

01-13B INTAKE-AIR SYSTEM [FS]

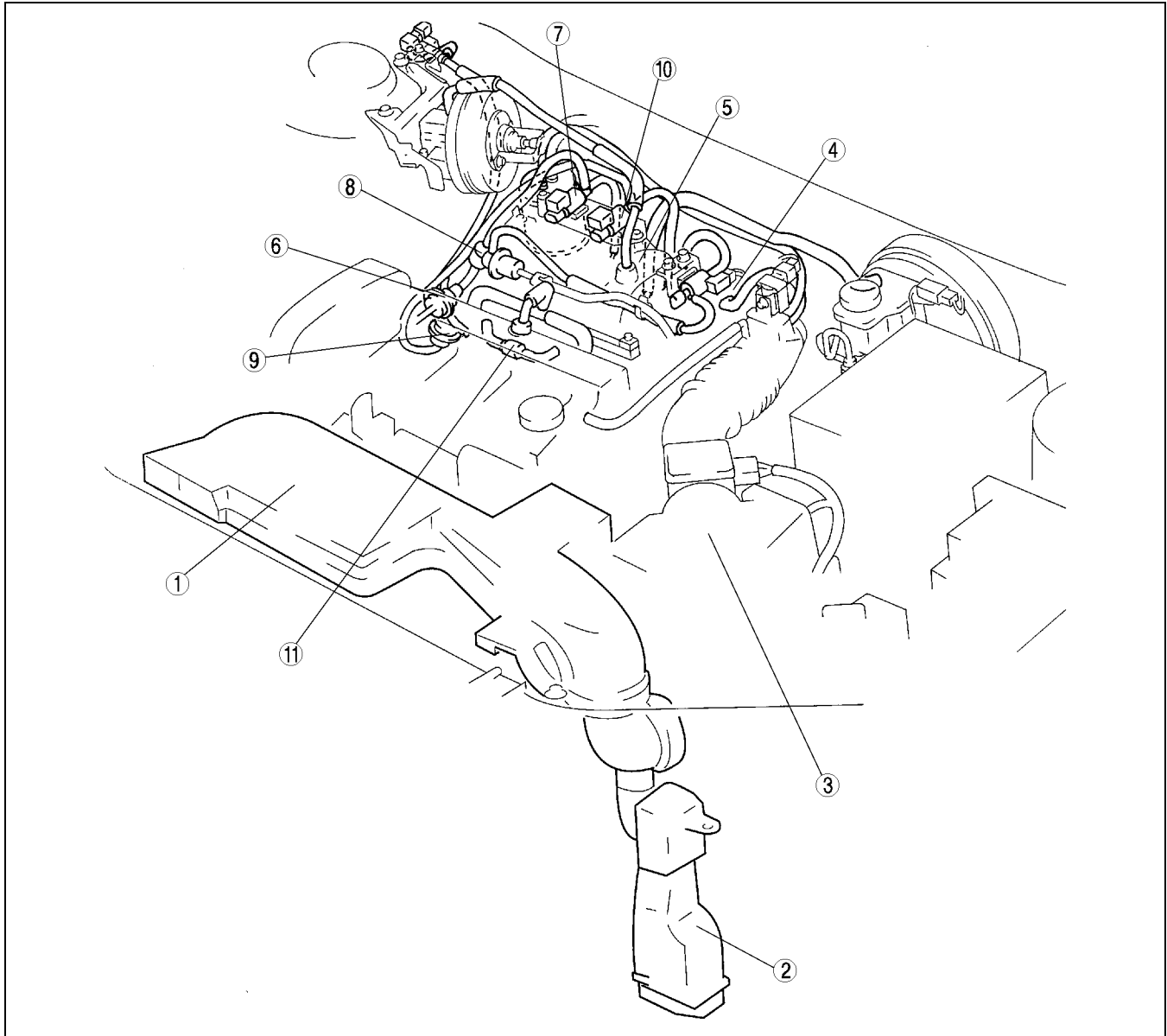
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INTAKE-AIR SYSTEM [FS]

INTAKE-AIR SYSTEM LOCATION INDEX [FS]

A3U011301005W01



Z3U0113W005

| | |
|---|---|
| 1 | Fresh-air duct (See 01-13B-6 INTAKE-AIR SYSTEM REMOVAL/ INSTALLATION [FS]) |
| 2 | Resonance chamber (See 01-13B-6 INTAKE-AIR SYSTEM REMOVAL/ INSTALLATION [FS]) |
| 3 | Air cleaner (See 01-13B-6 INTAKE-AIR SYSTEM REMOVAL/ INSTALLATION [FS]) |
| 4 | Throttle body (See 01-13B-6 INTAKE-AIR SYSTEM REMOVAL/ INSTALLATION [FS]) |
| 5 | Intake manifold (See 01-13B-6 INTAKE-AIR SYSTEM REMOVAL/ INSTALLATION [FS]) |

| | |
|---|---|
| 6 | VTCS shutter valve actuator (See 01-13B-13 VARIABLE TUMBLE CONTROL SYSTEM (VTCS) SHUTTER VALVE ACTUATOR REMOVAL/INSTALLATION [FS]) (See 01-13B-14 VARIABLE TUMBLE CONTROL SYSTEM (VTCS) SHUTTER VALVE ACTUATOR INSPECTION [FS]) |
| 7 | VTCS solenoid valve (See 01-13B-6 INTAKE-AIR SYSTEM REMOVAL/ INSTALLATION [FS]) (See 01-13B-15 VARIABLE TUMBLE CONTROL SYSTEM (VTCS) SOLENOID VALVE INSPECTION [FS]) |
| 8 | VTCS delay valve (See 01-13B-14 VARIABLE TUMBLE CONTROL SYSTEM (VTCS) DELAY VALVE REMOVAL/ INSTALLATION [FS]) (See 01-13B-15 VARIABLE TUMBLE CONTROL SYSTEM (VTCS) DELAY VALVE INSPECTION [FS]) |

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| | |
|---|---|
| 9 | VICS shutter valve actuator (See 01-13B-11 VARIABLE INERTIA CHARGING SYSTEM (VICS) SHUTTER VALVE ACTUATOR REMOVAL/INSTALLATION [FS]) (See 01-13B-11 VARIABLE INERTIA CHARGING SYSTEM (VICS) SHUTTER VALVE ACTUATOR INSPECTION [FS]) |
|---|---|

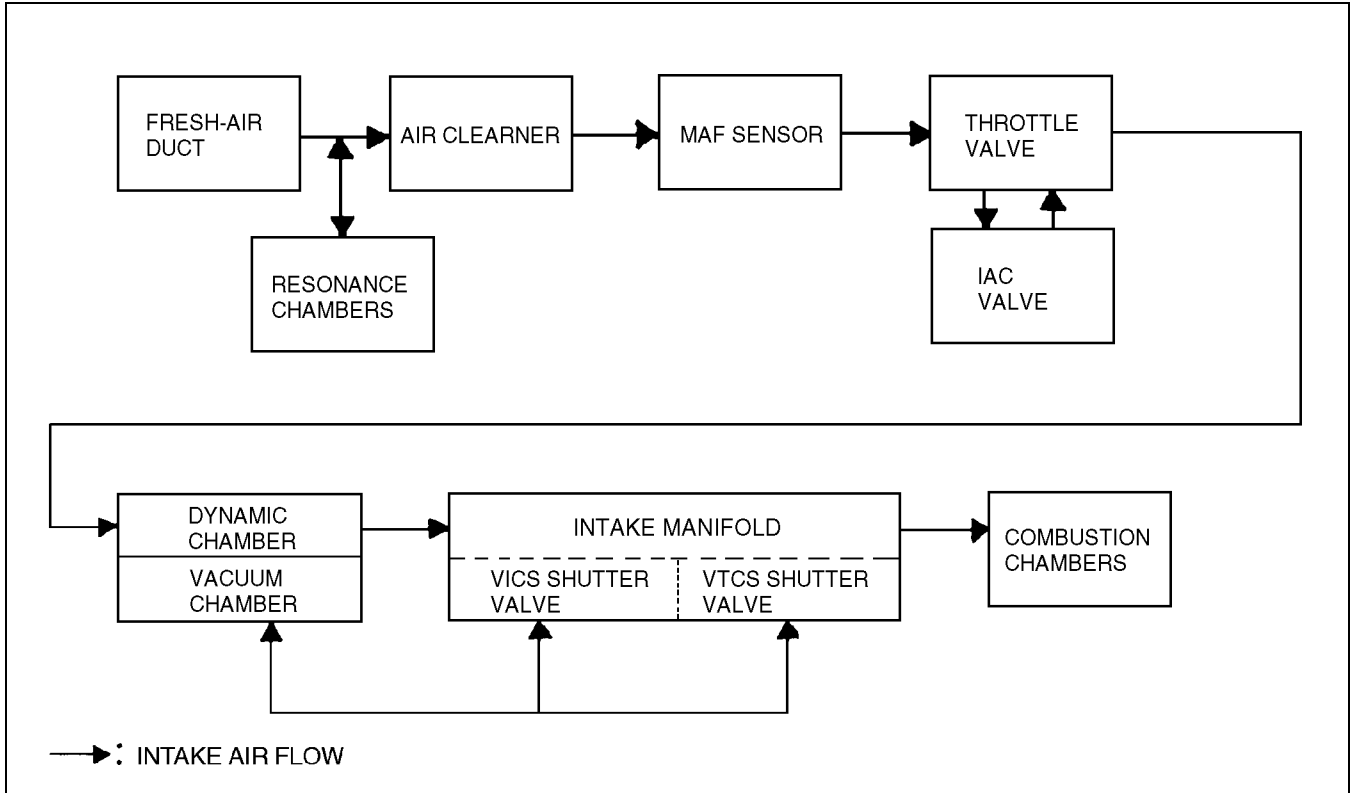
| | |
|----|---|
| 10 | VICS solenoid valve (See 01-13B-6 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [FS]) (See 01-13B-12 VARIABLE INERTIA CHARGING SYSTEM (VICS) SOLENOID VALVE INSPECTION [FS]) |
| 11 | Vacuum chamber check valve (See 01-13B-9 VACUUM CHAMBER CHECK VALVE REMOVAL/INSTALLATION [FS]) (See 01-13B-9 VACUUM CHAMBER CHECK VALVE INSPECTION [FS]) |

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INTAKE-AIR SYSTEM [FS]

INTAKE-AIR SYSTEM FLOW DIAGRAM [FS]

A3U011301005W02

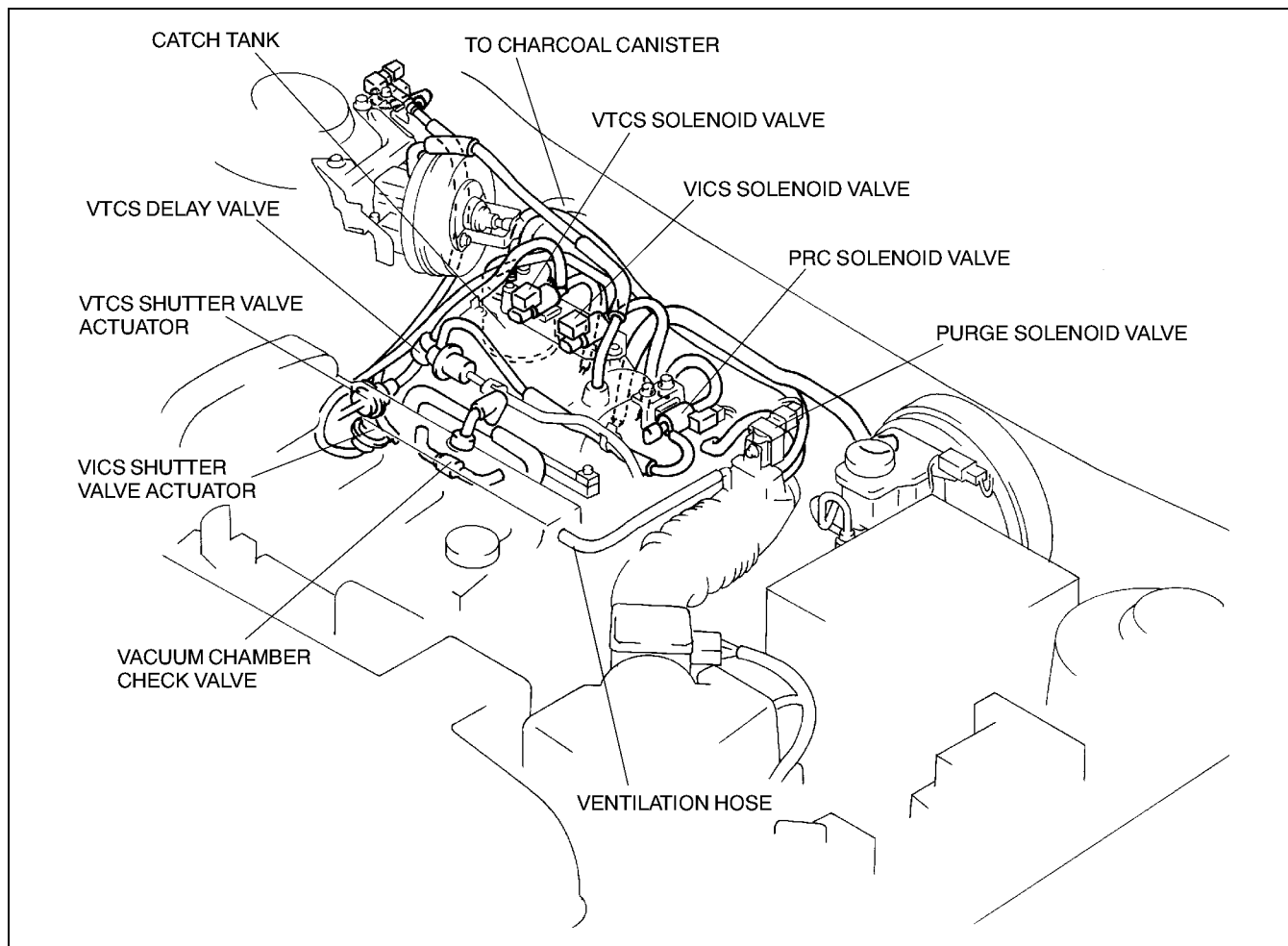


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INTAKE-AIR SYSTEM [FS]

VACUUM HOSE ROUTING DIAGRAM [FS]

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Z3U0113W007

INTAKE-AIR SYSTEM [FS]

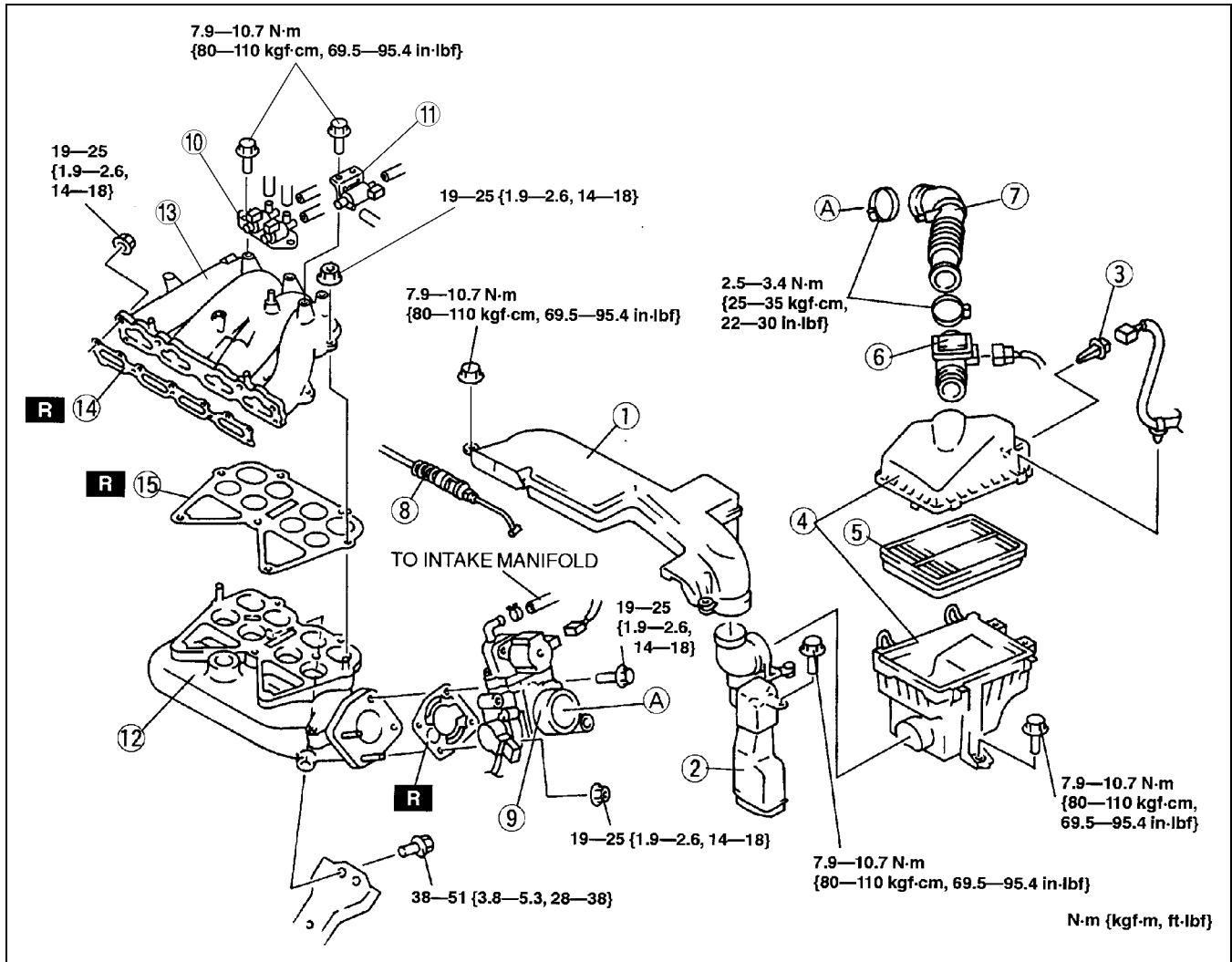
INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [FS]

A3U011313000W01

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.)

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



Z3U0113W008

| | |
|---|--|
| 1 | Fresh-air duct |
| 2 | Resonance chamber |
| 3 | IAT sensor |
| 4 | Air cleaner |
| 5 | Air cleaner element |
| 6 | MAF sensor |
| 7 | Air hose |
| 8 | Accelerator cable (See 01-13B-7 Accelerator Cable Installation Note) |
| 9 | Throttle body (See 01-13B-7 Throttle Body Removal Note) (See 01-13B-7 Throttle Body Installation Note) |

| | |
|----|---|
| 10 | Solenoid valve bracket |
| 11 | PRC solenoid valve |
| 12 | Dynamic chamber |
| 13 | Intake manifold (See 01-13B-7 Intake Manifold Removal Note) |
| 14 | Intake manifold gasket (See 01-13B-7 Intake Manifold Gasket Installation Note) |
| 15 | Dynamic chamber gasket (See 01-13B-7 Dynamic Chamber Gasket Installation Note) |

INTAKE-AIR SYSTEM [FS]

Throttle Body Removal Note

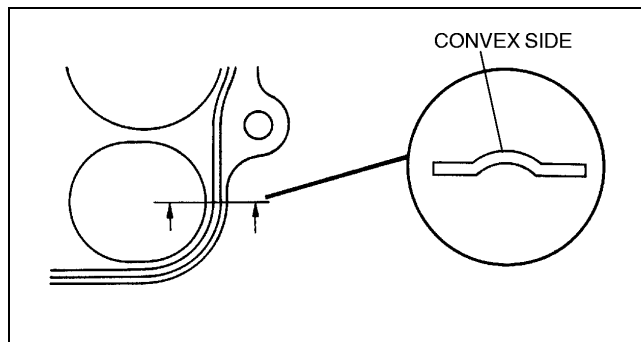
1. Drain the engine coolant from the radiator before removing the throttle body. (See 01-12-3 ENGINE COOLANT REPLACEMENT.) (See 01-12-2 COOLING SYSTEM SERVICE WARNINGS.)

Intake Manifold Removal Note

1. Remove the fuel injector before removing the intake manifold. (See 01-14-21 FUEL INJECTOR REMOVAL/INSTALLATION.)

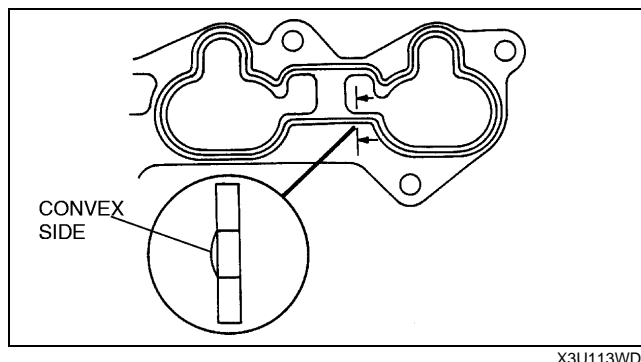
Dynamic Chamber Gasket Installation Note

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



Intake Manifold Gasket Installation Note

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



Throttle Body Installation Note

1. 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

1. Carry out the "ACCELERATOR CABLE INSPECTION/ADJUSTMENT" procedure after installing the accelerator cable. (See 01-13B-17 ACCELERATOR CABLE INSPECTION [FS].) (See 01-13B-17 ACCELERATOR CABLE ADJUSTMENT [FS].)

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INTAKE-AIR SYSTEM [FS]

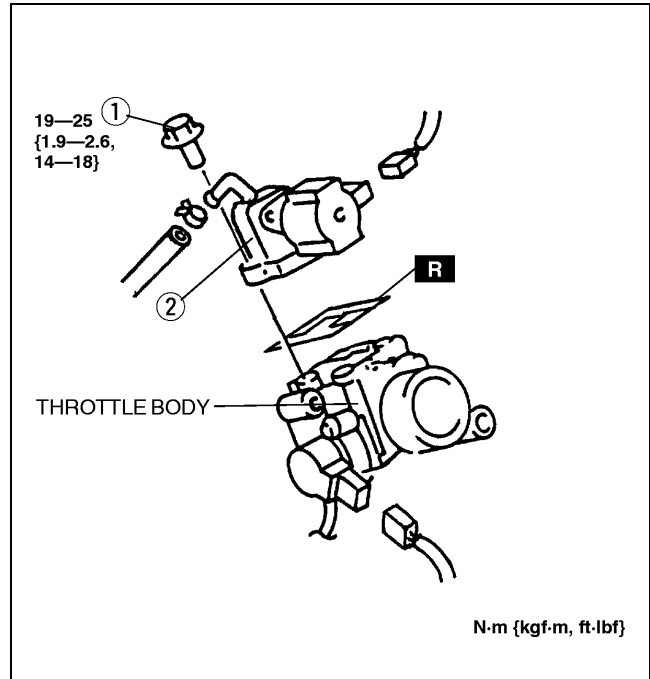
IDLE AIR CONTROL (IAC) VALVE REMOVAL/INSTALLATION [FS]

A3U011320661W01

1. Disconnect the battery negative cable.
2. Remove the air hose and throttle body. (See 01-13B-6 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [FS].)
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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IDLE AIR CONTROL (IAC) VALVE INSPECTION [FS]

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Resistance Inspection

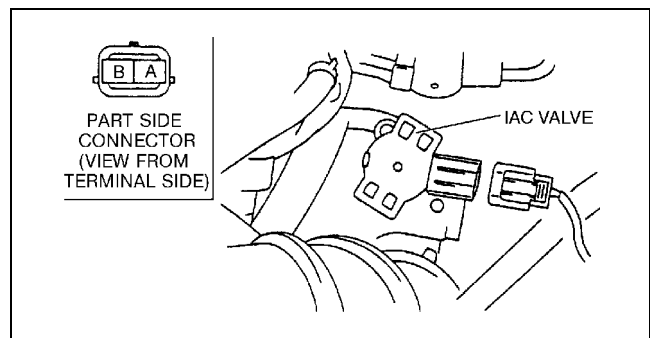
Note

- Perform the following test only as directed.

1. Carry out the “Idle Air Control (IAC) Inspection”. (See 01-03B-56 Idle Air Control (IAC) Inspection.)
 - If not as specified, perform the further inspection for the IAC valve.
2. Disconnect the battery negative 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 01-13B-8 IDLE AIR CONTROL (IAC) VALVE REMOVAL/INSTALLATION [FS].)
 - If as specified, but PID value failed, carry out the “Circuit Open/Short inspection”.
 - If there is an open or short circuit, repair or replace wiring harnesses.
 - If there is no open or short circuit, replace IAC valve.

Resistance

7.7—9.3 ohms [23 °C {73 °F}]



Z3U0113W997

INTAKE-AIR SYSTEM [FS]

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01-40B-7 PCM REMOVAL/INSTALLATION [FS].)
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.

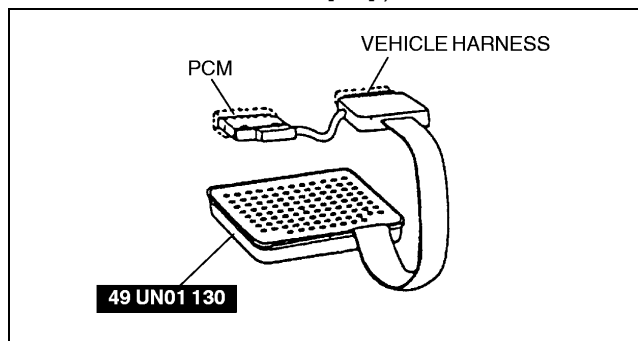
Open circuit

- 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 battery negative cable.



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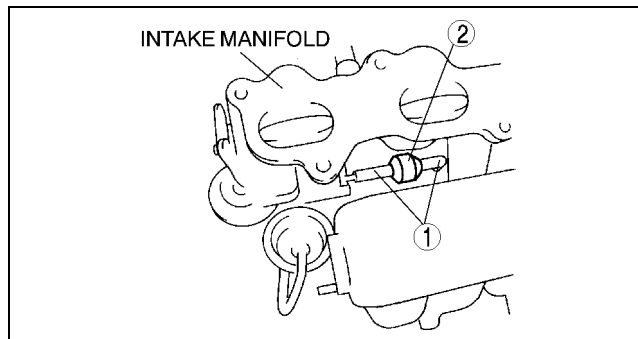
01-13B

VACUUM CHAMBER CHECK VALVE REMOVAL/INSTALLATION [FS]

A3U011342910W01

1. Disconnect the battery negative cable.
2. Remove the air hose, throttle body and intake manifold. (See 01-13B-6 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [FS].)
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.

| | |
|---|----------------------------|
| 1 | Vacuum hose |
| 2 | Vacuum chamber check valve |

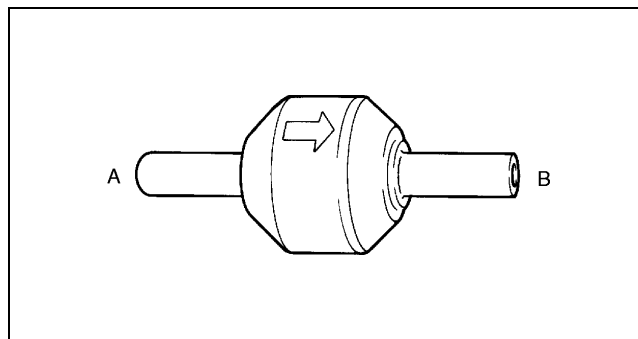


Z3U0113W009

VACUUM CHAMBER CHECK VALVE INSPECTION [FS]

A3U011342910W02

1. Remove the vacuum chamber check valve. (See 01-13B-9 VACUUM CHAMBER CHECK VALVE REMOVAL/INSTALLATION [FS].)
2. Blow through port A and verify that the air flows from port B.
 - If not as specified, replace the vacuum chamber check valve.
3. Blow through port B and verify that the air does not flow from port A.
 - If not as specified, replace the vacuum chamber check valve.

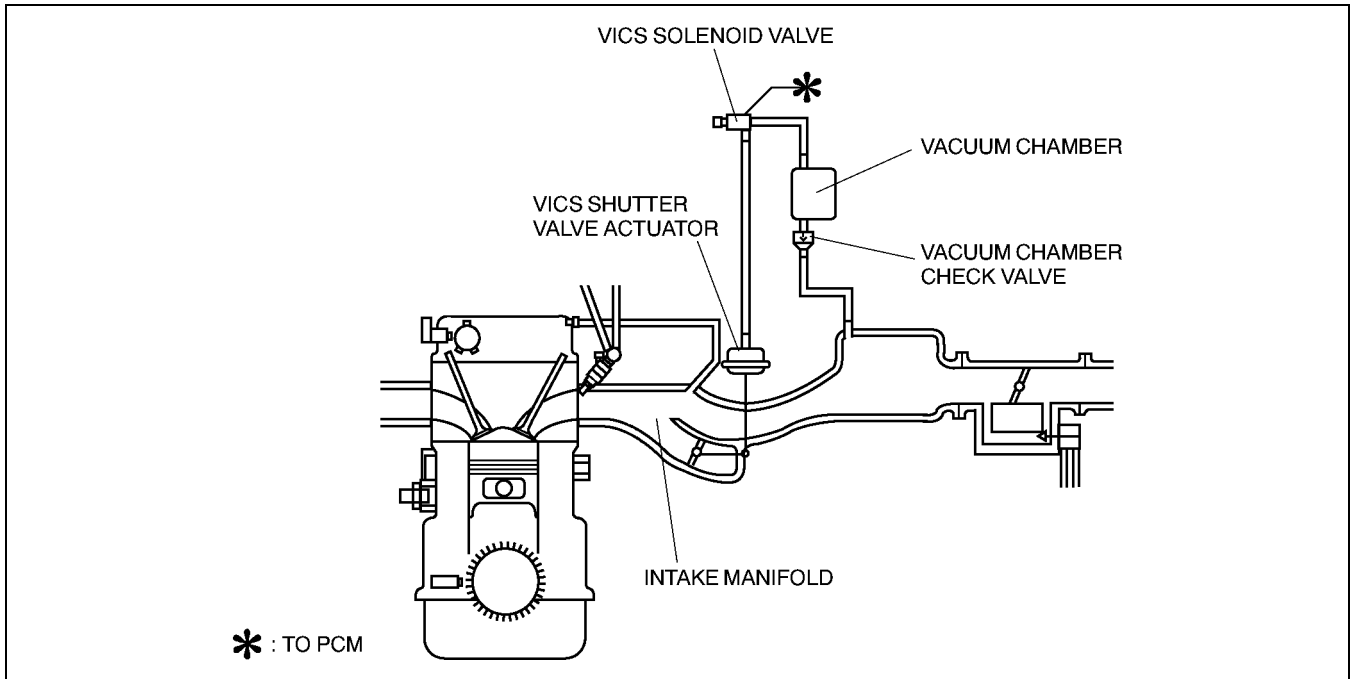


X3U113WD8

INTAKE-AIR SYSTEM [FS]

VARIABLE INERTIA CHARGING SYSTEM (VICS) DIAGRAM [FS]

A3U011313011W01



Z3U0113W010

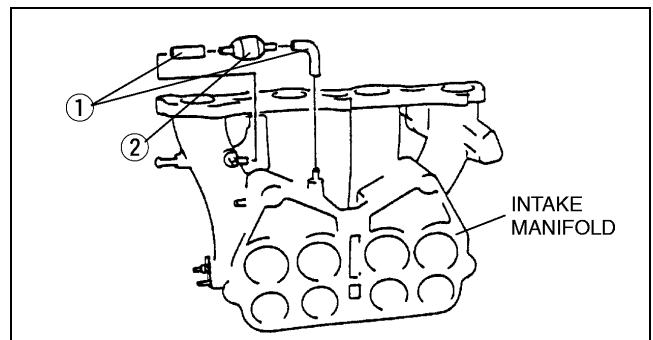
VARIABLE INERTIA CHARGING SYSTEM (VICS) CHECK VALVE (ONE-WAY) REMOVAL/INSTALLATION [FS]

A3U011313995W01

1. Disconnect the negative battery cable.
2. Remove the air hose, throttle body and intake manifold. (See 01-13B-6 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [FS].)
3. Remove in the order indicated in the table.

| | |
|---|----------------------------|
| 1 | Vacuum hose |
| 2 | VICS check valve (one-way) |

4. Install in the reverse order of removal.

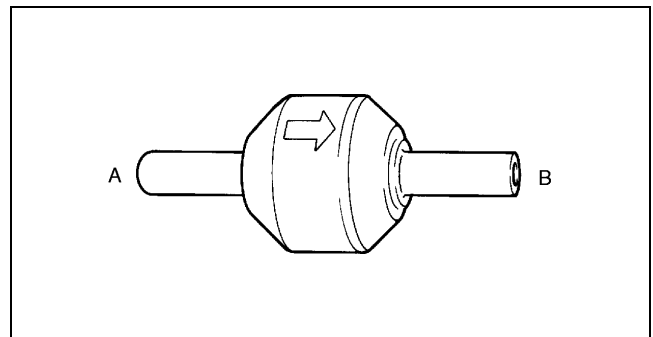


X3U113WD7

VARIABLE INERTIA CHARGING SYSTEM (VICS) CHECK VALVE (ONE-WAY) INSPECTION [FS]

A3U011313995W02

1. Remove the VICS check valve (one-way). (See 01-13B-10 VARIABLE INERTIA CHARGING SYSTEM (VICS) CHECK VALVE (ONE-WAY) REMOVAL/INSTALLATION [FS].)
2. Blow through port A and verify that the air flows from port B.
 - If not as specified, replace the VICS 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 VICS check valve (one-way).



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INTAKE-AIR SYSTEM [FS]

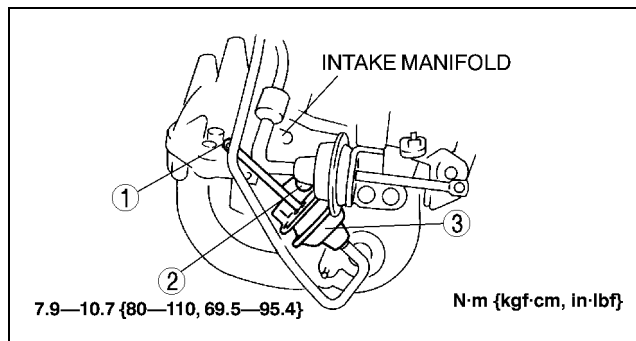
VARIABLE INERTIA CHARGING SYSTEM (VICS) SHUTTER VALVE ACTUATOR REMOVAL/INSTALLATION [FS]

A3U011320152W01

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

| | |
|---|-----------------------------|
| 1 | E ring |
| 2 | Bolt |
| 3 | VICS shutter valve actuator |

3. Install in the reverse order of removal.



Z3U0113W011

01-13B

VARIABLE INERTIA CHARGING SYSTEM (VICS) SHUTTER VALVE ACTUATOR INSPECTION [FS]

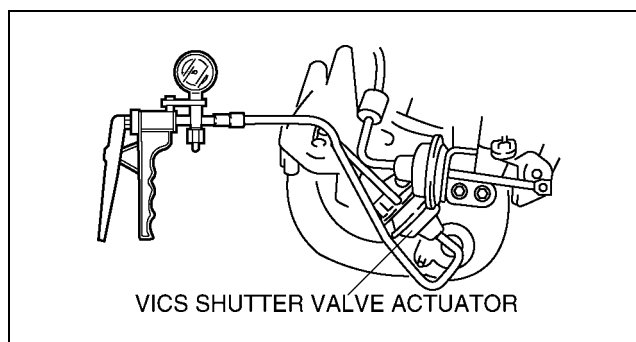
A3U011320152W02

Operating Inspection

Note

- Perform the following test only as directed.

1. Carry out the “VICS Operation Inspection”. (See 01-03B-57 VICS Operation Inspection.)
 - If not as specified, perform the further inspection for the VICS shutter valve actuator.
2. Disconnect the vacuum hose from the VICS shutter valve actuator.
3. Connect a vacuum pump to the VICS shutter valve actuator.
4. Apply pressure slowly and inspect the rod movement of the VICS shutter valve actuator under the following condition.
 - If not as specified, replace the VICS shutter valve actuator. (See 01-13B-11 VARIABLE INERTIA CHARGING SYSTEM (VICS) SHUTTER VALVE ACTUATOR REMOVAL/INSTALLATION [FS].)
 - If as specified, but “VICS Operation Inspection” failed, inspect the vacuum hoses for proper routing, kinks or leakage.



Z3U0113W017

| Pressure (kPa {mmHg, inHg}) | Rod movement |
|--------------------------------------|----------------|
| Above -2.7 {-20, -0.80} | Not pulled |
| -8.0—-35.3 {-61—-264, -2.4—-10.4} | Starts to move |
| Below -35.3 {-265, -10.4} | Fully pulled |

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

INTAKE-AIR SYSTEM [FS]

VARIABLE INERTIA CHARGING SYSTEM (VICS) SOLENOID VALVE INSPECTION [FS]

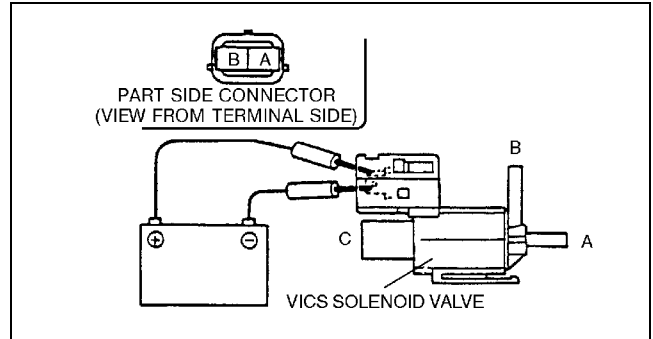
A3U011318740W01

Airflow Inspection

Note

- Perform the following test only as directed.

1. Carry out the "VICS Operation Inspection". (See 01-03B-57 VICS Operation Inspection.)
 - If not as specified, perform the further inspection for the VICS solenoid valve.
2. Disconnect the battery negative cable.
3. Remove the VICS solenoid valve.
4. Inspect for airflow between each port under the following condition.
 - If not as specified, replace the VICS solenoid valve.
 - If as specified but the "VICS Operation Inspection" failed, carry out the "Circuit Open/Short Inspection".
 - If there is an open or short circuit, repair or replace wiring harnesses.
 - If there is no open or short circuit, replace VICS solenoid valve.



Y3U113WAB

○—○ : Continuity ○=○ : Airflow

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

X3U113WDF

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See 01-40B-7 PCM REMOVAL/INSTALLATION [FS].)
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.

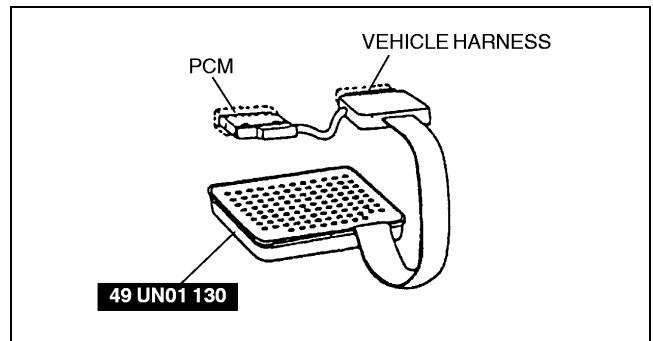
Open circuit

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

Short circuit

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

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

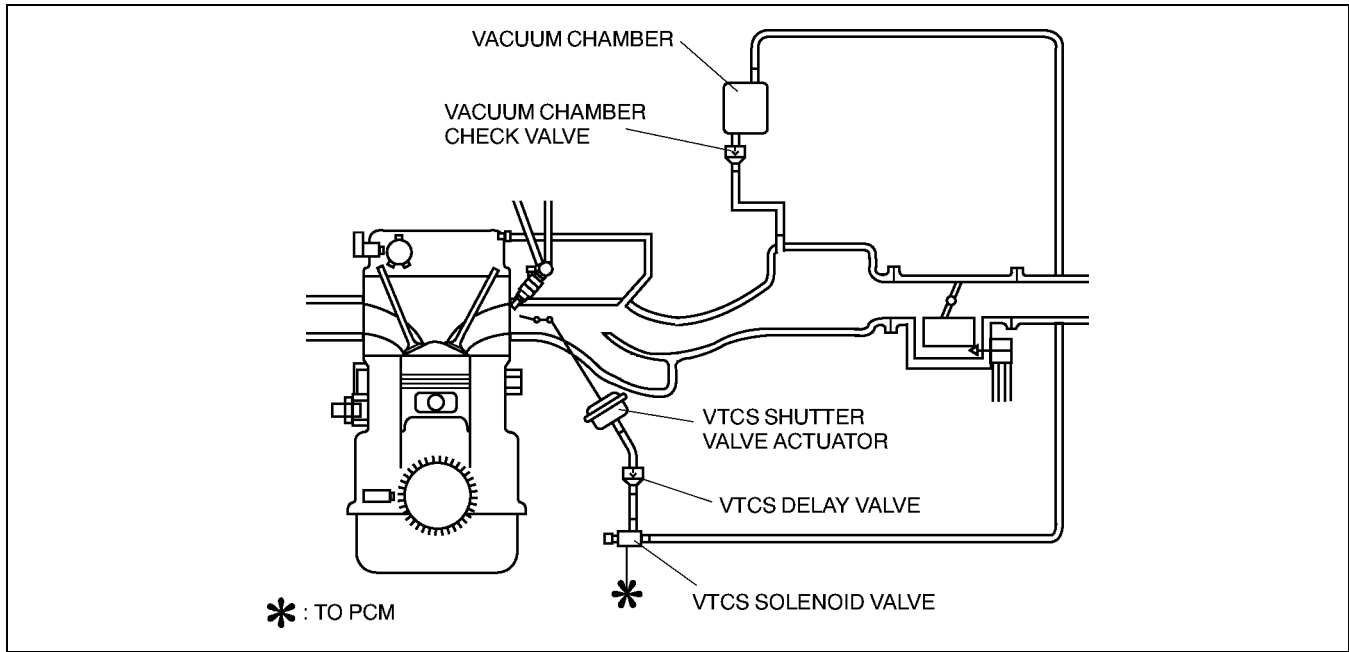


X3U113WDG

INTAKE-AIR SYSTEM [FS]

VARIABLE TUMBLE CONTROL SYSTEM (VTCS) DIAGRAM [FS]

A3U011313012W01



01-13B

Z3U0113W012

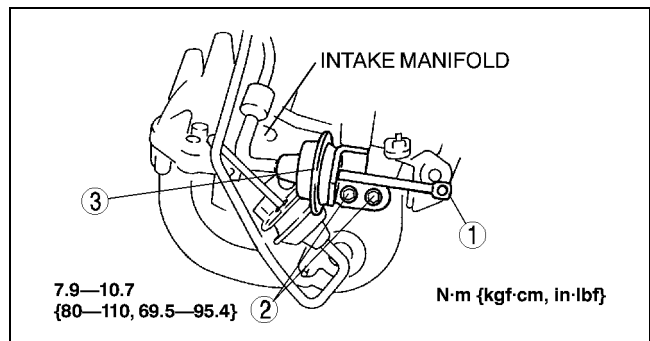
VARIABLE TUMBLE CONTROL SYSTEM (VTCS) SHUTTER VALVE ACTUATOR REMOVAL/INSTALLATION [FS]

A3U011320153W01

1. Disconnect the battery negative cable.
2. Remove the air hose, throttle body and intake manifold. (See 01-13B-6 INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [FS].)
3. Remove in the order indicated in the table.

| | |
|---|-----------------------------|
| 1 | E-ring |
| 2 | Bolts |
| 3 | VTCS shutter valve actuator |

4. Install in the reverse order of removal.



Z3U0113W013

INTAKE-AIR SYSTEM [FS]

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

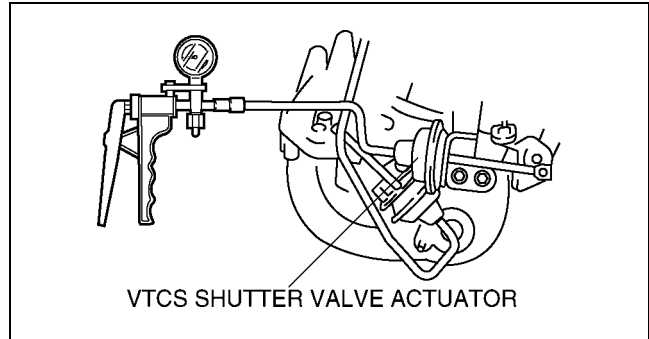
A3U011320153W02

Operating Inspection

Note

- Perform the following test only as directed.

1. Carry out the "VTCS Operation Inspection". (See 01-03B-57 Variable Tumble Control System (VTCS) Inspection.)
 - If not as specified, perform the further inspection for the VTCS shutter valve actuator inspection.
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 01-13B-13 VARIABLE TUMBLE CONTROL SYSTEM (VTCS) SHUTTER VALVE ACTUATOR REMOVAL/INSTALLATION [FS].)
 - If as specified, but "VTCS Operation Inspection" is failed, inspect the vacuum hoses for improper routing, kinks or leakage.



Z3U0113W014

| Pressure (kPa {mmHg, inHg}) | Rod movement |
|---|----------------|
| Above -2.7 {-2.0, -0.80} | Not pulled |
| -8.0— -35.3 {-61— -264, -2.4— -10.4} | Starts to move |
| Below -35.3 {-26.5, -10.4} | Fully pulled |

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

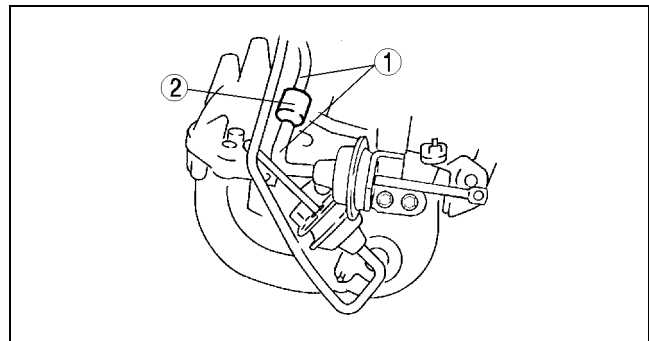
VARIABLE TUMBLE CONTROL SYSTEM (VTCS) DELAY VALVE REMOVAL/INSTALLATION [FS]

A3U011318800W01

1. Disconnect the battery negative 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.



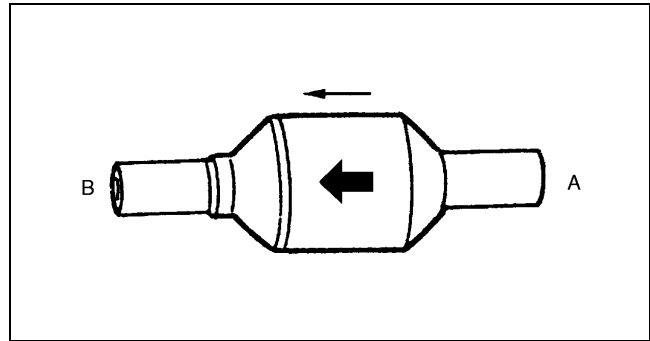
Z3U0113W016

INTAKE-AIR SYSTEM [FS]

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

A3U011318800W02

1. Remove the VTCS delay valve. (See 01–13B–14 VARIABLE TUMBLE CONTROL SYSTEM (VTCS) DELAY VALVE REMOVAL/INSTALLATION [FS].)
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.



X3U113WAA

01–13B

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

A3U011318745W01

Simulation Test

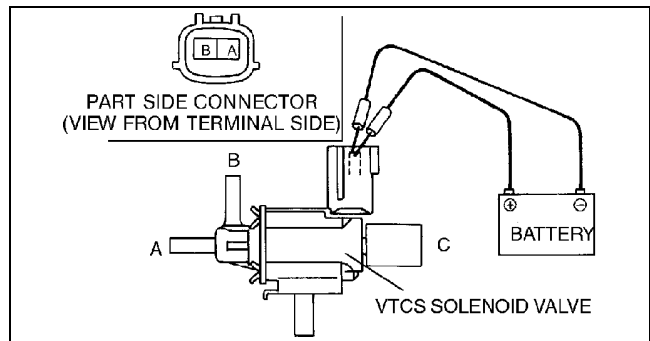
1. Carry out the “VTCS Operation Inspection”. (See 01–03B–57 Variable Tumble Control System (VTCS) Inspection.)
 - If not as specified, perform the further inspection for the VTCS solenoid valve.

Airflow Inspection

Note

- Perform the following test only as directed.

1. Remove the VTCS solenoid valve.
2. Inspect for 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 inspect “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.



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○—○ : Continuity ○=○ : Airflow

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

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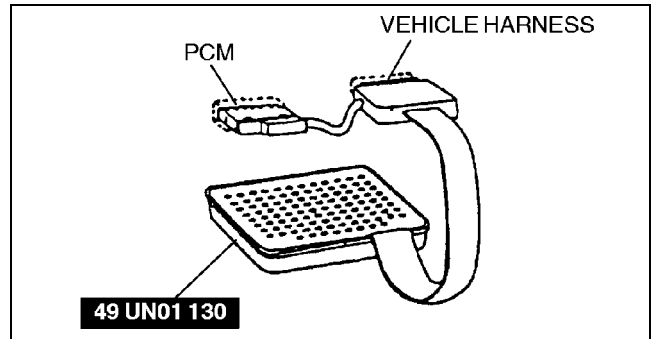
INTAKE-AIR SYSTEM [FS]

Circuit Open/Short Inspection

1. Disconnect the PCM connector.
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}



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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.

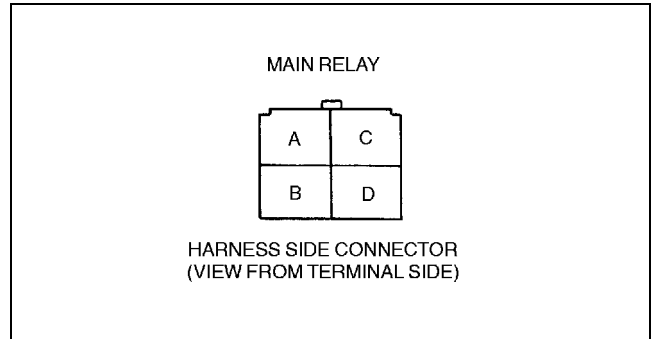
Open circuit

- Power circuit (VTCS solenoid valve connector terminal A and main relay connector terminal D)
- 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 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 battery negative cable.



Z3U0113W998

ACCELERATOR CABLE REMOVAL/INSTALLATION [FS]

A3U011341660W01

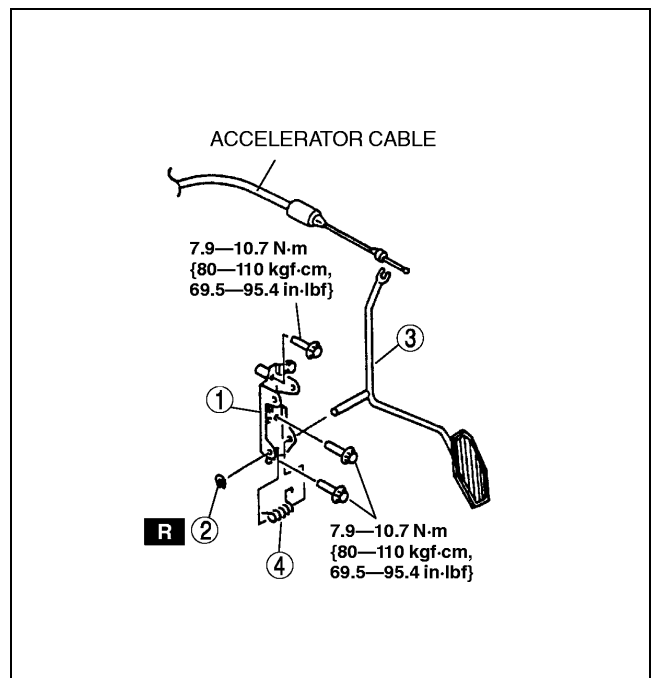
Note

- 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 01-13B-17 Accelerator Pedal Installation Note) |
| 4 | Return spring |

2. Install in the reverse order of removal.



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INTAKE-AIR SYSTEM [FS]

Accelerator Pedal Installation Note

1. Set the accelerator pedal securely, be sure not to bend the accelerator cable.

ACCELERATOR CABLE INSPECTION [FS]

A3U011341660W02

1. Verify that the throttle valve is fully closed.

Note

- To measure cable free play, push the cable into the housing and put a white mark on the cable at the end of the housing, then pull it out and measure distance from the white mark to the end of the cable housing.
2. Measure the free play of accelerator cable.
 - If not as specified, adjust the accelerator cable. (See 01-13B-17 ACCELERATOR CABLE ADJUSTMENT [FS].)

01-13B

Free Play

1—3 mm {0.04—0.11 in}

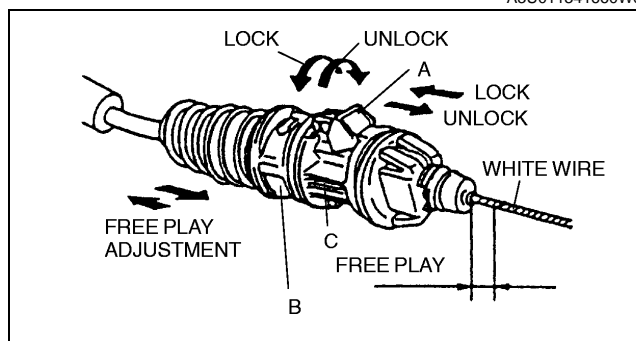
ACCELERATOR CABLE ADJUSTMENT [FS]

A3U011341660W03

1. Move the white locking tab A to the unlock position.
2. Turn stopper B to the unlock position.

Note

- If the stopper B will not be unlocked, it may be necessary to carefully bend the tab C out using a suitable tool.
3. To adjust the free play, push or pull the accelerator cable housing directly behind the spring.
 4. Turn the stopper B to the lock position.



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Free Play

1—3 mm {0.04—0.11 in}

5. Measure the throttle cable free play, making sure that it is within the specification.
6. Move the white locking tab A to the lock position.
7. Verify correct accelerator operation.