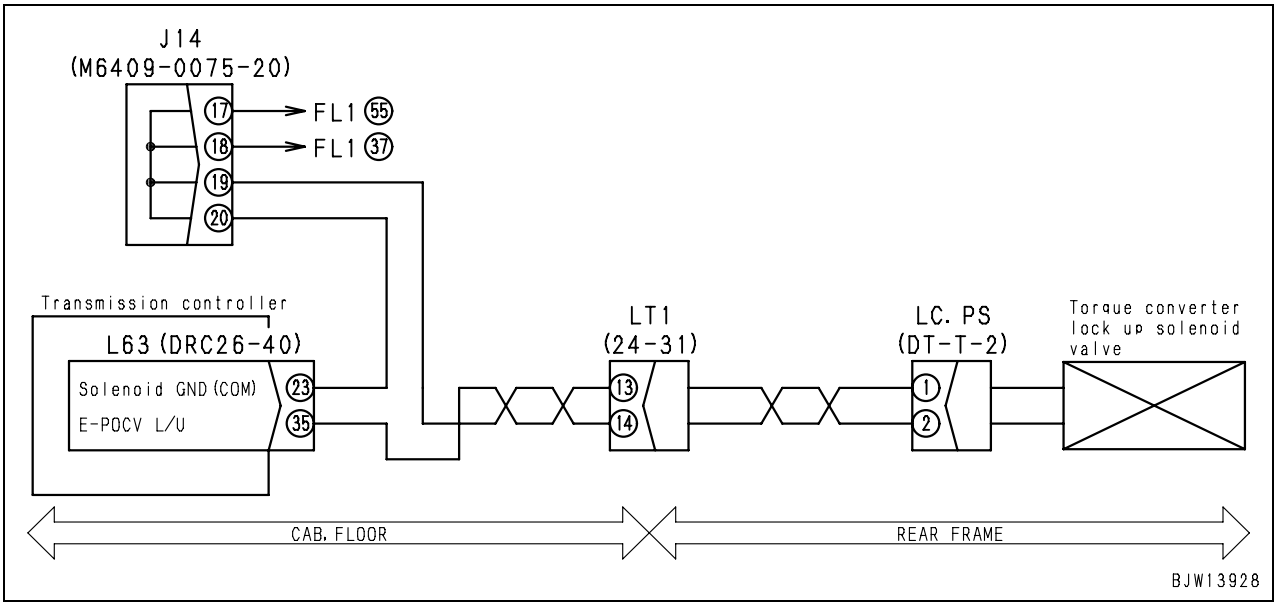
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Failure code [DXH1KA] (Lockup ECMV solenoid: Disconnection)

Action code	Failure code	Trouble	Lockup ECMV solenoid: Disconnection (Transmission controller system)
E01	**DXH1KA**		
Contents of trouble	• Since the lockup ECMV solenoid system is disconnected, no current flows when the lockup solenoid output is ON.		
Action of controller	• Stops outputting the signal to the lockup ECMV solenoid. • Determines that the lockup fill switch is OFF. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• Torque converter lockup is not turned on		
Related information	• The output state (current) to the lockup ECMV solenoid can be checked with the monitoring function (Code: 31609 ECMV LU DIR). • Method of reproducing failure code: Start engine, turn the torque convertor lockup switch ON, and drive the machine.		

	Cause		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective lockup ECMV solenoid (Internal disconnection)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			LC.PS (male)	Resistance	
			Between (1) and (2)	5 – 15 Ω	
	2	Disconnection in wiring harness (Disconnection or defective contact of connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between L63 (female) (23) – LC.PS (female) (2)	Resistance	Max. 1 Ω
			Wiring harness between L63 (female) (35) – LC.PS (female) (1)	Resistance	Max. 1 Ω
	3	Defective transmission controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			L63 (female)	Resistance	
			Between (23) and (35)	5 – 15 Ω	

Circuit diagram related to lockup ECMV solenoid



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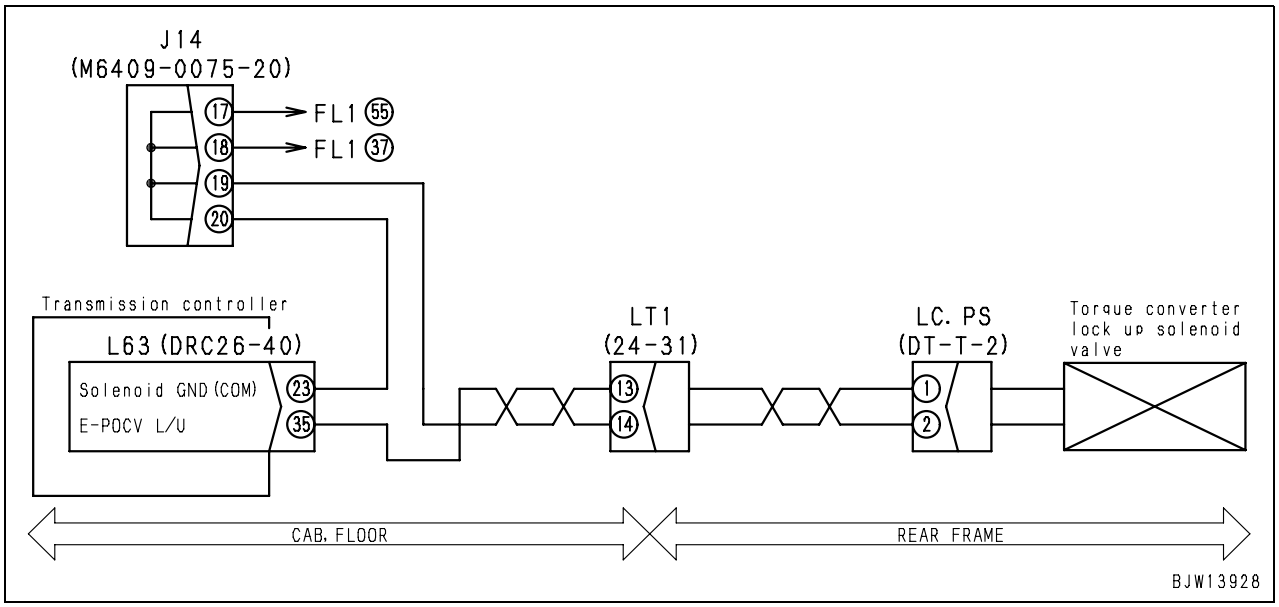
Failure code [DXH1KB] (Lockup ECMV solenoid: Short circuit)

Action code	Failure code	Trouble	Lockup ECMV solenoid: Short circuit (Transmission controller system)
E01	**DXH1KB**		
Contents of trouble	• Since the lockup ECMV solenoid system is short with the chassis ground, abnormal current flowed when the lockup solenoid output was ON.		
Action of controller	• Stops outputting the signal to the lockup ECMV solenoid. • Determines that the lockup fill switch is OFF. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• Torque converter lockup is not turned on.		
Related information	• The output state (current) to the lockup ECMV solenoid can be checked with the monitoring function (Code: 31609 ECMV LU DIR). • Method of reproducing failure code: Engine started + torque convertor lockup switch ON + Travel		

	Cause		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective lockup ECMV solenoid (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			LC.PS (male)	Resistance		
			Between (1) and (2)	5 – 15 Ω		
			Between (1), (2) and chassis ground	Min. 1 MΩ		
	2	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L63 (female) (35) – LC.PS (female) (1) and chassis ground	Resistance	Max. 1 Ω	
	3	Defective transmission controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L63 (female)	Resistance		
			Between (23) and (35)	5 – 15 Ω		
			Between (23), (35) and chassis ground	Min. 1 MΩ		

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Circuit diagram related to lockup ECMV solenoid



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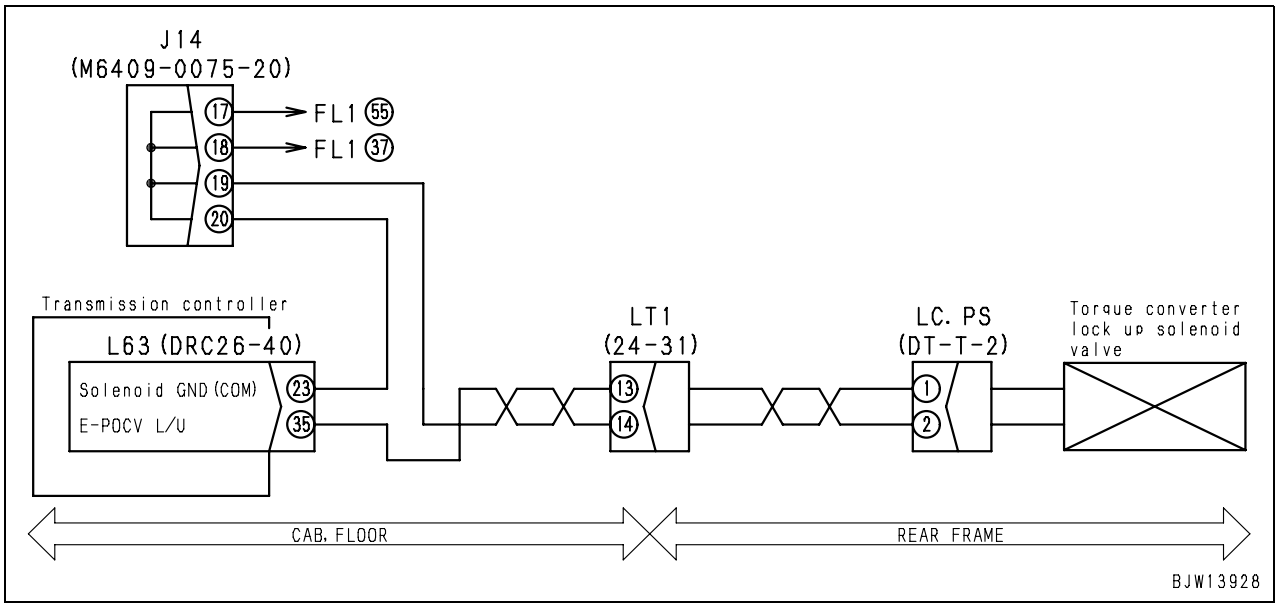
Failure code [DXH1KY] (Lockup ECMV solenoid: Short circuit with power supply line)

Action code	Failure code	Trouble	Lockup ECMV solenoid: Short circuit with power supply line (Transmission controller system)
E03	**DXH1KY**		
Contents of trouble	• Since the lockup ECMV solenoid system was shorted with the power source, abnormal voltage was applied when the lockup ECMV solenoid output was OFF.		
Action of controller	• Keeps the transmission in neutral. • Releases the transmission from neutral if you move the FNR (directional) lever, joystick steering FNR (directional) switch, or right FNR (directional) switch to N (neutral). • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until the FNR (directional) lever, joystick steering FNR (directional) switch, or right FNR (directional) switch is set to N (Neutral).		
Problem that appears on machine	• Neutral is held until the FNR (directional) lever, joystick steering FNR (directional) switch, or right FNR (directional) switch is set to N (neutral). • The lockup clutch is always in the meshed state.		
Related information	• The output state (current) to the lockup ECMV solenoid can be checked with the monitoring function (Code: 31609 ECMV LU DIR). • Method of reproducing failure code: Turn starting switch ON.		

	Cause		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective lockup ECMV solenoid (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			LC.PS (male)	Resistance	
			Between (1) and (2)	5 – 15 Ω	
			Between (1), (2) and chassis ground	Min. 1 MΩ	
	2	Hot short in wiring harness (Contact with 24 V circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			Wiring harness between L63 (female) (35) – LC.PS (female) (1) and chassis ground	Voltage	Max. 1 V
	3	Defective transmission controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			L63 (female)	Resistance	
			Between (23) and (35)	5 – 15 Ω	
			Between (23), (35) and chassis ground	Min. 1 MΩ	

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Circuit diagram related to lockup ECMV solenoid



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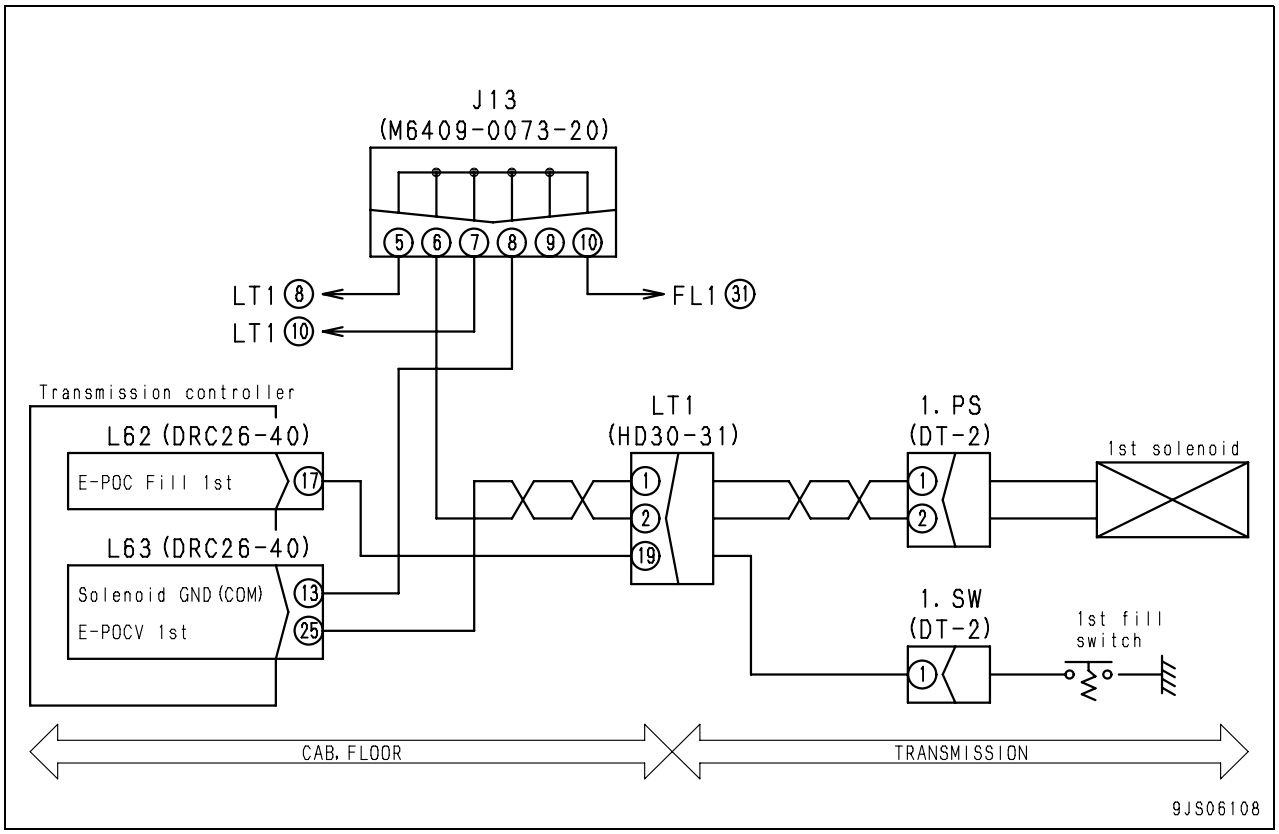
Failure code [DXH4KA] (1st clutch ECMV solenoid: Disconnection)

Action code	Failure code	Trouble	1st clutch ECMV solenoid: Disconnection (Transmission controller system)
E03	**DXH4KA**		
Contents of trouble	• When the 1st clutch ECMV solenoid system is disconnected, no current flows when 1st clutch ECMV solenoid output is ON.		
Action of controller	• Stops outputting the signal to the 1st clutch ECMV solenoid. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• The transmission does not shift into 1st (The machine can travel in any gear speed other than 1st),		
Related information	• The output state (current value) to the 1st (1st speed) clutch ECMV solenoid can be checked with the monitoring function (Code: 31602, ECMV 1 DIR). • Method of reproducing failure code: Turn on the starting switch, set the transmission auto-shift/manual shift selector switch in the MANUAL position and select 1st using the shift down switch or move the gear shift lever to 1st.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective 1st clutch ECMV solenoid (Internal disconnection)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			1.PS (male)	Resistance		
			Between (1) and (2)	5 – 15 Ω		
	2	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L63 (female) (13) – 1.PS (female) (2)	Resistance	Max. 1 Ω	
			Wiring harness between L63 (female) (25) – 1.PS (female) (1)	Resistance	Max. 1 Ω	
	3	Defective transmission controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L63 (female)	Resistance		
			Between (25) and (13)	5 – 15 Ω		

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Circuit diagram related to 1st clutch ECMV solenoid



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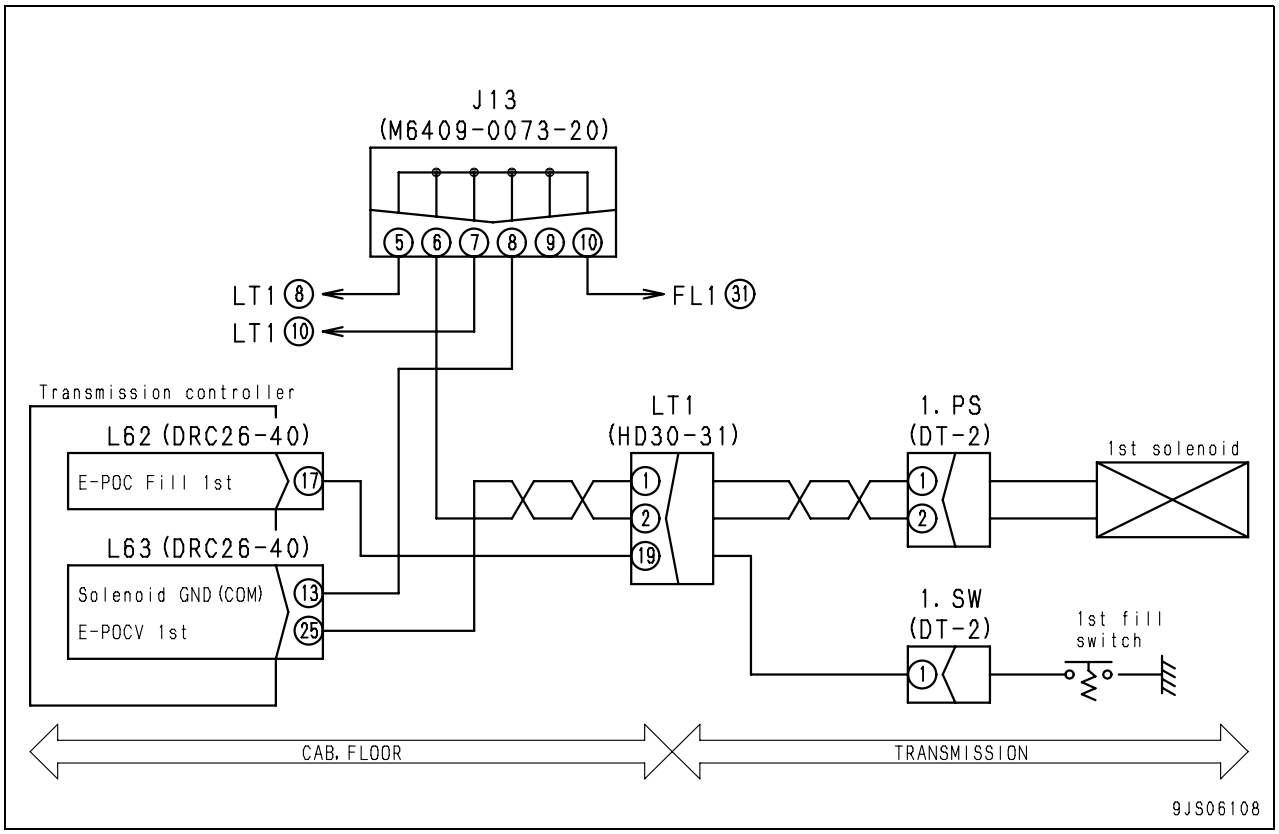
Failure code [DXH4KB] (1st clutch ECMV solenoid: Short circuit)

Action code	Failure code	Trouble	1st clutch ECMV solenoid: Short circuit (Transmission controller system)
E03	**DXH4KB**		
Contents of trouble	• Since the 1st ECMV solenoid system is shorted, abnormal current flows when 1st clutch ECMV solenoid output is ON.		
Action of controller	• Stops outputting the signal to the 1st clutch ECMV solenoid. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• The transmission does not shift into 1st (The machine can travel in any gear speed other than 1st),		
Related information	• The output state (current value) to the 1st (1st speed) clutch ECMV solenoid can be checked with the monitoring function (Code: 31602, ECMV 1 DIR). • Method of reproducing failure code: Turn on the starting switch, set the transmission auto-shift/manual shift selector switch in the MANUAL position and select 1st using the shift down switch or move the gearshift lever to 1st.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective 1st clutch ECMV solenoid (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			1.PS (male)	Resistance		
			Between (1) and (2)	5 – 15 Ω		
			Between (1), (2) and chassis ground	Min. 1 MΩ		
	2	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L63 (female) (25) – 1.PS (female) (1) and chassis ground	Resistance	Min. 1 MΩ	
	3	Defective transmission controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L63 (female)	Resistance		
			Between (25) and (13)	5 – 15 Ω		
			Between (25), (13) and chassis ground	Min. 1 MΩ		

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Circuit diagram related to 1st clutch ECMV solenoid



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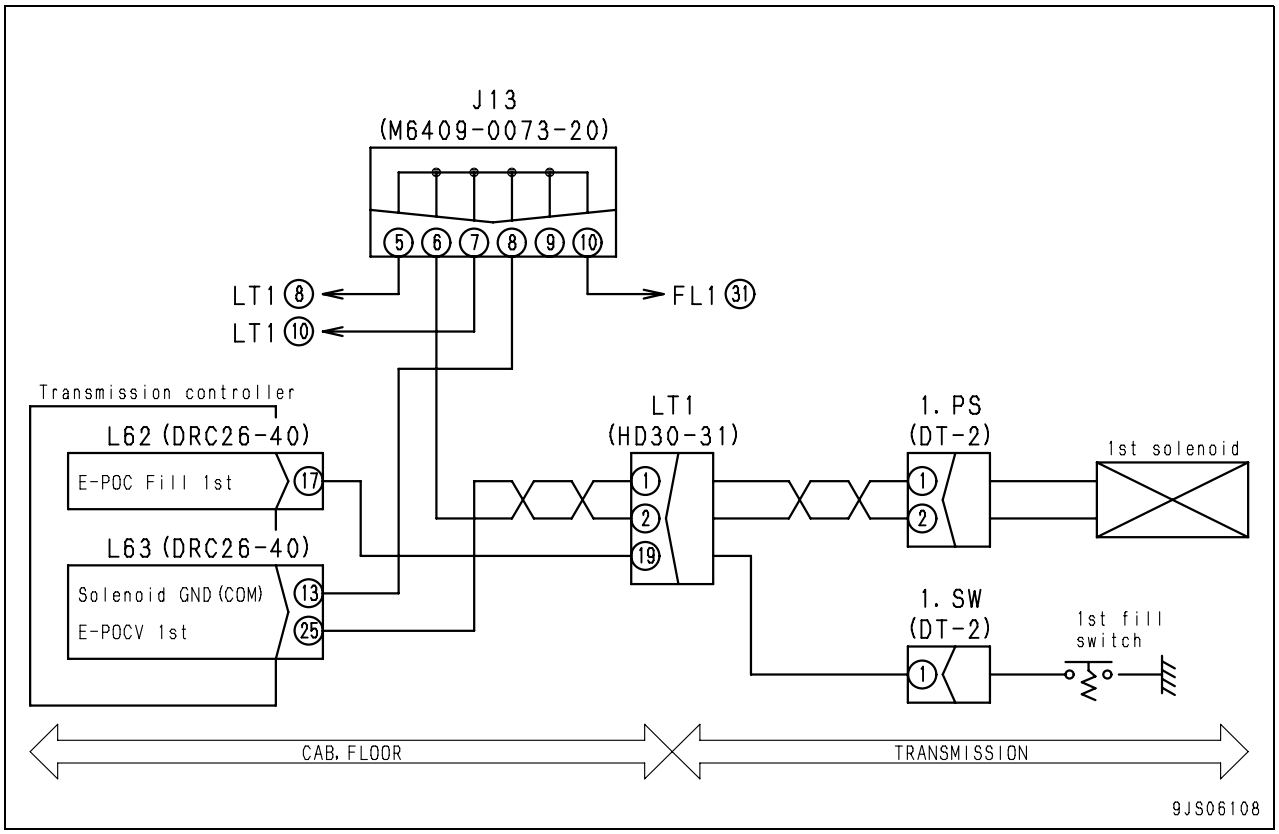
Failure code [DXH4KY] (1st clutch ECMV solenoid: Short circuit with power supply line)

Action code	Failure code	Trouble	1st clutch ECMV solenoid: Short circuit with power supply line (Transmission controller system)
E03	**DXH4KY**		
Contents of trouble	• Since the 1st ECMV solenoid system is shorted with the power source, abnormal voltage is applied when 1st clutch ECMV solenoid output is OFF.		
Action of controller	• Stops outputting the signal to the 2nd, 3rd, and 4th clutch ECMV solenoids. • Also stops outputting the signal to the F (Forward) and R (Reverse) clutch ECMV solenoids when the speed clutch output is OFF (other than 1st speed). • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until FNR (directional) lever, joystick steering FNR (directional) switch or right FNR (directional) switch is set to N (Neutral).		
Problem that appears on machine	• The transmission does not shift into 2nd, 3rd, nor 4th (the machine can travel at 1st).		
Related information	• The output state (current value) to the 1st (1st speed) clutch ECMV solenoid can be checked with the monitoring function (Code: 31602, ECMV 1 DIR). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective 1st clutch ECMV solenoid (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			1.PS (male)	Resistance	
			Between (1) and (2)	5 – 15 Ω	
			Between (1), (2) and chassis ground	Min. 1 MΩ	
	2	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			Wiring harness between L63 (female) (25) – 1.PS (female) (1) and chassis ground	Voltage	Max. 1 V
	3	Defective transmission controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			L63 (female)	Resistance	
			Between (25) and (13)	5 – 15 Ω	
			Between (25), (13) and chassis ground	Min. 1 MΩ	

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Circuit diagram related to 1st clutch ECMV solenoid



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WA430-6 Wheel loader

Form No. SEN01746-01

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WHEEL LOADER

WA430-6

Machine Model	Serial Number
WA430-6	65001 and up

40 Troubleshooting

Troubleshooting by failure code (Display of code), Part 10

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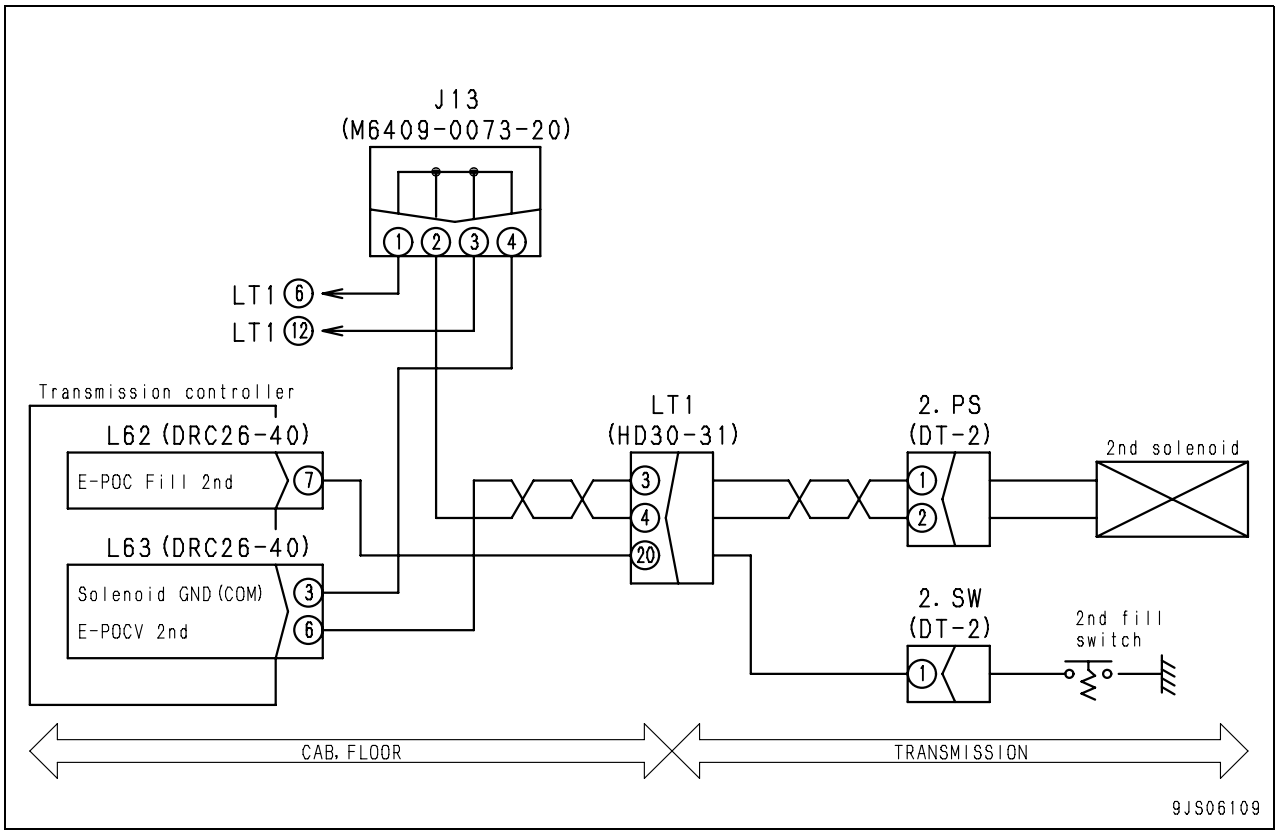
Failure code [DXH5KA] (2nd clutch ECMV solenoid: Disconnection)

Action code	Failure code	Trouble	2nd clutch ECMV solenoid: Disconnection (Transmission controller system)
E03	**DXH5KA**		
Contents of trouble	• When the 2nd clutch ECMV solenoid system is disconnected, no current flows when 2nd clutch ECMV solenoid output is ON.		
Action of controller	• Stops outputting the signal to the 2nd clutch ECMV solenoid. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• The transmission does not shift into 2nd (The machine can travel in any gear speed other than 2nd.)		
Related information	• The output state (current value) to the 2nd (2nd speed) clutch ECMV solenoid can be checked with the monitoring function (Code: 31603, ECMV 2 DIR). • Method of reproducing failure code: Turn on the starting switch, set the transmission auto-shift/manual shift selector switch in the MANUAL position, and select 2nd using the shift down switch or moving the gear shift lever to 2nd.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective 2nd clutch ECMV solenoid (Internal disconnection)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			2.PS (male)	Resistance		
			Between (1) and (2)	5 – 15 Ω		
	2	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L63 (female) (6) – 2.PS (female) (1)	Resistance	Max. 1 Ω	
			Wiring harness between L63 (female) (3) – 2.PS (female) (2)	Resistance	Max. 1 Ω	
	3	Defective transmission controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L63 (female)	Resistance		
			Between (6) and (3)	5 – 15 Ω		

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Circuit diagram related to 2nd clutch ECMV solenoid



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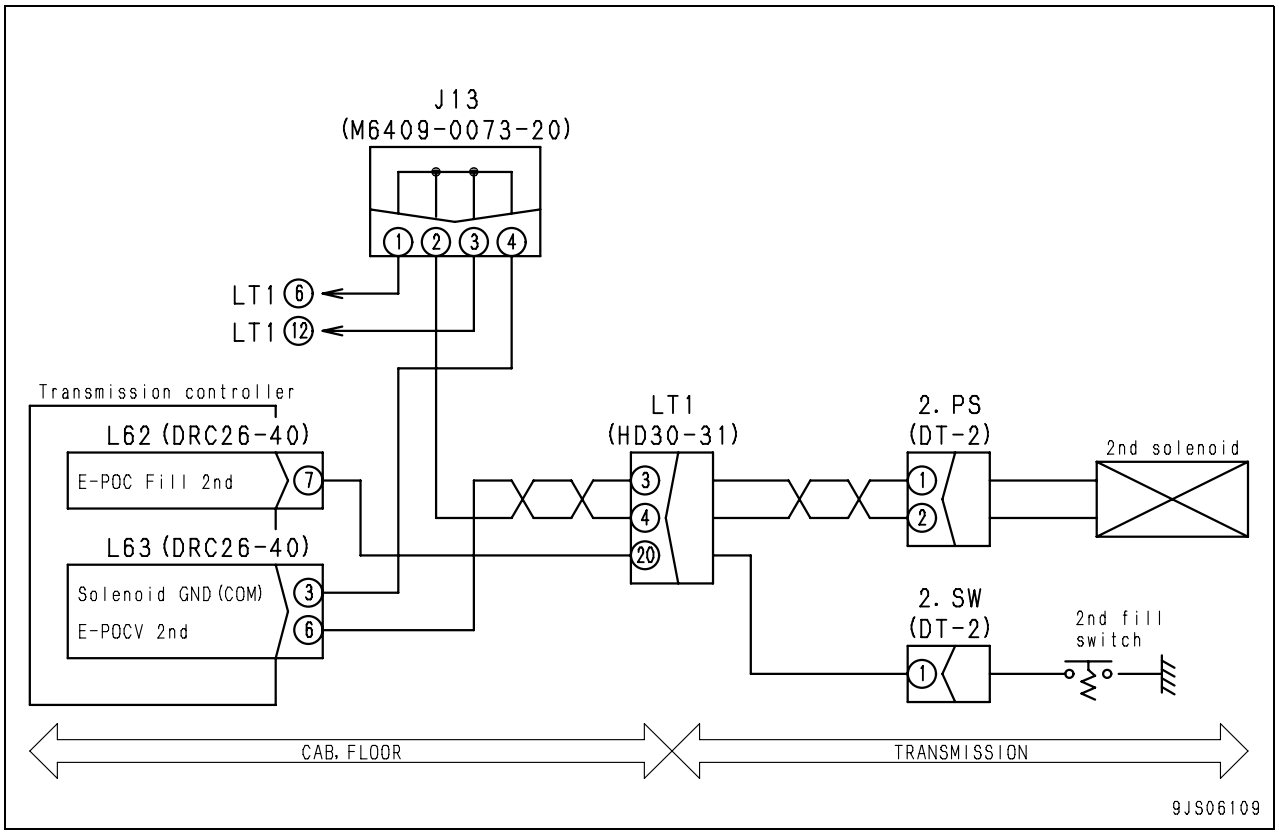
Failure code [DXH5KB] (2nd clutch ECMV solenoid: Short circuit)

Action code	Failure code	Trouble	2nd clutch ECMV solenoid: Short circuit (Transmission controller system)
E03	**DXH5KB**		
Contents of trouble	• Since the 2nd clutch ECMV solenoid system is shorted, abnormal current flows when 2nd clutch ECMV solenoid output is ON.		
Action of controller	• Stops outputting the signal to the 2nd clutch ECMV solenoid. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• The transmission does not shift into 2nd (The machine can travel in any gear speed other than 2nd.)		
Related information	• The output state (current value) to the 2nd (2nd speed) clutch ECMV solenoid can be checked with the monitoring function (Code: 31603, ECMV 2 DIR). • Method of reproducing failure code: Turn on the starting switch, set the transmission auto-shift/manual shift selector switch in the MANUAL position, and select 2nd using the shift down switch or moving the gear shift lever to 2nd.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective 2nd clutch ECMV solenoid (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			2.PS (male)	Resistance		
			Between (1) and (2)	5 – 15 Ω		
			Between (1), (2) and chassis ground	Min. 1 MΩ		
	2	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L63 (female) (6) – 2.PS (female) (1) and chassis ground	Resistance	Min. 1 MΩ	
	3	Defective transmission controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L63 (female)	Resistance		
			Between (6) and (3)	5 – 15 Ω		
			Between (6), (3) and chassis ground	Min. 1 MΩ		

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Circuit diagram related to 2nd clutch ECMV solenoid



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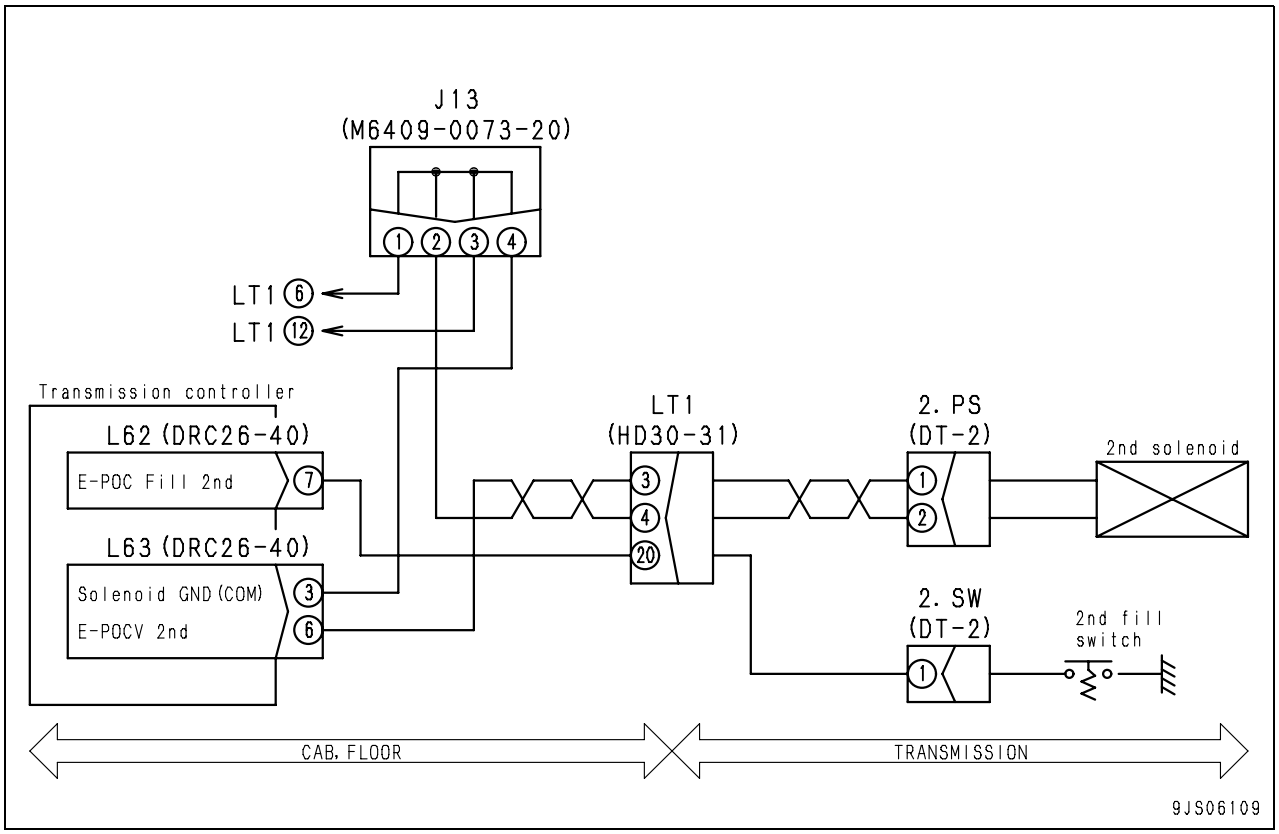
Failure code [DXH5KY] (2nd clutch ECMV solenoid: Short circuit with power supply line)

Action code	Failure code	Trouble	2nd clutch ECMV solenoid: Short circuit with power supply line (Transmission controller system)
E03	**DXH5KY**		
Contents of trouble	• When the 2nd clutch ECMV solenoid system was shorted with the power source, abnormal voltage was applied when 2nd clutch ECMV solenoid output was OFF.		
Action of controller	• Stops outputting the signal to the 1st, 3rd, and 4th clutch ECMV solenoids. • Also stops outputting the signal to the F (Forward) and R (Reverse) clutch ECMV solenoids when the speed clutch output is OFF (other than 2nd speed). • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until the FNR (directional) lever, joystick steering FNR (directional) switch, or right FNR (directional) switch is set to N (Neutral).		
Problem that appears on machine	• The transmission does not shift into 1st, 3rd, nor 4th (the machine can travel at 2nd).		
Related information	• The output state (current) to the 2nd clutch ECMV solenoid can be checked with the monitoring function (Code: 31603 ECMV 2 DIR). • Method of reproducing failure code: Turn starting switch ON.		

	Cause		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective 2nd clutch ECMV solenoid (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			2.PS (male)	Resistance	
			Between (1) and (2)	5 – 15 Ω	
			Between (1), (2) and chassis ground	Min. 1 MΩ	
	2	Hot short in wiring harness (Contact with 24 V circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			Wiring harness between L63 (female) (6) – 2.PS (female) (1) and chassis ground	Voltage	Max. 1 V
	3	Defective transmission controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			L63 (female)	Resistance	
			Between (6) and (3)	5 – 15 Ω	
			Between (6), (3) and chassis ground	Min. 1 MΩ	

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Circuit diagram related to 2nd clutch ECMV solenoid



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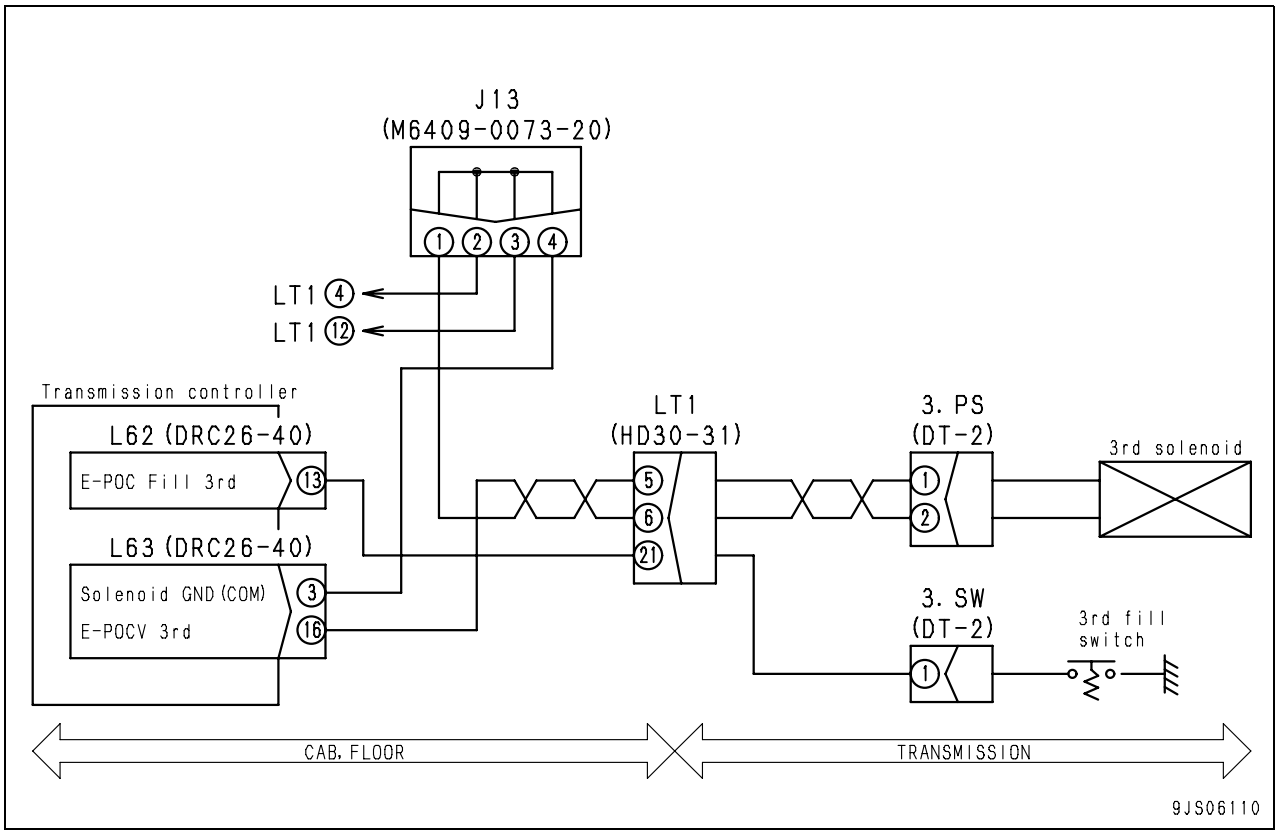
Failure code [DXH6KA] (3rd clutch ECMV solenoid: Disconnection)

Action code	Failure code	Trouble	3rd clutch ECMV solenoid: Disconnection (Transmission controller system)
E03	**DXH6KA**		
Contents of trouble	• Since the 3rd clutch ECMV solenoid system is disconnected, no current flows when 3rd clutch ECMV solenoid output is ON.		
Action of controller	• Stops outputting the signal to the 3rd clutch ECMV solenoid. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• The transmission does not shift into 3rd (The machine can travel in any gear speed other than 3rd.)		
Related information	• The output state (current value) to the 3rd clutch ECMV solenoid can be checked with the monitoring function (Code: 31604, ECMV 3 DIR). • Method of reproducing failure code: Turn on the starting switch, set the transmission auto-shift/manual shift selector switch to the MANUAL position, and select 3rd using the shift down switch or moving the gear shift lever to 3rd.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective 3rd clutch ECMV solenoid (Internal disconnection)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			3.PS (male)	Resistance		
			Between (1) and (2)	5 – 15 Ω		
	2	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L63 (female) (3) – 3.PS (female) (2)	Resistance	Max. 1 Ω	
			Wiring harness between L63 (female) (16) – 3.PS (female) (1)	Resistance	Max. 1 Ω	
	3	Defective transmission controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L63 (female)	Resistance		
			Between (16) and (3)	5 – 15 Ω		

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Circuit diagram related to 3rd clutch ECMV solenoid



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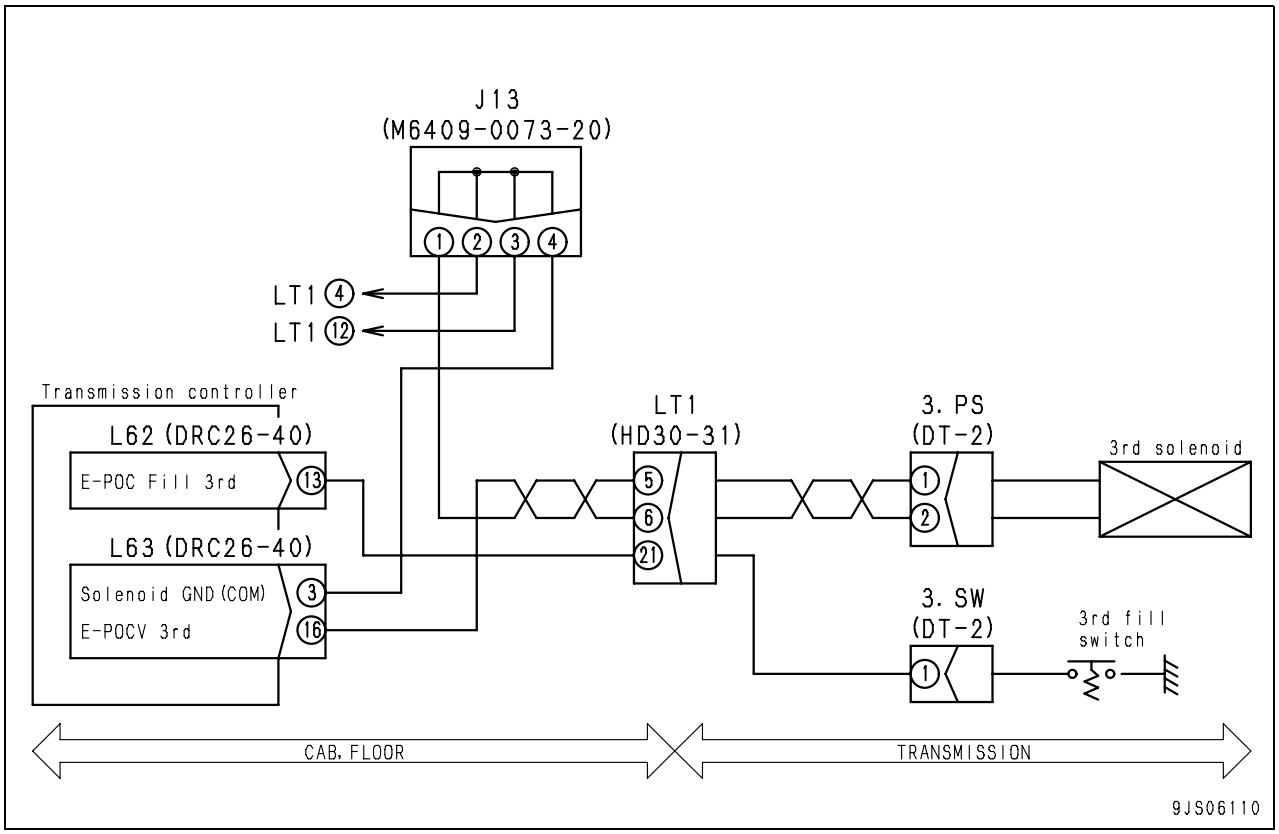
Failure code [DXH6KB] (3rd clutch ECMV solenoid: Short circuit)

Action code	Failure code	Trouble	3rd clutch ECMV solenoid: Short circuit (Transmission controller system)
E03	**DXH6KB**		
Contents of trouble	• Since the 3rd clutch ECMV solenoid system is shorted, abnormal current flows when 3rd clutch ECMV solenoid output is ON.		
Action of controller	• Stops outputting the signal to the 3rd clutch ECMV solenoid. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• The transmission does not shift into 3rd (The machine can travel in any gear speed other than 3rd.)		
Related information	• The output state (current value) to the 3rd clutch ECMV solenoid can be checked with the monitoring function (Code: 31604, ECMV 3 DIR). • Method of reproducing failure code: Turn on the starting switch, set the transmission auto-shift/manual shift selector switch to the MANUAL position, and select 3rd using the shift down switch or moving the gear shift lever to 3rd.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective 3rd clutch ECMV solenoid (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			3.PS (male)	Resistance		
			Between (1) and (2)	5 – 15 Ω		
			Between (1), (2) and chassis ground	Min. 1 MΩ		
	2	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L63 (female) (16) – 3.PS (female) (1) and chassis ground	Resistance	Min. 1 MΩ	
	3	Defective transmission controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L63 (female)	Resistance		
			Between (16) and (3)	5 – 15 Ω		
			Between (16), (3) and chassis ground	Min. 1 MΩ		

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Circuit diagram related to 3rd clutch ECMV solenoid



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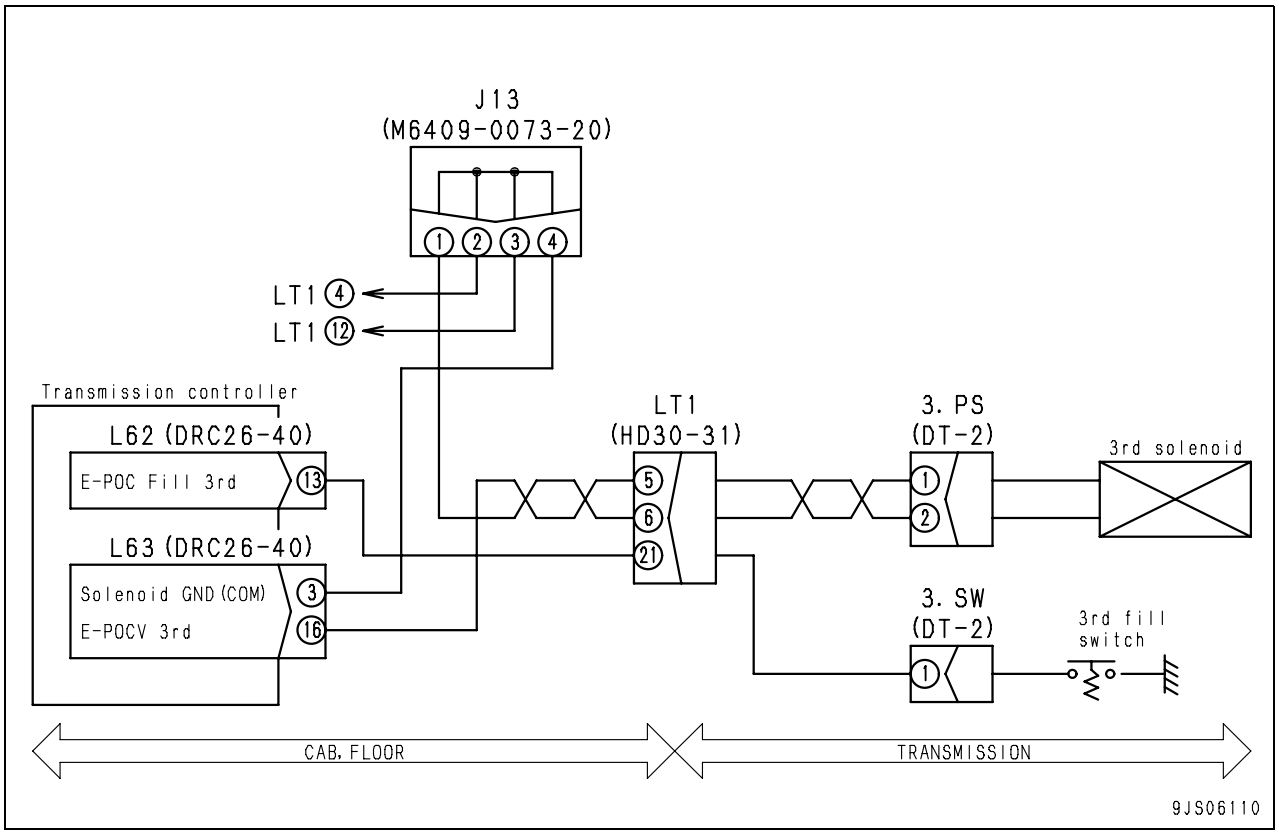
Failure code [DXH6KY] (3rd clutch ECMV solenoid: Short circuit with power supply line)

Action code	Failure code	Trouble	3rd clutch ECMV solenoid: Short circuit with power supply line (Transmission controller system)
E03	**DXH6KY**		
Contents of trouble	• Since the 3rd ECMV solenoid system is shorted with the power source, abnormal voltage is applied when 3rd clutch ECMV solenoid output is OFF.		
Action of controller	• Stops outputting the signal to the 1st, 2nd, and 4th clutch ECMV solenoids. • Also stops outputting the signal to the F (Forward) and R (Reverse) clutch ECMV solenoids when the speed clutch output is OFF (other than 3rd speed). • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until FNR (directional) lever, joystick steering FNR (directional) switch or right FNR (directional) switch is set to N (Neutral).		
Problem that appears on machine	• The transmission does not shift into 1st, 2nd or 4th (the machine can travel at 3rd).		
Related information	• The output state (current value) to the 3rd clutch ECMV solenoid can be checked with the monitoring function (Code: 31604, ECMV 3 DIR). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective 3rd clutch ECMV solenoid (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			3.PS (male)	Resistance	
			Between (1) and (2)	5 – 15 Ω	
			Between (1), (2) and chassis ground	Min. 1 MΩ	
	2	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			Wiring harness between L63 (female) (16) – 3.PS (female) (1) and chassis ground	Voltage	Max. 1 V
	3	Defective transmission controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			L63 (female)	Resistance	
			Between (16) and (3)	5 – 15 Ω	
			Between (16), (3) and chassis ground	Min. 1 MΩ	

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Circuit diagram related to 3rd clutch ECMV solenoid



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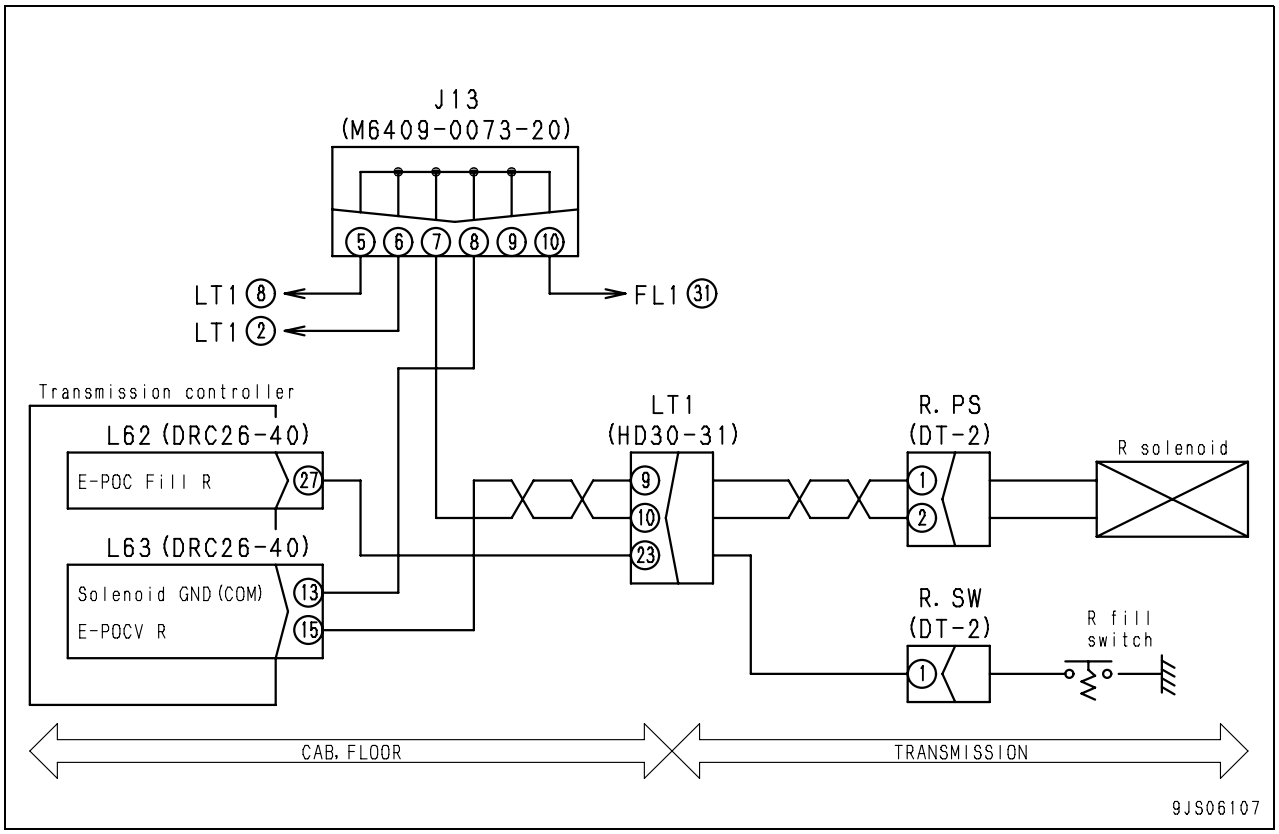
Failure code [DXH7KA] (R clutch ECMV solenoid: Disconnection)

Action code	Failure code	Trouble	R clutch ECMV solenoid: Disconnection (Transmission controller system)
E03	**DXH7KA**		
Contents of trouble	• When the R (Reverse) clutch ECMV solenoid system is disconnected, no current flows when R (Reverse) clutch ECMV solenoid output is ON.		
Action of controller	• Stops outputting the signal to the R (Reverse) clutch ECMV solenoid. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• The transmission cannot be set in the R (Reverse) position (the machine can travel at F (Forward)).		
Related information	• The output state (current value) to the R (reverse) clutch ECMV solenoid can be checked with the monitoring function (Code: 31606, ECMV R DIR). • Method of reproducing failure code: Turn the starting switch ON and set FNR (directional) lever, joystick steering FNR (directional) switch or right FNR (directional) switch to R (reverse).		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective R (Reverse) clutch ECMV solenoid (Internal disconnection)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			R.PS (male)	Resistance		
			Between (1) and (2)	5 – 15 Ω		
	2	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L63 (female) (13) – R.PS (female) (2)	Resistance	Max. 1 Ω	
			Wiring harness between L63 (female) (15) – R.PS (female) (1)	Resistance	Max. 1 Ω	
	3	Defective transmission controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L63 (female)	Resistance		
			Between (15) and (13)	5 – 15 Ω		

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Circuit diagram related to R (Reverse) clutch ECMV solenoid



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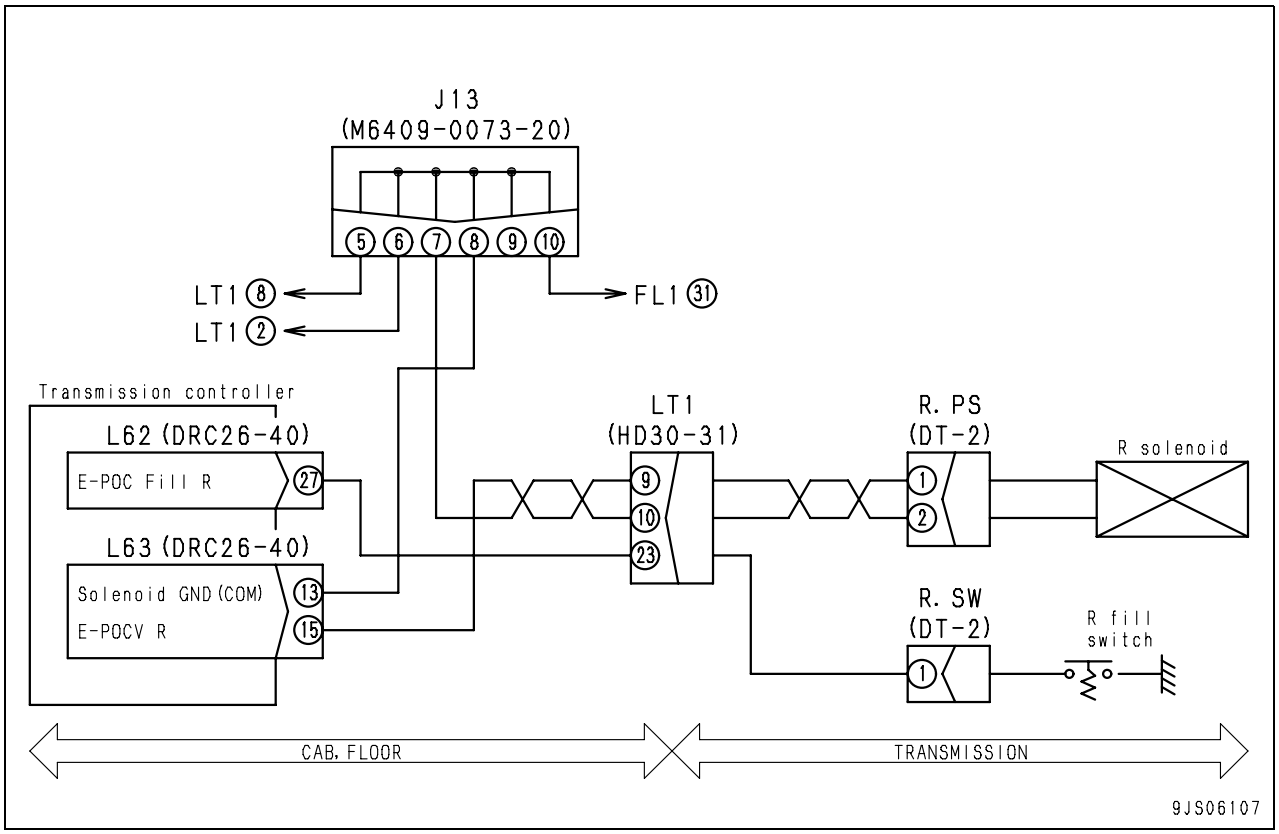
Failure code [DXH7KB] (R clutch ECMV solenoid: Short circuit)

Action code	Failure code	Trouble	R clutch ECMV solenoid: Short circuit (Transmission controller system)
E03	**DXH7KB**		
Contents of trouble	• Since the R (Reverse) clutch ECMV solenoid system is shorted, abnormal current flows when R (Reverse) clutch ECMV solenoid output is ON.		
Action of controller	• Stops outputting the signal to the R (Reverse) clutch ECMV solenoid. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• The transmission cannot be set in the R (Reverse) position (the machine can travel at F (Forward)).		
Related information	• The output state (current value) to the R (reverse) clutch ECMV solenoid can be checked with the monitoring function (Code: 31606, ECMV R DIR). • Method of reproducing failure code: Turn the starting switch ON and set FNR (directional) lever, joystick steering FNR (directional) switch or right FNR (directional) switch to R (reverse).		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective R (Reverse) clutch ECMV solenoid (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			R.PS (male)	Resistance		
			Between (1) and (2)	5 – 15 Ω		
			Between (1), (2) and chassis ground	Min. 1 MΩ		
	2	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L63 (female) (15) – R.PS (female) (1) and chassis ground	Resistance	Min. 1 MΩ	
	3	Defective transmission controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L63 (female)	Resistance		
			Between (15) and (13)	5 – 15 Ω		
			Between (15), (13) and chassis ground	Min. 1 MΩ		

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Circuit diagram related to R (Reverse) clutch ECMV solenoid



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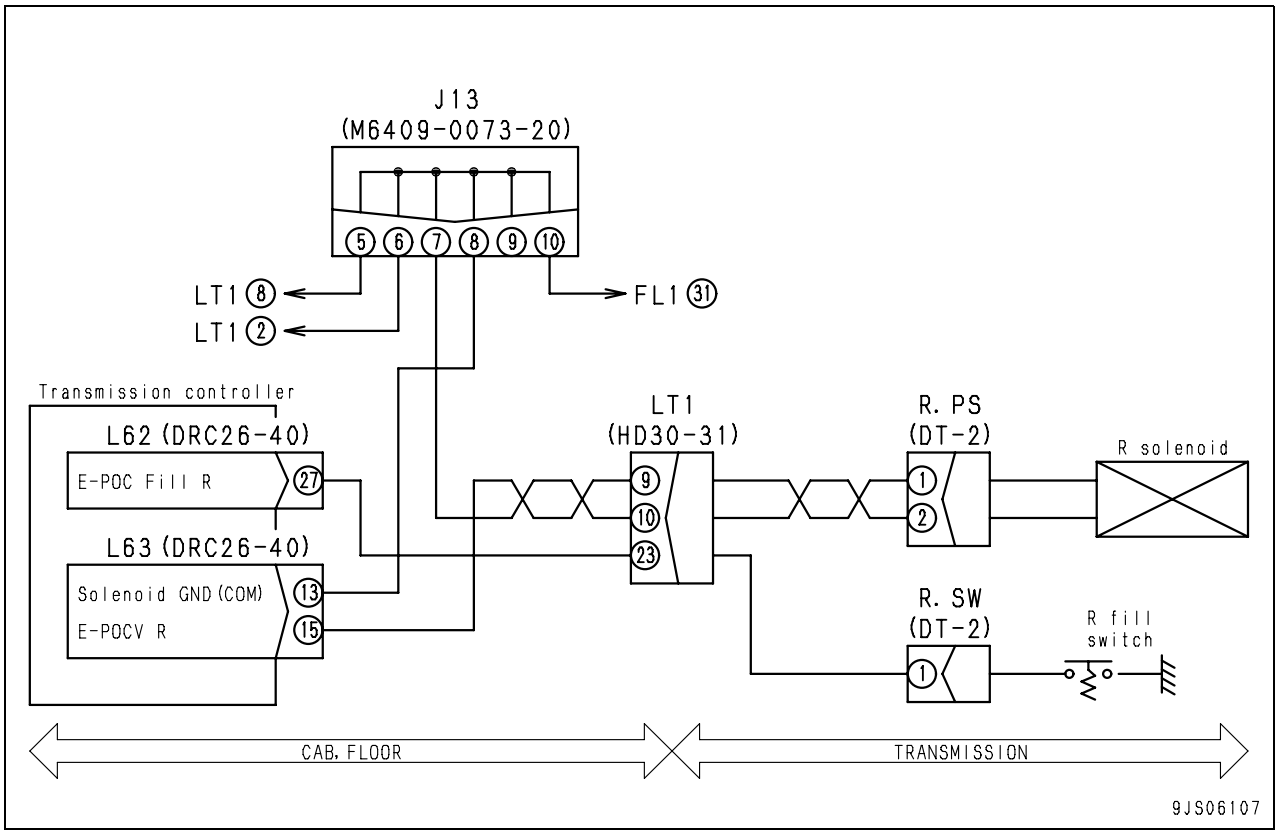
Failure code [DXH7KY] (R clutch ECMV solenoid: Short circuit with power supply line)

Action code	Failure code	Trouble	R clutch ECMV solenoid: Short circuit with power supply line (Transmission controller system)
E03	**DXH7KY**		
Contents of trouble	• Since the R (Reverse) ECMV solenoid system is shorted with the power source, abnormal voltage is applied when the R (Reverse) ECMV solenoid output is OFF.		
Action of controller	• Outputs the signal to the R (Reverse) clutch ECMV solenoid when the directional lever or directional switch is in R (Reverse). • Sets the transmission in N (Neutral) when the gear shift lever is in N (Neutral) or F (Forward). • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until FNR (directional) lever, joystick steering FNR (directional) switch or right FNR (directional) switch is set to N (Neutral).		
Problem that appears on machine	• The machine can travel in the R (Reverse) position alone.		
Related information	• The output state (current value) to the R (reverse) clutch ECMV solenoid can be checked with the monitoring function (Code: 31606, ECMV R DIR). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective R (Reverse) clutch ECMV solenoid (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			R.PS (male)	Resistance	
			Between (1) and (2)	5 – 15 Ω	
			Between (1), (2) and chassis ground	Min. 1 MΩ	
	2	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			Wiring harness between L63 (female) (15) – R.PS (female) (1) and chassis ground	Voltage	Max. 1 V
	3	Defective transmission controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			L63 (female)	Resistance	
			Between (15) and (13)	5 – 15 Ω	
			Between (15), (13) and chassis ground	Min. 1 MΩ	

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Circuit diagram related to R (Reverse) clutch ECMV solenoid



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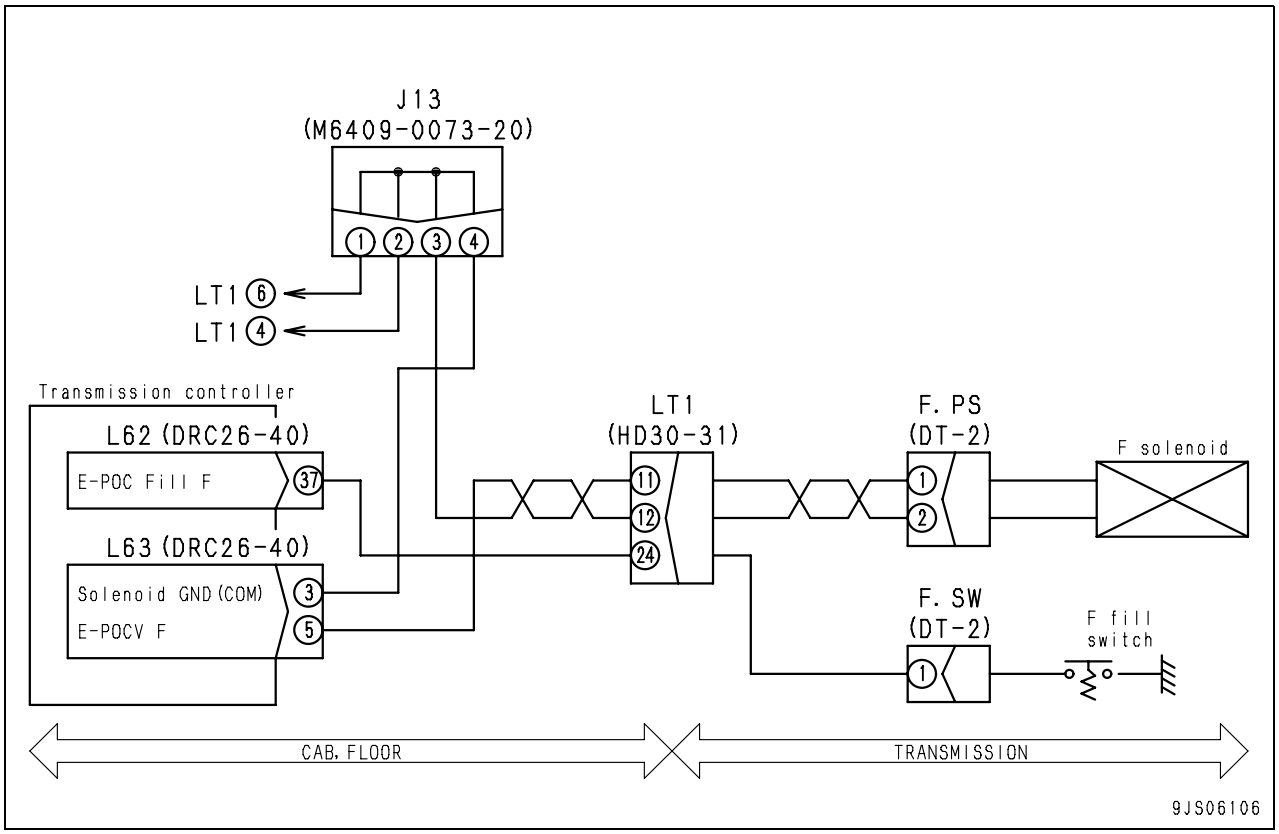
Failure code [DXH8KA] (F clutch ECMV solenoid: Disconnection)

Action code	Failure code	Trouble	F clutch ECMV solenoid: Disconnection (Transmission controller system)
E03	**DXH8KA**		
Contents of trouble	• Since the F (Forward) clutch ECMV solenoid system is disconnected, no current flows when F (Forward) clutch ECMV solenoid output is ON.		
Action of controller	• Stops outputting the signal to the F (Forward) clutch ECMV solenoid. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• The transmission cannot be set in the F (Forward) position (the machine can travel at R (Reverse)).		
Related information	• The output state (current value) to the F (Forward) clutch ECMV solenoid can be checked with the monitoring function (Code: 31608, ECMV F DIR). • Method of reproducing failure code: Turn the starting switch ON and set FNR (directional) lever, joystick steering FNR (directional) switch, or right FNR (directional) switch to F (forward).		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective F (Forward) clutch ECMV solenoid (Internal disconnection)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			F.PS (male)	Resistance		
			Between (1) and (2)	5 – 15 Ω		
	2	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L63 (female) (3) – F.PS (female) (2)	Resistance	Max. 1 Ω	
			Wiring harness between L63 (female) (5) – F.PS (female) (1)	Resistance	Max. 1 Ω	
	3	Defective transmission controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L63 (female)	Resistance		
			Between (5) and (3)	5 – 15 Ω		

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Circuit diagram related to F (Forward) clutch ECMV solenoid



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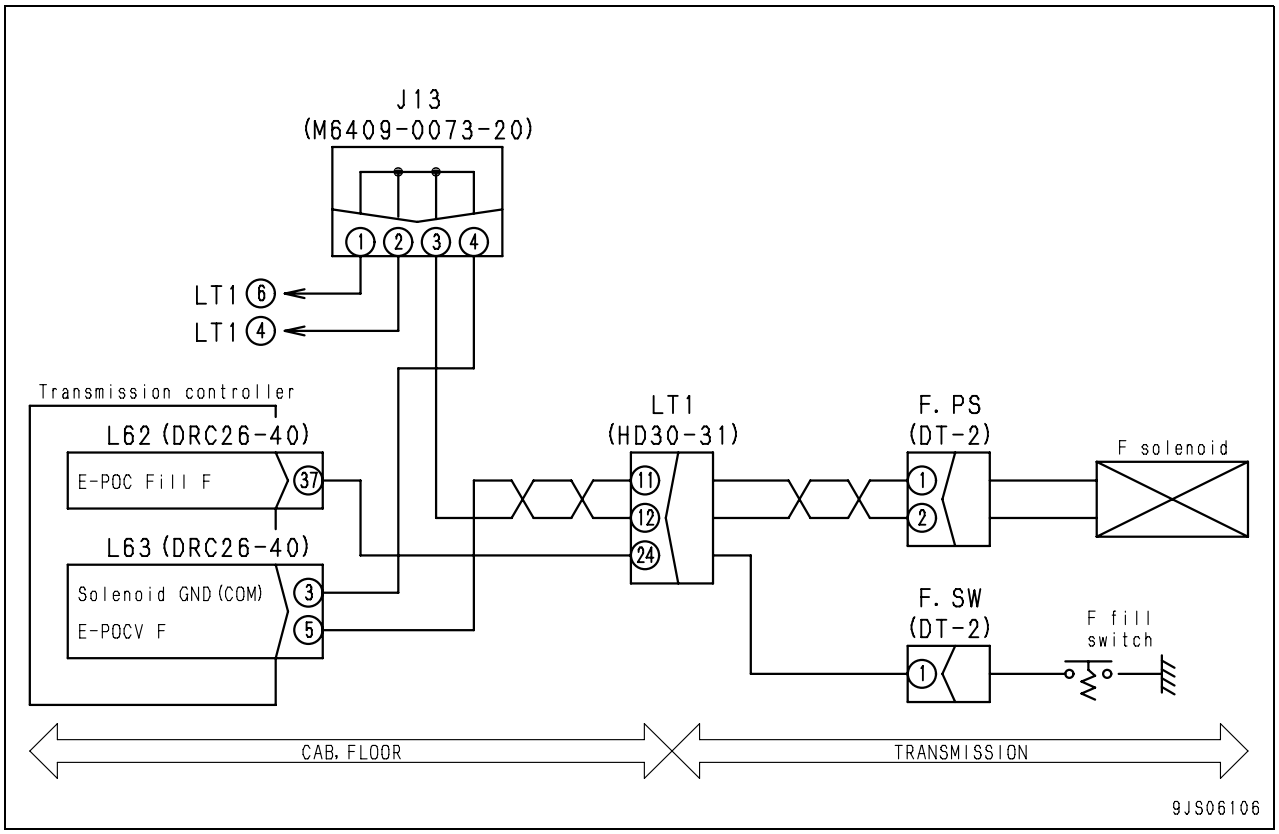
Failure code [DXH8KB] (F clutch ECMV solenoid: Short circuit)

Action code	Failure code	Trouble	F clutch ECMV solenoid: Short circuit (Transmission controller system)
E03	**DXH8KB**		
Contents of trouble	• When the F (Forward) clutch ECMV solenoid system is shorted, abnormal current flows when F (Forward) clutch ECMV solenoid output is ON.		
Action of controller	• Stops outputting the signal to the F (Forward) clutch ECMV solenoid. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• The transmission cannot be set in the F (Forward) position (the machine can travel at R (Reverse)).		
Related information	• The output state (current value) to the F (Forward) clutch ECMV solenoid can be checked with the monitoring function (Code: 31608, ECMV F DIR). • Method of reproducing failure code: Turn the starting switch ON and set FNR (directional) lever, joystick steering FNR (directional) switch, or right FNR (directional) switch to F (forward).		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective F (Forward) clutch ECMV solenoid (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			F.PS (male)	Resistance		
			Between (1) and (2)	5 – 15 Ω		
			Between (1), (2) and chassis ground	Min. 1 MΩ		
	2	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L63 (female) (5) – F.PS (female) (1) and chassis ground	Resistance	Min. 1 MΩ	
	3	Defective transmission controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L63 (female)	Resistance		
			Between (5) and (3)	5 – 15 Ω		
			Between (5), (3) and chassis ground	Min. 1 MΩ		

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Circuit diagram related to F (Forward) clutch ECMV solenoid



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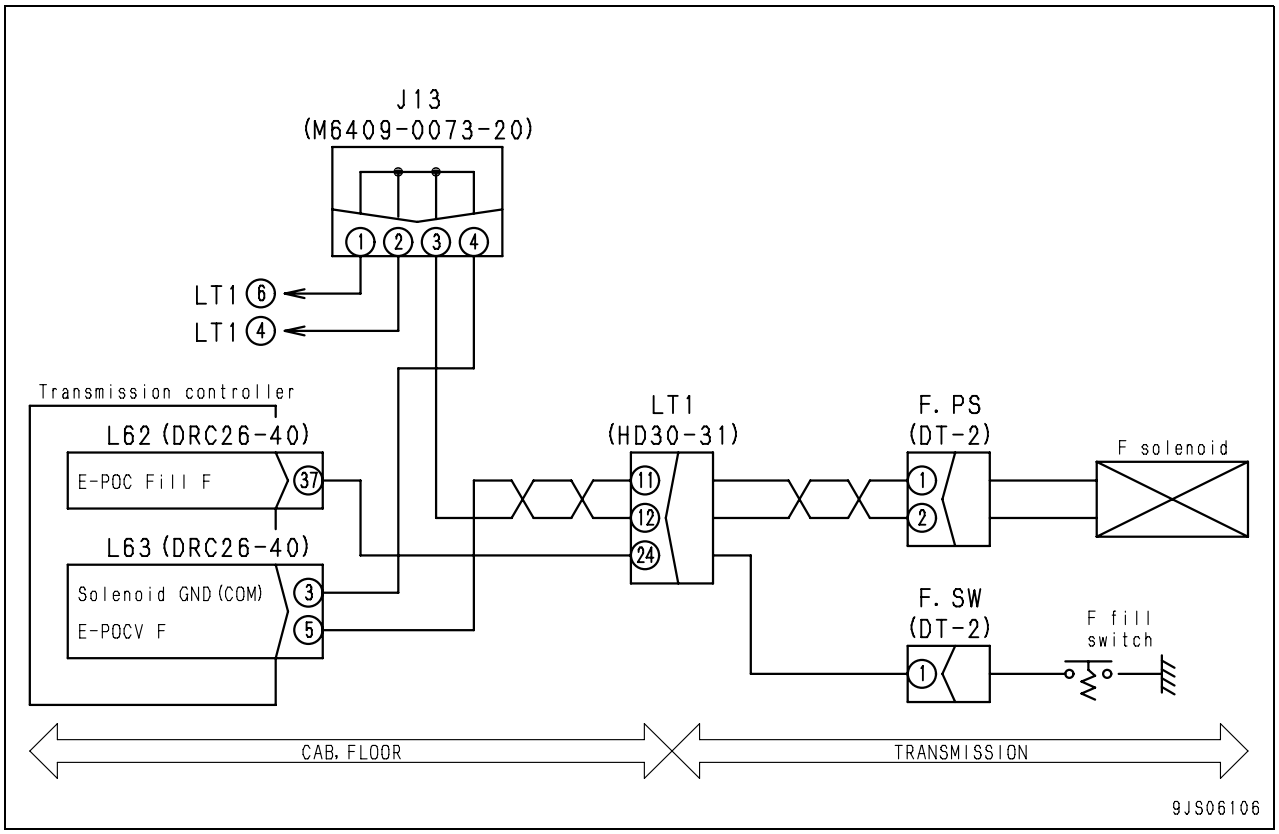
Failure code [DXH8KY] (F clutch ECMV solenoid: Short circuit with power supply line)

Action code	Failure code	Trouble	F clutch ECMV solenoid: Short circuit with power supply line (Transmission controller system)
E03	**DXH8KY**		
Contents of trouble	• Since the F (Forward) ECMV solenoid system is shorted with the power source, abnormal voltage is applied when the F (Forward) ECMV solenoid output is OFF.		
Action of controller	• Outputs the signal to the F (Forward) clutch ECMV solenoid when the directional lever or directional switch is in F (Forward). • Sets the transmission in N (Neutral) when the gear shift lever is in N (Neutral) or R (Reverse). • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until FNR (directional) lever, joystick steering FNR (directional) switch or right FNR (directional) switch is set to N (Neutral).		
Problem that appears on machine	• The machine can travel in the F (Forward) position alone.		
Related information	• The output state (current value) to the F (Forward) clutch ECMV solenoid can be checked with the monitoring function (Code: 31608, ECMV F DIR). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective F (Forward) clutch ECMV solenoid (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			F.PS (male)	Resistance	
			Between (1) and (2)	5 – 15 Ω	
			Between (1), (2) and chassis ground	Min. 1 MΩ	
	2	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			Wiring harness between L63 (female) (5) – F.PS (female) (1) and chassis ground	Voltage	Max. 1 V
	3	Defective transmission controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			L63 (female)	Resistance	
			Between (5) and (3)	5 – 15 Ω	
			Between (5), (3) and chassis ground	Min. 1 MΩ	

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Circuit diagram related to F (Forward) clutch ECMV solenoid



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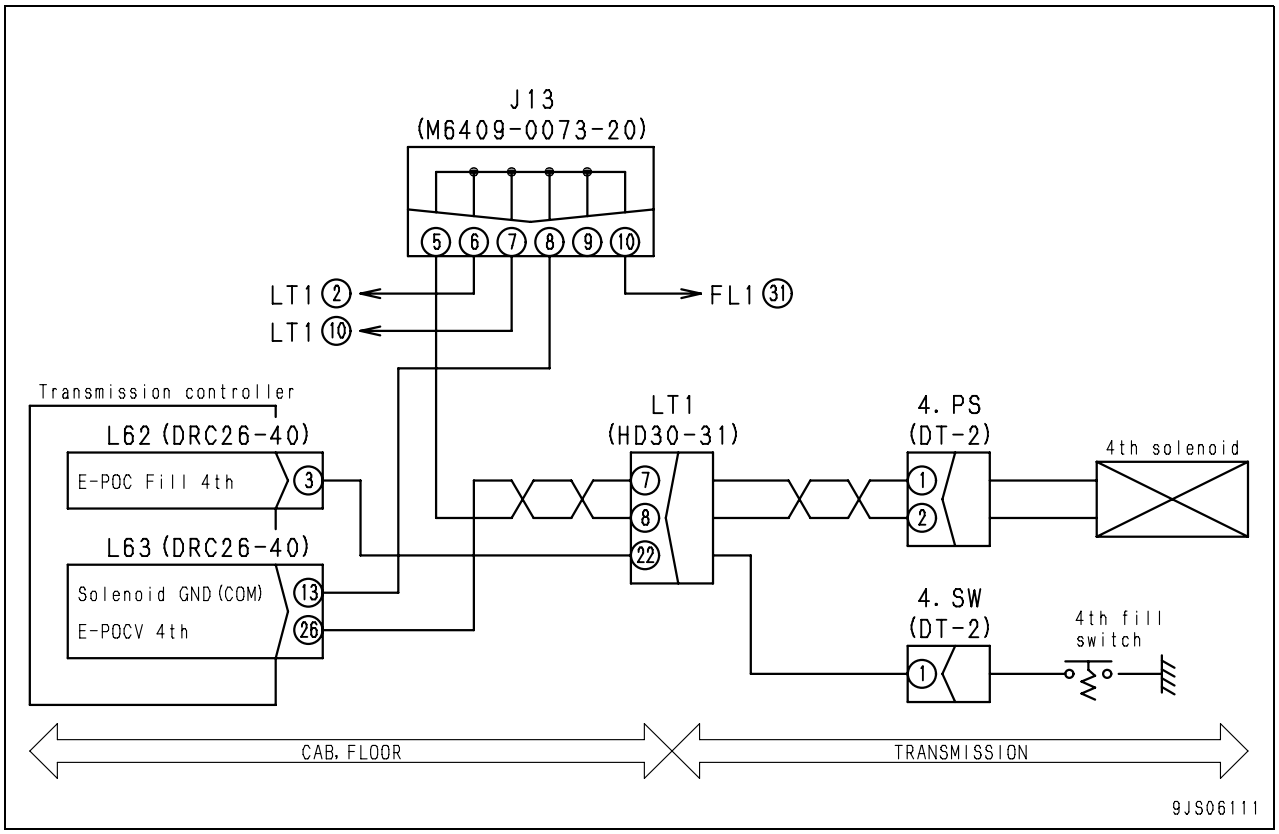
Failure code [DXHHKA] (4th clutch ECMV solenoid: Disconnection)

Action code	Failure code	Trouble	4th clutch ECMV solenoid: Disconnection (Transmission controller system)
E03	**DXHHKA**		
Contents of trouble	• Since the 4th clutch ECMV solenoid system is disconnected, no current flows when 4th clutch ECMV solenoid output is ON.		
Action of controller	• Stops outputting the signal to the 4th clutch ECMV solenoid. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• The transmission does not shift into 4th (The machine can travel in any gear speed other than 4th.)		
Related information	• The output state (current value) to the 4th clutch ECMV solenoid can be checked with the monitoring function (Code: 31605, ECMV 4 DIR). • Method of reproducing failure code: Turn the starting switch ON, set the transmission auto-shift/manual shift selector switch in the MANUAL position, and select 4th using the shift down switch or moving the gear shift lever to 4th.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective 4th clutch ECMV solenoid (Internal disconnection)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			4.PS (male)	Resistance		
			Between (1) and (2)	5 – 15 Ω		
	2	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L63 (female) (13) – 4.PS (female) (2)	Resistance	Max. 1 Ω	
			Wiring harness between L63 (female) (26) – 4.PS (female) (1)	Resistance	Max. 1 Ω	
	3	Defective transmission controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L63 (female)	Resistance		
			Between (26) and (13)	5 – 15 Ω		

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Circuit diagram related to 4th clutch ECMV solenoid



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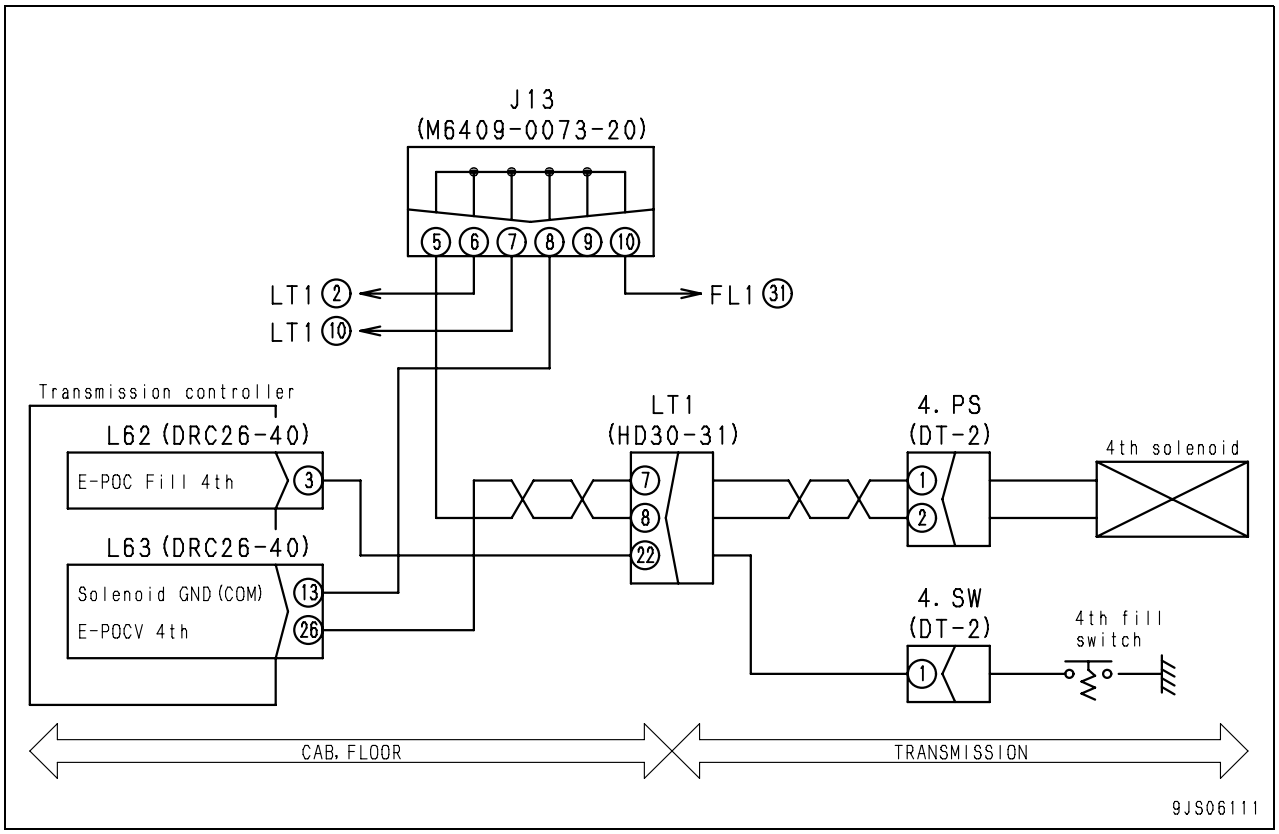
Failure code [DXHHKB] (4th clutch ECMV solenoid: Short circuit)

Action code	Failure code	Trouble	4th clutch ECMV solenoid: Short circuit (Transmission controller system)
E03	**DXHHKB**		
Contents of trouble	• Since the 4th clutch ECMV solenoid system is shorted, abnormal current flows when 4th clutch ECMV solenoid output is ON.		
Action of controller	• Stops outputting the signal to the 4th clutch ECMV solenoid. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• The transmission does not shift into 4th (The machine can travel in any gear speed other than 4th.)		
Related information	• The output state (current value) to the 4th clutch ECMV solenoid can be checked with the monitoring function (Code: 31605, ECMV 4 DIR). • Method of reproducing failure code: Turn the starting switch ON, set the transmission manual/auto shift selector switch in the MANUAL position, and select 4th using the shift down switch or moving the gear shift lever to 4th.		

Possible causes and standard value in normal state	Causes		Standard value in normal state/Remarks on troubleshooting			
	1	Defective 4th clutch ECMV solenoid (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			4.PS (male)	Resistance		
			Between (1) and (2)	5 – 15 Ω		
			Between (1), (2) and chassis ground	Min. 1 MΩ		
	2	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L63 (female) (26) – 4.PS (female) (1) and chassis ground	Resistance	Min. 1 MΩ	
	3	Defective transmission controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L63 (female)	Resistance		
			Between (26) and (13)	5 – 15 Ω		
			Between (26), (13) and chassis ground	Min. 1 MΩ		

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Circuit diagram related to 4th clutch ECMV solenoid



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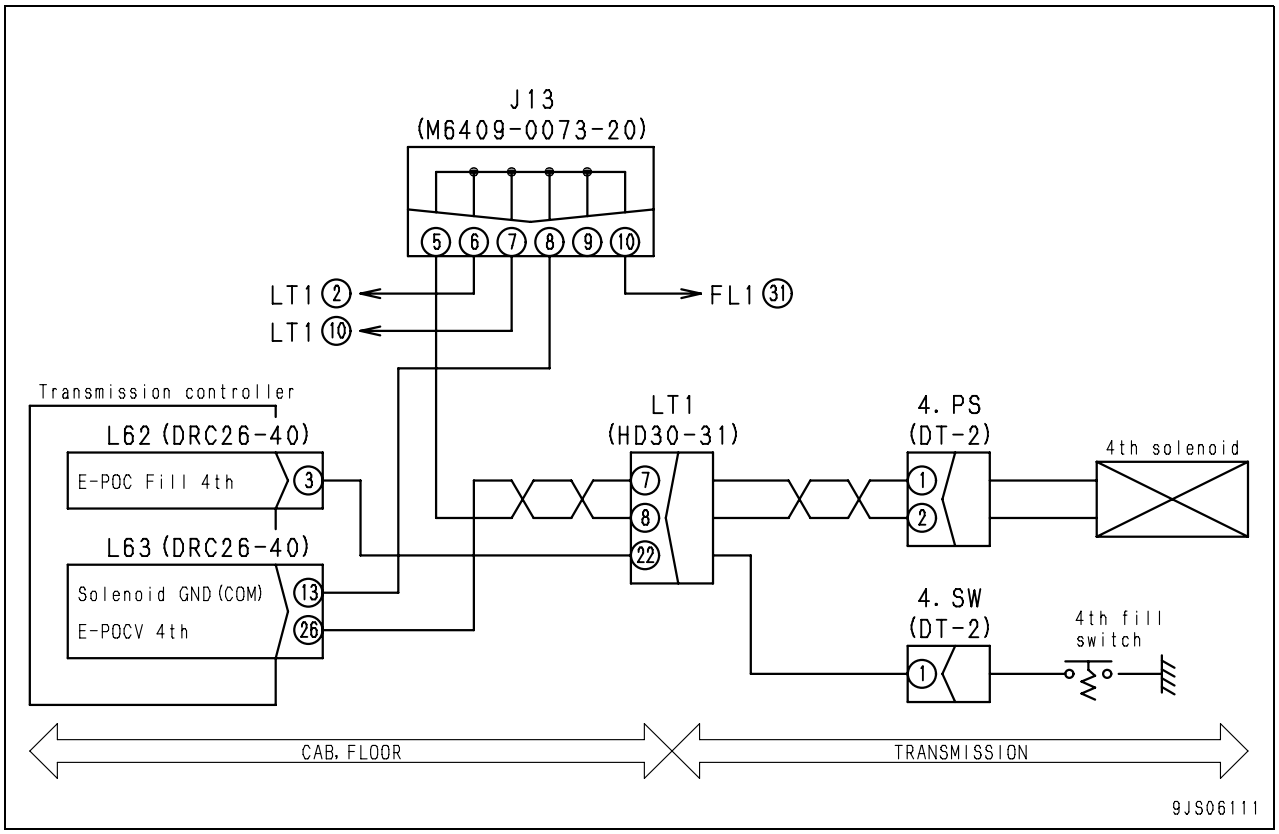
Failure code [DXHHKY] (4th clutch ECMV solenoid: Short circuit with power supply line)

Action code	Failure code	Trouble	4th clutch ECMV solenoid: Short circuit with power supply line (Transmission controller system)
E03	**DXHHKY**		
Contents of trouble	• Since the 4th ECMV solenoid system is shorted with the power source, abnormal voltage is applied when 4th clutch ECMV solenoid output is OFF.		
Action of controller	• Stops outputting the signal to the 1st, 2nd, and 3rd clutch ECMV solenoids. • Also stops outputting the signal to the F (Forward) and R (Reverse) clutch ECMV solenoids when the speed clutch output is OFF (other than 4th speed). • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until FNR (directional) lever, joystick steering FNR (directional) switch or right FNR (directional) switch is set to N (Neutral).		
Problem that appears on machine	• The transmission does not shift into 1st, 2nd or 3rd (the machine can travel at 4th).		
Related information	• The output state (current value) to the 4th clutch ECMV solenoid can be checked with the monitoring function (Code: 31605, ECMV 4 DIR). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective 4th clutch ECMV solenoid (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			4.PS (male)	Resistance		
			Between (1) and (2)	5 – 15 Ω		
			Between (1), (2) and chassis ground	Min. 1 MΩ		
	2	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			Wiring harness between L63 (female) (26) – 4.PS (female) (1) and chassis ground	Voltage	Max. 1 V	
	3	Defective transmission controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L63 (female)	Resistance		
			Between (26) and (13)	5 – 15 Ω		
			Between (26), (13) and chassis ground	Min. 1 MΩ		

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Circuit diagram related to 4th clutch ECMV solenoid



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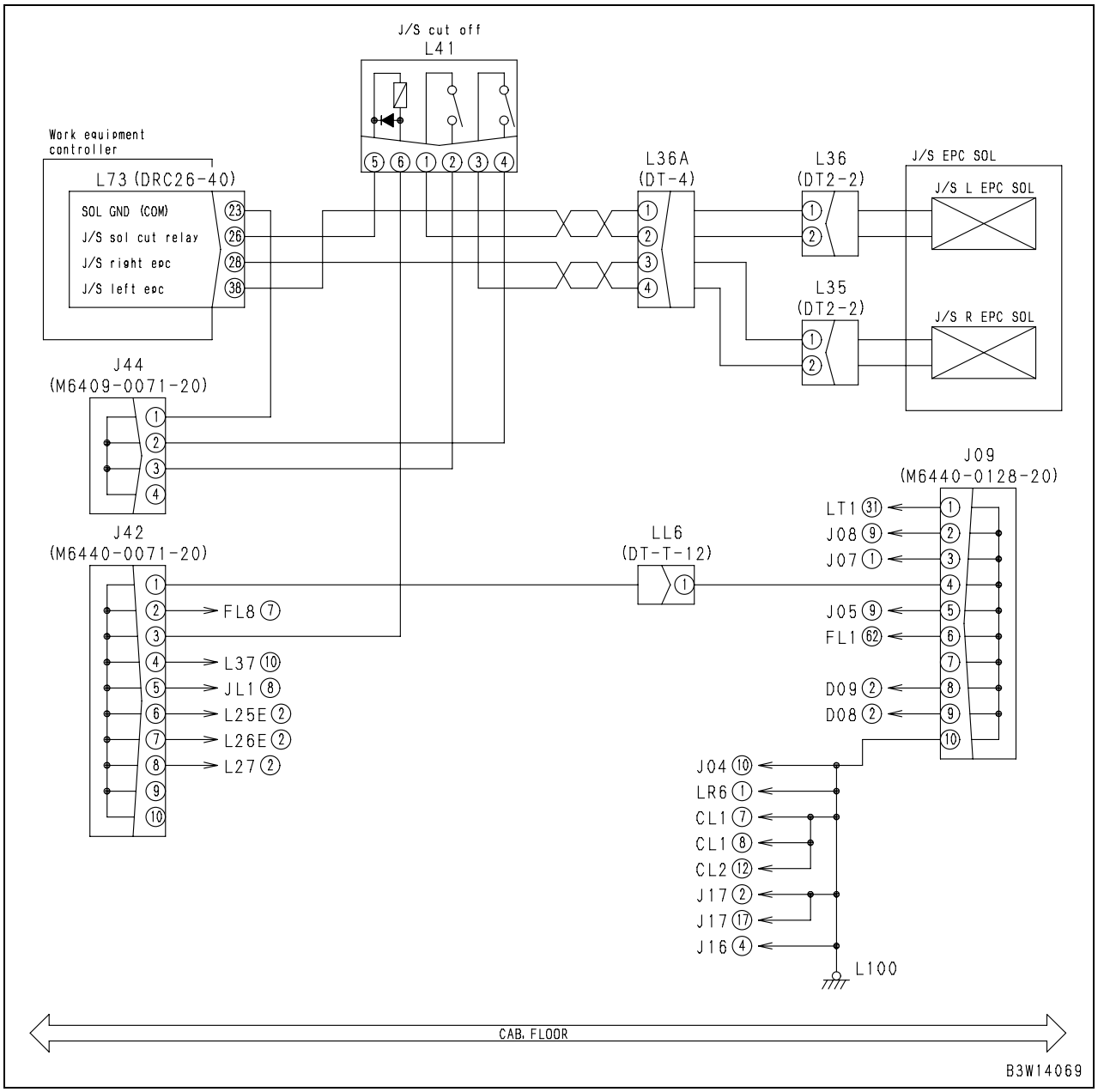
Failure code [DXHLKA] (Joystick steering right EPC solenoid: Disconnection)

Action code	Failure code	Trouble	Joystick steering right EPC solenoid: Disconnection (Work equipment controller system)
E03	**DXHLKA**		
Contents of trouble	• Since the joystick steering right EPC solenoid system is disconnected, no current flows when the joystick steering right EPC solenoid output is ON.		
Action of controller	• Stops outputting the signal to the joystick steering right and left EPC solenoids. • Stops outputting the signal to the joystick steering solenoid cut-off relay. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• Steering control with the joystick steering becomes unavailable (steering control from the handle mode is available).		
Related information	• The output state (current value) to the joystick steering right EPC solenoid can be checked with the monitoring function (Code: 41904, J/S EPC DIR RH). • The output state (ON/OFF) to the joystick steering solenoid cut-off relay can be checked with the monitoring function (Code: 41953, D-OUT-8). • When the failure code (D193KA, D193KB or D193KY) for the joystick steering solenoid cut-off relay system is displayed at the same time, carry out troubleshooting for it first. • Method of reproducing failure code: Start engine and steer to the right using the joystick steering.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective joystick steering right EPC solenoid (Internal disconnection)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L35 (male)	Resistance		
			Between (1) and (2)	5 – 15 Ω		
	2	Defective joystick steering cut-off relay (L41) (Internal disconnection)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L41 (male)	Resistance		
			Between (5) and (6)	200 – 400 Ω		
			★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			When joystick steering cut-off relay (L41) is replaced with a relay of the same type, if the condition becomes normal, the joystick steering cut-off relay is defective.			
	3	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L73 (female) (28) – L35 (female) (1)	Resistance	Max. 1 Ω	
			Wiring harness between L35 (female) (2) – L41 (female) (3)	Resistance	Max. 1 Ω	
			Wiring harness between L41 (female) (4) – L73 (female) (23)	Resistance	Max. 1 Ω	
	4	Defective work equipment controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L73	Joystick steering lever	Voltage	
			Between (28) and (23)	Neutral	Max. 1 V	
				Full right steering	20 – 30 V	

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Circuit diagram related to joystick steering right EPC solenoid



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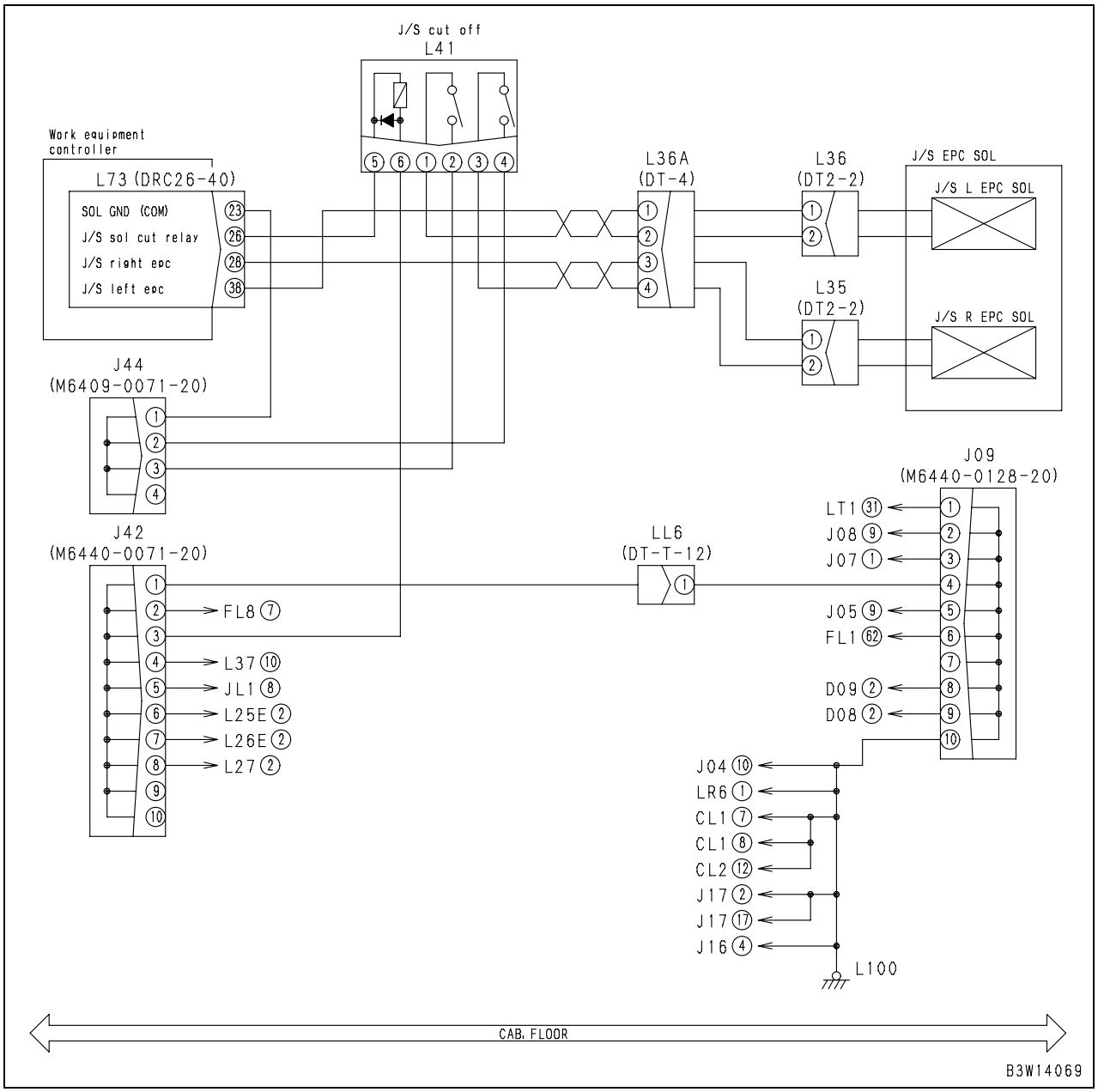
Failure code [DXHLKB] (Joystick steering right EPC solenoid: Short circuit)

Action code	Failure code	Trouble	Joystick steering right EPC solenoid: Short circuit (Work equipment controller system)
E03	**DXHLKB**		
Contents of trouble	• Since the joystick steering right EPC solenoid system is shorted, abnormal current flows when the joystick steering right EPC solenoid output is ON.		
Action of controller	• Stops outputting the signal to the joystick steering right and left EPC solenoids. • Stops outputting the signal to the joystick steering solenoid cut-off relay. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• Steering control with the joystick steering becomes unavailable (steering control from the handle mode is available). • Wiring harness or controller may burn.		
Related information	• The output state (current value) to the joystick steering right EPC solenoid can be checked with the monitoring function (Code: 41904, J/S EPC DIR RH). • Method of reproducing failure code: Start engine and steer to the right using the joystick steering.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective joystick steering right EPC solenoid (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L35 (male)	Resistance		
			Between (1) and (2)	5 – 15 Ω		
			Between (1), (2) and chassis ground	Min. 1 MΩ		
	2	Defective joystick steering cut-off relay (L41) (Internal disconnection)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L41 (male)	Resistance		
			Between (5) and (6)	200 – 400 Ω		
			★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			When joystick steering cut-off relay (L41) is replaced with a relay of the same type, if the condition becomes normal, the joystick steering cut-off relay is defective.			
	3	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L73 (female) (28) – L35 (female) (1) and chassis ground	Resistance	Min. 1 MΩ	
	4	Defective work equipment controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L73 (female)	Resistance		
			Between (28) and (23)	5 – 15 Ω		
			Between (23), (28) and chassis ground	Min. 1 MΩ		

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Circuit diagram related to joystick steering right EPC solenoid



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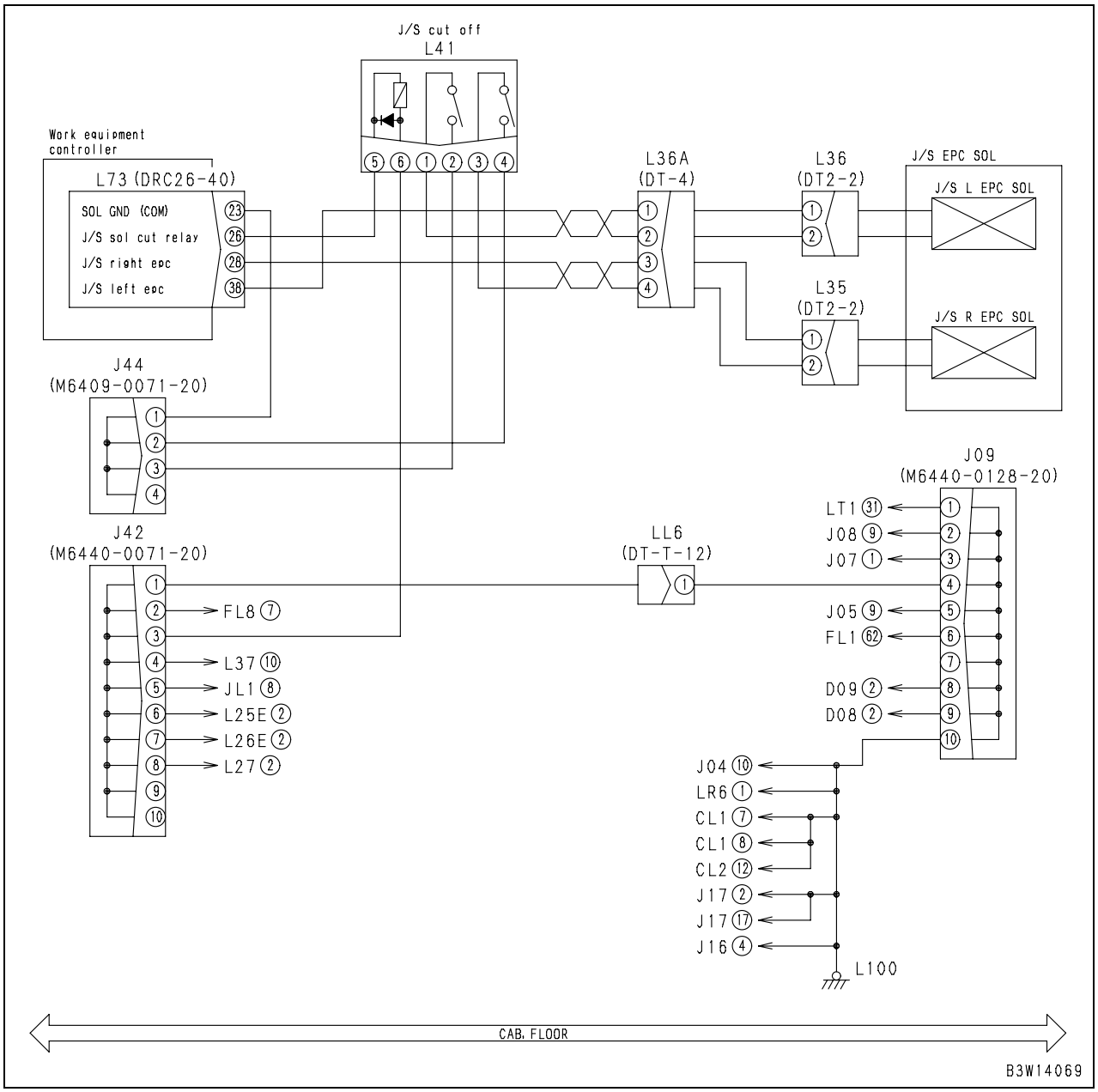
Failure code [DXHLKY] (Joystick steering right EPC solenoid: Short circuit with power supply line)

Action code	Failure code	Trouble	Joystick steering right EPC solenoid: Short circuit with power supply line (Work equipment controller system)
E03	**DXHLKY**		
Contents of trouble	• Since the joystick steering right EPC solenoid system is shorted with the power source, abnormal voltage is applied when the joystick steering right EPC solenoid output is OFF.		
Action of controller	• Stops outputting the signal to the joystick steering right and left EPC solenoids. • Stops outputting the signal to the joystick steering solenoid cut-off relay. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• Steering control with the joystick steering becomes unavailable (steering control from the handle mode is available).		
Related information	• The output state (current value) to the joystick steering right EPC solenoid can be checked with the monitoring function (Code: 41904, J/S EPC DIR RH). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective joystick steering right EPC solenoid (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L35 (male)	Resistance		
			Between (1) and (2)	5 – 15 Ω		
			Between (1), (2) and chassis ground	Min. 1 MΩ		
	2	Defective joystick steering cut-off relay (L41) (Internal disconnection)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L41 (male)	Resistance		
			Between (5) and (6)	200 – 400 Ω		
			★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			When joystick steering cut-off relay (L41) is replaced with a relay of the same type, if the condition becomes normal, the joystick steering cut-off relay is defective.			
	3	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			Wiring harness between L73 (female) (28) – L35 (female) (1) and chassis ground	Voltage	Max. 1 V	
	4	Defective work equipment controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L73 (female)	Resistance		
			Between (28) and (23)	5 – 15 Ω		
			Between (23), (28) and chassis ground	Min. 1 MΩ		

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Circuit diagram related to joystick steering right EPC solenoid



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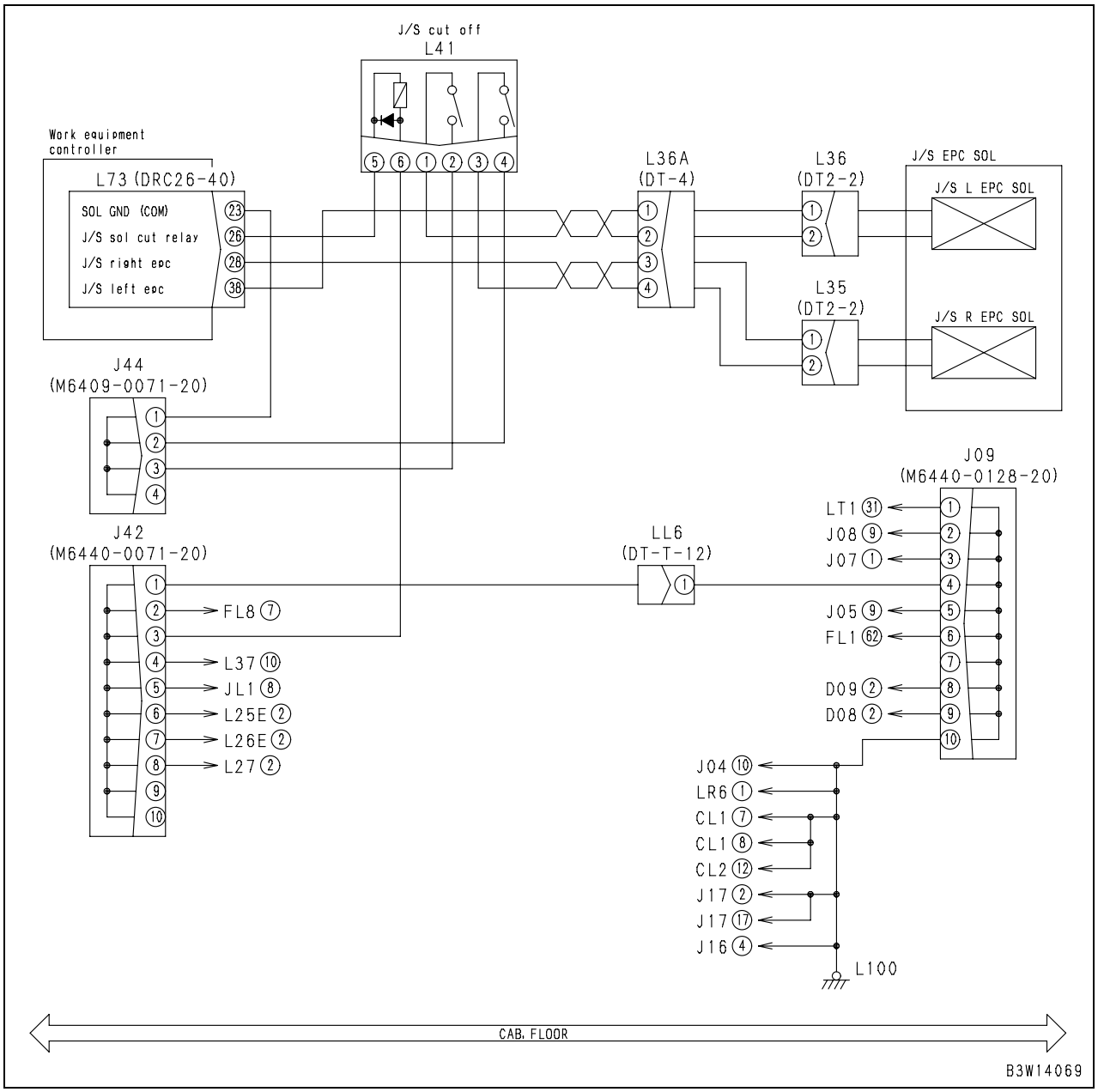
Failure code [DXHMKA] (Joystick steering left EPC solenoid: Disconnection)

Action code	Failure code	Trouble	Joystick steering left EPC solenoid: Disconnection (Work equipment controller system)
E03	**DXHMKA**		
Contents of trouble	• Since the joystick steering left EPC solenoid system is disconnected, no current flows when the joystick steering left EPC solenoid output is ON.		
Action of controller	• Stops outputting the signal to the joystick steering right and left EPC solenoids. • Stops outputting the signal to the joystick steering solenoid cut-off relay. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• Steering control with the joystick steering becomes unavailable (steering control from the handle mode is available).		
Related information	• The output state (current) to the joystick steering left EPC solenoid can be checked with the monitoring function (Code: 41905, J/S EPC DIR LH). • Method of reproducing failure code: Start the engine and steer to the left using the joystick steering.		

	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective joystick steering left EPC solenoid (Internal disconnection)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			L36 (male)	Resistance	
			Between (1) and (2)	5 – 15 Ω	
	2	Defective joystick steering cut-off relay (L41) (Internal disconnection)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			L41 (male)	Resistance	
			Between (5) and (6)	200 – 400 Ω	
			★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			When joystick steering cut-off relay (L41) is replaced with a relay of the same type, if the condition becomes normal, the joystick steering cut-off relay is defective.		
	3	Disconnection in wiring harness (Disconnection or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between L73 (female) (38) – L36 (female) (1)	Resistance	Max. 1 Ω
			Wiring harness between L36 (female) (2) – L41 (female) (1)	Resistance	Max. 1 Ω
			Wiring harness between L41 (female) (2) – L73 (female) (23)	Resistance	Max. 1 Ω
	4	Defective work equipment controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			L73 (female)	Resistance	
			Between (38) and (23)	5 – 15 Ω	

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Circuit diagram related to joystick steering left EPC solenoid



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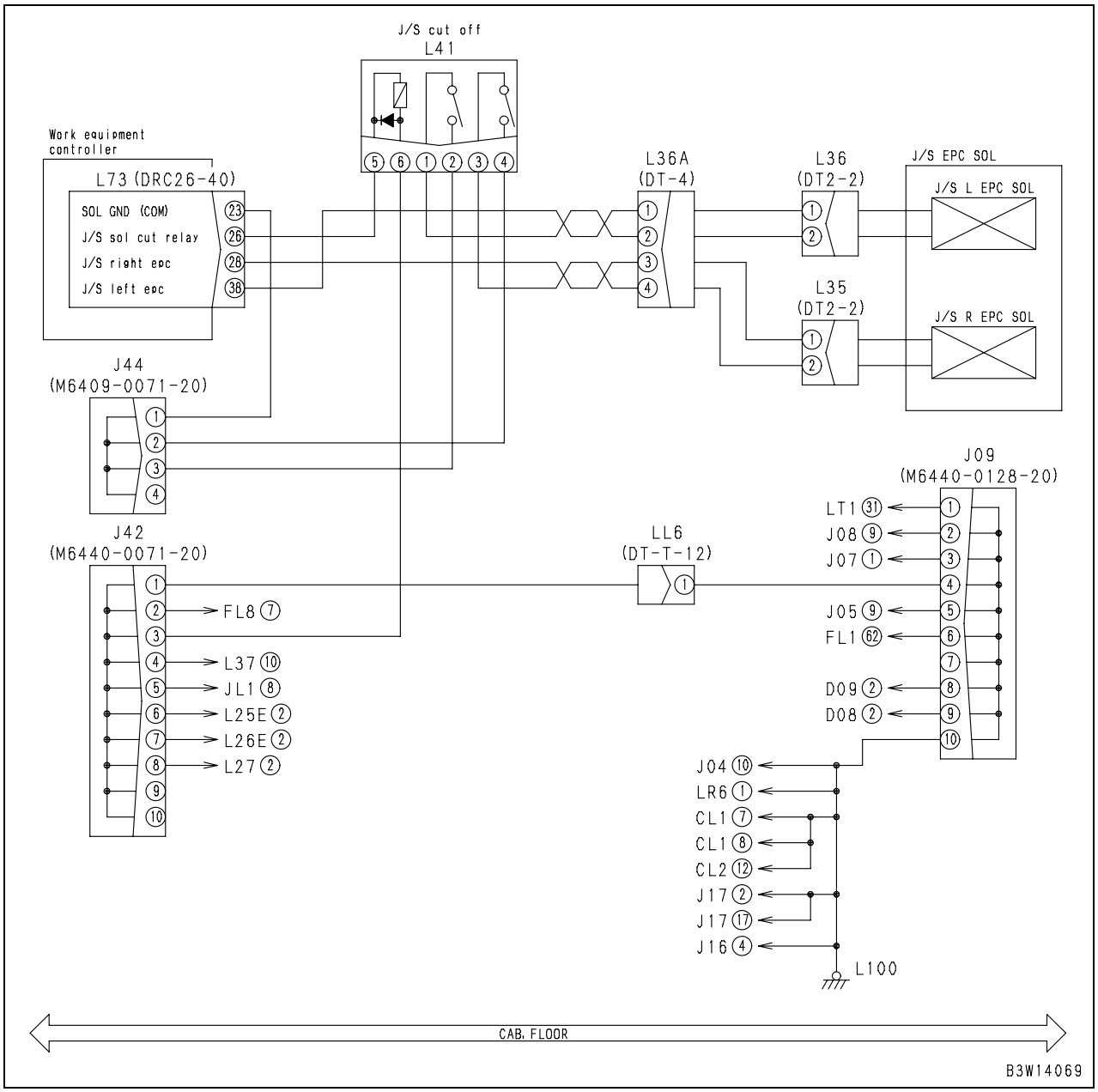
Failure code [DXHMKB] (Joystick steering left EPC solenoid: Short circuit)

Action code	Failure code	Trouble	Joystick steering left EPC solenoid: Short circuit (Work equipment controller system)
E03	**DXHMKB**		
Contents of trouble	• Since the joystick steering left EPC solenoid system is shorted, abnormal current flows when the joystick steering left EPC solenoid output is ON.		
Action of controller	• Stops outputting the signal to the joystick steering right and left EPC solenoids. • Stops outputting the signal to the joystick steering solenoid cut-off relay. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• Steering control with the joystick steering becomes unavailable (steering control from the handle mode is available). • Wiring harness or controller may burn.		
Related information	• The output state (current) to the joystick steering left EPC solenoid can be checked with the monitoring function (Code: 41905, J/S EPC DIR LH). • Method of reproducing failure code: Start the engine and steer to the left using the joystick steering.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective joystick steering left EPC solenoid (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L36 (male)	Resistance		
			Between (1) and (2)	5 – 15 Ω		
			Between (1), (2) and chassis ground	Min. 1 MΩ		
	2	Defective joystick steering cut-off relay (L41) (Internal disconnection)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L41 (male)	Resistance		
			Between (5) and (6)	200 – 400 Ω		
			★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			When joystick steering cut-off relay (L41) is replaced with a relay of the same type, if the condition becomes normal, the joystick steering cut-off relay is defective.			
	3	Grounding fault in wiring harness (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L73 (female) (38) – L36 (female) (1) and chassis ground	Resistance	Min. 1 MΩ	
	4	Defective work equipment controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L73 (female)	Resistance		
			Between (38) and (23)	5 – 15 Ω		
			Between (23), (38) and chassis ground	Min. 1 MΩ		

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Circuit diagram related to joystick steering left EPC solenoid



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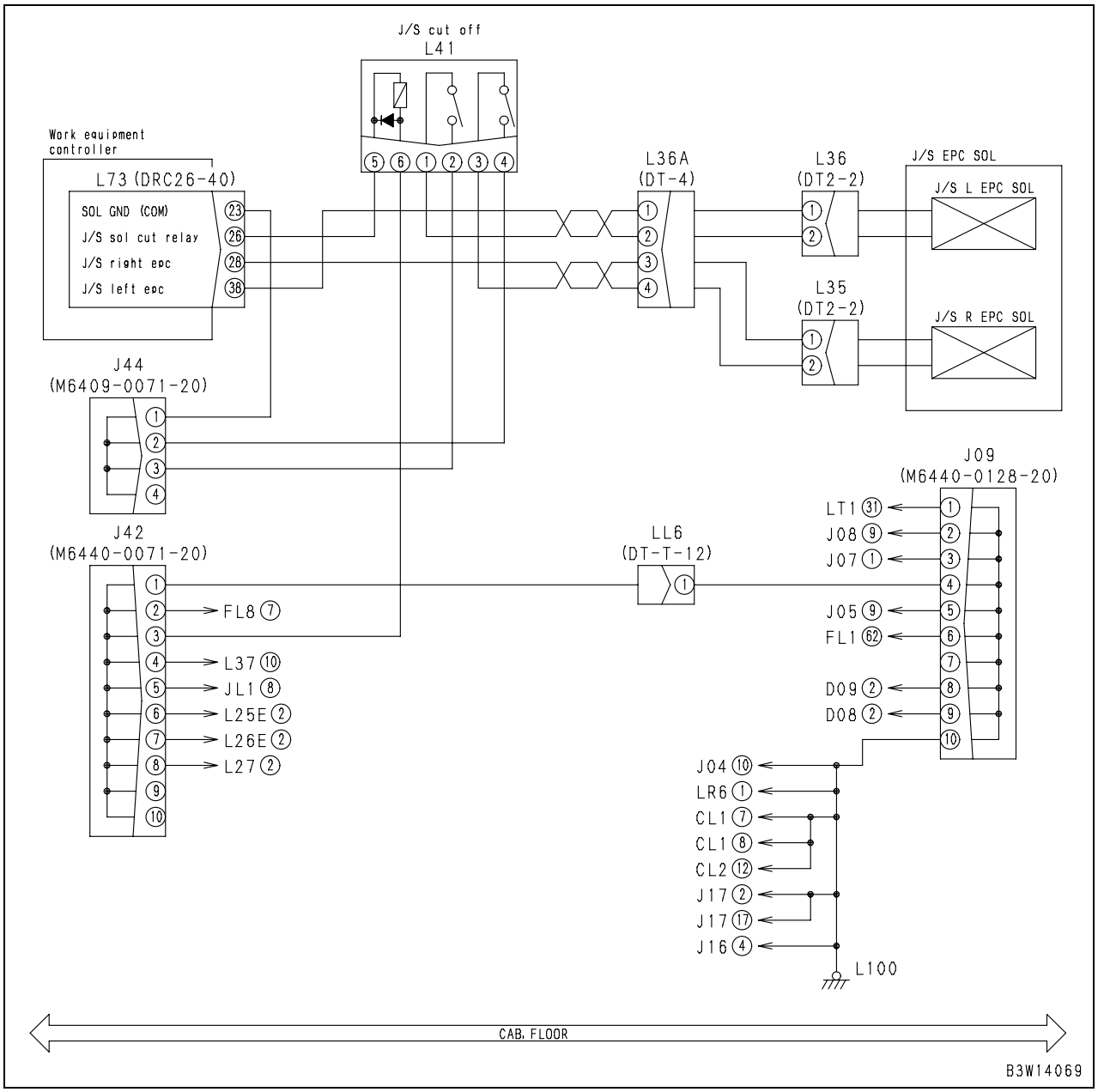
Failure code [DXHMKY] (Joystick steering left EPC solenoid: Short circuit with power supply line)

Action code	Failure code	Trouble	Joystick steering left EPC solenoid: Short circuit with power supply line (Work equipment controller system)
E03	**DXHMKY**		
Contents of trouble	• Since the joystick steering left EPC solenoid system is shorted with the power source, abnormal voltage is applied when the joystick steering left EPC solenoid output is OFF.		
Action of controller	• Stops outputting the signal to the joystick steering right and left EPC solenoids. • Stops outputting the signal to the joystick steering solenoid cut-off relay. • Turns the centralized warning lamp and alarm buzzer ON. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• Steering control with the joystick steering becomes unavailable (steering control from the handle mode is available). • Wiring harness or controller may burn.		
Related information	• The output state (current) to the joystick steering left EPC solenoid can be checked with the monitoring function (Code: 41905, J/S EPC DIR LH). • Method of reproducing failure code: Turn the starting switch ON.		

	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective joystick steering left EPC solenoid (Internal short circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L36 (male)	Resistance		
			Between (1) and (2)	5 – 15 Ω		
			Between (1), (2) and chassis ground	Min. 1 MΩ		
	2	Defective joystick steering cut-off relay (L41) (Internal disconnection)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L41 (male)	Resistance		
			Between (5) and (6)	200 – 400 Ω		
			★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			When joystick steering cut-off relay (L41) is replaced with a relay of the same type, if the condition becomes normal, the joystick steering cut-off relay is defective.			
	3	Hot short in wiring harness (Contact with 24V circuit)	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			Wiring harness between L73 (female) (38) – L36 (female) (1) and chassis ground	Voltage	Max. 1 V	
	4	Defective work equipment controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L73 (female)	Resistance		
			Between (38) and (23)	5 – 15 Ω		
			Between (23), (38) and chassis ground	Min. 1 MΩ		

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Circuit diagram related to joystick steering left EPC solenoid



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Failure code [DY30MA] Motor-driven emergency steering pump failure (During operation of machine)

Action code	Failure code	Trouble	Motor-driven emergency steering pump failure (During operation of machine) (Transmission controller system)
E01	**DY30MA**		
Contents of trouble	• While transmission controller does not output emergency steering operation command, emergency steering operating signal (CAN communication) is received from monitor.		
Action of controller	• If trouble disappears, system resets itself after starting switch is turned OFF.		
Problem that appears on machine	• The motor-driven emergency steering motor (pump) operates although the motor-driven emergency steering switch is not operated. If motor is operated for long time, it will burn. • The emergency steering operation indicator comes on.		
Related information	• Check operation of the emergency steering with the monitoring function (Code: 40903 D-IN-30). • Check steering pressure drop with the monitoring function (Code: 40905 D-IN-0, D-IN-1).		

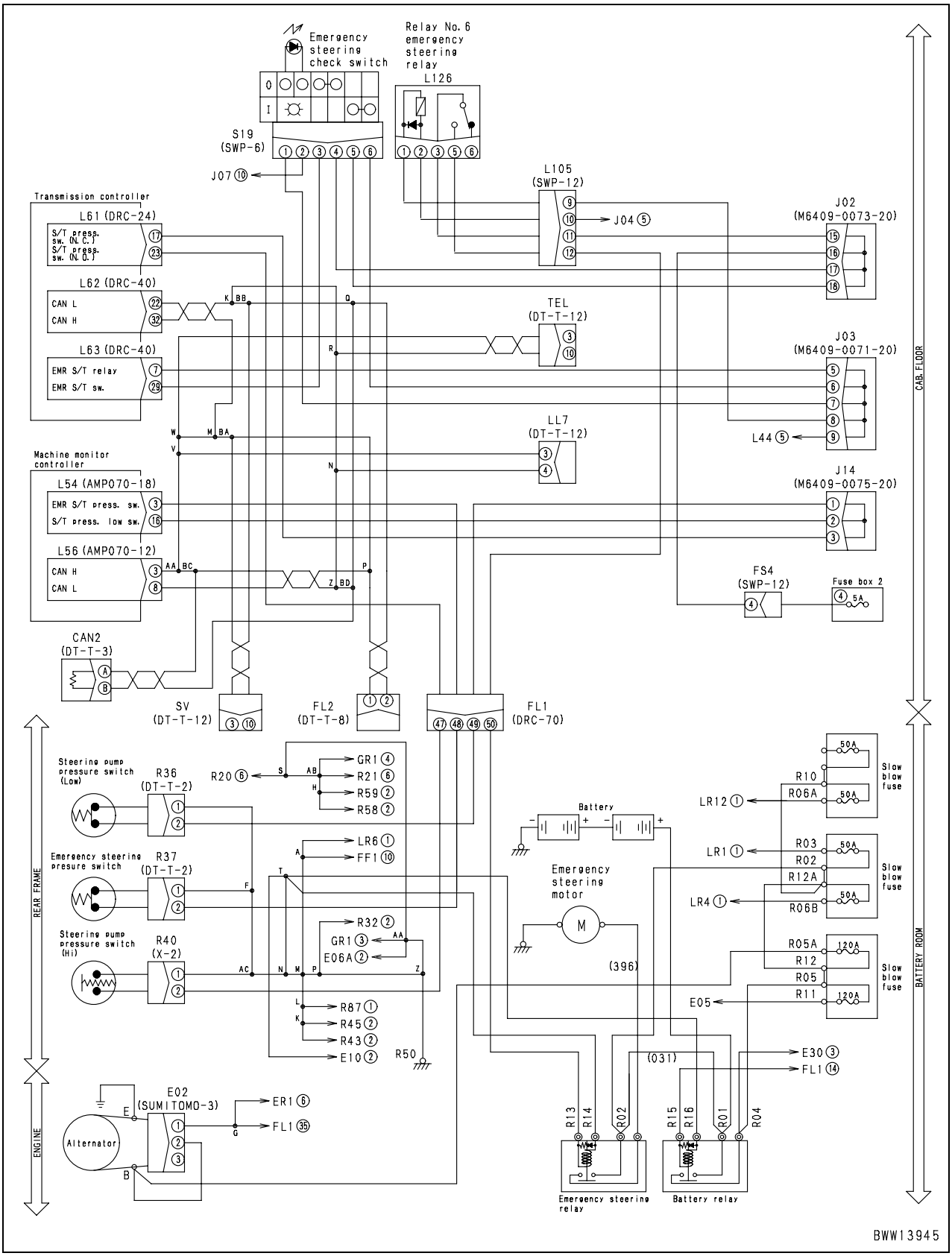
	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective emergency steering relay (L126) (Power and signal lines short-circuited)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Between L105 (male) (11) and (12)	Relay: OFF	Resistance	Min. 1 MΩ
			★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Between L105 (male) (9) – (10)		Resistance	200 – 400 Ω
	2	Defective emergency steering relay (For driving emergency steering motor) (Power and signal lines short-circuited)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Between disconnected relay terminals (3) and (5)		Resistance	Min. 1 MΩ
	3	Hot short-circuiting between harnesses	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			Between L63 (female) (7), L105 (female) (9) – chassis ground		Voltage	Max. 1 V
			Between L105 (female) (12), R13 terminal – chassis ground		Voltage	Max. 1 V
			Between line 396 (Emergency steering relay, emergency steering motor, and chassis ground)		Voltage	Max. 1 V
	4	Wiring harness discontinuity (Disconnection or defective contact)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between L54 (female) (3) – R37 (female) (2)		Resistance	Max. 1 Ω

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	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	5	Defective emergency steering pressure switch	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Between R37 (male) (2) and (1)	Emergency steering: Stopped	Resistance	Max. 1 Ω
				At open to atmosphere (for reference)	Resistance	Max. 1 Ω
				Emergency steering: Operating (High pressure) (Operate in manual mode switch ON.)	Resistance	Min. 1 MΩ
	6	Defective transmission and fan pump motor controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Between L63 (female) (7) – chassis ground		Resistance	200 – 400 Ω

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Related circuit diagram



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Failure code [DY30MC] Motor-driven emergency steering pump failure (Malfunction in manual mode)

Action code	Failure code	Trouble	Motor-driven emergency steering pump failure (Malfunction in manual mode) (Transmission controller system)
E03	**DY30MC**		
Contents of trouble	• While transmission controller outputs emergency steering operation command, emergency steering operating signal (CAN communication) is not received from monitor.		
Action of controller	• If trouble disappears, system resets itself after starting switch is turned OFF.		
Problem that appears on machine	• The motor-driven emergency steering motor (pump) does not operate although the motor-driven emergency steering switch is operated.		
Related information	• Check operation of the emergency steering with the monitoring function (Code: 40903 D-IN-30). • Check steering pressure drop with the monitoring function (Code: 40905 D-IN-0, D-IN-1).		

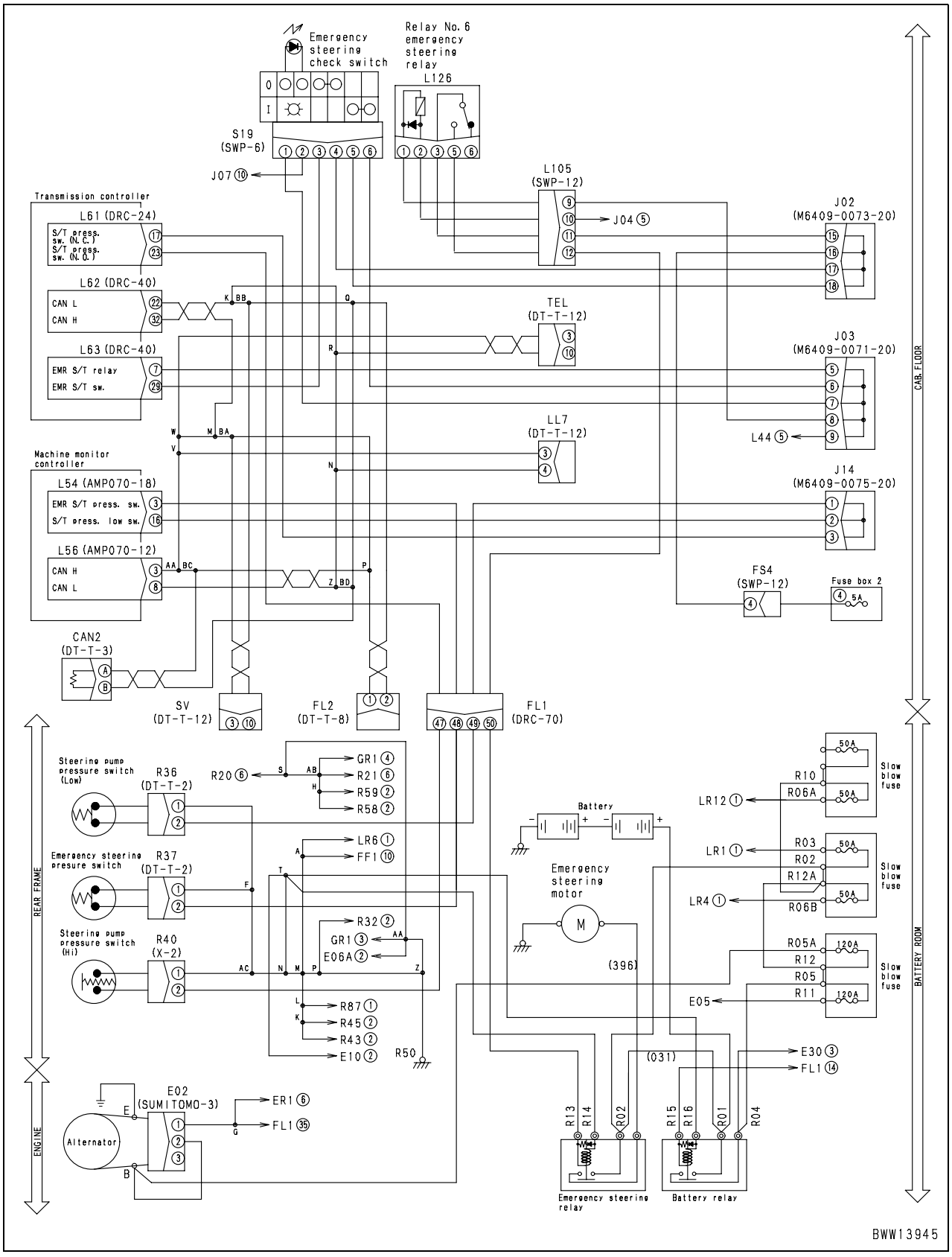
	Causes		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective emergency steering relay (L126) (Internal discontinuity or defective contact)	1) Keep engine START for 10 seconds or longer and turn starting switch OFF. 2) Replace L126 relay with another relay of the same type. 3) Turn starting switch ON (for self-check).		
			Issues this failure code [DY30MC].	Relay (L126): Normal	
			Does not issue this failure code [DY30MC].	Relay (L126): Defective	
			★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Between L105 (male) (9) and (10)	Resistance	200 – 400 Ω
	2	Wiring harness discontinuity (Disconnection or defective contact)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between L105 (female) (12) – R13 terminal	Resistance	Max. 1 Ω
			Wiring harness between R14 terminal – chassis ground	Resistance	Max. 1 Ω
			Line 031 (Battery relay and emergency steering relay)	Resistance	Max. 1 Ω
			Line 396 (Emergency steering relay and emergency steering motor)	Resistance	Max. 1 Ω
	3	Wiring harness ground fault (Contact with ground circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between L54 (female) (3) – R37 (female) (2) and chassis ground	Resistance	Min. 1 MΩ

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	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	4	Defective emergency steering pressure switch	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Between R37 (male) (2) and (1)	Emergency steering: Stopped	Resistance	Max. 1 Ω
				At open to atmosphere (for reference)	Resistance	Max. 1 Ω
				Emergency steering: Operating (High pressure) (Operate in manual mode switch ON.)	Resistance	Min. 1 MΩ
	5	Defective emergency steering motor	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			Between emergency steering motor (+) terminal and body	Emergency steering: Stopped	Voltage	Max. 1 V
				Emergency steering: Operating (High pressure) (Operate in manual mode switch ON.)	Voltage	20 – 30 V
	6	Defective transmission and fan pump motor controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Between L63 (female) (7) and chassis ground		Resistance	200 – 400 Ω

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Related circuit diagram



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Failure code [DY30ME] Emergency steering: Operating for more than 1 minute

Action code	Failure code	Trouble	Emergency steering: Operating for more than 1 minute (Machine monitor system)
E02	**DY30ME**		
Contents of trouble	• Emergency steering operation detecting circuit is kept "OPEN" for more than 1 minute.		
Action of controller	• Alarm activated.		
Problem that appears on machine	• With 1-minute emergency steering operation alarm is activated ON (Emergency steering motor may be malfunctioning or may have burned). • While emergency steering motor is not operating, indicator lights up. • Emergency steering operates continuously.		
Related information	• Check operating condition of emergency steering with monitoring function (Code: 40903 D-IN-30).		

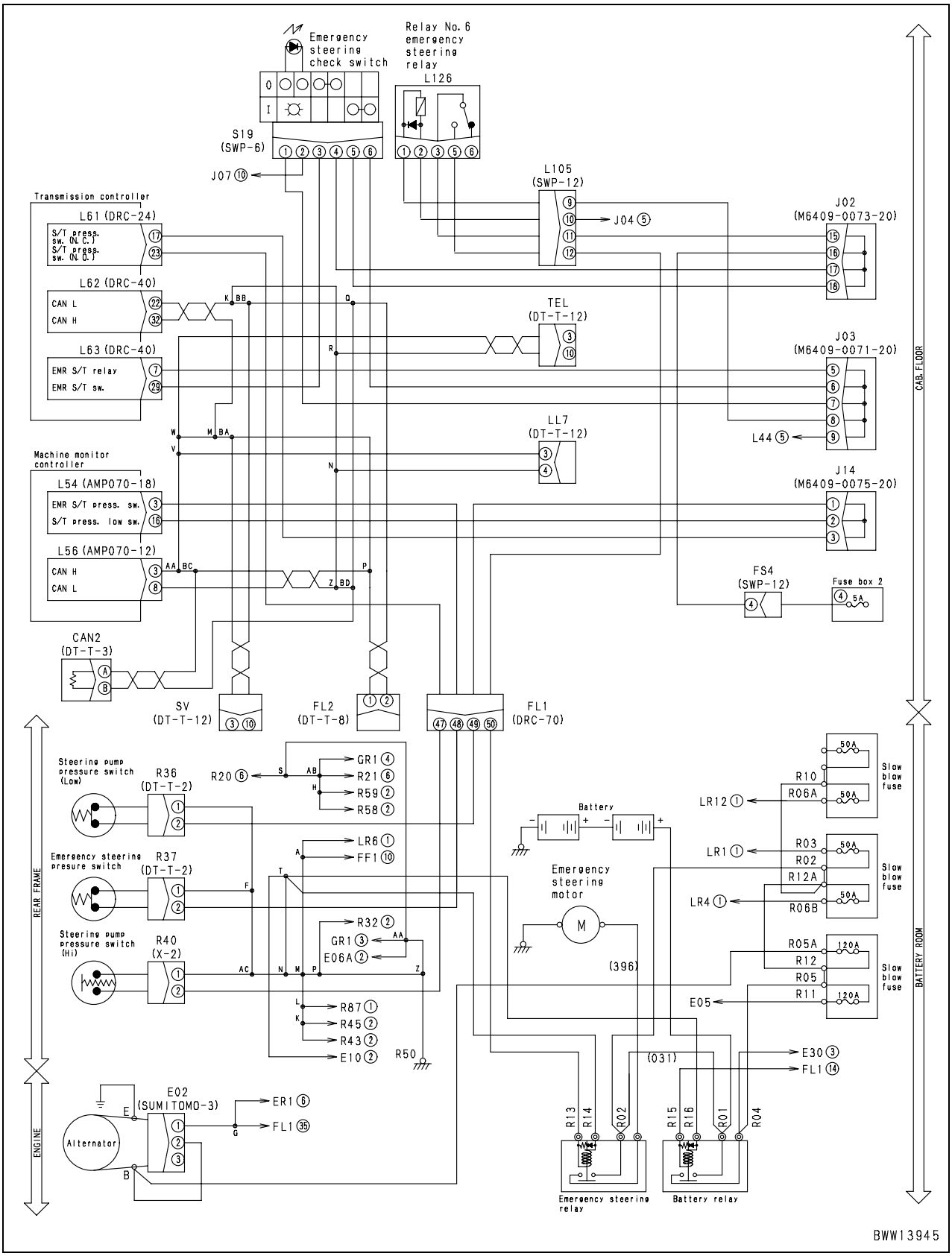
	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective emergency steering relay (L126)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			L105 (male)	Resistance		
			Between (9) and (10)	200 – 400 Ω		
	2	Defective emergency steering relay (for driving emergency steering motor)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Between relay contacts	Resistance		
				Min. 1 MΩ		
	3	Defective 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 L54 (female) (3) – R37 (female) (2)	Resistance	Max. 1 Ω	
			Wiring harness between R37 (female) (1) – machine	Resistance	Max. 1 Ω	
	4	Ground fault in wiring harness (Contact with GND circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Between L54 (female) (3) – R37 (female) (2) wiring harness and chassis ground	Resistance	Min. 1 MΩ	
			Between L61 (female) (17) – R36 (female) (2) wiring harness and chassis ground	Resistance	Min. 1 MΩ	
			Between L61 (female) (23) – R40 (female) (2) wiring harness and chassis ground	Resistance	Min. 1 MΩ	
			Between L63 (female) (29) – L126 (female) (3) wiring harness and chassis ground	Resistance	Min. 1 MΩ	
			Between L126 (female) (5) - terminal R13 wiring harness and chassis ground	Resistance	Min. 1 MΩ	

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	Causes		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	5	Defective emergency steering pressure switch	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Between R37 (male) (2) – (1)	When emergency steering stopped	Resistance	Max. 1 Ω
				Open to atmosphere (Reference)	Resistance	Max. 1 Ω
				When emergency steering operated (High pressure) (Manual operation switch ON)	Resistance	Min. 1 MΩ
	6	Defective steering pressure switch	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Between R36 (male) (2) – (1)	Engine stopped	Resistance	Max. 1 Ω
				Open to atmosphere (Reference)	Resistance	Max. 1 Ω
				Engine operated	Resistance	Min. 1 MΩ
			Between R40 (male) (2) – (1)	Engine stopped	Resistance	Min. 1 MΩ
				Open to atmosphere (Reference)	Resistance	Min. 1 MΩ
				Engine operated	Resistance	Max. 1 Ω
	7	Defective emergency steering check switch	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Between S19 (male) (4) – (3)	Emergency steering switch ON	Resistance	Max. 1 Ω
				Emergency steering switch OFF	Resistance	Min. 1 MΩ
	8	Defective machine monitor	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			Between L54 (3) – chassis ground	Emergency steering stopped	Voltage	Max. 1 V
				Emergency steering operated (High pressure) (Manual operation switch ON)	Voltage	20 – 30 V

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Related circuit diagram



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