

2012 - Mazda6 - HVAC

NO.4 NO TEMPERATURE CONTROL WITH CLIMATE CONTROL UNIT [MANUAL AIR CONDITIONER]

4	No temperature control with climate control unit
DESCRIPTION	Malfunction in A/C unit and/or climate control unit air mix system
POSSIBLE CAUSE	- Climate control unit (B+ signal) system malfunction - Air mix actuator malfunction - Climate control unit (COLD, HOT signal) system malfunction - A/C unit air mix link malfunction - A/C unit air mix door malfunction - Heater piping malfunction

- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while performing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, inspect to make sure connectors, terminals and wiring harnesses are connected correctly and undamaged.

Diagnostic procedure

STEP	INSPECTION	ACTION
1	INSPECT COOLANT TEMPERATURE Is the coolant sufficiently warmed up?	Yes Go to the next step.
		No Warm up the engine, then go to Step 20.
2*	INSPECT CLIMATE CONTROL UNIT POWER SUPPLY FUSE FOR B+ SIGNAL Is the climate control unit power supply fuse for B+ signal normal?.	Yes Go to the next step.
		No Inspect for short to GND in blown fuse circuit. Repair or replace as necessary. Install appropriate amperage fuse.

3*	INSPECT TO SEE WHETHER MALFUNCTION (OPEN CIRCUIT) IS IN B+ SIGNAL WIRING HARNESS (BETWEEN FUSE BLOCK AND CLIMATE CONTROL UNIT) OR ELSEWHERE • Disconnect the climate control unit connector (24-pin). • Switch the ignition to ON. • Measure voltage at climate control unit harness-side connector (24-pin) terminal 1Q (B+ signal). • Is the voltage approx. 12V?	Yes Go to the next step. No Repair wiring harness between fuse block and climate control unit, then go to Step 21.
*4	INSPECT TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN WIRING HARNESS (BETWEEN CLIMATE CONTROL UNIT AND GND) OR ELSEWHERE • Climate control unit connector (24-pin) disconnected. • Verify that continuity between climate control unit harness-side connector (24-pin) terminal 1U and GND. • Is the continuity?	Yes Go to the next step. No Repair wiring harness between climate control unit and GND. Inspect GND point condition. Then go to Step 21.
*5	INSPECT TO SEE WHETHER MALFUNCTION IS IN BLOWER UNIT OR AIR MIX ACTUATOR • Switch the ignition to ON. • Measure the voltage at climate control unit terminal 1T (24-pin) when temperature control dial at MAX HOT and MAX COLD. (See CLIMATE CONTROL UNIT INSPECTION [MANUAL AIR CONDITIONER].) • Is voltage normal?	Yes Go to Step 17. No Go to the next step.
*6	INSPECT TO SEE WHETHER MALFUNCTION IS IN POSITION SENSOR OR ELSEWHERE • Switch the ignition to ON. • Measure voltage at climate control unit terminal 1R (24-pin) when airflow mode change to DEFROSTER and VENT (See CLIMATE CONTROL UNIT INSPECTION [MANUAL AIR CONDITIONER].) • Is voltage normal?	Yes Go to Step 9. No Go to the next step.
*7	INSPECT TO SEE WHETHER MALFUNCTION	Yes Go to the next step.

	(LACK OF CONTINUITY OR SHORT TO BATTERY POWER OR GND) IS IN POSITION SENSOR POWER SUPPLY (CLIMATE CONTROL UNIT TERMINAL 1S) OR ELSEWHERE • Switch the ignition to ON. • Measure voltage at climate control unit terminal 1S (24-pin). • Is voltage approx. 5V?	No	Repair wiring harness between climate control unit terminal 1S and follows: • Air mix actuator terminal F • Airflow mode actuator terminal F Then go to Step 21.
*8	INSPECT TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY OR OPEN) IS IN POSITION SENSOR GND (CLIMATE CONTROL UNIT TERMINAL 1V) OR ELSEWHERE • Measure voltage at climate control unit terminal 1V (24-pin). • Is the voltage below . 1.0V?	Yes	Go to Step 12.
		No	Repair wiring harness between climate control unit terminal 1V and follows: • Air mix actuator terminal D • Airflow mode actuator terminal D Then go to Step 21.
9	INSPECT TO SEE WHETHER MALFUNCTION (SHORT TO POWER) IS IN WIRING HARNESS (AIR MIX POSITION SIGNAL) OR ELSEWHERE • Is climate unit terminal 1T voltage approx. 12V, at Step 5?	Yes	Repair wiring harness between climate control unit terminal 1T and air mix actuator terminal E. Then go to Step 21.
		No	Go to the next step.
*10	INSPECT TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN WIRING HARNESS (AIR MIX POSITION SIGNAL) OR ELSEWHERE • Switch the ignition to off. • Disconnect the climate control and air mix actuator connectors. • Verify continuity between climate control unit terminal 1T (24-pin) and each side air mix actuator terminal E at harness-side connector. • Is there continuity?	Yes	Go to the next step.
		No	Repair wiring harness between climate control unit terminal 1T and air mix actuator terminal E. Then go to Step 21.

*11	INSPECT TO SEE WHETHER MALFUNCTION (SHORT TO GND) IS IN WIRING HARNESS (AIR MIX POSITION SIGNAL) OR POSITION SENSOR COMMON (POWER SUPPLY OR GND) HARNESS	Yes Repair wiring harness between climate control unit terminal 1T and air mix actuator terminal F. Then go to Step 21.
	• Verify continuity between climate control unit harness-side connector terminal 1T (24-pin) and GND. • Is there continuity?	No Inspect and repair for open circuit following: • Between air mix actuator terminal F and junction point to airflow mode actuator (position sensor power supply). • Between air mix actuator terminal D and junction point to airflow mode actuator (position sensor GND). Then go to Step 21.
*12	INSPECT TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN AIR MIX ACTUATOR WIRING HARNESS (BETWEEN CLIMATE CONTROL UNIT AND AIR MIX ACTUATOR) OR ELSEWHERE • Switch the ignition to ON. • Measure voltage at the following terminals of climate control unit. ▪ Terminal 1G (24-pin, COLD motor drive signal) ▪ Terminal 1I (24-pin, HOT motor drive signal) (See CLIMATE CONTROL UNIT INSPECTION [MANUAL AIR CONDITIONER].) • Are voltages okay?	Yes Go to the next step. No Go to Step 14.
*13	INSPECT TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN AIR MIX ACTUATOR OR WIRING HARNESS (BETWEEN CLIMATE CONTROL UNIT AND AIR MIX	Yes Go to Step 18. No Repair wiring harness between climate control unit and air mix

	ACTUATOR) • Measure voltage at the following terminals of air mix actuator. ▪ Terminal B (COLD motor drive signal) ▪ Terminal A (HOT motor drive signal) • Are voltage s as shown below? ▪ COLD motor drive signal: approx. 10V during COLD and approx. 0.5V during HOT ▪ HOT motor drive signal: approx. 0.5V during HOT and approx. 10V during HOT		actuator. Then go to Step 21.
*14	INSPECT TO SEE WHETHER MALFUNCTION IS IN AIR MIX ACTUATOR OR ELSEWHERE • Disconnect the air mix actuator. • Measure voltage at the following terminals of climate control unit. ▪ Terminal 1G (24-pin, COLD motor drive signal) ▪ Terminal 1I (24-pin, HOT motor drive signal) (See CLIMATE CONTROL UNIT INSPECTION [MANUAL AIR CONDITIONER].) • Are voltages okay?	Yes	Go to Step 17.
		No	Go to the next step.
*15	INSPECT TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (SHORT TO B+ BETWEEN CLIMATE CONTROL UNIT AND AIR MIX ACTUATOR) OR ELSEWHERE • Disconnect the climate control unit connector. • Measure voltage at the following terminals of the climate control unit harness-side connector. ▪ Terminal 1G (24-pin, COLD motor drive signal) ▪ Terminal 1I (24-pin, HOT motor drive signal) • Are voltages approx. 0V?	Yes	Go to the next step.
		No	Repair wiring harness between climate control unit and air mix actuator. Then go to Step 21.

*16	INSPECT TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (SHORT TO GND BETWEEN CLIMATE CONTROL UNIT AND AIR MIX ACTUATOR) OR ELSEWHERE - Switch the ignition to off. - Verify that continuity at the following harness-aide connector terminals between climate control unit and GND. - Terminal 1G (24-pin, COLD motor drive signal) - Terminal 1I (24-pin, HOT motor drive signal) - Is there continuity?	Yes Repair wiring harness between climate control unit and air mix actuator. Then go to Step 21.	No Go to the next step.
17	INSPECT AIR MIX ACTUATOR - Inspect air mix actuator. (See AIR MIX ACTUATOR INSPECTION [MANUAL AIR CONDITIONER].) - Is air mix actuator normal?	Yes Go to the next step.	No Replace the air mix actuator. Then go to Step 21. (See AIR MIX ACTUATOR REMOVAL/ INSTALLATION [MANUAL AIR CONDITIONER].)
18	INSPECT AIR MIX LINK - Inspect air mix links for each-side. - Is grease on link? - Are links securely and properly installed? - Are links free of obstructions and hindrances? - Are above items okay?	Yes Go to the next step.	No Apply grease to links. If any links are damaged, replace malfunctioning part. Then go to Step 21.
19	INSPECT TO SEE WHETHER MALFUNCTION IS IN CLIMATE CONTROL UNIT OR AIR MIX DOOR ELSEWHERE - Inspect blower unit and air mix door. - Is door free of unit and obstruction, and damage? - Are doors securely and properly installed? - Are above items okay?	Yes Go to the next step.	No Remove the obstruction, or install door in proper position. If any door are cracked, replace them. Then go to the next step.
20	INSPECT HEATER LINES	Yes Replace the climate control	

	- Inspect heater lines for followings: - Is heater piping free if damage and cracks? - Are heater piping connections free of engine coolant leakage? - Are heater piping connections securely tightened? - Are heater piping installation points on A/C unit free of engine coolant leakage? - Are above items okay?	unit. Then go to the next step. (See CLIMATE CONTROL UNIT REMOVAL/ INSTALLATION [MANUAL AIR CONDITIONER] .)
		No If heater piping connections is loosed, tighten connections with specified torque. Repair or replace heater piping. Then go to the next step.
21	VERIFY THAT MALFUNCTION SYMPTOM OCCURS AFTER REPAIR Does the unit operate in every temperature setting?	Yes Trouble shooting completed. Explain repairs customer.
		No Recheck malfunction symptoms, then repeat from Step1 if the malfunction recurs.

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Diagnostic procedure

STEP	INSPECTION	ACTION
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		No Warm up the engine, then go to Step 20.
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		No Inspect for short to GND in blown fuse circuit. Repair or replace as necessary. Install appropriate amperage fuse.

3*	INSPECT TO SEE WHETHER MALFUNCTION (OPEN CIRCUIT) IS IN B+ SIGNAL WIRING HARNESS (BETWEEN FUSE BLOCK AND CLIMATE CONTROL UNIT) OR ELSEWHERE • Disconnect the climate control unit connector (24-pin). • Switch the ignition to ON. • Measure voltage at climate control unit harness-side connector (24-pin) terminal 1Q (B+ signal). • Is the voltage approx. 12V?	Yes Go to the next step. No Repair wiring harness between fuse block and climate control unit, then go to Step 21.
*4	INSPECT TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN WIRING HARNESS (BETWEEN CLIMATE CONTROL UNIT AND GND) OR ELSEWHERE • Climate control unit connector (24-pin) disconnected. • Verify that continuity between climate control unit harness-side connector (24-pin) terminal 1U and GND. • Is the continuity?	Yes Go to the next step. No Repair wiring harness between climate control unit and GND. Inspect GND point condition. Then go to Step 21.
*5	INSPECT TO SEE WHETHER MALFUNCTION IS IN BLOWER UNIT OR AIR MIX ACTUATOR • Switch the ignition to ON. • Measure the voltage at climate control unit terminal 1T (24-pin) when temperature control dial at MAX HOT and MAX COLD. (See CLIMATE CONTROL UNIT INSPECTION [MANUAL AIR CONDITIONER].) • Is voltage normal?	Yes Go to Step 17. No Go to the next step.
*6	INSPECT TO SEE WHETHER MALFUNCTION IS IN POSITION SENSOR OR ELSEWHERE • Switch the ignition to ON. • Measure voltage at climate control unit terminal 1R (24-pin) when airflow mode change to DEFROSTER and VENT (See CLIMATE CONTROL UNIT INSPECTION [MANUAL AIR CONDITIONER].) • Is voltage normal?	Yes Go to Step 9. No Go to the next step.
*7	INSPECT TO SEE WHETHER MALFUNCTION	Yes Go to the next step.

	(LACK OF CONTINUITY OR SHORT TO BATTERY POWER OR GND) IS IN POSITION SENSOR POWER SUPPLY (CLIMATE CONTROL UNIT TERMINAL 1S) OR ELSEWHERE • Switch the ignition to ON. • Measure voltage at climate control unit terminal 1S (24-pin). • Is voltage approx. 5V?	No	Repair wiring harness between climate control unit terminal 1S and follows: • Air mix actuator terminal F • Airflow mode actuator terminal F Then go to Step 21.
*8	INSPECT TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY OR OPEN) IS IN POSITION SENSOR GND (CLIMATE CONTROL UNIT TERMINAL 1V) OR ELSEWHERE • Measure voltage at climate control unit terminal 1V (24-pin). • Is the voltage below . 1.0V?	Yes	Go to Step 12.
		No	Repair wiring harness between climate control unit terminal 1V and follows: • Air mix actuator terminal D • Airflow mode actuator terminal D Then go to Step 21.
9	INSPECT TO SEE WHETHER MALFUNCTION (SHORT TO POWER) IS IN WIRING HARNESS (AIR MIX POSITION SIGNAL) OR ELSEWHERE • Is climate unit terminal 1T voltage approx. 12V, at Step 5?	Yes	Repair wiring harness between climate control unit terminal 1T and air mix actuator terminal E. Then go to Step 21.
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*10	INSPECT TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN WIRING HARNESS (AIR MIX POSITION SIGNAL) OR ELSEWHERE • Switch the ignition to off. • Disconnect the climate control and air mix actuator connectors. • Verify continuity between climate control unit terminal 1T (24-pin) and each side air mix actuator terminal E at harness-side connector. • Is there continuity?	Yes	Go to the next step.
		No	Repair wiring harness between climate control unit terminal 1T and air mix actuator terminal E. Then go to Step 21.

*11	INSPECT TO SEE WHETHER MALFUNCTION (SHORT TO GND) IS IN WIRING HARNESS (AIR MIX POSITION SIGNAL) OR POSITION SENSOR COMMON (POWER SUPPLY OR GND) HARNESS • Verify continuity between climate control unit harness-side connector terminal 1T (24-pin) and GND. • Is there continuity?	Yes Repair wiring harness between climate control unit terminal 1T and air mix actuator terminal F. Then go to Step 21.	No Inspect and repair for open circuit following: • Between air mix actuator terminal F and junction point to airflow mode actuator (position sensor power supply). • Between air mix actuator terminal D and junction point to airflow mode actuator (position sensor GND). Then go to Step 21.
*12	INSPECT TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN AIR MIX ACTUATOR WIRING HARNESS (BETWEEN CLIMATE CONTROL UNIT AND AIR MIX ACTUATOR) OR ELSEWHERE • Switch the ignition to ON. • Measure voltage at the following terminals of climate control unit. ▪ Terminal 1G (24-pin, COLD motor drive signal) ▪ Terminal 1I (24-pin, HOT motor drive signal) (See CLIMATE CONTROL UNIT INSPECTION [MANUAL AIR CONDITIONER].) • Are voltages okay?	Yes Go to the next step.	No Go to Step 14.
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		No	Repair wiring harness between climate control unit and air mix actuator. Then go to Step 21.

*16	INSPECT TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (SHORT TO GND BETWEEN CLIMATE CONTROL UNIT AND AIR MIX ACTUATOR) OR ELSEWHERE - Switch the ignition to off. - Verify that continuity at the following harness-aide connector terminals between climate control unit and GND. - Terminal 1G (24-pin, COLD motor drive signal) - Terminal 1I (24-pin, HOT motor drive signal) - Is there continuity?	Yes Repair wiring harness between climate control unit and air mix actuator. Then go to Step 21.	No Go to the next step.
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