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2011 MAZDA CX-9 OEM Service and Repair Workshop Manual

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DIFFERENTIAL OIL TEMPERATURE SENSOR REMOVAL/INSTALLATION

SM2898043

id03190080080

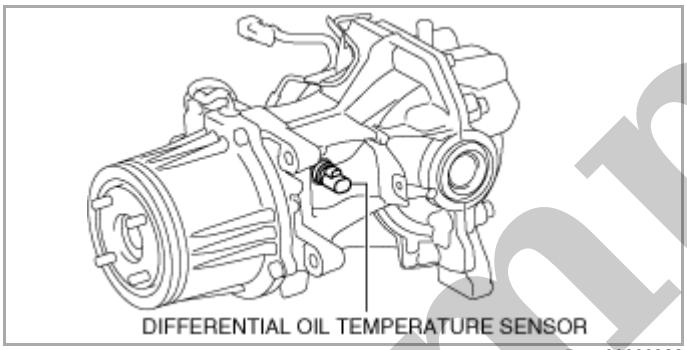
Warning

• Hot differential oil may cause severe burns. Do not perform maintenance while differential oil is hot.

1.Disconnect the negative battery terminal. (See NEGATIVE BATTERY TERMINAL DISCONNECTION/CONNECTION.)

2.Disconnect the differential oil temperature sensor connector.

3.Remove the differential oil temperature sensor.



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4.Install the differential oil temperature sensor.

Tightening torque

13−17 N·m {133−173 kgf·cm, 116−150 in·lbf}

5.Connect the differential oil temperature sensor connector.

6.Connect the negative battery terminal. (See NEGATIVE BATTERY TERMINAL DISCONNECTION/CONNECTION.)

DRIVELINE/AXLE TECHNICAL DATA

SM2898046

id03500080010

Item		Specification
Front wheel bearing maximum play		0.05 mm {0.002 in}
Rear wheel bearing maximum play		0.05 mm {0.002 in}
Front drive shaft (tripod joint) full length (standard) (SKYACTIV-G 2.5 (Without cylinder deactivation))		LH: 672.5–682.5 mm {26.48–26.87 in} RH: 1036.4–1046.4 mm {40.804–41.196 in}
Front drive shaft (tripod joint) full length (standard) (SKYACTIV-G 2.5 (With cylinder deactivation))		LH: 663.5–673.5 mm {26.13–26.51 in} RH: 1045.5–1055.5 mm {41.162–41.555 in}
Front drive shaft (tripod joint) full length (standard) (SKYACTIV-G 2.5T, SKYACTIV-D 2.2)		LH: 661.8–671.8 mm {26.06–26.44in} RH: 1043.3–1053.3 mm {41.075–41.468 in}
Rear drive shaft standard length		LH: 834.7–844.7 mm {32.87–33.25 in} RH: 873.2–883.2 mm {34.38–34.77 in}
Rear differential oil	Type	MAZDA LONG LIFE HYPOID GEAR OIL SG1
	Capacity (approx. quantity)	0.35 L {0.37 US qt, 0.31 Imp qt}
Rear differential backlash of pinion gear and side gear		0.1 mm {0.004 in} or less
Rear differential drive pinion preload		0.2–0.5 N·m {2.1–5.0 kgf·cm, 1.8–4.4 in·lbf}
Rear differential backlash of drive pinion and ring gear		Standard: 0.09–0.14 mm {0.004–0.005 in} Minimum: 0.05 mm {0.002 in} or more Variance: 0.07 mm {0.003 in} or less
Propeller shaft maximum runout		0.8 mm {0.031 in}
Propeller shaft rotation torque		0.3–1.4 N·m {3.1–14.0 kgf·cm, 2.7–12.0 in·lbf}
Transfer oil	Type	MAZDA LONG LIFE HYPOID GEAR OIL SG1
	Capacity (approx. quantity)	0.45 L {0.48 US qt, 0.40 Imp qt}

Step	Inspection	Results	Action
4	**INSPECT ELECTRIC PARKING BRAKE MOTOR GEAR UNIT (LH) CIRCUIT FOR OPEN CIRCUIT** • Verify that the electric parking brake motor gear unit (LH) and electric parking brake control module connectors are disconnected. • Inspect for continuity between the following terminals (wiring harness-side): — Electric parking brake motor gear unit (LH) terminal A—Electric parking brake control module terminal 1U — Electric parking brake motor gear unit (LH) terminal B—Electric parking brake control module terminal 1Z • Is there continuity?	Yes	Go to the next step.
		No	Refer to the wiring diagram and verify whether or not there is a common connector between the following terminals: • Electric parking brake motor gear unit (LH) terminal A—Electric parking brake control module terminal 1U • Electric parking brake motor gear unit (LH) terminal B—Electric parking brake control module terminal 1Z **If there is a common connector:** • Determine the malfunctioning part by inspecting the common connector and the terminal for corrosion, damage, or pin disconnection, and the common wiring harness for an open circuit. • Repair or replace the malfunctioning part. **If there is no common connector:** • Repair or replace the wiring harness which has an open circuit. Go to Step 7.
5	**INSPECT REAR BRAKE CALIPER (LH) PISTON FOR STICKING** • Verify the condition of the rear brake caliper (LH) piston. • Is the rear brake caliper (LH) piston stuck?	Yes	Repair the piston for sticking. (See REAR BRAKE CALIPER DISASSEMBLY/ASSEMBLY.) Go to Step 7.
		No	Go to the next step.
6	**VERIFY IF MALFUNCTIONING LOCATION IS ELECTRIC PARKING BRAKE MOTOR GEAR UNIT (LH) DEPENDING ON REPEATABILITY** • Always reconnect all disconnected connectors. • Connect the negative battery terminal. (See NEGATIVE BATTERY TERMINAL DISCONNECTION/CONNECTION.) • Clear the DTC for the electric parking brake control module using the M-MDS. (See CLEARING DTC [ELECTRIC PARKING BRAKE CONTROL MODULE].) • Perform the following procedure 3 times or more. — Pull up the electric parking brake switch to operate the electric parking brake. — Press down the electric parking brake switch to release the electric parking brake. • Retrieve the electric parking brake control module DTCs using the M-MDS. (See DTC INSPECTION [ELECTRIC PARKING BRAKE CONTROL MODULE].) • Is the same DTC displayed?	Yes	Replace the electric parking brake motor gear unit (LH), then go to the next step. (See ELECTRIC PARKING BRAKE MOTOR GEAR UNIT REMOVAL/INSTALLATION.)
		No	Go to Step 8.

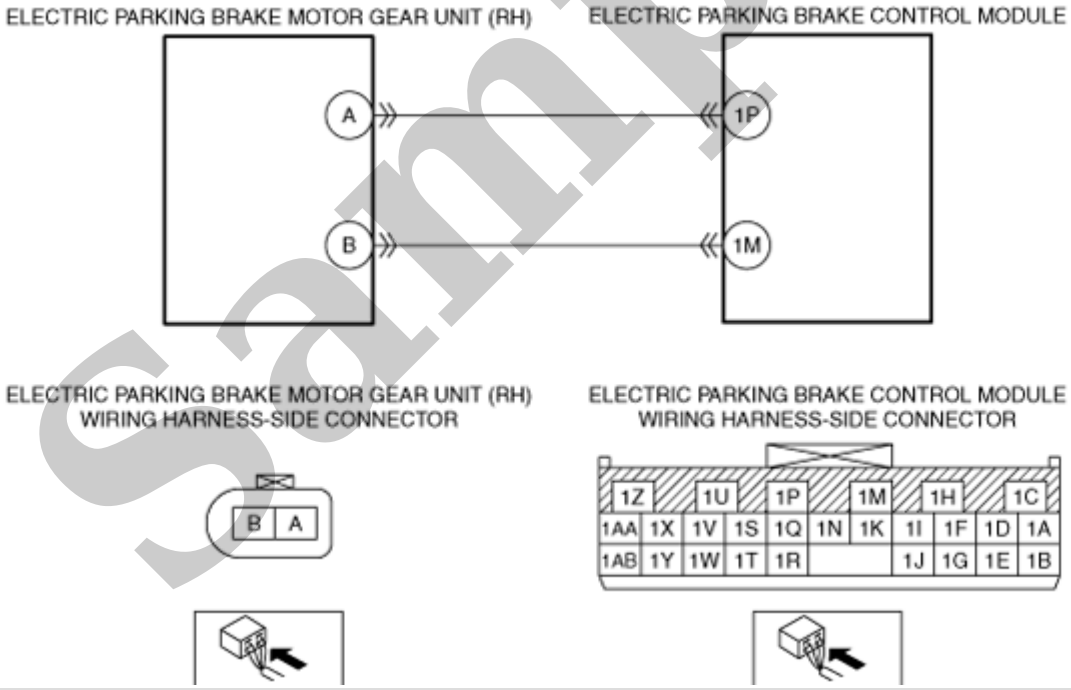
Step	Inspection	Results	Action
1	**VERIFY OTHER ELECTRIC PARKING BRAKE CONTROL MODULE DTCs** • Clear the DTC for the electric parking brake control module using the M-MDS. (See CLEARING DTC [ELECTRIC PARKING BRAKE CONTROL MODULE].) • Perform the following procedure 3 times or more. — Pull up the electric parking brake switch to operate the electric parking brake. — Press down the electric parking brake switch to release the electric parking brake. • Retrieve the electric parking brake control module DTCs using the M-MDS. (See DTC INSPECTION [ELECTRIC PARKING BRAKE CONTROL MODULE].) • Are any DTCs other than DTC C2006:74 displayed?	Yes	**If a procedure which verifies other DTCs is included in the diagnostic procedure of the displayed DTC:** • Go to the next step. **If a procedure which verifies other DTCs is not included in the diagnostic procedure of the displayed DTC:** • Repair or replace the malfunctioning part according to the applicable DTC troubleshooting. (See DTC TABLE [ELECTRIC PARKING BRAKE CONTROL MODULE].)
		No	Go to the next step.
2	**INSPECT ELECTRIC PARKING BRAKE MOTOR GEAR UNIT (LH) CONNECTOR CONDITION** • Switch the ignition off. • Disconnect the negative battery terminal. (See NEGATIVE BATTERY TERMINAL DISCONNECTION/CONNECTION.) • Disconnect the electric parking brake motor gear unit (LH) connector. • Inspect the connector engagement and connection condition and inspect the terminals for damage, deformation, corrosion, or disconnection. • Is the connector normal?	Yes	Go to the next step.
		No	Repair or replace the connector, then go to Step 7.
3	**INSPECT ELECTRIC PARKING BRAKE CONTROL MODULE CONNECTOR CONDITION** • Disconnect the electric parking brake control module connector. • Inspect the connector engagement and connection condition and inspect the terminals for damage, deformation, corrosion, or disconnection. • Is the connector normal?	Yes	Go to the next step.
		No	Repair or replace the connector, then go to Step 7.

DTC C2005:74 [ELECTRIC PARKING BRAKE CONTROL MODULE]

SM2898061

id04023425200

Description	**Electric parking brake motor gear unit (RH) power transmission impossible (spin)**
Detection condition	• Electric parking brake control module detects an electric parking brake motor gear unit (RH) power transmission impossible (spin).
Fail-safe	Not applicable
Possible cause	• Electric parking brake motor gear unit (RH) connector or terminal malfunction • Electric parking brake control module connector or terminal malfunction • Open circuit in wiring harness between the following terminals: — Electric parking brake motor gear unit (RH) terminal A—Electric parking brake control module terminal 1P — Electric parking brake motor gear unit (RH) terminal B—Electric parking brake control module terminal 1M • Rear brake caliper (RH) piston stuck • Spindle in electric parking brake motor gear unit (RH) is stuck • Electric parking brake motor gear unit (RH) malfunction • Electric parking brake control module malfunction



Diagnostic Procedure

Step	Inspection	Results	Action
7	VERIFY THAT REPAIRS HAVE BEEN COMPLETED • Always reconnect all disconnected connectors. • Connect the negative battery terminal. (See NEGATIVE BATTERY TERMINAL DISCONNECTION/CONNECTION.) • Clear the DTC for the electric parking brake control module using the M-MDS. (See CLEARING DTC [ELECTRIC PARKING BRAKE CONTROL MODULE].) • Perform the following procedure 3 times or more. — Pull up the electric parking brake switch to operate the electric parking brake. — Press down the electric parking brake switch to release the electric parking brake. • Retrieve the electric parking brake control module DTCs using the M-MDS. (See DTC INSPECTION [ELECTRIC PARKING BRAKE CONTROL MODULE].) • Is the same DTC displayed?	Yes	Repeat the inspection from Step 1. • If the malfunction recurs, replace the electric parking brake control module. (See ELECTRIC PARKING BRAKE CONTROL MODULE REMOVAL/INSTALLATION.) Go to the next step.
		No	Go to the next step.
8	VERIFY IF OTHER DTCs DISPLAYED • Are any other DTCs displayed?	Yes	Repair or replace the malfunctioning part according to the applicable DTC troubleshooting. (See DTC TABLE [ELECTRIC PARKING BRAKE CONTROL MODULE].)
		No	DTC troubleshooting completed.

Step	Inspection	Results	Action
4	**INSPECT ELECTRIC PARKING BRAKE MOTOR GEAR UNIT (RH) CIRCUIT FOR OPEN CIRCUIT** • Verify that the electric parking brake motor gear unit (RH) and electric parking brake control module connectors are disconnected. • Inspect for continuity between the following terminals (wiring harness-side): — Electric parking brake motor gear unit (RH) terminal A—Electric parking brake control module terminal 1P — Electric parking brake motor gear unit (RH) terminal B—Electric parking brake control module terminal 1M • Is there continuity?	Yes	Go to the next step.
		No	Refer to the wiring diagram and verify whether or not there is a common connector between the following terminals: • Electric parking brake motor gear unit (RH) terminal A—Electric parking brake control module terminal 1P • Electric parking brake motor gear unit (RH) terminal B—Electric parking brake control module terminal 1M **If there is a common connector:** • Determine the malfunctioning part by inspecting the common connector and the terminal for corrosion, damage, or pin disconnection, and the common wiring harness for an open circuit. • Repair or replace the malfunctioning part. **If there is no common connector:** • Repair or replace the wiring harness which has an open circuit. Go to Step 7.
5	**INSPECT REAR BRAKE CALIPER (RH) PISTON FOR STICKING** • Verify the condition of the rear brake caliper (RH) piston. • Is the rear brake caliper (RH) piston stuck?	Yes	Repair the piston for sticking. (See REAR BRAKE CALIPER DISASSEMBLY/ASSEMBLY.) Go to Step 7.
		No	Go to the next step.
6	**VERIFY IF MALFUNCTIONING LOCATION IS ELECTRIC PARKING BRAKE MOTOR GEAR UNIT (RH) DEPENDING ON REPEATABILITY** • Always reconnect all disconnected connectors. • Connect the negative battery terminal. (See NEGATIVE BATTERY TERMINAL DISCONNECTION/CONNECTION.) • Clear the DTC for the electric parking brake control module using the M-MDS. (See CLEARING DTC [ELECTRIC PARKING BRAKE CONTROL MODULE].) • Perform the following procedure 3 times or more. — Pull up the electric parking brake switch to operate the electric parking brake. — Press down the electric parking brake switch to release the electric parking brake. • Retrieve the electric parking brake control module DTCs using the M-MDS. (See DTC INSPECTION [ELECTRIC PARKING BRAKE CONTROL MODULE].) • Is the same DTC displayed?	Yes	Replace the electric parking brake motor gear unit (RH), then go to the next step. (See ELECTRIC PARKING BRAKE MOTOR GEAR UNIT REMOVAL/INSTALLATION.)
		No	Go to Step 8.

Step	Inspection	Results	Action
1	**INSPECT ELECTRIC PARKING BRAKE MOTOR GEAR UNIT (LH) CONNECTOR CONDITION** • Switch the ignition off. • Disconnect the negative battery terminal. (See NEGATIVE BATTERY TERMINAL DISCONNECTION/CONNECTION.) • Disconnect the electric parking brake motor gear unit (LH) connector. • Inspect the connector engagement and connection condition and inspect the terminals for damage, deformation, corrosion, or disconnection. • Is the connector normal?	Yes	Go to the next step.
		No	Repair or replace the connector, then go to Step 6.
2	**INSPECT ELECTRIC PARKING BRAKE CONTROL MODULE CONNECTOR CONDITION** • Disconnect the electric parking brake control module connector. • Inspect the connector engagement and connection condition and inspect the terminals for damage, deformation, corrosion, or disconnection. • Is the connector normal?	Yes	Go to the next step.
		No	Repair or replace the connector, then go to Step 6.
3	**INSPECT ELECTRIC PARKING BRAKE MOTOR GEAR UNIT (LH) CIRCUIT FOR OPEN CIRCUIT** • Verify that the electric parking brake motor gear unit (LH) and electric parking brake control module connectors are disconnected. • Inspect for continuity between the following terminals (wiring harness-side): — Electric parking brake motor gear unit (LH) terminal A—Electric parking brake control module terminal 1U — Electric parking brake motor gear unit (LH) terminal B—Electric parking brake control module terminal 1Z • Is there continuity?	Yes	Go to the next step.
		No	Refer to the wiring diagram and verify whether or not there is a common connector between the following terminals: • Electric parking brake motor gear unit (LH) terminal A—Electric parking brake control module terminal 1U • Electric parking brake motor gear unit (LH) terminal B—Electric parking brake control module terminal 1Z **If there is a common connector:** • Determine the malfunctioning part by inspecting the common connector and the terminal for corrosion, damage, or pin disconnection, and the common wiring harness for an open circuit. • Repair or replace the malfunctioning part. **If there is no common connector:** • Repair or replace the wiring harness which has an open circuit. Go to Step 6.
4	**INSPECT REAR BRAKE CALIPER (LH) PISTON FOR STICKING** • Verify the condition of the rear brake caliper (LH) piston. • Is the rear brake caliper (LH) piston stuck?	Yes	Repair the piston for sticking. (See REAR BRAKE CALIPER DISASSEMBLY/ASSEMBLY.) Go to Step 6.
		No	Go to the next step.

Step	Inspection	Results	Action
1	**INSPECT ELECTRIC PARKING BRAKE MOTOR GEAR UNIT (RH) CONNECTOR CONDITION** • Switch the ignition off. • Disconnect the negative battery terminal. (See NEGATIVE BATTERY TERMINAL DISCONNECTION/CONNECTION.) • Disconnect the electric parking brake motor gear unit (RH) connector. • Inspect the connector engagement and connection condition and inspect the terminals for damage, deformation, corrosion, or disconnection. • Is the connector normal?	Yes	Go to the next step.
		No	Repair or replace the connector, then go to Step 6.
2	**INSPECT ELECTRIC PARKING BRAKE CONTROL MODULE CONNECTOR CONDITION** • Disconnect the electric parking brake control module connector. • Inspect the connector engagement and connection condition and inspect the terminals for damage, deformation, corrosion, or disconnection. • Is the connector normal?	Yes	Go to the next step.
		No	Repair or replace the connector, then go to Step 6.
3	**INSPECT ELECTRIC PARKING BRAKE MOTOR GEAR UNIT (RH) CIRCUIT FOR OPEN CIRCUIT** • Verify that the electric parking brake motor gear unit (RH) and electric parking brake control module connectors are disconnected. • Inspect for continuity between the following terminals (wiring harness-side): — Electric parking brake motor gear unit (RH) terminal A—Electric parking brake control module terminal 1P — Electric parking brake motor gear unit (RH) terminal B—Electric parking brake control module terminal 1M • Is there continuity?	Yes	Go to the next step.
		No	Refer to the wiring diagram and verify whether or not there is a common connector between the following terminals: • Electric parking brake motor gear unit (RH) terminal A—Electric parking brake control module terminal 1P • Electric parking brake motor gear unit (RH) terminal B—Electric parking brake control module terminal 1M **If there is a common connector:** • Determine the malfunctioning part by inspecting the common connector and the terminal for corrosion, damage, or pin disconnection, and the common wiring harness for an open circuit. • Repair or replace the malfunctioning part. **If there is no common connector:** • Repair or replace the wiring harness which has an open circuit. Go to Step 6.
4	**INSPECT REAR BRAKE CALIPER (RH) PISTON FOR STICKING** • Verify the condition of the rear brake caliper (RH) piston. • Is the rear brake caliper (RH) piston stuck?	Yes	Repair the piston for sticking. (See REAR BRAKE CALIPER DISASSEMBLY/ASSEMBLY.) Go to Step 6.
		No	Go to the next step.