CASE CONSTRUCTION

SERVICE MANUAL

CRAWLER EXCAVATOR

CX290B

87673891 B

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CRAWLER EXCAVATOR
CX290B
SERVICE MANUAL

TABLE OF CONTENTS

DIVISION/SECTION		SECTION N°	REFERENCE N°
1	**GENERAL INFORMATION**		
	Safety, general information and standard torque data	1001	7-27691EN
	General specifications and special torque setting	1002	SM290B1002-1NA
2	**ENGINE**		
	Removal and installation of the engine	2000	SM290B2000-0EN
	Removal and installation of the fuel cooler, engine inter-cooler, radiator and oil cooler	2001	SM290B2001-0EN
	Removal and installation of the turbo charger	2004	SM290B2004-0EN
	Removal and installation of EGR cooler and EGR valve	2005	SM350B2005-0EN
	Removal and installation of the engine hood	2006	SM350B2006-0EN
	Engine specifications	*	
	Disassembly and assembly of the engine	*	
3	**FUEL SYSTEM**		
	Removal and installation of the fuel tank	3001	SM290B3001-0EN
	Removal and installation of the supply pump and common rail	3004	SM290B3004-0EN
	Removal and installation of the injectors	3005	SM350B3005-0EN
	Fuel engine system	*	
4	**ELECTRICAL SYSTEM**		
	Service connector kit	4000	SM350B4000-1EN
	Electrical and engine functions and service support	4001	SC210B4001-2EN
	Removal and installation of the starter motor	4004	SM290B4004-0EN
	Removal and installation of the alternator	4005	SM350B4005-0EN
	Electrical equipment and electrical circuit diagrams	4020	SM210B4020-1EN
	Engine error code (DTC)	4021	SM350B4021-0EN
	Main body error code (DTC)	4022	SM210B4022-0EN
	Troubleshooting, 6HK1 engine	4023	SM350B4023-0EN
5	**UNDERCARRIAGE**		
	Removal and installation of tracks	5001	SM290B5001-0EN
	Rollers	5003	SM290B5003-0EN
	Take-up roller	5005	SM290B5005-0EN
	Removal and installation of grease cylinder	5006	SM290B5006-0EN
	Disassembly and assembly of grease cylinder	5007	SM290B5007-0EN
6	**DRIVE TRAIN**		
	Removal and installation of the drive motor and final drive transmission	6001	SM350B6001-0EN
	Disassembly and assembly of the drive motor and final drive transmission	6002	SM350B6002-0EN
	Removal and installation of the swing motor and swing reduction gear	6003	SM290B6003-0EN
	Disassembly and assembly of the swing reduction gear	6004	SM350B6004-0EN
7	**UNDERCARRIAGE HYDRAULICS**		

* *Consult the Engine Service Manual*

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DIVISION/SECTION	SECTION N°	REFERENCE N°
8 UPPERSTRUCTURE HYDRAULICS		
Specifications, troubleshooting, checks and hydraulic pressure settings	8001	SC290B8001-0NA
Removal and installation of the hydraulic reservoir	8002	SM290B8002-0EN
Removal and installation of the main hydraulic pump	8003	SM350B8003-0EN
Removal and installation of the main hydraulic control valve	8004	SM290B8004-0EN
Removal and installation of the attachment cylinders	8005	SM350B8005-0EN
Removal and installation of the hydraulic swivel	8006	SM290B8006-0EN
Removal and installation of the pilot blocs	8007	SM290B8007-0EN
Disassembly and assembly of the main hydraulic pump	8010	SM290B8010-0EN
Disassembly and assembly of the main hydraulic control valve	8011	SM350B8011-0EN
Disassembly and assembly of the attachment cylinders	8012	SM130B8012-0EN
Disassembly and assembly of the hand control levers	8013	SM130B8013-0EN
Disassembly and assembly of the foot control levers	8014	SM160B8014-1EN
Disassembly and assembly of the cushion valve	8016	SM290B8016-0EN
Removal and installation of the safety valve	8017	SM350B8017-0EN
Disassembly and assembly of the hydraulic swivel	8018	SM290B8018-0EN
Disassembly and assembly of the swing motor	8019	SM290B8019-0EN
Hydraulic functions	8020	SC290B8020-0NA
Hydraulic component functions	8030	SC290B8030-0NA
9 UPPERSTRUCTURE		
Removal and installation of the counterweight	9002	SM290B9002-0EN
Removal and installation of the boom, dipper and bucket	9003	SM350B9003-0EN
Removal and installation of the seat	9004	SM130B9004-0EN
Removal and installation of the cab and cab equipment	9005	SM130B9005-0EN
Air conditioner functions and troubleshooting	9006	SC210B9006-3EN
Air conditioning unit	9007	SM130B9007-0EN
Air conditioning components	9009	SM290B9009-0EN
Large size hydraulic schematics	Pocket	87601004A
Large size electrical schematics	Pocket	87601010A

NOTE: CNH France S.A. Company reserves the right to make changes in the specification and design of the machine without prior notice and without incurring any obligation to modify units previously sold.

The description of the models shown in this manual has been made in accordance with the technical specifications known as of the date of design of this document.

All data given in this manual is subject to production variations. Dimensions and weights are provided with approximate values and the machine fitting shown in the illustrations may not correspond with standard models. For precise information on specific machine models and versions, please contact your CASE dealer.

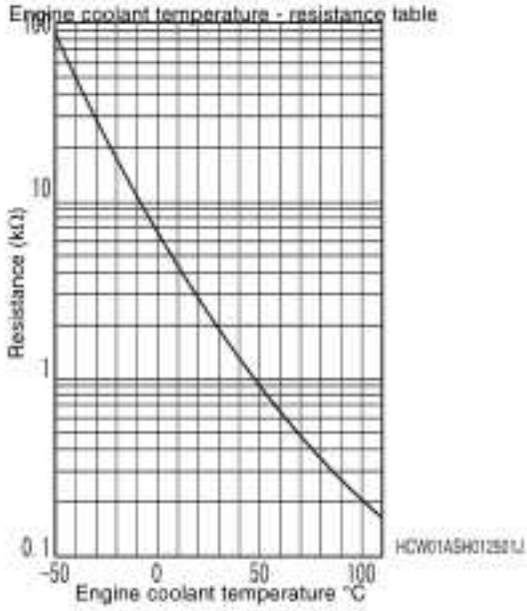
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Inspection procedures for sensors on actual machine

1. Disconnect the intermediate connectors and perform sensor inspection from the engine harness connector.
2. Disconnect the connector from the sensor and short circuit the sensor connector wiring.
3. Inspect the harness disconnection from the intermediate connector.
   - If there is an abnormality in both procedures 1 and 2, repair the harness and repeat inspection from procedure 1.
   - If there is an abnormality in procedure 1 only, replace the sensor.

Engine coolant temperature - resistance table



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Step	Action	Value	Yes	No
4	Perform fuel air bleeding and check whether the symptoms occur again. **Note:** **See the "Fuel system air bleeding" for the work procedures.** Have the engine symptoms normalized?	-	Go to step 20.	Go to step 5.
5	Perform checking of the suction air system. Is the action complete?	-	Go to step 6.	Go to "Checking the Suction Air System".
6	Perform checking of the fuel system. Is the action complete?	-	Go to step 7.	Go to "Checking the Fuel System".
7	Inspect the injector. 1. Delete the diagnostic trouble code. 2. Start the engine. 3. See "Injector Inspection Methods Using a Thermogun". Was there a cylinder with little temperature change?	-	Go to step 8.	Go to step 9.
8	Replace the injector for the cylinder with little temperature change. **Note:** **See the "Engine" section in the Service Manual for the work procedures.** Is the action complete?	-	Go to step 9.	-
9	Check the engine symptoms again. Have the engine symptoms normalized?	-	-	Go to step 10.
10	Inspect the condition of electrical components installed after purchasing such as wireless devices and working lights. Do the engine symptoms not change even when the power supply to the electrical components installed after purchasing is switched OFF?	-	Go to step 11.	Go to step 12.
11	Either correct the installation condition of electrical components or remove them. Is the action complete?	-	Go to step 12.	-
12	Inspect the installation condition of the crankshaft position (CKP) sensor and camshaft position (CMP) sensor. Inspect whether there are any installation problems such as rattling with the CKP sensor and CMP sensor. Are the installation conditions normal?	-	Go to step 18.	Go to step 13.
13	Correct the installation condition of the CKP and CMP sensor. Is the action complete?	-	Go to step 18.	-
14	Inspect the signal detection condition of the CKP sensor. 1. Start the engine. 2. Remove the harness from the CMP sensor. (This operation will cause a diagnostic trouble code to be detected, so make sure to delete the diagnostic trouble code after repairing the main unit.) Is the idling condition normal?	-	Go to step 19.	Go to step 15.

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8 Disassembly of straight travel signal control valve

1) Remove the hexagon socket head bolts (83) (5 mm hexagon socket diameter) and remove the body assembly (42).
2) Loosen and remove the plug assembly (42-5) (5 mm hexagon socket diameter) and remove the O-ring.
3) Pull out the spools (42-2) and (42-3) and spring (42-4).
4) Loosen the orifice plug (42-7) (36 mm hexagon diameter) and remove it from the body (42-1).

9 Disassembly of other plugs

1) Loosen and remove the plug assembly (71) (10 mm hexagon socket diameter) and remove the O-ring.
2) Loosen and remove the plug assembly (72) (8 mm hexagon socket diameter) and remove the O-ring.
3) Loosen and remove the orifice plug (40) (5 mm hexagon socket diameter). (D-D cross section)
4) Loosen and remove the plug assembly (92) (36 mm hexagon diameter) and remove the O-ring.
5) Loosen and remove the plug assembly (73) (6 mm hexagon socket diameter) and remove the O-ring.

10 Disassembly of add-on section

1) Loosen and remove the 4 hexagon nuts (97) (22 mm hexagon diameter).
2) Remove the outlet housing (95).
   Execute Steps [3] - [5] below as necessary.
3) Remove the spool section assembly (98) and remove the matching surface O-rings (98-10) and (98-11).
4) Remove the inlet section assembly (99) and remove the matching surface O-rings (99-3) and (99-4).
5) Remove the spool section assembly (111) and remove the matching surface O-rings (110-10) and (110-11).
6) Remove the main unit body matching surface O-rings (56) and (64).
7) Loosen the tie rod (96) and remove it from the main unit valve housing (1).
   (Use a pipe wrench.)

⚠ **WARNING:** When removing the add-on section, be careful not to cause any dents, scratches, or the like on matching surfaces. Any dents, scratches, or the like on matching surfaces have a danger of allowing oil to leak from those surfaces and causing malfunction. Also, be careful not to let any foreign matter enter the oil path. Such foreign matter has a danger of the spool sticking due to biting of the spool sliding section or a load check seat defect making the actuator run wild or stop disabled.

11 Disassembly of valve housing union bolt

⚠	**WARNING:**	1. Do not disassemble the union bolt (77) unless necessary.. 2. If such disassembly is necessary, place the main unit on a flat table to do the work. 3. Prepare the replacement O-rings (65) and (66).

1) Loosen and remove the 8 hexagon socket head bolts (77) (14 mm hexagon socket diameter).
   Tightening torque: 166 - 177 Nm
2) Remove the valve housing matching surface O-rings (65) and (66).

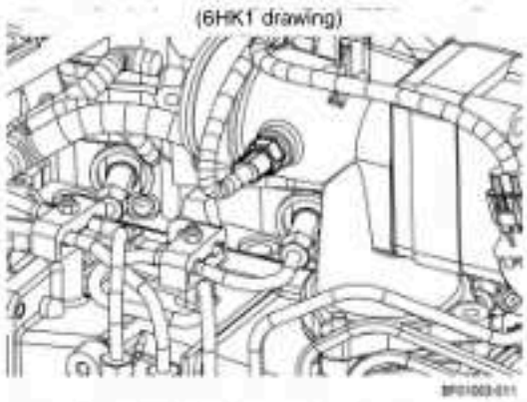
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12)Boost temperature sensor

(4HK1 drawing)



(6HK1 drawing)



The boost temperature sensor is installed on the upstream side of the EGR valve on the intake manifold.
This sensor is the thermistor type. The internal resistance of the sensor changes with the temperature.

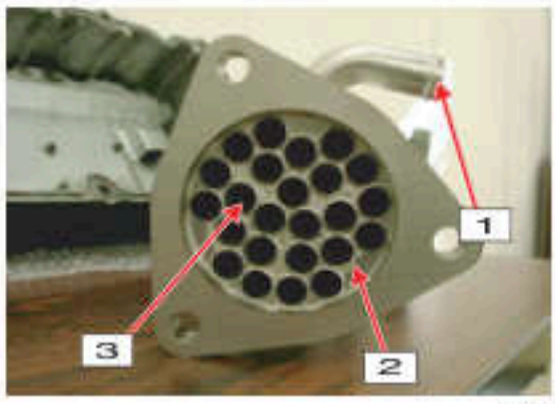
13)Charge Fuel Pump



Converting the fuel filter and pre-filter to remote operation increased the distance from the fuel tank to the feed pump.
Therefore, this pump was added to assist in drawing the fuel from the tank and to make it easy to bleed out air during maintenance.
This pump always operates when the key switch is ON.

14)EGR Cooler





1	Coolant inlet
2	Coolant path (outside of hehaust gas path)
3	Exhaust gas path

The cooled EGR (cooling system installed in the path) uses the engine coolant to cool exhaust gas at high temperature (about 700°C {1292°F}) down to about 200°C {392°F}, to drop the combustion temperature, and to reduce NOx.

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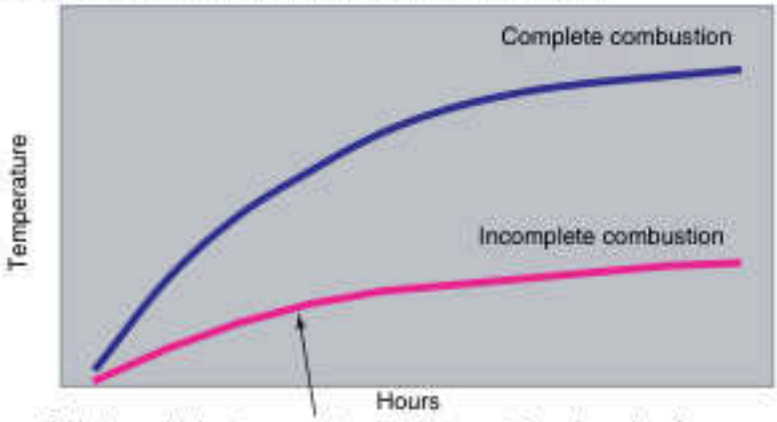
Injector Inspection Methods Using A Thermogun

Common rail-type fuel injection device injectors are located inside the head cover, and inspection (removal and installation of couplers, outside injection from cylinder) cannot be performed. An inspection method for mechanical problems (spray deficiencies, clogging, seizing) for which a diagnostic trouble code does not appear is necessary.

Judgment through temperature measurement

For engines in which combustion conditions are normal, the temperature of each cylinder will ordinarily increase.
However, for cylinders in which there is trouble and combustion conditions are poor, it is difficult for the temperature to increase.
Use these characteristics and observe the temperature change in each cylinder to judge whether there are cylinder problems.

«Difference in temperature change by state of combustion»



Cylinders with low temperature have poor status of combustion.

Therefore, you can judge that there has been some kind of trouble.

TSSA0001

The cause of the problem is often a defect (spray deficiencies, clogging, seizing) with the injector itself.
Also investigate other causes and thoroughly perform trouble diagnosis before deciding what the problem is.

Thermogun

A thermogun is a infrared thermometer capable of non-contact temperature measurement.
As a maintenance tool, this is sold as a thermogun and infrared thermometer.

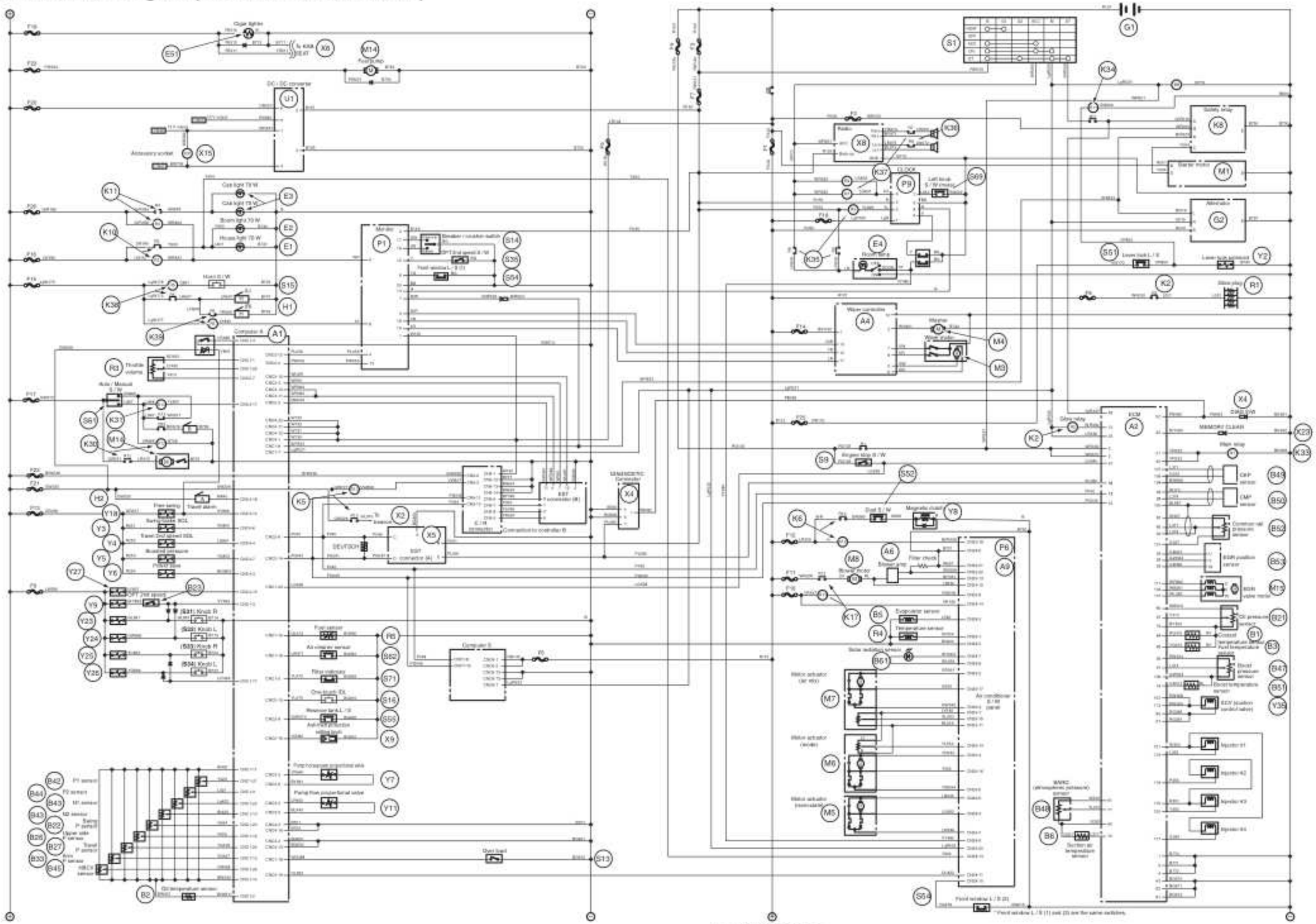
- Ideal for measuring temperatures from 0 °C to 500 °C.
- Includes laser pointer
- Includes spot measurement function (convergence ratio of about 10:1)



TSSA0004

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Sequence Circuit Diagram (CX210B, CX230B, CX240B)



Lep SM210B4020-1EN

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