Your Ultimate Source for OEM Repair Manuals

FactoryManuals.net is a great resource for anyone who wants to save money on repairs by doing their own work. The manuals provide detailed instructions and diagrams that make it easy to understand how to fix a vehicle.

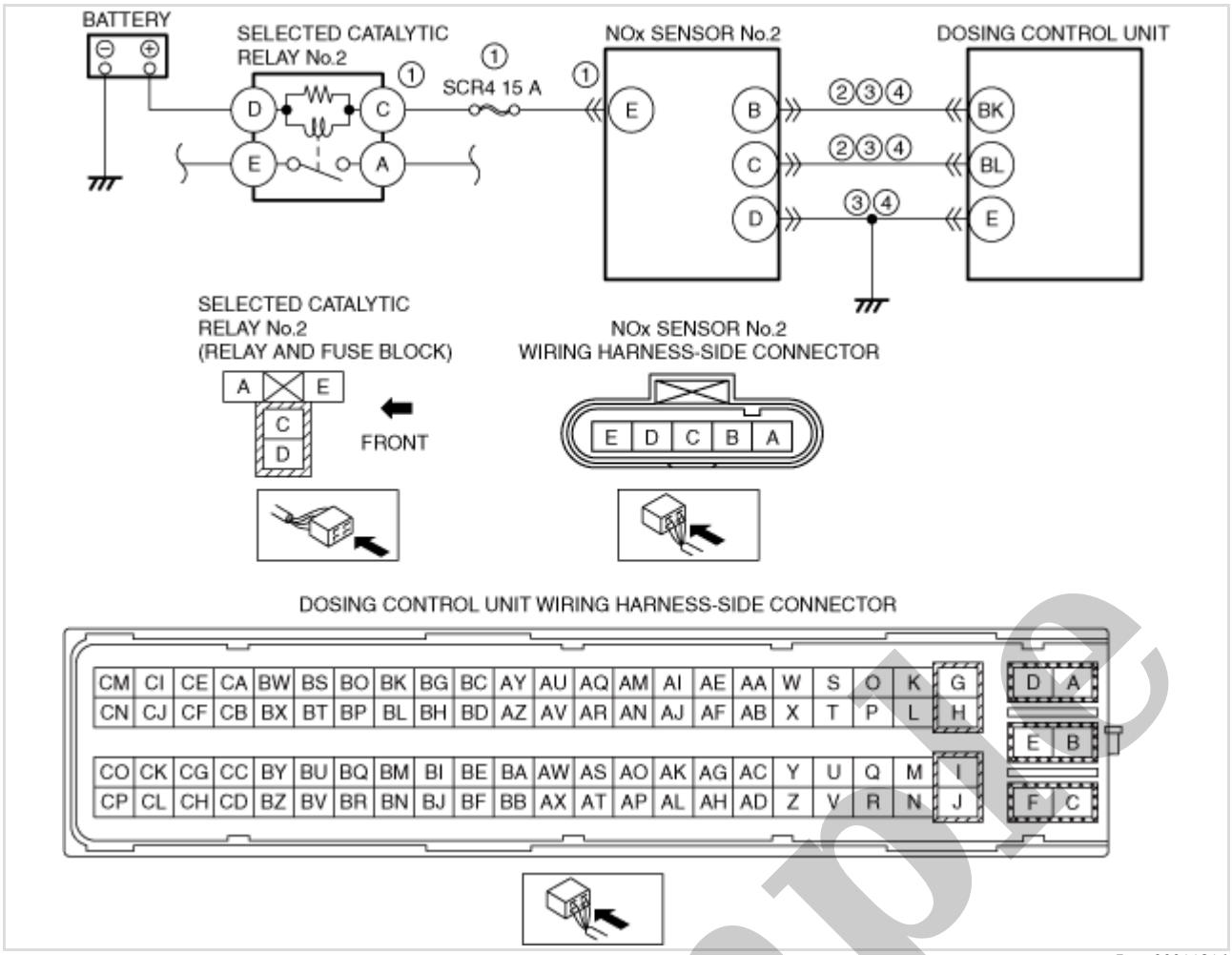
1992 MAZDA 626 (Mk.4) Hatchback OEM Service and Repair Workshop Manual

Go to manual page

• Step 5–6

— Verify that primary malfunction is resolved and there are no other malfunctions.

STEP	INSPECTION	RESULTS	ACTION
1	**PURPOSE: INSPECT NOx SENSOR No.1 POWER SUPPLY CIRCUIT FOR SHORT TO GROUND OR OPEN CIRCUIT** • Switch the ignition off. • Disconnect the NOx sensor No.1 connector. • Switch the ignition ON (engine off). **Note** **• Another DTC may be stored by the dosing control unit detecting an open circuit.** • Measure the voltage at the NOx sensor No.1 terminal E (wiring harness-side). • Is the voltage B+?	Yes	Go to the next step.
		No	Inspect the SCR4 15 A fuse. • If the fuse is blown: — Refer to the wiring diagram and verify whether or not there is a common connector between SCR4 15 A fuse and NOx sensor No.1 terminal E. **If there is a common connector:** • Determine the malfunctioning part by inspecting the common connector and the terminal for corrosion, damage, or pin disconnection, and the common wiring harness for a short to ground. • Repair or replace the malfunctioning part. **If there is no common connector:** • Repair or replace the wiring harness which has a short to ground. • Replace the fuse. **If the fuse is damaged:** — Replace the fuse. **If the fuse is normal:** — Refer to the wiring diagram and verify whether or not there is a common connector between SCR4 15 A fuse and NOx sensor No.1 terminal E. **If there is a common connector:** • Determine the malfunctioning part by inspecting the common connector and the terminal for corrosion, damage, or pin disconnection, and the common wiring harness for an open circuit. • Repair or replace the malfunctioning part. **If there is no common connector:** • Repair or replace the wiring harness which has an open circuit. Go to Step 5.
2	**PURPOSE: INSPECT NOx SENSOR No.1 CIRCUIT FOR SHORT TO GROUND** • Verify that the NOx sensor No.1 and dosing control unit connectors are disconnected. • Inspect for continuity between the following terminals (wiring harness-side) and body ground: — NOx sensor No.1 terminal B — NOx sensor No.1 terminal C • Is there continuity?	Yes	Refer to the wiring diagram and verify whether or not there is a common connector between the following terminals: • NOx sensor No.1 terminal B–dosing control unit terminal BK • NOx sensor No.1 terminal C–dosing control unit terminal BL **If there is a common connector:** • Determine the malfunctioning part by inspecting the common connector and the terminal for corrosion, damage, or pin disconnection, and the common wiring harness for a short to ground. • Repair or replace the malfunctioning part. **If there is no common connector:** • Repair or replace the wiring harness which has a short to ground. Go to Step 5.
		No	Go to the next step.



ac5uuw00011316

Function Explanation (DTC Detection Outline)

• The dosing control unit monitors the NOx sensor activation condition when the heater equipped to NOx sensor No.2 is operated.
• If NOx sensor No.2 is not activated even though a certain period of time has elapsed since the heater was operated, the dosing control unit stores a DTC.

Repeatability Verification Procedure

1.Perform the "COMPULSORY DIESEL PARTICULATE FILTER REGENERATION". (See COMPULSORY DIESEL PARTICULATE FILTER REGENERATION [SKYACTIV-D 2.2].)

2.Idle the engine for 3 min.

PID Item/Simulation Item Used In Diagnosis

PID/DATA monitor item table

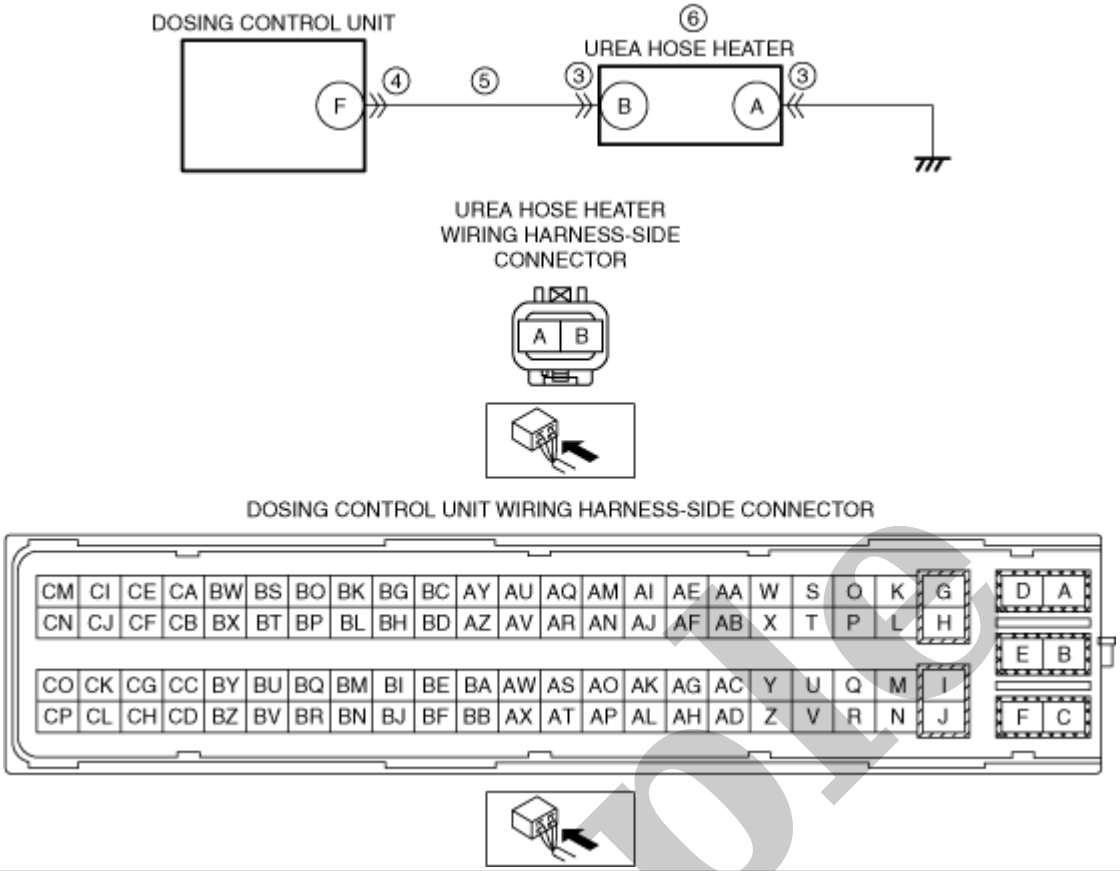
–: Not applicable

Item	Definition	Unit	Condition/Specification
NOX_C_B1S2	NOx sensor No.2	– (ppm)	• Displays the exhaust gas NOx concentration after SCR converter

STEP	INSPECTION	RESULTS	ACTION
3	**PURPOSE: INSPECT NOx SENSOR No.2 CIRCUIT FOR SHORT TO POWER SUPPLY** • Verify that the NOx sensor No.2 and dosing control unit connectors are disconnected. • Switch the ignition ON (engine off). **Note** **• Another DTC may be stored by the dosing control unit detecting an open circuit.** • Measure the voltage at the following terminals (wiring harness-side). — NOx sensor No.2 terminal B — NOx sensor No.2 terminal C — NOx sensor No.2 terminal D • Is the voltage 0 V?	Yes	Go to the next step.
		No	Refer to the wiring diagram and verify whether or not there is a common connector between the following terminals: • NOx sensor No.2 terminal B—dosing control unit terminal BK • NOx sensor No.2 terminal C—dosing control unit terminal BL • NOx sensor No.2 terminal D—body GND **If there is a common connector:** • Determine the malfunctioning part by inspecting the common connector and the terminal for corrosion, damage, or pin disconnection, and the common wiring harness for a short to power supply. • Repair or replace the malfunctioning part. **If there is no common connector:** • Repair or replace the wiring harness which has a short to power supply. Go to Step 5.
4	**PURPOSE: INSPECT NOx SENSOR No.2 CIRCUIT FOR OPEN CIRCUIT** • Verify that the NOx sensor No.2 and dosing control unit connectors are disconnected. • Switch the ignition off. • Inspect for continuity between the following terminals (wiring harness-side): — NOx sensor No.2 terminal B—dosing control unit terminal BK — NOx sensor No.2 terminal C—dosing control unit terminal BL — NOx sensor No.2 terminal D—body GND • Is there continuity?	Yes	Replace the NOx sensor No.2, then go to the next step. (See NOx SENSOR REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	Refer to the wiring diagram and verify whether or not there is a common connector between the following terminals: • NOx sensor No.2 terminal B—dosing control unit terminal BK • NOx sensor No.2 terminal C—dosing control unit terminal BL • NOx sensor No.2 terminal D—body GND **If there is a common connector:** • Determine the malfunctioning part by inspecting the common connector and the terminal for corrosion, damage, or pin disconnection, and the common wiring harness for an open circuit. • Repair or replace the malfunctioning part. **If there is no common connector:** • Repair or replace the wiring harness which has an open circuit. Go to the next step.
5	**PURPOSE: VERIFICATION OF VEHICLE REPAIR COMPLETION** • Always reconnect all disconnected connectors. • Clear the DTC from the dosing control unit memory using the M-MDS. (See CLEARING DTC [DOSING CONTROL UNIT (SKYACTIV-D 2.2)].) • Implement the repeatability verification procedure. (See -2 Repeatability Verification Procedure.) • Perform the Pending Trouble Code Access Procedure. (See ON-BOARD DIAGNOSTIC TEST [DOSING CONTROL UNIT (SKYACTIV-D 2.2)].) • Is the same Pending DTC present?	Yes	Repeat the inspection from Step 1. • If the malfunction recurs, replace the dosing control unit. (See DOSING CONTROL UNIT REMOVAL/INSTALLATION [SKYACTIV-D 2.2].) Go to the next step.
		No	Go to the next step.
6	**PURPOSE: VERIFY IF THERE IS ANY OTHER MALFUNCTION** • Is any other DTC or pending code stored?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [DOSING CONTROL UNIT (SKYACTIV-D 2.2)].)
		No	DTC troubleshooting completed.

STEP	INSPECTION	RESULTS	ACTION
3	**INSPECT UREA HOSE HEATER GROUND CIRCUIT FOR OPEN CIRCUIT** • Verify that the urea hose heater connector is disconnected. • Inspect for continuity between the urea hose heater terminal A (wiring harness-side) and body ground. • Is there continuity?	Yes	Go to the next step.
		No	Refer to the wiring diagram and verify whether or no there is a common connector between the urea hose heater terminal A and body ground. **If there is a common connector:** • Determine the malfunctioning part by inspecting the common connector and the terminal for corrosion, damage, or pin disconnection, and the common wiring harness for an open circuit. • Repair or replace the malfunctioning part. **If there is no common connector:** • Inspect for the following: — Open circuit between urea hose heater and body ground — Loose or lifting ground point • Repair or replace the malfunctioning part. Go to Step 8.
4	**INSPECT DOSING CONTROL UNIT CONNECTOR CONDITION** • Disconnect the dosing control unit connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the connector and/or terminals, then go to Step 8.
		No	Go to the next step.
5	**INSPECT UREA HOSE HEATER CIRCUIT FOR SHORT TO GROUND** • Verify that the urea hose heater and dosing control unit connectors are disconnected. • Inspect for continuity between the urea hose heater terminal B (wiring harness-side) and body ground. • Is there continuity?	Yes	Refer to the wiring diagram and verify whether or no there is a common connector between the urea hose heater terminal B and dosing control unit terminal F. **If there is a common connector:** • Determine the malfunctioning part by inspecting the common connector and the terminal for corrosion, damage, or pin disconnection, and the common wiring harness for a short to ground. • Repair or replace the malfunctioning part. **If there is no common connector:** • Repair or replace the wiring harness which has a short to ground. Go to Step 8.
		No	Go to the next step.
6	**INSPECT UREA HOSE HEATER CIRCUIT FOR OPEN CIRCUIT** • Verify that the urea hose heater and dosing control unit connectors are disconnected. • Inspect for continuity between the urea hose heater terminal B (wiring harness-side) and dosing control unit terminal F (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Refer to the wiring diagram and verify whether or no there is a common connector between the urea hose heater terminal B and dosing control unit terminal F. **If there is a common connector:** • Determine the malfunctioning part by inspecting the common connector and the terminal for corrosion, damage, or pin disconnection, and the common wiring harness for an open circuit. • Repair or replace the malfunctioning part. **If there is no common connector:** • Repair or replace the wiring harness which has an open circuit. Go to Step 8.
7	**INSPECT UREA HOSE HEATER** • Inspect the urea hose heater. (See UREA HOSE HEATER INSPECTION [SKYACTIV-D 2.2].) • Is there any malfunction?	Yes	Replace the urea hose, then go to the next step. (See UREA TANK REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	Go to the next step.

DTC P221D:00	Urea hose heater circuit high input



Diagnostic Procedure

STEP	INSPECTION	RESULTS	ACTION
1	RECORD VEHICLE STATUS AT TIME OF DTC DETECTION TO UTILIZE WITH REPEATABILITY VERIFICATION Note • Recording can be facilitated using the screen capture function of the PC. • Record the snapshot data on the repair order.	–	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 repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	INSPECT UREA HOSE HEATER CONNECTOR CONDITION • Switch the ignition off. • Disconnect the urea hose heater connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the connector and/or terminals, then go to Step 7.
		No	Go to the next step.

DESCRIPTION	NOx sensor No.1: NOx concentration is too high
POSSIBLE CAUSE	• NOx sensor No.1 connector or terminals malfunction • Dosing control unit connector or terminals malfunction • NOx sensor No.1 malfunction • Dosing control unit malfunction • Misfire

System Wiring Diagram

• Not applicable

Function Explanation (DTC Detection Outline)

• The dosing control unit detects the NOx concentration in the exhaust gas based on the NOx sensor No.1 signal.
• If the NOx value detected by NOx sensor No.1 during deceleration fuel cut is too high, the dosing control unit stores a DTC.

Repeatability Verification Procedure

1.Perform the "COMPULSORY DIESEL PARTICULATE FILTER REGENERATION". (See COMPULSORY DIESEL PARTICULATE FILTER REGENERATION [SKYACTIV-D 2.2].)

2.Perform acceleration/deceleration 5 times or more repeatedly at a vehicle speed of 80 km/h {50 mph} or less.

PID Item/Simulation Item Used In Diagnosis

PID/DATA monitor item table

–: Not applicable

Item	Definition	Unit	Condition/Specification
NOX_C_B1S1	NOx sensor No.1	– (ppm)	• Displays the exhaust gas NOx concentration before SCR converter

Function Inspection Using M-MDS

STEP	INSPECTION	RESULTS	ACTION
1	PURPOSE: VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

DTC P225D:00 [DOSING CONTROL UNIT (SKYACTIV-D 2.2)]

SM2896381

id0102k172690

Note

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

Details On DTCs

DESCRIPTION	**NOx sensor No.1: NOx concentration is too low**	
DETECTION CONDITION	Determination conditions	• NOx value detected by NOx sensor No.1 during fuel cut is too low
	Preconditions	• CAN communication condition is normal • Engine speed: 900–4,000 rpm • EGR valve position: 6 % or less • Throttle valve position: 55 % or more • NOx sensor No.1 heater operates for 30 s or more • Fuel injection amount during fuel cut is less than 0.5 mg/stroke for 0.4 s or more • Diesel particulate filter regeneration control is not performed for 30 s or more • Fuel injection amount during fuel cut is less than 0.5 mg/stroke for 0.4 s or more • NOx temperature, NOx emission amount, and NH3 emission amount are within standard • Intake air amount: 110–500 g {3.88–17.6 oz} • Battery voltage: 10.9–16.0 V • The following DTCs are not detected: — Boost air temperature sensor: P007B:00, P007C:00, P007D:00 — IAT sensor No.2: P00E9:00, P00EA:00, P00EB:00 — MAP sensor No.2: P0106:00, P0107:00, P0108:00 — ECT sensor: P0116:00, P0117:00, P0118:00, P011A:00 — Intake shutter valve position sensor: P0122:00, P0123:00 — EGR valve position sensor: P0405:00, P0406:00 — Exhaust gas pressure sensor No.1: P0471:00, P0472:00, P0473:00 — Exhaust gas temperature sensor No.1: P0545:00, P0546:00, P161D:00, P2080:00 — NOx sensor No.1: P2200:00, P220E:00 — EGR cooler bypass valve position sensor: P2494:00, P2495:00 — CAN system communication error: U0100:00
	Drive cycle	• 2
	Self test type	• CMDTC self test
	Sensor used	• NOx sensor No.1 • Dosing control unit
FAIL-SAFE FUNCTION	• Not applicable	
VEHICLE STATUS WHEN DTCs ARE OUTPUT	• Illuminates selective catalytic reduction (SCR) warning light. • DTC P1640:00 is also stored in the PCM.	

• Step 1

— Perform inspection of NOx sensor No.1.

• Step 2

— Verify if misfire is occurring.

• Step 3–4

— Verify that the primary malfunction is resolved and there are no other malfunctions.

STEP	INSPECTION	RESULTS	ACTION
1	PURPOSE: DETERMINE INTEGRITY OF NOx SENSOR NO.1 • Inspect the NOx sensor No.1. (See NOx SENSOR INSPECTION [SKYACTIV-D 2.2].) • Is there any malfunction?	Yes	Replace the NOx sensor No.1, then go to Step 3. (See NOx SENSOR REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	Go to the next step.
2	PURPOSE: VERIFY IF MISFIRE IS OCCURRING • Verify if a misfire is occurring referring to the troubleshooting procedure for DTC P0300:00. (See DTC P0300:00 [PCM (SKYACTIV-D 2.2)].) • Has a misfire occurred?	Yes	Specify the cause of the misfire and repair or replace the malfunctioning location referring to the troubleshooting procedure for DTC P0300:00. (See DTC P0300:00 [PCM (SKYACTIV-D 2.2)].) Go to the next step.
		No	Go to the next step.
3	PURPOSE: VERIFICATION OF VEHICLE REPAIR COMPLETION • Clear the DTC from the dosing control unit memory using the M-MDS. (See CLEARING DTC [DOSING CONTROL UNIT (SKYACTIV-D 2.2)].) • Implement the repeatability verification procedure. (See Repeatability Verification Procedure.) • Perform the Pending Trouble Code Access Procedure. (See ON-BOARD DIAGNOSTIC TEST [DOSING CONTROL UNIT (SKYACTIV-D 2.2)].) • Is the same Pending DTC present?	Yes	Repeat the inspection from Step 1. • If the malfunction recurs, replace the dosing control unit. (See DOSING CONTROL UNIT REMOVAL/INSTALLATION [SKYACTIV-D 2.2].) Go to the next step.
		No	Go to the next step.
4	PURPOSE: VERIFY IF THERE IS ANY OTHER MALFUNCTION • Is any other DTC or pending code stored?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [DOSING CONTROL UNIT (SKYACTIV-D 2.2)].)
		No	DTC troubleshooting completed.

STEP	INSPECTION	RESULTS	ACTION
2	PURPOSE: RECORD FREEZE FRAME DATA/SNAPSHOT DATA AND DIAGNOSTIC MONITORING TEST RESULTS TO UTILIZE WITH REPEATABILITY VERIFICATION Note • Recording can be facilitated using the screen capture function of the PC. • Record the FREEZE FRAME DATA/snapshot data and DIAGNOSTIC MONITORING TEST RESULTS (NOx sensor No.2) on the repair order.	–	Go to the next step.
3	PURPOSE: VERIFY IF DIAGNOSTIC RESULT IS AFFECTED BY OTHER RELATED DTCs OCCURRING • Switch the ignition off, then ON (engine off). • Perform the Pending Trouble Code Access Procedure and DTC Reading Procedure. • Is the PENDING CODE/DTC P229E:00 or U029E:00 also present?	Yes	Go to the applicable DTC inspection. (See DTC P229E:00 [DOSING CONTROL UNIT (SKYACTIV-D 2.2)].) (See DTC U029E:00 [DOSING CONTROL UNIT (SKYACTIV-D 2.2)].) Repair or replace the applicable wiring harness or connector parts. Go to the troubleshooting procedure to perform the procedure from Step 2.
		No	Go to the next step.
4	PURPOSE: VERIFY IF THERE IS PID ITEM CAUSING DRASTIC CHANGES OF ACCELERATION FLUCTUATION BY INPUT SIGNAL TO PCM OR DOSING CONTROL UNIT • Access the following PIDs using the M-MDS: (See ON-BOARD DIAGNOSTIC TEST [DOSING CONTROL UNIT (SKYACTIV-D 2.2)].) — NOX_C_B1S2 • Is there any signal that is far out of specification?	Yes	Go to the next step.
		No	Go to Troubleshooting Diagnostic Procedure to perform the procedure from step 1.
5	PURPOSE: VERIFY CONNECTOR CONNECTIONS • Access the following PIDs using the M-MDS: (See ON-BOARD DIAGNOSTIC TEST [DOSING CONTROL UNIT (SKYACTIV-D 2.2)].) — NOX_C_B1S2 • When the following parts are shaken, does the PID value include a PID item which has changed? — NOx sensor No.2 — Dosing control unit	Yes	Inspect the related wiring harness and connector. • Repair or replace the malfunctioning part.
		No	Go to Troubleshooting Diagnostic Procedure to perform the procedure from step 1.

Troubleshooting Diagnostic Procedure

Intention of troubleshooting procedure

• Step 1

— Perform inspection of NOx sensor No.2.

• Step 2–3

— Verify that the primary malfunction is resolved and there are no other malfunctions.