

01-16 EMISSION SYSTEM

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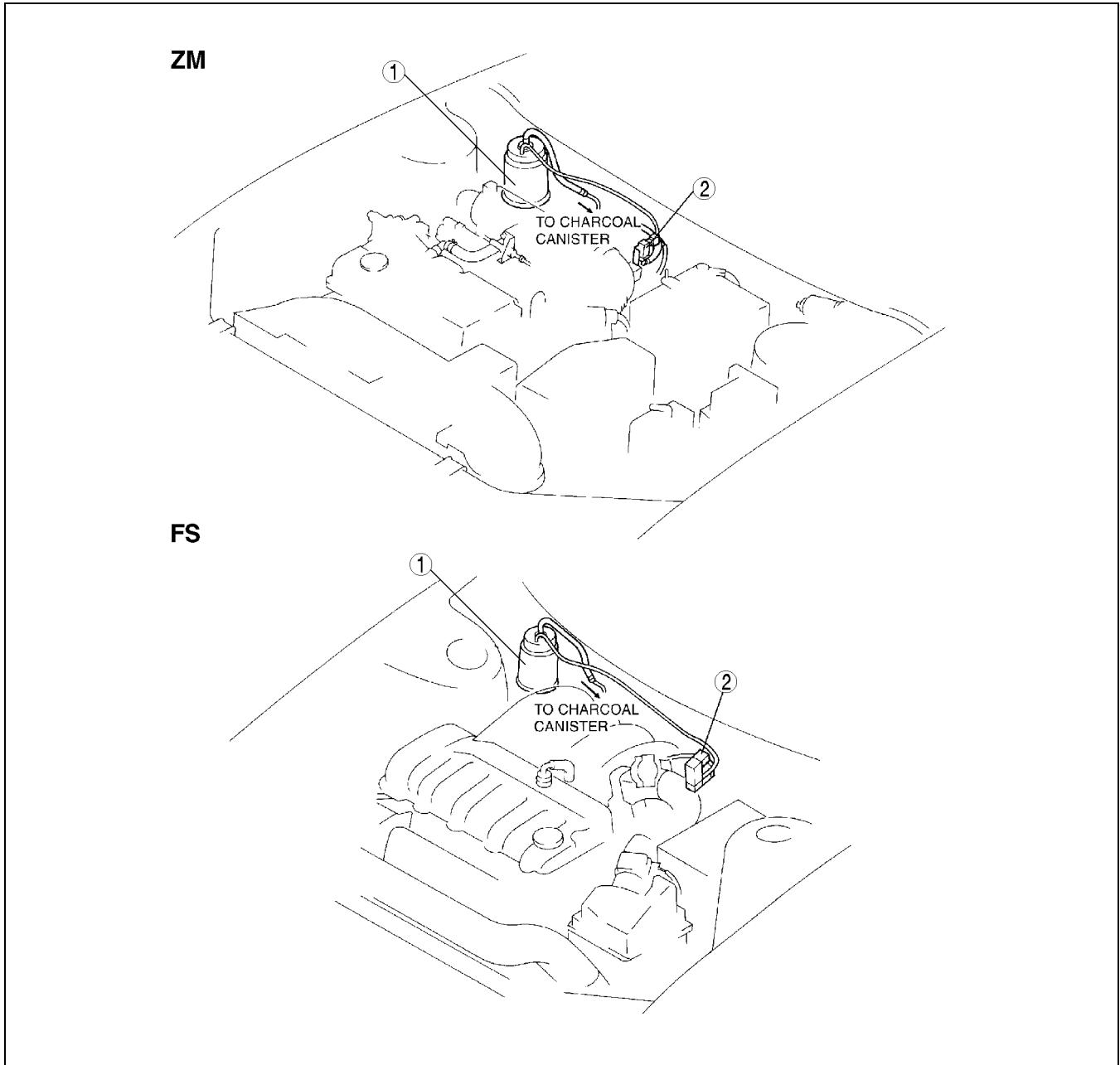
01-16

EMISSION SYSTEM

EMISSION SYSTEM LOCATION INDEX

A3U011601074W01

Evaporative Emission (EVAP) Control System Engine room side



Z3U0116W996

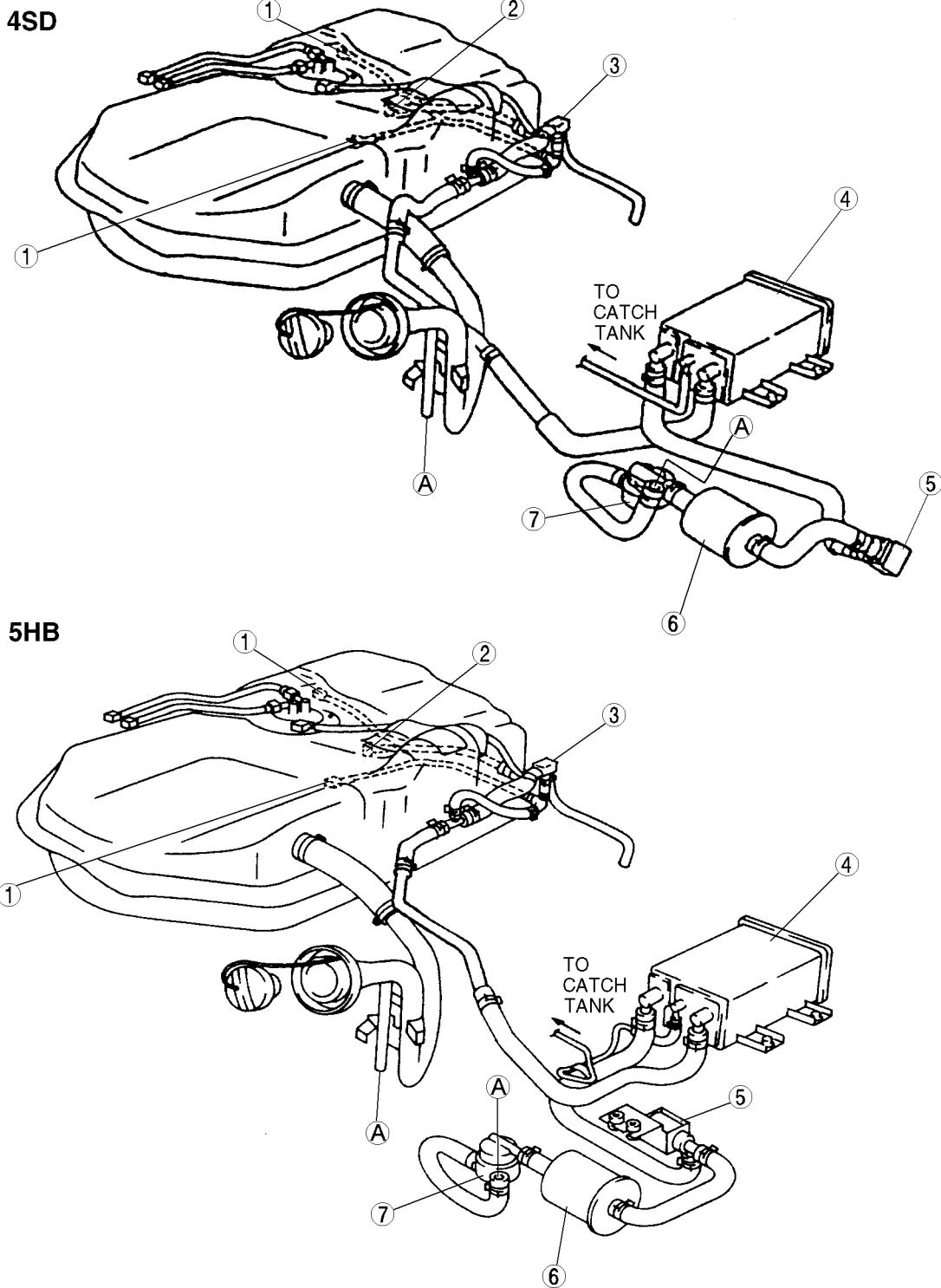
1	Catch tank (See 01-16-11 CATCH TANK INSPECTION)
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2	Purge solenoid valve (See 01-16-11 PURGE SOLENOID VALVE REMOVAL/INSTALLATION) (See 01-16-12 PURGE SOLENOID VALVE INSPECTION)
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EMISSION SYSTEM

Fuel tank

01-16



A3U0116W001

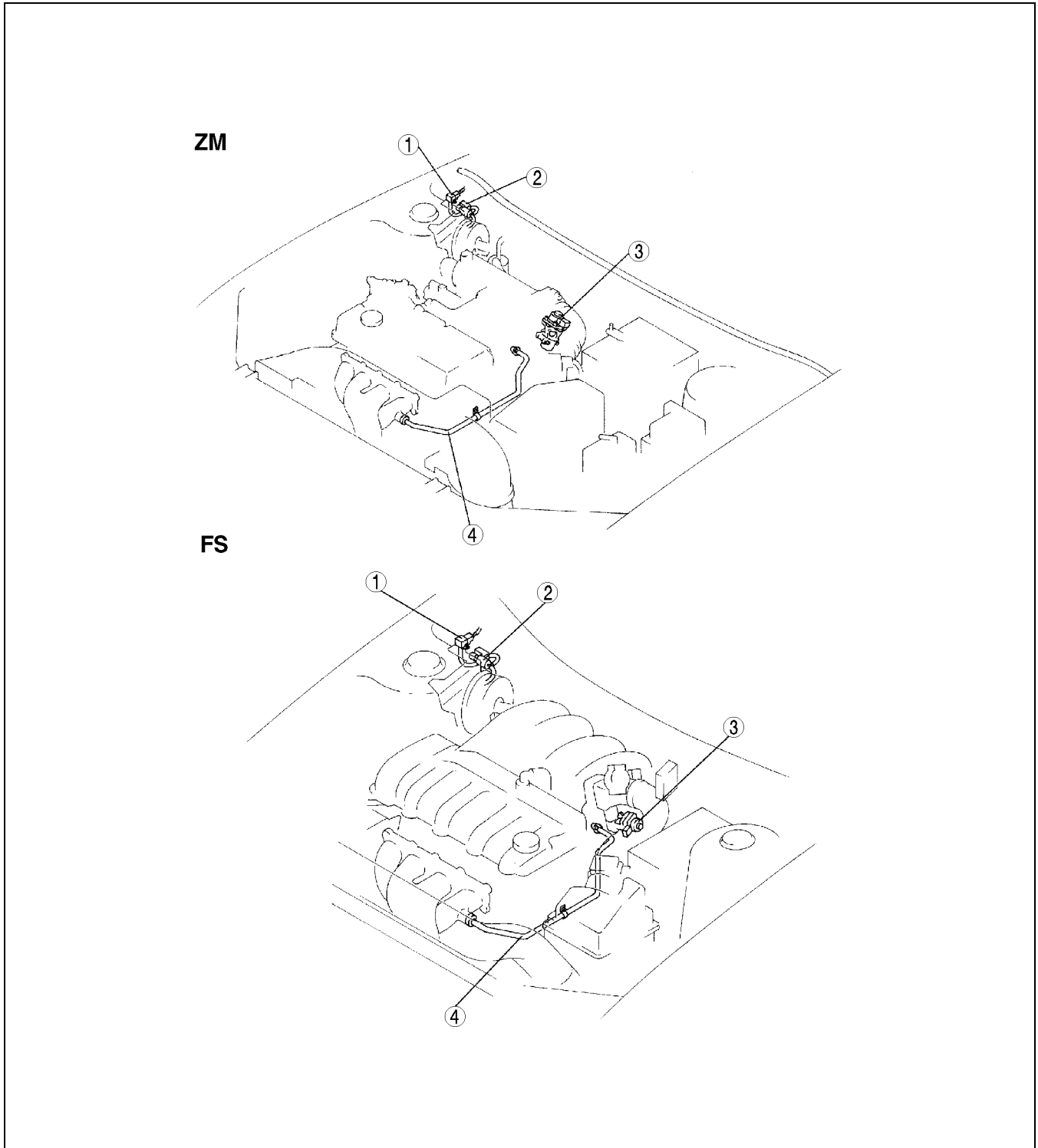
1	Rollover valve (See 01-14-13 FUEL TANK INSPECTION)
2	Fuel shut-off valve (See 01-14-13 FUEL TANK INSPECTION)
3	Fuel tank pressure sensor (See 01-40A-40 FUEL TANK PRESSURE SENSOR INSPECTION [ZM]) (See 01-40B-40 FUEL TANK PRESSURE SENSOR INSPECTION [FS])

4	Charcoal canister (See 01-16-9 CHARCOAL CANISTER INSPECTION)
5	Canister drain cut valve (CDCV) (See 01-16-10 CANISTER DRAIN CUT VALVE (CDCV) INSPECTION)
6	Air filter (See 01-16-9 AIR FILTER INSPECTION)

EMISSION SYSTEM

7	Evaporative gas check valve (two-way) (See 01-16-8 EVAPORATIVE GAS CHECK VALVE (TWO-WAY) INSPECTION)
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EGR System



Z3U0116W995

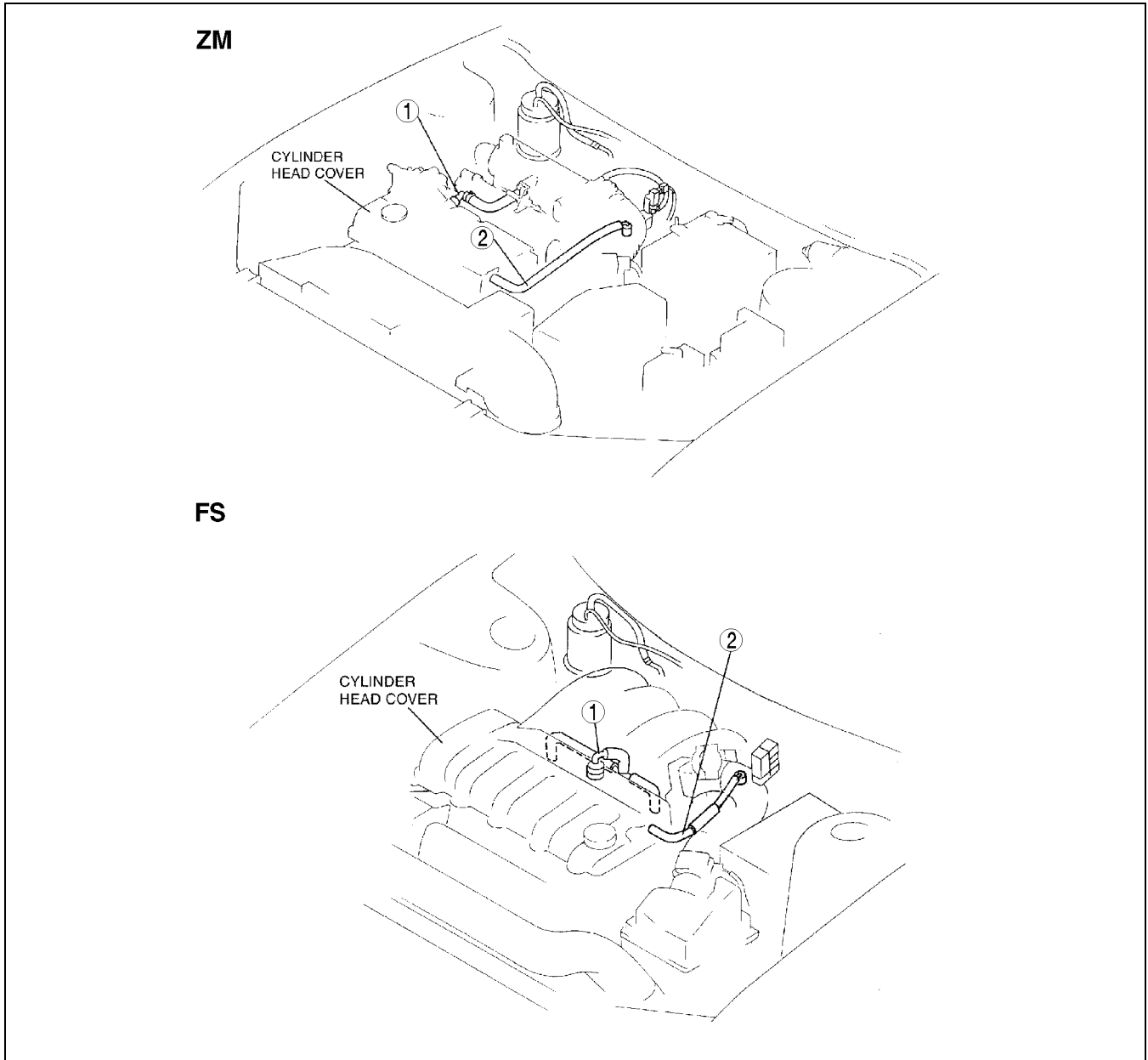
1	EGR boost sensor (See 01-40A-38 EGR BOOST SENSOR INSPECTION [ZM]) (See 01-40B-39 EGR BOOST SENSOR INSPECTION [FS])
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2	EGR boost sensor solenoid valve (See 01-16-17 EGR BOOST SENSOR SOLENOID VALVE INSPECTION)
3	EGR valve (See 01-16-15 EGR VALVE REMOVAL/ INSTALLATION) (See 01-16-15 EGR VALVE INSPECTION)

EMISSION SYSTEM

4	EGR pipe
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Positive Crankcase Ventilation (PCV) System



01-16

Z3U0116W994

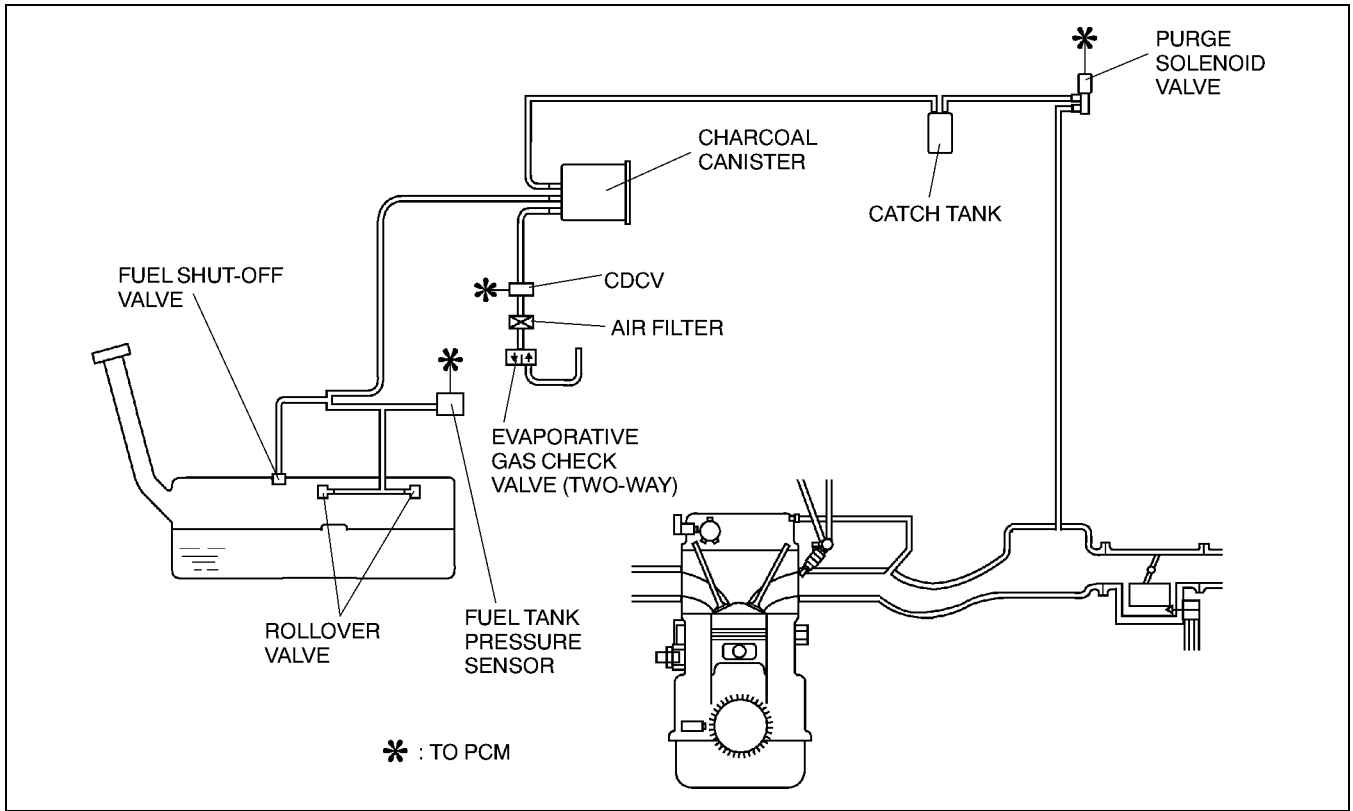
1	PCV valve (See 01-16-18 POSITIVE CRANKCASE VENTILATION (PCV) VALVE INSPECTION)
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2	Ventilation hose
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EMISSION SYSTEM

EVAPORATIVE EMISSION (EVAP) CONTROL SYSTEM DIAGRAM

A3U011601074W02



Z3U0116W002

EMISSION SYSTEM

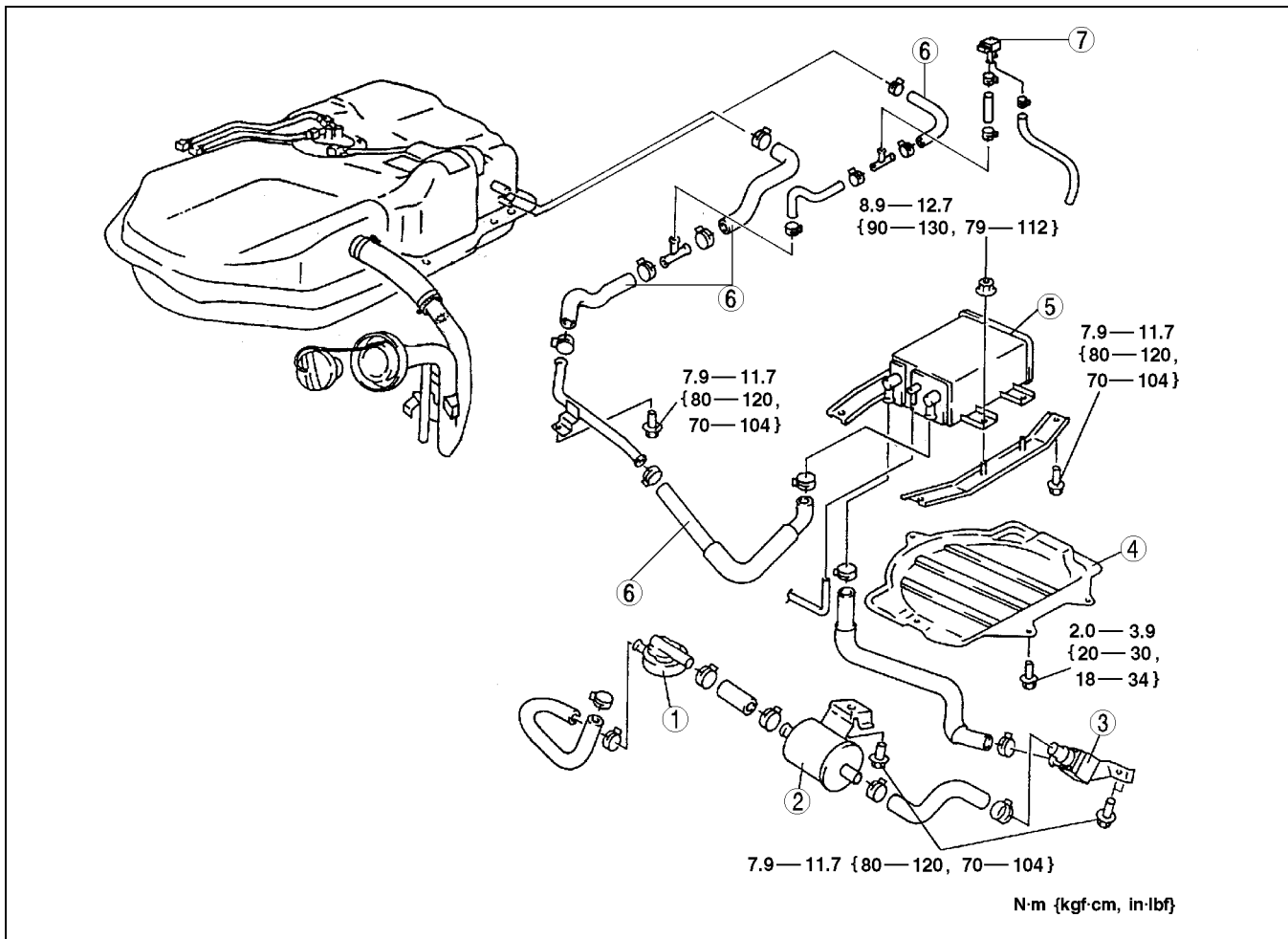
EVAPORATIVE EMISSION (EVAP) CONTROL SYSTEM (FUEL TANK SIDE) COMPONENT REMOVAL/INSTALLATION

A3U011601074W03

1. Raise the rear of the vehicle and support it with safety stands.
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.

4SD

01-16



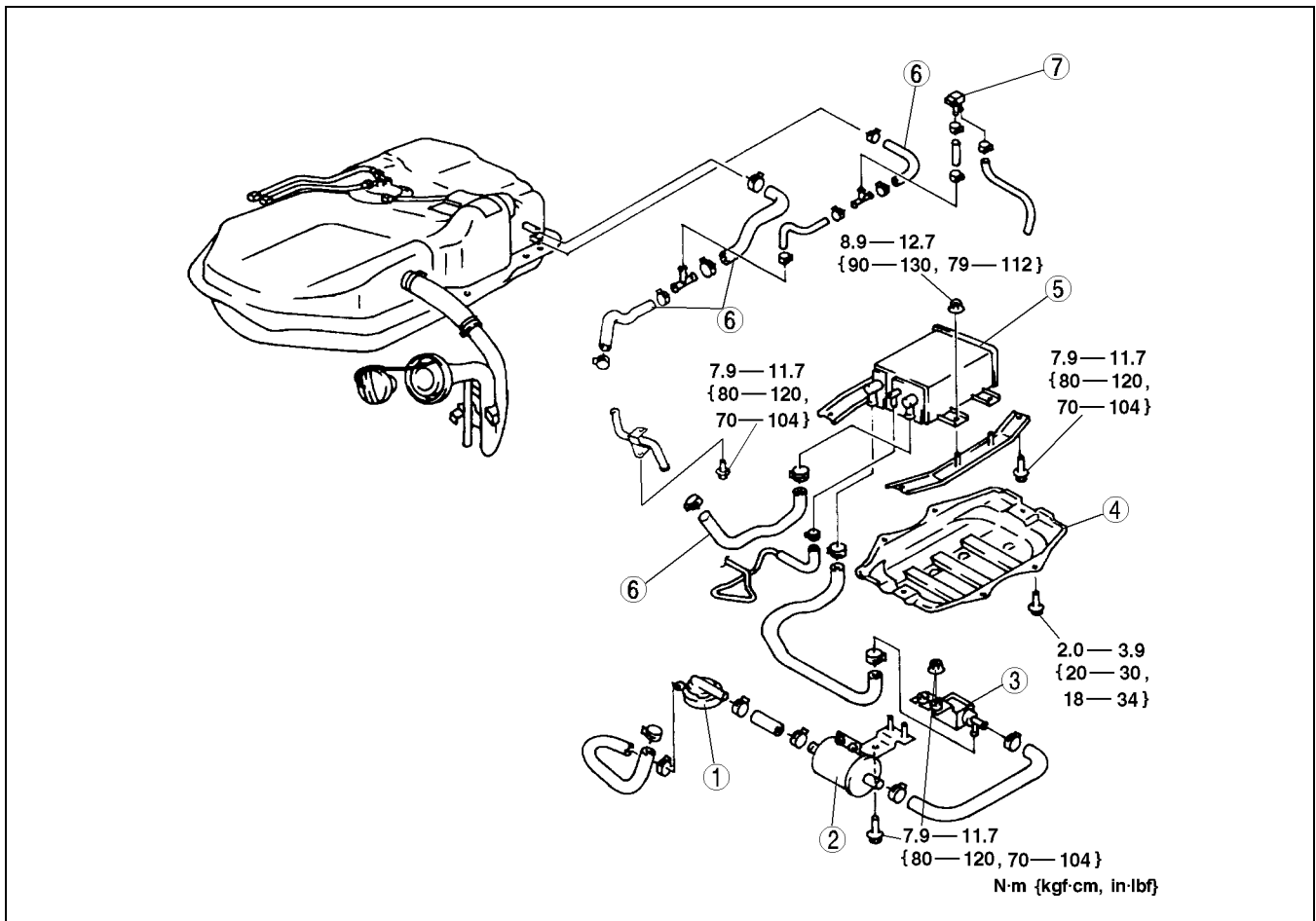
A3U0116W003

1	Evaporative gas check valve (two-way)
2	Air filter
3	CDCV
4	Charcoal canister insulator

5	Charcoal canister
6	Evaporative hose
7	Fuel tank pressure sensor

EMISSION SYSTEM

5HB



A3U0116W002

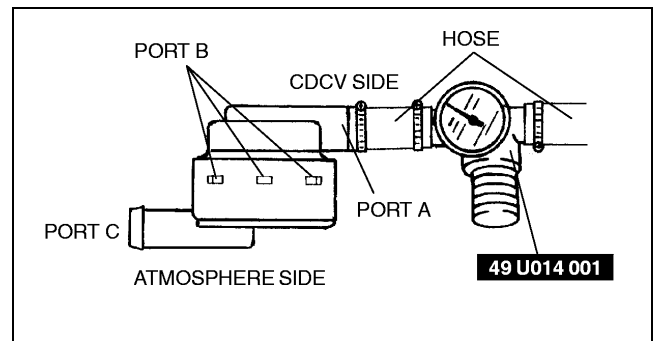
1	Evaporative gas check valve (two-way)
2	Air filter
3	CDCV
4	Charcoal canister insulator

5	Charcoal canister
6	Evaporative hose
7	Fuel tank pressure sensor

EVAPORATIVE GAS CHECK VALVE (TWO-WAY) INSPECTION

A3U011642914W01

1. Remove the check valve (two-way).
2. Attach an air hose to the **SST**.
3. Set the **SST** to port A as shown in the figure.
4. Verify that there is airflow from port B when pressure of **+0.99 kPa {+7.4 mmHg, +0.29 inHg}** is applied to port A.
 - If there is no airflow, replace the evaporative gas check valve (two-way).
5. Verify that there is airflow from port A when pressure of **+0.99 kPa {+7.4 mmHg, +0.29 inHg}** is applied to port C.
 - If there is no airflow, replace the evaporative gas check valve (two-way).



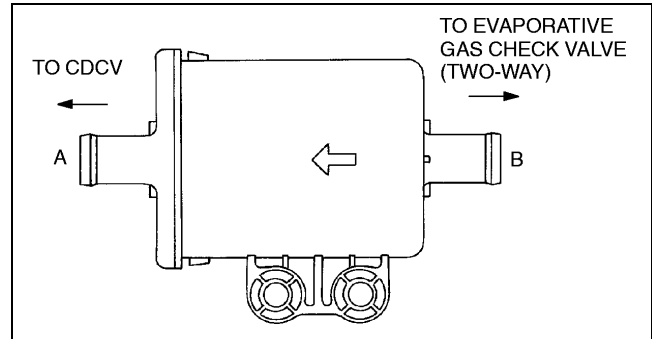
X3U116WB9

EMISSION SYSTEM

AIR FILTER INSPECTION

A3U011613988W01

1. Remove the air filter.
2. Blow from port A and verify that there is airflow from port B.
 - If not as specified, replace the air filter.
3. Blow from port B and verify that there is airflow from port A.
 - If not as specified, replace the air filter.



X3U116WA1

01-16

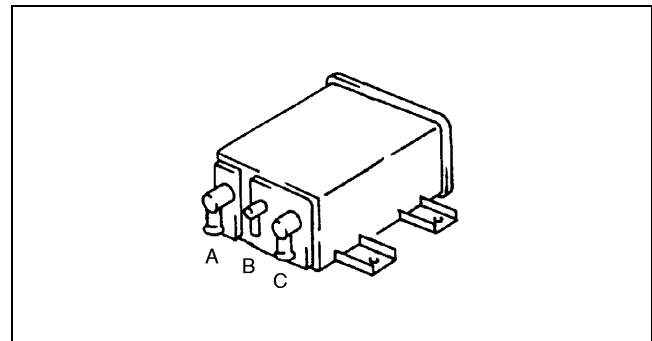
CHARCOAL CANISTER INSPECTION

A3U011613970W01

Caution

- Do not apply the pressure more than 20 kPa {0.2 kgf/cm², 2.8 psi} to the charcoal canister, or the charcoal canister will be damaged.

1. Remove the charcoal canister. (See 01-16-7 EVAPORATIVE EMISSION (EVAP) CONTROL SYSTEM (FUEL TANK SIDE) COMPONENT REMOVAL/INSTALLATION.)
2. Plug ports A and C, then blow air into port B.
3. Verify that there is no air leakage from the case.
 - If not as specified, replace the charcoal canister.



X3U116WA6

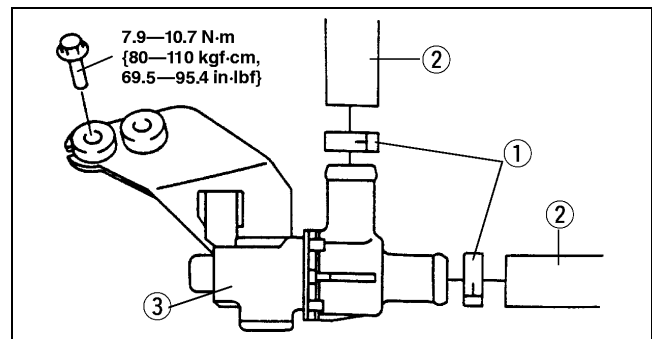
CANISTER DRAIN CUT VALVE (CDCV) REMOVAL/INSTALLATION

A3U011618743W01

1. Disconnect the negative battery cable.
2. Raise the rear of the vehicle and support it with safety stands.
3. Remove in the order indicated in the table.

1	Clamp
2	Evaporative hose (See 01-16-9 Evaporative Hose Installation Note)
3	CDCV

4. Install in the reverse order of removal.



Y3U116WA0

Evaporative Hose Installation Note

1. Install the evaporative hose until it contacts the stopper.

EMISSION SYSTEM

CANISTER DRAIN CUT VALVE (CDCV) INSPECTION

A3U011618743W02

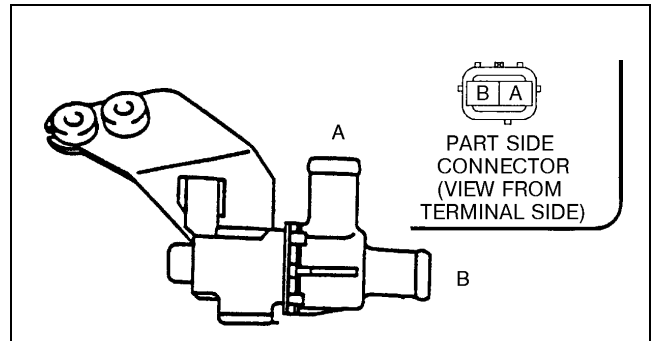
Simulation Test

1. Carry out the "Evaporative Emission Control System Inspection". (See 01-03A-56 Evaporative System Leak Inspection Using Vacuum Pump.) (See 01-03B-55 Evaporative System Leak Inspection Using Vacuum Pump.)
 - If not as specified, perform the following inspection for the CDCV.

Airflow Inspection

Note

- Perform the following test only when directed.
1. Disconnect the negative battery cable.
 2. Remove the CDCV. (See 01-16-9 CANISTER DRAIN CUT VALVE (CDCV) REMOVAL/INSTALLATION.)
 3. Inspect airflow between the ports under the following conditions.
 - If not as specified, replace the CDCV.
 - If as specified but the "Simulation Test" is failed, inspect evaporative hoses for improper routing, kinks or leakage, and carry out the "Circuit Open/Short Inspection" and repair or replace the parts if necessary.



Y3U116WA1

○—○ : Continuity ○—○ : Airflow

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

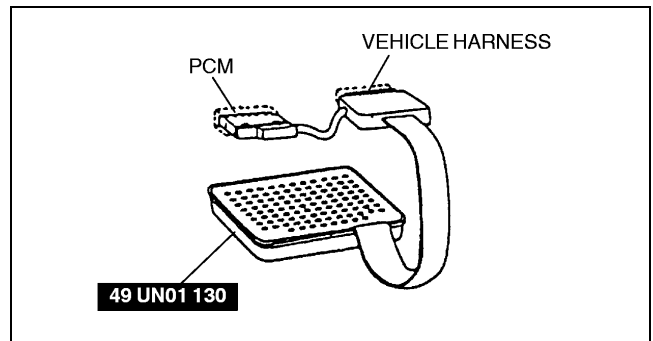
X3U116WCA

Circuit Open/Short Inspection

1. Remove the PCM.
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}



Y3U116WAG

EMISSION SYSTEM

- 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

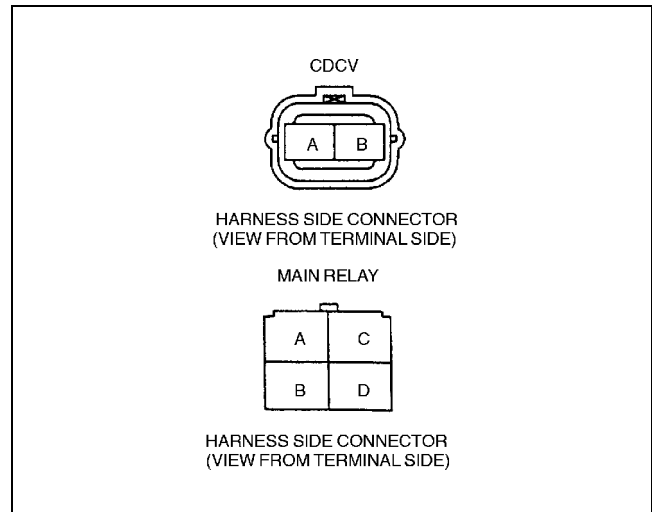
- GND circuit (CDCV connector terminal B and PCM connector terminal 18 through common connector)
- Power circuit (CDCV connector terminal A and main relay connector terminal D)

Short circuit

- GND circuit (CDCV connector terminal B and PCM connector terminal 18 through common connector to GND)
- Power circuit (CDCV connector terminal A and main relay connector terminal D to GND)

- Install the CDCV.

- Connect the negative battery cable.



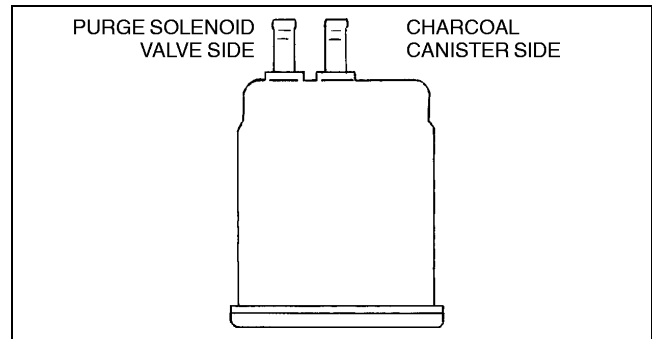
Z3U0116W997

01-16

CATCH TANK INSPECTION

- Remove the catch tank.
- Plug the purge solenoid valve side port of the catch tank.
- Blow from the charcoal canister side port and verify that there is no air leakage from the case.
 - If not as specified, replace the catch tank.

A3U011613978W01



X3U116WB0

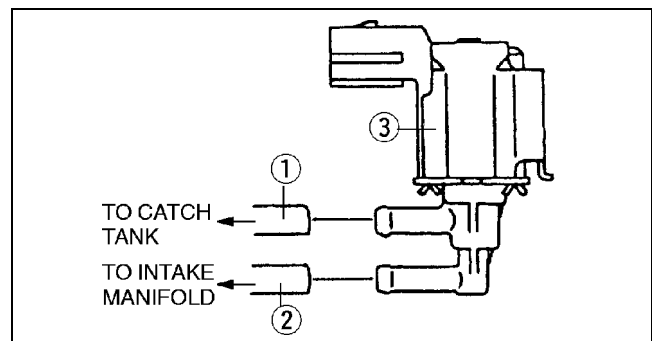
PURGE SOLENOID VALVE REMOVAL/INSTALLATION

- Disconnect the negative battery cable.
- Remove in the order indicated in the table.

1	Evaporative hose (See 01-16-11 Evaporative Hose Installation Note)
2	Vacuum hose (See 01-16-11 Vacuum Hose Installation Note)
3	Purge solenoid valve

A3U011618740W01

- Install in the reverse order of removal.



Z3U0116W993

Vacuum Hose Installation Note

- Install the vacuum hose until it contacts the stopper.

Evaporative Hose Installation Note

- Attach the evaporative hose until it contacts the stopper.

EMISSION SYSTEM

PURGE SOLENOID VALVE INSPECTION

A3U011618740W02

Airflow Inspection

Note

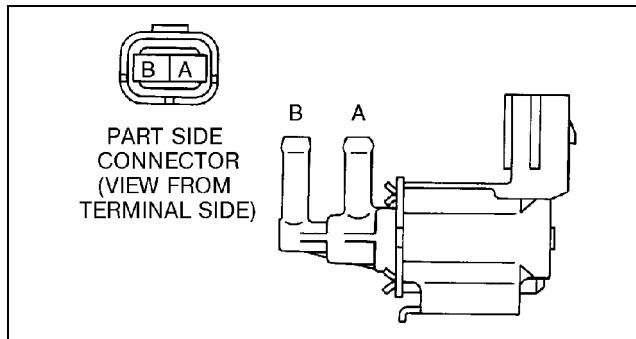
- Perform the following test only when directed.

1. Remove the purge solenoid valve. (See 01–16–11 PURGE SOLENOID VALVE REMOVAL/ INSTALLATION.)
2. Inspect airflow between the ports under the following conditions.
 - If not as specified, replace the purge solenoid valve.
 - If as specified, inspect the vacuum hoses for improper routing, kinks or leakage, and carry out the "Circuit Open/Short Inspection" and repair or replace the parts if necessary.

○—○ : Continuity ○—○ : Airflow

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

X3U116WC1



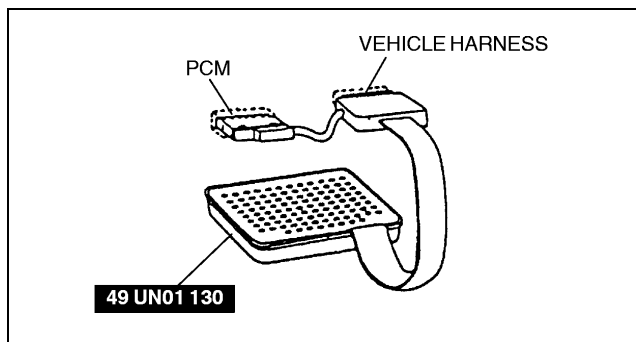
Z3U0116W992

Circuit Open/Short Inspection

1. Remove the PCM.
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}

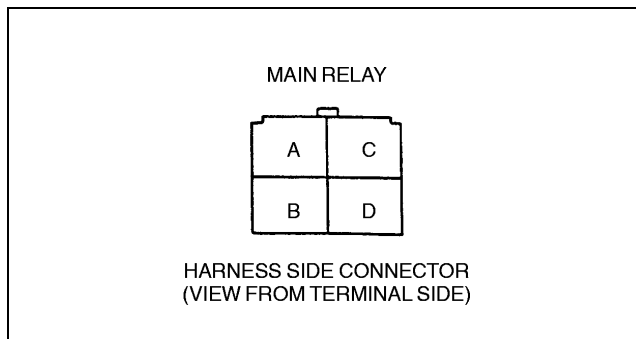


Y3U116WAJ

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 (purge solenoid valve connector terminal A and main relay connector terminal D through common connector)
- Control circuit (purge solenoid valve connector terminal B and PCM connector terminal 67 through common connector)



X3U116WC0

Short circuit

- Power circuit (purge solenoid valve connector terminal A and main relay connector terminal D through common connector to GND)
 - Control circuit (purge solenoid valve connector terminal B and PCM connector terminal 67 through common connector to GND)
5. Install the purge solenoid valve.
 6. Connect the negative battery cable.

FUEL-FILLER CAP INSPECTION

A3U011642250W01

01-16

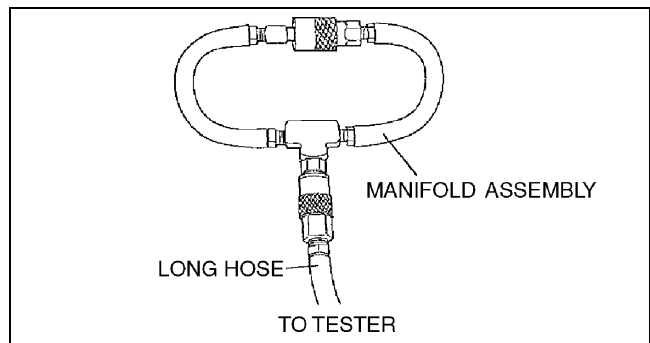
leakage inspection

1. Perform the following **SST** (Evaporative Emission System Tester MZ254AT3641) self-test.

Note

- If the tester does not work correctly during self-test, see the tester operators manual for more detailed procedures.

- (1) Verify the gas cylinder valve is closed and the control valve located on the tester is in the TEST position. All tester display should be off at this time.
- (2) Connect the long hose (part of **SST**) to the tester.
- (3) Connect the manifold assembly (part of **SST**) to the long hose as shown.
- (4) Open the gas cylinder valve and verify the gas cylinder regulator left gauge reads **10 to 12 psi** (preset at factory).
 - If not, see the tester operators manual to contact tester manufacturer.
- (5) Press the ON/OFF switch to turn on the **SST** and make sure the left display reads 0.0.
- (6) Turn the control valve on the tester to the FILL position.
- (7) Verify the left display reading is **within 13.9 to 14.0 inches** of water.
 - If not, adjust the pressure using the regulator knob located on the right side of the tester.
- (8) Turn the control valve to TEST position and press the START switch.
- (9) After the **2-minute** countdown (left display) is completed, the right display shows the total pressure loss for that period. A **0.5 inch** of water loss is acceptable on the self-test.
 - If the loss is **more than 0.5 inch** of water, perform one or more self-test. If the failed test repeats, check for leak using the ultrasonic leak detector (part of **SST**).



YMU116WZ1

2. Press the RESET switch to set the left display reading to 0.0.
3. Connect the fuel cap receiver assembly (part of **SST**) to the manifold assembly and fuel-filler cap from the vehicle.

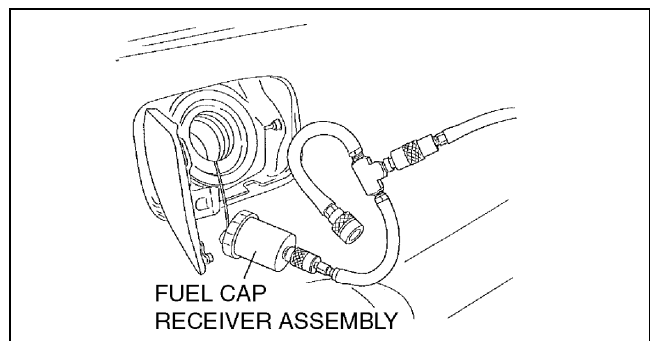
- If the fuel-filler cap is not a genuine part, replace it.

4. Turn the control valve to the FILL position.
5. Wait (**maximum 20 s**) until the left display reads **13.9 to 14 inches** of water.
 - If the reading is slightly below, adjust it using the regulator knob.
 - If the reading is far below, the fuel-filler cap has leak. Replace it.
6. Turn the control valve to the TEST position and press the START switch.
7. After the **2-minute** countdown (left display) is completed, check the test result (the failed/ passed light on the tester).

- If the green light turns on, the fuel-filler cap is OK.

- If the red light turns on, the fuel-filler cap has leakage. Replace it.

8. Close the gas cylinder valve.
9. Turn the control valve to the FILL position.
10. Press the ON/OFF switch to turn off the tester.



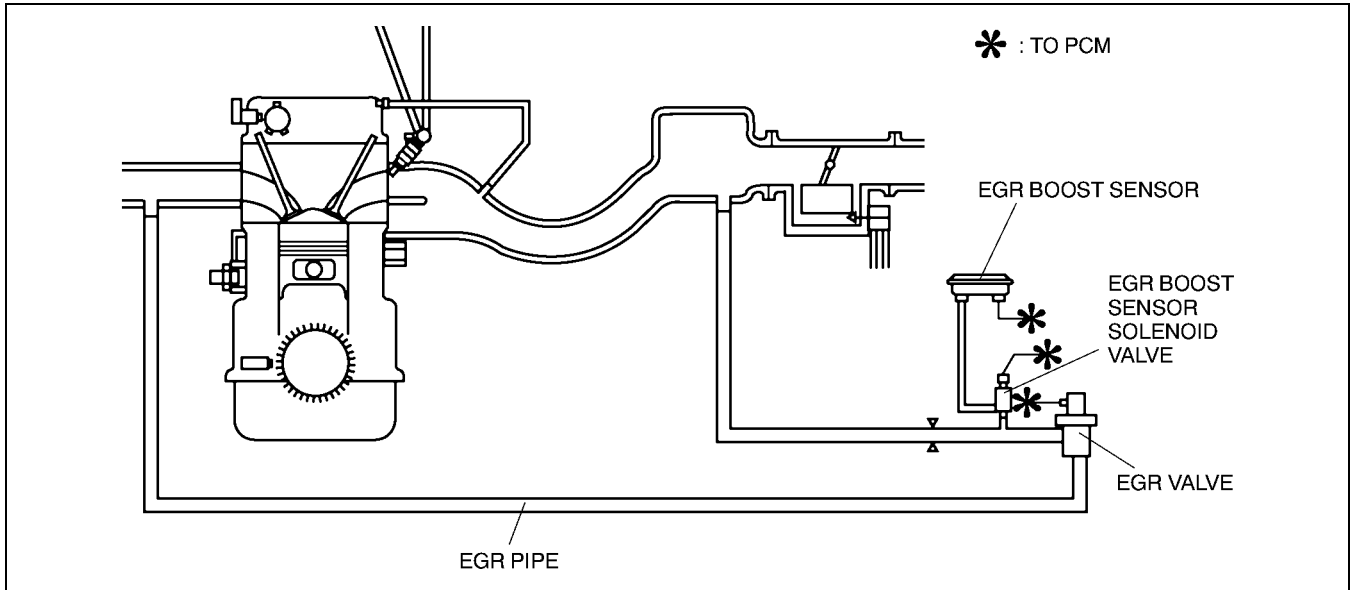
YMU116WZ2

EMISSION SYSTEM

EGR SYSTEM DIAGRAM

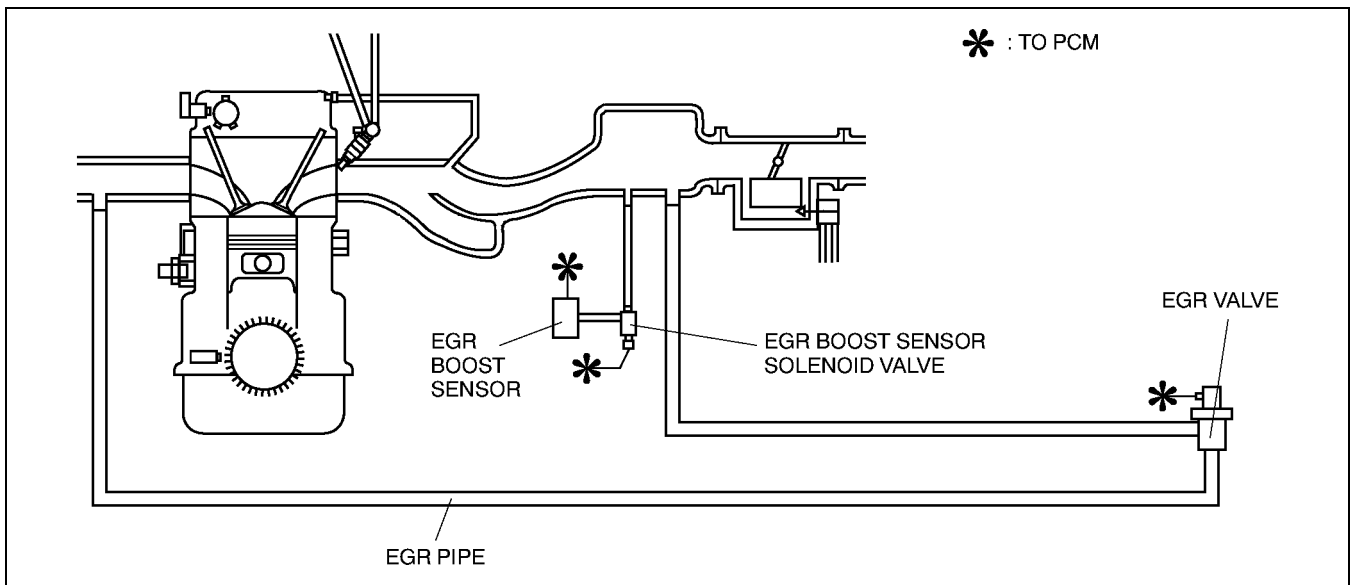
A3U01162000W01

ZM



Z3U0116W004

FS



Z3U0116W005

EMISSION SYSTEM

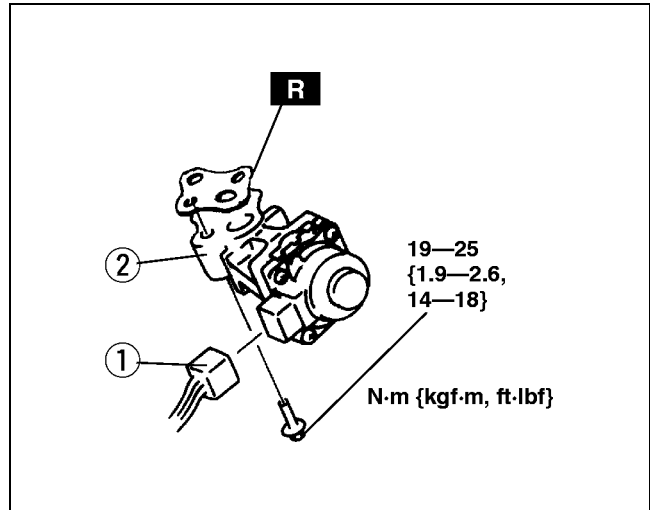
EGR VALVE REMOVAL/INSTALLATION

A3U011620300W01

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

1	EGR valve connector
2	EGR valve

4. Connect the negative battery cable.



Z3U0116W007

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EGR VALVE INSPECTION

Resistance Inspection

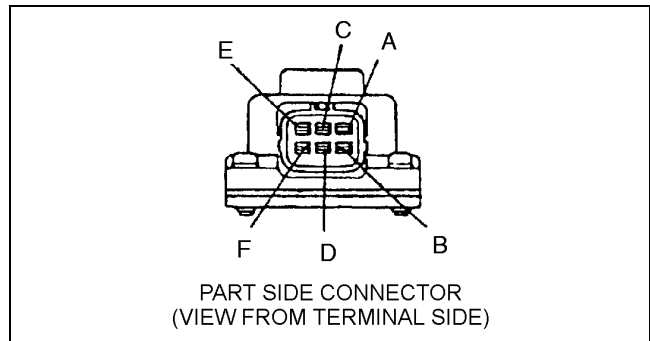
A3U011620300W02

Note

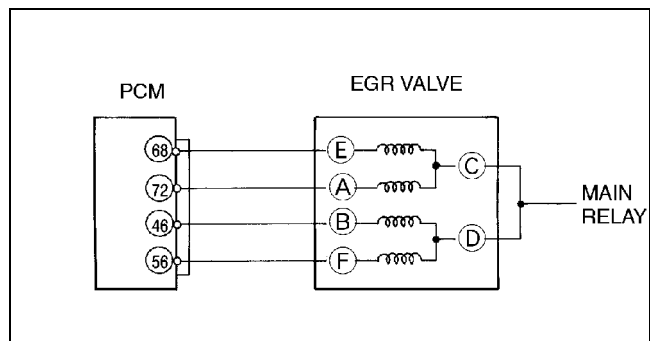
- Perform the following test only when directed.

1. Disconnect the negative battery cable.
2. Inspect resistance of the EGR valve coils.
 - If not as specified, replace the EGR valve.
 - If as specified, inspect the vacuum hoses for improper routing, kinks or leakage, and carry out the "Circuit Open/Short Inspection" and repair or replace the parts if necessary.

Terminals	Resistance (ohm)
C—E	20—24
C—A	
D—B	
D—F	



Y3U116WA8



X3U116WB4

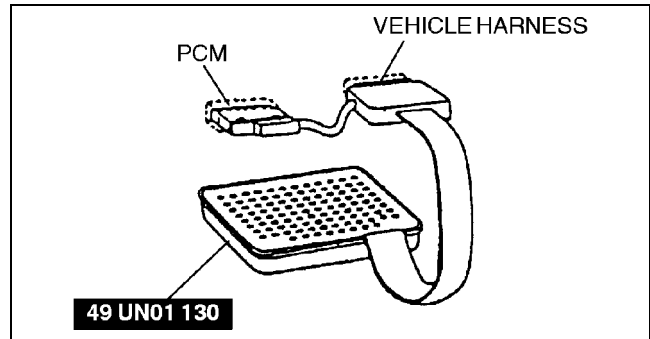
EMISSION SYSTEM

Circuit Open/Short Inspection

1. Remove the PCM.
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}



Y3U116WAK

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.

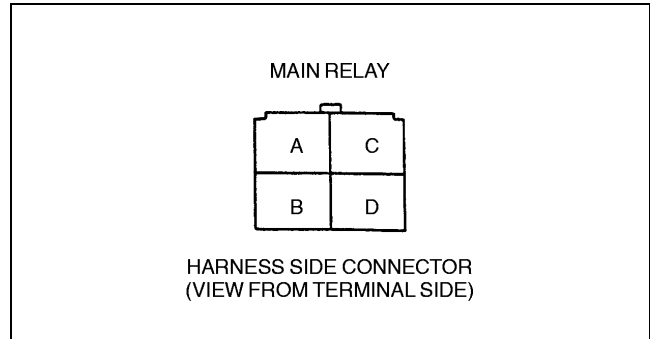
Open circuit

- Control circuit (EGR valve connector terminal E and PCM connector terminal 68)
- Control circuit (EGR valve connector terminal A and PCM connector terminal 72)
- Control circuit (EGR valve connector terminal B and PCM connector terminal 46)
- Control circuit (EGR valve connector terminal F and PCM connector terminal 56)
- Power circuit (EGR valve connector terminal C or D and main relay connector terminal D through common connector)

Short circuit

- Control circuit (EGR valve connector terminal E and PCM connector terminal 68 to GND)
- Control circuit (EGR valve connector terminal A and PCM connector terminal 72 to GND)
- Control circuit (EGR valve connector terminal B and PCM connector terminal 46 to GND)
- Control circuit (EGR valve connector terminal F and PCM connector terminal 56 to GND)
- Power circuit (EGR valve connector terminal C or D and main relay connector terminal D through common connector to GND)

5. Remove the EGR valve, and inspect for any damage or clogging. Replace the EGR valve if not as specified.
6. Connect the negative battery cable.



X3U116WB5

EGR BOOST SENSOR SOLENOID VALVE INSPECTION

A3U011618744W01

Airflow Inspection

Note

- Perform the following test only when directed.

- Disconnect the negative battery cable.
- Remove the EGR boost sensor solenoid valve.
- Inspect airflow between each port under the following conditions.
 - If not as specified, replace the EGR boost sensor solenoid valve.
 - If as specified, inspect the vacuum hoses for improper routing, kinks or leakage, and carry out the "Circuit Open/Short Inspection" and repair or replace the parts if necessary.

○—○ : Continuity ○=○ : Airflow

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

X3U116WCB

- Connect the negative battery cable.

Circuit Open/Short Inspection

- Remove the PCM.
- 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.

Open circuit

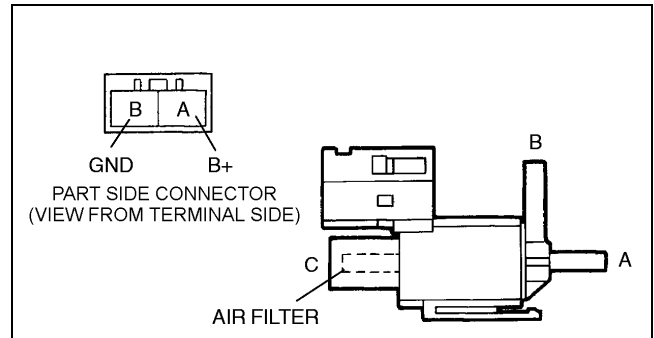
- Power circuit (EGR boost sensor solenoid valve connector terminal A and main relay connector terminal D through common connector)
- Control circuit (EGR boost sensor solenoid valve connector terminal B and PCM connector terminal 98)

Short circuit

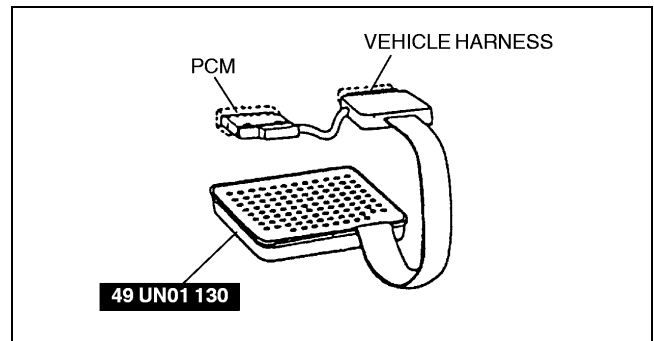
- Power circuit (EGR boost sensor solenoid valve connector terminal A and main relay connector terminal D through common connector to GND)
- Control circuit (EGR boost sensor solenoid valve connector terminal B and PCM connector terminal 98 to GND)

- Install the EGR boost sensor solenoid valve.
- Connect the negative battery cable.

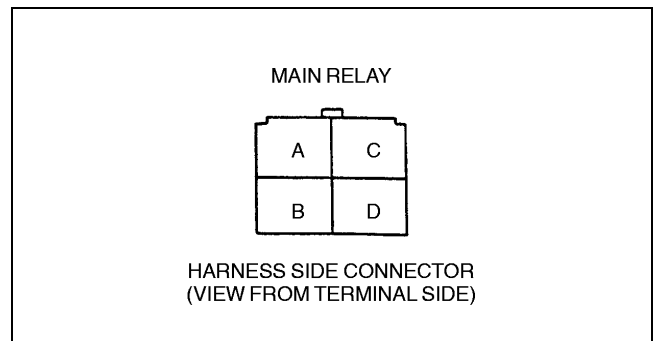
01-16



Y3U116WA3



Y3U116WAH

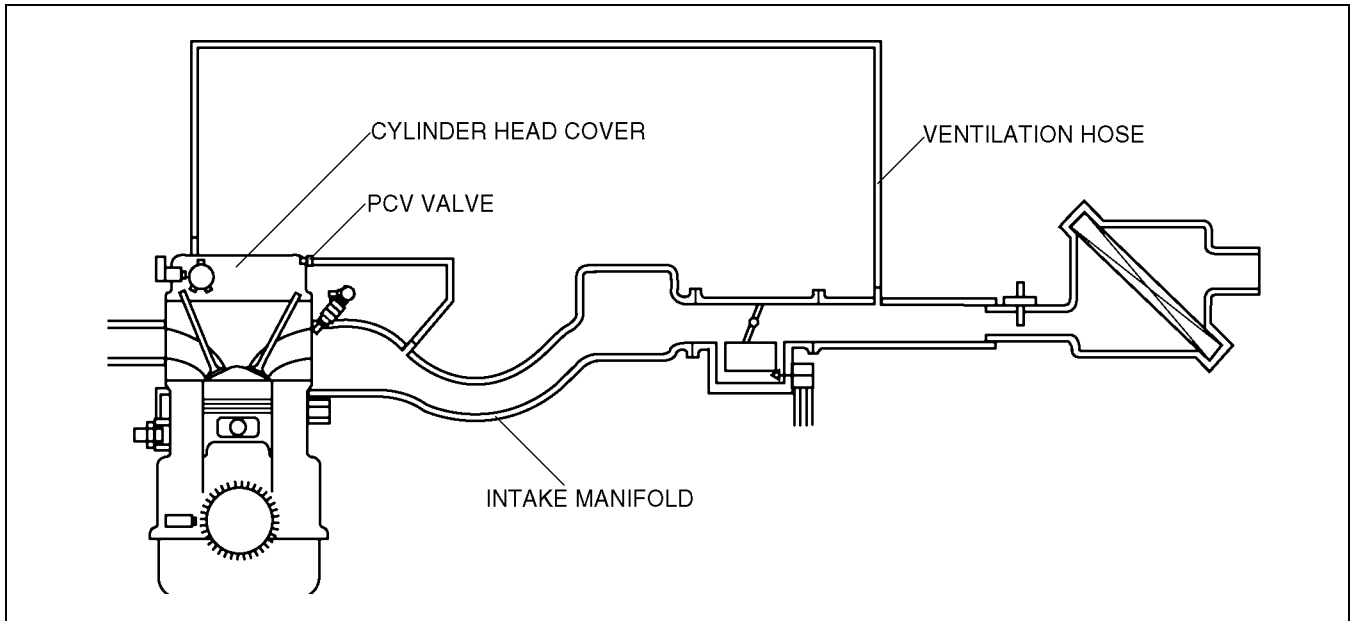


X3U116WB7

EMISSION SYSTEM

POSITIVE CRANKCASE VENTILATION (PCV) SYSTEM FLOW DIAGRAM

A3U011613890W01



Z3U0116W006

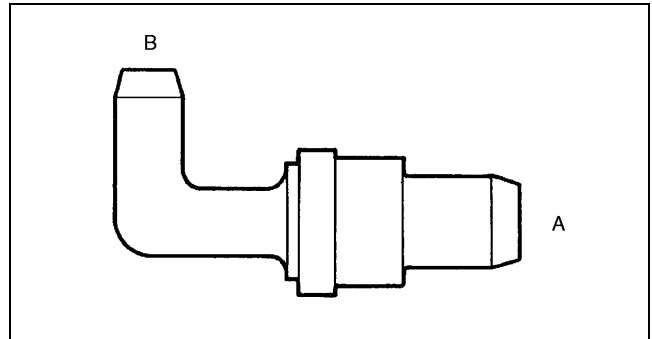
POSITIVE CRANKCASE VENTILATION (PCV) VALVE INSPECTION

A3U011613890W02

1. Remove the PCV valve.
2. Blow through the valve and verify that air flows as specified.
 - If not as specified, replace the PCV valve.

Specification

Condition	Airflow
Air applied from port A	Yes
Air applied from port B	No



X3U116WB8

EMISSION SYSTEM

WARM UP THREE-WAY CATALYTIC CONVERTER (WU-TWC) INSPECTION

A3U011620505W01

Note

- Make sure that no HO2S DTC has been detected. If detected, this inspection cannot be used for WU-TWC inspection.

1. Connect the WDS or equivalent and monitor PIDs as following.
 - Monitor the WU-TWC using O2S11 PID for upstream HO2S and O2S12 PID for downstream HO2S.
2. Begin to monitor the appropriate PIDs.
3. Drive the vehicle for **10 min** at **65—96 km/h {40—60 mph}** to ensure the WU-TWC reaches operating temperature.
4. Stop the vehicle and leave in a safe place.
5. Let the engine at idle.
6. Record PIDs for **1 min**.
7. Select the appropriate PIDs and read the graph.
8. Count the number of times (inversions) that the upstream HO2S graph line actually crosses the **0.5 V** line.
9. Count the number of times (inversions) that the downstream HO2S graph line actually crosses the **0.5 V** line.

Note

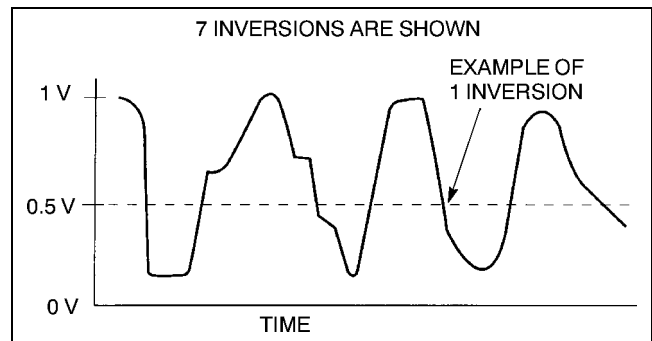
- Do not count the number of peaks. Refer to the illustration.

10. Using the following equation, calculate the value of ratio.

Equation

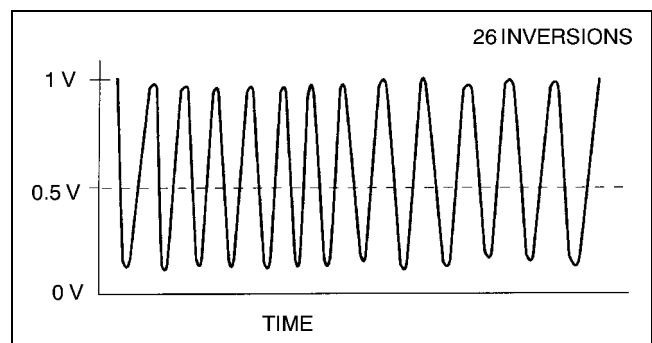
$$\text{RATIO} = \text{Upstream HO2S inversion} + \text{downstream HO2S inversion}$$

- If the ratio is **2** or more or no downstream HO2S inversion, the WU-TWC is functioning properly.
- If the ratio is less than **2**, the WU-TWC is not functioning properly. Replace the WU-TWC.



Z3U0116W011

Upstream HO2S graphline example



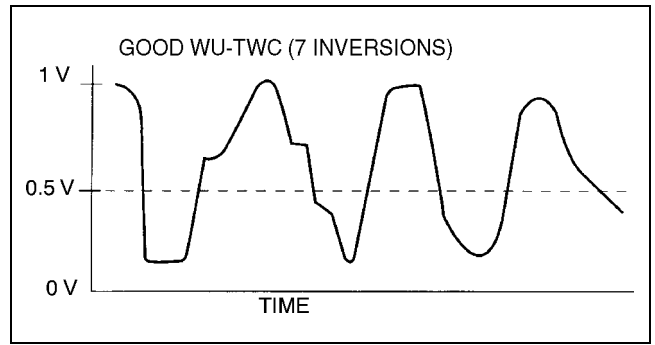
Y3U116WAA

EMISSION SYSTEM

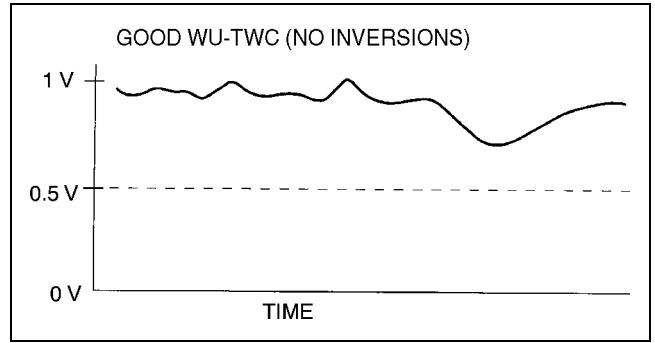
Downstream HO2S graphline example 1

Equation

$\text{RATIO} = 26 \text{ inversions (upstream HO2S inversions)} + 7 \text{ inversions (downstream HO2S inversions)} = 3.7 \text{ (good WU-TWC)}$



Downstream HO2S graphline example 2



Downstream HO2S graphline example 3

Equation

$\text{RATIO} = 26 \text{ inversions (upper stream HO2S inversions)} \div 19 \text{ inversions (downstream HO2S inversions)} = 1.4 \text{ (deteriorated WU-TWC)}$

