PCM INSPECTION [SKYACTIV-D 2.2]

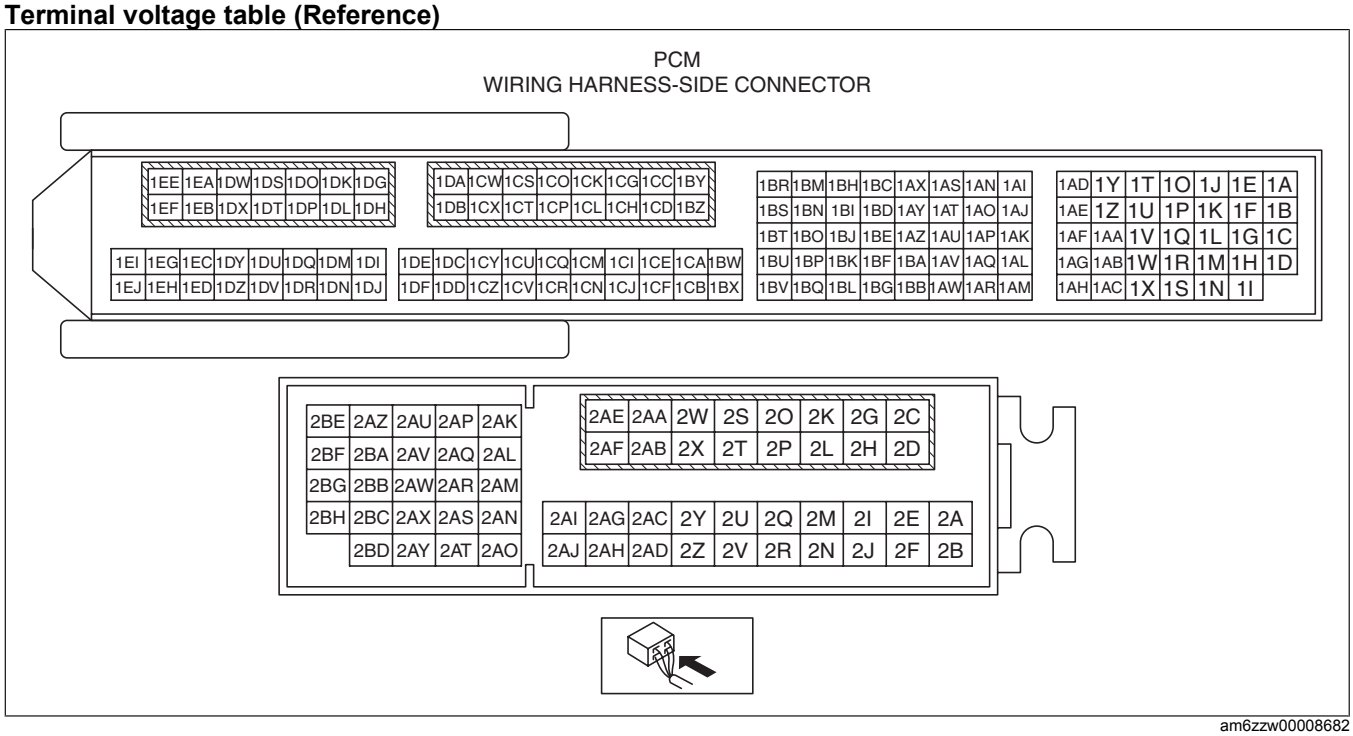
id0140z7802500

Without Using the M-MDS

Note

- Because the PCM uses a waterproof connector, the inspection for the voltage/wave pattern cannot be performed. The following values are for reference.

Terminal voltage table (Reference)



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Terminal	Signal	Connected to	Test condition	Voltage (V)	inspection item
1A	CMP (G+)	CMP sensor	(See CMP (G+) signal.)		• CMP sensor • Related wiring harness
1B	CMP (G–)	CMP sensor	Switch ignition off	Approx. 0.197	• CMP sensor • Related wiring harness
			Switch ignition ON (engine off)	Approx. 0.31	
1C	—	—	—	—	—
1D	Generator output voltage	Generator (terminal P)	(See Generator output voltage signal.)		• Generator • Related wiring harness
1E	CKP (NE+)	CKP sensor	(See CKP (NE+) signal.)		• CKP sensor • Related wiring harness
1F	CKP (NE–)	CKP sensor	Switch ignition ON (engine off)	Approx. 0.32	• CKP sensor • Related wiring harness
1G	GND	Sensor shield	Switch ignition ON (engine off)	Approx. 0.32	• Related wiring harness
1H	A/F (+)	A/F sensor	Idle (after warm up)	Approx. 2.315	• A/F sensor • Related wiring harness
1I	A/F (−)	A/F sensor	Idle (after warm up)	Approx. 1.735	• A/F sensor • Related wiring harness
1J	Constant voltage (Vref)	CKP sensor	Switch ignition ON (engine off)	Approx. 5.03	• Related wiring harness
1K	Constant voltage (Vref)	CMP sensor	Switch ignition ON (engine off)	Approx. 5.03	• Related wiring harness
1M	—	—	—	—	—
1N	—	—	—	—	—
1O	—	—	—	—	—
1P	—	—	—	—	—
1Q	—	—	—	—	—
1R	—	—	—	—	—

Terminal	Signal	Connected to	Test condition	Voltage (V)	inspection item
1S	—	—	—	—	—
1T	—	—	—	—	—
1U	—	—	—	—	—
1V	—	—	—	—	—
1W	—	—	—	—	—
1X	—	—	—	—	—
1Y*1	CAN_2L	CAN system related modules	Because this terminal is for CAN, integrity determination by terminal voltage is not possible.		• Related wiring harness
1Z	Exhaust gas pressure	Exhaust gas pressure sensor No.2	Switch ignition ON (engine off)	Approx. 0.525	• Exhaust gas pressure sensor No.2 • Related wiring harness
			Idle (after warm up)	0.580—0.750	
1AA	—	—	—	—	—
1AB	—	—	—	—	—
1AC	GND	Exhaust gas temperature sensor No.1	Switch ignition ON (engine off)	Approx. 0.31	• Related wiring harness
1AD*1	CAN_2H	CAN system related modules	Because this terminal is for CAN, integrity determination by terminal voltage is not possible.		• Related wiring harness
1AE	GND	Exhaust gas pressure sensor No.2	Switch ignition ON (engine off)	Approx. 0.31	• Related wiring harness
1AF	—	—	—	—	—
1AG	—	—	—	—	—
1AH	GND	Boost air temperature sensor	Switch ignition ON (engine off)	Approx. 0.31	• Related wiring harness
1AI	—	—	—	—	—
1AJ	GND	Fuel pressure sensor	Switch ignition ON (engine off)	Approx. 0.31	• Related wiring harness
1AK	Constant voltage (Vref)	Exhaust gas pressure sensor No.2	Switch ignition ON (engine off)	Approx. 5.03	• Related wiring harness
1AL	Fuel pressure	Fuel pressure sensor	Switch ignition ON (engine off)	Approx. 0.884	• Fuel pressure sensor • Related wiring harness
			Idle (after warm up)	1.460—1.560	
1AM	—	—	—	—	—
1AN	—	—	—	—	—
1AO	GND	EGR valve position sensor	Switch ignition ON (engine off)	Approx. 0.31	• Related wiring harness
1AP	Constant voltage (Vref)	EGR valve position sensor	Switch ignition ON (engine off)	Approx. 5.03	• Related wiring harness
1AQ	EGR valve position	EGR valve position sensor	Switch ignition ON (engine off)	Approx. 1.236	• EGR valve position sensor • Related wiring harness
			Idle (after warm up)	1.210—1.490	
1AR	Constant voltage (Vref)	Fuel pressure sensor	Switch ignition ON (engine off)	Approx. 5.03	• Related wiring harness
1AS	Intake shutter valve (ISV−)	Intake shutter valve	Switch ignition ON (engine off)	Approx. 12.10	• Intake shutter valve • Related wiring harness
			(See Intake shutter valve (ISV-) signal.)		
1AT	GND	EGR cooler bypass valve position sensor	Switch ignition ON (engine off)	Approx. 0.31	• Related wiring harness
1AU	Constant voltage (Vref)	EGR cooler bypass valve position sensor	Switch ignition ON (engine off)	Approx. 5.03	• Related wiring harness

Terminal	Signal	Connected to	Test condition	Voltage (V)	inspection item
1AV	EGR cooler bypass valve position	EGR cooler bypass valve position sensor	Switch ignition ON (engine off)	Approx. 0.743	• EGR cooler bypass valve position sensor • Related wiring harness
			Idle (after warm up)	1.210—1.380	
1AW	GND	Sensor shield	Switch ignition ON (engine off)	Approx. 0.31	• Related wiring harness
1AX	Intake shutter valve (ISV+)	Intake shutter valve	Switch ignition ON (engine off)	Approx. 12.10	• Intake shutter valve • Related wiring harness
			Idle	Approx. 14.15	
1AY	GND	Intake shutter valve position sensor	Switch ignition ON (engine off)	Approx. 0.32	• Related wiring harness
1AZ	Constant voltage (Vref)	Intake shutter valve position sensor	Switch ignition ON (engine off)	Approx. 5.03	• Related wiring harness
1BA	Intake shutter valve position	Intake shutter valve position sensor	Switch ignition ON (engine off)	Approx. 4.11	• Intake shutter valve position sensor • Related wiring harness
			Idle (after warm up)	0.700—0.840	
1BB	—	—	—	—	—
1BC	EGR cooler bypass valve (−) (EGR−)	EGR cooler bypass valve	Switch ignition ON (engine off)	Approx. 12.10	• EGR cooler bypass valve • Related wiring harness
			(See EGR cooler bypass valve (-) (EGR-) signal.)		
1BD	—	—	—	—	—
1BE	—	—	—	—	—
1BF	—	—	—	—	—
1BG	—	—	—	—	—
1BH	EGR cooler bypass valve (+) (EGR+)	EGR cooler bypass valve	Switch ignition ON (engine off)	Approx. 12.10	• EGR cooler bypass valve • Related wiring harness
			Idle	Approx. 12.10	
1BI	GND	MAP sensor No.1	Switch ignition ON (engine off)	Approx. 0.32	• Related wiring harness
1BJ	Constant voltage (Vref)	MAP sensor No.1	Switch ignition ON (engine off)	Approx. 5.03	• Related wiring harness
1BK	MAP	MAP sensor No.1	Switch ignition ON (engine off)	Approx. 1.202	• MAP sensor No.1 • Related wiring harness
			Idle (after warm up)	1.235—1.49	
1BL	—	—	—	—	—
1BM	EGR valve (EGR−)	EGR valve	Switch ignition ON (engine off)	Approx. 12.09	• EGR valve • Related wiring harness
			Idle (when cold)	Approx. 12.09	
			Idle (after warm up)	Approx. 13.08	
1BN	GND	Regulating valve position sensor	Switch ignition ON (engine off)	Approx. 0.32	• Related wiring harness
1BO	Constant voltage (Vref)	Regulating valve position sensor	Switch ignition ON (engine off)	Approx. 5.03	• Related wiring harness
1BP	Regulating valve position	Regulating valve position sensor	Switch ignition ON (engine off)	Approx. 0.874	• Regulating valve position sensor • Related wiring harness
			Idle (after warm up)	Approx. 4.410	
1BQ	—	—	—	—	—
1BR	EGR valve (EGR+)	EGR valve	Switch ignition ON (engine off)	Approx. 12.09	• EGR valve • Related wiring harness
1BS	GND	Exhaust gas temperature sensor No.3	Under any condition	Approx. 0.32	• Related wiring harness

Terminal	Signal	Connected to	Test condition	Voltage (V)	inspection item
1BT	—	—	—	—	—
1BU	—	—	—	—	—
1BV	—	—	—	—	—
1BW	Exhaust gas temperature	Exhaust gas temperature sensor No.3	Switch ignition ON (engine off)	Approx. 5.03	• Exhaust gas temperature sensor No. 3 • Related wiring harness
1BX	—	—	—	—	—
1BY	Suction control valve	Suction control valve	Switch ignition ON (engine off)	Approx. 0.31	• Suction control valve • Related wiring harness
			(See Suction control valve signal.)		
1BZ	GND	GND	Switch ignition ON (engine off)	Approx. 0.28	• Related wiring harness
1CA	Exhaust gas temperature	Exhaust gas temperature sensor No.2	Switch ignition ON (engine off)	Approx. 5.03	• Exhaust gas temperature sensor No. 2 • Related wiring harness
1CB	GND	Exhaust gas temperature sensor No.2	Switch ignition ON (engine off)	Approx. 0.31	• Related wiring harness
1CC	Suction control valve	Suction control valve	Switch ignition ON (engine off)	Approx. 0.31	• Suction control valve • Related wiring harness
			(See Suction control valve signal.)		
1CD	GND	GND	Switch ignition ON (engine off)	Approx. 0.28	• Related wiring harness
1CE	Exhaust gas pressure	Exhaust gas pressure sensor No.1	Switch ignition ON (engine off)	Approx. 0.957	• Exhaust gas pressure sensor No.1 • Related wiring harness
			Idle (after warm up)	0.975—1.230	
1CF	GND	Exhaust gas pressure sensor No.1	Switch ignition ON (engine off)	Approx. 0.31	• Related wiring harness
1CG	A/F sensor heater control	A/F sensor heater	(See A/F sensor heater control signal.)		• A/F sensor heater • Related wiring harness
1CH	Engine oil control	Engine oil solenoid valve	(See Engine oil control signal.)		• Engine oil solenoid valve • Related wiring harness
1CI	Exhaust gas temperature	Exhaust gas temperature sensor No.1	Switch ignition ON (engine off)	Approx. 4.94	• Exhaust gas temperature sensor No. 1 • Related wiring harness
1CJ	Constant voltage (Vref)	Exhaust gas pressure sensor No.1	Switch ignition ON (engine off)	Approx. 5.03	• Related wiring harness
1CK	IDEVA*4 control	OCV	Switch ignition ON (engine off)	Approx. 12.10	• OCV • Related wiring harness
			Idle (after warm up)	Approx. 12.10	
1CL	Wastegate solenoid valve	Wastegate solenoid valve	(See Wastegate solenoid valve signal.)		• Wastegate solenoid valve • Related wiring harness
1CM	Boost air temperature	Boost air temperature sensor	Switch ignition ON (engine off)	Approx. 2.8	• Boost air temperature sensor • Related wiring harness
1CN	Constant voltage (Vref)	MAP sensor No.2	Switch ignition ON (engine off)	Approx. 5.03	• Related wiring harness
1CO	Compressor bypass solenoid valve	Compressor bypass solenoid valve	Switch ignition ON (engine off)	Approx. 1.652	• Compressor bypass solenoid valve • Related wiring harness
			Idle (after warm up)	Approx. 14.50	
1CP	Regulating solenoid valve	Regulating solenoid valve	(See Regulating solenoid valve signal.)		• Regulating solenoid valve • Related wiring harness

Terminal	Signal	Connected to	Test condition	Voltage (V)	inspection item
1CQ	MAP	MAP sensor No.2	Switch ignition ON (engine off)	Approx. 1.652	• MAP sensor No.2 • Related wiring harness
			Idle (after warm up)	1,380—1.580	
1CR	GND	MAP sensor No.2	Switch ignition ON (engine off)	Approx. 0.32	• Related wiring harness
1CS	Fuel injection control (+)	Fuel injector No.3	(See Fuel injection control (+) signal.)		• Fuel injector No.3 • Related wiring harness
1CT	Fuel injection control (+)	Fuel injector No.2	(See Fuel injection control (+) signal.)		• Fuel injector No.2 • Related wiring harness
1CU	Fuel temperature	Fuel temperature sensor	Switch ignition ON (engine off)	Approx. 2.26	• Fuel temperature sensor • Related wiring harness
1CV	GND	Fuel temperature sensor	Switch ignition ON (engine off)	Approx. 0.31	• Related wiring harness
1CW	Fuel injection control (−)	Fuel injector No.2	(See Fuel injection control (-) signal.)		• Fuel injector No.2 • Related wiring harness
1CX	—	—	—	—	—
1CY	—	—	—	—	—
1CZ	—	—	—	—	—
1DA	Fuel injection control (−)	Fuel injector No.3	(See Fuel injection control (-) signal.)		• Fuel injector No.3 • Related wiring harness
1DB	—	—	—	—	—
1DC	ECT	ECT sensor	Switch ignition ON (engine off)	Approx. 2.22	• ECT sensor • Related wiring harness
1DD	GND	ECT sensor	Switch ignition ON (engine off)	Approx. 0.31	• Related wiring harness
1DE	—	—	—	—	—
1DF	—	—	—	—	—
1DG	PRD−	Fuel pressure relief valve	Switch ignition ON (engine off)	Approx. 11.74	• Fuel pressure relief valve • Related wiring harness
			Idle (after warm up)	Approx. 13.80	
1DH	Battery voltage	Main relay	Switch ignition ON (engine off)	B+	• Related wiring harness
1DI	Engine oil temperature	Engine oil temperature sensor	Switch ignition ON (engine off)	Approx. 3.37	• Engine oil temperature sensor • Related wiring harness
1DJ	GND	Engine oil temperature sensor, engine oil pressure sensor	Switch ignition ON (engine off)	Approx. 0.32	• Related wiring harness
1DK	PRD+	Fuel pressure relief valve	Switch ignition ON (engine off)	Approx. 11.75	• Fuel pressure relief valve • Related wiring harness
			Idle (after warm up)	Approx. 13.80	
1DL	Battery voltage	Main relay	Switch ignition ON (engine off)	B+	• Related wiring harness
1DM	Engine oil pressure	Engine oil pressure sensor	Switch ignition ON (engine off)	Approx. 0.521	• Engine oil pressure sensor • Related wiring harness
			Idle (after warm up)	1.075—1.475	
1DN	Constant voltage (Vref)	Engine oil temperature sensor, engine oil pressure sensor	Switch ignition ON (engine off)	Approx. 5.03	• Related wiring harness
1DO	—	—	—	—	—
1DP	—	—	—	—	—
1DQ	—	—	—	—	—
1DR	—	—	—	—	—
1DS	—	—	—	—	—
1DT	—	—	—	—	—
1DU	—	—	—	—	—
1DV	—	—	—	—	—

Terminal	Signal	Connected to	Test condition		Voltage (V)	inspection item
1DW	Fuel injection control (−)	Fuel injector No.4	(See Fuel injection control (-) signal.)			• Fuel injector No.4 • Related wiring harness
1DX	GND	Sensor shield	Switch ignition ON (engine off)		Approx. 0.31	• Related wiring harness
1DY	—	—	—		—	—
1DZ	—	—	—		—	—
1EA	Fuel injection control (−)	Fuel injector No.1	(See Fuel injection control (-) signal.)			• Fuel injector No.1 • Related wiring harness
1EB	GND	Sensor shield	Switch ignition ON (engine off)		Approx. 0.31	• Related wiring harness
1EC	—	—	—		—	—
1ED	—	—	—		—	—
1EE	Fuel injection control (+)	Fuel injector No.1	(See Fuel injection control (+) signal.)			• Fuel injector No.1 • Related wiring harness
1EF	Fuel injection control (+)	Fuel injector No.4	(See Fuel injection control (+) signal.)			• Fuel injector No.4 • Related wiring harness
1EG*2	Neutral position	Neutral switch No. 1	Shift lever is at neutral position		Below 1.0	• Neutral switch No.1 • Related wiring harness
			Shift lever is not at neutral position		B+	
1EH*2	Back-up light	Back-up light switch	Shift lever is at R position		Below 1.0	• Back-up light switch • Related wiring harness
			Shift lever is not at R position		B+	
1EI	Generator field coil control	Generator (terminal D)	(See Generator field coil control signal.)			• Generator • Related wiring harness
1EJ*2	Neutral switch No.2	Neutral switch No. 2	Switch ignition ON (engine off)	Neutral	Below 1.0	• Neutral switch No.2 • Related wiring harness
				Except above	B+	
2A	—	—	—		—	—
2B	—	—	—		—	—
2C	Blow-by heater relay	Blow-by heater relay	Switch ignition ON (engine off)		Approx. 12.09	• Blow-by heater relay • Related wiring harness
			Idle (after warm up)		Approx. 14.50	
2D	Blow-by heater relay	Blow-by heater relay	Switch ignition ON (engine off)		Approx. 0.013	• Blow-by heater relay • Related wiring harness
			Idle (after warm up)		Approx. 0.010	
2E	Check connector	Check connector	Switch ignition ON (engine off)		Approx. 12.07	• Check connector • Related wiring harness
2F	Sedimentor	Sedimentor switch	Switch ignition ON (engine off)		Approx. 12.07	• Sedimentor switch • Related wiring harness
2H	Ignition (IG1)	IG1 relay	Switch ignition ON (engine off)		Approx. 12.53	• IG1 relay • Related wiring harness
2I	GRU_DI	Glow control module	Switch ignition ON (engine off)		Approx. 11.90	• Glow control module • Related wiring harness
			Idle		Approx. 0.001	
2J	—	—	—		—	—
2K	Main relay control	Main relay	Switch ignition ON (engine off)		Approx. 0.980	• Main relay • Related wiring harness
2L	—	—	—		—	—
2M	—	—	—		—	—
2N	IAT (No.2)	IAT sensor No.2	Switch ignition ON (engine off)		Approx. 3.15	• IAT sensor No.2 • Related wiring harness
2O	Battery voltage	Battery	Switch ignition ON (engine off)		Approx. 12.39	• Related wiring harness
2P	DC-DC converter control	DC-DC converter	Switch ignition ON (engine off)		Approx. 0.003	• DC-DC converter • Related wiring harness
2Q	—	—	—		—	—
2R	—	—	—		—	—
2S	Battery voltage	Main relay	Switch ignition ON (engine off)		Approx. 12.32	• Related wiring harness
2T	Battery voltage	Main relay	Switch ignition ON (engine off)		Approx. 12.23	• Related wiring harness

Terminal	Signal	Connected to	Test condition		Voltage (V)	inspection item
2U	MAF	MAF sensor	Switch ignition ON (engine off)		Approx. 0.751	• MAF sensor • Related wiring harness
			Idle (after warm up)		1.085—1.235	
2V	GND	MAF sensor, IAT sensor No.1	Switch ignition ON (engine off)		Approx. 0.32	• Related wiring harness
2W	—	—	—		—	—
2X	GND	GND	Switch ignition ON (engine off)		Approx. 0.28	• Related wiring harness
2Y	IAT (No.1)	IAT sensor No.1	Switch ignition ON (engine off)		Approx. 2.39	• Related wiring harness
2Z	—	—	—		—	—
2AA	Brake (No.1)	Brake switch (No.1 signal)	Brake pedal released		Approx. 0.005	• Brake switch (No.1 signal) • Related wiring harness
			Brake pedal depressed		Approx. 11.68	
2AB	Brake (No.2)	Brake switch (No.2 signal)	Brake pedal released		Approx. 0.007	• Brake switch (No.2 signal) • Related wiring harness
			Brake pedal depressed		Approx. 11.77	
2AC	Constant voltage (Vref)	MAF sensor	Switch ignition ON (engine off)		Approx. 5.04	• Related wiring harness
2AD	GND	GND	Switch ignition ON (engine off)		Approx. 0.28	• Related wiring harness
2AE	GND	GND	Switch ignition ON (engine off)		Approx. 0.28	• Related wiring harness
2AF	GND	GND	Switch ignition ON (engine off)		Approx. 0.28	• Related wiring harness
2AG*2	CPP	CPP switch, start stop unit	Clutch pedal depressed		Below 1.0	• CPP switch • Start stop unit • Related wiring harness
			Clutch pedal released		B+	
2AH*2	GND	Clutch stroke sensor	Under any condition		Below 1.0	• Related wiring harness
2AI	Selector lever position*1	TCM, start stop unit	Selector lever position is not P or N position		M or R position: Approx. 11.67	• TCM • Start stop unit • Related wiring harness
					D position: Approx. 11.72	
			Selector lever position is P or N position		P position: Approx. 0.139	
					N position: Approx. 0.138	
	Starter interlock*2	Starter interlock switch, start stop unit	Clutch pedal depressed		Below 1.0	• Starter interlock switch • Start stop unit • Related wiring harness
			Clutch pedal released		B+	
2AJ*2	Clutch stroke sensor	Clutch stroke sensor	Switch ignition ON (engine off)	Clutch pedal released	Approx. 0.6	• Clutch stroke sensor • Related wiring harness
				Clutch pedal depressed	Approx. 4.5	
2AK	CAN_H	CAN system related modules	Because this terminal is for CAN, integrity determination by terminal voltage is not possible.			• Related wiring harness
2AL	CAN_L	CAN system related modules	Because this terminal is for CAN, integrity determination by terminal voltage is not possible.			• Related wiring harness

Terminal	Signal	Connected to	Test condition		Voltage (V)	inspection item
2AM	Constant voltage (Vref)	APP sensor No.1	Switch ignition ON (engine off)		Approx. 5.04	• Related wiring harness
2AN	APP (No.1)	APP sensor No.1	Switch ignition ON (engine off)	Accelerator pedal released	Approx. 0.797	• APP sensor No.1 • Related wiring harness
				Accelerator pedal depressed	Approx. 3.99	
2AO	GND	APP sensor No.1	Under any condition		Approx. 0.032	• Related wiring harness
2AP	—	—	—		—	—
2AQ	—	—	—		—	—
2AR	Constant voltage (Vref)	APP sensor No.2	Switch ignition ON (engine off)		Approx. 5.03	• Related wiring harness
2AS	APP (No.2)	APP sensor No.2	Switch ignition ON (engine off)	Accelerator pedal released	Approx. 0.423	• APP sensor No.2 • Related wiring harness
				Accelerator pedal depressed	Approx. 2.01	
2AT	GND	APP sensor No.2	Switch ignition ON (engine off)		Approx. 0.32	• Related wiring harness
2AU	—	—	—		—	—
2AV	GND	IAT sensor No.2	Switch ignition ON (engine off)		Approx. 0.31	• Related wiring harness
2AW	Fan control	Fan control module No.2	Switch ignition ON (engine off)		Approx. 0.32	• Fan control module No.2 • Related wiring harness
2AX*3	Ambient temperature	Ambient temperature sensor	Switch ignition ON (engine off)		Approx. 2.46	• Ambient temperature sensor • Related wiring harness
2AY*3	GND	Ambient temperature sensor	Switch ignition ON (engine off)		Approx. 0.031	• Related wiring harness
2AZ	—	—	—		—	—
2BA	GRU_ST	Glow control module	Switch ignition ON (engine off)		Approx. 11.25	• Glow control module • Related wiring harness
			Idle (after warm up)		Approx. 13.65	
2BB	Constant voltage (Vref)	Power brake unit vacuum sensor, clutch stroke sensor*2, refrigerant pressure sensor*3	Switch ignition ON (engine off)		Approx. 5.03	• Related wiring harness
2BC	Power brake unit vacuum	Power brake unit vacuum sensor	Switch ignition ON (engine off)	Brake pedal depressed (10 times)	Approx. 3.83	• Power brake unit vacuum sensor • Related wiring harness
			Idle (after warm up)	Brake pedal released	0.31— 0.69	
2BD	GND	Power brake unit vacuum sensor, refrigerant pressure sensor*3	Switch ignition ON (engine off)		Approx. 0.32	• Related wiring harness
2BE*3	A/C cut-off control	A/C relay	A/C relay off		Approx. 12.08	• A/C relay • Related wiring harness
			A/C relay on		Approx. 0.301	

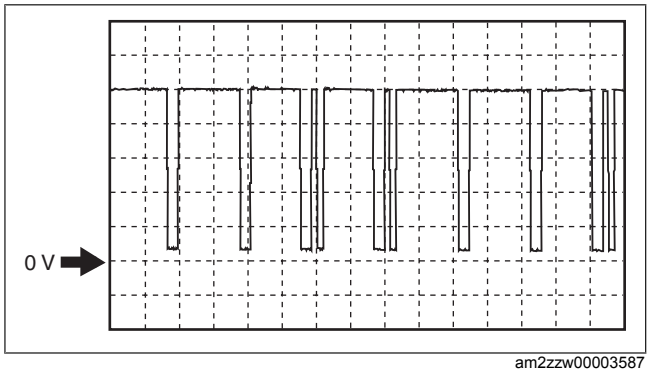
Terminal	Signal	Connected to	Test condition		Voltage (V)	inspection item
2BF	Starter cut-off control	Starter relay, start stop unit	Switch ignition ON (engine off)	**MTX** • Clutch pedal released	B+	• Starter relay • Start stop unit • Related wiring harness
				ATX • Selector lever position is not P or N position	R position: Approx. 11.11	
					D position: Approx. 11.16	
					M position: Approx. 11.18	
				MTX • Clutch pedal depressed	Below 1.0	
				ATX • Selector lever position is P or N position	P position: Approx. 11.16	
					N position: Approx. 11.15	
2BG	Fan control	Fan control module No.1	Switch ignition ON (engine off)		Approx. 0.32	• Fan control module No.1 • Related wiring harness
2BH*3	Refrigerant pressure	Refrigerant pressure sensor	Switch ignition ON (engine off)	A/C switch off	Approx. 0.771	• Refrigerant pressure sensor • Related wiring harness
			Idle (after warm up) or switch ignition ON (engine off)		1.480—1.765	

*1 : ATX
*2 : MTX
*3 : With air conditioner
*4 : Intake stroke EGR using double exhaust valve actuation system

Inspection Using An Oscilloscope (Reference)
CMP (G+) signal
PCM terminals
- 1A(+)—body ground(–)

Oscilloscope setting
- 1 V/DIV (Y), 20 ms/DIV (X), DC range

Vehicle condition
- Idle (after warm up)



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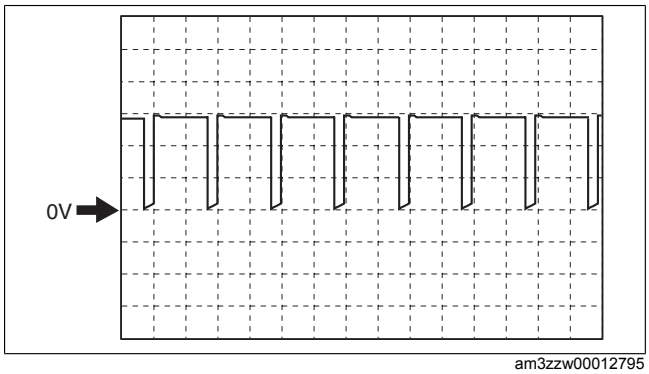
Intake shutter valve (ISV-) signal
PCM terminals
- 1AS(+)—body ground(–)

Oscilloscope setting
- 5 V/DIV (Y), 1 ms/DIV (X), DC range

Vehicle condition
- Idle (after warm up)



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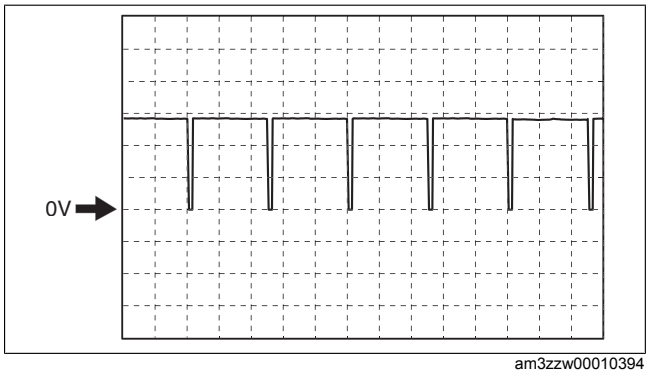
EGR cooler bypass valve (-) (EGR-) signal
PCM terminals
- 1BC(+)—body ground(–)

Oscilloscope setting
- 5 V/DIV (Y), 400 µs/DIV (X), DC range

Vehicle condition
- Idle after warm up

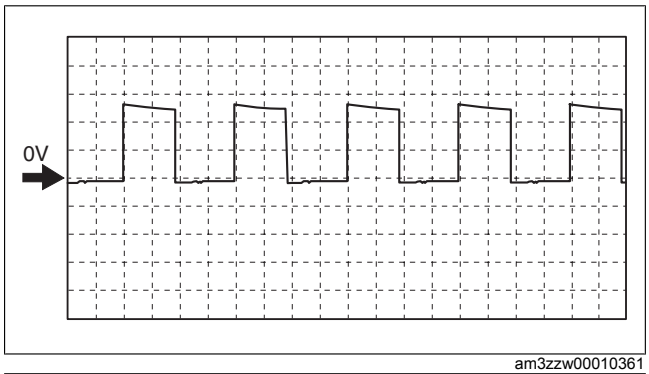


am3zzw00010394

Suction control valve signal
PCM terminals
- 1BY(+)—body ground(–)

Oscilloscope setting
- 5 V/DIV (Y), 1 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up

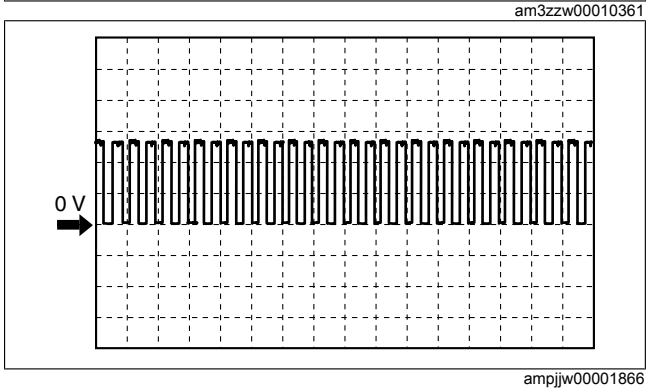


am3zzw00010361

PCM terminals
- 1CC(+)—body ground(–)

Oscilloscope setting
- 5 V/DIV (Y), 10 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up

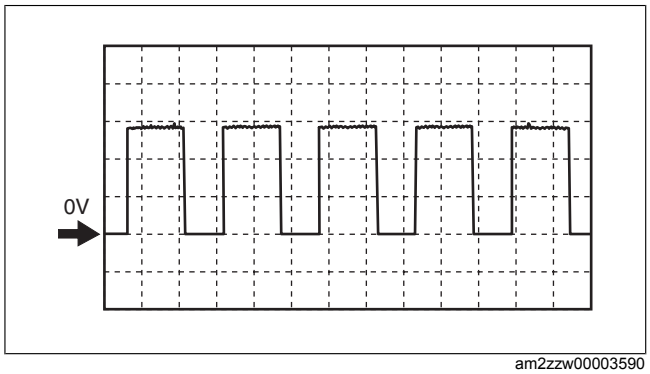


ampjjw00001866

A/F sensor heater control signal
PCM terminals
- 1CG(+)—body ground(–)

Oscilloscope setting
- 5 V/DIV (Y), 20 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up

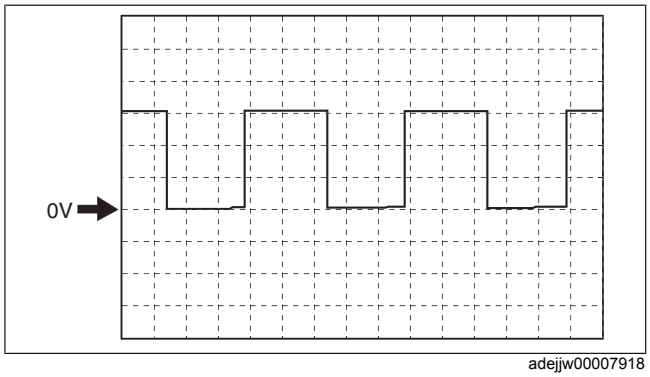


am2zzw00003590

Engine oil control signal
PCM terminals
- 1CH(+)—body ground(–)

Oscilloscope setting
- 5 V/DIV (Y), 1 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up

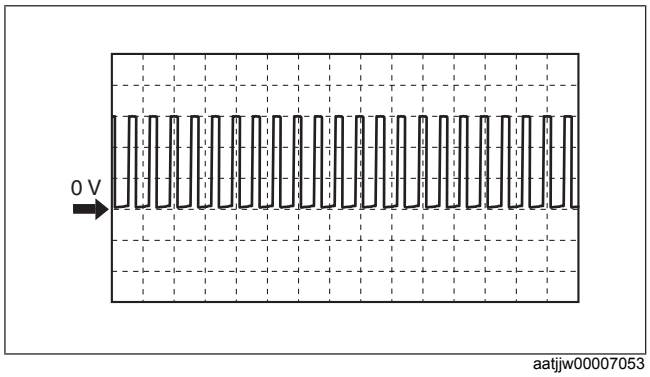


adejjw00007918

Wastegate solenoid valve signal
PCM terminals
- 1CL(+)—body ground(–)

Oscilloscope setting
- 5 V/DIV (Y), 4 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up

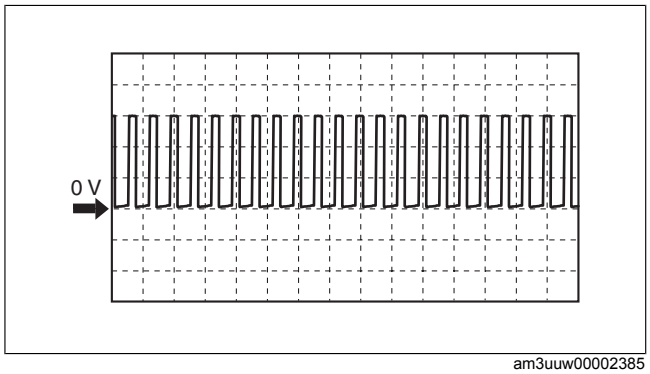


aatjjw00007053

Regulating solenoid valve signal
PCM terminals
- 1CP(+)—body ground(–)

Oscilloscope setting
- 5 V/DIV (Y), 5 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up

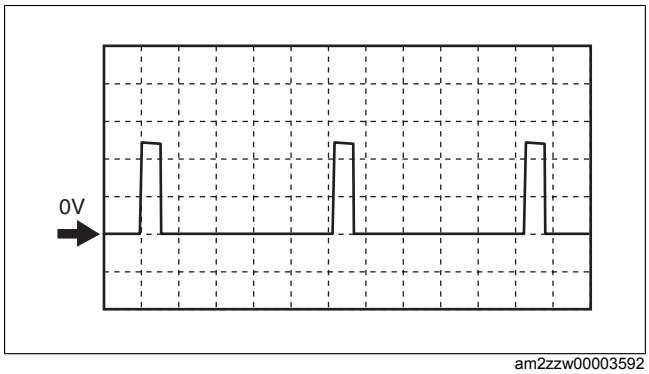


am3uuw00002385

Fuel injection control (-) signal
PCM terminals
- Fuel injection No.1: 1EA(+)—body ground(–)
- Fuel injection No.2: 1CW(+)—body ground(–)
- Fuel injection No.3: 1DA(+)—body ground(–)
- Fuel injection No.4: 1DW(+)—body ground(–)

Oscilloscope setting
- 50 V/DIV (Y), 300 µs/DIV (X), DC range

Vehicle condition
- Idle after warm up

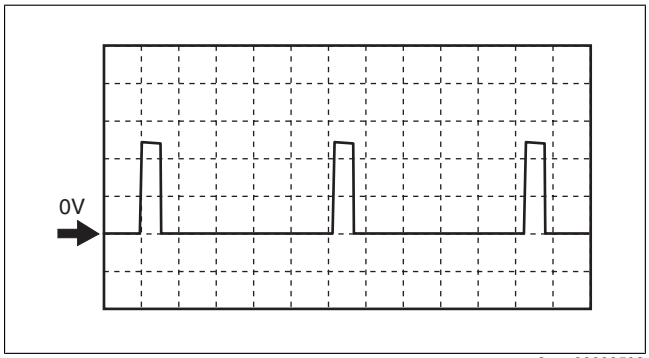


am2zzw00003592

Fuel injection control (+) signal
PCM terminals
- Fuel injection No.1: 1EE(+)—body ground(–)
- Fuel injection No.2: 1CT(+)—body ground(–)
- Fuel injection No.3: 1CS(+)—body ground(–)
- Fuel injection No.4: 1EF(+)—body ground(–)

Oscilloscope setting
- 50 V/DIV (Y), 300 µs/DIV (X), DC range

Vehicle condition
- Idle after warm up

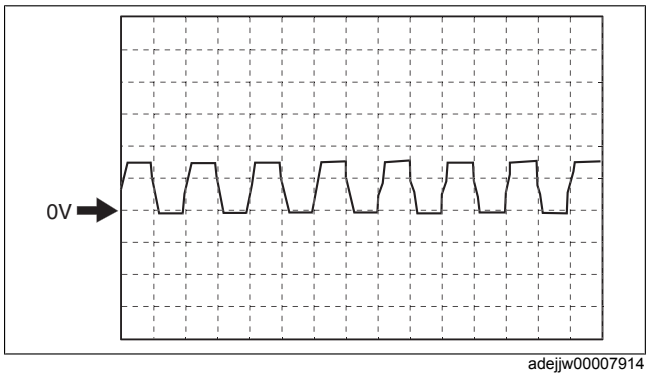


am2zzw00003592

Generator output voltage signal
PCM terminals
- 1D(+)—body ground(–)

Oscilloscope setting
- 5 V/DIV (Y), 2 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up

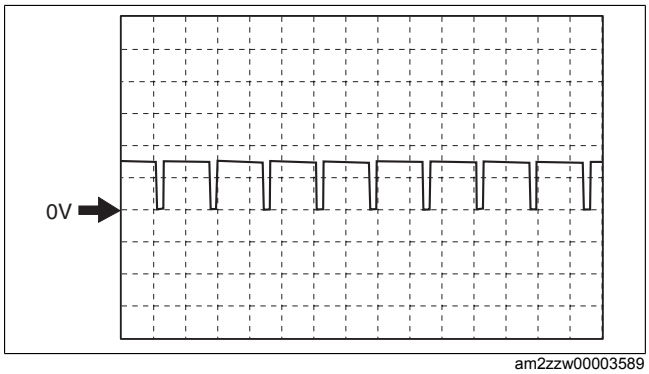


adejjw00007914

CKP (NE+) signal
PCM terminals
- 1E(+)—body ground(–)

Oscilloscope setting
- 3 V/DIV (Y), 1 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up

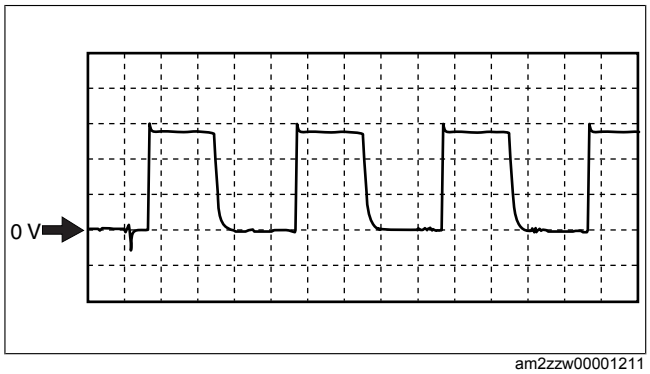


am2zzw00003589

Generator field coil control signal
PCM terminals
- 1EI(+)—body ground(–)

Oscilloscope setting
- 500 mV/DIV (Y), 1 ms/DIV (X), DC range

Vehicle condition
- Idle after warm up



am2zzw00001211

Using the M-MDS

Note
- PIDs for the following parts are not available on this model. Go to the appropriate part inspection page.
  - — CMP sensor (See CAMSHAFT POSITION (CMP) SENSOR INSPECTION [SKYACTIV-D 2.2].)
  - — Main relay (See RELAY INSPECTION.)

1. Connect the M-MDS to the DLC-2.
2. Switch the ignition ON (engine off).
3. Measure the PID value.
   - If PID value is not within the specification, follow the instructions in Action column.

Note
- The PID/DATA MONITOR function monitors the calculated value of the input/output signals in the PCM. Therefore, an output device malfunction is not directly indicated as a malfunction of the monitored value for the output device. If a monitored value of an output device is out of specification, inspect the monitored value of the input device related to the output control.
- The simulation items that are used in the ENGINE CONTROL SYSTEM OPERATION INSPECTION are as follows.
  - — ACCS, ARPMDES, COMP_BPV, EGR_C_BP, EGRP, FAN_DUTY, FAN_DUTY2, INJ_1, INJ_2, INJ_3, INJ_4, ISV_DSD, REGV, WGV

PID/DATA monitor item table

—: Not applicable

Item	Definition	Unit/Condition	Condition/Specification (Reference)
AC_PRES	Refrigerant pressure	KPa {MPa}, mBar {Bar}, psi, in H20	**Idle** • A/C switch on: Approx. 1.04 MPa {10.6 kgf/cm^2, 151 psi}
AC_REQ	A/C request signal	Off/On	• A/C switch off: Off • A/C switch on: On
ACCS	A/C relay	Off/On	• A/C relay is off: Off • A/C relay is on: On
ALTT V	Generator output voltage	V	• Switch ignition ON (engine off): 0 V • Idle: Approx. 10.75 V • Racing (engine speed 2,000 rpm): Approx. 10.75 V
AMB_TEMP	Ambient air temperature	°C, °F	• Displays ambient air temperature
APP1	APP sensor No.1 voltage	V	**Switch ignition ON (engine off)** • Accelerator pedal released: Approx. 0.78 V • Accelerator pedal depressed: Approx. 3.93 V
	APP sensor No.1	%	**Switch ignition ON (engine off)** • Accelerator pedal released: Approx. 0% • Accelerator pedal depressed: Approx. 100%

Item	Definition	Unit/Condition	Condition/Specification (Reference)
APP2	APP sensor No.2 voltage	V	**Switch ignition ON (engine off)** • Accelerator pedal released: Approx. 0.39 V • Accelerator pedal depressed: Approx. 1.97 V
	APP sensor No.2	%	**Switch ignition ON (engine off)** • Accelerator pedal released: Approx. 0% • Accelerator pedal depressed: Approx. 100%
ARPMDES	Target engine speed	RPM	• Displays target engine speed
BARO	Barometric pressure	KPa {MPa}, mBar {Bar}, psi, in H20	• Displays BARO
BATT_CUR	Battery current	A	• Displays battery charge/discharge current value
BATT_DAY	Number of days elapsed since current sensor initialization	—	• Displays vehicle battery days in service
BATT_RES	Battery internal resistance (estimated)	—	• Displays battery inferred internal resistance
BATT_SOC	Battery charge condition (estimated)	%	• Displays battery estimated state of charge
BATT_TEMP	Battery temperature	°C, °F	• Displays battery fluid temperature
BATT_V	Battery voltage	V	• Displays battery voltage
BBP	Power brake unit vacuum sensor	KPa {MPa}, mBar {Bar}, psi, in H20	• Switch ignition ON (engine off) and depress the brake pedal 10 times: Approx. 97.13 kPa {0.9904 kgf/cm^2, 14.09 psi} • Idle: Approx. 7.6 kPa {0.077 kgf/cm^2, 1.1 psi} • The instant the brake pedal is depressed and released while idling: Approx. 47 kPa {0.48 kgf/cm^2, 6.8 psi}
BFP	Brake fluid pressure	KPa {MPa}, mBar {Bar}, psi, in H20	**Idle** • Brake pedal released: 0 kPa {0 kgf/cm^2, 0 psi} • Brake pedal depressed: Approx. 12 kPa {0.12 kgf/cm^2, 1.7 psi}
BOO	Brake switch (No.1 signal)	High/Low	• Brake pedal released: Low • Brake pedal depressed: High
BPA	Brake switch (No.2 signal)	High/Low	• Brake pedal released: Low • Brake pedal depressed: High
CACT12	Boost air temperature	°C, °F	• Displays boost air temperature
CC_DIFP_WOA	Actual difference in phase between camshaft and crankshaft (no correction)	° (deg)	• Displays actual difference in phase between camshaft and crankshaft
CLR_DIST	Distance after DTC cleared	—	• Displays mileage after DTC cleared
CLU_CUT_SW*1	Starter interlock switch	Off/On	• Starter interlock switch off: Off • Starter interlock switch on: On
CLU_SW*1	CPP switch	Off/On	• Clutch pedal released: Off • Clutch pedal depressed: On
COMP_BPV	Compressor bypass valve	Off/On	• Racing (engine speed above 3,000 rpm): On
CPP*1	Clutch pedal position	%	• Displays clutch pedal position
CPP/PNP*1	Shift lever position	Off/On	• Other than neutral: Off • Neutral: On
DPF_LMP	Diesel particulate filter indicator light	Off/On	• Diesel particulate filter indicator light not illuminated: Off • Diesel particulate filter indicator light illuminated: On
DPF_LMP_CNT	Number of times diesel particulate filter indicator light illuminated	—	• Displays number of times diesel particulate filter indicator light illuminated

Item	Definition	Unit/Condition	Condition/Specification (Reference)
DPF_REG_CNT	Diesel particulate filter regeneration count	—	• Displays diesel particulate filter regeneration count
ECT	Engine coolant temperature	°C, °F	• Displays ECT
EGR_C_BP	EGR cooler bypass valve	%	• Displays EGR cooler bypass valve position
EGR_C_BP_ACT	Actual measured EGR cooler bypass valve opening angle	%	**ECT: above 70 °C {158 °F}** • Idle: Approx. 0% (after 20—30 s have elapsed since start the engine) • Racing (engine speed 2,000 rpm): 0%
EGR_LRN	EGR valve learning value (closed condition)	V	• Displays EGR valve fully-closed learning value
EGRP	EGR valve	%	• Displays 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%
EOP	Engine oil pressure	KPa {MPa}, mBar {Bar}, psi, in H20	• Switch ignition ON (engine off): Approx. −1 kPa {−0.01 kgf/cm^2, −0.1 psi} • Idle: Approx. 184 kPa {1.88 kgf/cm^2, 26.7 psi} • Racing (engine speed 4,000 rpm): Approx. 366 kPa {3.73 kgf/cm^2, 53.1 psi}
EOT	Engine oil temperature	°C, °F	• Displays engine oil temperature
EXHPRES1	Exhaust gas pressure (No.1)	KPa {MPa}, mBar {Bar}, psi, in H20	• Idle: Approx. 100 kPa {1.02 kgf/cm^2, 14.5 psi} • Racing (engine speed above 4,000 rpm): Approx. 193 kPa {1.97 kgf/cm^2, 28.0 psi} • Racing (engine speed above 5,000 rpm): Approx. 266 kPa {2.71 kgf/cm^2, 38.6 psi}
EXHPRESS_DIF	Exhaust gas pressure (No.2)	KPa {MPa}, mBar {Bar}, psi, in H20	• Displays difference in pressure between exhaust gas pressure before and after passing the diesel particulate filter
EXHTEMP	Exhaust gas temperature (No.1)	°C, °F	• Displays exhaust gas temperature
EXHTEMP1	Exhaust gas temperature (No.2)	°C, °F	• Displays exhaust gas temperature
EXHTEMP2	Exhaust gas temperature (No.3)	°C, °F	• Displays exhaust gas temperature
FAN_DUTY	Fan control module No.1	%	**Idle** • ECT is below 100 °C {212 °F}: 0% • ECT is above 100 °C {212 °F}: Approx. 34% (after a certain period has elapsed from when ECT reaches 100 °C {212 °F})
FAN_DUTY2	Fan control module No.2	%	**Idle** • ECT is below 100 °C {212 °F}: 0% • ECT is above 100 °C {212 °F}: Approx. 34% (after a certain period has elapsed from when ECT reaches 100 °C {212 °F})
FI_LRN_01	Fuel injection learning value (fuel injector No.1 at 35 MPa {357 kgf/cm^2, 5076 psi})	—(μs)	• Displays fuel injection learning value (fuel injector No.1 at 35 MPa {357 kgf/cm^2, 5076 psi})
FI_LRN_02	Fuel injection learning value (fuel injector No.2 at 35 MPa {357 kgf/cm^2, 5076 psi})	—(μs)	• Displays fuel injection learning value (fuel injector No.2 at 35 MPa {357 kgf/cm^2, 5076 psi})
FI_LRN_03	Fuel injection learning value (fuel injector No.3 at 35 MPa {357 kgf/cm^2, 5076 psi})	—(μs)	• Displays fuel injection learning value (fuel injector No.3 at 35 MPa {357 kgf/cm^2, 5076 psi})

Item	Definition	Unit/Condition	Condition/Specification (Reference)
FI_LRN_04	Fuel injection learning value (fuel injector No.4 at 35 MPa {357 kgf/cm^2, 5076 psi})	—(μs)	• Displays fuel injection learning value (fuel injector No.4 at 35 MPa {357 kgf/cm^2, 5076 psi})
FI_LRN_11	Fuel injection learning value (fuel injector No.1 at 65 MPa {663 kgf/cm^2, 9427 psi})	—(μs)	• Displays fuel injection learning value (fuel injector No.1 at 65 MPa {663 kgf/cm^2, 9427 psi})
FI_LRN_12	Fuel injection learning value (fuel injector No.2 at 65 MPa {663 kgf/cm^2, 9427 psi})	—(μs)	• Displays fuel injection learning value (fuel injector No.2 at 65 MPa {663 kgf/cm^2, 9427 psi})
FI_LRN_13	Fuel injection learning value (fuel injector No.3 at 65 MPa {663 kgf/cm^2, 9427 psi})	—(μs)	• Displays fuel injection learning value (fuel injector No.3 at 65 MPa {663 kgf/cm^2, 9427 psi})
FI_LRN_14	Fuel injection learning value (fuel injector No.4 at 65 MPa {663 kgf/cm^2, 9427 psi})	—(μs)	• Displays fuel injection learning value (fuel injector No.4 at 65 MPa {663 kgf/cm^2, 9427 psi})
FI_LRN_21	Fuel injection learning value (fuel injector No.1 at 100 MPa {1020 kgf/cm^2, 14504 psi})	—(μs)	• Displays fuel injection learning value (fuel injector No.1 at 100 MPa {1020 kgf/cm^2, 14504 psi})
FI_LRN_22	Fuel injection learning value (fuel injector No.2 at 100 MPa {1020 kgf/cm^2, 14504 psi})	—(μs)	• Displays fuel injection learning value (fuel injector No.2 at 100 MPa {1020 kgf/cm^2, 14504 psi})
FI_LRN_23	Fuel injection learning value (fuel injector No.3 at 100 MPa {1020 kgf/cm^2, 14504 psi})	—(μs)	• Displays fuel injection learning value (fuel injector No.3 at 100 MPa {1020 kgf/cm^2, 14504 psi})
FI_LRN_24	Fuel injection learning value (fuel injector No.4 at 100 MPa {1020 kgf/cm^2, 14504 psi})	—(μs)	• Displays fuel injection learning value (fuel injector No.4 at 100 MPa {1020 kgf/cm^2, 14504 psi})
FI_LRN_31	Fuel injection learning value (fuel injector No.1 at 140 MPa {1428 kgf/cm^2, 20305 psi})	—(μs)	• Displays fuel injection learning value (fuel injector No.1 at 140 MPa {1428 kgf/cm^2, 20305 psi})
FI_LRN_32	Fuel injection learning value (fuel injector No.2 at 140 MPa {1428 kgf/cm^2, 20305 psi})	—(μs)	• Displays fuel injection learning value (fuel injector No.2 at 140 MPa {1428 kgf/cm^2, 20305 psi})
FI_LRN_33	Fuel injection learning value (fuel injector No.3 at 140 MPa {1428 kgf/cm^2, 20305 psi})	—(μs)	• Displays fuel injection learning value (fuel injector No.3 at 140 MPa {1428 kgf/cm^2, 20305 psi})
FI_LRN_34	Fuel injection learning value (fuel injector No.4 at 140 MPa {1428 kgf/cm^2, 20305 psi})	—(μs)	• Displays fuel injection learning value (fuel injector No.4 at 140 MPa {1428 kgf/cm^2, 20305 psi})
FI_LRN_41	Fuel injection learning value (fuel injector No.1 at 197 MPa {2009 kgf/cm^2, 28572 psi})	—(μs)	• Displays fuel injection learning value (fuel injector No.1 at 197 MPa {2009 kgf/cm^2, 28572 psi})
FI_LRN_42	Fuel injection learning value (fuel injector No.2 at 197 MPa {2009 kgf/cm^2, 28572 psi})	—(μs)	• Displays fuel injection learning value (fuel injector No.2 at 197 MPa {2009 kgf/cm^2, 28572 psi})
FI_LRN_43	Fuel injection learning value (fuel injector No.3 at 197 MPa {2009 kgf/cm^2, 28572 psi})	—(μs)	• Displays fuel injection learning value (fuel injector No.3 at 197 MPa {2009 kgf/cm^2, 28572 psi})
FI_LRN_44	Fuel injection learning value (fuel injector No.4 at 197 MPa {2009 kgf/cm^2, 28572 psi})	—(μs)	• Displays fuel injection learning value (fuel injector No.4 at 197 MPa {2009 kgf/cm^2, 28572 psi})
FIA_DSD	Supply pump flow desired value	—(mm^3/Stroke)	• Displays supply pump flow desired value
FIP_FL	Supply pump flow control current	A	• Switch ignition ON (engine off): 0 A • Idle: Approx. 1.87 A • Racing (engine speed above 4,000 rpm): Approx. 1.75 A

Item	Definition	Unit/Condition	Condition/Specification (Reference)
FIP_SCV	Suction control valve	A	• Switch ignition ON (engine off): Approx. 44 mA • Idle: Approx. 1.91 A • Racing (engine speed above 4,000 rpm): Approx. 1.79 A
FP_DUTY	Supply pump duty cycle	%	• Switch ignition ON (engine off): 0% • Idle: Approx. 50% • Racing (engine speed above 4,000 rpm): Approx. 46%
FP_RCV	Fuel pressure relief valve operation time	—(ms)	• Switch ignition ON (engine off): 0 • Idle: 0 • Racing (engine speed above 4,000 rpm): 0
FRP	Common rail pressure	KPa {MPa}, mBar {Bar}, psi, in H20	• Switch ignition ON (engine off): 0—130 kPa {0—1.32 kgf/cm^2, 0—18.8 psi} • Idle: Approx. 40 MPa {408 kgf/cm^2, 5802 psi} • Racing (engine speed above 4,000 rpm): Approx. 80 MPa {816 kgf/cm^2, 11603 psi}
FRP_DSD	Common rail pressure desired value	KPa {MPa}, mBar {Bar}, psi, in H20	• Displays common rail pressure desired value
FRT	Fuel temperature inside the fuel supply line	°C, °F	• Displays fuel temperature inside the fuel supply line
GPC_DUTY	Glow plug coil duty cycle	%	• Switch ignition ON (engine off): 0% **Idle** • ECT is 36 °C {86 °F}: Approx. 51% • After a certain period has elapsed from when ECT exceeds 40 °C {104 °F}: 0%
HTR11	A/F sensor heater control	%	• Switch ignition ON (engine off): 0% • Idle: Approx. 10.49% • Racing (engine speed above 4,000 rpm): Approx. 50%
IAT	Intake air temperature (No.1)	°C, °F	• Displays intake air temperature (No.1)
IAT13	Intake air temperature (No.2)	°C, °F	• Displays intake air temperature (No.2)
INGEAR*2	Gears are engaged	Off/On	• Selector lever at P or N position: Off • Selector lever at R, D or M position: On
INJ_AL_DIS	Distance travelled when automatic fuel injection amount learning	km, ft, mi	• Displays distance travelled when automatic fuel injection amount learning
INJ_AL_FRQ	Number of times automatic fuel injection amount learning is completed	—	• Displays number of times automatic fuel injection amount learning is completed
INJ_WL_DIS	Distance travelled when fuel injection amount learning at service factory	km, ft, mi	• Displays distance travelled when fuel injection amount learning at service factory
INJ_WL_FRQ	Number of times fuel injection amount learning is completed at service factory	—	• Displays number of times fuel injection amount learning is completed at service factory
INJ1_CMP	Fuel injector No.1 correction value	—(mm^3/Stroke)	• Switch ignition ON (engine off): Approx. −0.2 • Idle: Approx. −0.03 • Racing (engine speed above 4,000 rpm): 0
INJ2_CMP	Fuel injector No.2 correction value	—(mm^3/Stroke)	• Switch ignition ON (engine off): Approx. 0.27 • Idle: Approx. −0.06 • Racing (engine speed above 4,000 rpm): 0
INJ3_CMP	Fuel injector No.3 correction value	—(mm^3/Stroke)	• Switch ignition ON (engine off): Approx. 0.01 • Idle: Approx. 0.03 • Racing (engine speed above 4,000 rpm): 0

Item	Definition	Unit/Condition	Condition/Specification (Reference)
INJ4_CMP	Fuel injector No.4 correction value	—(mm^3/Stroke)	• Switch ignition ON (engine off): Approx. −0.01 • Idle: Approx. 0.03 • Racing (engine speed above 4,000 rpm): 0
ISV_ACT	Intake shutter valve control actual value	° (deg)	• Switch 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 intake shutter valve control desired value
ISV_LRN_C	Intake shutter valve learning value (closed)	° (deg)	• Displays intake shutter valve learning value (closed)
ISV_POS	Intake shutter valve	%	• Switch ignition ON (engine off): Approx. 88.23% • Idle: Approx. 4.31% • Racing (engine speed above 4,000 rpm): Approx. 82.35%
LOAD	Engine load	%	• Idle: Approx. 2.35% • Racing (engine speed above 4,000 rpm): Approx. 2.35% • Racing (engine speed above 5,000 rpm): Approx. 80% or more
M_GEAR*1	Manual gear position	Neutral/1st gear/2nd gear/ 3rd gear/4th gear/5th gear/ 6th gear/ Reverse/ Undefined/Auto/ In_Progress/ YSF/Error	• Displays manual gear position
MAF	Mass air flow	g/Sec	• Switch ignition ON (engine off): Approx. 1.00 g/s {0.132 lb/min} • Idle: Approx. 5.47 g/s {0.724 lb/min} • Racing (engine speed 2,000 rpm): Approx. 13.84 g/s {1.831 lb/min} • Racing (engine speed 4,000 rpm): Approx. 85.13 g/s {11.26 lb/min}
MAP	Manifold absolute pressure (No.2)	KPa {MPa}, mBar {Bar}, psi, in H20	• Displays manifold absolute pressure (No.2)
MIL	Check engine light	Off/On	• Check engine light not illuminated: Off • Check engine light illuminated: On
MIL_DIS	Travelled distance since check engine light illuminated	km, ft, mi	• Displays travelled distance since check engine light illuminated
O2	Oxygen concentration in exhaust gas	%	• Switch ignition ON (engine off): 0% • Idle: 0% • Racing (engine speed above 4,000 rpm): Approx. 18.2% • Deceleration fuel cut: Approx. 23.2%
O2S_IMP	A/F sensor element impedance	ohm	• Displays A/F sensor element impedance
O2S11	A/F sensor	V	• Switch ignition ON (engine off): Approx. 2.2 V • Idle: Approx. 2.2 V • Racing (engine speed above 4,000 rpm): Approx. 3.53 V • Deceleration fuel cut: Approx. 3.9 V

Item	Definition	Unit/Condition	Condition/Specification (Reference)
O2S11_CAL	A/F sensor calibration value	—	• Switch ignition ON (engine off): Approx. 1.09 • Idle: Approx. 1.09 • Racing (engine speed above 4,000 rpm): Approx. 1.09 • Deceleration fuel cut: Approx. 1.09
O2S11_MODE	A/F sensor activation status	—	• Switch ignition ON (engine off): 0 • Idle: 0 • Racing (engine speed above 4,000 rpm): 3 • Deceleration fuel cut: 3
OIL_DIL	Engine oil dilution amount	kg, lb	• Displays engine oil dilution amount
OIL_P_DUTY	Engine oil pressure control circuit duty cycle	%	• Switch ignition ON (engine off): 0% • Idle: Approx. 55% • Racing (engine speed above 4,000 rpm): 0%
OILCHG_DIS	Distance from the last engine oil change	km, ft, mi	• Displays distance from the last engine oil change
PCVHC	Blow-by heater control	%	**ECT: above 90 °C {194 °F}** • Switch ignition ON (engine off): 0% • Idle: 0%
PM_ACC	PM accumulation amount	—(g/l)	• Displays PM accumulation amount
PM_ACC_DSD	PM accumulation amount desired	—(g/l)	• Displays PM accumulation amount desired
PM_GEN	PM generation amount	—(g/l)	• Displays PM generation amount
PN_SW*2	Park/Neutral position determination	Open/Closed	• Selector lever at R, D or M position: Open • Selector lever at P or N position: Closed
REG_DIS	Distance since last diesel particulate filter regeneration	km, ft, mi	• Displays distance since last diesel particulate filter regeneration
REGV	Regulating valve	%	• Displays regulating valve position
REGVP	Regulating valve position sensor	%	• Idle: Approx. 16.47% • Racing (engine speed approx 3,500 rpm): Approx. 41.17%
REGVP_DSD	Regulating valve position desired value	%	• Displays distance since last diesel particulate filter regeneration
REV_SW	Reverse position determination	Off/On	• Displays reverse position
RPM	Engine speed	RPM	• Displays engine speed
SED_SW	Sedimentor switch	Off/On	• There is no water in sedimentor: Off • There is water in sedimentor: On
TB_LRN_FRQ	Frequency of completed turbocharger learning	—	• Displays frequency of completed turbocharger learning
TCA_CINP	Manifold absolute pressure (No.1)	KPa {MPa}, mBar {Bar}, psi, in H20	• Idle: Approx. 12 kPa {0.12 kgf/cm^2, 1.7 psi} • Racing (engine speed above 4,000 rpm): Approx. 17 kPa {0.17 kgf/cm^2, 2.5 psi} • Racing (engine speed above 5,000 rpm): Approx. 21 kPa {0.21 kgf/cm^2, 3.0 psi}
VPWR	Battery positive voltage	V	• Switch ignition ON (engine off): Approx. 12.78 V • Idle: Approx. 13.78 V
VSS	Vehicle speed	KPH, MPH	• Displays vehicle speed
WGV	Wastegate solenoid valve	%	• Displays wastegate solenoid valve position
WT_LEV_CNT	Number of times sedimentor switch operates	—	• Displays number of times sedimentor switch operates

*1 : MTX
*2 : ATX