# Your Ultimate Source for OEM Repair Manuals

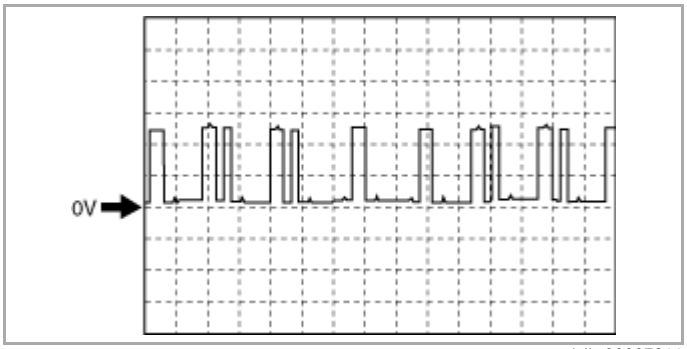
FactoryManuals.net is a great resource for anyone who wants to save money on repairs by doing their own work. The manuals provide detailed instructions and diagrams that make it easy to understand how to fix a vehicle.

## 2010 MAZDA 2 / Demio - sedan OEM Service and Repair Workshop Manual

Go to manual page

| Terminal | Signal | Connected to | Test condition | Voltage (V) | inspection item |
|---|---|---|---|---|---|
| 1CR | Drive-by-wire control (-) | Throttle valve actuator | Idle (after warm up)<br>Because the drive-by-wire control (-) terminal value varies depending on the vehicle, examination using only the ICQ terminal is not possible. When performing the inspection, perform it together with the ICR terminal.<br>• Type A<br>— B+<br>• Type B<br>— Approx. 0 | | • Throttle valve actuator<br>• Related wiring harness |
| 1CS | – | – | – | – | – |
| 1CT | – | – | – | – | – |
| 1CU | Fuel injection control (+) | Fuel injector No.3 | (See Fuel injection control (+) signal.) | | • Fuel injector No.3<br>• Related wiring harness |
| 1CV | Fuel injection control (-) | Fuel injector No.3 | (See Fuel injection control (-) signal.) | | • Fuel injector No.3<br>• Related wiring harness |
| 1CW | Coolant control valve control (+) | Coolant control valve | Ignition switched ON (engine off) | B+ | • Coolant control valve<br>• Related wiring harness |
| 1CX | Coolant control valve control (-) | Coolant control valve | Ignition switched ON (engine off) | B+ | • Coolant control valve<br>• Related wiring harness |
| 1CY | Fuel injection control (+) | Fuel injector No.2 | (See Fuel injection control (+) signal.) | | • Fuel injector No.2<br>• Related wiring harness |
| 1CZ | Fuel injection control (-) | Fuel injector No.2 | (See Fuel injection control (-) signal.) | | • Fuel injector No.2<br>• Related wiring harness |
| 1DA | – | – | – | – | – |
| 1DB | – | – | – | – | – |
| 1DC | Fuel injection control (+) | Fuel injector No.4 | (See Fuel injection control (+) signal.) | | • Fuel injector No.4<br>• Related wiring harness |
| 1DD | Fuel injection control (-) | Fuel injector No.4 | (See Fuel injection control (-) signal.) | | • Fuel injector No.4<br>• Related wiring harness |
| 1DE | – | – | – | – | – |
| 1DF | – | – | – | – | – |

| Terminal | Signal | Connected to | Test condition | | Voltage (V) | inspection item |
|---|---|---|---|---|---|---|
| 2AL | CV solenoid control | CV solenoid valve | Ignition switched ON (engine off) | | B+ | • CV solenoid valve<br>• Related wiring harness |
| | | | Idle (CV solenoid valve not operating) | | B+ | |
| | | | Idle (CV solenoid valve operating) | | Below 1.0 | |
| 2AM | Cooling fan control | Cooling fan relay No.2 | Cooling fan operating | | Below 1.0 | • Cooling fan relay No.2<br>• Related wiring harness |
| | | | Cooling fan not operating | | B+ | |
| 2AN | – | – | – | | – | – |
| 2AO | Constant voltage (Vref) | APP sensor No.2 | Ignition switched ON (engine off) | | Approx. 5.0 | • Related wiring harness |
| 2AP | – | – | – | | – | – |
| 2AQ | – | – | – | | – | – |
| 2AR | – | – | – | | – | – |
| 2AS | Cooling fan control | Cooling fan relay No.1, cooling fan relay No.3 | Cooling fan operating | | Below 1.0 | • Cooling fan relay No.1, No.3<br>• Related wiring harness |
| | | | Cooling fan not operating | | B+ | |
| 2AT | Constant voltage (Vref) | MAF sensor, IAT sensor No.1 | Ignition switched ON (engine off) | | Approx. 5.0 | • Related wiring harness |
| 2AU | Constant voltage (Vref) | Clutch stroke sensor, fuel tank pressure sensor | Ignition switched ON (engine off) | | Approx. 5.0 | • Related wiring harness |
| 2AV | Refrigerant pressure | Refrigerant pressure sensor | Refrigerant pressure: 1.0 MPa {10 kgf/cm $^2$, 145 psi} | | Approx. 1.58 | • Refrigerant pressure sensor<br>• Related wiring harness |
| | | | Refrigerant pressure: 1.1 MPa {11 kgf/cm $^2$, 160 psi} | | Approx. 1.75 | |
| | | | Refrigerant pressure: 1.2 MPa {12 kgf/cm $^2$, 174 psi} | | Approx. 1.88 | |
| 2AW | Fuel pump control | Fuel pump relay | Ignition switched ON (engine off) | | B+ | • Fuel pump relay<br>• Related wiring harness |
| | | | Idle (after warm up) | | Below 1.0 | |
| 2AX | Fuel pump control module (diagnostic) | Fuel pump control module | (See Fuel pump control module (diagnostic) signal.) | | | • Fuel pump control module<br>• Related wiring harness |
| 2AY | – | – | – | | – | – |
| 2AZ | Constant voltage (Vref) | Refrigerant pressure sensor | Ignition switched ON (engine off) | | Approx. 5.0 | • Related wiring harness |
| 2BA | Constant voltage (Vref) | APP sensor No.1 | Ignition switched ON (engine off) | | Approx. 5.0 | • Related wiring harness |
| 2BB | APP (No.2) | APP sensor No.2 | Ignition switched ON (engine off) | Accelerator pedal released | Approx. 0.4 | • APP sensor No.2<br>• Related wiring harness |
| | | | | Accelerator pedal depressed | Approx. 2.2 | |
| 2BC | – | – | – | | – | – |




adejjw00007911

PCM terminals

• 1BZ(+)−body ground(-)

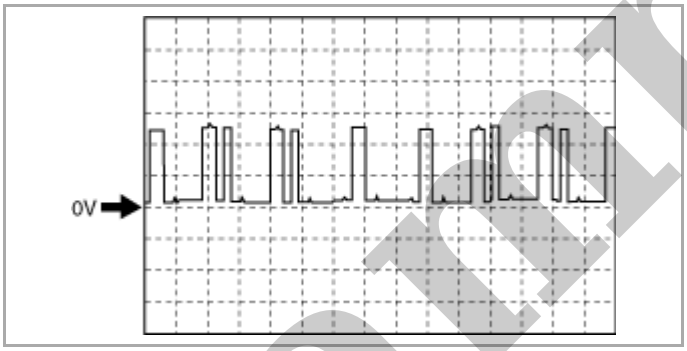
Oscilloscope setting

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

Vehicle condition

• Idle (after warm up)

## Intake CMP signal




adejjw00007911

PCM terminals

• 1BT(+)−body ground(-)

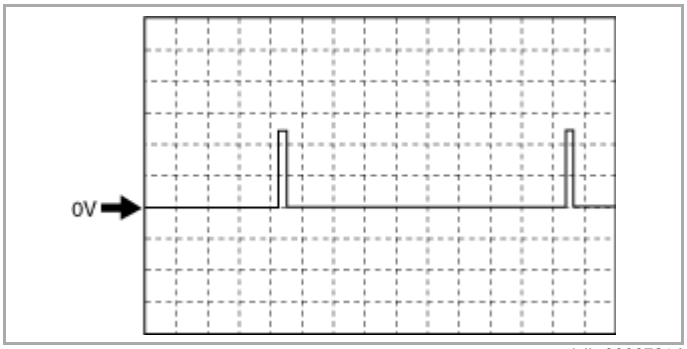
Oscilloscope setting

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

Vehicle condition

• Idle (after warm up)

## CKP signal



adejjw00007916

PCM terminals

• IGT1 (ignition coil No.1): 1BC(+)−body ground(-)
• IGT2 (ignition coil No.2): 1BI(+)−body ground(-)
• IGT3 (ignition coil No.3): 1BO(+)−body ground(-)
• IGT4 (ignition coil No.4): 1BU(+)−body ground(-)

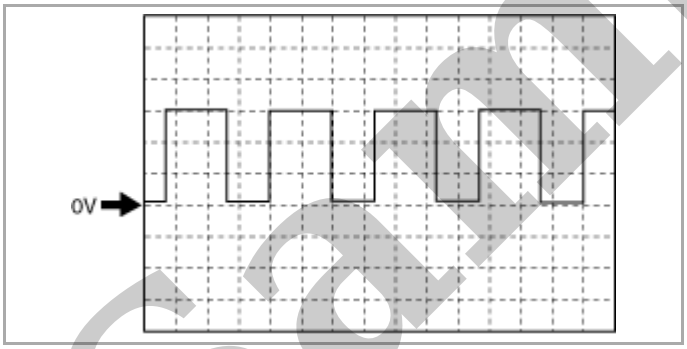
Oscilloscope setting

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

Vehicle condition

• Idle after warm up

## Hydraulic variable valve timing control signal



adejjw00007917

PCM terminals

• 1CO(+)−body ground(-)

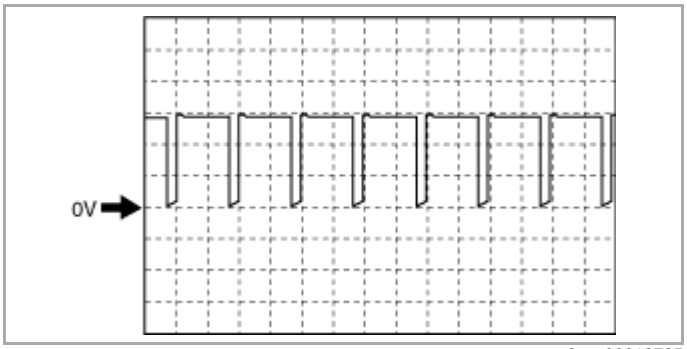
Oscilloscope setting

• 5 V/DIV (Y), 1 ms/DIV (X), DC range

Vehicle condition

• Racing (Engine speed: 2,000 rpm)

## Engine oil control signal



am3zzw00012795

PCM terminals

• 1CQ(+)−1CR(-)

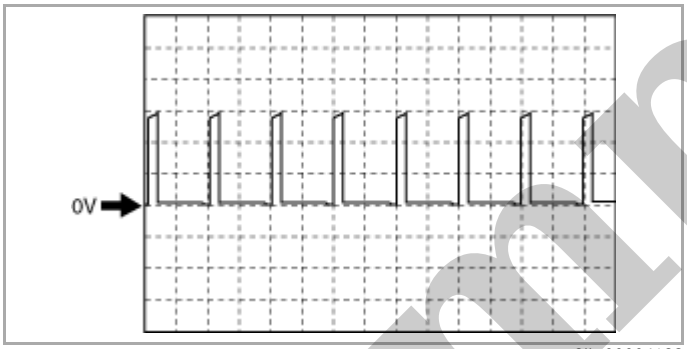
Oscilloscope setting

• 5 V/DIV (Y), 1 ms/DIV (X), DC range

Vehicle condition

• Idle after warm up

Type B



ac3jjw00004192

PCM terminals

• 1CQ(+)−1CR(-)

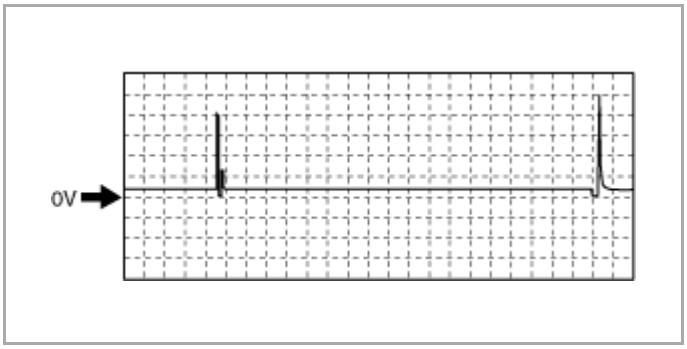
Oscilloscope setting

• 5 V/DIV (Y), 1 ms/DIV (X), DC range

Vehicle condition

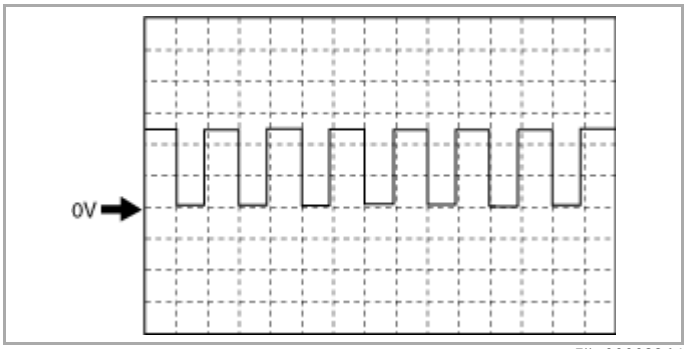
• Idle after warm up

## Fuel injection control (-) signal



adejjw00007923

PCM terminals



ac5jjw00009364

PCM terminals

• 2D(+)−body ground(-)

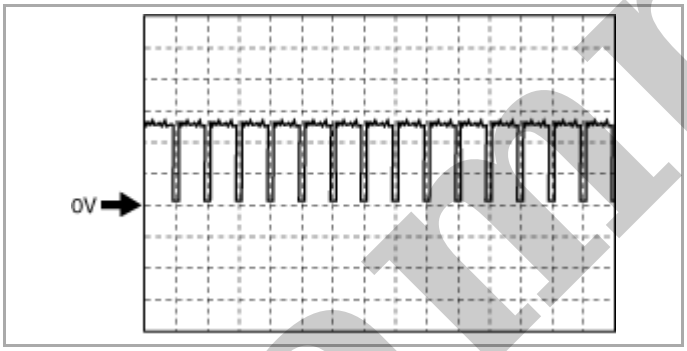
Oscilloscope setting

• 5 V/DIV (Y), 2 ms/DIV (X), DC range

Vehicle condition

• Idle after warm up

Fuel pump control module (diagnostic) signal



ac5uuw00009714

PCM terminals

• 2AX(+)−body ground(-)

Oscilloscope setting

• 2 V/DIV (Y), 50 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.

— Intake CMP sensor and exhaust CMP sensor (See CAMSHAFT POSITION (CMP) SENSOR INSPECTION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].)
— Main relay (See RELAY INSPECTION.)

1.Connect the M-MDS to the DLC-2.

| Item (definition) | Unit/Condition | Value type | Condition/Specification (Reference) |
|---|---|---|---|
| ECT<br>(Engine coolant temperature) | °C, °F | Calculation | • Displays ECT |
| | V | Input | • ECT is 20 °C {68 °F}: Approx. 3.10 V<br>• ECT is 40 °C {104 °F}: Approx. 2.16 V<br>• ECT is 60 °C {140 °F}: Approx. 1.40 V<br>• ECT is 80 °C {176 °F}: Approx. 0.87 V<br>• ECT is 100 °C {212 °F}: Approx. 0.54 V |
| ECT2_V<br>(ECT sensor No.2 voltage) | V | Input | • ECT is 20 °C {68 °F}: Approx. 3.10 V<br>• ECT is 40 °C {104 °F}: Approx. 2.16 V<br>• ECT is 60 °C {140 °F}: Approx. 1.40 V<br>• ECT is 80 °C {176 °F}: Approx. 0.87 V<br>• ECT is 100 °C {212 °F}: Approx. 0.54 V |
| ENG_CL_V_POS<br>(Coolant control valve opening angle) | ° (deg) | Calculation | • Displays target coolant control valve opening angle |
| ENG_CL_V_POS_R<br>(Coolant control valve opening angle raw) | ° (deg) | Input | • Ignition switched ON (engine off): Approx. 114° |
| ENG_EX_FLW<br>(Engine exhaust flow rate) | – | Calculation | • Displays engine exhaust flow rate |
| ENG_FRCTN_PER<br>(Engine friction percent torque) | % | Calculation | • Displays engine friction percent torque |
| EOL<br>(Engine oil level) | mm, in | Calculation | • Displays engine oil level |
| EOP<br>(Engine oil pressure) | KPa {MPA}, mBar {BAR}, psi, in H20 | Calculation | • Switch ignition ON (engine off): 0–1 kPa {0.00–0.01 kgf/cm $^2$, 0.0–0.1 psi}<br>• Idle: Approx. 150 kPa {1.53 kgf/cm2, 21.8 psi} |
| EOT2 *5<br>(Engine oil temperature from engine oil level sensor) | °C, °F | Calculation | • Displays engine oil temperature |
| EQ_RAT11<br>(Equivalence ratio (lambda)) | – | Calculation | • Idle (after warm up): Approx. 1 |
| EQ_RAT11_DSD<br>(Desired equivalence ratio (lambda)) | – | Calculation | • Indicate target lambda (Excess air factor = supplied air amount / theoretical air/fuel ratio) |
| ETC_ACT<br>(Electric throttle control actual) | ° (deg) | Calculation | Ignition switched ON (engine off)<br>• Accelerator pedal released: Approx. 12.89 °<br>• Accelerator pedal depressed: Approx. 86.03 °<br>Idle (after warm up)<br>• Accelerator pedal released: Approx. 3.87 ° |
| ETC_DSD<br>(Electric throttle control desired) | % | Calculation | • Displays target TP angle (percent) |
| | ° (deg) | Calculation | • Displays target TP angle |

| Item (definition) | Unit/Condition | Value type | Condition/Specification (Reference) |
|---|---|---|---|
| INGEAR<br>(Gears are engaged) | Off/On | Calculation | MTX<br>• When the following conditions are satisfied: On<br>— Other than neutral<br>— Clutch pedal released<br>• Except above: Off<br>ATX<br>• Selector lever at P position or N position: Off<br>• Except above: On |
| ISC_FBK<br>(ISC feedback value) | % | Calculation | • Displays ISC feedback value |
| ISC_FBK_LRN<br>(Learning value for calculating ISC feedback amount) | % | Calculation | • Displays learning value for calculating ISC feedback amount |
| IVS<br>(Idle flag) | Off Idle/Idle | Calculation | • Other than idling: Off Idle<br>• Idle: Idle |
| KNOCKR<br>(Ignition timing correction for suppressing engine knock) *6 | ° (deg) | Calculation | • Ignition switched ON (engine off): 0 °<br>• Idle (after warm up): 0 ° |
| LAFS_CM | Displays in the M-MDS but it does not operate. | | |
| LOAD<br>(Engine load) | % | Calculation | • Idle (after warm up): Approx. 16.07%<br>• Racing (engine speed is 2,000 rpm): Approx. 13.33%<br>• Racing (engine speed is 4,000 rpm): Approx. 15.29% |
| LONGFT1<br>(Long term fuel trim) | % | Calculation | • Idle (after warm up): Approx. -3.9%<br>• Racing (engine speed is 2,000 rpm): Approx. -0.78%<br>• Racing (engine speed is 4,000 rpm): Approx. -0.78% |
| LONGFT12<br>(Long term fuel trim (HO2S)) | % | Calculation | • Idle (after warm up): Approx. 0% |
| LOW_OIL<br>(Engine Oil Level Status) | Never Detected/Detected | Calculation | • Ignition switched ON (engine off): Detected<br>• Idle (after warm up): Never Detected |
| LRN_KCS<br>(Knock control system learning value) | – | Calculation | • Displays knock control system learning value |
| M_GEAR *1<br>(Manual Gear Position) | Neutral/1st gear/2nd gear/3rd gear/4th gear/5th gear/6th gear/Reverse/Undefined/Auto/In_Progress /YSF/Error | Calculation | • Displays manual gear position |
| MAF<br>(Mass airflow) | g/Sec | Calculation | • Displays MAF |
| | V | Input | • Ignition switched ON (engine off) (MAF: 0.00 g/s {0 lb/min}): Approx. 1.69 V (ECT is 53 °C {127 °F})<br>• Idle (after warm up) (MAF: 2.50 g/s {0.331 lb/min}): Approx. 1.89 V (ECT is 93 °C {199 °F})<br>• Racing (engine speed is 2,000 rpm) (MAF: 3.80 g/s {0.503 lb/min}): Approx. 2.02 V (ECT is 95 °C {203 °F}) |
| MAP<br>(Manifold absolute pressure) | KPa {MPA}, mBar {BAR}, psi, in H20 | Calculation | • Displays MAP |

| Item (definition) | Unit/Condition | Value type | Condition/Specification (Reference) |
|---|---|---|---|
| TP_REL<br>(Relative throttle position) | % | Calculation | • Accelerator pedal released: Approx. 12%<br>• Accelerator pedal depressed: Approx. 82% |
| TP1<br>(TP sensor No.1) | V | Input | • Accelerator pedal released: Approx. 1.11 V<br>• Accelerator pedal depressed: Approx. 4.59 V |
| | % | Calculation | • Accelerator pedal released: Approx. 22%<br>• Accelerator pedal depressed: Approx. 92% |
| TP2<br>(TP sensor No.2) | V | Input | • Accelerator pedal released: Approx. 3.92 V<br>• Accelerator pedal depressed: Approx. 0.41 V |
| | % | Calculation | • Accelerator pedal released: Approx. 22%<br>• Accelerator pedal depressed: Approx. 92% |
| TPCT<br>(TP sensor No.1 voltage at CTP) | V | Input | • Ignition switched ON (engine off): Approx. 0.5 V |
| TPCT2<br>(TP sensor No.2 voltage at CTP) | V | Input | • Ignition switched ON (engine off): Approx. 4.5 V |
| VPWR<br>(Battery positive voltage) | V | Input | • Displays battery voltage |
| VSS<br>(Vehicle speed) | KPH, MPH | Calculation | • Displays vehicle speed |
| VT_Adv_CM | • Displays in the M-MDS but it does not operate. | | |
| VT_CM | | | |
| VT EX_DES<br>(Desired exhaust valve timing) | ° (deg) | Calculation | • Displays desired exhaust valve timing |
| VT IN_ACT<br>(Actual intake valve timing) | ° (deg) | Calculation | • Displays actual intake valve timing |
| VT IN_DES<br>(Desired intake valve timing) | ° (deg) | Calculation | • Displays desired intake valve timing |
| VT_EX_ACT<br>(Actual exhaust valve timing) | ° (deg) | Calculation | • Displays actual exhaust valve timing |
| VT_EX_DUTY<br>(OCV control) | % | Calculation | • Idle (after warm up): Approx. 0%<br>• Racing (engine speed is 2,000 rpm): Approx. 40% |



*1:MTX

*2:ATX

*3:U.S.A., Canada and Israel

*4:Vehicle with active air shutter

*5:Vehicle with engine oil level sensor

*6:Performs retard correction (negative indication) according to the occurrence of engine knock, and it approaches approx. 0° by the advance correction due to engine knock suppression.