Note

• To determine the malfunctioning part, proceed with the diagnostics from "Function Inspection Using M-MDS".

# **Details On DTCs**

| DESCRIPTION  | Random misfire detected   |   |  |  |  |
|--|---|---|--|--|--|
|  | Determination conditions  | <ul> <li>Any one of the following conditions is met:         <ul> <li>The misfire rate for every 200 rotations of the crankshaft exceeds the specified value (misfire which may damage catalytic converter).</li> <li>The misfire rate for every 1,000 rotations of the crankshaft exceeds the specified value (misfire going against emission regulations).</li> </ul> </li> </ul> |  |  |  |
|  |   | * Battery voltage: 9—18 V *1 * Engine speed: 500—6,700 rpm*1  |  |  |  |
| DETECTION<br>CONDITION   | Preconditions   | <ul> <li>Engine coolant temperature: -10 °C {14 °F} or more *1</li> <li>Not cranking</li> <li>Not stalling</li> <li>Fuel-cut control not implemented</li> <li>Crankshaft installation tolerance learning completed</li> <li>Engine condition is stabilized (not directly after gear change)</li> <li>*1: Value can be verified by displaying PIDs using M-MDS</li> </ul>            |  |  |  |
|  | Malfunction   | 200 rotations of crankshaft (misfire which may damage catalytic converter)  |  |  |  |
|  | determination period  | • 1,000 rotations of crankshaft (misfire going against emission regulations)  |  |  |  |
|  | Drive cycle   | • 2   |  |  |  |
|  | Self test type  | CMDTC self test   |  |  |  |
|  | Sensor used   | <ul><li>CKP sensor</li><li>MAF sensor</li><li>MAP sensor</li></ul>  |  |  |  |
| FAIL-SAFE<br>FUNCTION  | <ul> <li>Limits intake air amount</li> <li>Implement fuel-cut control (if the catalytic converter may be damaged, perform fuel-cut on cylinder misfirithe most).</li> </ul> |   |  |  |  |
| * Misfiring which may damage catalytic converter (number of drive cycles: 1):     * Check engine light flashes and pending code is recorded     * Drive cycle directly after above drive cycle (number of drive cycles: 2):     * Malfunction determined: check engine light is illuminated     * Normal is determined: Pending code cleared     * Rough idling, poor acceleration, stalling |   |   |  |  |  |

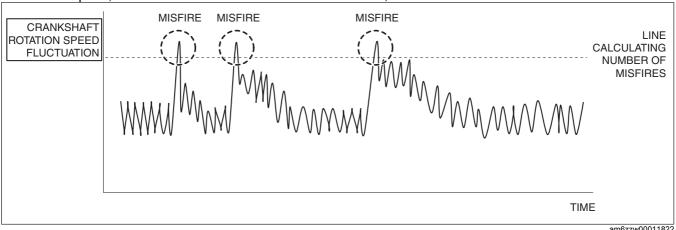
| DESCRIPTION | Random misfire detected  |
|-------------|--|
|             | Improper operation of ignition system  |
|             | Spark plug malfunction   |
|             | Ignition coil related wiring harness or connector malfunction                  |
|             | Ignition coil malfunction  |
|             | Fuel injector malfunction  |
|             | Improper operation of fuel injector  |
|             | Fuel injector related wiring harness malfunction                               |
|             | • Erratic signal to PCM  |
|             | CKP sensor signal malfunction  |
|             | ECT sensor No.1 signal malfunction   |
|             | MAF sensor signal malfunction  |
| POSSIBLE    | MAP sensor signal malfunction  |
| CAUSE       | — IAT sensor No.1 signal malfunction   |
| CAGGE       | APP sensor signal malfunction  |
|             | TP sensor signal malfunction   |
|             | VSS signal malfunction   |
|             | Related connector or terminals malfunction                                     |
|             | Related wiring harness malfunction   |
|             | Poor drive belt assembly or adhesion of oil                                    |
|             | Drive belt auto tensioner malfunction  |
|             | Air leakage from intake air system (between intake manifold and cylinder head) |
|             | Engine malfunction   |
|             | Insufficient engine compression  |
|             | Engine coolant leakage to combustion chamber                                   |
|             | PCM malfunction  |

### **System Wiring Diagram**

Not applicable

#### **Function Explanation (DTC Detection Outline)**

The PCM detects the crankshaft rotation speed based on the crankshaft position sensor signal. If there is a small amount of fluctuation in crankshaft rotation speed due to the effect of combustion of each cylinder while the engine is rotating and a misfire occurs in any of the pistons, the crankshaft rotation speed will change suddenly. The PCM adds the number of changes in sudden rotation speed (misfire rate) to each specified crankshaft rotation speed, and if the misfire rate exceeds a certain value, a DTC is recorded.



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# Repeatability Verification Procedure

- 1. Drive the vehicle at a speed of 40 km/h {25 mph} or more.
- Shift to 3rd gear and rapidly accelerate the vehicle to 60 km/h {37 mph} (to execute misfire monitor). 2.
- Release the accelerator pedal and decelerate the vehicle to 40 km/h {25 mph}.
- 4. Repeat Step 1 to 3 operations **above 5 times**.

#### **Note**

 Match the engine coolant temperature in the recorded FREEZE FRAME DATA (Mode 2)/snapshot data, the vehicle speed, and engine speed values to the best extent possible while driving the vehicle.

5. Try to reproduce the malfunction by driving the vehicle for **5 min** based on the values in the FREEZE FRAME DATA (Mode 2)/snapshot data.

# PID Item/Simulation Item Used In Diagnosis PID/DATA monitor item table

|               |  |                    | —: Not applicable  |
|---------------|--|--------------------|--|
| Item          | Definition                               | Unit/<br>Condition | Condition/Specification (Reference)  |
|               |  | %                  | Accelerator pedal released: Approx. 15%  |
| APP1          | APP sensor No.1                          |                    | Accelerator pedal depressed: Approx. 82%   |
|               |  | V                  | Accelerator pedal released: Approx. 0.75 V   |
|               |  |                    | Accelerator pedal depressed: Approx. 4.1 V   |
|               |  | %                  | Accelerator pedal released: Approx. 7.45%  |
| APP2          | APP sensor No.2                          |                    | Accelerator pedal depressed: Approx. 41%   |
|               |  | V                  | Accelerator pedal released: Approx. 0.38 V     Accelerator pedal degreesed: Approx. 2.05 V   |
|               |  | °C, °F             | Accelerator pedal depressed: Approx. 2.05 V     Displays ECT   |
|               |  | С, г               | • ECT is 20 °C {68 °F}: Approx. 3.10 V   |
|               |  |                    | • ECT is 40 °C {104 °F}: Approx. 2.16 V  |
| ECT           | Engine coolant temperature               | V                  | • ECT is 60 °C {140 °F}: Approx. 1.40 V  |
|               |  |                    | • ECT is 80 °C {176 °F}: Approx. 0.87 V  |
|               |  |                    | • ECT is 100 °C {212 °F}: Approx. 0.54 V   |
|               |  | °C, °F             | • Displays IAT (No.1)  |
|               |  | <u> </u>           | • IAT is 20 °C {68 °F}: Approx. 2.70 V   |
| IAT           | Intake air temperature No.1              | V                  | • IAT is 40 °C {104 °F}: Approx. 1.80 V  |
|               |  | •                  | • IAT is 60 °C {140 °F}: Approx. 1.20 V  |
|               |  | g/Sec              | Displays MAF   |
|               |  | <u> </u>           | Switch ignition ON (engine off) (MAF: 0.59 g/s {0.078})  |
|               |  |                    | lb/min}): Approx. 0.72 V   |
| MAF           | Mass airflow                             | .,                 | • Idle (after warm up) (MAF: 2.17 g/s {0.287 lb/min}):   |
|               |  | V                  | Approx. 0.86 V   |
|               |  |                    | • Racing (engine speed is 2,000 rpm) (MAF: 4.73 g/s  |
|               |  |                    | {0.626 lb/min}): Approx. 1.07 V  |
|               |  | KPa (MPa),         |  |
|               |  | mBar {Bar},        | Displays MAP   |
|               |  | psi, in H20        |  |
|               |  |                    | • Switch ignition ON (engine off) (MAP: 101 kPa {1.03  |
| MAP           | Manifold absolute pressure               | V                  | kgf/cm <sup>2</sup> , 14.6 psi}): Approx. 4.07 V   |
|               | ·  |                    | • Idle (after warm up) (MAP: 33 kPa {0.34 kgf/cm <sup>2</sup> , 4.8  |
|               |  | V                  | psi}): Approx. 1.34 V  |
|               |  |                    | • Racing (engine speed is 2,000 rpm) (MAP: 26 kPa  |
|               |  |                    | {0.27 kgf/cm <sup>2</sup> , 3.8 psi}): Approx. 1.05 V  |
|               | Number of misfires corresponding to      |                    |  |
| MF_CAT_2      | possible catalytic converter damage (No. | _                  | Displays number of misfires corresponding to   |
|               | 2 cylinder)                              |                    | possible catalytic converter damage (No.2 cylinder)  |
|               | Number of misfires corresponding to      |                    | District the second sec |
| MF_CAT_3      | possible catalytic converter damage (No. | _                  | Displays number of misfires corresponding to   |
|               | 3 cylinder)                              |                    | possible catalytic converter damage (No.3 cylinder)  |
|               | Number of misfires corresponding to      |                    | • Diaplaya number of minfires corresponding to   |
| MF_CAT_4      | possible catalytic converter damage (No. | -                  | Displays number of misfires corresponding to<br>possible catalytic converter damage (No.4 cylinder)  |
|               | 4 cylinder)                              |                    | possible catalytic conventer damage (No.4 Cylinder)  |
|               | Number of misfires corresponding to      |                    | Displays number of misfires corresponding to   |
| MF_CAT1       | possible catalytic converter damage (No. | -                  | possible catalytic converter damage (No.1 cylinder)  |
|               | 1 cylinder)                              |                    |  |
| MF_EMI_2      | Number of misfires possibly affecting    | _                  | Displays number of misfires possibly affecting   |
| IVII _LIVII_Z | emission (No.2 cylinder)                 |                    | emission (No.2 cylinder)   |
| MF_EMI_3      | Number of misfires possibly affecting    | _                  | Displays number of misfires possibly affecting   |
|               | emission (No.3 cylinder)                 | ļ                  | emission (No.3 cylinder)   |
| MF_EMI_4      | Number of misfires possibly affecting    | _                  | Displays number of misfires possibly affecting   |
|               | emission (No.4 cylinder)                 |                    | emission (No.4 cylinder)   |
| MF_EMI1       | Number of misfires possibly affecting    | _                  | Displays number of misfires possibly affecting   |
|               | emission (No.1 cylinder)                 |                    | emission (No.1 cylinder)   |

| Item   | Definition                 | Unit/<br>Condition | Condition/Specification (Reference)   |
|--------|----------------------------|--------------------|---|
| RPM    | Engine speed               | RPM                | Displays engine speed   |
| TP_REL | Relative throttle position | %                  | <ul> <li>Accelerator pedal released: Approx. 12%</li> <li>Accelerator pedal depressed: Approx. 82%</li> </ul> |
| VSS    | Vehicle speed              | KPH, MPH           | Displays vehicle speed  |

# **Function Inspection Using M-MDS**

| STEP | INSPECTION  | RESULTS | ACTION  |
|------|---|---------|---|
| 1    | PURPOSE: VERIFY RELATED SERVICE   | Yes     | Perform repair or diagnosis according to the available  |
| '    | INFORMATION AVAILABILITY  |         | Service Information.  |
|      | Verify related Service Information availability.                              |         | If the vehicle is not repaired, go to the next step.  |
|      | • Is any related Service Information available?                               | No      | Go to the next step.  |
| 2    | PURPOSE: IDENTIFY TRIGGER DTC FOR   | Yes     | Go to the next step.  |
| _    | FREEZE FRAME DATA (MODE 2)  | No      | Go to the troubleshooting procedure for DTC on  |
|      | Is the DTC P0300:00 on FREEZE FRAME   |         | FREEZE FRAME DATA (Mode 2).   |
|      | DATA (Mode 2)?  |         | (See DTC TABLE [SKYACTIV-G 2.0, SKYACTIV-G  |
|      | ,   |         | 2.5].)  |
| 3    | PURPOSE: RECORD VEHICLE STATUS AT   | Yes     | Go to the next step.  |
|      | TIME OF DTC DETECTION TO UTILIZE WITH   | No      | Record the FREEZE FRAME DATA (Mode 2)/snapshot  |
|      | REPEATABILITY VERIFICATION  |         | data on the repair order, then go to the next step.   |
|      | Has the FREEZE FRAME DATA (Mode 2)/   |         | , ,   |
|      | snapshot data been recorded?  |         | Note  |
|      | ·   |         | Recording can be facilitated using the screen   |
|      |   |         | capture function of the PC.   |
| 4    | PURPOSE: VERIFY RELATED PENDING   | Yes     | Go to the applicable PENDING CODE or DTC  |
|      | CODE AND/OR DTC   |         | inspection.   |
|      | Switch the ignition off, then ON (engine off).                                |         | (See DTC TABLE [SKYACTIV-G 2.0, SKYACTIV-G  |
|      | Perform the Pending Trouble Code Access                                       |         | 2.5].)  |
|      | Procedure and DTC Reading Procedure.  | No      | Go to the next step.  |
|      | (See ON-BOARD DIAGNOSTIC TEST   |         |   |
|      | [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)  |         |   |
|      | Are any other PENDING CODEs and/or DTCs                                       |         |   |
|      | present?  |         |   |
| 5    | PURPOSE: VERIFY IF THERE IS PID ITEM  | Yes     | Inspect the suspected sensor and related wiring   |
|      | CAUSING DRASTIC CHANGES OF  |         | harness.  |
|      | ACCELERATION FLUCTUATION BY INPUT   |         | If there is any malfunction:  Paragin on parallel of the graph of |
|      | SIGNAL TO PCM   |         | Repair or replace the malfunctioning part.  |
|      | • Start the engine.   |         | Go to the troubleshooting procedure to perform  |
|      | Access the following PIDs using the M-MDS:     (See ON-BOARD DIAGNOSTIC TEST) |         | the procedure from Step 10.  • If there is no malfunction:  |
|      | [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)  |         | Go to the next step.  |
|      | — APP1  | No      | Go to the next step.  |
|      | — APP2  | INO     | Go to the flext step.   |
|      | — ECT   |         |   |
|      | — LOT<br>— IAT  |         |   |
|      | — MAF   |         |   |
|      | — MAP   |         |   |
|      | — RPM   |         |   |
|      | — TP_REL  |         |   |
|      | — VSS   |         |   |
|      | Is there a PID item affected by acceleration                                  |         |   |
|      | fluctuation?  |         |   |

| STEP | INSPECTION   | RESULTS | ACTION   |
|------|--|---------|--|
| 6    | PURPOSE: RECORD NUMBER OF CURRENT  | _       | Go to the next step.                               |
|      | MISFIRES FOR USE WITH MISFIRE  |         | ·  |
|      | INSPECTION   |         |  |
|      | Display the misfire rate and record the number   |         |  |
|      | of misfires.   |         |  |
|      | <ul> <li>Access the following PIDs using the M-</li> </ul>                                       |         |  |
|      | MDS  |         |  |
|      | (See ON-BOARD DIAGNOSTIC TEST  |         |  |
|      | [SKYACTIV-G 2.0, SKYACTIV-G 2.5].) (See PCM INSPECTION [SKYACTIV-G                               |         |  |
|      | 2.0, SKYACTIV-G 2.5].)   |         |  |
|      | • MF CAT1  |         |  |
|      | • MF_CAT_2   |         |  |
|      | • MF CAT 3   |         |  |
|      | • MF_CAT_4   |         |  |
|      | • MF_EMI1  |         |  |
|      | • MF_EMI_2   |         |  |
|      | • MF_EMI_3   |         |  |
|      | • MF_EMI_4   |         |  |
| 7    | PURPOSE: VERIFY IF MISFIRE CAUSE IS  | Yes     | Go to the troubleshooting procedure to perform the |
|      | BAD SPARK PLUGS  |         | procedure from Step 1.                             |
|      | Switch the spark plugs on a cylinder that is     minimized and a cylinder that is not minimized. | No      | Go to the next step.                               |
|      | misfiring and a cylinder that is not misfiring. (See SPARK PLUG REMOVAL/                         |         |  |
|      | INSTALLATION [SKYACTIV-G 2.0,  |         |  |
|      | SKYACTIV-G 2.5].)  |         |  |
|      | • Start the engine.  |         |  |
|      | Verify all accessory loads (A/C, headlights,   |         |  |
|      | blower fan, rear window defroster) are off.  |         |  |
|      | Under no-load conditions (P or N position  |         |  |
|      | (ATX)/neutral (MTX), increase the engine   |         |  |
|      | speed to 3,000 rpm.  |         |  |
|      | Display the misfire rate and record the number   |         |  |
|      | of misfires.   |         |  |
|      | Access the following PIDs using the M-   |         |  |
|      | MDS  |         |  |
|      | (See ON-BOARD DIAGNOSTIC TEST [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)                                 |         |  |
|      | (See PCM INSPECTION [SKYACTIV-G  |         |  |
|      | 2.0, SKYACTIV-G 2.5].)   |         |  |
|      | • MF CAT1  |         |  |
|      | • MF_CAT_2   |         |  |
|      | • MF_CAT_3   |         |  |
|      | • MF_CAT_4   |         |  |
|      | • MF_EMI1  |         |  |
|      | • MF_EMI_2   |         |  |
|      | • MF_EMI_3   |         |  |
|      | • MF_EMI_4   |         |  |
|      | • Is there a change from the recorded number of  |         |  |
|      | misfires?  |         |  |

| INSPECTION                                      | RESULTS  | ACTION  |
|---|--|---|
| PURPOSE: VERIFY IF MISFIRE CAUSE IS             | Yes  | Go to the troubleshooting procedure to perform the  |
| BAD IGNITION COIL                               |  | procedure from Step 2.  |
| Switch the ignition coils on a cylinder that is | No   | Go to the troubleshooting procedure to perform the  |
|   |  | procedure from Step 3.  |
| •   |  |   |
| REMOVAL/INSTALLATION [SKYACTIV-G 2.0,           |  |   |
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| misfires?                                       |  |   |
|   | PURPOSE: VERIFY IF MISFIRE CAUSE IS BAD IGNITION COIL  • Switch the ignition coils on a cylinder that is misfiring and a cylinder that is not misfiring. (See IGNITION COIL/ION SENSOR REMOVAL/INSTALLATION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)  • Start the engine.  • Verify all accessory loads (A/C, headlights, blower fan, rear window defroster) are off.  • Under no-load conditions (P or N position (ATX)/neutral (MTX), increase the engine speed to 3,000 rpm.  • Display the misfire rate and record the number of misfires.  — Access the following PIDs using the M-MDS  (See ON-BOARD DIAGNOSTIC TEST [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)  (See PCM INSPECTION [SKYACTIV-G 2.5].)  • MF_CAT1  • MF_CAT_2  • MF_CAT_3  • MF_CAT_4  • MF_EMI1  • MF_EMI_2  • MF_EMI_3  • MF_EMI_4  • Is there a change from the recorded number of | PURPOSE: VERIFY IF MISFIRE CAUSE IS BAD IGNITION COIL  • Switch the ignition coils on a cylinder that is misfiring and a cylinder that is not misfiring. (See IGNITION COIL/ION SENSOR REMOVAL/INSTALLATION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)  • Start the engine.  • Verify all accessory loads (A/C, headlights, blower fan, rear window defroster) are off.  • Under no-load conditions (P or N position (ATX)/neutral (MTX), increase the engine speed to 3,000 rpm.  • Display the misfire rate and record the number of misfires.  — Access the following PIDs using the M-MDS (See ON-BOARD DIAGNOSTIC TEST [SKYACTIV-G 2.0, SKYACTIV-G 2.5].) (See PCM INSPECTION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)  • MF_CAT_1  • MF_CAT_2  • MF_CAT_3  • MF_CAT_4  • MF_EMI1  • MF_EMI_2  • MF_EMI_3  • MF_EMI_4  • Is there a change from the recorded number of |

# **Troubleshooting Diagnostic Procedure** Intention of troubleshooting procedure

- Step 1—2
  - Perform an ignition system parts inspection.
- Step 3
  - Perform a fuel injector control system inspection.
- Step 4—9
   Perform an inspection of parts which may be affected by misfire except for ignition-related parts and fuel
- Step 10—11
   Verify that the primary malfunction is resolved and there are no other malfunctions.

| STEP | INSPECTION   | RESULTS | ACTION  |
|------|--|---------|---|
| 1    | PURPOSE: DETERMINE INTEGRITY OF SPARK PLUG • Inspect the spark plug.                                       | Yes     | Replace the spark plug, then go to Step 10.<br>(See SPARK PLUG REMOVAL/INSTALLATION<br>[SKYACTIV-G 2.0, SKYACTIV-G 2.5].)                       |
|      | (See SPARK PLUG INSPECTION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].) • Is there any malfunction?                  | No      | Go to the next step.  |
| 2    | PURPOSE: DETERMINE INTEGRITY OF IGNITION COIL  • Inspect the ignition coil.  (See IGNITION COIL INSPECTION | Yes     | Replace the ignition coil/ion sensor, then go to Step 10. (See IGNITION COIL/ION SENSOR REMOVAL/INSTALLATION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].) |
|      | [SKYACTIV-G 2.0, SKYACTIV-G 2.5].) • Is there any malfunction?   | No      | Go to the next step.  |
| 3    | PURPOSE: DETERMINE INTEGRITY OF FUEL INJECTOR • Inspect the fuel injector.                                 | Yes     | Replace the fuel injector, then go to Step 10.<br>(See FUEL INJECTOR REMOVAL/INSTALLATION<br>[SKYACTIV-G 2.0, SKYACTIV-G 2.5].)                 |
|      | (See FUEL INJECTOR INSPECTION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].) • Is there any malfunction?               | No      | Go to the next step.  |

| STEP | INSPECTION                                       | RESULTS | ACTION  |
|------|--|---------|---|
| 4    | PURPOSE: VERIFY IF MALFUNCTION                   | Yes     | Repair or replace the malfunctioning part according to  |
|      | RELATED TO INTAKE-AIR SYSTEM IS CAUSE            |         | the inspection results, then go to Step 10.             |
|      | OF MISFIRE                                       | No      | Go to the next step.                                    |
|      | Visually inspect for loose, cracked or damaged   |         |   |
|      | hoses on intake air system.                      |         |   |
|      | Is there any malfunction?                        |         |   |
| 5    | PURPOSE: VERIFY IF POOR DRIVE BELT               | Yes     | Assemble drive belt correctly, then go to Step 10.      |
|      | ASSEMBLY IS CAUSE OF MISFIRE                     |         | (See DRIVE BELT REMOVAL/INSTALLATION                    |
|      | Verify the condition of the drive belt assembly. |         | [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)                      |
|      | (See DRIVE BELT INSPECTION [SKYACTIV-            | No      | Go to the next step.                                    |
|      | G 2.0, SKYACTIV-G 2.5].)                         |         |   |
|      | Is there any malfunction?                        |         |   |
| 6    | PURPOSE: VERIFY IF FOREIGN MATTER ON             | Yes     | Remove the foreign matter on the drive belt, then go to |
|      | DRIVE BELT IS CAUSE OF MISFIRE                   |         | Step 10.  |
|      | Verify if oil is on the drive belt.              | No      | Go to the next step.                                    |
|      | Is there foreign matter on the drive belt?       |         |   |
| 7    | PURPOSE: DETERMINE INTEGRITY OF                  | Yes     | Replace the drive belt auto tensioner, then go to Step  |
|      | DRIVE BELT AUTO TENSIONER                        |         | 10.   |
|      | Inspect the drive belt auto tensioner.           |         | (See DRIVE BELT AUTO TENSIONER REMOVAL/                 |
|      | (See DRIVE BELT AUTO TENSIONER                   |         | INSTALLATION [SKYACTIV-G 2.0, SKYACTIV-G                |
|      | INSPECTION [SKYACTIV-G 2.0, SKYACTIV-G           |         | 2.5].)  |
|      | 2.5].)   | No      | Go to the next step.                                    |
|      | Is there any malfunction?                        |         |   |

| STEP | INSPECTION  | RESULTS | ACTION  |
|------|---|---------|---|
| 8    | PURPOSE: VERIFY IF MALFUNCTION                                    | Yes     | Go to the next step.  |
|      | RELATED TO ENGINE COMPRESSION IS                                  | No      | Replace or overhaul the engine, then go to Step 10.   |
|      | CAUSE OF MISFIRE  |         |   |
|      | Inspect the engine compression.                                   |         |   |
|      | (See COMPRESSION INSPECTION                                       |         |   |
|      | [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)                                |         |   |
|      | Are compression pressures within                                  |         |   |
|      | specification?  |         |   |
|      | Specification:  |         |   |
|      | Compression [SKYACTIV-G 2.0, European                             |         |   |
|      | (L.H.D. U.K.) specs.]   |         |   |
|      | — Standard: 978 kPa {9.97 kgf/cm², 142 psi}<br>(300 rpm)          |         |   |
|      | — Minimum: 783 kPa {7.98 kgf/cm <sup>2</sup> , 114 psi}           |         |   |
|      | (300 rpm)   |         |   |
|      | <ul> <li>Maximum difference between cylinders:</li> </ul>         |         |   |
|      | 166 kPa {1.69 kgf/cm <sup>2</sup> , 24.1 psi} (300                |         |   |
|      | rpm)  |         |   |
|      | Compression [SKYACTIV-G 2.0, Except                               |         |   |
|      | European (L.H.D. U.K.) specs.]                                    |         |   |
|      | — Standard: 885 kPa {9.02 kgf/cm², 128 psi}<br>(300 rpm)          |         |   |
|      | — Minimum: 708 kPa {7.22 kgf/cm <sup>2</sup> , 103 psi} (300 rpm) |         |   |
|      | Maximum difference between cylinders:                             |         |   |
|      |   |         |   |
|      | 150 kPa {1.53 kgf/cm <sup>2</sup> , 21.8 psi} (300                |         |   |
|      | rpm) • Compression [SKYACTIV-G 2.5]                               |         |   |
|      |   |         |   |
|      | — Standard: 954 kPa {9.73 kgf/cm², 138 psi}<br>(300 rpm)          |         |   |
|      | — Minimum: 763 kPa {7.78 kgf/cm <sup>2</sup> , 111 psi}           |         |   |
|      | (300 rpm)  — Maximum difference between cylinders:                |         |   |
|      |   |         |   |
|      | 161 kPa {1.64 kgf/cm <sup>2</sup> , 23.4 psi} (300                |         |   |
|      | rpm)  |         |   |
|      | Note  |         |   |
|      | Because the SKYACTIV-G 2.0 and                                    |         |   |
|      | SKYACTIV-G 2.5 retards the intake valve                           |         |   |
|      | closing timing, compression pressure is low.                      |         |   |
| 9    | PURPOSE: VERIFY IF MALFUNCTION                                    | Yes     | Engine coolant leakage from the engine (between the   |
|      | RELATED TO SEALING OF ENGINE UNIT                                 |         | combustion chamber and the engine coolant passage)  |
|      | (COMBUSTION CHAMBER AND ENGINE                                    |         | may have occurred.  |
|      | COOLANT PASSAGE) IS CAUSE OF MISFIRE                              |         | Verify the conditions of the gasket and the cylinder  |
|      | • Perform the "ENGINE COOLANT LEAKAGE                             |         | head.   |
|      | INSPECTION".  |         | If there is any malfunction:      Panair or replace the malfunctioning part.  |
|      | (See ENGINE COOLANT LEAKAGE                                       |         | <ul> <li>Repair or replace the malfunctioning part<br/>according to the inspection results, then go to the</li> </ul> |
|      | INSPECTION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)                     |         | next step.  |
|      | Does the radiator cap tester needle drop even                     | No      | Go to the next step.  |
|      | though there is no engine coolant leakage from                    | 110     | Oo to the flext step.   |
|      | the radiator or the hoses?  |         |   |
|      | the radiator or the hoses?  |         |   |

| STEP | INSPECTION                                    | RESULTS | ACTION                                      |
|------|---|---------|---|
| 10   | PURPOSE: VERIFICATION OF VEHICLE              | Yes     | Repeat the inspection from Step 1.          |
|      | REPAIR COMPLETION                             |         | If the malfunction recurs, replace the PCM. |
|      | Always reconnect all disconnected connectors. |         | (See PCM REMOVAL/INSTALLATION [SKYACTIV-G   |
|      | Clear the DTC from the PCM memory using the   |         | 2.0, SKYACTIV-G 2.5].)                      |
|      | M-MDS.  |         | Go to the next step.                        |
|      | (See AFTER REPAIR PROCEDURE                   | No      | Go to the next step.                        |
|      | [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)            |         |   |
|      | Implement the repeatability verification      |         |   |
|      | procedure.                                    |         |   |
|      | (See Repeatability Verification Procedure.)   |         |   |
|      | Perform the Pending Trouble Code Access       |         |   |
|      | Procedure.                                    |         |   |
|      | (See ON-BOARD DIAGNOSTIC TEST                 |         |   |
|      | [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)            |         |   |
|      | • Is the PENDING CODE for this DTC present?   |         |   |
| 11   | PURPOSE: VERIFY IF THERE IS ANY OTHER         | Yes     | Go to the applicable DTC inspection.        |
|      | MALFUNCTION                                   |         | (See DTC TABLE [SKYACTIV-G 2.0, SKYACTIV-G  |
|      | • Is any other DTC or pending code stored?    |         | 2.5].)                                      |
|      |   | No      | DTC troubleshooting completed.              |