SEN06489-03

Shop Manual

MOTOR GRADER

GD705-5

SERIAL NUMBERS 26001 and up

ecot3

KOMATSU®

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Notice of revision 1

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Failure code [CA144] Coolant sensor high error

Action code	Failure code	Failure	Coolant temperature sensor voltage is high (Engine controller system)
E01	**CA144**		
Detail of failure	• Signal circuit of coolant temperature sensor detects high voltage.		
Action of controller	• Fixes coolant temperature value and continues operation.		
Problem on machine	• Engine does not start easily at low temperature. • Overheat prevention function does not work.		
Related information	• Input voltage from engine coolant temperature sensor can be checked by using monitoring function (Code: **ENGINE 04105 COOLANT TEMP**). • Temperature detected by engine coolant sensor can be checked by using monitoring function (Code: **ENGINE 04104 COOLANT TEMP**). • Method of reproducing failure code: Turn starting switch to ON position. • This failure code is displayed if temperature sensor connector is disconnected. • Since T-adapter for sensor connector is "socket", T-adapter cannot be connected to wiring harness.		

	Cause	Procedure, measuring location, criteria and remarks			
1	Defective wiring harness connector	See descriptions of wiring harness and connectors in "c: Electrical equipment" of "Check before troubleshooting" of "Related information to troubleshooting", and check them.			
2	Defective coolant temperature sensor	1. Turn starting switch to OFF position. 2. Disconnect connector COOLANT TEMP, and connect socket to male side of connector. ★ When coolant temperature is 0°C or higher, if coolant temperature sensor resistance is between 700 Ω and 37 kΩ, regard coolant temperature sensor as normal.			
		Between COOLANT TEMP (male) (A) and (B) ★ Coolant temperature-Resistance characteristics	0°C	Resistance	30 to 37 kΩ
			25°C	Resistance	9.3 to 10.7 kΩ
			50°C	Resistance	3.2 to 3.8 kΩ
			80°C	Resistance	1.0 to 1.3 kΩ
			95°C	Resistance	700 to 800 Ω
3	Open or short circuit in wiring harness	1. Turn starting switch to OFF position. 2. Disconnect connector ECM and connect T-adapter to female side.			
		Between ECM (female) (15) and (38) (Coolant temperature: Min. 0°C) ★ Use "Coolant temperature-Resistance characteristics" table shown above as resistance criteria.		Resistance	700 Ω to 37 kΩ
4	Defective engine controller	If no failure is found by above checks, engine controller is defective. (Since this is internal failure, troubleshooting cannot be performed.)			

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H-7 Torque converter oil temperature is high

Failure	• Torque converter oil temperature is high.
Related information	• Check that transmission case oil level is normal before performing troubleshooting. • Check the oil pressure while torque converter oil temperature gauge is in operator range. • Check that wheel brake and parking brake are not dragging, and then perform troubleshooting (it is normal if machine moves with the engine at low idle and at gear speed F4).

		Cause	Standard value in normal condition, remarks for troubleshooting
Probable causes and criteria	1	Malfunction of power train main relief valve	★ Be ready with engine stopped, then perform troubleshooting with engine started. Gear shift lever: P position; Engine: Low idle; Power train Main relief pressure: 2.55 ± 0.2 MPa {26.0 ± 2.0 kg/cm²} Gear shift lever: P position; Engine: Rated speed; Power train Main relief pressure: 2.70 ± 0.2 MPa {27.5 ± 2.0 kg/cm²}
	2	Malfunction of torque converter relief valve	★ Be ready with engine stopped, then perform troubleshooting with engine at high idle. Gear shift lever: P position; Torque converter inlet pressure: Max. 0.86 ± 0.1 MPa {Max. 8.8 ± 0.1 kg/cm²} Oil temperature: 80 ± 5°C
	3	Internal defect of torque converter	★ Be ready with engine stopped, then perform troubleshooting with engine at high idle. Gear shift lever: P position; Torque converter outlet pressure: 0.58 ± 0.1 MPa {5.9 ± 1.0 kg/cm²} Oil temperature: 80 ± 5°C If torque converter inlet pressure is normal but outlet pressure is abnormal, torque converter may have internal defect. Check it.
	4	Malfunction of torque converter lockup clutch valve (ECMV)	★ Be ready with engine stopped, then perform troubleshooting with engine at high idle (running track idle off ground). Transmission mode selector switch: Mode 1; Gear shift lever: F1 position; Clutch oil pressure: 1.76 ± 0.2 MPa {17.6 ± 2.0 kg/cm²}
	5	Defective seal of torque converter lockup clutch piston	Sealing of torque converter lockup clutch piston may be defective. Check it.
	6	Wear or damage of torque converter lockup clutch disc or plate	Torque converter lockup clutch disc or plate may be worn or damaged. Check it.
	7	Malfunction of transmission clutch valve (ECMV)	★ Be ready with engine stopped, then perform troubleshooting with engine at high idle (running track idle off ground). Measurement clutch: FL, FH, 1st, R; Clutch pressure: 2.05 to 2.45 MPa {20.9 to 25.0 kg/cm²} Measurement clutch: 2nd, 3rd, 4th; Clutch pressure: 1.96 to 2.46 MPa {20.0 to 25.1 kg/cm²} If oil level is not normal, replace clutch valve (ECMV) with the one of the same oil pressure setting, check it again, and then make judgment.
	8	Defective sealing of transmission clutch piston	Sealing of transmission clutch piston may be defective. Check it.
	9	Wear or damage of transmission clutch disc or plate	Transmission clutch disc or plate may be worn or damaged. Check it.
	10	Internal defect of transmission	Transmission may have internal defect. Check it.

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Information in troubleshooting table

Information in troubleshooting table

★ The following information is summarized in the troubleshooting table and the related electrical circuit diagram. Before performing troubleshooting, understand the information fully.

Failure	Problem on machine
Related information	Information related to detected failure or troubleshooting

Cause		Procedure, measuring location, criteria and remarks
1 2	Assumed causes for trouble (Perform trouble-shooting in order.)	Details: • Procedure • Measuring location ★ "Between A and B" means the measurement of voltage, resistance or others between terminals A and B. • Standard value required for judgement • Remarks requiredfor judgement Precautions for troubleshooting: (1) Pin number description sequence and tester lead handling For troubleshooting, connect the plus (+) and minus (–) leads as shown below unless otherwise specified. • Connect the plus (+) lead to a pin or harness indicated in the front. • Connect the minus(–) lead to a pin or harness indicated in the rear. (2) Example of troubleshooting by inspection of multiple places ★ Normal in 1 but abnormal in 2 In that occasion the description is made as "Defective (part)" as shown on the left
3	Defective (part)	

★ If a wiring harness is burnt, replace it.

Failures in wiring harness:

- Open circuit
  The connector connection is defective or wiring harness is disconnected.
- Ground fault
  A wiring harness not to be connected to the ground circuit is in contact with the ground circuit or chassis.
- Hot short
  A wiring harness not to be connected to the power (24 V) circuit is in contact with the power (24 V) circuit.
- Short circuit
  An independent wire in the wiring harness is in contact with one of other wires. (Defective insulation in connector or others)

Related circuit diagram

This is the excerpted circuit diagram related to the troubleshooting

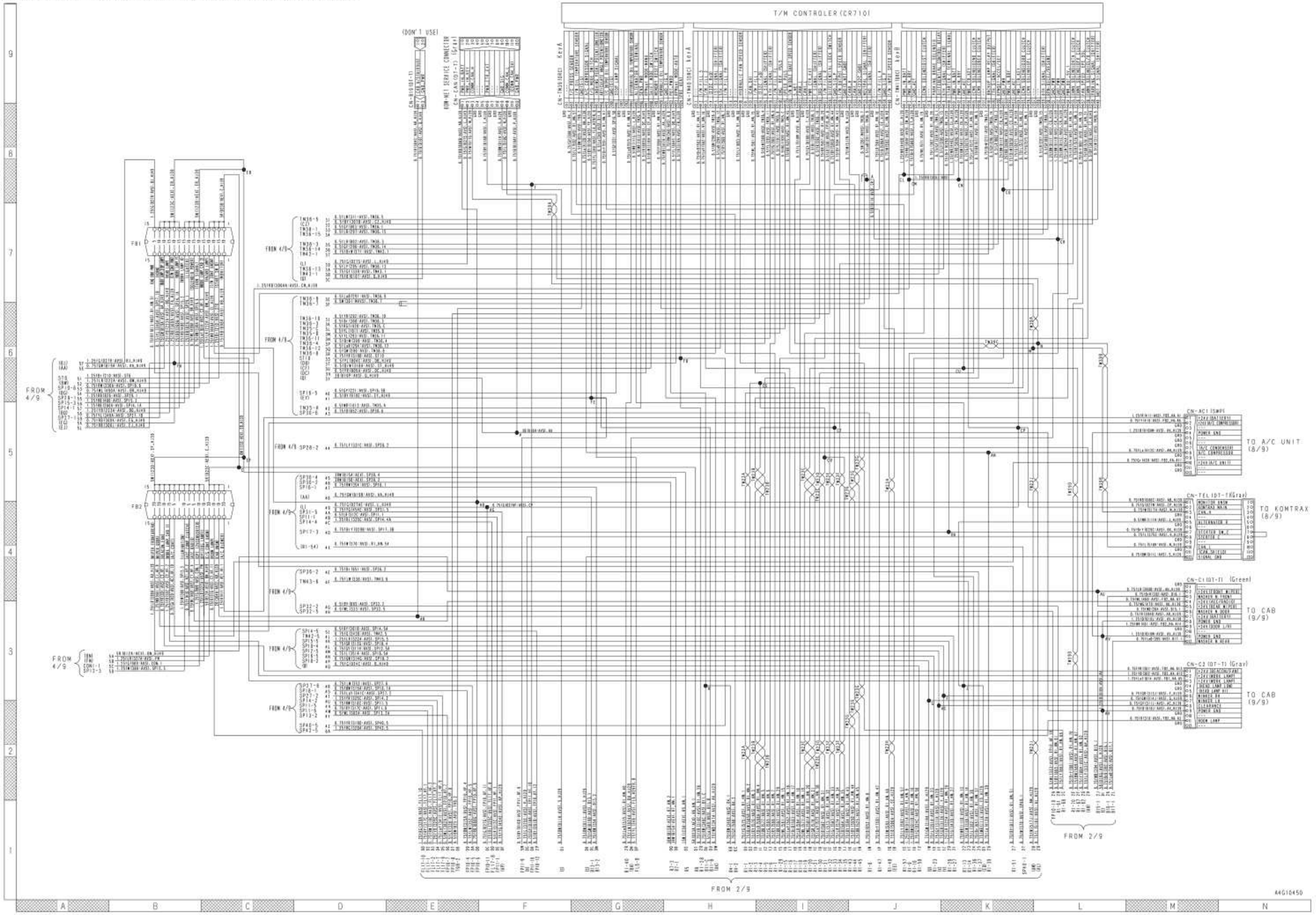
- Connector numbers and pin numbers are shown.
- See "Circuit diagram and layout of connector pins" and "Parts and connector locations" for connector location.
- The circuit diagram shows the size and colors of wires.
  W: White, B: Black, R: Red, G: Green, Y: Yellow, L: Blue, V: Purple, P: Pink, O: Orange, Br: Brown, Gr: Gray, Sb: Sky blue, Lg: Light green, Dg: Dark green, Ch: Dark brown
  ★ When there are two colors
  Example: WY: Yellow line on white background
  ★ The number before the wire color indicates the wire size.
- N.C.: Normally closed (Normally ON)
- [1], [2], ... are numbers of unlabeled connectors.
- Arrow (⟷): Roughly indicates their mounting place on the machine.

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Electrical circuit diagram (3/9)

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



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