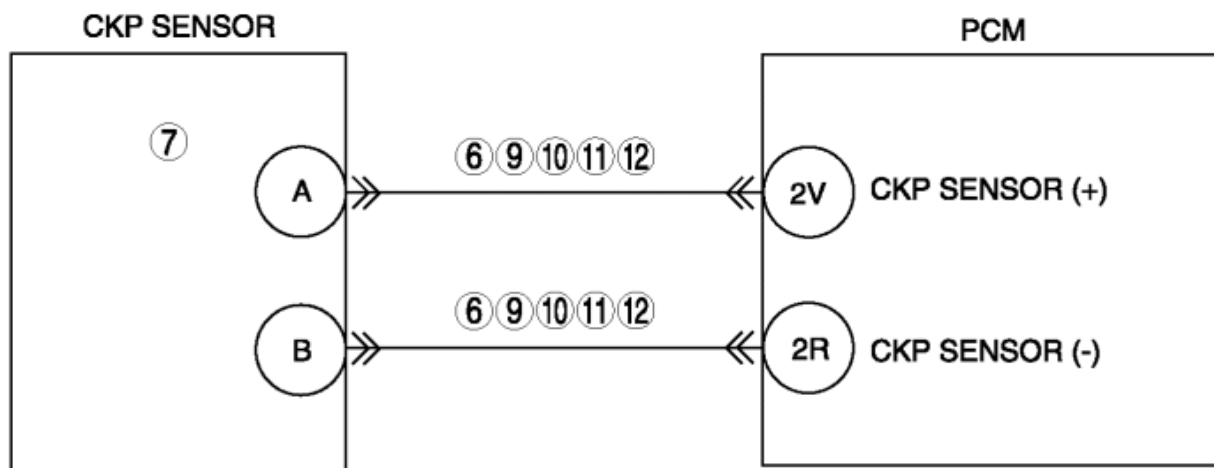


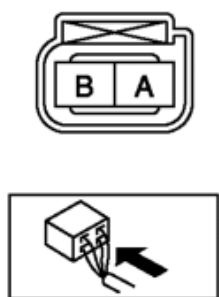
2012 - Mazda6 - Engine

DTC P0320:00 [MZI 3.7 V6]

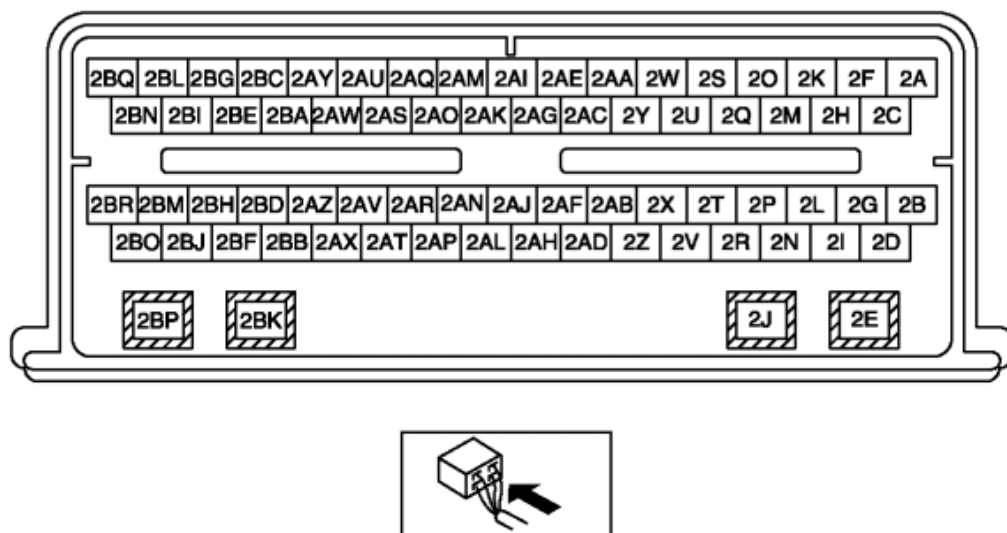
DTC P0320:00	Ignition/distributor engine speed input circuit
DETECTION CONDI TION	• The ignition engine speed sensor input signal to the PCM is continuously monitored. The test fails when the signal indicates that 2 successive erratic PIP pulses occurred.
POSSI BLE CAUSE	• Loose wires/connectors. • CKP sensor and/or trigger wheel physically damaged • CKP sensor malfunction • Arching secondary ignition components (coil, wires or plugs). • On-board transmitter (2-way radio). • CKP sensor circuits short to each other • Open circuit between PCM terminal 2V and CKP sensor terminal A • Open circuit between PCM terminal 2R and CKP sensor terminal B • Short to ground circuit between PCM terminal 2V and CKP sensor terminal A • Short to ground circuit between PCM terminal 2R and CKP sensor terminal B • Short to power supply circuit between PCM terminal 2V and CKP sensor terminal A • Short to power supply circuit between PCM terminal 2R and CKP sensor terminal B • PCM malfunction



**CKP SENSOR
WIRING HARNESS-SIDE CONNECTOR**



**PCM
WIRING HARNESS-SIDE CONNECTOR**



Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME DATA been recorded?	Yes Go to the next step. No Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY - Verify related Service Bulletins and/or on-line repair information availability. - Is any related Service Bulletins available?	Yes Perform repair or diagnosis according to the available Service Bulletins. If the vehicle is not repaired, go to the next step. No Go to the next step.
3	VERIFY RELATED PENDING CODE OR STORED DTCs	Yes Go to the appropriate DTC troubleshooting. (See DTC TABLE [MZI 3.7 V6] .)

	Switch the ignition to off, then to the ON (Engine off). • Verify related pending code or stored DTCs. • Are other DTCs present?	No	Go to the next step.
4	INSPECT CKP SENSOR SIGNAL SENT TO PCM NOTE: • The battery should be fully charged and the starting system should be functioning properly. • Switch the ignition to ON (Engine off) • Access the PCM and monitor the RPM PID. • Crank the engine. • Is the engine speed more than 150 rpm?	Yes	Go to Step 13. (The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector.)
		No	Go to the next step.
5	INSPECT TIMING COVER, CKP SENSOR AND EXTERNAL TRIGGER WHEEL (OUTSIDE TIMING COVER) FOR OBVIOUS PHYSICAL DAMAGE • Switch the ignition to off. • Visually check the timing cover, CKP sensor and external trigger wheel (outside the timing cover) for obvious physical damage. • Do any parts appear physically damaged?	Yes	Repair if necessary. Then go to Step 13.
		No	Go to the next step.
6	INSPECT FOR PROPER CKP BIAS VOLTAGES IN PCM • Disconnect the CKP sensor connector. • Switch the ignition to ON (Engine off) • Measure the voltage between: ▪ CKP sensor terminal A on the wiring harness side and battery negative ▪ CKP sensor terminal B on the wiring harness side and battery negative • Are the voltages between 1—3 V?	Yes	Go to the next step.
		No	Go to Step 9.
7	INSPECT CKP SENSOR RESISTANCE • CKP sensor connector is disconnected. • Switch the ignition to off. • Measure the resistance between CKP sensor terminal A and B on the component side. • Is the resistance between 575—790 ohms?	Yes	Go to the next step.
		No	Replace the CKP sensor. Then go to Step 13.
8	INSPECT CKP WIRING HARNESS SHIELD CIRCUIT FOR SHORT TO GROUND	Yes	Go to the next step.

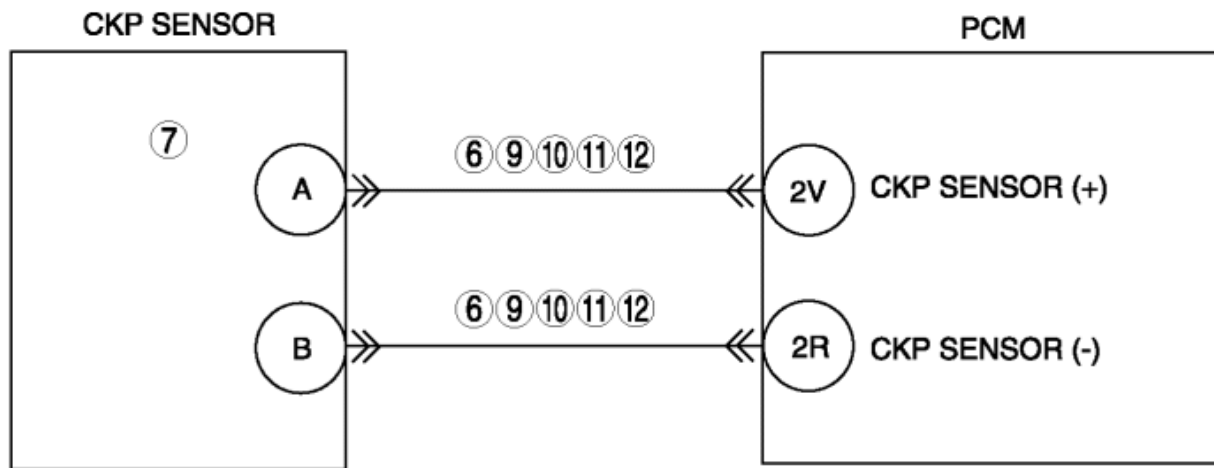
	NOTE: • The wiring harness shield protects the CKP signal from electrical noise and is grounded at one end, typically near the PCM. NOTE: • Perform the following resistance measurement between the CKP shield and the ground. • CKP sensor connector is disconnected. • Measure the resistance between: ▪ CKP_SHLD assembly connector wiring harness side and ground • Is the resistance less than 5 ohms?	No	Repair the short circuit. Check for a poor ground. Then go to Step 13.
9	INSPECT FOR SHORT BETWEEN CKP (+) AND CKP (-) IN WIRING HARNESS • CKP sensor connector is disconnected. • Switch the ignition to off. • Disconnect the PCM connector. • Measure the resistance between: ▪ CKP sensor terminal A and B on the wiring harness side • Is the resistance more than 10 kilohms?	Yes	Go to the next step.
		No	Repair for a short circuit, Then go to Step 13.
10	INSPECT CKP CIRCUIT(S) FOR OPEN CIRCUIT IN WIRING HARNESS • CKP sensor and PCM connectors are disconnected. • Measure the resistance between: ▪ CKP sensor connector A on the wiring harness side and PCM terminal 2V ▪ CKP sensor connector B on the wiring harness side and PCM terminal 2R • Are the resistances less than 5 ohms?	Yes	Go to the next step.
		No	Repair for an open circuit, Then go to Step 13.
11	INSPECT CKP CIRCUIT(S) FOR SHORT TO GROUND IN WIRING HARNESS • CKP sensor and PCM connectors are disconnected. • Measure the resistance between: ▪ CKP sensor connector A on the wiring harness side and battery negative ▪ CKP sensor connector B on the wiring harness side and battery negative	Yes	Go to the next step.
		No	Repair for a short to ground, Then go to Step 13.

	Are the resistances more than 10 kilohms?		
12	INSPECT CKP CIRCUIT FOR SHORT TO VOLTAGE IN WIRING HARNESS - CKP sensor and PCM connectors are disconnected. - Switch the ignition to ON (Engine off) - Measure the voltage between: - CKP sensor connector A on the wiring harness side and battery negative - CKP sensor connector B on the wiring harness side and battery negative - Are any voltage present?	Yes	Repair for a short to power supply, Then go to the next step.
		No	Go to the next step. (The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector.)
13	VERIFY TROUBLESHOOTING OF DTC P0320:00 HAS BEEN COMPLETED - Verify that all disconnected connectors are reconnected. - Switch the ignition to ON (Engine off). - Clear the DTC from the PCM memory using the M-MDS. - Perform the KOER self-test. (See KOE0/ KOER SELF TEST [MZI 3.7 V6].) - Is the PENDING CODE for this DTC present?	Yes	Repeat the inspection from Step 1. If the malfunction recurs, replace the PCM. (See PCM REMOVAL/ INSTALLATION [MZI 3.7 V6].) Go to the next step.
		No	Go to the next step.
14	VERIFY AFTER REPAIR PROCEDURE - Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE [MZI 3.7 V6].) - Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [MZI 3.7 V6] .)
		No	Troubleshooting completed.

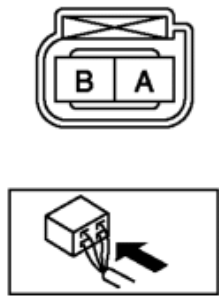
2012 - Mazda6 - Engine

DTC P0320:00 [MZI 3.7 V6]

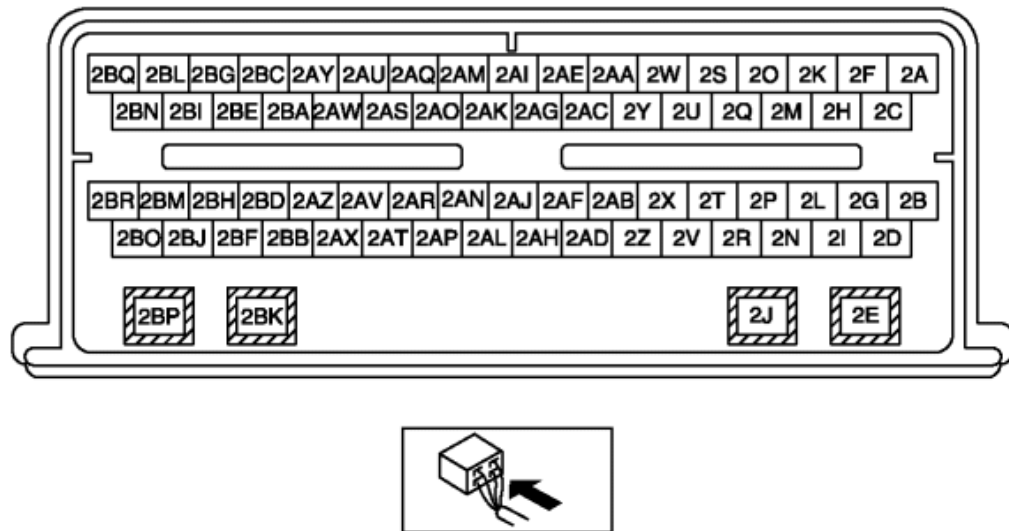
DTC P0320:00	Ignition/distributor engine speed input circuit
DETECTION CONDI TION	• The ignition engine speed sensor input signal to the PCM is continuously monitored. The test fails when the signal indicates that 2 successive erratic PIP pulses occurred.
POSSI BLE CAUSE	• Loose wires/connectors. • CKP sensor and/or trigger wheel physically damaged • CKP sensor malfunction • Arching secondary ignition components (coil, wires or plugs). • On-board transmitter (2-way radio). • CKP sensor circuits short to each other • Open circuit between PCM terminal 2V and CKP sensor terminal A • Open circuit between PCM terminal 2R and CKP sensor terminal B • Short to ground circuit between PCM terminal 2V and CKP sensor terminal A • Short to ground circuit between PCM terminal 2R and CKP sensor terminal B • Short to power supply circuit between PCM terminal 2V and CKP sensor terminal A • Short to power supply circuit between PCM terminal 2R and CKP sensor terminal B • PCM malfunction



**CKP SENSOR
WIRING HARNESS-SIDE CONNECTOR**



**PCM
WIRING HARNESS-SIDE CONNECTOR**



Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED Has FREEZE FRAME DATA been recorded?	Yes Go to the next step. No Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY - Verify related Service Bulletins and/or on-line repair information availability. - Is any related Service Bulletins available?	Yes Perform repair or diagnosis according to the available Service Bulletins. If the vehicle is not repaired, go to the next step. No Go to the next step.
3	VERIFY RELATED PENDING CODE OR STORED DTCs	Yes Go to the appropriate DTC troubleshooting. (See DTC TABLE [MZI 3.7 V6] .)

	Switch the ignition to off, then to the ON (Engine off). • Verify related pending code or stored DTCs. • Are other DTCs present?	No	Go to the next step.
4	INSPECT CKP SENSOR SIGNAL SENT TO PCM NOTE: • The battery should be fully charged and the starting system should be functioning properly. • Switch the ignition to ON (Engine off) • Access the PCM and monitor the RPM PID. • Crank the engine. • Is the engine speed more than 150 rpm?	Yes	Go to Step 13. (The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector.)
		No	Go to the next step.
5	INSPECT TIMING COVER, CKP SENSOR AND EXTERNAL TRIGGER WHEEL (OUTSIDE TIMING COVER) FOR OBVIOUS PHYSICAL DAMAGE • Switch the ignition to off. • Visually check the timing cover, CKP sensor and external trigger wheel (outside the timing cover) for obvious physical damage. • Do any parts appear physically damaged?	Yes	Repair if necessary. Then go to Step 13.
		No	Go to the next step.
6	INSPECT FOR PROPER CKP BIAS VOLTAGES IN PCM • Disconnect the CKP sensor connector. • Switch the ignition to ON (Engine off) • Measure the voltage between: ▪ CKP sensor terminal A on the wiring harness side and battery negative ▪ CKP sensor terminal B on the wiring harness side and battery negative • Are the voltages between 1—3 V?	Yes	Go to the next step.
		No	Go to Step 9.
7	INSPECT CKP SENSOR RESISTANCE • CKP sensor connector is disconnected. • Switch the ignition to off. • Measure the resistance between CKP sensor terminal A and B on the component side. • Is the resistance between 575—790 ohms?	Yes	Go to the next step.
		No	Replace the CKP sensor. Then go to Step 13.
8	INSPECT CKP WIRING HARNESS SHIELD CIRCUIT FOR SHORT TO GROUND	Yes	Go to the next step.

	NOTE: • The wiring harness shield protects the CKP signal from electrical noise and is grounded at one end, typically near the PCM. NOTE: • Perform the following resistance measurement between the CKP shield and the ground. • CKP sensor connector is disconnected. • Measure the resistance between: ▪ CKP_SHLD assembly connector wiring harness side and ground • Is the resistance less than 5 ohms?	No	Repair the short circuit. Check for a poor ground. Then go to Step 13.
9	INSPECT FOR SHORT BETWEEN CKP (+) AND CKP (-) IN WIRING HARNESS • CKP sensor connector is disconnected. • Switch the ignition to off. • Disconnect the PCM connector. • Measure the resistance between: ▪ CKP sensor terminal A and B on the wiring harness side • Is the resistance more than 10 kilohms?	Yes	Go to the next step.
		No	Repair for a short circuit, Then go to Step 13.
10	INSPECT CKP CIRCUIT(S) FOR OPEN CIRCUIT IN WIRING HARNESS • CKP sensor and PCM connectors are disconnected. • Measure the resistance between: ▪ CKP sensor connector A on the wiring harness side and PCM terminal 2V ▪ CKP sensor connector B on the wiring harness side and PCM terminal 2R • Are the resistances less than 5 ohms?	Yes	Go to the next step.
		No	Repair for an open circuit, Then go to Step 13.
11	INSPECT CKP CIRCUIT(S) FOR SHORT TO GROUND IN WIRING HARNESS • CKP sensor and PCM connectors are disconnected. • Measure the resistance between: ▪ CKP sensor connector A on the wiring harness side and battery negative ▪ CKP sensor connector B on the wiring harness side and battery negative	Yes	Go to the next step.
		No	Repair for a short to ground, Then go to Step 13.

	Are the resistances more than 10 kilohms?		
12	INSPECT CKP CIRCUIT FOR SHORT TO VOLTAGE IN WIRING HARNESS - CKP sensor and PCM connectors are disconnected. - Switch the ignition to ON (Engine off) - Measure the voltage between: - CKP sensor connector A on the wiring harness side and battery negative - CKP sensor connector B on the wiring harness side and battery negative - Are any voltage present?	Yes	Repair for a short to power supply, Then go to the next step.
		No	Go to the next step. (The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector.)
13	VERIFY TROUBLESHOOTING OF DTC P0320:00 HAS BEEN COMPLETED - Verify that all disconnected connectors are reconnected. - Switch the ignition to ON (Engine off). - Clear the DTC from the PCM memory using the M-MDS. - Perform the KOER self-test. (See KOE0/ KOER SELF TEST [MZI 3.7 V6].) - Is the PENDING CODE for this DTC present?	Yes	Repeat the inspection from Step 1. If the malfunction recurs, replace the PCM. (See PCM REMOVAL/ INSTALLATION [MZI 3.7 V6].) Go to the next step.
		No	Go to the next step.
14	VERIFY AFTER REPAIR PROCEDURE - Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE [MZI 3.7 V6].) - Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [MZI 3.7 V6] .)
		No	Troubleshooting completed.