

01-13A INTAKE-AIR SYSTEM [ZM]

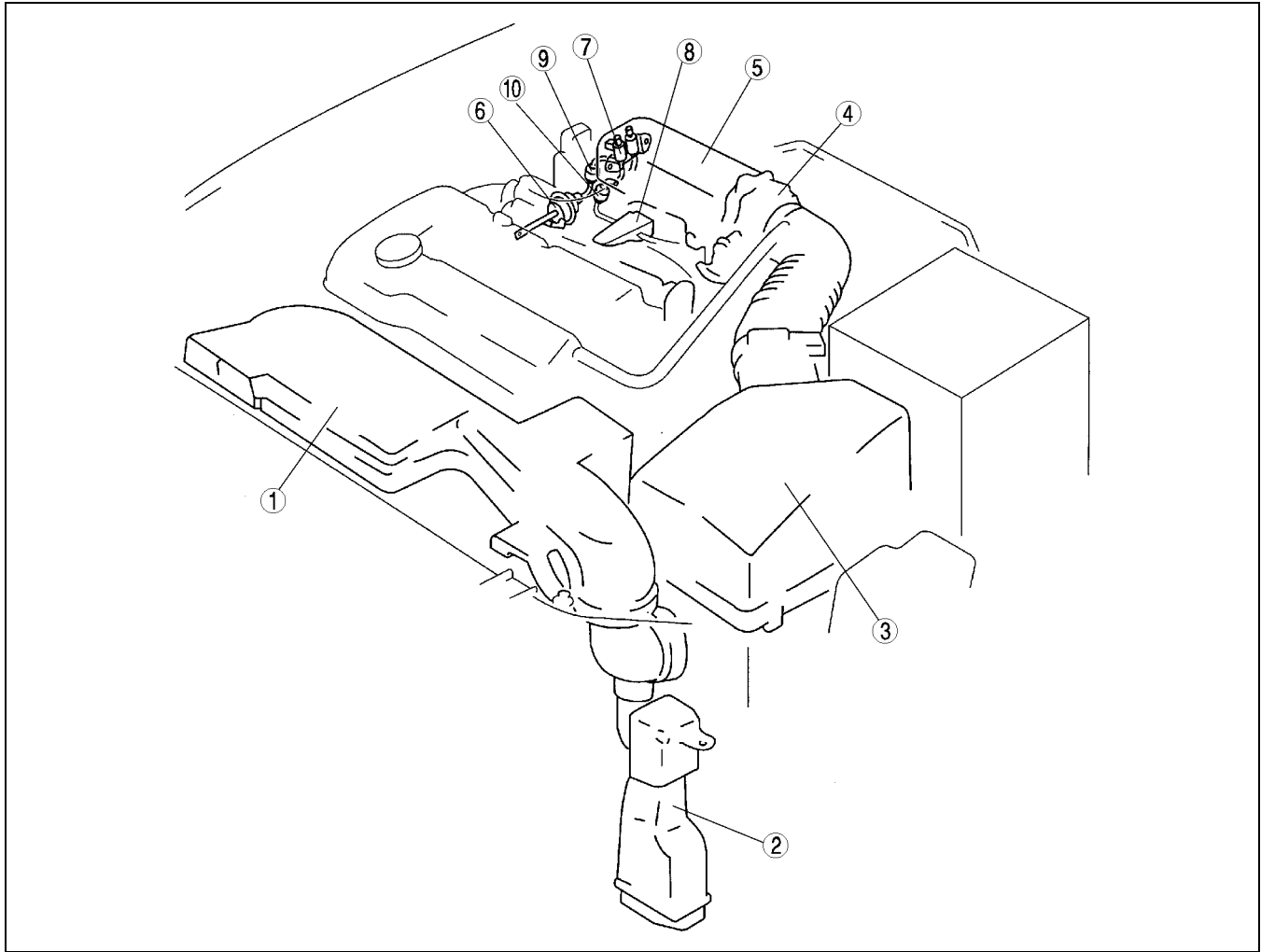
INTAKE-AIR SYSTEM LOCATION		(VTCS) CHECK VALVE (ONE-WAY)	
INDEX [ZM]	01-13A-2	INSPECTION [ZM]	01-13A-9
INTAKE-AIR SYSTEM FLOW		VARIABLE TUMBLE CONTROL SYSTEM	
DIAGRAM [ZM]	01-13A-3	(VTCS) SHUTTER VALVE ACTUATOR	
VACUUM HOSE ROUTING DIAGRAM		REMOVAL/INSTALLATION [ZM]	01-13A-9
[ZM]	01-13A-3	VARIABLE TUMBLE CONTROL SYSTEM	
INTAKE-AIR SYSTEM		(VTCS) SHUTTER VALVE ACTUATOR	
REMOVAL/INSTALLATION [ZM]	01-13A-5	INSPECTION [ZM]	01-13A-10
Throttle Body Removal Note	01-13A-6	Operating Inspection	01-13A-10
Intake Manifold Removal Note	01-13A-6	VARIABLE TUMBLE CONTROL SYSTEM	
Intake Manifold Gasket Installation		(VTCS) DELAY VALVE	
Note	01-13A-6	REMOVAL/INSTALLATION [ZM]	01-13A-10
Throttle Body Installation Note	01-13A-6	VARIABLE TUMBLE CONTROL SYSTEM	
Accelerator Cable Installation Note ...	01-13A-6	(VTCS) DELAY VALVE	
IDLE AIR CONTROL (IAC) VALVE		INSPECTION [ZM]	01-13A-11
REMOVAL/INSTALLATION [ZM]	01-13A-6	VARIABLE TUMBLE CONTROL SYSTEM	
IDLE AIR CONTROL (IAC) VALVE		(VTCS) SOLENOID VALVE	
INSPECTION [ZM]	01-13A-7	INSPECTION [ZM]	01-13A-11
Resistance Inspection	01-13A-7	Simulation Test	01-13A-11
Circuit Open/Short Inspection	01-13A-7	Airflow Inspection	01-13A-11
VARIABLE TUMBLE CONTROL SYSTEM		Circuit Open/Short Inspection	01-13A-12
(VTCS) DIAGRAM [ZM]	01-13A-8	ACCELERATOR CABLE	
VARIABLE TUMBLE CONTROL SYSTEM		REMOVAL/INSTALLATION [ZM]	01-13A-12
(VTCS) CHECK VALVE (ONE-WAY)		Accelerator Pedal Installation Note ...	01-13A-13
REMOVAL/INSTALLATION [ZM]	01-13A-8	ACCELERATOR CABLE	
VARIABLE TUMBLE CONTROL SYSTEM		INSPECTION/ADJUSTMENT [ZM]	01-13A-13

01-13A

INTAKE-AIR SYSTEM [ZM]

INTAKE-AIR SYSTEM LOCATION INDEX [ZM]

A3U011301005W03



Z3U0113W001

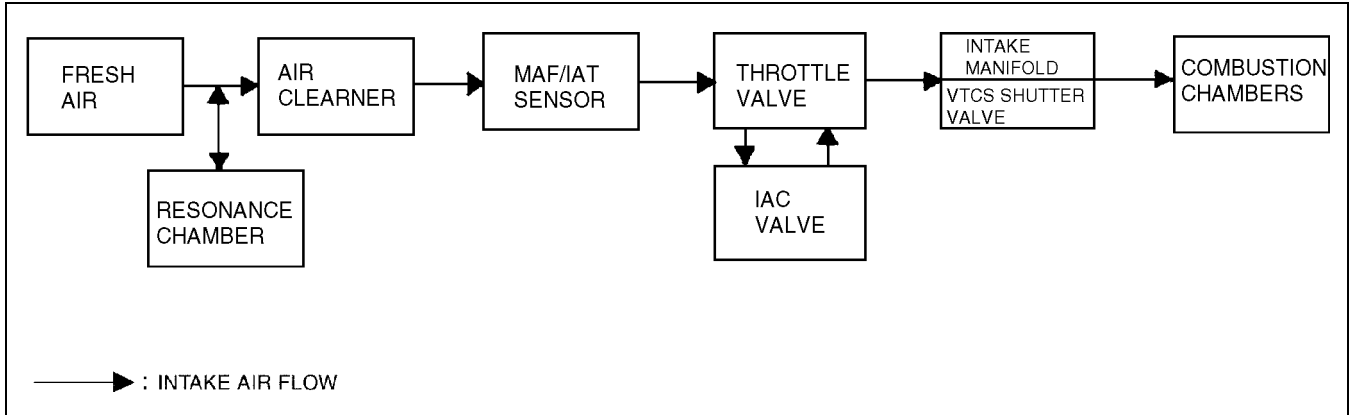
1	Fresh-air duct (See 01-13A-5 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [ZM])
2	Resonance chamber (See 01-13A-5 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [ZM])
3	Air cleaner (See 01-13A-5 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [ZM])
4	Throttle body (See 01-13A-5 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [ZM])
5	Intake manifold (See 01-13A-5 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [ZM])
6	VTCS shutter valve actuator (See 01-13A-9 VARIABLE TUMBLE CONTROL SYSTEM (VTCS) SHUTTER VALVE ACTUATOR REMOVAL/INSTALLATION [ZM]) (See 01-13A-10 VARIABLE TUMBLE CONTROL SYSTEM (VTCS) SHUTTER VALVE ACTUATOR INSPECTION [ZM])

7	VTCS solenoid valve (See 01-13A-5 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [ZM]) (See 01-13A-11 VARIABLE TUMBLE CONTROL SYSTEM (VTCS) SOLENOID VALVE INSPECTION [ZM])
8	VTCS vacuum chamber
9	VTCS delay valve (See 01-13A-10 VARIABLE TUMBLE CONTROL SYSTEM (VTCS) DELAY VALVE REMOVAL/INSTALLATION [ZM]) (See 01-13A-11 VARIABLE TUMBLE CONTROL SYSTEM (VTCS) DELAY VALVE INSPECTION [ZM])
10	VTCS check valve (one-way) (See 01-13A-8 VARIABLE TUMBLE CONTROL SYSTEM (VTCS) CHECK VALVE (ONE-WAY) REMOVAL/INSTALLATION [ZM]) (See 01-13A-8 VARIABLE TUMBLE CONTROL SYSTEM (VTCS) CHECK VALVE (ONE-WAY) REMOVAL/INSTALLATION [ZM])

INTAKE-AIR SYSTEM [ZM]

INTAKE-AIR SYSTEM FLOW DIAGRAM [ZM]

A3U011301005W04

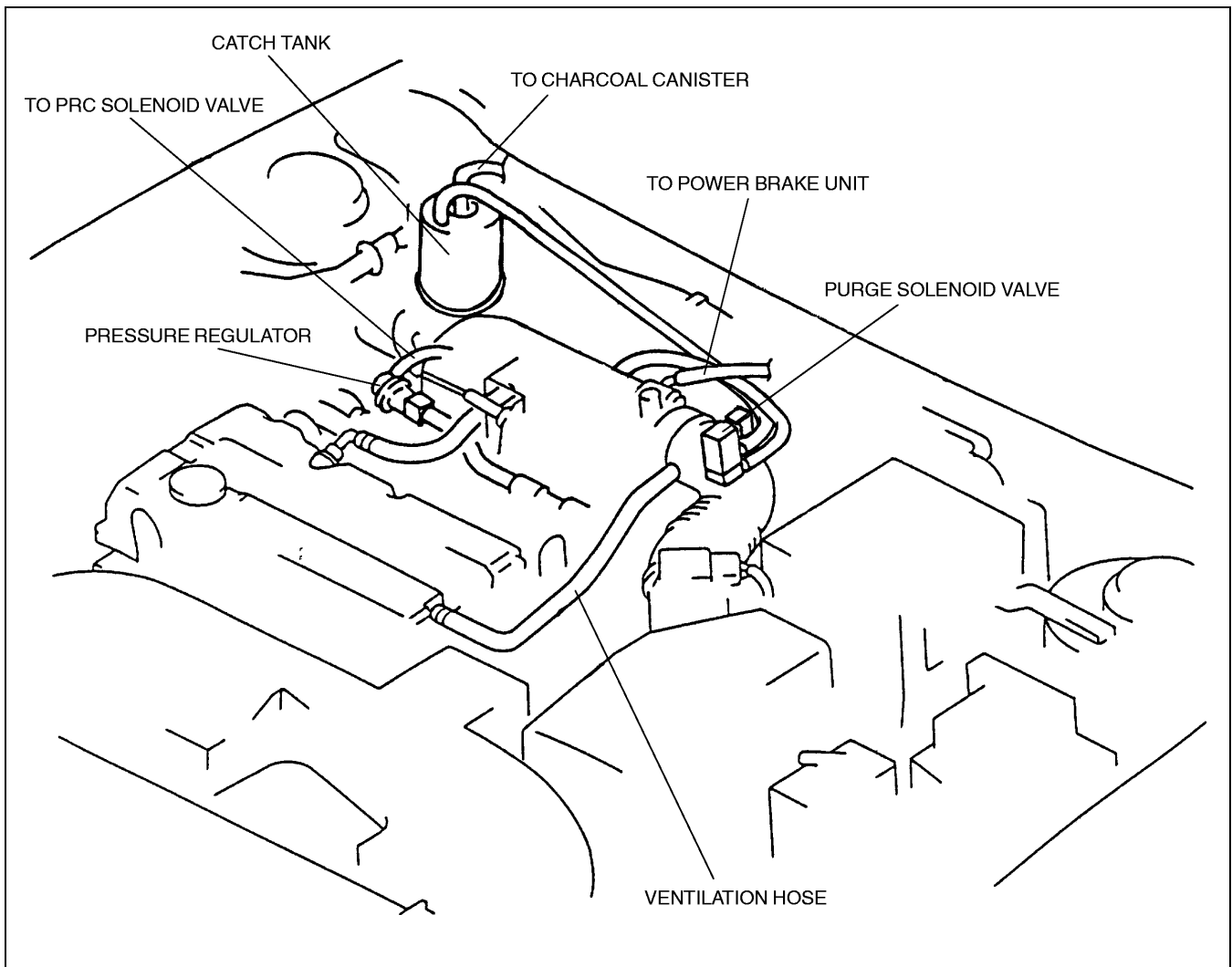


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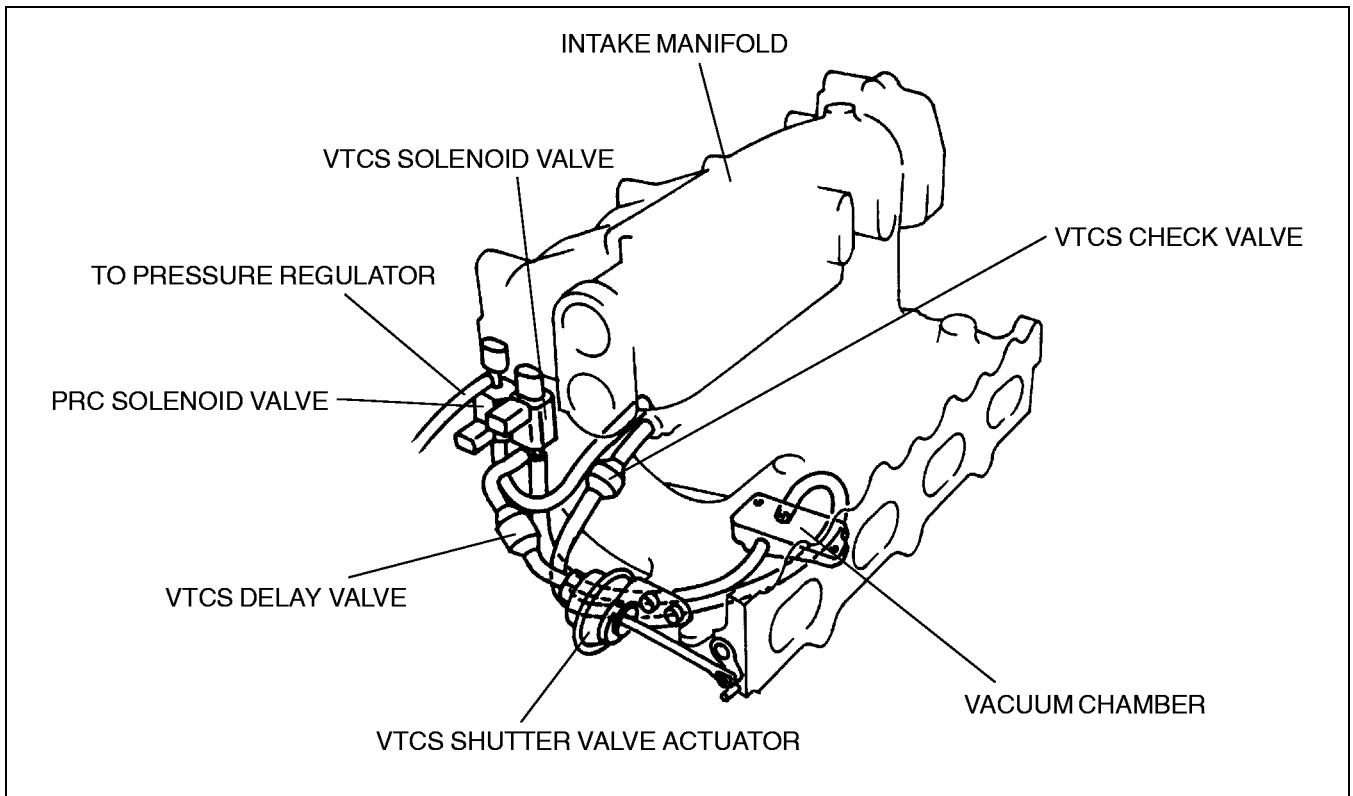
VACUUM HOSE ROUTING DIAGRAM [ZM]

A3U011320030W02



Y3U113WA5

INTAKE-AIR SYSTEM [ZM]



Z3U0113W015

INTAKE-AIR SYSTEM [ZM]

INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [ZM]

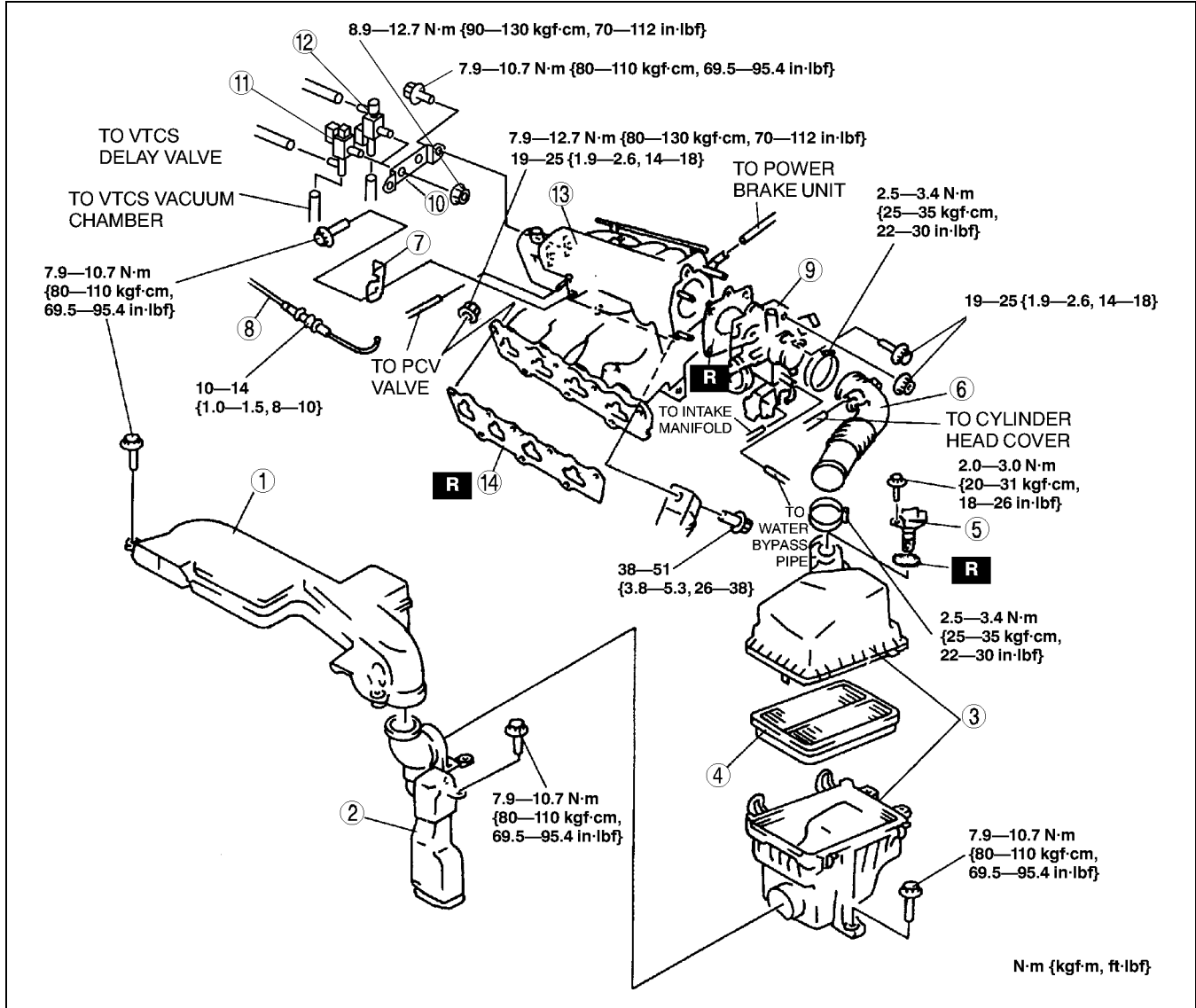
A3U01131300W02

Warning

- When the engine and intake-air system are hot, they can badly burn. Turn off the engine and wait until they are cool before removing the intake-air system.
- Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.
- Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedure". (See 01-14-4 BEFORE REPAIR PROCEDURE.)

01-13A

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.



Z3U0113W003

1	Fresh-air duct
2	Resonance chamber
3	Air cleaner
4	Air cleaner element
5	MAF sensor (Integrated with IAT sensor)
6	Air hose
7	Accelerator cable bracket
8	Accelerator cable (See 01-13A-6 Accelerator Cable Installation Note)

9	Throttle body (See 01-13A-6 Throttle Body Removal Note) (See 01-13A-6 Throttle Body Installation Note)
10	VTCS solenoid valve bracket
11	VTCS solenoid valve
12	PRC solenoid valve
13	Intake manifold (See 01-13A-6 Intake Manifold Removal Note)

INTAKE-AIR SYSTEM [ZM]

14	Intake manifold gasket (See 01-13A-6 Intake Manifold Gasket Installation Note)
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Throttle Body Removal Note

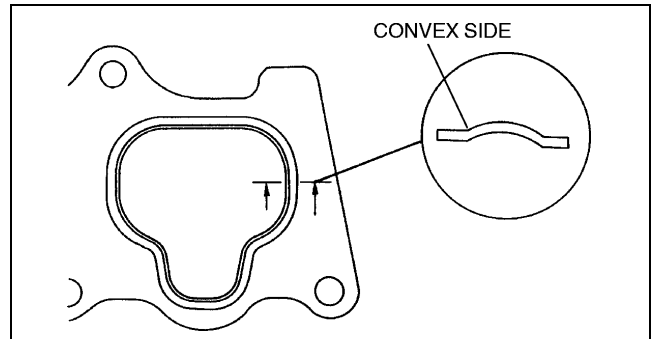
- Drain the engine coolant from the radiator. (See 01-12-3 ENGINE COOLANT REPLACEMENT.) (See 01-12-2 COOLING SYSTEM SERVICE WARNINGS.)

Intake Manifold Removal Note

- Remove the fuel injector before removing the throttle body. (See 01-14-21 FUEL INJECTOR REMOVAL/INSTALLATION.)

Intake Manifold Gasket Installation Note

- To install the intake manifold gasket, make sure that the convex side of the gasket is facing the intake manifold side.



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Throttle Body Installation Note

- Refill the radiator with engine coolant after installing the throttle body. (See 01-12-3 ENGINE COOLANT REPLACEMENT.) (See 01-12-2 COOLING SYSTEM SERVICE WARNINGS.)

Accelerator Cable Installation Note

- Carry out the "ACCELERATOR CABLE INSPECTION/ADJUSTMENT" procedure after installing the accelerator cable. (See 01-13A-13 ACCELERATOR CABLE INSPECTION/ADJUSTMENT [ZM].)

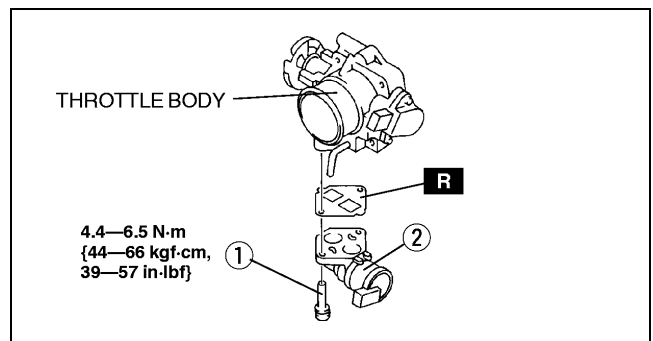
IDLE AIR CONTROL (IAC) VALVE REMOVAL/INSTALLATION [ZM]

A3U011320661W03

1. Disconnect the negative battery cable.
2. Remove the air hose and throttle body. (See 01-13A-5 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [ZM].)
3. Disconnect the IAC valve connector.
4. Remove in the order indicated in the table.

1	Bolt
2	IAC valve

5. Install in the reverse order of removal.



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INTAKE-AIR SYSTEM [ZM]

IDLE AIR CONTROL (IAC) VALVE INSPECTION [ZM]

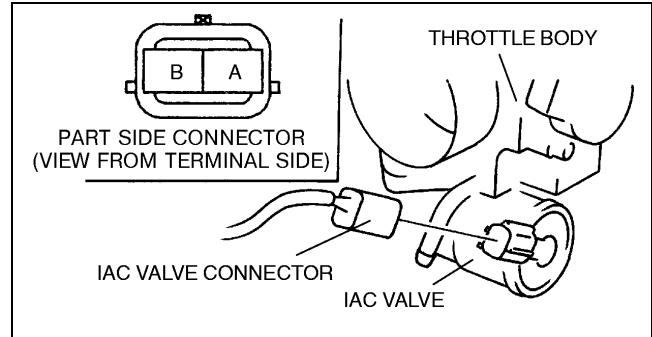
A3U011320661W04

Resistance Inspection

Note

- Perform the following test only as directed.

1. Carry out the "Idle Air Control (IAC) Inspection". (See 01-03A-57 Idle Air Control (IAC) Inspection.)
 - If not as specified, perform the further inspection for the IAC valve.
2. Disconnect the negative battery cable.
3. Disconnect the IAC valve connector.
4. Measure the resistance between the IAC valve terminals using an ohmmeter.
 - If not as specified, replace the IAC valve. (See 01-13A-6 IDLE AIR CONTROL (IAC) VALVE REMOVAL/INSTALLATION [ZM].)
 - If as specified, but PID value is failed, carry out the "Circuit Open/Short Inspection".
 - If there is an open or short circuit, repair or replace wiring harnesses.
 - If the above open or short circuit is okay, replace IAC valve.



Resistance

7.7—9.3 ohms [23 °C {73 °F}]

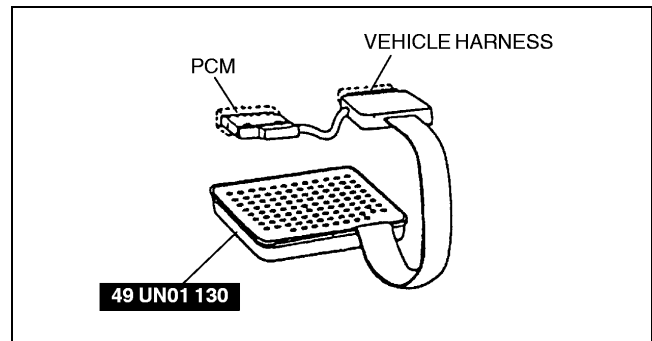
Circuit Open/Short Inspection

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.



Open circuit

- Power circuit (IAC valve connector terminal A and PCM connector terminal 54)
- GND circuit (IAC valve connector terminal B and PCM connector terminal 83)

Short circuit

- Power circuit (IAC valve connector terminal A and PCM connector terminal 54 to GND)
- GND circuit (IAC valve connector terminal B and PCM connector terminal 83 to GND)

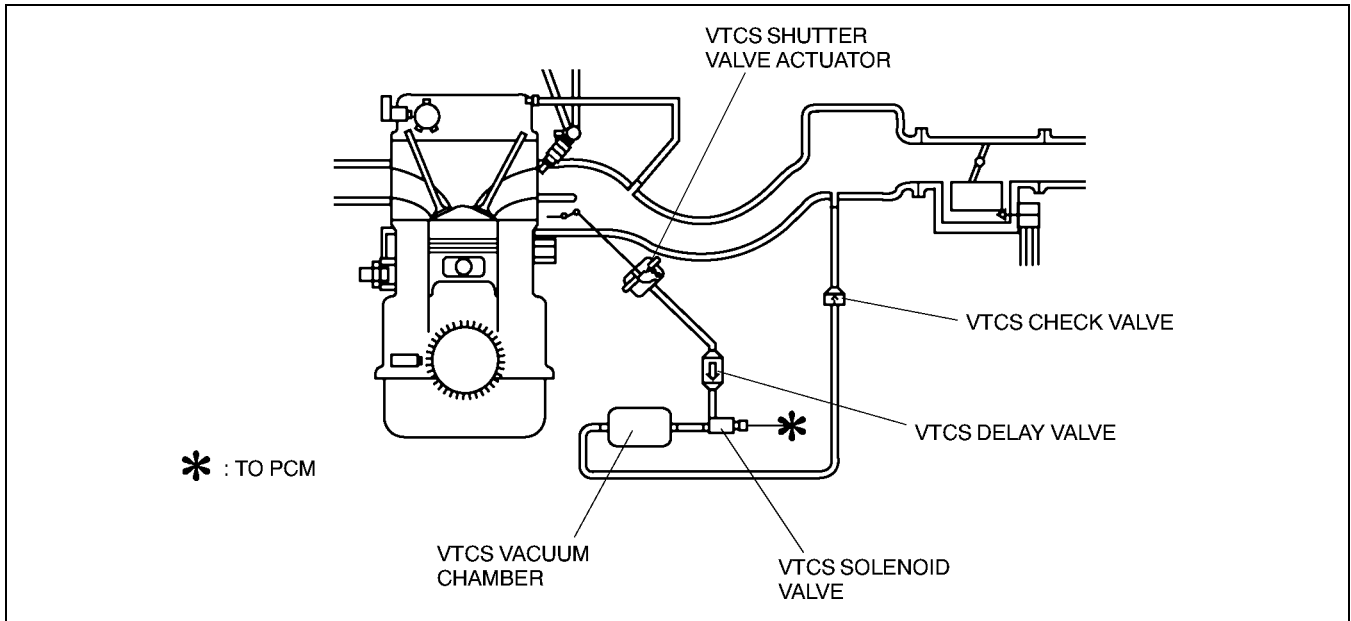
5. Reconnect the IAC valve connector.
6. Reconnect the negative battery cable.

01-13A

INTAKE-AIR SYSTEM [ZM]

VARIABLE TUMBLE CONTROL SYSTEM (VTCS) DIAGRAM [ZM]

A3U011313012W02



Z3U0113W004

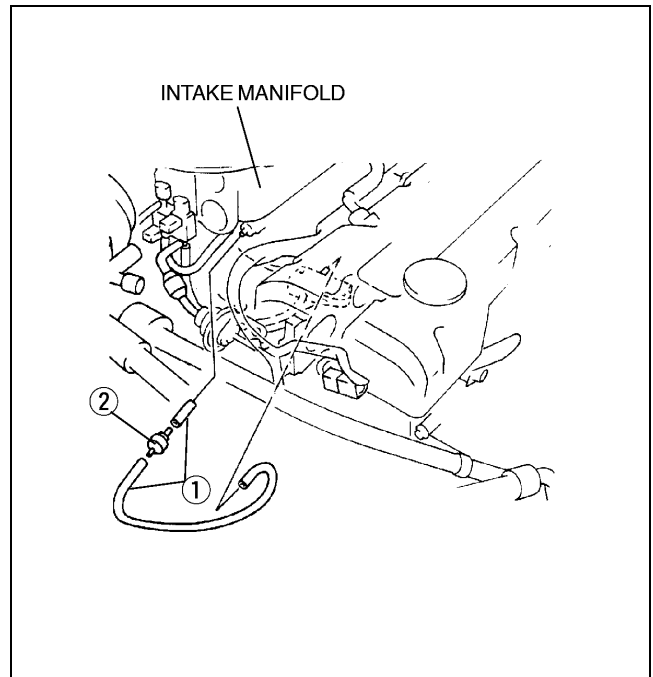
VARIABLE TUMBLE CONTROL SYSTEM (VTCS) CHECK VALVE (ONE-WAY) REMOVAL/INSTALLATION [ZM]

A3U011342913W01

1. Disconnect the negative battery cable.
2. Remove the air hose, throttle body and intake manifold. (See 01-13A-5 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [ZM].)
3. Remove in the order indicated in the table.

1	Vacuum hose
2	VTCS check valve (one-way)

4. Install in the reverse order of removal.



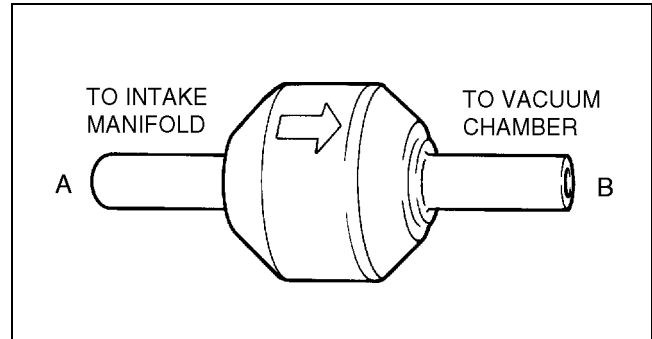
X3U113WA5

INTAKE-AIR SYSTEM [ZM]

VARIABLE TUMBLE CONTROL SYSTEM (VTCS) CHECK VALVE (ONE-WAY) INSPECTION [ZM]

A3U011342913W02

1. Remove the VTCS check valve (one-way). (See 01-13A-8 VARIABLE TUMBLE CONTROL SYSTEM (VTCS) CHECK VALVE (ONE-WAY) REMOVAL/INSTALLATION [ZM].)
2. Blow through port A and verify that the air flows from port B.
 - If not as specified, replace the VTCS check valve (one-way).
3. Blow through port B and verify that the air does not flow from port A.
 - If not as specified, replace the VTCS check valve (one-way).



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01-13A

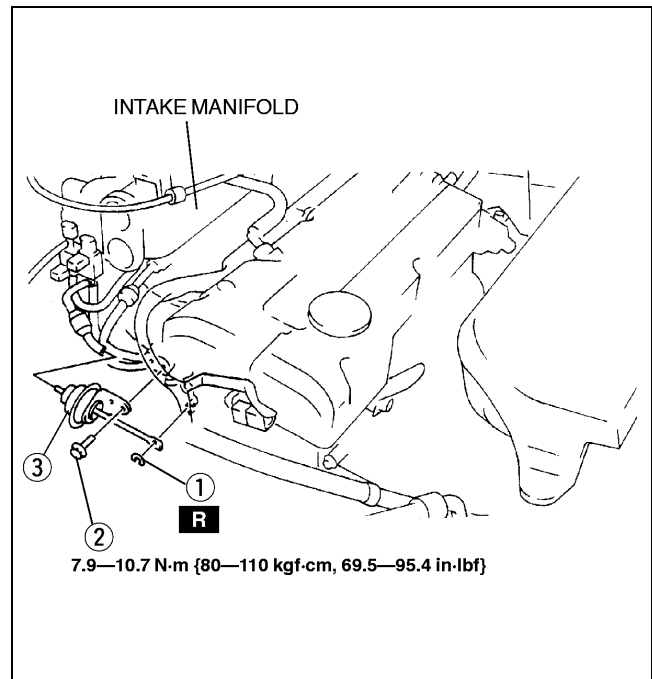
VARIABLE TUMBLE CONTROL SYSTEM (VTCS) SHUTTER VALVE ACTUATOR REMOVAL/INSTALLATION [ZM]

A3U011320153W03

1. Disconnect the negative battery cable.
2. Remove the air hose, throttle body and intake manifold. (See 01-13A-5 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [ZM].)
3. Remove in the order indicated in the table.

1	E-ring
2	Bolt
3	VTCS shutter valve actuator

4. Install in the reverse order of removal.



Y3U113WA6

INTAKE-AIR SYSTEM [ZM]

VARIABLE TUMBLE CONTROL SYSTEM (VTCS) SHUTTER VALVE ACTUATOR INSPECTION [ZM]

A3U011320153W04

Operating Inspection

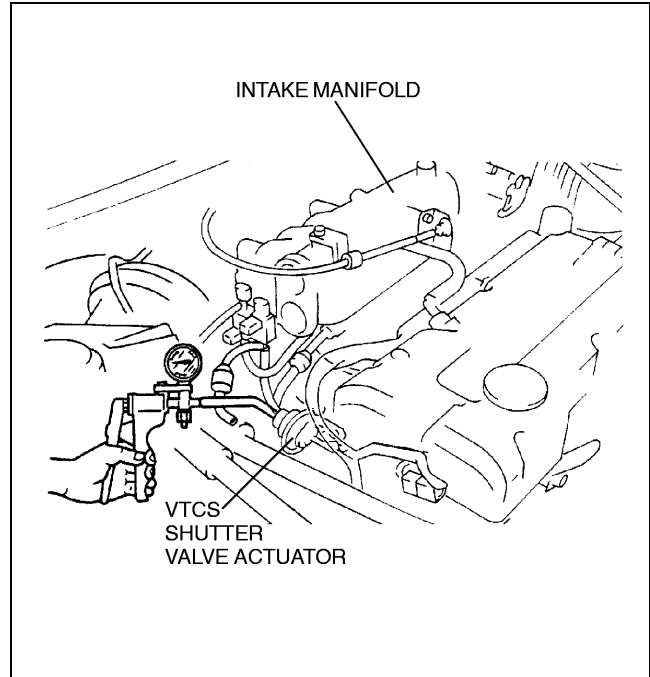
Note

- Perform the following test only as directed.

1. Carry out the "VTCS Operation Inspection". (See 01-03A-58 Variable Tumble Control System (VTCS) Inspection.)
 - If not as specified, perform the further inspection for the VTCS shutter valve actuator.
2. Disconnect the vacuum hose from the VTCS shutter valve actuator.
3. Connect a vacuum pump to the VTCS shutter valve actuator.
4. Apply pressure slowly and inspect the rod movement of the VTCS shutter valve actuator under the following condition.
 - If not as specified, replace the VTCS shutter valve actuator. (See 01-13A-9 VARIABLE TUMBLE CONTROL SYSTEM (VTCS) SHUTTER VALVE ACTUATOR REMOVAL/INSTALLATION [ZM].)
 - If as specified, but "VTCS Operation Inspection" is failed, inspect the vacuum hoses for improper routing, kinks or leakage, and inspect the following:

Pressure (kPa {mmHg, inHg})	Rod movement
Above -1.2 {-9.0, -0.35}	Not pulled
-3.6 -27.9 {-28 -209, -1.1 -8.2}	Start to move
Below -27.9 {-209, -8.2}	Fully pulled

5. Disconnect the vacuum pump to the VTCS shutter valve actuator.
6. Reconnect the vacuum hose from the VTCS shutter valve actuator.



X3U113WA8

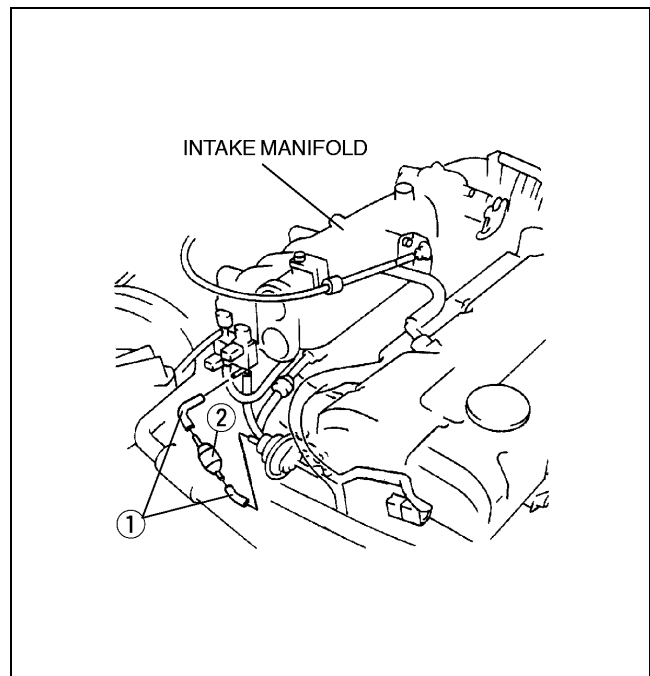
VARIABLE TUMBLE CONTROL SYSTEM (VTCS) DELAY VALVE REMOVAL/INSTALLATION [ZM]

A3U011318800W03

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.

1	Vacuum hose
2	VTCS delay valve

3. Install in the reverse order of removal.



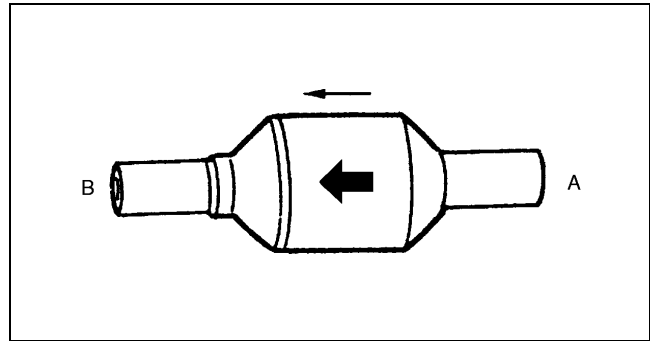
X3U113WA9

INTAKE-AIR SYSTEM [ZM]

VARIABLE TUMBLE CONTROL SYSTEM (VTCS) DELAY VALVE INSPECTION [ZM]

A3U011318800W04

1. Remove the VTCS delay valve. (See 01–13A–10 VARIABLE TUMBLE CONTROL SYSTEM (VTCS) DELAY VALVE REMOVAL/INSTALLATION [ZM].)
2. Blow through port A and verify that the air flows from port B.
 - If not as specified, replace the VTCS delay valve.
3. Blow through port B and verify that the air does not flow from port A.
 - If not as specified, replace the VTCS delay valve.



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01-13A

VARIABLE TUMBLE CONTROL SYSTEM (VTCS) SOLENOID VALVE INSPECTION [ZM]

A3U011318745W02

Simulation Test

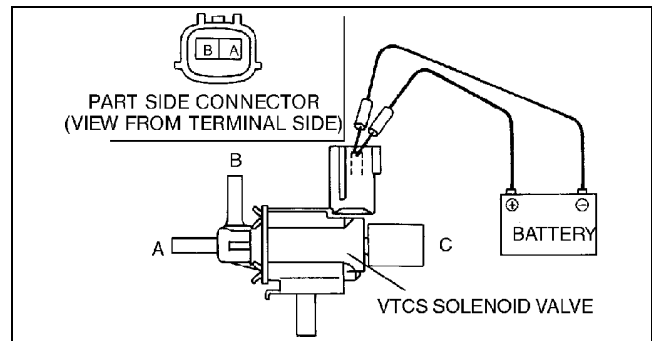
1. Carry out the “VTCS Operation Inspection”. (See 01–03A–58 Variable Tumble Control System (VTCS) Inspection.)
 - If not as specified, perform the further inspection for the VTCS solenoid valve.

Airflow Inspection

Note

- Perform the following test only as directed.

1. Remove the VTCS solenoid valve.
2. Inspect airflow each port under the following condition.
 - If as specified, replace the VTCS solenoid valve.
 - If as specified but the “VTCS Operation Inspection” is failed, inspect evaporative hoses for improper routing, kinks or leakage, and “Circuit Open/Short Inspection”.
 - If there is an open or short circuit, repair or replace wiring harnesses.
 - If the above open or short circuit is okay, replace VTCS solenoid valve.



Y3U113WA4

○—○ : Continuity ○=○ : Airflow

Step	Terminal		Port		
	A	B	A	B	C
1	○—○	○—○		○=○	○=○
2	B+	GND	○—○	○=○	

X3U113WAI

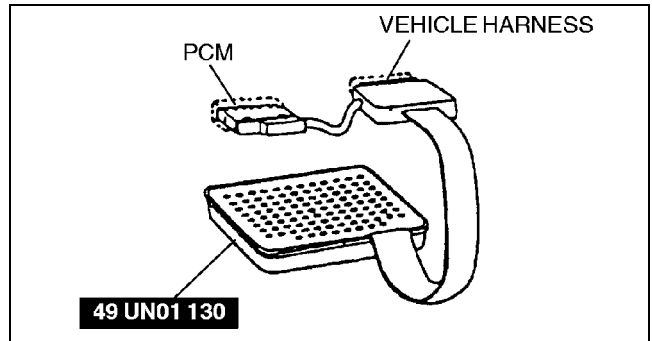
INTAKE-AIR SYSTEM [ZM]

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}



X3U113WAC

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.

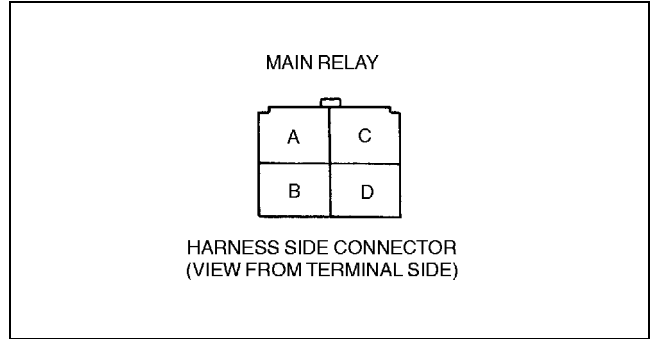
Open circuit

- Power circuit (VTCS solenoid valve connector terminal A and main relay connector terminal D through common connector)
- Control circuit (VTCS solenoid valve connector terminal B and PCM connector terminal 19)

Short circuit

- Power circuit (VTCS solenoid valve connector terminal A and main relay connector terminal D through common connector to GND)
- Control circuit (VTCS solenoid valve connector terminal B and PCM connector terminal 19 to GND)

5. Reconnect the VTCS solenoid valve connector.
6. Reconnect the negative battery cable.



Z3U0113W998

ACCELERATOR CABLE REMOVAL/INSTALLATION [ZM]

A3U011341660W04

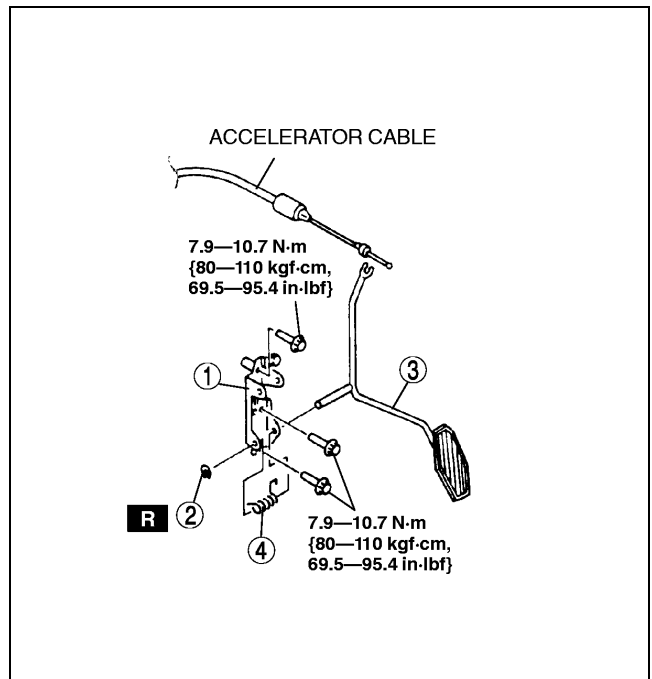
Note

- Accelerator removal and installation on cruise control system-equipped vehicles is not possible.

1. Remove in the order indicated in the table.

1	Retainer
2	E-ring
3	Accelerator pedal (See 01-13A-13 Accelerator Pedal Installation Note)
4	Return spring

2. Install in the reverse order of removal.



X3U113WAD

INTAKE-AIR SYSTEM [ZM]

Accelerator Pedal Installation Note

1. Set the accelerator pedal securely, taking care not to bend the accelerator cable.

ACCELERATOR CABLE INSPECTION/ADJUSTMENT [ZM]

A3U011341660W05

1. Verify that the throttle valve is fully closed.
2. Pull the accelerator cable in A and B directions, and measure the free play.
 - If not as specified, adjust by turning locknuts C.

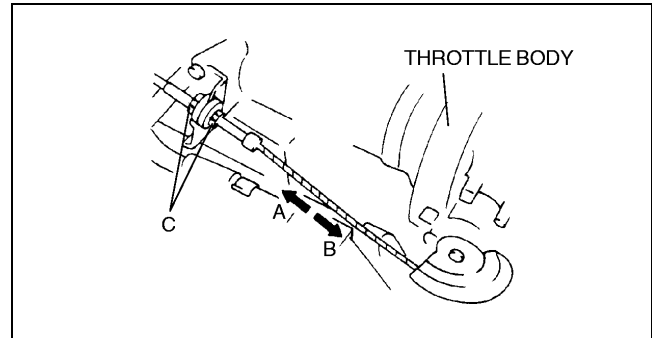
Free Play

1—3 mm {0.04—0.11 in}

Tightening torque

10—14 N·m {1.0—1.5 kgf·m, 8—10 ft·lbf}

01-13A



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