

EXHAUST GAS RECIRCULATION (EGR) SYSTEM

GENERAL INFORMATION (EXHAUST GAS RECIRCULATION SYSTEM) <CALIFORNIA>

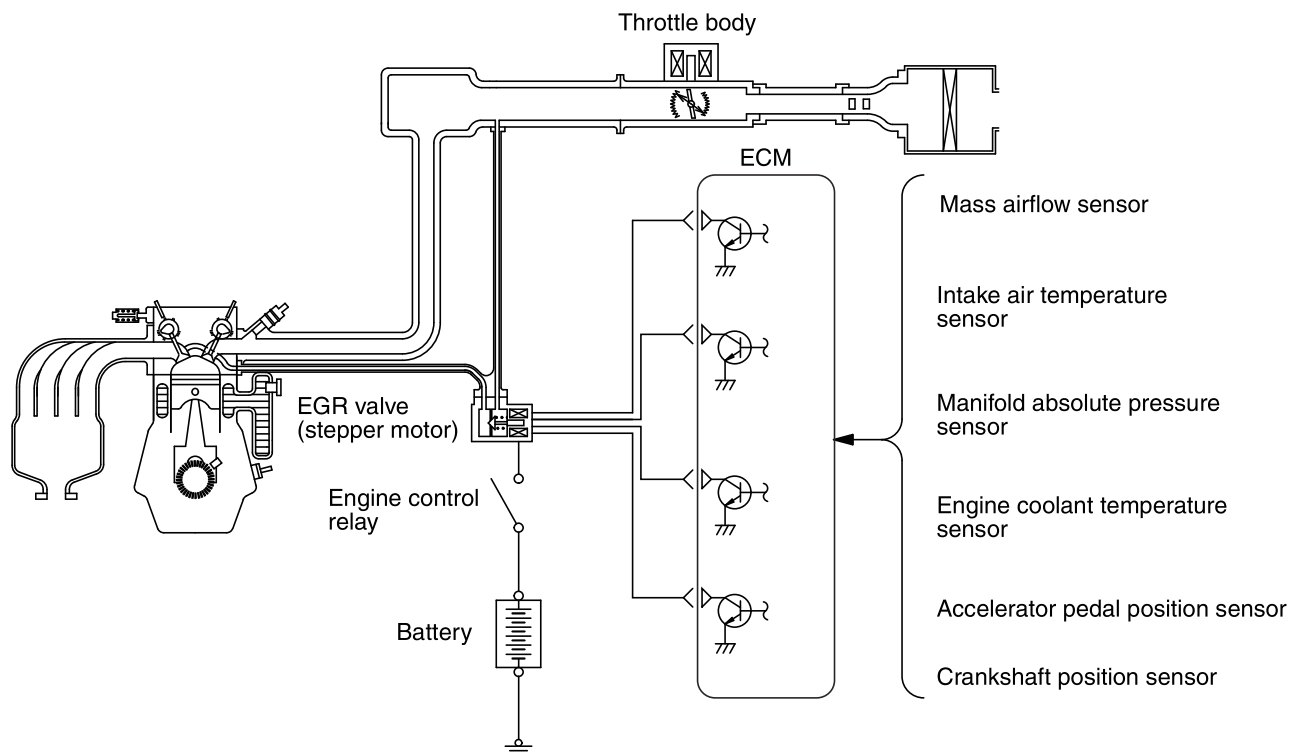
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The exhaust gas recirculation system (EGR) lowers the nitrogen oxides (NOx) emission level. When the air/fuel mixture combustion temperature is high, a large quantity of NOx is generated in the combustion chamber. Therefore, this system recirculates part of exhaust gas from the exhaust port of the cylinder head to the combustion chamber through the intake manifold to decrease the air/fuel mixture combustion temperature, resulting in reduction of NOx. The EGR flow rate is controlled by the EGR valve (Stepper Motor) for driveability quality.

OPERATION

When the engine coolant temperature is low, when the engine is at idle or when a wide open throttle operation is performed, the EGR valve (Stepper Motor) is kept closed, achieving no EGR. After warming up the engine, the EGR valve (Stepper Motor) can be opened by the engine control module (ECM). The ECM monitors the EGR system and illuminates the Malfunction Indicator Lamp (SERVICE ENGINE SOON or Check Engine Lamp) to indicate that there is a malfunction.

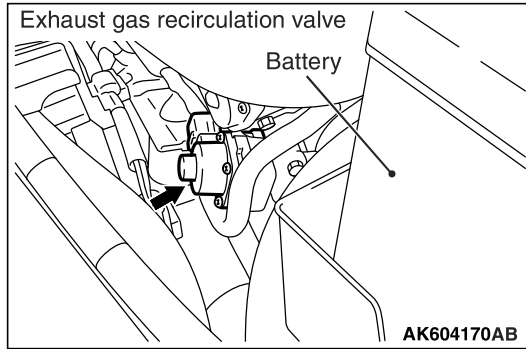
SYSTEM DIAGRAM



AK604169 AB

COMPONENT LOCATION

M1173007600570



EGR VALVE (STEPPER MOTOR) CHECK

M1173050200424

Required Special Tool:

MB991658: Test Harness Set

Checking the Operation Sound

1. Check that the operation sound of the stepper motor can be heard from the EGR valve when the ignition switch is turned ON (without starting the engine).
2. If the operation sound cannot be heard, inspect the drive circuit of the stepper motor.

NOTE: If the operation sound is not heard, and the circuit is normal, either the stepper motor or the ECM may have failed.

Checking the Coil Resistance

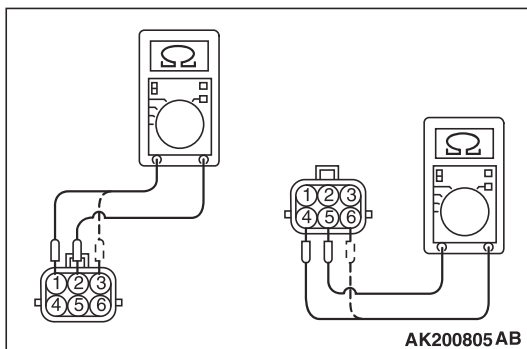
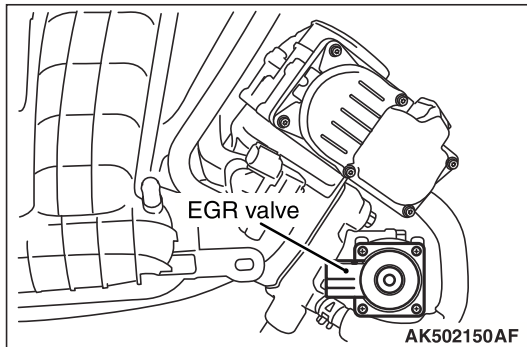
1. Remove the EGR valve.
2. Measure the resistance between terminal No. 2 and either terminal No. 1 or terminal No. 3 of the connector at the EGR valve.

Standard value: 20 –24 Ω [at 20° C (68° F)]

3. If the resistance is not within the standard, replace the EGR valve.
4. Measure the resistance between terminal No. 5 and either terminal No. 6 or terminal No. 4 of the connector at the EGR valve.

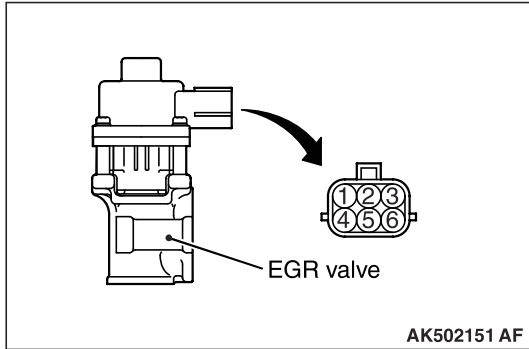
Standard value: 20 –24 Ω [at 20° C (68° F)]

5. If the resistance is not within the standard, replace the EGR valve.

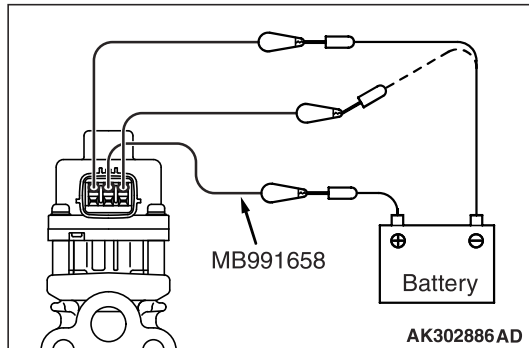


Operation Check

1. Remove the EGR valve.



2. Connect special tool MB991658 to the EGR valve.



3. Connect the battery positive (+) terminal to terminal No. 2.

⚠ CAUTION

Connecting battery voltage to the EGR valve for a long time could damage the coil.

4. Connect terminals 1 and 3 to the negative (-) terminal of the battery, in order to test whether the stepper motor vibrates (with a slight shudder), indicating that the stepper motor is operating.

5. Connect the battery positive (+) terminal to terminal No. 5.

⚠ CAUTION

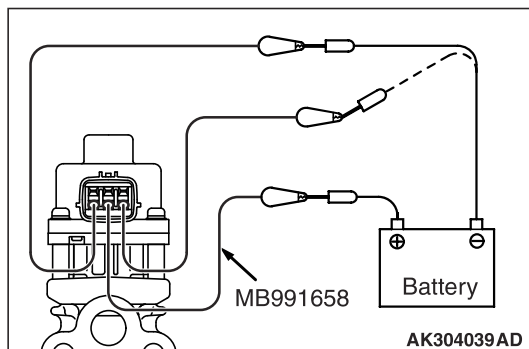
Connecting battery voltage to the EGR valve for a long time could damage the coil.

6. Connect terminals 4 and 6 to the negative (-) terminal of the battery, in order to test whether the stepper motor vibrates (with a slight shudder), indicating that the stepper motor is operating.

7. If vibrations can be felt as a result of the test, the stepper motor is determined to be normal.

8. Using a new gasket, install the EGR valve by tightening its mounting bolts to the specified torque.

Tightening torque: 24 ± 3 N·m (212 ± 27 in·lb)



EGR VALVE (STEPPER MOTOR) CLEANING

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NOTE: DO not use solvents or other cleaning agents, which will enter the motor and cause a malfunction.

Remove the EGR valve and make sure that it is not stuck and does not have any carbon deposits. If there are any carbon deposits, use a wire brush to clean it.

MASS AIRFLOW SENSOR CHECK

M1173050400183

To inspect the sensor, refer to GROUP 13A, Multiport Fuel Injection (MFI) –Multiport Fuel Injection (MFI) Diagnosis –Diagnostic Trouble Code Chart [P.13A-46](#).

INTAKE AIR TEMPERATURE SENSOR CHECK

M1173008200393

To inspect the sensor, refer to GROUP 13A, Multiport Fuel Injection (MFI) –Multiport Fuel Injection (MFI) Diagnosis –Diagnostic Trouble Code Chart [P.13A-46](#).

MANIFOLD ABSOLUTE PRESSURE SENSOR CHECK

M1173050000130

To inspect the sensor, refer to GROUP 13A, Multiport Fuel Injection (MFI) –Multiport Fuel Injection (MFI) Diagnosis –Diagnostic Trouble Code Chart [P.13A-46](#).

ENGINE COOLANT TEMPERATURE SENSOR CHECK

M1173008100749

To inspect the sensor, refer to GROUP 13A, Multiport Fuel Injection (MFI) –Multiport Fuel Injection (MFI) Diagnosis –Diagnostic Trouble Code Chart [P.13A-46](#).

ACCELERATOR PEDAL POSITION SENSOR CHECK

M1173050500027

To inspect the sensor, refer to GROUP 13A, Multiport Fuel Injection (MFI) –Multiport Fuel Injection (MFI) Diagnosis –Diagnostic Trouble Code Chart [P.13A-46](#).

CRANKSHAFT POSITION SENSOR CHECK

M1173008300389

To inspect the sensor, refer to GROUP 13A, Multiport Fuel Injection (MFI) –Multiport Fuel Injection (MFI) Diagnosis –Diagnostic Trouble Code Chart [P.13A-46](#).