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Subject: ROUGH IDLE WITH MIL ON AND DTC P0015 / P0524	Bulletin No: 01-028/12
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APPLICABLE MODEL(S)/VINS

2012-2013 Mazda3 2.0L SKYACTIV

2013 CX-5

DESCRIPTION

Some vehicles may experience a rough idle with the MIL on and DTC P0015 / P0524 stored in memory.

- P0015:00 - Exhaust CMP timing over-retarded
- P0524:00 - Engine oil pressure too low

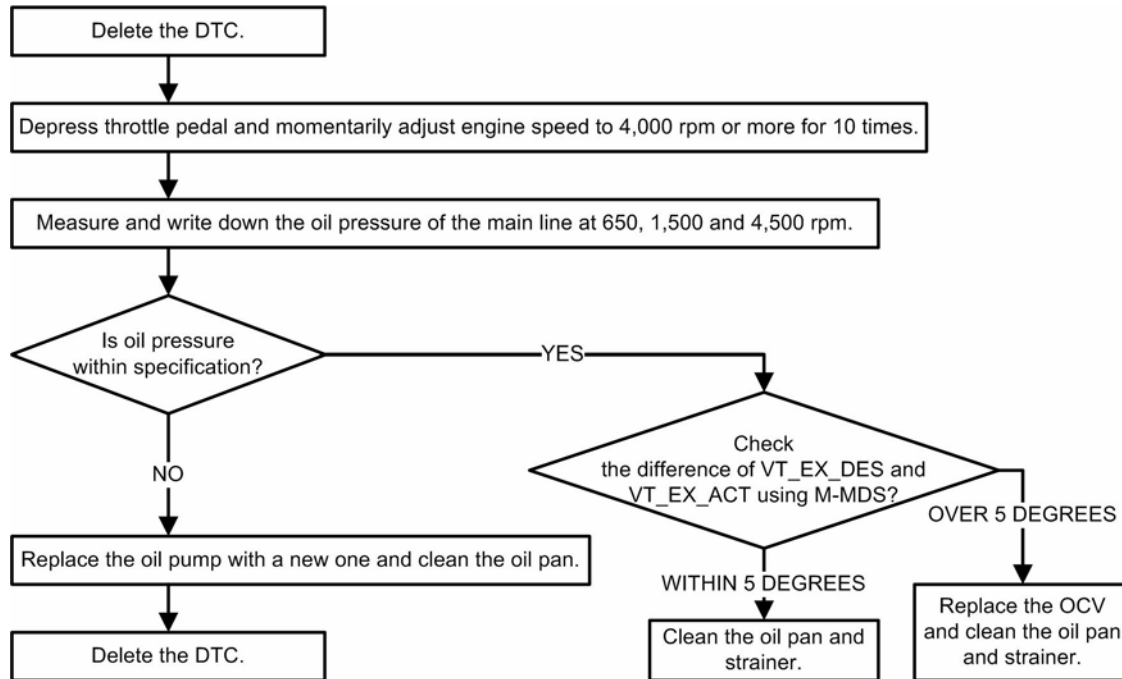
This is caused by a drop in engine oil pressure due to a piece of foreign object stuck on the oil pump pressure relief valve or OCV. The temporary entry of the foreign object triggers a MIL illumination, but rough idle will not be produced until a later time.

Customers having this concern should have their vehicle repaired using the following flow charts and repair procedure.

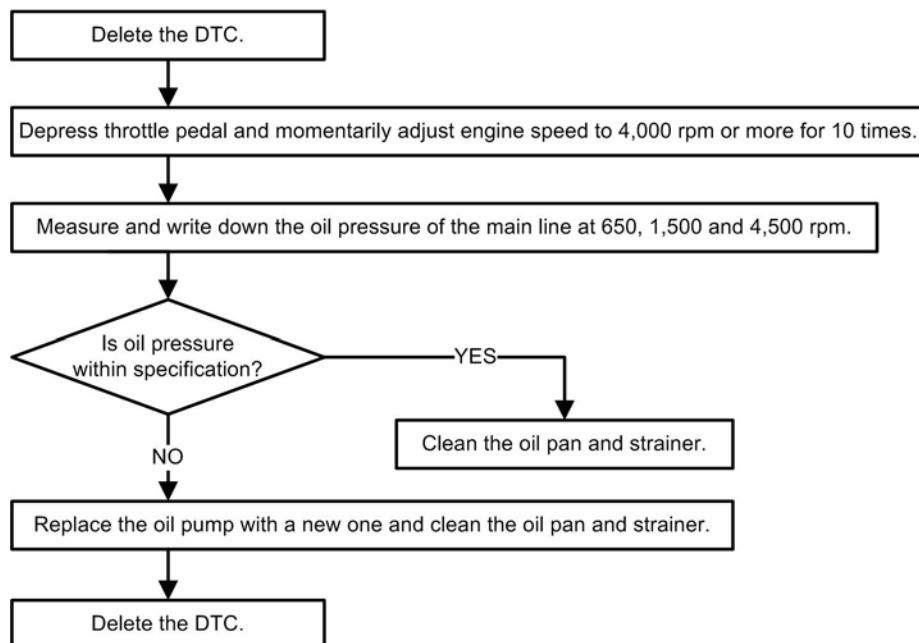
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FLOWCHARTS

Only P0015 is stored:



P0015 and P0524 or only P0524 is stored:



REPAIR PROCEDURE

1. Verify customer concern.

Only P0015 is stored:

1. Delete the DTC.
2. Depress the throttle pedal and momentarily adjust the engine speed to 4,000 rpm or more for 10 times.
3. Measure the main line oil pressure at 650 rpm, 1,500 rpm and 4,500 rpm. Refer to MS3 online instructions or Workshop Manual section 01-11 OIL PRESSURE INSPECTION.
 - a. Connect M-MDS to monitor ECT, OIL_TEMP and RPM.
 - b. Start the engine and turn off all electrical loads such as A/C, headlights, etc.
 - c. Warm up the engine until ECT and OIL_TEMP reach 90 °C (194 °F) or more.
 - d. Turn off all electrical loads such as A/C and headlights.
 - e. Wait until RPM on IDS becomes stable at 650 rpm. DO NOT read RPM on the tachometer in the vehicle.
 - f. Measure and write down the main oil line pressure at 650 rpm, 1,500 rpm and 4,500 rpm.

RPM	Normal oil pressure
650	50 kpa (7 psi) or more
1,500	110-175 kpa (16.0 - 25.3 psi)
4,500	300-430 kpa (43.6 - 62.3 psi)

- **If Abnormal oil pressure is observed:**

- 1) Replace the oil pump and clean the bottom of the oil pan with a clean cloth. Refer to MS3 online instructions or Workshop Manual section 01-11 OIL PUMP REMOVAL/INSTALLATION.
- 2) Replace the engine oil.

NOTE: There is no need to replace the oil filter, strainer (including gasket), or oil pan.

- **If Normal oil pressure is observed:**

- 1) Verify that the difference of VT_EX_DES (Exhaust valve opening angle - target) and VT_EX-ACT (Exhaust valve opening angle - actual) is within 5 degrees (between 1,500 rpm and 2,000 rpm) using M-MDS.

- **Within 5 degrees:**

- 1) Clean the bottom of the oil pan (with a clean cloth) and the strainer.
- 2) Replace the engine oil.

NOTE: There is no need to replace the oil filter, strainer (including gasket), or oil pan.

- **Over 5 degrees:**

- 1) Replace the oil control valve (OCV) with a new one.
- 1) Clean the bottom of the oil pan (with a clean cloth) and the oil strainer.
- 2) Replace the engine oil.

NOTE: There is no need to replace the oil filter, strainer (including gasket), or oil pan.

4. Verify repair.

P0015 and P0524 or only P0524 is stored:

1. Delete the DTC.
2. Depress the throttle pedal and momentarily adjust the engine speed to 4,000 rpm or more for 10 times.
3. Measure the main line oil pressure at 650 rpm, 1,500 rpm and 4,500 rpm. Refer to MS3 online instructions or Workshop Manual section 01-11 OIL PRESSURE INSPECTION.
 - a. Connect M-MDS to monitor ECT, OIL_TEMP and RPM.
 - b. Start the engine and turn off all electrical loads such as A/C, headlights, etc.
 - c. Warm up the engine until ECT and OIL_TEMP reach 90 °C (194 °F) or more.
 - d. Turn off all electrical loads such as A/C and headlights.
 - e. Wait until RPM on IDS becomes stable at 650 rpm. DO NOT read RPM on the tachometer in the vehicle.
 - f. Measure and write down the main oil line pressure at 650 rpm, 1,500 rpm and 4,500 rpm.

RPM	Normal oil pressure
650	50 kpa (7 psi) or more
1,500	110-175 kpa (16.0 - 25.3 psi)
4,500	300-430 kpa (43.6 - 62.3 psi)

- **If Abnormal oil pressure is observed:**

- 1) Replace the oil pump and clean the bottom of the oil pan (with a clean cloth) and the strainer. Refer to MS3 online instructions or Workshop Manual section 01-11 OIL PUMP REMOVAL/INSTALLATION.
- 2) Replace the engine oil.

NOTE: There is no need to replace the oil filter, strainer (including gasket), or oil pan.

- **If Normal oil pressure is observed:**

- 1) Clean the bottom of the oil pan (with a clean cloth) and the oil strainer.
- 2) Replace the engine oil.

NOTE: There is no need to replace the oil filter, strainer (including gasket), or oil pan.

4. Verify repair.

PART(S) INFORMATION

Part Number	Description	Qty.	Notes
PE01-14-100	Oil Pump	1	When replacing oil pump
PE01-14-420	Oil Control Valve (OCV)	1	When replacing OCV
PE01-10-235	Head Cover Gasket	1	When replacing oil pump or OCV
PE01-12-257	O-Ring	1	When replacing oil pump
9956-41-400	Gasket	1	When cleaning oil pan

WARRANTY INFORMATION

NOTE:

- This warranty information applies only to verified customer complaints on vehicles eligible for warranty repair.
- This repair will be covered under Mazda's Powertrain Limited Warranty term.
- Additional diagnostic time cannot be claimed for this repair.

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When replacing the OCV and cleaning the oil pan:	
Warranty Type	A
Symptom Code	6X
Damage Code	9W
DTC	P0015
Part Number Main Cause	PE01-14-420
Quantity	1
Operation Number / Labor Hours:	XXH9YXRX / 1.8 Hrs.

When replacing the oil pump and cleaning the oil pan:	
Warranty Type	A
Symptom Code	6X
Damage Code	9W
DTC	P0015 or P0524
Part Number Main Cause	PE01-14-100
Quantity	1
Operation Number / Labor Hours:	XXH9ZXRX / 3.9 Hrs.

When cleaning the oil pan only:	
Warranty Type	A
Symptom Code	6X
Damage Code	9W
DTC	P0015 or P0524
Part Number Main Cause	PE01-14-100
Quantity	0
Operation Number / Labor Hours:	XXHA1XRX / 1.4 Hrs.

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When replacing the OCV and cleaning the oil pan:	
Warranty Type	A
Symptom Code	6X
Damage Code	9W
DTC	P0015
Part Number Main Cause	PE01-14-420
Quantity	1
Operation Number / Labor Hours:	XXH2AXRX / 1.8 Hrs.

When replacing the oil pump and cleaning the oil pan:	
Warranty Type	A
Symptom Code	6X
Damage Code	9W
DTC	P0015 or P0524
Part Number Main Cause	PE01-14-100
Quantity	1
Operation Number / Labor Hours:	XXHA4XRX / 4.0 Hrs.

When cleaning the oil pan only:	
Warranty Type	A
Symptom Code	6X
Damage Code	9W
DTC	P0015 or P0524
Part Number Main Cause	PE01-14-100
Quantity	0
Operation Number / Labor Hours:	XXHA5XRX / 1.4 Hrs.