

01-40A CONTROL SYSTEM [ZM]**CONTROL SYSTEM COMPONENT**

LOCATION INDEX [ZM]	01-40A-2
CONTROL SYSTEM DIAGRAM [ZM]...	01-40A-4
CONTROL SYSTEM WIRING	
DIAGRAM [ZM]	01-40A-5
PCM REMOVAL/INSTALLATION [ZM] .	01-40A-7
PCM INSPECTION [ZM]	01-40A-7
PCM Inspection Using the SST (WDS or equivalent)	01-40A-7
PCM Inspection Using the SST (104 Pin Breakout Box)	01-40A-12
Inspection Using An Oscilloscope (Reference)	01-40A-21
INSPECTION USING AN	
OSCILLOSCOPE (REFERENCE) [ZM]	01-40A-25
Purpose	01-40A-25
MASS AIR FLOW (MAF)/INTAKE AIR TEMPERATURE (IAT) SENSOR	
INSPECTION [ZM]	01-40A-26
MAF Sensor Inspection	01-40A-26
Circuit Open/Short Inspection	01-40A-26
IAT Sensor Resistance Inspection...	01-40A-27
Circuit Open/Short Inspection	01-40A-28
THROTTLE POSITION (TP) SENSOR	
INSPECTION [ZM]	01-40A-28
Resistance Inspection	01-40A-28
Circuit Open/Short Inspection	01-40A-29
THROTTLE POSITION (TP) SENSOR REMOVAL/INSTALLATION [ZM]	
01-40A-30	
ENGINE COOLANT TEMPERATURE (ECT) SENSOR	
REMOVAL/INSTALLATION [ZM]	01-40A-30
ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION [ZM] ...	
01-40A-31	
ECT Sensor Resistance Inspection ...	01-40A-31
Circuit Open/Short Inspection	01-40A-32

CRANKSHAFT POSITION (CKP) SENSOR

INSPECTION [ZM]	01-40A-32
Air Gap Inspection	01-40A-32
Resistance Inspection	01-40A-33
Circuit Open/Short Inspection	01-40A-33

CRANKSHAFT POSITION (CKP) SENSOR

ADJUSTMENT [ZM]	01-40A-34
-----------------------	-----------

CRANKSHAFT POSITION (CKP) SENSOR

REMOVAL/INSTALLATION [ZM]	01-40A-34
---------------------------------	-----------

PLATE REMOVAL/INSTALLATION

[ZM]	01-40A-34
------------	-----------

CAMSHAFT POSITION (CMP) SENSOR

REMOVAL/INSTALLATION [ZM]	01-40A-35
---------------------------------	-----------

CAMSHAFT POSITION (CMP) SENSOR

INSPECTION [ZM]	01-40A-35
Visual Inspection	01-40A-35
Wave profile Inspection	01-40A-35
Circuit Open/Short Inspection	01-40A-36

HEATED OXYGEN SENSOR (HO2S)

INSPECTION [ZM]	01-40A-36
HO2S (Front and Rear) Voltage Inspection	01-40A-36
HO2S Heater (Front and Rear) Resistance Inspection	01-40A-37

EGR BOOST SENSOR INSPECTION

[ZM]	01-40A-38
Circuit Open/Short Inspection	01-40A-39

FUEL TANK PRESSURE SENSOR

INSPECTION [ZM]	01-40A-40
Circuit Open/Short Inspection	01-40A-41

CLUTCH SWITCH INSPECTION [ZM] ..

01-40A-41	
Circuit Open/Short Inspection	01-40A-42

NEUTRAL SWITCH INSPECTION [ZM] .

01-40A-42	
Circuit Open/Short Inspection	01-40A-43

POWER STEERING PRESSURE (PSP)

SWITCH INSPECTION [ZM]	01-40A-43
Continuity Inspection	01-40A-43
Circuit Open/Short Inspection	01-40A-44

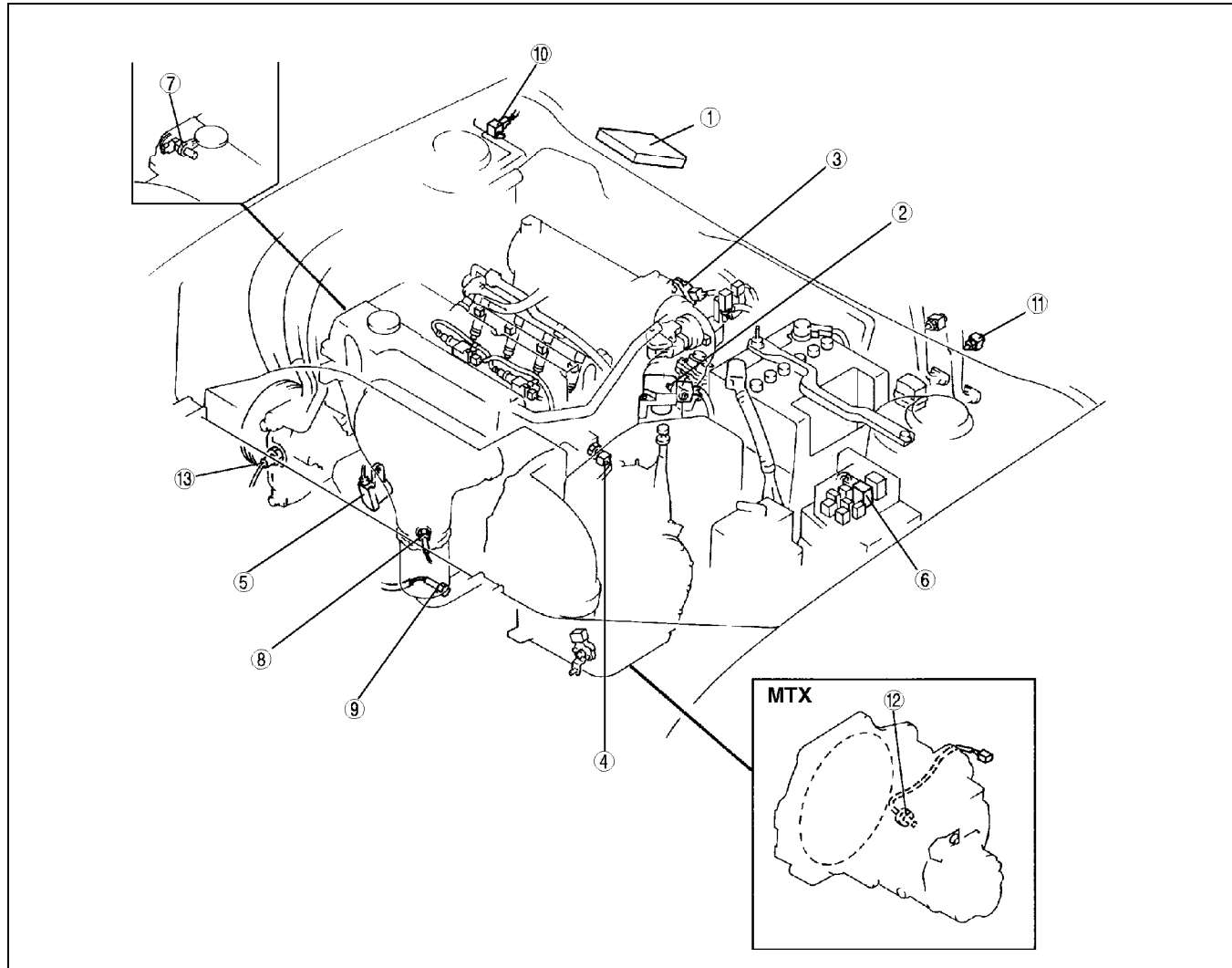
01-40A

CONTROL SYSTEM [ZM]

CONTROL SYSTEM COMPONENT LOCATION INDEX [ZM]

A3U014018881W05

Engine compartment side



Z3U0140W001

1	PCM (See 01-40A-7 PCM REMOVAL/INSTALLATION [ZM]) (See 01-40A-7 PCM INSPECTION [ZM])
2	Mass air flow (MAF)/intake air temperature (IAT) sensor (See 01-40A-26 MASS AIR FLOW (MAF)/INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION [ZM])
3	Throttle position (TP) sensor (See 01-40A-28 THROTTLE POSITION (TP) SENSOR INSPECTION [ZM]) (See 01-40A-30 THROTTLE POSITION (TP) SENSOR REMOVAL/INSTALLATION [ZM])
4	Engine coolant temperature (ECT) sensor (See 01-40A-30 ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION [ZM]) (See 01-40A-31 ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION [ZM])

5	Crankshaft position (CKP) sensor (See 01-40A-32 CRANKSHAFT POSITION (CKP) SENSOR INSPECTION [ZM]) (See 01-40A-34 CRANKSHAFT POSITION (CKP) SENSOR ADJUSTMENT [ZM]) (See 01-40A-34 CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION [ZM])
6	Main relay (See 09-21-5 RELAY INSPECTION)
7	Camshaft position (CMP) sensor (See 01-40A-35 CAMSHAFT POSITION (CMP) SENSOR REMOVAL/INSTALLATION [ZM]) (See 01-40A-35 CAMSHAFT POSITION (CMP) SENSOR INSPECTION [ZM])
8	Heated oxygen sensor (front) (See 01-40A-36 HEATED OXYGEN SENSOR (HO2S) INSPECTION [ZM])
9	Heated oxygen sensor (rear) (See 01-40A-36 HEATED OXYGEN SENSOR (HO2S) INSPECTION [ZM])
10	EGR boost sensor (See 01-40A-38 EGR BOOST SENSOR INSPECTION [ZM])
11	Clutch switch (See 01-40A-41 CLUTCH SWITCH INSPECTION [ZM])

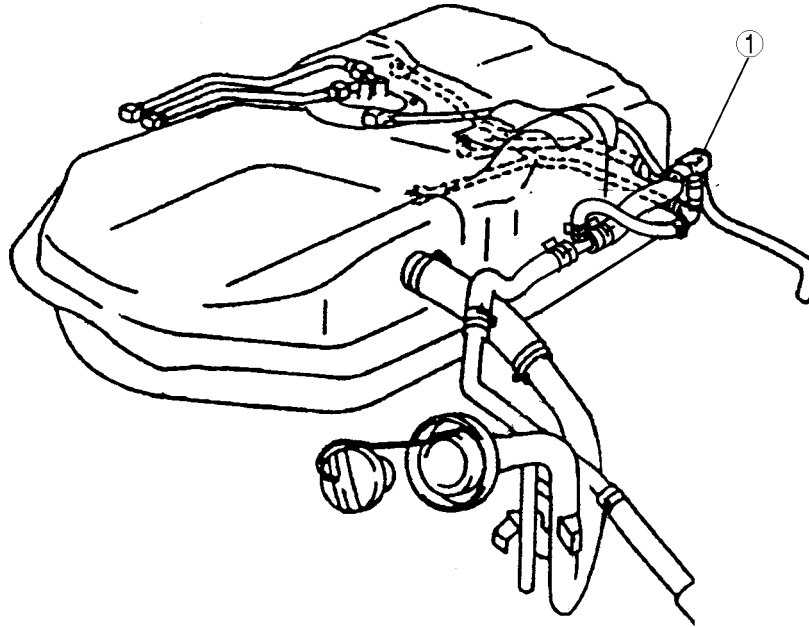
CONTROL SYSTEM [ZM]

12	Neutral switch (See 01-40A-42 NEUTRAL SWITCH INSPECTION [ZM])
----	--

13	Power steering pressure (PSP) switch (See 01-40A-43 POWER STEERING PRESSURE (PSP) SWITCH INSPECTION [ZM])
----	--

Fuel tank side

01-40A



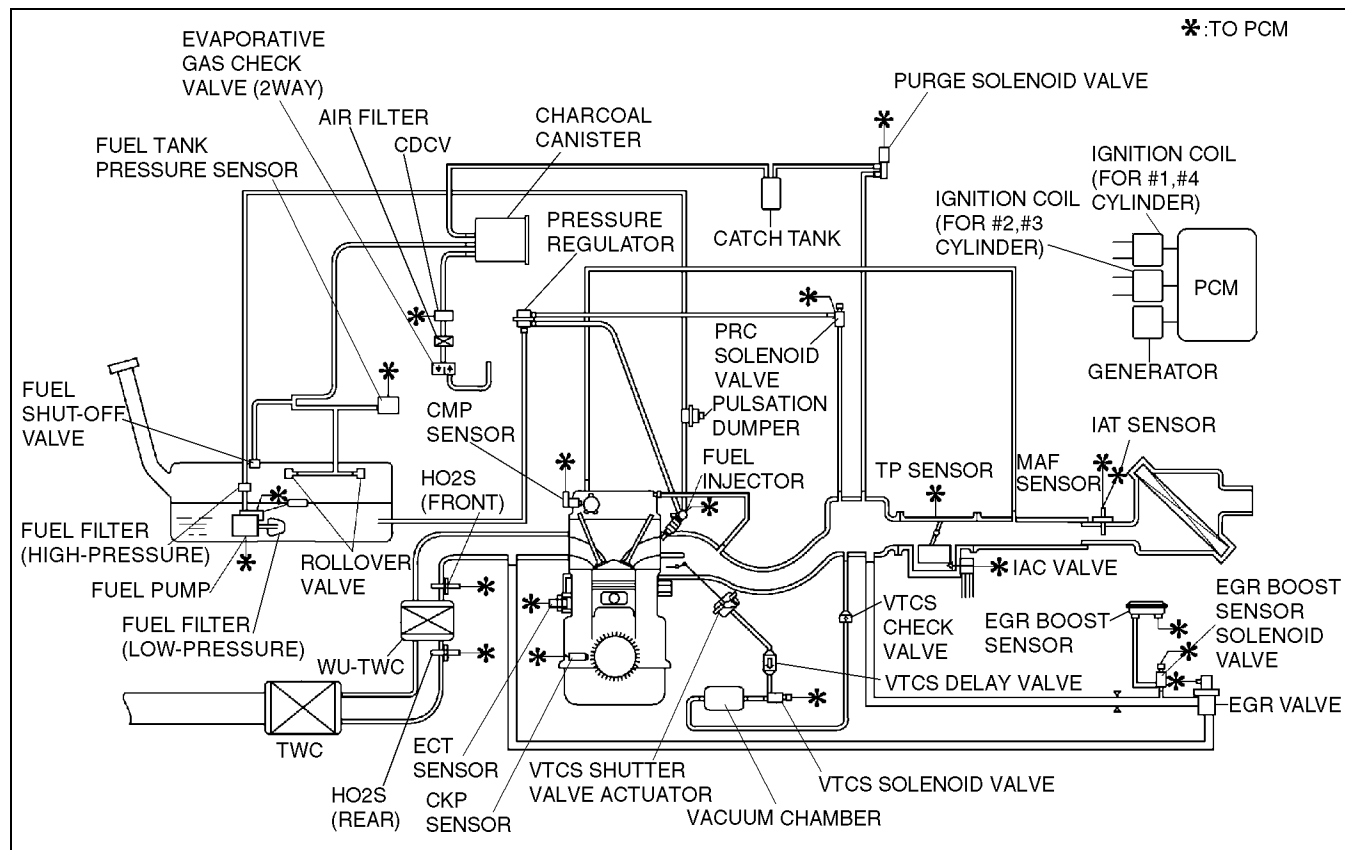
Z3U0140W002

1	Fuel tank pressure sensor (See 01-40A-40 FUEL TANK PRESSURE SENSOR INSPECTION [ZM])
---	--

CONTROL SYSTEM [ZM]

CONTROL SYSTEM DIAGRAM [ZM]

A3U014018881W06



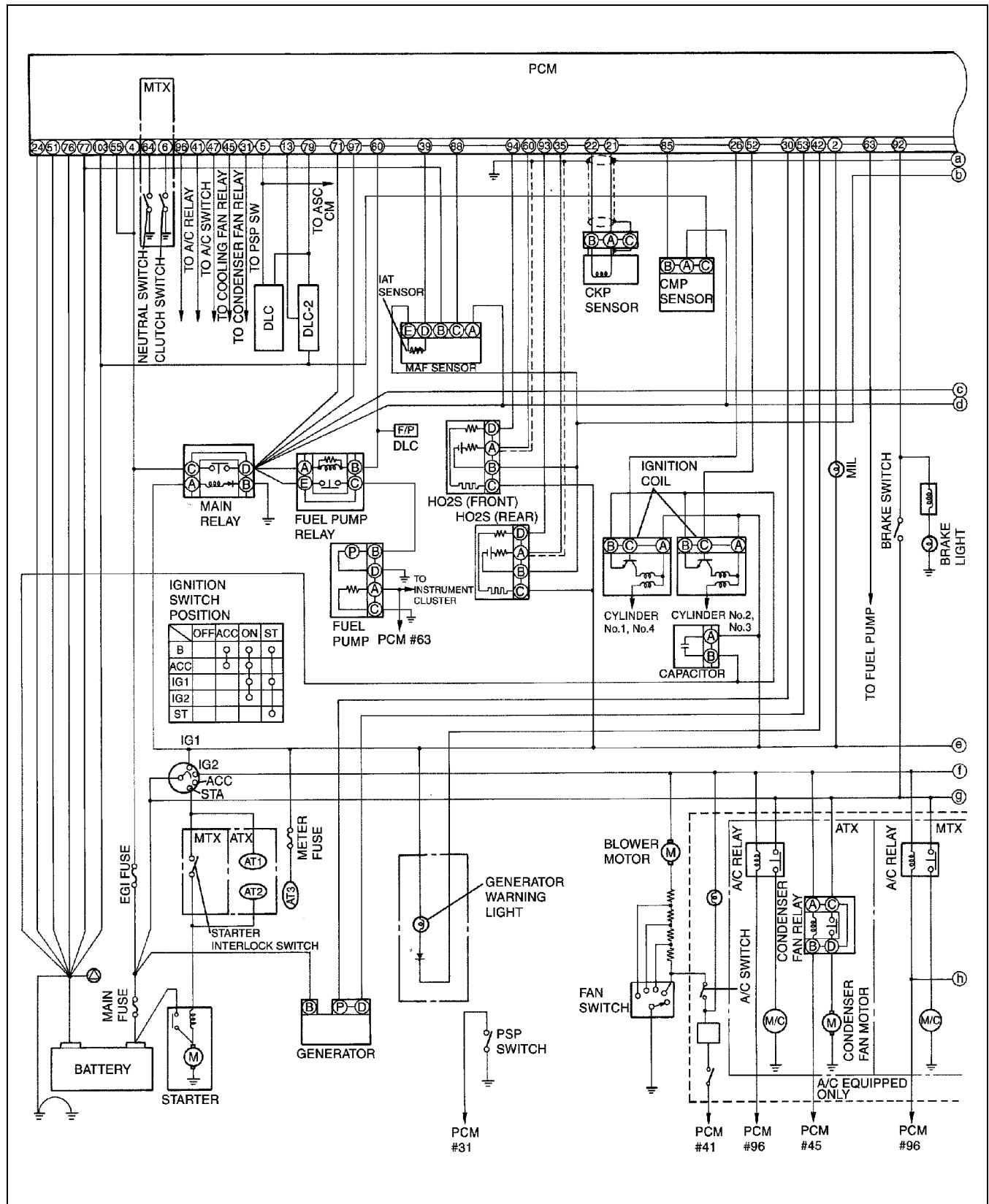
Z3U0140W003

CONTROL SYSTEM [ZM]

CONTROL SYSTEM WIRING DIAGRAM [ZM]

A3U014018881W07

01-40A



A3U0140W005

Wiring diagram for the PCM (Powertrain Control Module) showing connections to various sensors and actuators. The diagram includes terminals for ATX, PCM, and ATX. Components include EGR Valve, Purge Solenoid Valve, PRC Solenoid Valve, VTC Solenoid Valve, EGR Boost Solenoid Valve, EGR Boost Sensor, Fuel Tank Pressure Sensor, ECT Sensor, TP Sensor, Fuel Injector (Nos. 1-4), IAC Valve, Input/Turbine Speed Sensor, ATF Temperature Sensor, Pressure Control Solenoid, TR Switch, Cooling Fan Relay, and Cooling Fan Motor. A legend identifies shift solenoids SS1 through SS5.

Legend:

- SS1: SHIFT SOLENOID A
- SS2: SHIFT SOLENOID B
- SS3: SHIFT SOLENOID C
- SS4: SHIFT SOLENOID D
- SS5: SHIFT SOLENOID E

01-40A-6

PCM REMOVAL/INSTALLATION [ZM]

A3U014018880W03

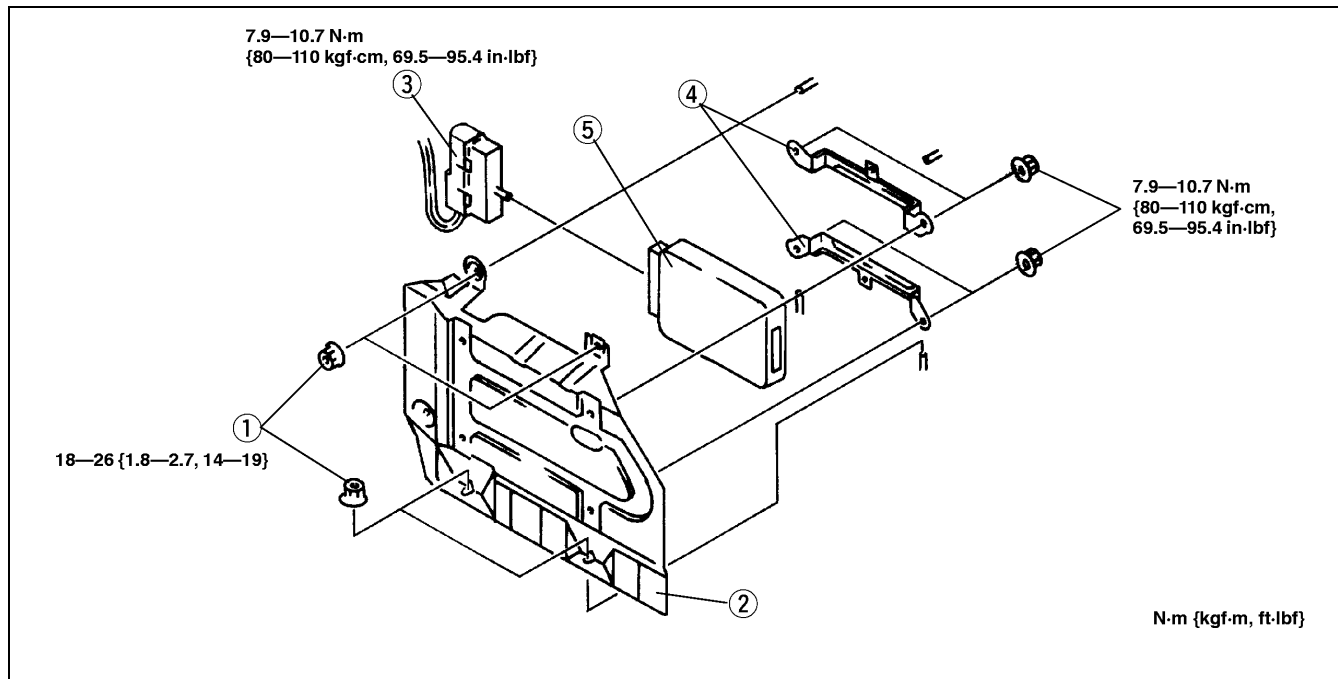
1. Disconnect the negative battery cable.
2. Remove the front passenger side scuff plate.
3. Remove the front passenger side trims.
4. Partially peel off the floor covering from the front of the passenger's side.

Warning

- The edge of the PCM plate is sharp. Be careful not to cut yourself when handling the PCM plate.

01-40A

5. Remove in the order indicated in the table.
6. Install in the reverse order of removal.



X3U140WA1

1	Nut
2	PCM panel
3	PCM connector

4	Bracket
5	PCM

PCM INSPECTION [ZM]

A3U014018880W04

Caution

- The PCM terminal voltages vary with change in measuring conditions and vehicle conditions. Always complete the inspection of the input systems, output systems, and PCM to determine the cause of trouble. Otherwise, a wrong diagnosis will fail.

PCM Inspection Using the SST (WDS or equivalent)

Note

- PIDs for the following parts are not available on this model. Go to the appropriate part inspection page.
 - CMP sensor (See 01-40A-35 CAMSHAFT POSITION (CMP) SENSOR INSPECTION [ZM].)
 - Main relay (See 09-21-5 RELAY INSPECTION.)

1. Connect the WDS or equivalent to the DLC-2. (See 01-02A-8 ON-BOARD DIAGNOSTIC TEST [ZM].)
2. Turn the ignition switch to ON.
3. Measure the value.
 - If the value is not within the specification, follow the instruction in action column.

CONTROL SYSTEM [ZM]

PID/DATA MONITOR table (Reference)

Monitor item (Definition)	Unit/ Condition		Condition/Specification (Reference)	Action	PCM terminal
ACCS (A/C relay)	ON/OFF		A/C operating: ON Ignition switch ON: OFF	Inspect following PIDs: RPM, TP, ECT, ACSW Inspect A/C relay (See 09-21-5 RELAY INSPECTION)	96
ACSW (A/C switch)	ON/OFF		A/C switch and fan switch ON: ON A/C switch OFF: OFF	Inspect A/C switch (See 07-40-11 CLIMATE CONTROL UNIT INSPECTION)	41
ALTF (Generator field coil control duty value)	%		Ignition switch ON: 0% Idle: 0—100% Generator operating → E/L ON: Duty value rise	Inspect following PIDs: IAT, RPM, VPWR, B+2, ALTT V Inspect generator (See 01-17-3 GENERATOR INSPECTION)	53
ALTT V (Generator output voltage)	V		Ignition switch ON: 0 V Idle: 14—16 V	Inspect following PIDs: IAT, RPM, VPWR, B+2, ALTF Inspect generator (See 01-17-3 GENERATOR INSPECTION)	30
ARPMDES (Target engine speed)	rpm		Idle (No load): 650—750 rpm	Perform “On-Board Diagnostic Test” (See 01-02A-8 ON-BOARD DIAGNOSTIC TEST [ZM])	—
BARO (Barometric pressure)	kPa	inHg	Below 400 m {0.25 mile} above sea level: 99—103 kPa {29—30 inHg}	Inspect EGR boost sensor (See 01-40A-38 EGR BOOST SENSOR INSPECTION [ZM])	34
	V		Below 400 m {0.25 mile} above sea level: 4.1—4.3 V	Inspect EGR boost sensor (See 01-40A-38 EGR BOOST SENSOR INSPECTION [ZM])	34
BOO (Brake switch)	ON/OFF		Brake pedal depressed: ON Brake pedal released: OFF	Inspect brake switch (See 04-11-5 BRAKE SWITCH INSPECTION)	92
B+2 (PCM back-up positive voltage)	V		Constant: B+	Inspect battery (See 01-17-1 BATTERY INSPECTION)	4
CDCV (Canister drain cut valve)	ON/OFF		Ignition switch ON: OFF Idle: OFF	Inspect CDCV (See 01-16-10 CANISTER DRAIN CUT VALVE (CDCV) INSPECTION)	18
CHRG LP (Generator warning light)	ON/OFF		Ignition switch ON: ON Idle: OFF	Inspect generator warning light	42
CPP*2 (Clutch switch)	ON/OFF		Clutch pedal depressed: ON Clutch pedal released: OFF	Inspect clutch switch (See 01-40A-41 CLUTCH SWITCH INSPECTION [ZM])	6
ECT (Engine coolant temperature)	°C	°F	ECT 20 °C {68 °F}: 20 °C {68 °F} ECT 60 °C {140 °F}: 60 °C {140 °F}	Inspect ECT sensor (See 01-40A-31 ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION [ZM])	38
	V		ECT 20 °C {68 °F}: 2.9—3.1 V After warm up: 0.2—1.0 V	Inspect ECT sensor (See 01-40A-31 ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION [ZM])	38
EGRCHK (EGR boost sensor solenoid valve)	ON/OFF		Ignition switch ON: OFF Idle: OFF	Inspect EGR boost sensor solenoid valve (See 01-16-17 EGR BOOST SENSOR SOLENOID VALVE INSPECTION)	98
EVAPCP (Purge solenoid valve duty value)	%		Ignition switch ON: 0% Idle: 0%	Inspect following PIDs: IAT, RPM, ECT, MAF, TP, BARO, O2S11, VPWR Inspect purge solenoid valve (See 01-16-12 PURGE SOLENOID VALVE INSPECTION)	67
FAN2 (Condenser fan control)	ON/OFF		A/C operated: ON Others: OFF	Inspect following PIDs: RPM, TP, ECT, ACSW, TEST Inspect condenser fan relay (See 09-21-5 RELAY INSPECTION)	45

CONTROL SYSTEM [ZM]

Monitor item (Definition)	Unit/ Condition		Condition/Specification (Reference)	Action	PCM terminal
FAN3 (Cooling fan control)	ON/OFF		Cooling fan operating (ECT above 97 °C {207 °F}) or terminal TEN grounded and throttle valve open or A/C relay on: ON Others: OFF	Inspect following PIDs: RPM, TP, ECT, ACSW, TEST Inspect cooling fan relay (See 09-21-5 RELAY INSPECTION)	47
FP (Fuel pump relay)	ON/OFF		Ignition switch ON: OFF Idle: ON Cranking: ON	Inspect following PID: RPM Inspect fuel pump relay (See 09-21-5 RELAY INSPECTION)	80
FPRC (PRC solenoid valve)	ON/OFF		Ignition switch ON: OFF Idle: OFF After hot start: ON	Inspect PRC solenoid valve (See 01-14-31 PRC SOLENOID VALVE INSPECTION)	95
FTL V (Fuel tank level signal voltage)	V		Idle condition <ul style="list-style-type: none">Fuel tank full: 1.0—1.5 VFuel tank empty: 4.4—4.8 VFuel tank half: 2.8—3.4 V Note <ul style="list-style-type: none">The voltages above will be measured when the battery positive voltage is between 12V and 14 V.	Inspect fuel gauge sender unit (See 09-22-4 Fuel Gauge)	63
FTP (Fuel tank pressure)	kPa	inHg	Ignition switch ON: 0—1.0 kPa {0—0.3 inHg} Idle: 0—1.0 kPa {0—0.3 inHg} Note <ul style="list-style-type: none">The pressure and output voltage varies according to the fuel temperature.	Inspect fuel tank pressure sensor (See 01-40A-40 FUEL TANK PRESSURE SENSOR INSPECTION [ZM])	62
	V		Ignition switch ON: 2.5—2.8 V Idle: 2.5—2.8 V Fuel tank pressure 0 kPa {0 mmHg, 0 inHg}: 2.5 V Fuel tank pressure 1 kPa {7.5 mmHg, 0.3 inHg}: 2.8 V Note <ul style="list-style-type: none">The pressure and output voltage vary according to the fuel temperature.	Inspect fuel tank pressure sensor (See 01-40A-40 FUEL TANK PRESSURE SENSOR INSPECTION [ZM])	62
FTP1SV	kPa		Perform “DTC INSPECTION”. (See 01-02A-15 DTC TABLE [ZM])		—
FTP2SV	kPa				
FUELPW1 (Fuel injection duration)	ms		Ignition switch ON: 0 msec Idle: 2.5—4.0 msec	Inspect following PIDs: MAF, IAT, RPM, TP, ECT, PNP, CPP, O2S11, PSP, BOO, ACSW, VPWR Inspect CMP sensor (See 01-40A-35 CAMSHAFT POSITION (CMP) SENSOR INSPECTION [ZM])	74, 75, 100, 101
GEAR (Gear position)	1/2/3/4		1GR: 1 2GR: 2 3GR: 3 4GR: 4	Inspect following PIDs: SSA/SS1, SSB/SS2, SSC/SS3, SSD/SS4, SSE/SS5	1, 27, 82, 99, 102
HTR11 (HO2S heater (Front))	ON/OFF		Ignition switch ON (engine stopped): OFF Approx. 15 seconds after engine start with ECT 20—30 °C {68—86°F): ON Others: ON ⇔ OFF	Inspect following PIDs: ECT, MAF Inspect HO2S heater (See 01-40A-37 HO2S Heater (Front and Rear) Resistance Inspection)	94
HTR12 (HO2S heater (Rear))	ON/OFF		ECT above 70 °C {158 °F): ON HO2S (Rear) heater is malfunctioning: OFF	Inspect following PIDs: ECT, MAF Inspect HO2S heater (See 01-40A-37 HO2S Heater (Front and Rear) Resistance Inspection)	93

01-40A

CONTROL SYSTEM [ZM]

Monitor item (Definition)	Unit/ Condition		Condition/Specification (Reference)	Action	PCM terminal
IAC (IAC valve)	%		Ignition switch ON: 0% Idle: 25—35%	Inspect following PIDs: IAT, RPM, ECT, MAF, TP, PNP, CPP, PSP, ACSW, TEST Inspect IAC valve (See 01-13A-7 IDLE AIR CONTROL (IAC) VALVE INSPECTION [ZM])	54, 83
IAT (Intake air temperature)	°C	°F	IAT 20 °C {68 °F}: 20 °C {68 °F}	Inspect IAT sensor (See 01-40A-26 MASS AIR FLOW (MAF)/INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION [ZM])	39
	V		IAT 20 °C {68 °F}: 2.3—2.4 V IAT 30 °C {86 °F}: 1.7—1.9 V	Inspect IAT sensor (See 01-40A-26 MASS AIR FLOW (MAF)/INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION [ZM])	39
IMRC (VTCS solenoid valve)	ON/OFF		ECT above 65 °C {149 °F} while idling: OFF ECT below 65 °C {149 °F} and engine speed at 1,500 rpm: ON	Inspect following PIDs: ECT, RPM, TP Inspect VTCS solenoid valve (See 01-13A-11 VARIABLE TUMBLE CONTROL SYSTEM (VTCS) SOLENOID VALVE INSPECTION [ZM])	19
LOAD (Load)	%		Idle: 13—20% (MTX), 14—22% (ATX) Engine speed at 2,500 rpm: 11—17% (MTX), 13—19% (ATX)	Perform "On-Board Diagnostic Test" (See 01-02A-8 ON-BOARD DIAGNOSTIC TEST [ZM])	—
LONGFT1 (Long fuel trim)	%		Idle: -5—5%	Perform "On-Board Diagnostic Test" (See 01-02A-8 ON-BOARD DIAGNOSTIC TEST [ZM])	—
LPS*1 (Pressure control solenoid)	A		Change current value according to throttle opening angle	Inspect pressure control solenoid (See 05-17-28 SOLENOID VALVES INSPECTION)	44, 81
MAF (Intake MAF)	g/s		Idle: 1.6—2.2 g/s (MTX), 1.6—2.4 g/s (ATX) Engine speed at 2,500 rpm: 5.1—6.5 g/s (MTX), 5.6—7.2 g/s (ATX)	Inspect MAF sensor (See 01-40A-26 MAF Sensor Inspection)	88
	V		Ignition switch ON: 0.6—2.0 V Idle: 0.8—2.2 V	Inspect MAF sensor (See 01-40A-26 MASS AIR FLOW (MAF)/INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION [ZM])	88
MIL (Malfunction indicator light)	ON/OFF		Ignition switch ON: ON DTC output: ON No DTC output: OFF	Inspect MIL	2
MODE1 (Readiness Function Code)	ON/OFF		RFC exists: ON No RFC: OFF	—	—
O2S11 (HO2S (Front))	V		Ignition switch ON: 0—1.0 V After warm up: 0—1.0 V Acceleration: 0.5—1.0 V Deceleration: 0—0.5 V	Inspect HO2S (See 01-40A-36 HO2S (Front and Rear) Voltage Inspection)	60
O2S12 (HO2S (Rear))	V		Ignition switch ON: 0—1.0 V Idle (After warm up): 0—1.0 V Idle (Engine cold): 0—0.5 V Accelerate: 0.5—1.0 V Decelerate: 0—0.5 V	Inspect HO2S (See 01-40A-36 HO2S (Front and Rear) Voltage Inspection)	35
PNP*1 (TR switch)	ON/OFF		P or N range: ON Others: OFF	Inspect TR switch (See 05-17-20 TRANSAXLE RANGE (TR) SWITCH INSPECTION)	64
PNP*2 (Neutral switch)	ON/OFF		Shift position at neutral: ON Others: OFF	Inspect neutral switch (See 01-40A-42 NEUTRAL SWITCH INSPECTION [ZM])	64
PSP (PSP switch)	ON/OFF		Steering wheel is at straight ahead position: OFF Steering wheel is fully turned: ON	Inspect PSP switch (See 01-40A-43 POWER STEERING PRESSURE (PSP) SWITCH INSPECTION [ZM])	31

CONTROL SYSTEM [ZM]

Monitor item (Definition)	Unit/ Condition		Condition/Specification (Reference)	Action	PCM terminal
RPM (Engine speed)	rpm		Idle: 650—750 rpm	Inspect CKP sensor (See 01-40A-32 CRANKSHAFT POSITION (CKP) SENSOR INSPECTION [ZM])	21, 22
SEGRP (EGR valve (stepping motor) position)	step		Ignition switch ON: 0 step Idle: 0 step Cranking: 0—60 steps	Inspect following PIDs: ECT, TP Inspect EGR valve (See 01-16-15 EGR VALVE INSPECTION)	46, 56, 68, 72
SHRTFT1 (Short fuel trim)	%		Idle: -10—10%	Perform "On-Board Diagnostic Test" (See 01-02A-8 ON-BOARD DIAGNOSTIC TEST [ZM])	—
SPARKADV (Ignition timing)	BTDC		Idle: BTDC 6—18° Idle (Terminal TEN ground): BTDC 9—11°	Inspect following PIDs: MAF, IAT, RPM, TP, ECT, PSP, PNP, CPP, ACSW, TEST Perform Engine tune-up. (See 01-10A-25 ENGINE TUNE-UP [ZM])	26, 52
SSA/SS1*1 (Shift solenoid A)	%		Fourth gear: 100% Others: 0%	Inspect shift solenoid A (See 05-17-28 SOLENOID VALVES INSPECTION)	82
SSB/SS2*1 (Shift solenoid B)	%		First gear: 100% Others: 0%	Inspect shift solenoid B (See 05-17-28 SOLENOID VALVES INSPECTION)	99
SSC/SS3*1 (Shift solenoid C)	%		First gear: 100% Second gear: 100% N position: ON Others: 0%	Inspect shift solenoid C (See 05-17-28 SOLENOID VALVES INSPECTION)	102
SSD/SS4*1 (Shift solenoid D)	ON/OFF		P or N position: ON 1 range: ON Others: OFF	Inspect shift solenoid D (See 05-17-28 SOLENOID VALVES INSPECTION)	27
SSE/SS5*1 (Shift solenoid E)	ON/OFF		TCC operating: ON 1 range: ON Others: OFF	Inspect shift solenoid E (See 05-17-28 SOLENOID VALVES INSPECTION)	1
TCIL (O/D OFF indicator light)	ON/OFF		O/D OFF mode: ON Others: OFF	Inspect O/D OFF indicator light	43
TCS (O/D OFF switch)	ON/OFF		O/D OFF switch pressed: ON Others: OFF	Inspect O/D OFF switch (See 05-17-19 O/D OFF SWITCH INSPECTION)	29
TEST (TEN terminal (DLC))	ON/OFF		Open terminal TEN: OFF Short terminal TEN: ON	Inspect DLC TEN terminal and PCM connector terminal 5	5
TFT*1 (Transaxle fluid temperature)	°C	°F	TFT 20 °C {68 °F}: 20 °C {68 °F} TFT 130 °C {266 °F}: 130 °C {266 °F}	Inspect TFT sensor (See 05-17-25 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR INSPECTION)	37
TFTV*1 (TFT sensor signal voltage)	V		TFT 20 °C {68 °F}: 3.4—3.6 V TFT 130 °C {266 °F}: 0.4—0.5 V	Inspect TFT sensor (See 05-17-25 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR INSPECTION)	37
TPOD*1 (TP)	%		CTP: 0% WOT: 100%	Inspect TP sensor (See 01-40A-28 THROTTLE POSITION (TP) SENSOR INSPECTION [ZM])	89
TP (TP sensor signal voltage)	V		CTP: 0.1—1.1 V WOT: 3.0—4.6 V	Inspect TP sensor (See 01-40A-28 THROTTLE POSITION (TP) SENSOR INSPECTION [ZM])	89
TRL ¹ (TR switch [1range])	ON/OFF		1 range: ON Others: OFF	Inspect TR switch (See 05-17-20 TRANSAXLE RANGE (TR) SWITCH INSPECTION)	7
TROD*1 (TR switch [D range])	ON/OFF		D range: ON Others: OFF	Inspect TR switch (See 05-17-20 TRANSAXLE RANGE (TR) SWITCH INSPECTION)	6

01-40A

CONTROL SYSTEM [ZM]

Monitor item (Definition)	Unit/ Condition		Condition/Specification (Reference)	Action	PCM terminal
TRR* ¹ (TR switch [R position])	ON/OFF		R position: ON Others: OFF	Inspect TR switch (See 05-17-20 TRANSAXLE RANGE (TR) SWITCH INSPECTION)	32
TRD* ¹ (TR switch [2range])	ON/OFF		2 range: ON Others: OFF	Inspect TR switch (See 05-17-20 TRANSAXLE RANGE (TR) SWITCH INSPECTION)	9
TSS* ¹ (Input/turbine speed signal)	rpm		Ignition switch ON: 0 rpm Idle: 650—750 rpm	Inspect input/turbine speed sensor (See 05-17-20 TRANSAXLE RANGE (TR) SWITCH INSPECTION)	23, 84
VPWR (Battery positive voltage)	V		Ignition switch ON: B+	Inspect main relay (See 09-21-5 RELAY INSPECTION Inspect battery) (See 01-17-1 BATTERY INSPECTION)	71, 97
VSS (Vehicle speed)	km/h	mph	Vehicle speed 20 km/h {12.5 mph}: 20 km/h {12.5 mph} Vehicle speed 40 km/h {25 mph}: 40km/h {25 mph}	Inspect VSS MTX: (See 09-22-4 Speedometer) ATX: (See 05-17-27 VEHICLE SPEEDOMETER SENSOR (VSS) INSPECTION [ATX])	58

*1 : ATX only

*2 : MTX only

PCM Inspection Using the SST (104 Pin Breakout Box)

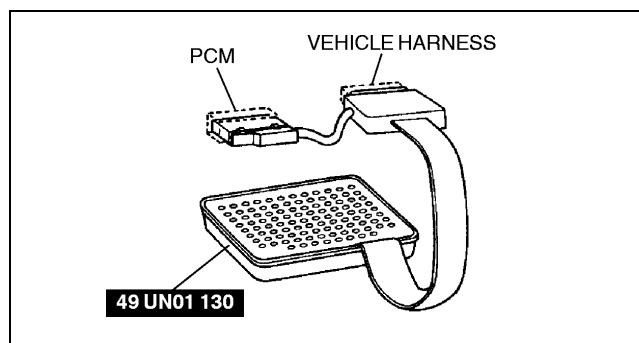
1. Disconnect the negative battery cable.
2. Disconnect the PCM connector.
3. Connect the **SST** (104 Pin Breakout Box) to the PCM as shown.
4. Tighten the connector bolt.

Tightening torque

7.9—10.7 N·m

{80—110 kgf·m, 69.5—95.4 in·lbf}

5. Connect the negative battery cable.
6. Measure the voltage at each terminal.
 - If any incorrect voltage is detected, inspect the related system(s), wiring harnesses and connector(s) referring to the action column in the terminal voltage table.



X3U140WA2

Terminal voltage table (Reference)

Terminal	Signal	Connected to	Test condition	Voltage (V)	Action
1* ¹	Shift solenoid E control	Shift solenoid E	Idle (P position)	Below 1.0	<ul style="list-style-type: none"> • Inspect shift solenoid E (See 05-17-28 SOLENOID VALVES INSPECTION) • Inspect related harness
			1 range (1GR)	B+	
2	MIL control	MIL (in instrument cluster)	Ignition switch ON	Below 1.0	<ul style="list-style-type: none"> • Inspect MIL • Inspect related harness
			Idle	B+	
3	—	—	—	—	—
4	B+ monitor	Battery	Under any condition	B+	<ul style="list-style-type: none"> • Inspect battery (See 01-17-1 BATTERY INSPECTION) • Inspect EGI fuse • Inspect related harness

CONTROL SYSTEM [ZM]

Terminal	Signal	Connected to	Test condition		Voltage (V)	Action
5	Diagnostic test mode	DLC terminal TEN	Ignition switch ON	Open terminal TEN	B+	<ul style="list-style-type: none"> Inspect related harness
				Short to ground terminal TEN	Below 1.0	
6	Clutch operation (MTX)	Clutch switch	Clutch pedal depressed		Below 1.0	<ul style="list-style-type: none"> Inspect clutch switch (See 01-40A-41 CLUTCH SWITCH INSPECTION [ZM]) Inspect related harness
			Clutch pedal released		B+	
	D range (ATX)	TR switch (terminal G)	Ignition switch ON	Selector lever is at D range	B+	<ul style="list-style-type: none"> Inspect TR switch (See 05-17-20 TRANSAXLE RANGE (TR) SWITCH INSPECTION) Inspect related harness
				Selector lever is at other than D range	Below 1.0	
7*1	1 range	TR switch (terminal E)	Ignition switch ON	Selector lever is at 1 range	B+	<ul style="list-style-type: none"> Inspect TR switch (See 05-17-20 TRANSAXLE RANGE (TR) SWITCH INSPECTION) Inspect related harness
				Selector lever is at other than 1 range	Below 1.0	
8	—	—	—		—	—
9*1	2 range	TR switch (terminal F)	Ignition switch ON	Selector lever is at 2 range	B+	<ul style="list-style-type: none"> Inspect TR switch (See 05-17-20 TRANSAXLE RANGE (TR) SWITCH INSPECTION) Inspect related harness
				Selector lever is at other than 2 range	Below 1.0	
10	—	—	—		—	—
11	—	—	—		—	—
12	—	—	—		—	—
13	EPROM flashing	DLC-2 terminal FEPS	Because this terminal is for serial communication, good/no good judgment by terminal voltage is not possible.			<ul style="list-style-type: none"> Inspect related harness
14	—	—	—		—	—
15	—	—	—		—	—
16	—	—	—		—	—
17	—	—	—		—	—
18	CDCV control	CDCV	Ignition switch ON		B+	<ul style="list-style-type: none"> Inspect CDCV (See 01-16-10 CANISTER DRAIN CUT VALVE (CDCV) INSPECTION) Inspect related harness
			Diagnosis executed (while on-board device control is carrying out)		Below 1.0	
19	VTCS control	VTCS solenoid valve	ECT above 65 °C {149 °F} while idling		B+	<ul style="list-style-type: none"> Inspect VTCS solenoid valve (See 01-13A-11 VARIABLE TUMBLE CONTROL SYSTEM (VTCS) SOLENOID VALVE INSPECTION [ZM]) Inspect related harness
			ECT below 65 °C {149 °F} and engine speed at 1,500 rpm		Below 1.0	
20	—	—	—		—	—

01-40A

CONTROL SYSTEM [ZM]

Terminal	Signal	Connected to	Test condition		Voltage (V)	Action
21	NE (+)	CKP sensor	<ul style="list-style-type: none"> Inspect using the wave profile. (See 01-40A-21 Inspection Using An Oscilloscope (Reference)) 			<ul style="list-style-type: none"> Inspect CKP sensor (See 01-40A-32 CRANKSHAFT POSITION (CKP) SENSOR INSPECTION [ZM]) Inspect related harness
22	NE (-)	CKP sensor	<ul style="list-style-type: none"> Inspect using the wave profile. (See 01-40A-21 Inspection Using An Oscilloscope (Reference)) 			<ul style="list-style-type: none"> Inspect CKP sensor (See 01-40A-32 CRANKSHAFT POSITION (CKP) SENSOR INSPECTION [ZM]) Inspect related harness
23*1	Input/turbine speed (-)	Input/turbine speed sensor	<ul style="list-style-type: none"> Inspect using the wave profile. (See 01-40A-21 Inspection Using An Oscilloscope (Reference)) 			<ul style="list-style-type: none"> Inspect input/turbine speed sensor (See 05-17-26 INPUT/TURBINE SPEED SENSOR INSPECTION) Inspect related harness
24	GND	GND	Under any condition		Below 1.0	<ul style="list-style-type: none"> Inspect related harness
25	—	—	—		—	—
26	IGT1	Ignition coil (No. 1, 4 cylinders)	<ul style="list-style-type: none"> Inspect using the wave profile. (See 01-40A-21 Inspection Using An Oscilloscope (Reference)) 			<ul style="list-style-type: none"> Inspect ignition coil (See 01-18-2 IGNITION COIL INSPECTION) Inspect related harness
27*1	Shift solenoid D control	Shift solenoid D	Idle	Selector lever is at P, N position and 1 range	B+	<ul style="list-style-type: none"> Inspect shift solenoid D (See 05-17-28 SOLENOID VALVES INSPECTION) Inspect related harness
				Others	Below 1.0	
28*1	Vehicle speed output	Speedometer (in instrument cluster)	<ul style="list-style-type: none"> Inspect using the wave profile. (See 01-40A-21 Inspection Using An Oscilloscope (Reference)) 			<ul style="list-style-type: none"> Inspect speedometer (See 09-22-4 Speedometer) Inspect related harness
29*1	O/D OFF signal	O/D OFF switch	Ignition switch ON	O/D OFF switch pushed	Below 1.0	<ul style="list-style-type: none"> Inspect O/D OFF switch (See 05-17-19 O/D OFF SWITCH INSPECTION) Inspect related harness
				O/D OFF switch released	B+	
30	Generator output voltage	Generator (terminal P)	<ul style="list-style-type: none"> Inspect using the wave profile. (See 01-40A-21 Inspection Using An Oscilloscope (Reference)) 			<ul style="list-style-type: none"> Inspect generator (See 01-17-3 GENERATOR INSPECTION) Inspect related harness

CONTROL SYSTEM [ZM]

Terminal	Signal	Connected to	Test condition		Voltage (V)	Action
31	PSP	PSP switch	Ignition switch ON		B+	<ul style="list-style-type: none"> Inspect PSP switch (See 01-40A-43 POWER STEERING PRESSURE (PSP) SWITCH INSPECTION [ZM]) Inspect power steering system Inspect related harness
			Idle	Steering wheel at straight ahead position	B+	
				While turning steering wheel	Below 1.0	
32*1	R position	TR switch (terminal C)	Ignition switch ON	Selector lever is at R position	B+	<ul style="list-style-type: none"> Inspect TR switch (See 05-17-20 TRANSAXLE RANGE (TR) SWITCH INSPECTION) Inspect related harness
				Selector lever is at other than R position	Below 1.0	
33	—	—	—		—	—
34	BARO/EGR boost	EGR boost sensor	Ignition switch ON (Barometric pressure at 102 kPa {765 mmHg, 30 inHg})		Approx. 4.0	<ul style="list-style-type: none"> Inspect EGR boost sensor (See 01-40A-38 EGR BOOST SENSOR INSPECTION [ZM]) Inspect related harness
35	Catalytic converter efficiency	HO2S (Rear)	Ignition switch ON		Below 1.0	<ul style="list-style-type: none"> Inspect HO2S (Rear) (See 01-40A-36 HO2S (Front and Rear) Voltage Inspection) Inspect related harness
			Idle	Engine cold	Approx. 0	
				After warm up	0.1—0.9	
36	—	—	—		—	—
37*1	TFT	TFT sensor	Ignition switch ON	TFT 20 °C {68 °F}	3—4	<ul style="list-style-type: none"> Inspect TFT sensor (See 05-17-25 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR INSPECTION) Inspect related harness
				TFT 130 °C {266 °F}	0.2—0.7	
38	ECT	ECT sensor	Ignition switch ON	ECT 20 °C {68 °F}	2.9—3.1	<ul style="list-style-type: none"> Inspect ECT sensor (See 01-40A-31 ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION [ZM]) Inspect related harness
				After warm up	0.2—1.0	
39	IAT	IAT sensor (integrated with MAF sensor)	Ignition switch ON	IAT 20 °C {68 °F}	2.3—2.4	<ul style="list-style-type: none"> Inspect IAT sensor (See 01-40A-27 IAT Sensor Resistance Inspection) Inspect related harness
				IAT 30 °C {86 °F}	1.7—1.9	
40	—	—	—		—	—
41	A/C on signal	Refrigerant pressure switch	Idle	A/C switch and fan switch on	Below 1.0	<ul style="list-style-type: none"> Inspect A/C switch (See 07-40-9 REFRIGERANT PRESSURE SWITCH INSPECTION) Inspect related harness
				A/C switch off	B+	

01-40A

CONTROL SYSTEM [ZM]

Terminal	Signal	Connected to	Test condition		Voltage (V)	Action
42	Generator warning light control	Generator warning light (in instrument cluster)	Ignition switch ON		Below 1.0	<ul style="list-style-type: none"> Inspect generator warning light Inspect related harness
			Idle		B+	
43*1	O/D OFF indicator light signal	O/D OFF indicator light	Ignition switch ON	O/D OFF indicator light illuminates	Below 1.0	<ul style="list-style-type: none"> Inspect O/D OFF indicator light Inspect related harness
				O/D OFF indicator light does not illuminate	B+	
44*1	Pressure control solenoid control (+)	Pressure control solenoid	<ul style="list-style-type: none"> Inspect using the wave profile. (See 01-40A-21 Inspection Using An Oscilloscope (Reference)) 			<ul style="list-style-type: none"> Inspect pressure control solenoid (See 05-17-28 SOLENOID VALVES INSPECTION) Inspect related harness
45	Condenser fan control	Condenser fan relay	Ignition switch ON		B+	<ul style="list-style-type: none"> Inspect condenser fan relay (See 09-21-5 RELAY INSPECTION) Inspect related harness
			Idle	Condenser fan operating	Below 1.0	
				Others	B+	
46	EGR valve #3 coil control	EGR valve (terminal B)	Ignition switch ON		B+	<ul style="list-style-type: none"> Inspect EGR valve (See 01-16-15 EGR VALVE INSPECTION) Inspect related harness
			Idle		B+	
47	Cooling fan control	Cooling fan relay	Ignition switch ON		B+	<ul style="list-style-type: none"> Inspect cooling fan relay (See 09-21-5 RELAY INSPECTION) Inspect related harness
			Idle	Cooling fan operating	Below 1.0	
				Others	B+	
48	Engine speed	Tachometer (in instrument cluster), DLC terminal IG-	<ul style="list-style-type: none"> Inspect using the wave profile. (See 01-40A-21 Inspection Using An Oscilloscope (Reference)) 			<ul style="list-style-type: none"> Inspect tachometer (See 09-22-4 Tachometer) Inspect related harness
49	—	—	—		—	—
50	—	—	—		—	—
51	GND	GND	Under any condition		Below 1.0	<ul style="list-style-type: none"> Inspect related harness
52	IGT2	Ignition coil (No. 2, 3 cylinders)	<ul style="list-style-type: none"> Inspect using the wave profile. (See 01-40A-21 Inspection Using An Oscilloscope (Reference)) 			<ul style="list-style-type: none"> Inspect ignition coil (See 01-18-2 IGNITION COIL INSPECTION) Inspect related harness
53	Generator field coil control	Generator (terminal D)	<ul style="list-style-type: none"> Inspect using the wave profile. (See 01-40A-21 Inspection Using An Oscilloscope (Reference)) 			<ul style="list-style-type: none"> Inspect generator (See 01-17-3 GENERATOR INSPECTION) Inspect related harness
54	IAC (+)	IAC valve	Ignition switch ON		B+	<ul style="list-style-type: none"> Inspect IAC valve (See 01-13A-7 IDLE AIR CONTROL (IAC) VALVE INSPECTION [ZM]) Inspect related harness
			Idle (After warm up and E/L off)		B+	

CONTROL SYSTEM [ZM]

Terminal	Signal	Connected to	Test condition		Voltage (V)	Action
55	Back-up power supply	Battery (positive terminal)	Under any condition		B+	<ul style="list-style-type: none"> Inspect battery (See 01-17-1 BATTERY INSPECTION) Inspect EGI fuse Inspect related harness
56	EGR valve #4 coil control	EGR valve (terminal F)	Ignition switch ON		Below 1.0	<ul style="list-style-type: none"> Inspect EGR valve (See 01-16-15 EGR VALVE INSPECTION) Inspect related harness
			Idle		Below 1.0	
57	—	—	—		—	—
58	Vehicle speed	Speedometer (MTX)	<ul style="list-style-type: none"> Inspect using the wave profile. (See 01-40A-21 Inspection Using An Oscilloscope (Reference)) 			<ul style="list-style-type: none"> Inspect VSS (See 09-22-4 Speedometer) Inspect related harness
		VSS (ATX)				<ul style="list-style-type: none"> Inspect VSS (See 05-17-27 VEHICLE SPEEDOMETER SENSOR (VSS) INSPECTION [ATX]) Inspect related harness
59	—	—	—		—	—
60	HO2S (Front)	HO2S (Front)	Ignition switch ON		0—1.0	<ul style="list-style-type: none"> Inspect HO2S (Front) (See 01-40A-36 HO2S (Front and Rear) Voltage Inspection) Inspect related harness
			Idle		0—1.0	
			Acceleration		0.5—1.0	
			Deceleration		0—0.5	
61	—	—	—		—	—
62	Fuel tank pressure	Fuel tank pressure sensor	Ignition switch ON	Fuel tank pressure 0 kPa {0 mmHg, 0 inHg}	Approx. 2.5	<ul style="list-style-type: none"> Inspect fuel tank pressure sensor (See 01-40A-40 FUEL TANK PRESSURE SENSOR INSPECTION [ZM]) Inspect related harness
				Fuel tank pressure 1 kPa {7.5 mmHg, 0.3 inHg}	Approx. 2.8	
63	Fuel tank level	Fuel gauge sender unit	Full fuel		0.2—0.5	<ul style="list-style-type: none"> Inspect fuel gauge sender unit (See 09-22-4 Fuel Gauge) Inspect related harness
			Half fuel		2.0—2.8	
			Empty fuel		3.4—4.4	
64	Neutral position (MTX)	Neutral switch	Shift lever is at neutral position		Below 1.0	<ul style="list-style-type: none"> Inspect neutral switch (See 01-40A-42 NEUTRAL SWITCH INSPECTION [ZM]) Inspect related harness
			Shift lever is not at neutral position		B+	
	Load/no load signal (ATX)	TR switch (terminal H)	Ignition switch ON	Selector lever is at P or N position	Below 1.0	<ul style="list-style-type: none"> Inspect TR switch (See 05-17-20 TRANSAXLE RANGE (TR) SWITCH INSPECTION) Inspect related harness
				Others	B+	
65	—	—	—		—	—
66	—	—	—		—	—

01-40A

CONTROL SYSTEM [ZM]

Terminal	Signal	Connected to	Test condition	Voltage (V)	Action
67	Purge control	Purge solenoid valve	<ul style="list-style-type: none"> Inspect using the wave profile. (See 01-40A-21 Inspection Using An Oscilloscope (Reference)) 		<ul style="list-style-type: none"> Inspect purge solenoid valve (See 01-16-12 PURGE SOLENOID VALVE INSPECTION) Inspect related harness
68	EGR valve #1 coil control	EGR valve (terminal E)	Ignition switch ON	Below 1.0	<ul style="list-style-type: none"> Inspect EGR valve (See 01-16-15 EGR VALVE INSPECTION) Inspect related harness
			Idle	Below 1.0	
69	—	—	—	—	—
70	—	—	—	—	—
71	Power supply	Main relay	Ignition switch ON	B+	<ul style="list-style-type: none"> Inspect main relay (See 09-21-5 RELAY INSPECTION) Inspect EGI fuse Inspect related harness
			Ignition switch off	Below 1.0	
72	EGR valve #2 coil control	EGR valve (terminal A)	Ignition switch ON	B+	<ul style="list-style-type: none"> Inspect EGR valve (See 01-16-15 EGR VALVE INSPECTION) Inspect related harness
			Idle	B+	
73	—	—	—	—	—
74	Fuel injection (#3)	Fuel injector No.3	<ul style="list-style-type: none"> Inspect using the wave profile. (See 01-40A-21 Inspection Using An Oscilloscope (Reference)) 		<ul style="list-style-type: none"> Inspect fuel injector No.3 (See 01-14-24 FUEL INJECTOR INSPECTION) Inspect related harness
75	Fuel injection (#1)	Fuel injector No.1	<ul style="list-style-type: none"> Inspect using the wave profile. (See 01-40A-21 Inspection Using An Oscilloscope (Reference)) 		<ul style="list-style-type: none"> Inspect fuel injector No.1 (See 01-14-24 FUEL INJECTOR INSPECTION) Inspect related harness
76	GND	GND	Under any condition	Below 1.0	<ul style="list-style-type: none"> Inspect related harness
77	GND	GND	Under any condition	Below 1.0	<ul style="list-style-type: none"> Inspect related harness
78	—	—	—	—	—
79	K-LINE (serial communication)	DLC terminal KLN	Because this terminal is for serial communication, good/no good judgment by terminal voltage is not possible.		<ul style="list-style-type: none"> Inspect related harness
80	Fuel pump control	Fuel pump relay	Ignition switch ON	B+	<ul style="list-style-type: none"> Inspect fuel pump relay (See 09-21-5 RELAY INSPECTION) Inspect related harness
			Cranking	Below 1.0	
			Idle	Below 1.0	
81*1	Pressure control solenoid (-) control	Pressure control solenoid	<ul style="list-style-type: none"> Inspect using the wave profile. (See 01-40A-21 Inspection Using An Oscilloscope (Reference)) 		<ul style="list-style-type: none"> Inspect pressure control solenoid (See 05-17-28 SOLENOID VALVES INSPECTION) Inspect related harness

CONTROL SYSTEM [ZM]

Terminal	Signal	Connected to	Test condition		Voltage (V)	Action
82*1	Shift solenoid A control	Shift solenoid A	<ul style="list-style-type: none"> Inspect using the wave profile. (See 01-40A-21 Inspection Using An Oscilloscope (Reference)) 			<ul style="list-style-type: none"> Inspect shift solenoid A (See 05-17-28 SOLENOID VALVES INSPECTION) Inspect related harness
83	IAC (-)	IAC valve	<ul style="list-style-type: none"> Inspect using the wave profile. (See 01-40A-21 Inspection Using An Oscilloscope (Reference)) 			<ul style="list-style-type: none"> Inspect IAC valve (See 01-13A-7 IDLE AIR CONTROL (IAC) VALVE INSPECTION [ZM]) Inspect related harness
84*1	Input/turbine speed (+)	Input/turbine speed sensor	<ul style="list-style-type: none"> Inspect using the wave profile. (See 01-40A-21 Inspection Using An Oscilloscope (Reference)) 			<ul style="list-style-type: none"> Inspect input/turbine speed sensor (See 05-17-26 INPUT/TURBINE SPEED SENSOR INSPECTION) Inspect related harness
85	SGC	CMP sensor	<ul style="list-style-type: none"> Inspect using the wave profile. (See 01-40A-21 Inspection Using An Oscilloscope (Reference)) 			<ul style="list-style-type: none"> Inspect CMP sensor (See 01-40A-35 CAMSHAFT POSITION (CMP) SENSOR INSPECTION [ZM]) Inspect related harness
86	—	—	—		—	—
87	—	—	—		—	—
88	MAF	MAF sensor	Ignition switch ON		0.9—2.0	<ul style="list-style-type: none"> Inspect MAF sensor (See 01-40A-26 MASS AIR FLOW (MAF)/INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION [ZM]) Inspect related harness
			Idle		1.7—2.4	
89	Throttle position	TP sensor	Ignition switch ON	CTP	0.1—1.1	<ul style="list-style-type: none"> Inspect TP sensor (See 01-40A-28 THROTTLE POSITION (TP) SENSOR INSPECTION [ZM]) Inspect related harness
				WOT	3.0—4.6	
90	Constant voltage (Vref)	TP sensor, EGR boost sensor, Fuel tank pressure sensor	Ignition switch ON		Approx. 5.0	<ul style="list-style-type: none"> Inspect related harness
91	Sensor GND	ECT sensor, IAT sensor, EGR boost sensor, Fuel tank pressure sensor, TP sensor, HO2S (Front, Rear), TFT sensor	Under any condition		Below 1.0	<ul style="list-style-type: none"> Inspect related harness
92	Brake	Brake switch	Brake pedal depressed		B+	<ul style="list-style-type: none"> Inspect brake switch (See 04-11-5 BRAKE SWITCH INSPECTION) Inspect related harness
			Brake pedal released		Below 1.0	

01-40A

CONTROL SYSTEM [ZM]

Terminal	Signal	Connected to	Test condition		Voltage (V)	Action
93	HO2S (Rear) heater control	HO2S (Rear)	Idle	ECT above 70°C {158 °F}	Below 1.0	<ul style="list-style-type: none"> Inspect HO2S (Rear) (See 01-40A-37 HO2S Heater (Front and Rear) Resistance Inspection) Inspect related harness
				HO2S (Rear) is malfunctioning	B+	
94	HO2S (Front) heater control	HO2S (Front)	Ignition switch ON (engine stopped)		B+	<ul style="list-style-type: none"> Inspect HO2S (Front) heater. (See 01-40A-37 HO2S Heater (Front and Rear) Resistance Inspection) Inspect related harness
			Approx. 15 seconds after engine start with ECT 20—30°C {68—86 °F}		Below 1.0	
			Others		Below 1.0 ↔ B+	
95	PRC	PRC solenoid valve	Ignition switch ON		B+	<ul style="list-style-type: none"> Inspect PRC solenoid valve (See 01-14-31 PRC SOLENOID VALVE INSPECTION) Inspect related harness
			After hot start		Below 1.0	
96	A/C control	A/C relay	Idle	A/C switch and fan switch on	Below 1.0	<ul style="list-style-type: none"> Inspect A/C relay (See 09-21-5 RELAY INSPECTION) Inspect related harness
				A/C switch off	B+	
97	Power supply	Main relay	Ignition switch ON		B+	<ul style="list-style-type: none"> Inspect main relay (See 09-21-5 RELAY INSPECTION) Inspect related harness
			Ignition switch off		Below 1.0	
98	EGR boost sensor switching control	EGR boost solenoid valve	Ignition switch ON		B+	<ul style="list-style-type: none"> Inspect EGR boost solenoid valve (See 01-16-17 EGR BOOST SENSOR SOLENOID VALVE INSPECTION) Inspect related harness
			Idle		B+	
99*1	Shift solenoid B control	Shift solenoid B	<ul style="list-style-type: none"> Inspect using the wave profile. (See 01-40A-21 Inspection Using An Oscilloscope (Reference)) 			<ul style="list-style-type: none"> Inspect shift solenoid B (See 05-17-28 SOLENOID VALVES INSPECTION) Inspect related harness
100	Fuel injection (#4)	Fuel injector No.4	<ul style="list-style-type: none"> Inspect using the wave profile. (See 01-40A-21 Inspection Using An Oscilloscope (Reference)) 			<ul style="list-style-type: none"> Inspect fuel injector No.4 (See 01-14-24 FUEL INJECTOR INSPECTION) Inspect related harness
101	Fuel injection (#2)	Fuel injector No.2	<ul style="list-style-type: none"> Inspect using the wave profile. (See 01-40A-21 Inspection Using An Oscilloscope (Reference)) 			<ul style="list-style-type: none"> Inspect fuel injector No.2 (See 01-14-24 FUEL INJECTOR INSPECTION) Inspect related harness

CONTROL SYSTEM [ZM]

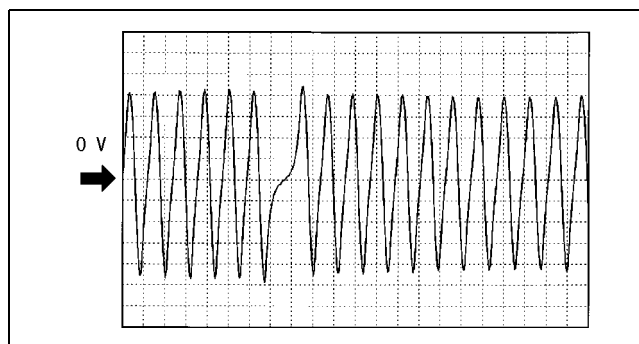
Terminal	Signal	Connected to	Test condition	Voltage (V)	Action
102*1	Shift solenoid C Control	Shift solenoid C	<ul style="list-style-type: none"> Inspect using the wave profile. (See 01-40A-21 Inspection Using An Oscilloscope (Reference)) 		<ul style="list-style-type: none"> Inspect shift solenoid C (See 05-17-28 SOLENOID VALVES INSPECTION) Inspect related harness
103	GND	GND	Under any condition	Below 1.0	<ul style="list-style-type: none"> Inspect related harness
104	—	—	—	—	—

*1 : ATX only

Inspection Using An Oscilloscope (Reference)

Ne signal

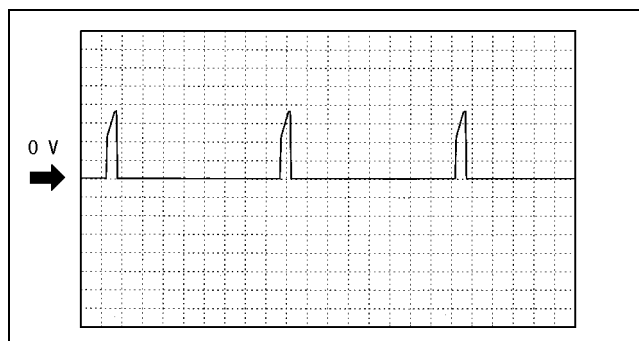
- PCM terminal: 21(+)-22(-)
- Oscilloscope setting: 2 V/DIV(Y), 2ms/DIV(X), AC range
- Vehicle condition: idle after warm up



Z3U0140W006

IGT signal

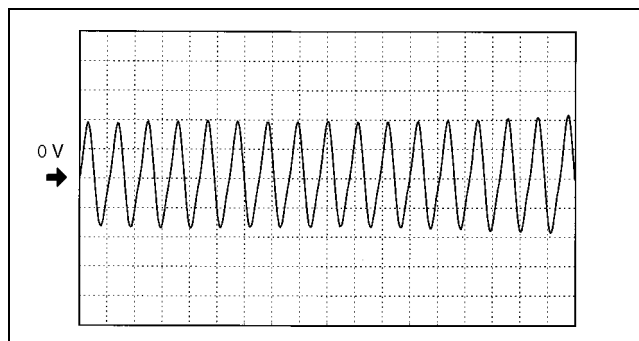
- PCM terminal:
 - IGT1: 26(+)-103(-)
 - IGT2: 52(+)-103(-)
- Oscilloscope setting: 1 V/DIV(Y), 10ms/DIV(X), DC range
- Vehicle condition: idle after warm up



Z3U0140W007

Input/turbine speed signal

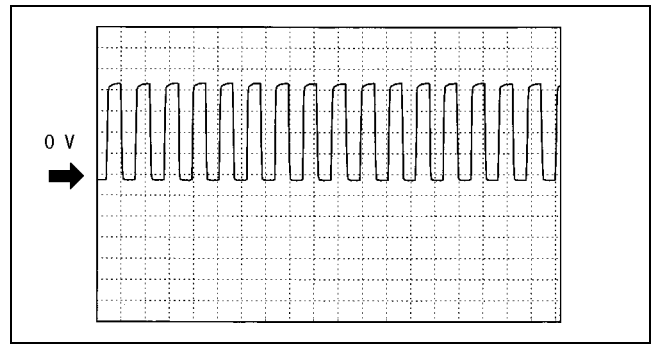
- PCM terminal: 84(+)-23(-)
- Oscilloscope setting: 0.4 V/DIV(Y), 2.5 ms/DIV(X), DC range
- Vehicle condition: idle after warm up



Z3U0140W008

Generator output voltage signal

- PCM terminal: 30(+)-103(-)
- Oscilloscope setting: 2 V/DIV(Y), 5 ms/DIV(X), DC range
- Vehicle condition: idle after warm up

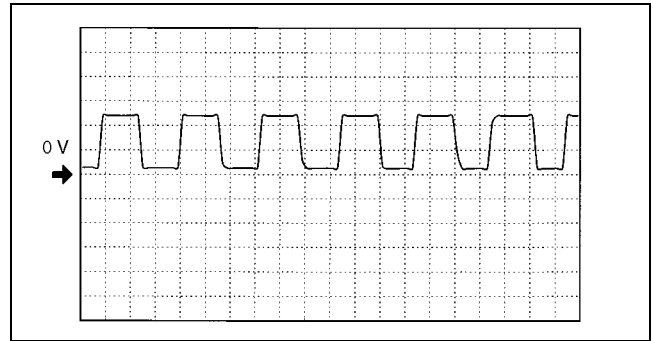


Z3U0140W009

Pressure control solenoid control signal

CTP

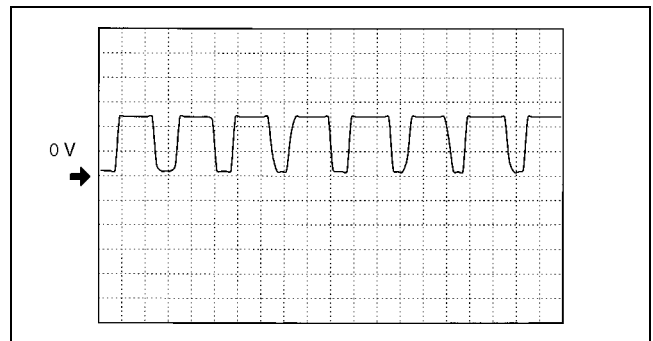
- PCM terminal: 80(+)-103(-)
- Oscilloscope setting: 0.5 V/DIV(Y), 0.1 ms/DIV(X), DC range
- Vehicle condition: ignition key at ON (Engine OFF) and closed throttle position.



Z3U0140W010

WOT

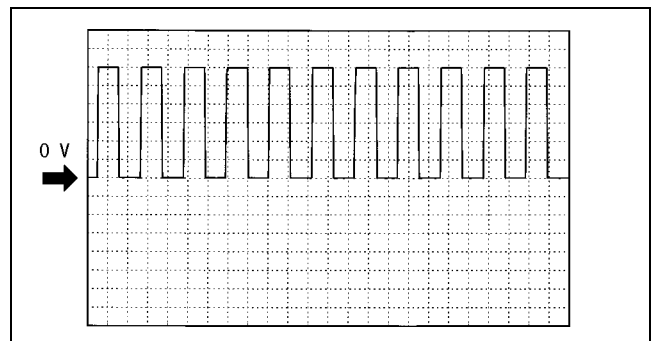
- PCM terminal: 81(+)-103(-)
- Oscilloscope setting: 0.5 V/DIV(Y), 0.1 ms/DIV(X), DC range
- Vehicle condition: ignition key at ON (Engine OFF) and wide open throttle



Z3U0140W019

Engine speed signal

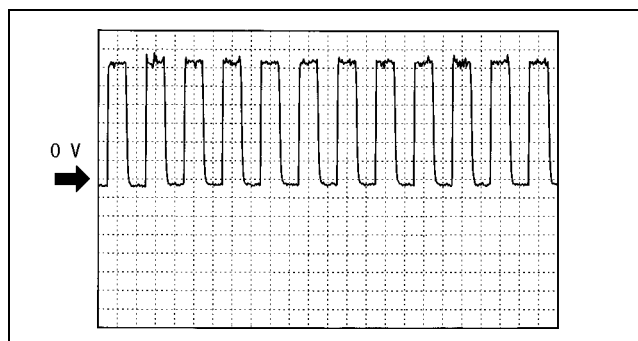
- PCM terminal: 48(+)-103(-)
- Oscilloscope setting: 2 V/DIV(Y), 20 ms/DIV(X), DC range
- Vehicle condition: idle after warm up



Z3U0140W011

Generator field coil control signal

- PCM terminal: 53(+)-103(-)
- Oscilloscope setting: 0.2 V/DIV(Y), 2ms/DIV(X), DC range
- Vehicle condition: idle after warm up

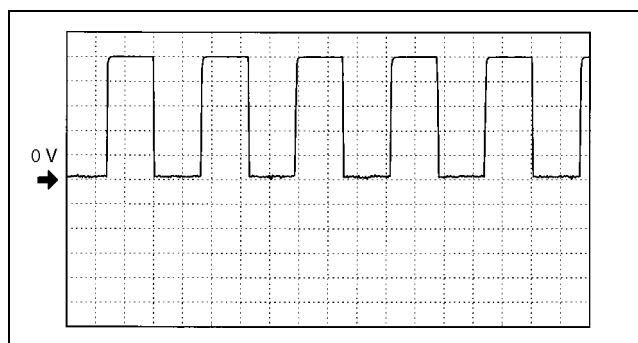


Z3U0140W012

01-40A

Vehicle speed signal

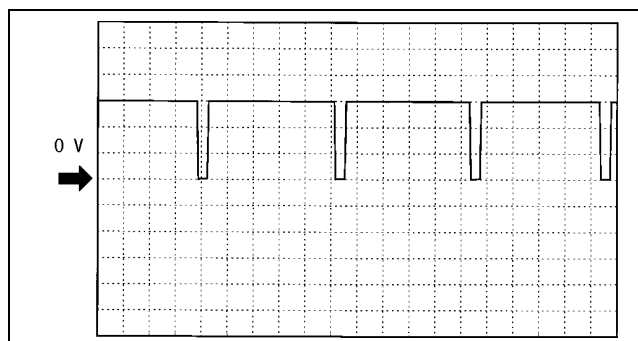
- PCM terminal: 58(+)-103(-)
- Oscilloscope setting: 1 V/DIV(Y), 2.5 ms/DIV(X), DC range
- Vehicle condition: drive the vehicle with 32 km/h [20 mph]



Z3U0140W013

Purge control signal

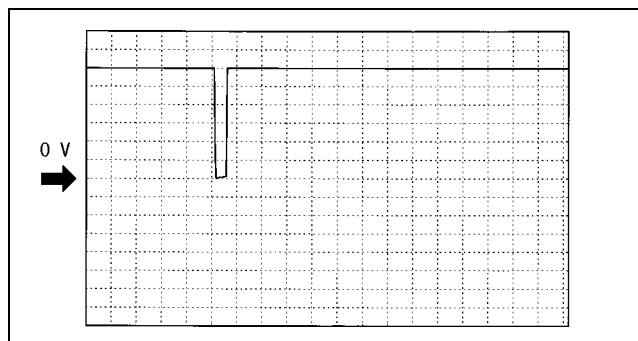
- PCM terminal: 67(+)-103(-)
- Oscilloscope setting: 4 V/DIV(Y), 20 ms/DIV(X), DC range
- Vehicle condition: idle after warm up



Z3U0140W014

Fuel injection signal

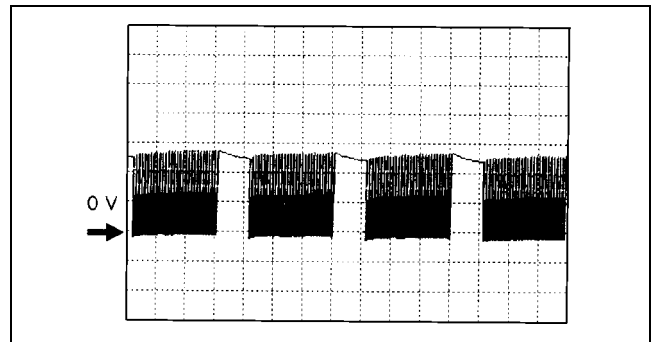
- PCM terminal
 - No.1:75(+)-103(-)
 - No.2:101(+)-103(-)
 - No.3:74(+)-103(-)
 - No.4:100(+)-103(-)
- Oscilloscope setting: 2 V/DIV(Y), 5 ms/DIV(X), DC range
- Vehicle condition: idle after warm up



Z3U0140W015

Shift solenoid A control

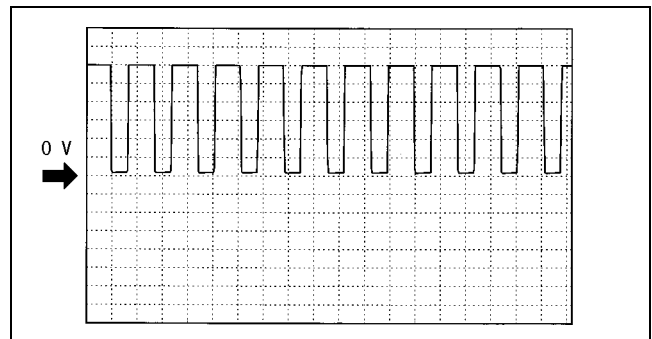
- PCM terminal: 82(+)-103(-)
- Oscilloscope setting: 5 V/DIV(Y), 5 ms/DIV(X), DC range
- Vehicle condition: drive in the 4th gear



Z3U0140W016

IAC signal

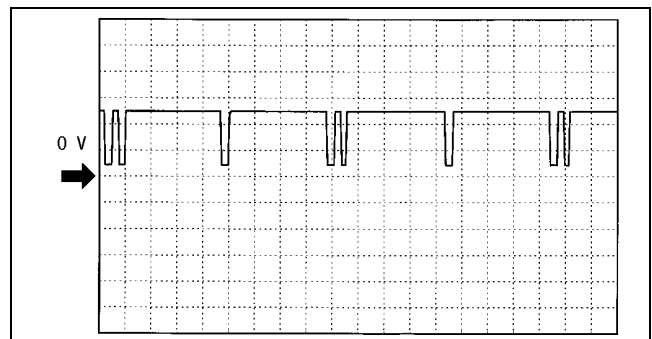
- PCM terminal: 83(+)-103(-)
- Oscilloscope setting: 2 V/DIV(Y), 0.5 ms/DIV(X), DC range
- Vehicle condition: idle after warm up



Z3U0140W017

SGC signal

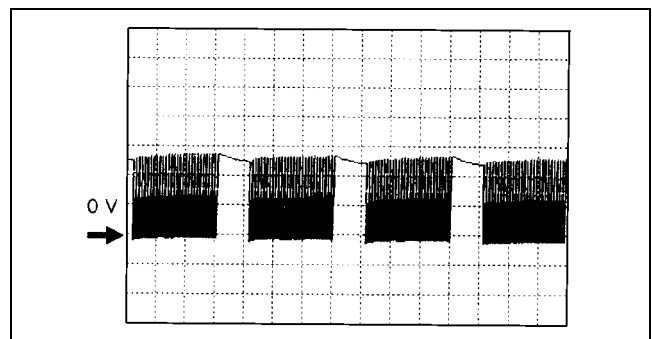
- PCM terminal: 85(+)-103(-)
- Oscilloscope setting: 2 V/DIV(Y), 20 ms/DIV(X), DC range
- Vehicle condition: idle after warm up



Z3U0140W018

Shift solenoid B control signal

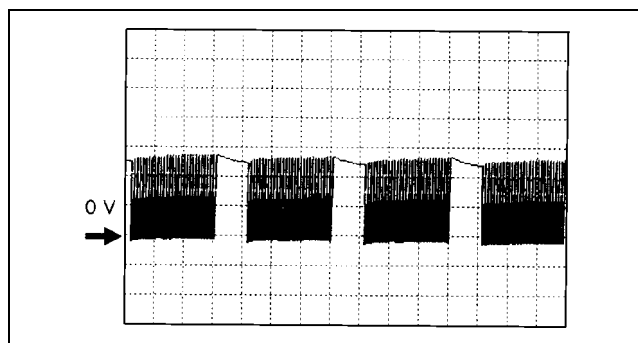
- PCM terminal: 99(+)-103(-)
- Oscilloscope setting: 5 V/DIV(Y), 5ms/DIV(X), DC range
- Vehicle condition: Drive in D range, 1st gear



Z3U0140W016

Shift solenoid C control signal

- PCM terminal: 102(+)-103(-)
- Oscilloscope setting: 5 V/DIV(Y), 5 ms/DIV(X), DC range
- Vehicle condition: Drive in 1st or 2nd gear



Z3U0140W016

01-40A

INSPECTION USING AN OSCILLOSCOPE (REFERENCE) [ZM]

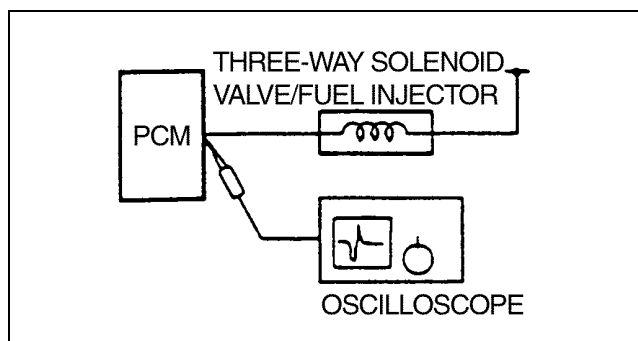
A3U014018881W08

Note

- "INSPECTION USING AN OSCILLOSCOPE (REFERENCE)" is a general inspection for the following output devices.
 - Fuel injector
 - Purge solenoid valve
 - PRC solenoid valve
 - VTCS solenoid valve
 - EGR boost sensor solenoid valve

Purpose

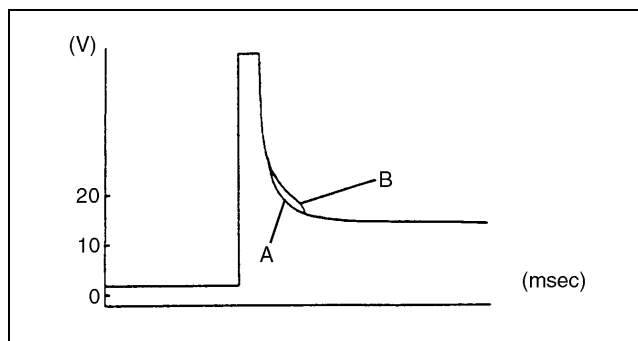
1. The use of oscilloscope makes the inspection of a part such as a stuck solenoid valve possible without actually removing parts.



YLU140WBT

When normal

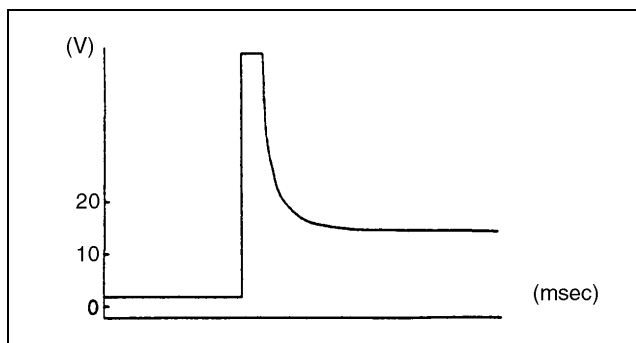
1. Counter electromotive voltage A, generated when the three-way solenoid valve or the fuel injector is turned off from on, shows irregular convergence because induced electromotive voltage B, generated by the plunger return operation, is added to it.



Y3U140WAA

When plunger stuck

1. When the plunger is stuck, pulse convergence is smooth because no induced electromotive voltage B is generated.



YLU140WBV

MASS AIR FLOW (MAF)/INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION [ZM]

A3U014013200W01

Note

- Perform the following test only when directed.

MAF Sensor Inspection

1. Visually inspect for damage, cracks, terminal bends and terminal rust on the MAF sensor.
 - If any of the above are found, replace the MAF sensor.
 - If the MAF sensor PID value or PCM terminal 88 voltage are out of specification, carry out the "Circuit Open/Short Inspection".

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01-40A-7 PCM REMOVAL/INSTALLATION [ZM].)
2. Connect the **SST** (104 Pin Breakout Box) to the PCM as shown.
3. Tighten the connector attaching screw.

Tightening torque

7.9—10.7 N·m

{80—110 kgf·cm, 69.5—95.4 in·lbf}

4. Inspect for an open or short circuit in the following wiring harnesses by probing the applicable sensor and **SST** (104 Pin Breakout Box) terminals with ohmmeter leads.

- If there is an open or short circuit, repair or replace wiring harnesses.
- If there is no open or short circuit, replace the MAF sensor.

Open circuit

- MAF signal circuit (MAF sensor connector terminal C and PCM connector terminal 88)
- Power circuit (MAF sensor connector terminal A and main relay terminal D through common connector)
- GND circuit (MAF sensor connector terminal B and PCM connector terminal 77 through common connector)

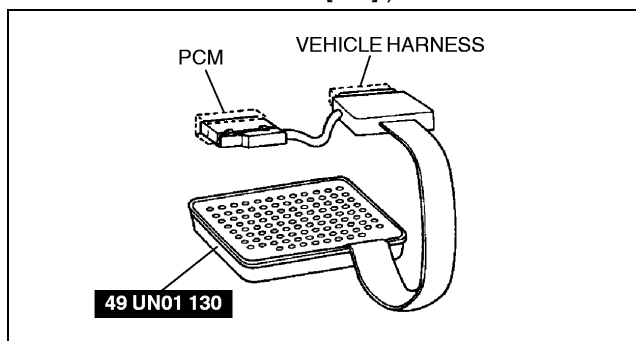
Short circuit

- MAF signal circuit (MAF sensor connector terminal C and PCM connector terminal 88 to GND)
- Power circuit (MAF sensor connector terminal A and main relay terminal D through common connector to GND)

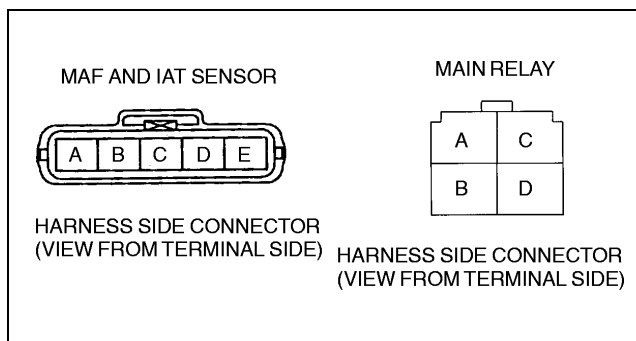
5. Reconnect the MAF sensor connector.

Note

- The scan tool shows the MAF rate and load value.



X3U140WBN



X3U140WA3

Specification

	Intake MAF (g/s)		Engine load calculated value (%)	
	MTX	ATX	MTX	ATX
Idle*1	1.6—2.2	1.6—2.4	13.0—20.0	14.0—22.0
Engine speed 2,500 rpm*2	5.1—6.5	5.6—7.2	11.0—17.0	13.0—19.0

*1 : 650—750 rpm

*2 : No load, neutral or P position

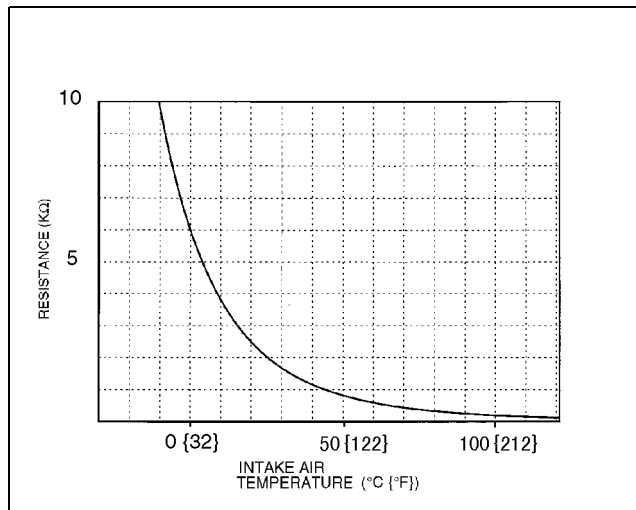
IAT Sensor Resistance Inspection

1. Disconnect the MAF sensor connector.
2. Measure the resistance between MAF sensor terminals D and E using an ohmmeter.
 - If not as specified, replace the MAF sensor.
 - If IAT sensor is okay, but PID value or PCM terminal 39 voltage are out of specification, carry out the "Circuit Open/Short Inspection".

Specification

Ambient temperature (°C {°F})	Resistance (kilohm)
10 {50}	3.1—4.4
20 {68}	2.2—2.7
30 {86}	1.4—1.9

IAT sensor signal characteristic (reference)



Z3U0140W021

Circuit Open/Short Inspection

1. Remove the PCM. (See 01–40A–7 PCM REMOVAL/INSTALLATION [ZM].)
2. Connect the **SST** (104 Pin Breakout Box) to the PCM as shown.
3. Tighten the connector attaching screw.

Tightening torque

7.9—10.7 N·m

{80—110 kgf·cm, 69.5—95.4 in·lbf}

4. Inspect for an open or short circuit in the following wiring harnesses by probing the applicable sensor and **SST** (104 Pin Breakout Box) terminals with ohmmeter leads.

- If there is an open or short circuit, repair or replace wiring harnesses.
- If there is no open or short circuit, replace the MAF sensor.

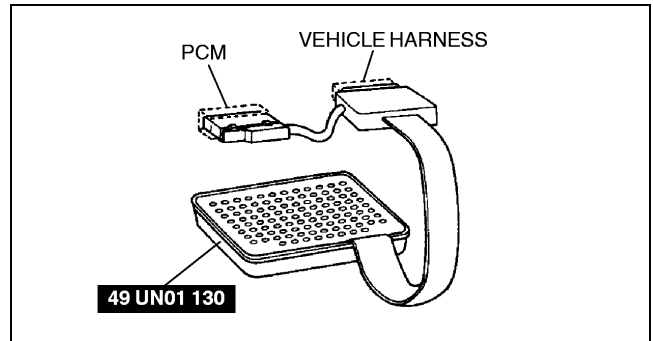
Open circuit

- IAT signal circuit (MAF sensor connector terminal D and PCM connector terminal 39)
- GND circuit (MAF sensor connector terminal E and PCM connector terminal 91 through common connector)

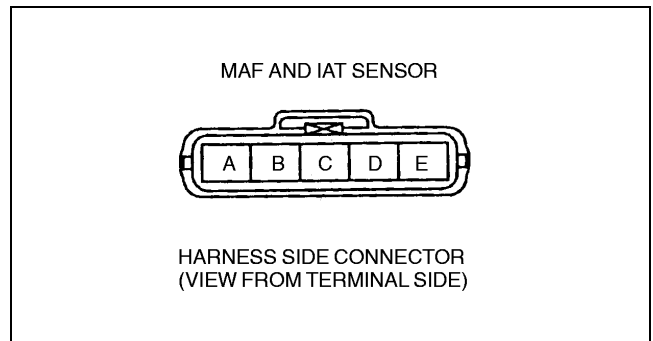
Short circuit

- IAT signal circuit (MAF sensor connector terminal D and PCM connector terminal 39 to GND)

5. Reconnect the sensor connector.



X3U140WBN



X3U140WA4

THROTTLE POSITION (TP) SENSOR INSPECTION [ZM]

A3U014018910W02

Note

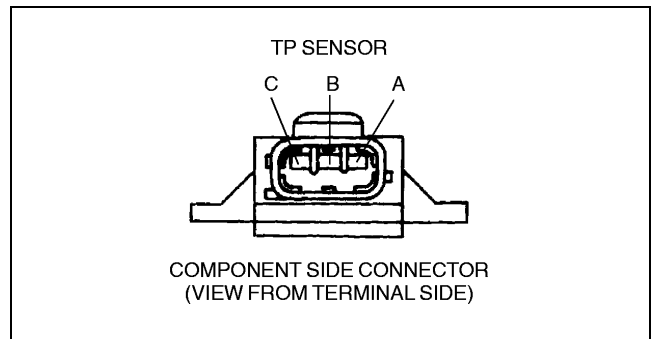
- The TP sensor on this type of vehicle is a maintenance-free type.
- Perform the following test only when directed.

Resistance Inspection

1. Verify that the throttle valve is at CTP.
2. Inspect accelerator cable free play. (See 01–13A–13 ACCELERATOR CABLE INSPECTION/ADJUSTMENT [ZM].)
3. Measure the resistance between TP sensor terminals A and C using an ohmmeter.
 - If not as specified, replace the TP sensor.
 - If as specified, but PID value or PCM terminal 89 voltage is out of specification, carry out the “Circuit Open/Short Inspection”.

Specification

2.5—6 kilohms



X3U140WA5

Circuit Open/Short Inspection

1. Remove the PCM. (See 01-40A-7 PCM REMOVAL/INSTALLATION [ZM].)
2. Connect the **SST** (104 Pin Breakout Box) to the PCM as shown.
3. Tighten the connector attaching screw.

Tightening torque

7.9—10.7 N·m

{80—110 kgf·cm, 69.5—95.4 in·lbf}

4. Inspect for an open or short circuit in the following wiring harnesses by probing the applicable sensor and **SST** (104 Pin Breakout Box) terminals with ohmmeter leads.
 - If there is an open or short circuit, repair or replace wiring harnesses.
 - If there is no open or short circuit, replace the TP sensor.

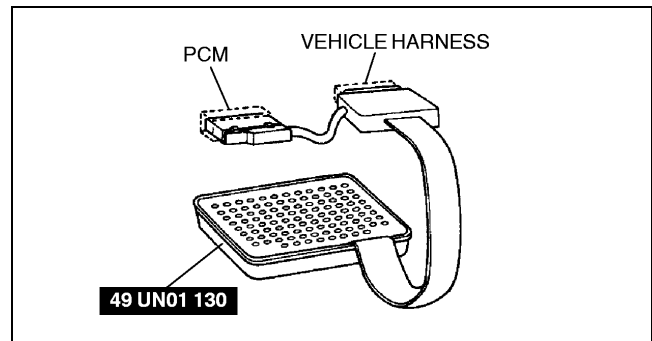
Open circuit

- Constant voltage circuit (TP sensor connector terminal A and PCM connector terminal 90)
- TP signal circuit (TP sensor connector terminal C and PCM connector terminal 89)
- GND circuit (TP sensor connector terminal B and PCM connector terminal 91)

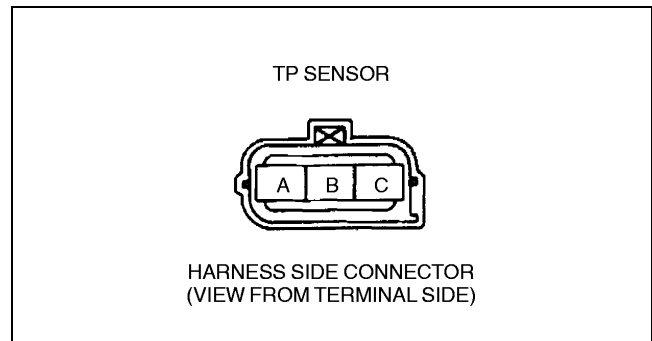
Short circuit

- Constant voltage circuit (TP sensor connector terminal A and PCM connector terminal 90 to GND)
- TP signal circuit (TP sensor connector terminal C and PCM connector terminal 89 to GND)

5. Reconnect the TP sensor connector.



X3U140WBN



X3U140WA6

CONTROL SYSTEM [ZM]

THROTTLE POSITION (TP) SENSOR REMOVAL/INSTALLATION [ZM]

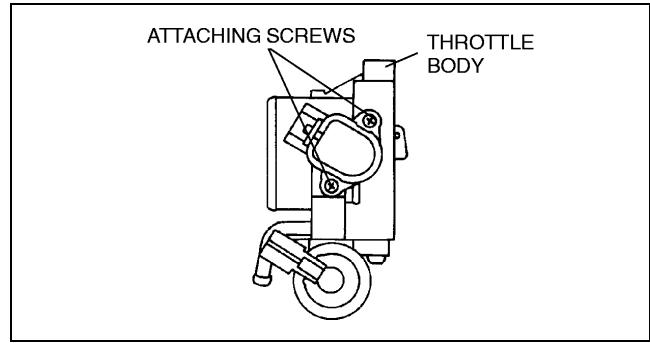
A3U014018910W03

1. Disconnect the TP sensor connector.
2. Remove the TP sensor screws.
3. Remove the TP sensor from the throttle body.
4. Verify that the throttle valve is fully closed.
5. Install the TP sensor to the throttle body.
6. Tighten the TP sensor screws.

Tightening torque

1.6—2.3 N·m {16—24 kgf·cm, 14—20 in·lbf}

7. Verify that the throttle valve moves smoothly.
8. Reconnect the TP sensor connector.



X3U140WA7

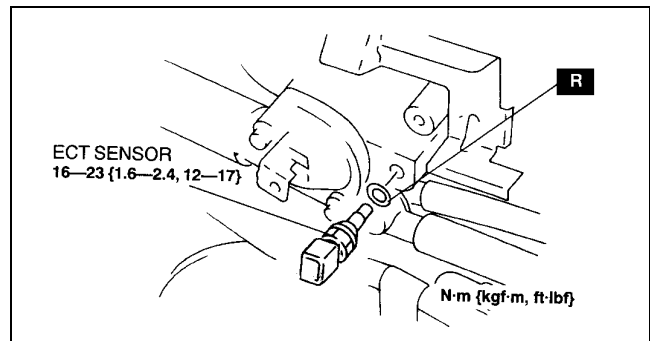
ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION [ZM]

A3U014018840W03

Warning

- When the engine is hot, it can badly burn. Turn off the engine and wait until it is cool before removing or installing the ECT sensor.

1. Drain the engine coolant. (See 01-12-2 COOLING SYSTEM SERVICE WARNINGS.) (See 01-12-3 ENGINE COOLANT REPLACEMENT.)
2. Disconnect the ECT sensor connector.
3. Remove the ECT sensor.
4. Replace the gasket.
5. Install in the reverse order of removal.
6. Refill the engine coolant. (See 01-12-2 COOLING SYSTEM SERVICE WARNINGS.) (See 01-12-3 ENGINE COOLANT REPLACEMENT.)



Y3U140WA1

Note

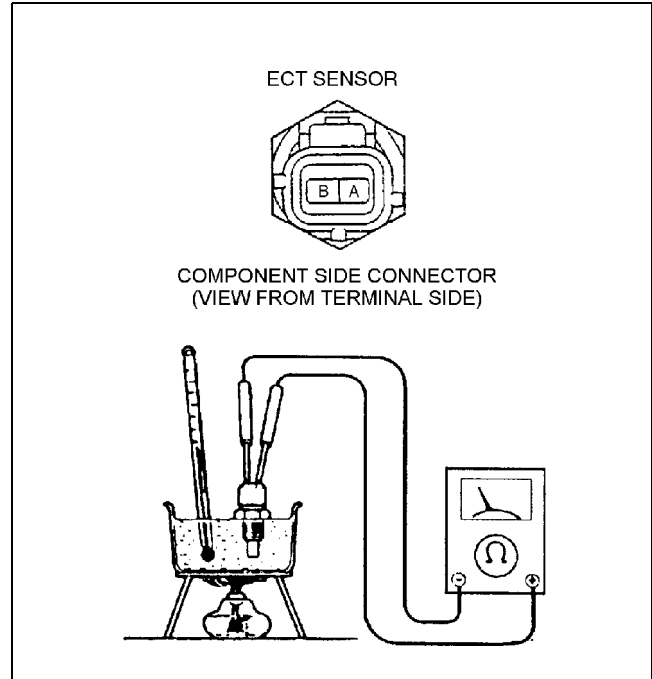
- Perform the following test only when directed.

ECT Sensor Resistance Inspection

- Drain the engine coolant. (See 01-12-2 COOLING SYSTEM SERVICE WARNINGS.) (See 01-12-3 ENGINE COOLANT REPLACEMENT.)
- Remove the ECT sensor.
- Place the ECT sensor in water with a thermometer, and heat the water gradually.
- Measure the resistance between the ECT sensor terminals A and B using an ohmmeter.
 - If not as specified, replace the ECT sensor.
 - If the ECT sensor is okay, but PID value or PCM terminal 38 voltage are out of specification, carry out the "Circuit Open/Short Inspection".

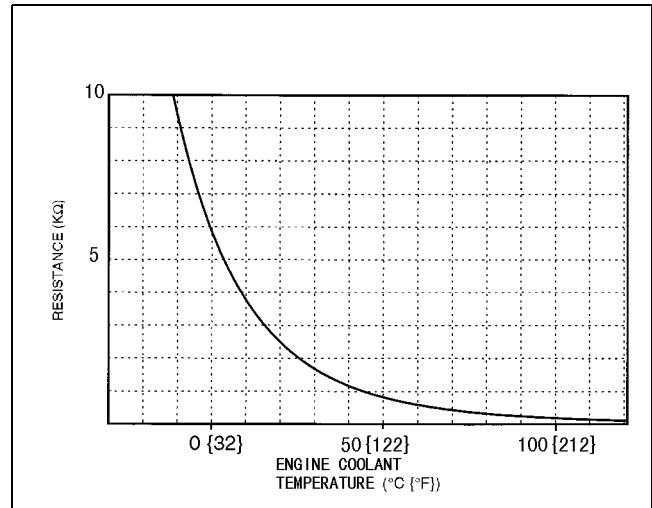
Specification

Water temperature (°C {°F})	Resistance (kilohm)
20 {68}	2.2—2.6
80 {176}	0.29—0.34



Z3U0140W025

ECT sensor signal characteristic (reference)



Z3U0140W022

CONTROL SYSTEM [ZM]

Circuit Open/Short Inspection

1. Remove the PCM. (See 01-40A-7 PCM REMOVAL/INSTALLATION [ZM].)
2. Connect the **SST** (104 Pin Breakout Box) to the PCM as shown.
3. Tighten the connector attaching screw.

Tightening torque

16—23 N·m

{1.6—2.4 kgf·m, 12—17 ft·lbf}

4. Inspect for an open or short circuit in the following wiring harnesses by probing the applicable sensor and **SST** (104 Pin Breakout Box) terminals with ohmmeter leads.

- If there is an open or short circuit, repair or replace wiring harnesses.
- If there is no open or short circuit, replace the ECT sensor.

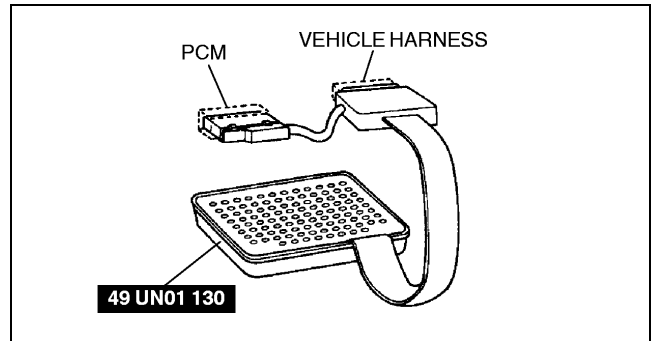
Open circuit

- ECT signal circuit (ECT sensor connector terminal A and PCM connector terminal 38 through common connector)
- GND circuit (ECT sensor connector terminal B and PCM connector terminal 91)

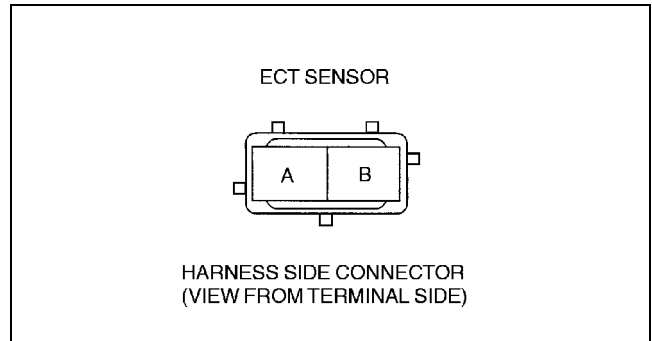
Short circuit

- ECT signal circuit (ECT sensor connector terminal A and PCM connector terminal 38 to GND)
- GND circuit (ECT sensor connector terminal B and PCM connector terminal 91 to GND)

5. Install the ECT sensor.



X3U140WBN



Z3U0140W026

CRANKSHAFT POSITION (CKP) SENSOR INSPECTION [ZM]

A3U014018230W03

Air Gap Inspection

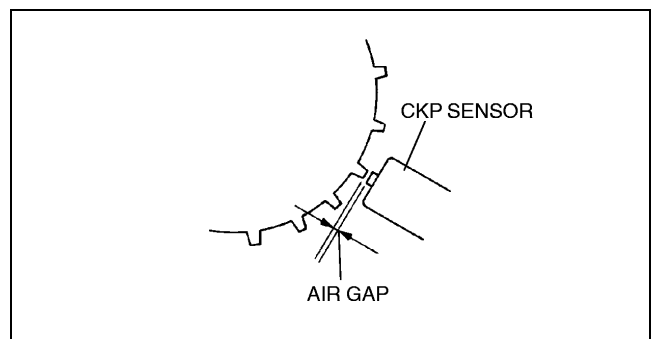
Note

- Perform the following test only when directed.

1. Verify that the CKP sensor is installed properly.
2. Measure the air gap between the plate teeth and the CKP sensor using a feeler gauge.
 - If not as specified, adjust the CKP sensor or inspect the plate teeth for being twisted and/or chipped.
 - If any of the plate teeth is twisted and/or chipped, replace the plate. (See 01-40A-34 PLATE REMOVAL/INSTALLATION [ZM].)

Specification

0.5—1.5 mm {0.020—0.059 in}



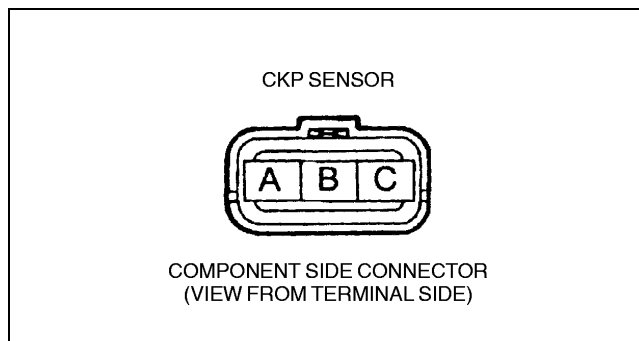
X3U140WAB

Resistance Inspection

1. Disconnect the CKP sensor connector.
2. Measure the resistance between CKP sensor terminals A and B using an ohmmeter.
 - If not as specified, replace the CKP sensor.
 - If CKP sensor resistance is okay, but PID value or PCM terminal 21 and 22 voltage are out of specification, carry out the "Circuit Open/Short Inspection".

Specification

Approx. 550 ohms



X3U140WBT

01-40A

Circuit Open/Short Inspection

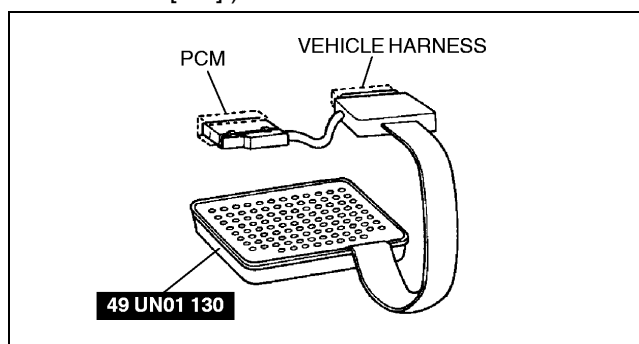
1. Remove the PCM. (See 01-40A-7 PCM REMOVAL/INSTALLATION [ZM].)
2. Connect the **SST** (104 Pin Breakout Box) to the PCM as shown.
3. Tighten the connector attaching screw.

Tightening torque

7.9—10.7 N·m

{80—110 kgf·cm, 69.5—95.4 in·lbf}

4. Inspect for an open or short circuit in the following wiring harnesses by probing the applicable sensor and **SST** (104 Pin Breakout Box) terminals with ohmmeter leads.
 - If there is an open or short circuit, repair or replace wiring harnesses.
 - If there is no open or short circuit, replace the CKP sensor.



X3U140WBN

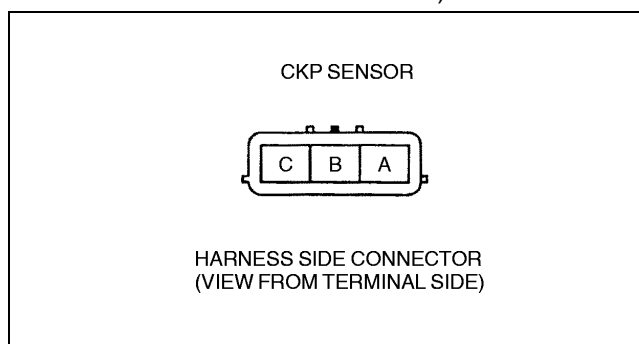
Open circuit

- CKP signal (+) circuit (CKP sensor connector terminal A and PCM connector terminal 21)
- CKP signal (-) circuit (CKP sensor connector terminal B and PCM connector terminal 22)

Short circuit

- CKP signal (+) circuit (CKP sensor connector terminal A and PCM connector 21 to GND)
- CKP signal (-) circuit (CKP sensor connector terminal B and PCM connector terminal 22)

5. Reconnect the CKP sensor connector.



Y3U140WAF

CONTROL SYSTEM [ZM]

CRANKSHAFT POSITION (CKP) SENSOR ADJUSTMENT [ZM]

A3U014018230W04

1. Loosen the CKP sensor installation bolt.
2. While moving the CKP sensor, adjust the air gap between the CKP sensor and the plate teeth on the plate using a feeler gauge.
 - If not adjusted within specification, replace the plate behind the crankshaft pulley or CKP sensor. (See 01-40A-34 PLATE REMOVAL/INSTALLATION [ZM].) (See 01-40A-34 CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION [ZM].)

Specification

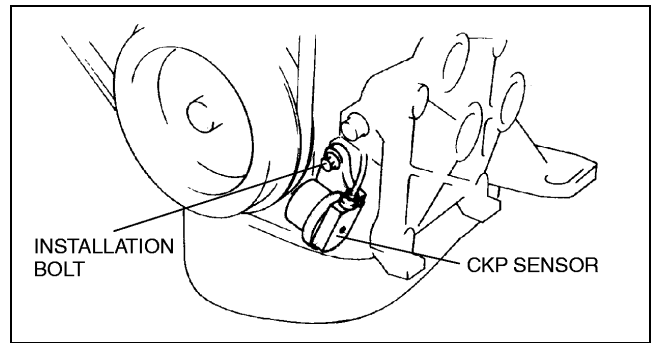
0.5—1.5 mm {0.020—0.059 in}

3. Tighten the CKP sensor installation bolt.

Tightening torque

7.9—10.7 N·m

{80—110 kgf·cm, 69.5—95.4 in·lbf}



X3U140WAD

CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION [ZM]

A3U014018230W05

Caution

- When foreign material such as an iron chip is on the CKP sensor, it can cause abnormal output from the sensor because of flux turbulence and adversely affect the engine control. Be sure there is no foreign material on the CKP sensor when replacing.

1. Disconnect the CKP sensor connector.
2. Remove the undercover.
3. Remove the CKP sensor installation bolt.
4. Install in the reverse order of removal.

Tightening torque

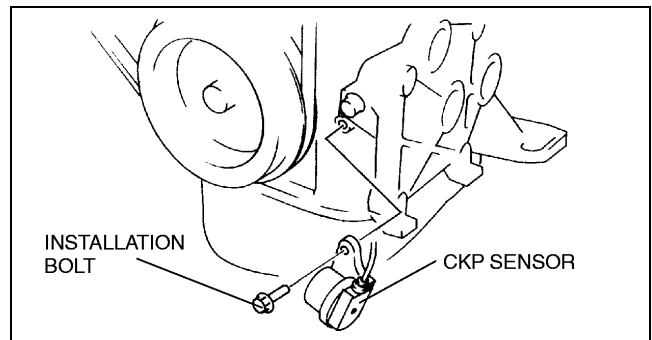
7.9—10.7 N·m

{80—110 kgf·cm, 69.5—95.4 in·lbf}

5. Reconnect the CKP sensor connector.

Caution

- Do not forcefully pull the wiring harness of the CKP sensor, or harness will be damaged.



X3U140WAE

6. Adjust the air gap. (See 01-40A-34 CRANKSHAFT POSITION (CKP) SENSOR ADJUSTMENT [ZM].)

PLATE REMOVAL/INSTALLATION [ZM]

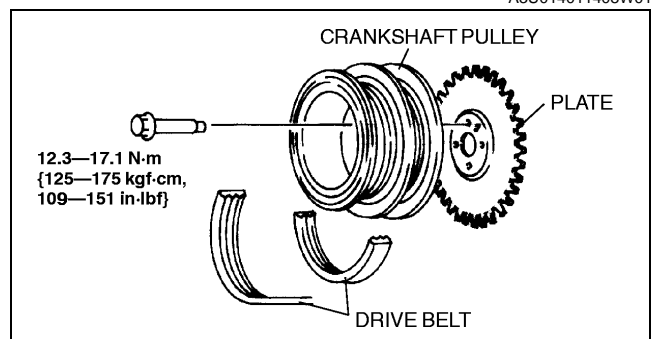
A3U014011408W01

1. Remove the crankshaft pulley. (See 01-10A-9 TIMING BELT REMOVAL/INSTALLATION [ZM].)
2. Remove the plate.

Note

- Adjust the drive belt when installing the drive belt. (See 01-10A-4 DRIVE BELT ADJUSTMENT [ZM].)

3. Install in the reverse order of removal.



12.3—17.1 N·m
{125—175 kgf·cm,
109—151 in·lbf}

Y3U140WA4

CAMSHAFT POSITION (CMP) SENSOR REMOVAL/INSTALLATION [ZM]

A3U014018200W03

Caution

- When foreign material such as an iron chip is on the CMP sensor, it can cause abnormal output from the sensor because of flux turbulence and adversely affect the engine control. Be sure there is no foreign material on the CMP sensor when replacing.

1. Disconnect the negative battery cable.
2. Disconnect the CMP sensor connector.
3. Remove the CMP sensor installation bolt.
4. Remove the CMP sensor.
5. Make sure that the CMP sensor is free of any metallic shavings or particles.
 - If metallic shavings or particles are found on the sensor, clean them off.
6. Install in the reverse order of removal.

Tightening torque

7.9—10.7 N·m
{80—110 kgf·cm, 69.5—95.4 in·lbf}

01-40A

CAMSHAFT POSITION (CMP) SENSOR INSPECTION [ZM]

A3U014018200W04

Visual Inspection

1. Remove the CMP sensor. (See 01-40A-35 CAMSHAFT POSITION (CMP) SENSOR REMOVAL/INSTALLATION [ZM].)

Note

- Make sure that the CMP sensor is free of any metallic shavings or particles.
- If metallic shavings or particles are found on the sensor, clean them off.

2. Install the CMP sensor. (See 01-40A-35 CAMSHAFT POSITION (CMP) SENSOR REMOVAL/INSTALLATION [ZM].)

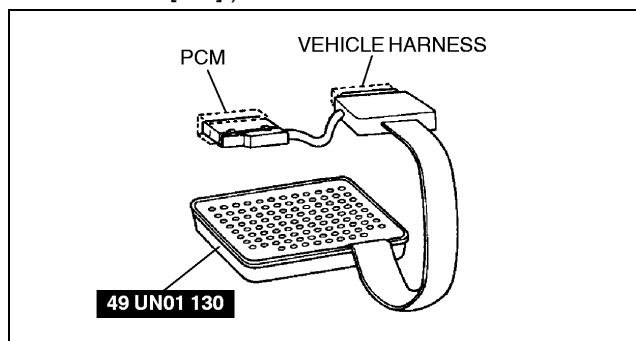
Wave profile Inspection

1. Remove the PCM. (See 01-40A-7 PCM REMOVAL/INSTALLATION [ZM].)
2. Connect the **SST** (104 Pin Breakout Box) to the PCM as shown.
3. Tighten the connector attaching screw.

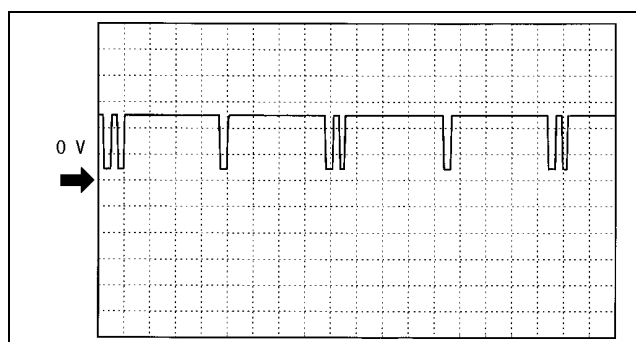
Tightening torque

7.9—10.7 N·m
{80—110 kgf·cm, 69.5—95.4 in·lbf}

4. Connect the oscilloscope testleads to the following PCM connector terminals.
 - (+) lead: PCM terminal 85
 - (-) lead: PCM terminal 103
5. Start the engine.
6. Monitor RPM PID.
7. Inspect wave profile at idle.
 - If wave profile or voltage are out of specifications, carry out the "Circuit Open/Short Inspection".
 - PCM terminal: 85(+) ↔ 103(-)
 - Oscilloscope setting: 2 V/DIV(Y), 20 ms/DIV(X), DC range
 - Vehicle condition: Idle after warm up



X3U140WBN



Z3U0140W018

CONTROL SYSTEM [ZM]

Circuit Open/Short Inspection

1. Remove the PCM. (See 01–40A–7 PCM REMOVAL/INSTALLATION [ZM].)
2. Connect the **SST** (104 Pin Breakout Box) to the PCM as shown.
3. Tighten the connector attaching screw.

Tightening torque

7.9—10.7 N·m

{80—110 kgf·cm, 69.5—95.4 in·lbf}

4. Inspect for an open or short circuit in the following wiring harnesses by probing the applicable sensor and **SST** (104 Pin Breakout Box) terminals with ohmmeter leads.

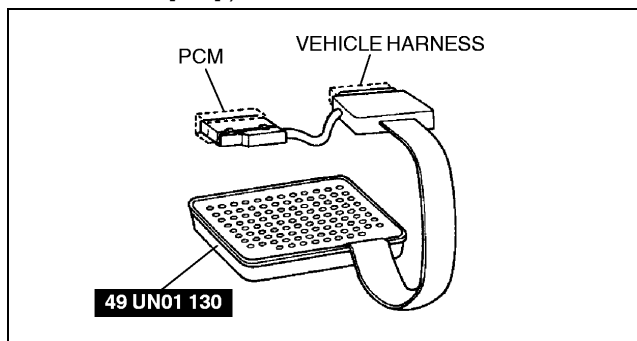
- If there is an open or short circuit, repair or replace wiring harnesses.
- If there is no open or short circuit, replace the CMP sensor.

Open circuit

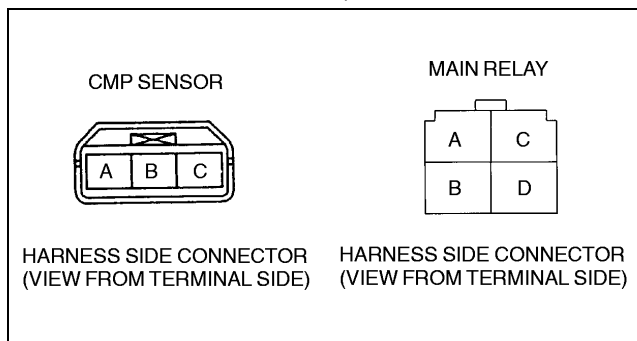
- CMP signal circuit (CMP sensor connector terminal B and PCM connector terminal 85)
- Power circuit (CMP sensor connector terminal A and main relay terminal D through common connector)
- GND circuit (CMP sensor connector terminal C and PCM connector terminal 103)

Short circuit

- CMP signal circuit (CMP sensor connector terminal B and PCM connector terminal 85 to GND)
 - Power circuit (CMP sensor connector terminal A and main relay terminal D through common connector to GND)
5. Reconnect the CMP sensor connector.
 6. Inspect the camshaft pulley (exhaust side) for damage and cracks.



X3U140WBN



X3U140WAT

HEATED OXYGEN SENSOR (HO2S) INSPECTION [ZM]

HO2S (Front and Rear) Voltage Inspection

A3U014018861W02

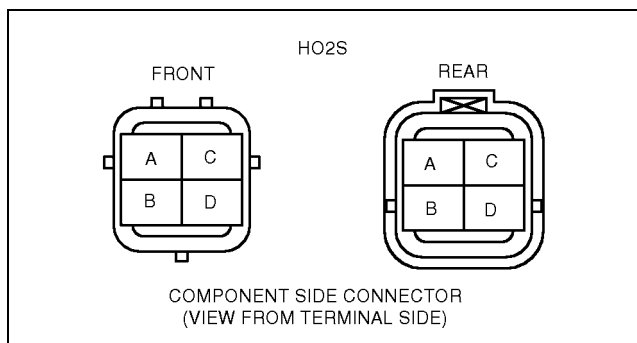
Note

- Perform the following test only when directed.

1. Warm up the engine and run it at idle.
2. Disconnect the HO2S (Front or Rear) connector.
3. Connect the voltmeter test leads to the following HO2S terminals:
 - (+) lead—HO2S terminal A
 - (–) lead—HO2S terminal B
4. Run the engine at **3,000 rpm** until the voltmeter indicates **approx. 0—1.0 V**.
5. Verify that the voltmeter needle moves when the engine speed increases and decreases suddenly several times.
 - If not as specified, replace the HO2S.
 - If the HO2S is okay, but PID value or PCM terminal 60 (Front), 35 (Rear) voltage is out of specification, carry out the "Circuit Open/Short Inspection".

Specification

Engine speed	Voltage (V)
Increase	0.5—1.0
Decrease	0—0.5



Z3U0140W023

Circuit Open/Short Inspection

1. Remove the PCM. (See 01-40A-7 PCM REMOVAL/INSTALLATION [ZM].)
2. Connect the **SST** (104 Pin Breakout Box) to the PCM as shown.
3. Tighten the connector attaching screw.

Tightening torque

7.9—10.7 N·m

{80—110 kgf·cm, 69.5—95.4 in·lbf}

4. Inspect for an open or short circuit in the following wiring harnesses by probing the applicable sensor and **SST** (104 Pin Breakout Box) terminals with ohmmeter leads.
 - If there is an open or short circuit, repair or replace wiring harnesses.
 - If there is no open or short circuit, replace the HO2S.

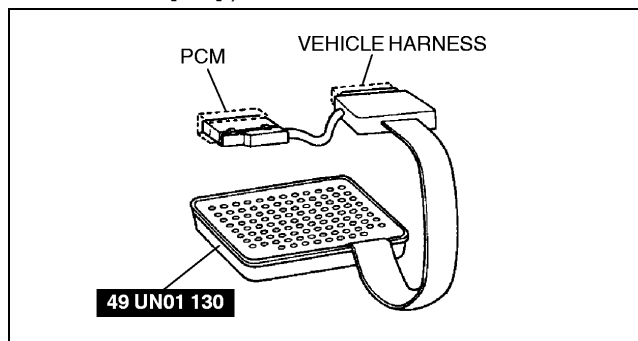
Open circuit

- HO2S signal circuit (HO2S connector terminal A and PCM connector terminal 60 (Front), 35 (Rear))
- GND circuit (HO2S connector terminal B and PCM connector terminal 91)

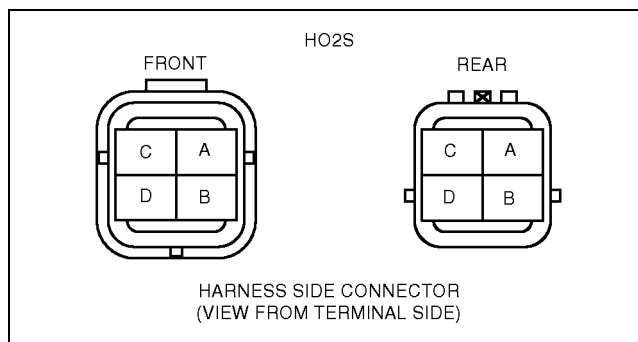
Short circuit

- HO2S signal circuit (HO2S terminal A and PCM connector terminal 60 (Front), 35 (Rear) to GND)

5. Reconnect the HO2S connector.



X3U140WBN



Z3U0140W024

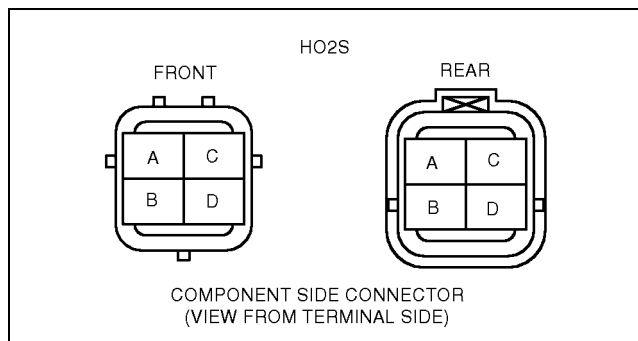
HO2S Heater (Front and Rear) Resistance Inspection

1. Disconnect the HO2S (Front or Rear) connector.
2. Measure the resistance between HO2S terminals C and D using an ohmmeter.
 - If not as specified, replace the HO2S.
 - If the HO2S heater is okay, but PID value or PCM terminal 94 (Front), 93 (Rear) voltage are out of specification, carry out the "Circuit Open/Short Inspection".

Specification

Front: Approx. 5.6 ohms

Rear: Approx. 15.7 ohms



Z3U0140W023

CONTROL SYSTEM [ZM]

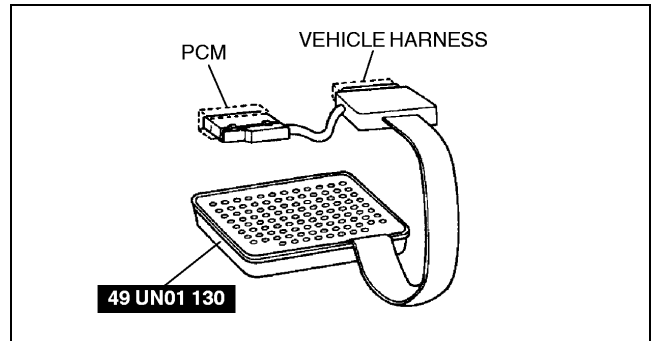
Circuit Open/Short Inspection

1. Remove the PCM. (See 01–40A–7 PCM REMOVAL/INSTALLATION [ZM].)
2. Connect the **SST** (104 Pin Breakout Box) to the PCM as shown.
3. Tighten the connector attaching screw.

Tightening torque

7.9—10.7 N·m

{80—110 kgf·cm, 69.5—95.4 in·lbf}



4. Inspect for an open or short circuit in the following wiring harnesses by probing the applicable sensor and **SST** (104 Pin Breakout Box) terminals with ohmmeter leads.

- If there is an open or short circuit, repair or replace wiring harnesses.
- If there is no open or short circuit, replace the HO2S.

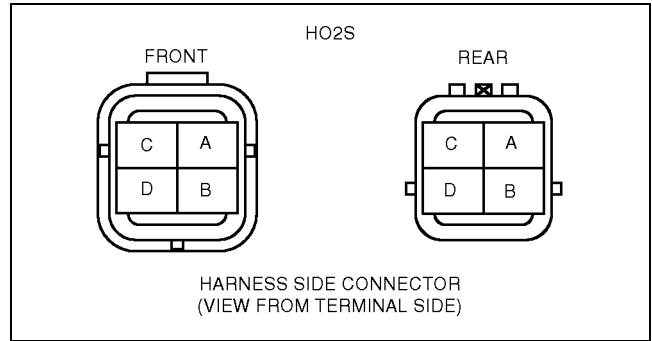
Open circuit

- Control circuit (HO2S connector terminal C and ignition switch (IG1) circuit through common connector)
- GND circuit (HO2S connector terminal D and PCM connector terminal 94 (Front), 93 (Rear))

Short circuit

- Control circuit (HO2S connector terminal C and ignition switch (IG1) circuit through common connector to GND)
- GND circuit (HO2S connector terminal D and PCM connector terminal 94 (Front), 93 (Rear) to GND)

5. Reconnect the HO2S connector.



EGR BOOST SENSOR INSPECTION [ZM]

A3U014018211W02

Note

- Perform the following test only when directed.
- The following vacuum values are indicated by relative pressure from barometric pressure.

1. Remove the PCM. (See 01–40A–7 PCM REMOVAL/INSTALLATION [ZM].)
2. Connect the **SST** (104 Pin Breakout Box) to the PCM as shown.
3. Tighten the connector bolt.

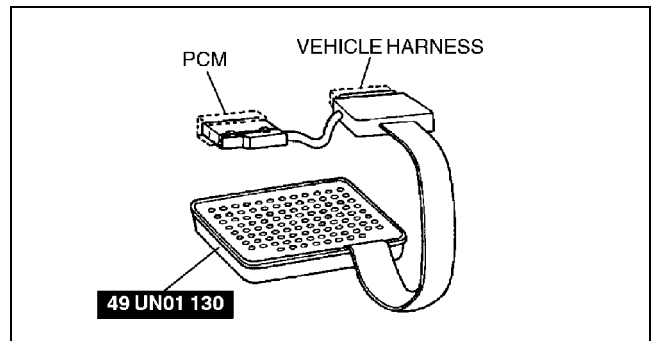
Tightening torque

7.9—10.7 N·m

{80—110 kgf·cm, 69.5—95.4 in·lbf}

Caution

- Do not apply vacuum outside of the specified limits, or EGR boost sensor will be damaged.



4. Turn the ignition switch to ON.

- Disconnect the vacuum hose between the EGR boost sensor and intake manifold.

Note

- The output voltage varies with the measuring condition.

- Verify that the PCM terminal 34 voltage is within specification.

Measuring condition:

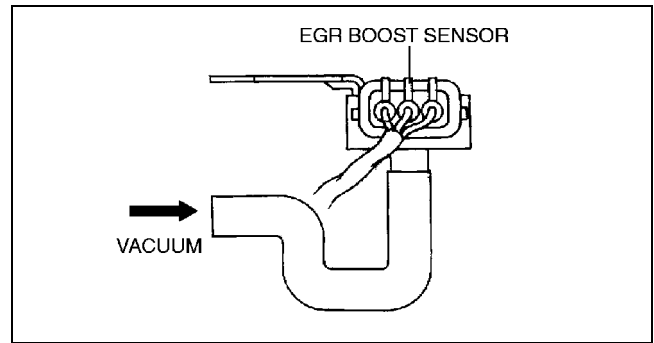
Input voltage: 4.5—5.5 V

Ambient temperature: 10—50 °C {50—122 °F}

Sea level: -20—3,000 m {-656—9,840 ft}

Specification

BARO V variation: 2.3—4.7 V



01-40A

- Apply vacuum of **-26.6 kPa {-200 mmHg, -7.85 inHg}** to EGR boost sensor and verify that PCM 34 terminal voltage from Step 6 is within specification.

- If not as specified, carry out the "Circuit Open/Short Inspection".

Specification

BARO V variation: 0.8—1.3 V

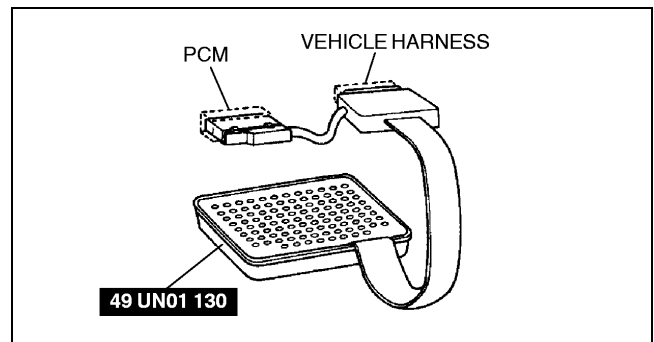
Circuit Open/Short Inspection

- Remove the PCM. (See 01-40A-7 PCM REMOVAL/INSTALLATION [ZM].)
- Connect the **SST** (104 Pin Breakout Box) to the PCM as shown.
- Tighten the connector attaching screw.

Tightening torque

7.9—10.7 N·m

{80—110 kgf·cm, 69.5—95.4 in·lbf}



- Inspect for an open or short circuit in the following wiring harnesses by probing the applicable sensor and **SST** (104 Pin Breakout Box) terminals with ohmmeter leads.

- If there is an open or short circuit, repair or replace wiring harnesses.
- If there is no open or short circuit, replace the EGR boost sensor.

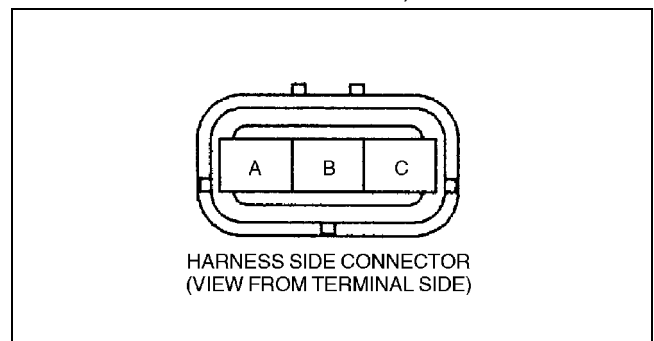
Open circuit

- EGR boost (Barometric pressure) signal circuit (EGR boost sensor connector terminal A and PCM connector terminal 34)
- Constant voltage circuit (EGR boost sensor connector terminal C and PCM connector terminal 90)
- GND circuit (EGR boost sensor connector terminal B and PCM connector terminal 91)

Short circuit

- EGR boost (Barometric pressure) signal circuit (EGR boost sensor connector terminal A and PCM connector terminal 34)
- Constant voltage circuit (EGR boost sensor connector terminal C and PCM connector terminal 90)

- Reconnect the EGR boost sensor connector.



FUEL TANK PRESSURE SENSOR INSPECTION [ZM]

A3U014018212W02

Note

- Perform the following test only when directed.
- The following vacuum values are indicated by relative pressure from barometric pressure.

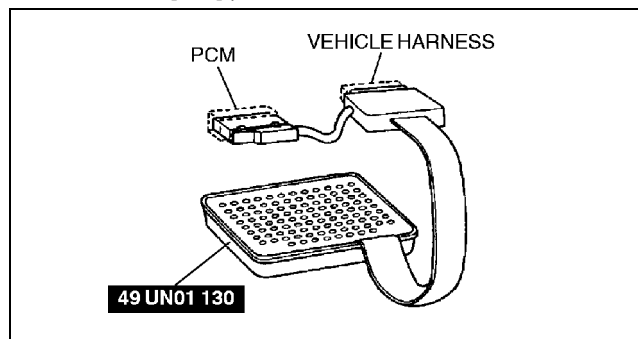
1. Remove the PCM. (See 01–40A–7 PCM REMOVAL/INSTALLATION [ZM].)
2. Connect the **SST** (104 Pin Breakout Box) to the PCM as shown.
3. Tighten the connector bolt.

Tightening torque

7.9—10.7 N·m
{80—110 kgf·cm, 69.5—95.4 in·lbf}

Caution

- **Do not apply vacuum outside of the specified limits, or the fuel tank pressure sensor will be damaged.**



X3U140WB3

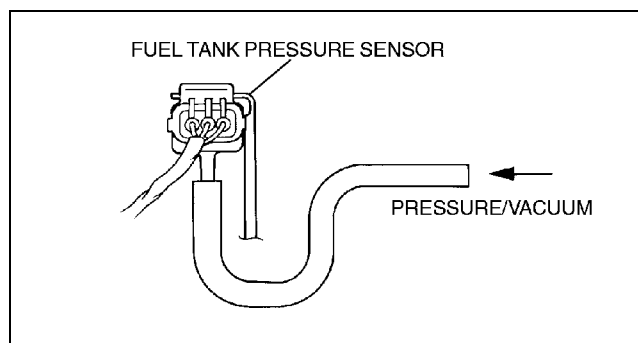
4. Turn the ignition switch to ON.
5. Apply pressure then vacuum to the fuel tank pressure sensor according to the following procedure.

Note

- The output voltage varies with the measuring condition.

6. Decrease the applied pressure from **+6.66 kPa {+50 mmHg, +1.97 inHg}** to **–6.66 kPa {–50 mmHg, –1.97 inHg}** and verify that the PCM terminal 62 voltage decreases accordingly as specified.

- If not as specified, replace the fuel tank pressure sensor.
- If fuel tank pressure sensor is okay, but PCM terminal 62 voltage is out of specification, carry out the “Circuit Open/Short Inspection”.



X3U140WB4

Specification

Applied vacuum	Output voltage (V)*
–6.66 kPa {–50 mmHg, –1.97 inHg}	0.45—0.55
0 kPa {0 mmHg, 0 inHg}	2.25—2.75
+6.66 kPa {+50 mmHg, +1.97 inHg}	4.05—4.95

* : Measuring condition is as follows.

Input voltage: 5.0 V

Barometric pressure: 101.3 kPa {760 mmHg, 29.9 inHg} (Absolute pressure)

Barometric temperature: 30—100 °C {0—182 °F}

Circuit Open/Short Inspection

1. Remove the PCM. (See 01-40A-7 PCM REMOVAL/INSTALLATION [ZM].)
2. Connect the **SST** (104 Pin Breakout Box) to the PCM as shown.
3. Tighten the connector attaching screw.

Tightening torque

7.9—10.7 N·m

{80—110 kgf·cm, 69.5—95.4 in·lbf}

4. Inspect for an open or short circuit in the following wiring harnesses by probing the applicable sensor and **SST** (104 Pin Breakout Box) terminals with ohmmeter leads.

- If there is an open or short circuit, repair or replace wiring harnesses.
- If there is no open or short circuit, replace the fuel tank pressure sensor.

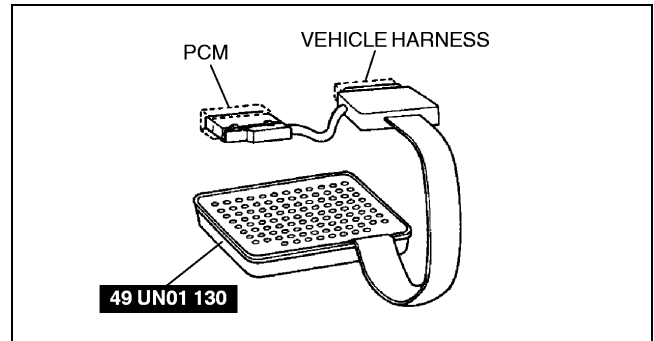
Open circuit

- Fuel tank pressure signal circuit (Fuel tank pressure sensor connector terminal B and PCM connector terminal 62)
- Constant voltage circuit (Fuel tank pressure sensor connector terminal C and PCM connector terminal 90)
- GND circuit (Fuel tank pressure sensor connector terminal A and PCM connector terminal 91)

Short circuit

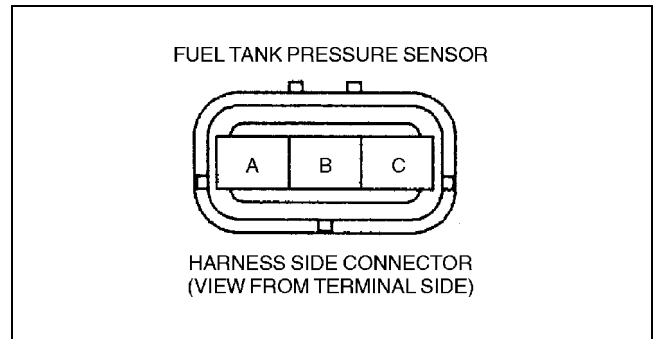
- Fuel tank pressure signal circuit (Fuel tank pressure sensor connector terminal B and PCM connector terminal 62)
- Constant voltage circuit (Fuel tank pressure sensor connector terminal C and PCM connector terminal 90)

5. Reconnect the fuel tank pressure sensor connector.



X3U140WBN

01-40A



X3U140WB5

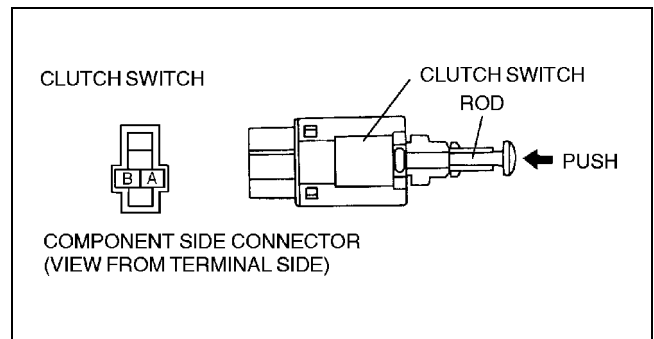
CLUTCH SWITCH INSPECTION [ZM]

A3U014018660W02

Note

- Perform the following test only when directed.

1. Verify that the clutch switch is installed properly.
2. Disconnect the negative battery cable.
3. Remove the clutch switch. (See 05-10-5 CLUTCH PEDAL REMOVAL/INSTALLATION.)
4. Inspect continuity between the clutch switch terminals A and B using an ohmmeter.
 - If not as specified, replace the clutch switch.
 - If the clutch switch is okay, but PID value or PCM terminal 6 voltage is out of specification, carry out the "Circuit Open/Short Inspection".



Z3U0140W029

○—○ : Continuity

Condition	Terminal	
	A	B
The rod is pushed		
Except above	○—○	○—○

Z3U0140W030

CONTROL SYSTEM [ZM]

Circuit Open/Short Inspection

1. Remove the PCM. (See 01-40A-7 PCM REMOVAL/INSTALLATION [ZM].)
2. Connect the **SST** (104 Pin Breakout Box) to the PCM as shown.
3. Tighten the connector attaching screw.

Tightening torque

7.9—10.7 N·m

{80—110 kgf·cm, 69.5—95.4 in·lbf}

4. Inspect for an open or short circuit in the following wiring harnesses by probing the applicable sensor and **SST** (104 Pin Breakout Box) terminals with ohmmeter leads.

- If there is an open or short circuit, repair or replace wiring harnesses.
- If there is no open or short circuit, replace the clutch switch.

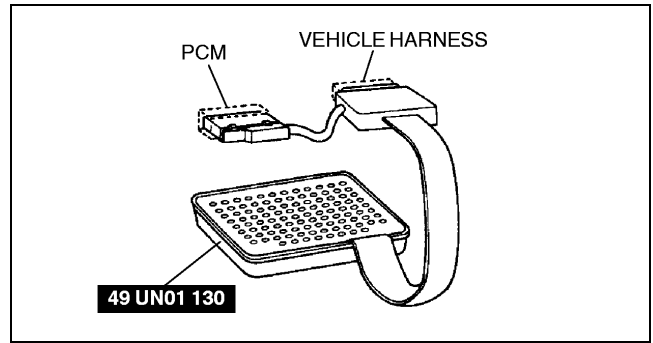
Open circuit

- Signal circuit (Clutch switch connector terminal B and PCM connector terminal 6 through common connector)
- GND circuit (Clutch switch connector terminal A and GND)

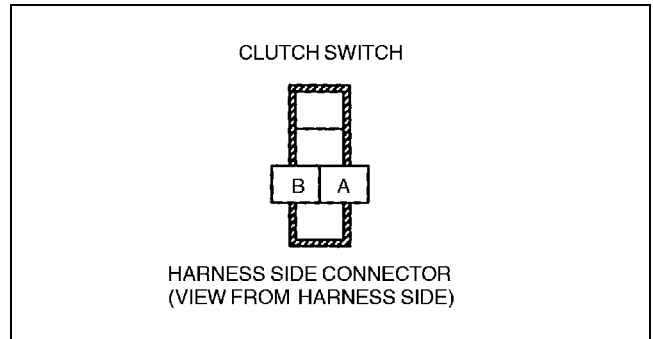
Short circuit

- Signal circuit (Clutch switch connector terminal B and PCM connector terminal 6 through common connector to GND)

5. Install the clutch switch.



X3U140WBN



Z3U0140W031

NEUTRAL SWITCH INSPECTION [ZM]

A3U014017640W02

Note

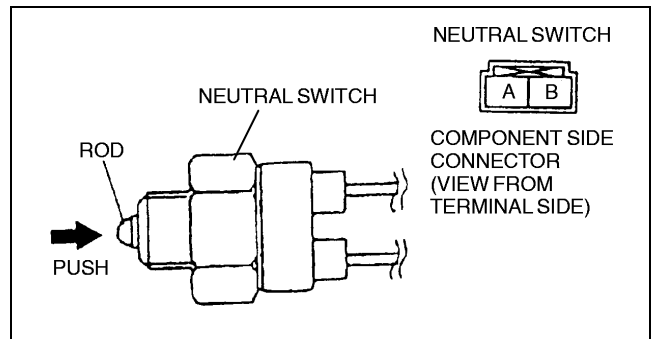
- Perform the following test only when directed.

1. Disconnect the negative battery cable.
2. Remove the neutral switch.
3. Inspect for continuity between the neutral switch terminals A and B using an ohmmeter.
 - If not as specified, replace the neutral switch.
 - If the neutral switch is okay, but PID value or PCM terminal 64 voltage is out of specification, carry out the "Circuit Open/Short Inspection".

Condition	Terminal	
	A	B
The rod is pushed	○—○	○—○
Except above		

○—○ : Continuity

X3U140WBD



X3U140WBC

Circuit Open/Short Inspection

1. Remove the PCM. (See 01-40A-7 PCM REMOVAL/INSTALLATION [ZM].)
2. Connect the **SST** (104 Pin Breakout Box) to the PCM as shown.
3. Tighten the connector attaching screw.

Tightening torque

7.9—10.7 N·m

{80—110 kgf·cm, 69.5—95.4 in·lbf}

4. Inspect for an open or short circuit in the following wiring harnesses by probing the applicable sensor and **SST** (104 Pin Breakout Box) terminals with ohmmeter leads.

- If there is an open or short circuit, repair or replace wiring harnesses.
- If there is no open or short circuit, replace the neutral switch.

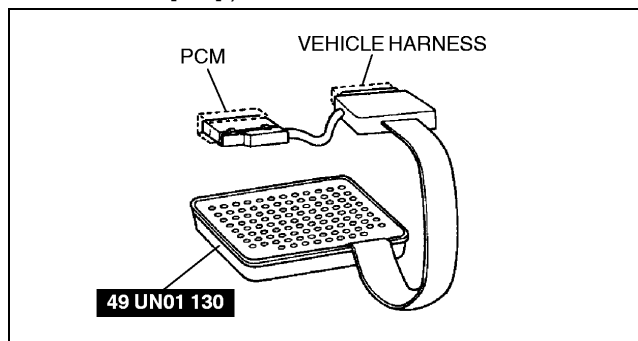
Open circuit

- Signal circuit (Neutral switch connector terminal A and PCM connector terminal 64 through common connector)
- GND circuit (Neutral switch connector terminal B and GND through common connector)

Short circuit

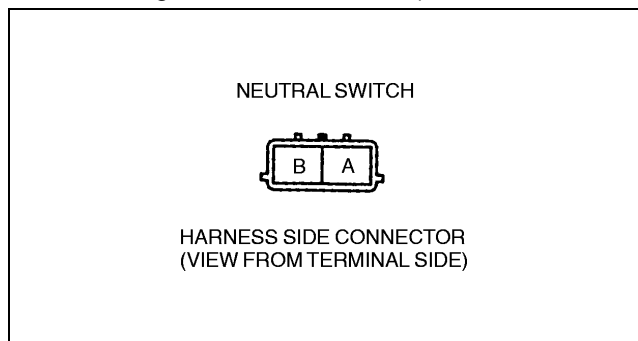
- Signal circuit (Neutral switch connector terminal A and PCM terminal 64 through common connector to GND)

5. Install the neutral switch.



X3U140WBN

01-40A



X3U140WBE

POWER STEERING PRESSURE (PSP) SWITCH INSPECTION [ZM]

A3U014032230W02

Continuity Inspection

Note

- Perform the following test only when directed.

1. Inspect the following if the power steering is inoperative. (See 06-12-3 POWER STEERING FLUID INSPECTION.)
 - Power steering fluid level
 - Power steering fluid leakage
 - Power steering fluid pressure
2. Disconnect the PSP switch connector.
3. Start the engine.
4. Inspect for continuity between the PSP switch terminal and GND using an ohmmeter.
 - If not as specified, replace the PSP switch.
 - If the PSP switch is okay, but PID value or PCM terminal 31 voltage is out of specification, carry out the "Circuit Open/Short Inspection".

○—○ : Continuity

Condition	Terminal	GND
Steering wheel is in straight ahead position		
Steering wheel is fully turned	○—	—○

X3U140WBF

Circuit Open/Short Inspection

1. Remove the PCM. (See 01–40A–7 PCM REMOVAL/INSTALLATION [ZM].)
2. Connect the **SST** (104 Pin Breakout Box) to the PCM as shown.
3. Tighten the connector attaching screw.

Tightening torque

7.9—10.7 N·m

{80—110 kgf·cm, 69.5—95.4 in·lbf}

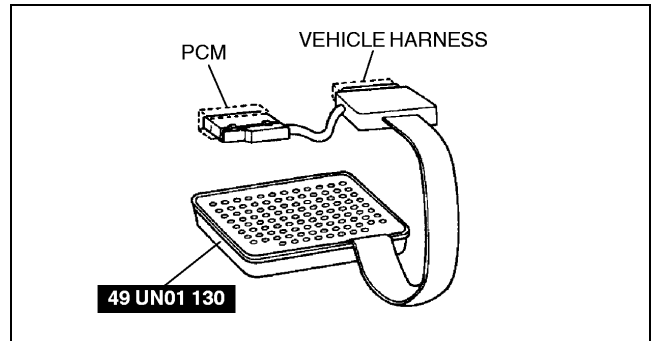
4. Inspect for an open or short circuit in the following wiring harnesses by probing the applicable sensor and **SST** (104 Pin Breakout Box) terminals with ohmmeter leads.

Open circuit

- PSP signal circuit (PSP switch connector terminal and PCM connector terminal 31 through common connector)
- GND circuit (PSP switch body and GND)
- If there is an open or short circuit, repair or replace wiring harnesses.
- If there is no open or short circuit, replace the PSP switch.

Short circuit

- PSP signal circuit (PSP switch connector terminal and PCM connector terminal 31 through common connector to GND)
5. Reconnect the PSP switch connector.



X3U140WBN