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1990 MAZDA 626 (Mk.3) Hatchback OEM Service and Repair Workshop Manual

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Sample

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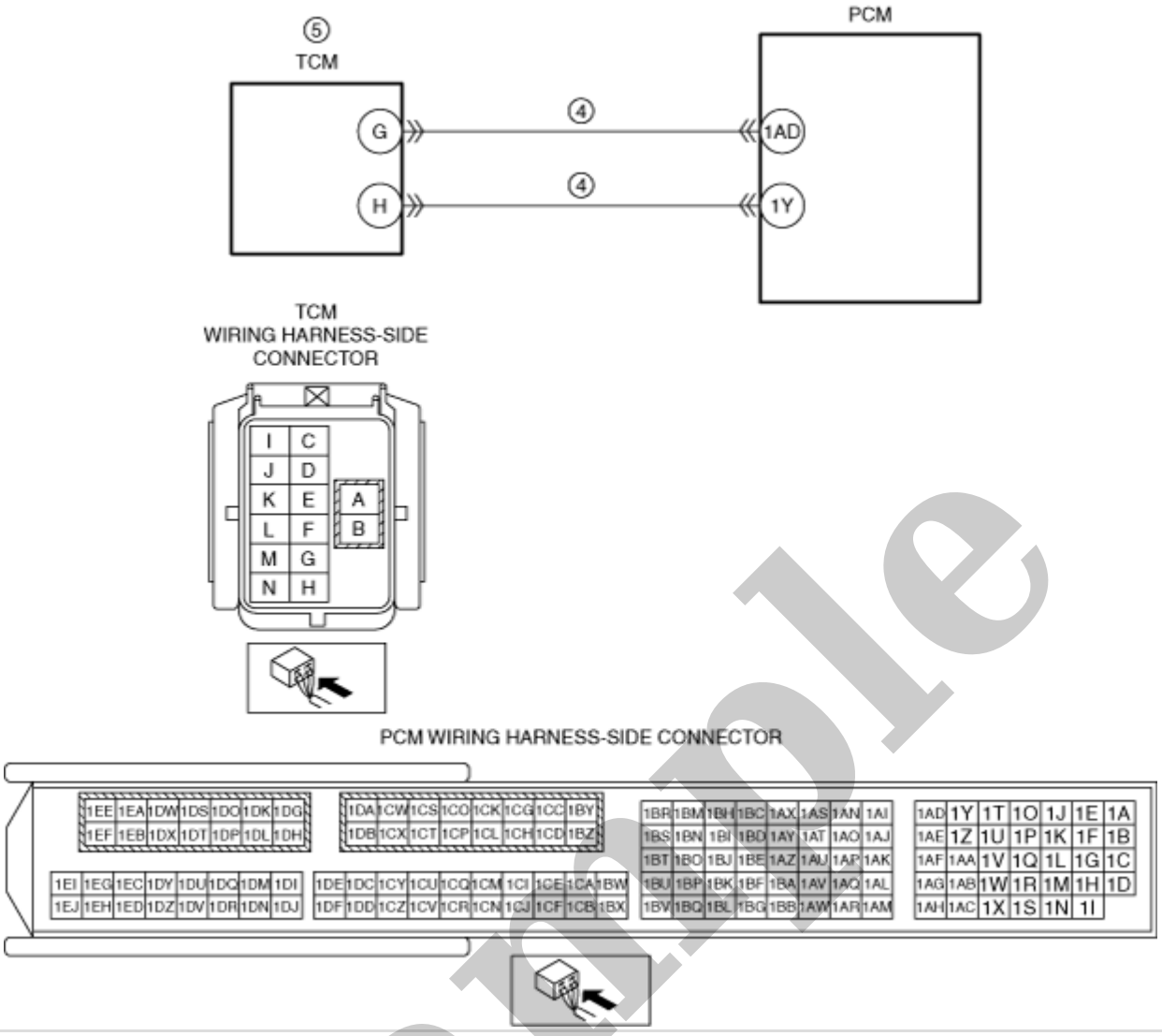
STEP	INSPECTION		ACTION
3	VERIFY RELATED PENDING CODE AND/OR DTC • Switch the ignition off, then ON (engine off). • Perform the Pending Trouble Code Access Procedure and DTC Reading Procedure. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-D 2.2)].) • Are any other PENDING CODEs and/or DTCs present?	Yes	Go to the applicable PENDING CODE or DTC inspection. (See DTC TABLE [PCM (SKYACTIV-D 2.2)].)
		No	Go to the next step.
4	INSPECT EXHAUST GAS PRESSURE SENSOR No.1 CONNECTOR CONDITION • Switch the ignition off. • Disconnect the exhaust gas pressure sensor No.1 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 10.
		No	Go to the next step.
5	INSPECT PCM CONNECTOR CONDITION • Disconnect the PCM 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 10.
		No	Go to the next step.
6	INSPECT EXHAUST GAS PRESSURE SENSOR No.1 SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY • Verify that the exhaust gas pressure sensor No.1 and PCM connectors are disconnected. • Switch the ignition ON (engine off). Note • Another DTC may be stored by the PCM detecting an open circuit. • Measure the voltage at the exhaust gas pressure sensor No.1 terminal B (wiring harness-side). • 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 exhaust gas pressure sensor No.1 terminal B and PCM terminal 1CE. 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 10.
7	INSPECT EXHAUST GAS PRESSURE SENSOR No.1 POWER SUPPLY CIRCUIT AND SIGNAL CIRCUIT FOR SHORT TO EACH OTHER • Verify that the exhaust gas pressure sensor No.1 and PCM connectors are disconnected. • Switch the ignition off. • Inspect for continuity between exhaust gas pressure sensor No.1 terminals A and B (wiring harness-side). • Is there continuity?	Yes	Refer to the wiring diagram and verify whether or not there is a common connector between the following terminals: • Exhaust gas pressure sensor No.1 terminal A–PCM terminal 1CJ • Exhaust gas pressure sensor No.1 terminal B–PCM terminal 1CE 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 each other. • Repair or replace the malfunctioning part. If there is no common connector: • Repair or replace the wiring harness which has a short to each other. Go to Step 10.
		No	Go to the next step.

Sample

DTC U0074:00	CAN system communication error (local CAN between PCM and TCM)

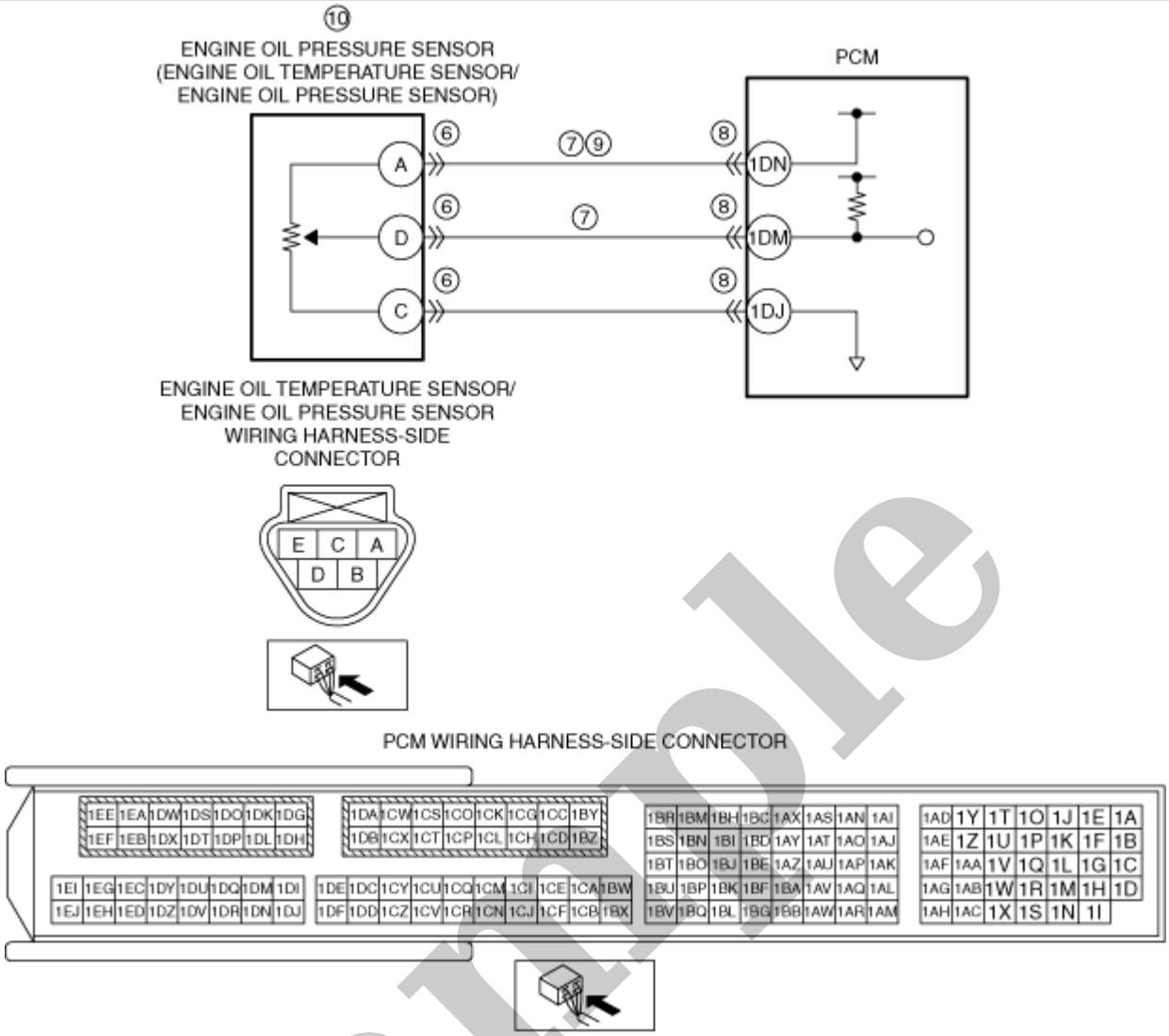


Sample

Diagnostic Procedure

STEP	INSPECTION		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 SERVICE INFORMATION AVAILABILITY • Verify related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to the available Service Information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

DTC P0524:00	Engine Oil Pressure Too Low



Sample

Diagnostic Procedure

STEP	INSPECTION		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 FREEZE FRAME DATA/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.

DTC P0130:00 [PCM (SKYACTIV-D 2.2)]

SM2896213

id0102j570210

DTC P0130:00	A/F sensor circuit range/performance problem
DETECTION CONDITION	• If the PCM detects that the difference between the positive and negative terminals of the A/F sensor is less than 0.1 V for 5 s with the following conditions met, the PCM determines that the A/F sensor circuit has a problem. MONITORING CONDITIONS — A/F sensor control IC output voltage: 4.7 V or more — A/F sensor terminal B voltage: 1.8 V or less — Battery voltage: 11–16 V — The following DTCs are not detected: • A/F sensor: P0131:00, P0132:00 Diagnostic support note • This is a continuous monitor (A/F sensor). • The check engine light illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA/Snapshot data is available. • DTC is stored in the PCM memory.
FAIL-SAFE FUNCTION	• PCM restricts engine torque. • Inhibits the automatic diesel particulate filter regeneration control and compulsory diesel particulate filter regeneration control. • Inhibits the DENOx/DESOx control. • Stops activation of the A/F sensor heater. • Inhibits the EGR control.
POSSIBLE CAUSE	• A/F sensor connector or terminals malfunction • PCM connector or terminals malfunction • A/F sensor positive circuit and negative circuit are shorted to each other • A/F sensor malfunction — A/F sensor deterioration • PCM malfunction

Sample

DTC P0134:00 [PCM (SKYACTIV-D 2.2)]

SM2896217

id0102j570250

DTC P0134:00	A/F sensor circuit no activity detected
DETECTION CONDITION	• The PCM monitors the A/F sensor impedance when the following conditions are met. If the impedance is more than threshold for 5 s, the PCM determines that A/F sensor is not activated. MONITORING CONDITIONS — Battery voltage: 11–16 V — A/F sensor feedback correction is actuated Diagnostic support note • This is a continuous monitor (A/F sensor). • The check engine light illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA/Snapshot data is available. • DTC is stored in the PCM memory.
FAIL-SAFE FUNCTION	• PCM restricts engine torque. • Inhibits the auto diesel particulate filter regeneration control. • Inhibits the compulsory diesel particulate filter regeneration control. • Inhibits the DENOx/DESOx control. • Stops activation of the A/F sensor heater. • Inhibits the EGR control.
POSSIBLE CAUSE	• Erratic signal from A/F sensor — A/F sensor connector or terminals malfunction — A/F sensor loose • PCM connector or terminals malfunction • Open circuit in wiring harness between the following terminals: — A/F sensor terminal A–PCM terminal 1H — A/F sensor terminal B–PCM terminal 1I • A/F sensor heater malfunction • A/F sensor malfunction — A/F sensor deterioration • PCM malfunction

Sample

STEP	INSPECTION		ACTION
11	VERIFY DTC TROUBLESHOOTING COMPLETED • Always reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. (See AFTER REPAIR PROCEDURE [PCM (SKYACTIV-D 2.2)].) • Start the engine and idle it. • Wait until the ECT PID value is above 80 °C {176 °F}. • Wait for 1 min (idle). • Perform the DTC Reading Procedure. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-D 2.2)].) • Is the same DTC present?	Yes	Repeat the inspection from Step 1. • If the malfunction recurs, replace the PCM. (See PCM REMOVAL/INSTALLATION [SKYACTIV-D 2.2].) Go to the next step.
		No	Go to the next step.
12	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE [PCM (SKYACTIV-D 2.2)].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [PCM (SKYACTIV-D 2.2)].)
		No	DTC troubleshooting completed.

Sample

STEP	INSPECTION		ACTION
3	**INSPECT A/F SENSOR CONNECTOR CONDITION** • Switch the ignition off. • Disconnect the A/F sensor 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.
4	**INSPECT PCM CONNECTOR CONDITION** • Disconnect the PCM 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.
5	**INSPECT A/F SENSOR CIRCUIT FOR SHORT TO GROUND** • Verify that the A/F sensor and PCM connectors are disconnected. • Inspect for continuity between the following terminals (wiring harness-side) and body ground: — A/F sensor terminal A — A/F sensor terminal B • Is there continuity?	Yes	Refer to the wiring diagram and verify whether or not there is a common connector between the following terminals: • A/F sensor terminal A—PCM terminal 1H • A/F sensor terminal B—PCM terminal 1I **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 7.
		No	Go to the next step.
6	**INSPECT A/F SENSOR** • Reconnect all disconnected connectors. • Inspect the A/F sensor. (See AIR FUEL RATIO (A/F) SENSOR INSPECTION [SKYACTIV-D 2.2].) • Is there any malfunction?	Yes	Replace the A/F sensor, then go to the next step. (See AIR FUEL RATIO (A/F) SENSOR REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	Go to the next step.
7	**VERIFY DTC TROUBLESHOOTING COMPLETED** • Always reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. (See CLEARING DTC [PCM (SKYACTIV-D 2.2)].) • Perform the KOEO or KOER self test. (See KOEO/KOER SELF TEST [PCM (SKYACTIV-D 2.2)].) • Is the same DTC present?	Yes	Repeat the inspection from Step 1. • If the malfunction recurs, replace the PCM. (See PCM REMOVAL/INSTALLATION [SKYACTIV-D 2.2].) Go to the next step.
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE [PCM (SKYACTIV-D 2.2)].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [PCM (SKYACTIV-D 2.2)].)
		No	DTC troubleshooting completed.

Sample

STEP	INSPECTION		ACTION
3	**INSPECT A/F SENSOR CONNECTOR CONDITION** • Switch the ignition off. • Disconnect the A/F sensor 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.
4	**INSPECT PCM CONNECTOR CONDITION** • Disconnect the PCM 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.
5	**INSPECT A/F SENSOR CIRCUIT FOR SHORT TO POWER SUPPLY** • Verify that the A/F sensor and PCM connectors are disconnected. • Switch the ignition ON (engine off). **Note** **• Another DTC may be stored by the PCM detecting an open circuit.** • Measure the voltage at the following terminals (wiring harness-side): — A/F sensor terminal A — A/F sensor terminal B • 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: • A/F sensor terminal A—PCM terminal 1H • A/F sensor terminal B—PCM terminal 1I **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 7.
6	**INSPECT A/F SENSOR** • Switch the ignition off. • Reconnect all disconnected connectors. • Inspect the A/F sensor. (See AIR FUEL RATIO (A/F) SENSOR INSPECTION [SKYACTIV-D 2.2].) • Is there any malfunction?	Yes	Replace the A/F sensor, then go to the next step. (See AIR FUEL RATIO (A/F) SENSOR REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	Go to the next step.
7	**VERIFY DTC TROUBLESHOOTING COMPLETED** • Always reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. (See CLEARING DTC [PCM (SKYACTIV-D 2.2)].) • Perform the KOEO or KOER self test. (See KOEO/KOER SELF TEST [PCM (SKYACTIV-D 2.2)].) • Is the same DTC present?	Yes	Repeat the inspection from Step 1. • If the malfunction recurs, replace the PCM. (See PCM REMOVAL/INSTALLATION [SKYACTIV-D 2.2].) Go to the next step.
		No	Go to the next step.
8	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE [PCM (SKYACTIV-D 2.2)].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [PCM (SKYACTIV-D 2.2)].)
		No	DTC troubleshooting completed.

Sample

• If the PCM determines that the malfunction recurs from the next drive cycle and thereafter, it stores a DTC and turns on the check engine light.

Repeatability Verification Procedure

1.Start the engine and warm up for 12 min or more with the engine coolant temperature at 60 °C {140 °F} or more.

2.Perform the following acceleration/deceleration driving 10 times repeatedly.

- Between a vehicle speed of 40−80 km/h {25−49 mph}, accelerate taking 15 s, and decelerate taking 10 s.

PID Item/Simulation Item Used In Diagnosis

PID/DATA monitor item table

Item	Definition	Unit	Condition/Specification
BARO	Barometric pressure	KPa {MPA}, mBar {BAR}, psi	• Displays the BARO.
EGRP	EGR valve	%	• Displays the EGR valve position.
EGRP_ACT	EGR valve actual opening angle	%	ECT: above 70 °C {158 °F} • Idle: 0 % (after 20−30 s have elapsed since start the engine) • Racing (engine speed 2,000 rpm): Approx. 60 %
EGR_C_BP	EGR cooler bypass valve	%	• Displays the EGR cooler bypass valve position.
EGR_C_BP_ACT	Actual measured EGR cooler bypass valve opening angle	%	ECT: above 70 °C {158 °F} • Idle: 0 % (after 20−30 s have elapsed since start the engine) • Racing (engine speed 2,000 rpm): 0 %
EXHTEMP1	Exhaust gas temperature (No.2)	°C, °F	• Displays the exhaust gas temperature.
EXHTEMP2	Exhaust gas temperature (No.3)	°C, °F	• Displays the exhaust gas temperature.
EXHTEMP4	Exhaust gas temperature (No.4)	°C, °F	• Displays the exhaust gas temperature.
EXHPRESS_DIF	Exhaust gas pressure (No.2)	KPa {MPA}, mBar {BAR}, psi	• Displays the difference in pressure between exhaust gas pressure before and after passing the diesel particulate filter.
HTR11	A/F sensor heater operation status	Off/On	• Ignition switched ON (engine off): Off • Idle (after warm up): On
	A/F sensor heater control duty value	%	• Ignition switched ON (engine off): 0 % • Idle (after warm up): Approx. 43 %
IAT	Intake air temperature (No.1)	°C, °F	• Displays the intake air temperature (No.1).
ISV_ACT	Intake shutter valve control actual value	°(deg)	• Switch the ignition ON (engine off): Approx. 88.28° • Idle: Approx. 4.36° • Racing (engine speed above 4,000 rpm): Approx. 82.5°
ISV_DSD	Intake shutter valve control desired value	°(deg) %	• Displays the intake shutter valve control desired value.
O2S11	A/F sensor current	μA	• Idle (after warm up): Approx. −39 μA • Deceleration fuel cut (accelerator pedal released from engine speed of 4,000 rpm or more): Approx. 3.84 mA

Sample