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| <b>Subject:</b><br>ROUGH IDLE WITH CHECK ENGINE LIGHT ON AND DTC P0015 / P0524 | <b>Bulletin No:</b> 01-009/16  |
|  | <b>Last Issued:</b> 04/13/2016 |

## BULLETIN NOTE

This bulletin supersedes the previously issued bulletin(s) listed below. The changes are noted below in Red beside the change bars.

| Previously Issued TSBs: | Date(s) Issued                  |
|-------------------------|---------------------------------|
| 01-009/16               | 03/07/15                        |
| 01-023/15               | 12/22/15, 11/03/15 and 09/28/15 |
| 01-009/14               | 09/13/14 and 04/07/14           |
| 01-003/13               | 01/16/15                        |
| 01-028/12               | 12/18/12                        |

## APPLICABLE MODEL(S)/VINS

2012-2016 Mazda3 SKYACTIV

2013-2016 CX-5 SKYACTIV

2014-2016 Mazda6 SKYACTIV

## DESCRIPTION

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

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

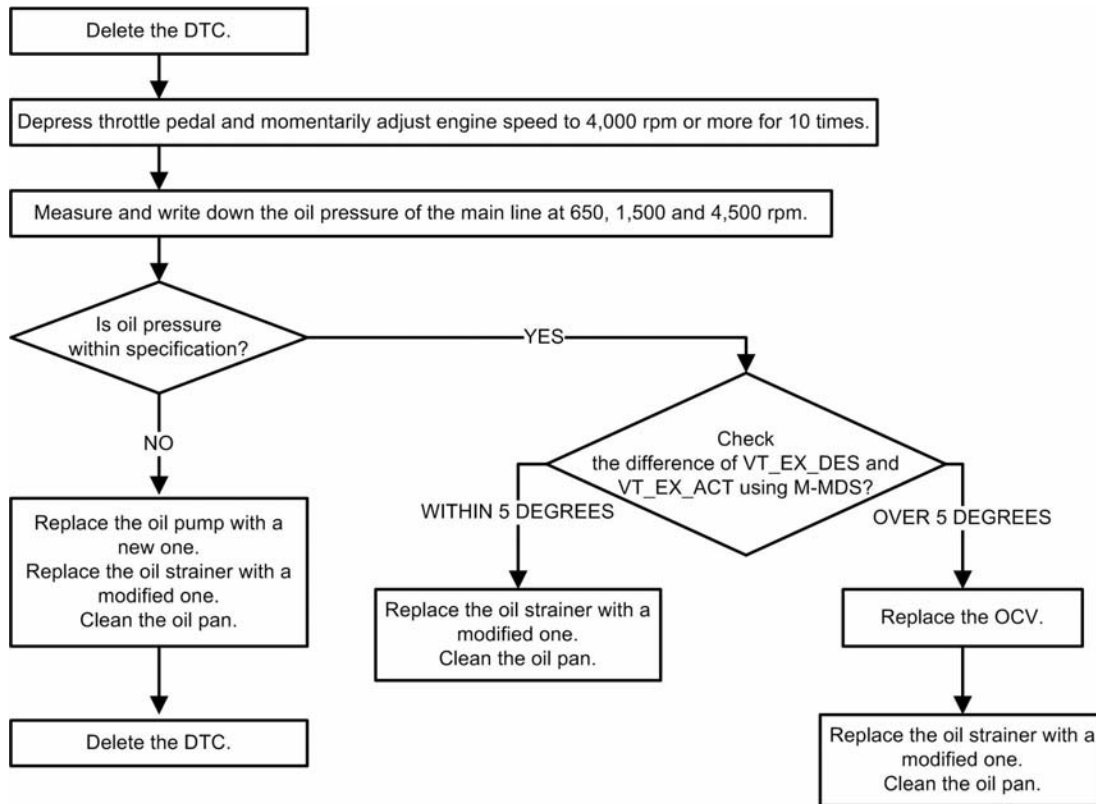
This is caused by a drop in engine oil pressure due to a piece of foreign object stuck on the oil pump pressure relief valve or oil control valve (OCV). The temporary entry of the foreign object triggers a check engine light on, but rough idle will not be produced until a later time.

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

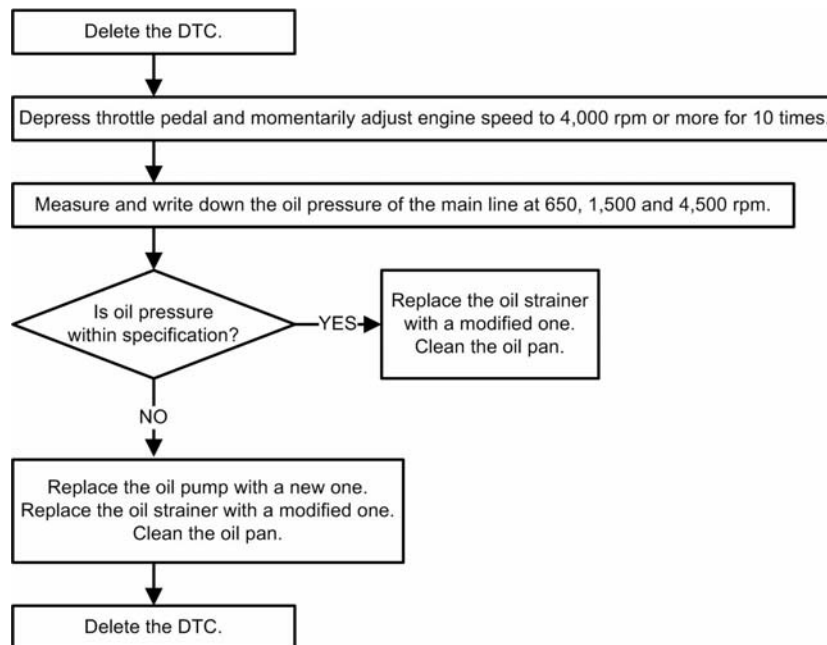
**CONSUMER NOTICE:** The information and instructions in this bulletin are intended for use by skilled technicians. Mazda technicians utilize the proper tools/equipment and take training to correctly and safely maintain Mazda vehicles. These instructions should not be performed by "do-it-yourselfers." Customers should not assume this bulletin applies to their vehicle or that their vehicle will develop the described concern. To determine if the information applies, customers should contact their nearest authorized Mazda dealership. Mazda North American Operations reserves the right to alter the specifications and contents of this bulletin without obligation or advance notice. All rights reserved. No part of this bulletin may be reproduced in any form or by any means, electronic or mechanical---including photocopying and recording and the use of any kind of information storage and retrieval system ---without permission in writing.

## 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 with a new one and replace the oil strainer with a modified one. Refer to MS3 online instructions or Workshop Manual section 01-11 OIL PAN REMOVAL/INSTALLATION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].

**NOTE:** The removal procedure for the oil pump in the Workshop Manual has been changed. It is no longer necessary to remove the front cover when following the new procedure.

- 2) Clean the bottom of the oil pan with a clean cloth.
- 3) Erase any DTC's.
- 4) Replace the engine oil.

**NOTE:** There is no need to replace the oil filter 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:**

- a) Replace the oil strainer with a modified one.
- b) Clean the bottom of the oil pan with a clean cloth.
- c) Replace the engine oil.

**NOTE:** There is no need to replace the oil filter or oil pan.

- **Over 5 degrees:**

- a) Replace the oil control valve (OCV).
- b) Replace the oil strainer with a modified one.
- c) Clean the bottom of the oil pan with a clean cloth.
- d) Replace the engine oil.

**NOTE:** There is no need to replace the oil pump, oil filter 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 with a new one and replace the oil strainer with a modified one. Refer to MS3 online instructions or Workshop Manual section 01-11 OIL PUMP REMOVAL/INSTALLATION.

**NOTE:** The removal procedure for the oil pump in the Workshop Manual has been changed. It is no longer necessary to remove the front cover when following the new procedure.

2) Clean the bottom of the oil pan with a clean cloth.

3) Erase any DTCs.

4) Replace the engine oil.

**NOTE:** There is no need to replace the oil filter or oil pan.

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

1) Replace the oil strainer with a modified one.

2) Clean the bottom of the oil pan with a clean cloth.

3) Replace the engine oil.

**NOTE:** There is no need to replace the oil pump, oil filter or oil pan.

4. Verify repair.

## PART(S) INFORMATION

**NOTE:** Refer to EPC for old part number of the Oil Strainer for the concerned vehicle and order the applicable new Oil Strainer shown below. If the new part number is "N/A" in the list, the oil strainer is already modified and does not need to be replaced.

| Part Number |             | Description              | Qty. | Notes   |
|-------------|-------------|--------------------------|------|---|
| New         | Old         |                          |      |   |
| PE01-14-100 | -           | Oil Pump (2.0L)          | 1    | When replacing oil pump   |
| PY01-14-100 | -           | Oil Pump (2.5L)          | 1    | When replacing oil pump   |
| PE01-14-420 | -           | Oil Control Valve (OCV)  | 1    | When replacing OCV  |
| PE01-10-235 | -           | Head Cover Gasket (2.0L) | 1    | When replacing OCV  |
| PY01-10-235 | -           | Head Cover Gasket (2.5L) | 1    | When replacing OCV  |
| 9956-41-400 | -           | Gasket                   | 1    | When cleaning oil pan   |
| PEDD-14-240 | PE01-14-240 | Oil Strainer             | 1    | 2013-16 SKYACTIV-G 2.0L (with some exceptions)  |
| PEY1-14-240 | PE07-14-240 | Oil Strainer             | 1    | 2012-13 SKYACTIV-G 2.0L (Mazda3 only)   |
| N/A         | PE7W-14-240 | Oil Strainer             | N/A  | 2014 Mazda3 SKYACTIV-G 2.0L with VINs starting with 3MZ (Mexico built) produced before July, 2014   |
| N/A         | PEDD-14-240 | Oil Strainer             | N/A  | 2014-16 Mazda3 SKYACTIV-G 2.0L with VINs starting with 3MZ (Mexico built) produced after July, 2014 |
| PYY1-14-240 | PY01-14-240 | Oil Strainer             | 1    | 2014-16 SKYACTIV-G 2.5L   |

## 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 or CA PZEV Emission Warranty where applicable.
- Additional diagnostic time cannot be claimed for this repair.

| When replacing the OCV and oil strainer and cleaning the oil pan: |                     |
|---|---------------------|
| Warranty Type   | A                   |
| Symptom Code  | 6X                  |
| Damage Code   | 9W                  |
| DTC   | P0015               |
| Part Number Main Cause  | 7777-SP-K50         |
| Quantity  | 0                   |
| Operation Number / Labor Hours                                    | XXL8MBRX / 1.8 Hrs. |

NOTE: Claim parts as related parts.

| When replacing the oil pump and oil strainer and cleaning the oil pan: |                    |
|--|--------------------|
| Warranty Type  | A                  |
| Symptom Code   | 6X                 |
| Damage Code  | 9W                 |
| DTC  | P0015 or P0524     |
| Part Number Main Cause   | 7777-SP-K50        |
| Quantity   | 0                  |
| Operation Number / Labor Hours   | XXL8MCRX / 1.7 Hrs |

NOTE: Claim parts as related parts.

| When replacing the oil strainer and cleaning the oil pan: |                     |
|---|---------------------|
| Warranty Type   | A                   |
| Symptom Code  | 6X                  |
| Damage Code   | 9W                  |
| DTC   | P0015 or P0524      |
| Part Number Main Cause                                    | 7777-SP-K50         |
| Quantity  | 0                   |
| Operation Number / Labor Hours                            | XXL8MARX / 1.4 Hrs. |

NOTE: Claim parts as related parts.