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2010 MAZDA 3 MPS / MAZDASPEED3 OEM Service and Repair Workshop Manual

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Terminal	Signal	Connected to	Test condition	Voltage (V)	inspection item
1H	A/F (+)	A/F sensor	Idle (after warm up)	Approx. 2.18	• 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 the ignition ON (engine off)	Approx. 5.03	• Related wiring harness
1K	Constant voltage (Vref)	CMP sensor	Switch the ignition ON (engine off)	Approx. 5.03	• Related wiring harness
1L	GND	Engine oil level sensor	Switch ignition ON (engine off)	Below 1.0	• Related wiring harness
1M	Constant voltage (Vref)	Fuel pressure sensor (in fuel injector No.1)	Switch ignition ON (engine off)	Approx. 5.03	• Related wiring harness
1N	Constant voltage (Vref)	Fuel pressure sensor (in fuel injector No.4)	Switch ignition ON (engine off)	Approx. 5.03	• Related wiring harness
1O	−	−	−	−	−
1P	LIN	Fuel temperature sensor (in fuel injector No.3)	Because this terminal is for communication, integrity determination using terminal voltage inspection is not possible.		• Related wiring harness
1Q	−	−	−	−	−
1R	GND	Fuel pressure sensor (in fuel injector No.1)	Switch ignition ON (engine off)	Below 1.0	• Related wiring harness
1S	GND	Fuel pressure sensor (in fuel injector No.4)	Switch ignition ON (engine off)	Below 1.0	• Related wiring harness
1T	LIN	Fuel temperature sensor (in fuel injector No.1)	Because this terminal is for communication, integrity determination using terminal voltage inspection is not possible.		• Related wiring harness
1U	LIN	Fuel temperature sensor (in fuel injector No.4)	Because this terminal is for communication, integrity determination using terminal voltage inspection is not possible.		• Related wiring harness
1V	LIN	Fuel temperature sensor (in fuel injector No.2)	Because this terminal is for communication, integrity determination using terminal voltage inspection is not possible.		• Related wiring harness
1W	−	−	−	−	−
1X	GND	ECT sensor No.2	Switch the ignition ON (engine off)	Below 1.0	• Related wiring harness
1Y	CAN_2L	CAN system related modules	Because this terminal is for CAN, good/no good judgment by terminal voltage is not possible.		• Related wiring harness
1Z	Exhaust gas pressure	Exhaust gas pressure sensor No.2	Switch the ignition ON (engine off)	Approx. 0.525	• Exhaust gas pressure sensor No.2 • Related wiring harness
			Idle (after warm up)	Approx. 0.57	
1AA	GND	Sensor shield	Switch the ignition ON (engine off)	Below 1.0	• Related wiring harness
1AB	EGR temperature	EGR temperature sensor	Switch the ignition ON (engine off)	Approx. 5.03	• EGR temperature sensor • Related wiring harness
1AC	GND	Exhaust gas temperature sensor No.1	Switch the ignition ON (engine off)	Below 1.0	• Related wiring harness

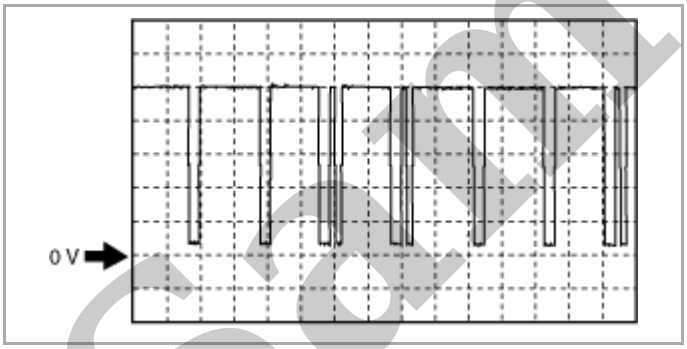
Terminal	Signal	Connected to	Test condition	Voltage (V)	inspection item
1BS	GND	Exhaust gas temperature sensor No.3	Under any condition	Below 1.0	• Related wiring harness
1BT	–	–	–	–	–
1BU	–	–	–	–	–
1BV	Constant voltage (Vref)	Fuel pressure sensor (in fuel injector No.3)	Switch the ignition ON (engine off)	Approx. 5.03	• Related wiring harness
1BW	Exhaust gas temperature	Exhaust gas temperature sensor No.3	Switch the ignition ON (engine off)	Approx. 5.03	• Exhaust gas temperature sensor No.3 • Related wiring harness
1BX	Constant voltage (Vref)	Fuel pressure sensor (in fuel injector No.2)	Switch the ignition ON (engine off)	Approx. 5.03	• Related wiring harness
1BY	Suction control valve	Suction control valve	Switch the ignition ON (engine off)	Below 1.0	• Suction control valve • Related wiring harness
			(See Suction control valve signal.)		
1BZ	GND	GND	Switch the ignition ON (engine off)	Below 1.0	• Related wiring harness
1CA	Exhaust gas temperature	Exhaust gas temperature sensor No.2	Switch the 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 the ignition ON (engine off)	Below 1.0	• Related wiring harness
1CC	Suction control valve	Suction control valve	Switch the ignition ON (engine off)	Below 1.0	• Suction control valve • Related wiring harness
			(See Suction control valve signal.)		
1CD	GND	GND	Switch the ignition ON (engine off)	Below 1.0	• Related wiring harness
1CE	Exhaust gas pressure	Exhaust gas pressure sensor No.1	Switch the 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 the ignition ON (engine off)	Below 1.0	• 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 the 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 the ignition ON (engine off)	Approx. 5.03	• Related wiring harness

Terminal	Signal	Connected to	Test condition	Voltage (V)	inspection item
1DX	GND	Sensor shield	Switch the ignition ON (engine off)	Below 1.0	• Related wiring harness
1DY	–	–	–	–	–
1DZ	GND	Exhaust gas temperature sensor No.5	Switch the ignition ON (engine off)	Below 1.0	• Related wiring harness
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 the ignition ON (engine off)	Below 1.0	• 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	–	–	–	–	–
1EH	–	–	–	–	–
1EI	Generator field coil control	Generator	(See Generator field coil control signal.)		• Generator • Related wiring harness
1EJ	–	–	–	–	–
2A	–	–	–	–	–
2B	–	–	–	–	–
2C	Blow-by heater relay	Blow-by heater relay	Switch the ignition ON (engine off)	B+	• Blow-by heater relay • Related wiring harness
			Idle (after warm up)	B+	
2D	Blow-by heater relay	Blow-by heater relay	Switch the ignition ON (engine off)	Below 1.0	• Blow-by heater relay • Related wiring harness
			Idle (after warm up)	Below 1.0	
2E	Check connector	Check connector	Switch the ignition ON (engine off)	B+	• Check connector • Related wiring harness
2F	Sedimentor	Sedimentor switch	Switch the ignition ON (engine off)	B+	• Sedimentor switch • Related wiring harness
2G	LIN	Glow control module, engine oil level sensor	Because this terminal is for CAN, good/no good judgment by terminal voltage is not possible.		• Glow control module • Engine oil level sensor • Related wiring harness
2H	Ignition (IG1)	IG1 relay	Switch the ignition ON (engine off)	B+	• IG1 relay • Related wiring harness
2I	–	–	–	–	–
2J	–	–	–	–	–

Terminal	Signal	Connected to	Test condition		Voltage (V)	inspection item
2BE	A/C cut-off control	A/C relay	A/C relay OFF		B+	• A/C relay • Related wiring harness
			A/C relay ON		Below 1.0	
2BF	Starter cut-off control	Starter relay, start stop unit	Switch the ignition ON (engine off)	Selector lever position is not P or N position	R position: B+	• Starter relay • Start stop unit • Related wiring harness
					D position: B+	
					M position: B+	
				Selector lever position is P or N position	P position: B+	
					N position: B+	
2BG	Fan control	Fan control module No.1	Switch the ignition ON (engine off)		Below 1.0	• Fan control module No.1 • Related wiring harness
2BH	Refrigerant pressure	Refrigerant pressure sensor	Switch the ignition ON (engine off)	A/C switch off	Approx. 0.771	• Refrigerant pressure sensor • Related wiring harness
			Idle (after warm up) or switch the ignition ON (engine off)		Approx. 1.23	

Inspection Using An Oscilloscope (Reference)

CMP (G+) signal



am6zzw00012043

PCM terminals

• 1A(+)−body ground(-)

Oscilloscope setting

• 1 V/DIV (Y), 20 ms/DIV (X), DC range

Vehicle condition

• Idle (after warm up)

Intake shutter valve (ISV-) signal

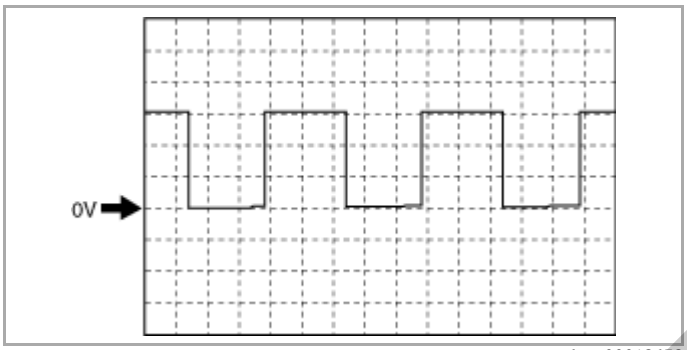
Oscilloscope setting

• 5 V/DIV (Y), 20 ms/DIV (X), DC range

Vehicle condition

• Idle (after warm up)

Engine oil control signal



am6zzw00012652

PCM terminals

• 1CH(+)−body ground(−)

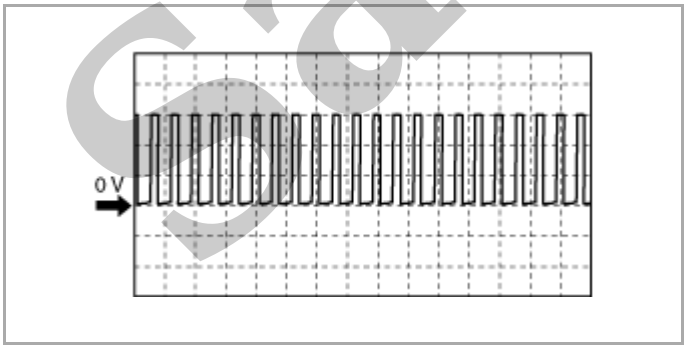
Oscilloscope setting

• 5 V/DIV (Y), 1 ms/DIV (X), DC range

Vehicle condition

• Idle (after warm up)

Wastegate solenoid valve signal



am6zzw00012050

PCM terminals

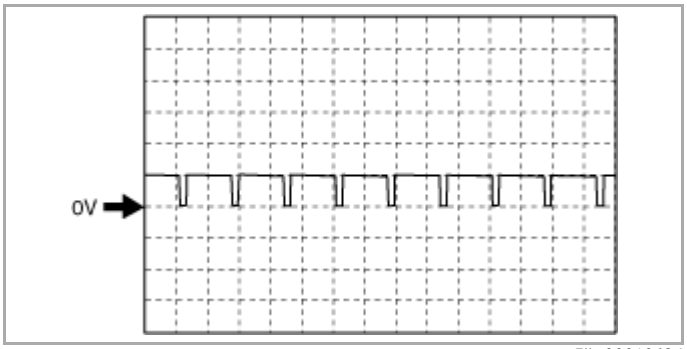
• 1CL(+)−body ground(−)

Oscilloscope setting

• 5 V/DIV (Y), 5 ms/DIV (X), DC range

Vehicle condition

• Idle (after warm up)



ac5jjw00010634

PCM terminals

• 1E(+)−body ground(-)

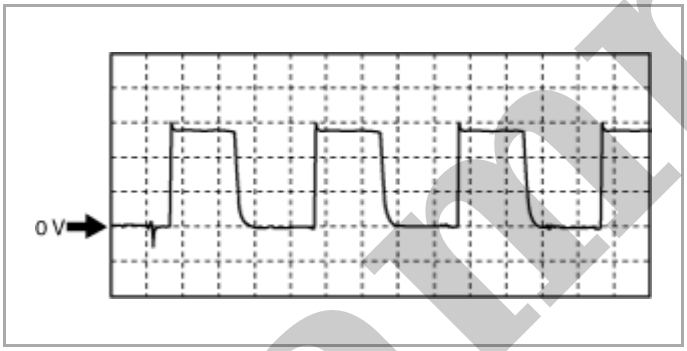
Oscilloscope setting

• 3 V/DIV (Y), 1 ms/DIV (X), DC range

Vehicle condition

• Idle (after warm up)

Generator field coil control signal



am6zzw00012655

PCM terminals

• 1EI(+)−body ground(-)

Oscilloscope setting

• 500 mV/DIV (Y), 1 ms/DIV (X), DC range

Vehicle condition

• Idle (after warm up)

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.

Item (definition)	Unit/Condition	Definition	Condition/Specification (Reference)
DEF_TYPE	–	DEF type	• Displays the DEF type.
DET_CNT_L1	–	Number of times DPF regeneration interval (5 g/l accumulation point) is 39 –69 km	• Number of times DPF regeneration interval (5 g/l accumulation point) is 39–69 km
DET_CNT_L2	–	Number of times DPF regeneration interval (5 g/l accumulation point) is 70 –99 km	• Number of times DPF regeneration interval (5 g/l accumulation point) is 70–99 km
DNS_F_WF	km, ft, mi	Distance to next service for water in fuel	• Displays the distance to next service for water in fuel.
DPF_DIS_1	Displays in the Mazda Modular Diagnostic System (M-MDS) but it does not operate.		
DPF_DIS_2			
DPF_DIS_3			
DPF_DIS_4			
DPF_DIS_5			
DPF_DIS_6			
DPF_DIS_7			
DPF_DIS_8			
DPF_DIS_9			
DPF_DIS_10			
DPF_LMP	Off/On	Diesel particulate filter indicator light	• Diesel particulate filter indicator light not illuminate: Off • Diesel particulate filter indicator light illuminate: On
DPF_LMP_CNT	–	Number of times diesel particulate filter indicator light illuminates	• Displays the number of times diesel particulate filter indicator light illuminates.
DPF_REG_CNT	–	Diesel particulate filter regeneration count	• Displays the diesel particulate filter regeneration count.
DPS_RGN_ST	–	Diesel particulate filter regen status	• Displays the diesel particulate filter regen status.
DV_RGT_CSPT_10K	Displays in the Mazda Modular Diagnostic System (M-MDS) but it does not operate.		
DV_RGT_CSPT_20K			
DV_RGT_CSPT_30K			
DV_RGT_CSPT_40K			
DV_RGT_CSPT_ACT			
EG_FRC_PRS_TRQ	%	Engine friction-percent torque	• Displays the engine friction-percent torque.
EGR_LRN	V	EGR valve learning value (closed condition)	• Displays the EGR valve fully-closed learning value.
EGR_VVT_MN_CP	Displays in the Mazda Modular Diagnostic System (M-MDS) but it does not operate.		
EGR_VVT_MNT			
EGRB_DC_POS	%	EGR cooler bypass valve	• Displays the EGR cooler bypass valve position.
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 %
EGRT	°C, °F	EGR gas temperature	• Displays the EGR gas temperature.
EGT_B1S5	°C, °F	Exhaust gas temperature (No.5)	• Displays the exhaust gas temperature.

Item (definition)	Unit/Condition	Definition	Condition/Specification (Reference)
GPC_DUTY	%	Glow plug coil duty cycle	• Switch the 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 %
GPL_OP_ST	Displays in the Mazda Modular Diagnostic System (M-MDS) but it does not operate.		
GPL_ST_SUP			
HPEGR_DSD			
HT_NOX_SRC_MN			
HTR11	%	A/F sensor heater control	• Switch the ignition ON (engine off): 0 % • idle: Approx. 10.49 % • Racing (engine speed above 4,000 rpm): Approx. 50 %
IAT_B1S1	°C, °F	Intake air temperature (No.1)	• Displays the intake air temperature (No.1).
IAT_B1S2	°C, °F	Intake air temperature (No.2)	• Displays the intake air temperature (No.2).
IAT13	°C, °F	Intake air temperature (No.3)	• Displays the intake air temperature (No.3).
ICP1	KPa {MPA}, mBar {BAR}, psi, in H20	Fuel pressure sensor (built into fuel injector No.1)	• Displays the fuel pressure sensor (built into fuel injector No.1).
ICP2	KPa {MPA}, mBar {BAR}, psi, in H20	Fuel pressure sensor (built into fuel injector No.2)	• Displays the fuel pressure sensor (built into fuel injector No.2).
ICP3	KPa {MPA}, mBar {BAR}, psi, in H20	Fuel pressure sensor (built into fuel injector No.3)	• Displays the fuel pressure sensor (built into fuel injector No.3).
ICP4	KPa {MPA}, mBar {BAR}, psi, in H20	Fuel pressure sensor (built into fuel injector No.4)	• Displays the fuel pressure sensor (built into fuel injector No.4).
IDC_SYS_ACT	Displays in the Mazda Modular Diagnostic System (M-MDS) but it does not operate.		
IFT1	KPa {MPA}, mBar {BAR}, psi, in H20	Fuel temperature sensor (built into fuel injector No.1)	• Displays the fuel temperature sensor (built into fuel injector No.1).
IFT2	KPa {MPA}, mBar {BAR}, psi, in H20	Fuel temperature sensor (built into fuel injector No.2)	• Displays the fuel temperature sensor (built into fuel injector No.2).
IFT3	KPa {MPA}, mBar {BAR}, psi, in H20	Fuel temperature sensor (built into fuel injector No.3)	• Displays the fuel temperature sensor (built into fuel injector No.3).
IFT4	KPa {MPA}, mBar {BAR}, psi, in H20	Fuel temperature sensor (built into fuel injector No.4)	• Displays the fuel temperature sensor (built into fuel injector No.4).
INCR_RGT_10K	Displays in the Mazda Modular Diagnostic System (M-MDS) but it does not operate.		
INCR_RGT_20K			
INCR_RGT_30K			
INCR_RGT_40K			
INCR_RGT_ACT			
INGEAR	Off/On	Gears are engaged	• Selector lever at R, D or M position: ON • Selector lever at P or N position: OFF
INJ1_CMP	−(mm ^{3}/Stroke)	Fuel injector No.1 correction value	• Switch the ignition ON (engine off): Approx. −0.2 • idle: Approx. −0.03 • Racing (engine speed above 4,000 rpm): 0
INJ2_CMP	−(mm ^{3}/Stroke)	Fuel injector No.2 correction value	• Switch the ignition ON (engine off): Approx. 0.27 • idle: Approx. −0.06 • Racing (engine speed above 4,000 rpm): 0
INJ3_CMP	−(mm ^{3}/Stroke)	Fuel injector No.3 correction value	• Switch the ignition ON (engine off): Approx. 0.01 • idle: Approx. 0.03 • Racing (engine speed above 4,000 rpm): 0
INJ4_CMP	−(mm ^{3}/Stroke)	Fuel injector No.4 correction value	• Switch the ignition ON (engine off): Approx. −0.01 • idle: Approx. 0.03 • Racing (engine speed above 4,000 rpm): 0

Item (definition)	Unit/Condition	Definition	Condition/Specification (Reference)
PRS_TRQ_DEM	%	Driver's demand engine-percent torque	• Displays the driver's demand engine-percent torque
RE_LIFE	%	Remaining life	• Displays the remaining life
RE_MILA	km, ft, mi	Remaining milage	• Displays the remaining milage
REG_DIS	km, ft, mi	Distance since last diesel particulate filter regeneration	• Displays the distance since last diesel particulate filter regeneration.
REGVP	mm	Regulating valve actuator position sensor	• idle: Approx. 19.02 mm • Racing (engine speed approx 3,500 rpm): Approx. 12.15 mm
REGVP_DSD	mm	Regulating valve actuator position desired value	• Displays the Regulating valve actuator position desired value
REL_THR_APOS	%	Relative throttle A position	• Displays the relative throttle A position
REV_SW	Off/On	Reverse position determination	• Displays the reverse position.
RGT_LV_T_LO_10K	Displays in the Mazda Modular Diagnostic System (M-MDS) but it does not operate.		
RGT_LV_T_LO_20K			
RGT_LV_T_LO_30K			
RGT_LV_T_LO_40K			
RGT_LV_T_LO_ACT			
RLF_DIST	%	Remaining life (distance)	• Displays the remaining life (distance)
RLF_PERIOD	%	Remaining life (period)	• Displays the remaining life (period)
RLF_RESOT	%	Remaining life (remaining soot)	• Displays the remaining life (remaining soot)
RLF_TBNUM	%	Remaining life (total base number)	• Displays the remaining life (total base number)
RPM	RPM	Engine speed	• Displays the engine speed.
SDARS_BSPR_CP	Displays in the Mazda Modular Diagnostic System (M-MDS) but it does not operate.		
SDARS_BSTPRE			
SED_SW	Off/On	Sedimentor switch	• There is no water in sedimentor: Off • There is water in sedimentor: On
T_ENG_RT	hh:mm:ss	Total engine run time	• Displays the total engine run time
TCA_CINP	KPa, Bar, psi	Manifold absolute pressure (No.1)	• idle: Approx. 104 kPa {1.06 kgf/cm ^{2}, 15.1 psi} • Racing (engine speed above 4,000 rpm): Approx. 152 kPa {1.54 kgf/cm ^{2}, 22.0 psi} • Racing (engine speed above 5,000 rpm): Approx. 176 kPa {1.79 kgf/cm ^{2}, 25.5 psi}
TFIQ_AFL_SM	–	Target fuel injection quantity after limitation for smoke	• Displays the target fuel injection quantity after limitation for smoke.
TIM_CLR_DTC	–	Time since DTCs cleared (min)	• Displays time since DTCs cleared (min)
TIRT	hh:mm:ss	Total idle run time	• Displays total idle run time
TIRT_SUP	–	Total idle run time supported	• Displays total idle run time supported
VEH_FEL_RATE	g/sec	Vehicle fuel rate	• Displays the vehicle fuel rate
VGT_CMODE	–	Turbocharger Control Mode	• Displays total run time with PTO active supported
VPWR	V	Battery positive voltage	• Switch the ignition ON (engine off): Approx. 12.78 V • idle: Approx. 13.78 V
VSS	KPH, MPH	Vehicle speed	• Displays the vehicle speed.
WGV	Displays in the Mazda Modular Diagnostic System (M-MDS) but it does not operate.		