

ENGINE 4J SERIES

SECTION 6E

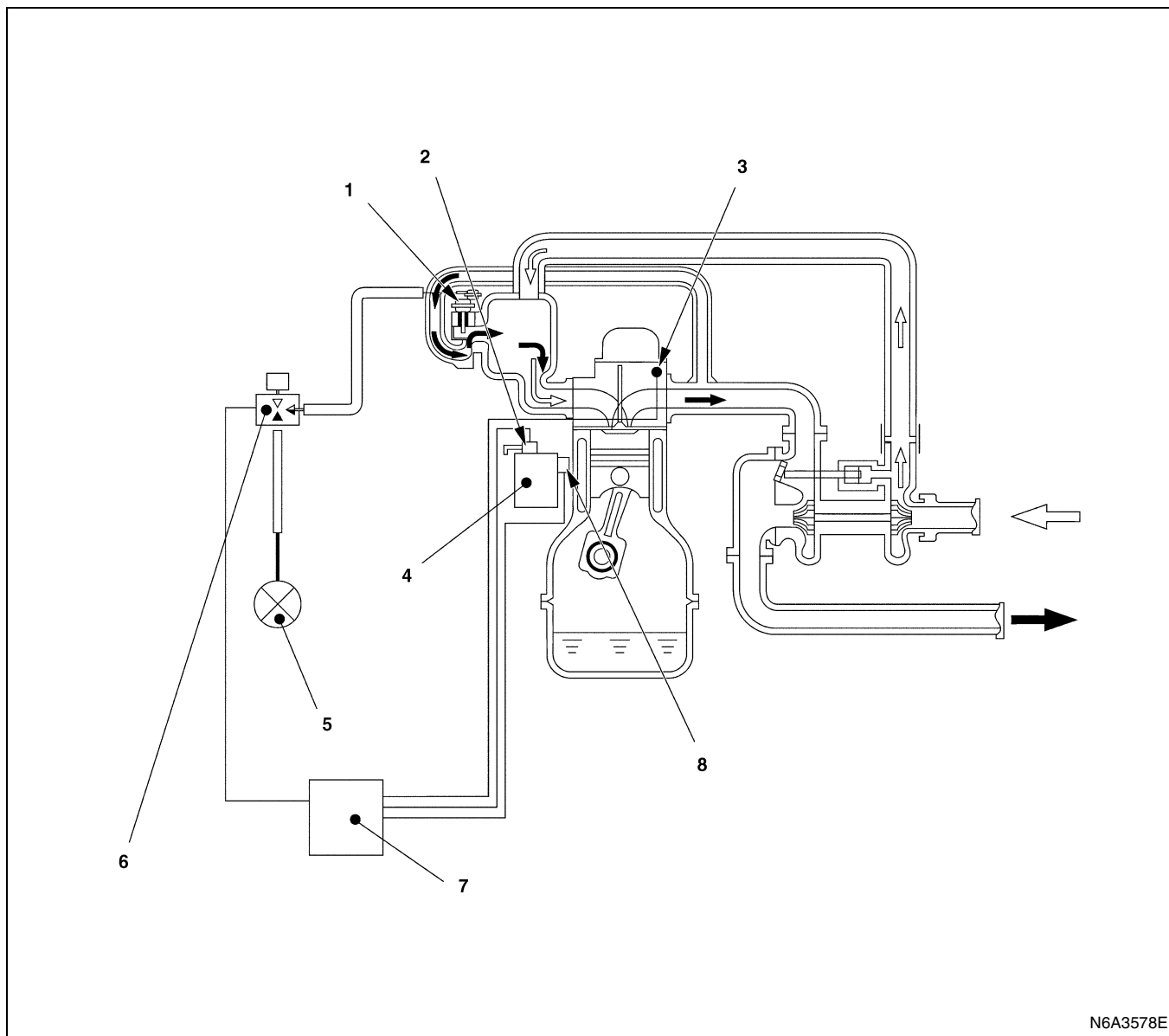
EXHAUST GAS RECIRCULATION (EGR) SYSTEM

Contents

GENERAL DESCRIPTION	6E-2
EGR SYSTEM WIRING DIAGRAM	6E-4
EGR SYSTEM OPERATION	6E-5
INSPECTION	6E-6
EGR COOLER	6E-7
Component	6E-7
Removal	6E-7
Installation	6E-8

GENERAL DESCRIPTION

4JB1-TC



N6A3578E

Legend

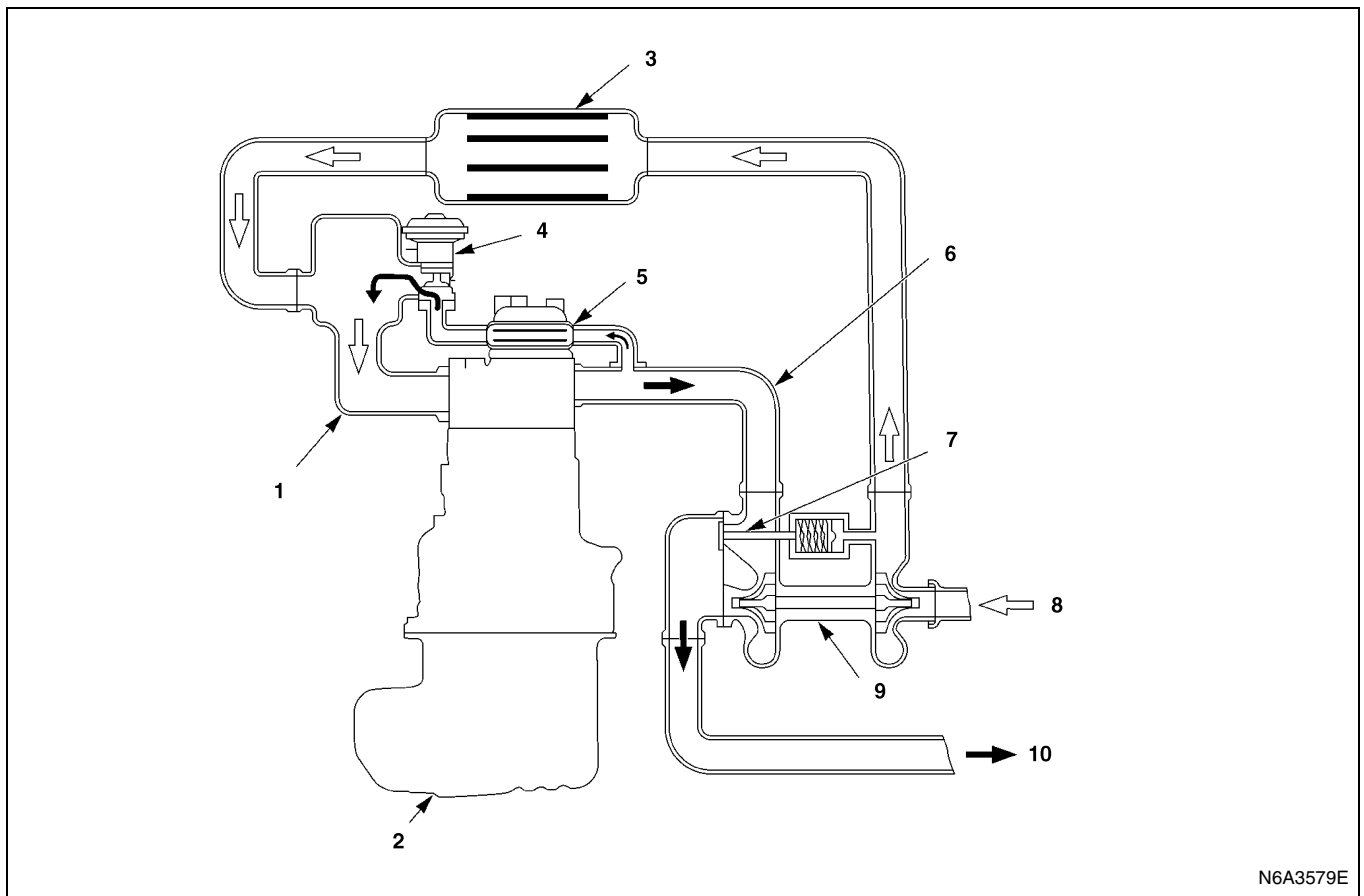
- | | |
|-------------------|-------------------|
| 1. EGR valve | 5. Vacuum pump |
| 2. Potentiometer | 6. V.S.V |
| 3. Thermo switch | 7. EGR controller |
| 4. Injection pump | 8. RPM sensor |

This system controls the formation of NO_x emission by recirculating the exhaust gas into the combustion chamber through the intake manifold.

The EGR valve are controlled by VSV, also VSV are controlled by EGR controller according to signals from RPM sensor and Potentiometer.

The amount of EGR depends on the number of engine rotations and the opening of the accelerator.

4JH1-TC

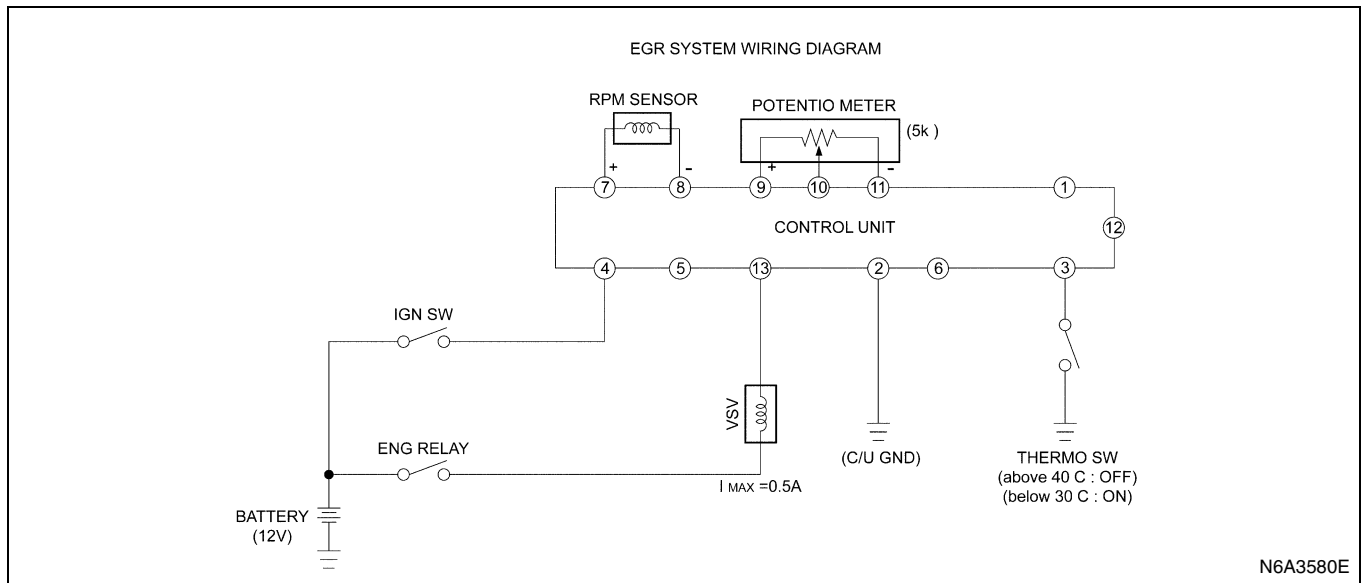
**Legend**

- | | |
|--------------------|---------------------|
| 1. Intake manifold | 6. Exhaust manifold |
| 2. Oil pan | 7. Wast gate |
| 3. Inter cooler | 8. Fresh air |
| 4. EGR valve | 9. Turbocharger |
| 5. EGR cooler | 10. Exhaust gas |

The 4JH1-TC engine is equipped with the EGR cooler. The cooler reduces the temperature of the air being drawn into the engine and the combustion temperatures. This results in reducing nitrogen oxide (NOx) emissions.

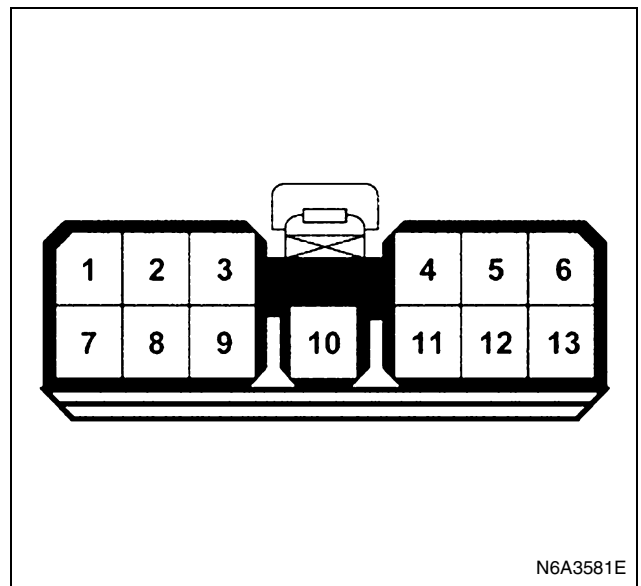
EGR SYSTEM WIRING DIAGRAM

For 4JB1-TC/4JG2



1. Connector Pin Assignment

No.	Connector Name
1	—
2	Battery (–) c/u GND
3	Thermo Switch
4	Battery (+)
5	—
6	—
7	rpm Signal (+)
8	rpm Signal (–)
9	Potentiometer (+)
10	Potentiometer
11	Potentiometer (–)
12	—
13	VSV



EGR SYSTEM OPERATION

1. On the input side of engine speed, there is provided a hysteresis of 50 rpm on the speed rising side.
2. It does not work until 70 seconds, pass after engine start.
3. It does not work while the water temperature switch is on (30°C or lower).
4. While engine speed drops from 3,800 rpm or higher, it does not work for 25 seconds.

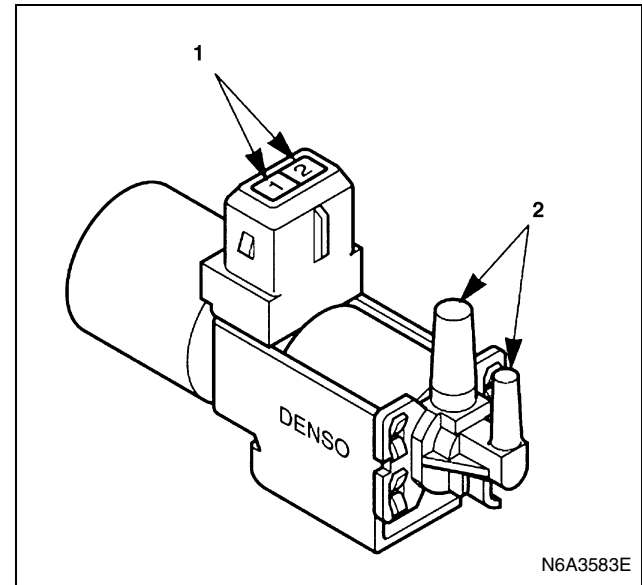
Exhaust Gas Recirculation (EGR) System Check

Step	Action	Value	YES	NO
1	Check the EGR valve for looseness. Is the EGR valve loose?	—	Go to Step 2	Go to Step 3
2	Tighten the EGR valve. Is the action complete?	—	Verify repair	—
3	1. Engine "OFF". 2. Ignition "ON". 3. Using test light to ground, check the EGR harness between the EGR valve and ignition feed. Does the test light illuminate?	—	Go to Step 5	Go to Step 4
4	Repair the EGR harness ignition feed. Was the problem corrected?	—	Verify repair	Go to Step 5
5	1. Remove the EGR valve. 2. Visually and physically inspect the EGR valve pintle, valve passages and adapter for excessive deposits, obstructions or any restrictions. Does the EGR valve have excessive deposits, obstructions or any restrictions?	—	Go to Step 6	Go to Step 7
6	Clean or replace EGR system components as necessary. Was the problem corrected?	—	Verify repair	Go to Step 7
7	1. Remove the EGR inlet and outlet pipes from the intake and exhaust manifolds. 2. Visually and physically inspect manifold EGR ports and EGR inlet and outlet pipes for blockage or restriction caused by excessive deposits or other damage. Do the manifold EGR ports or inlet and outlet pipes have excessive deposits, obstructions, or any restrictions?	—	Go to Step 8	EGR system working properly. No problem found.
8	Clean or replace EGR system components as necessary. Is the action complete?	—	Verify repair	—

INSPECTION

Vacuum Switch Valve (VSV)

Check the resistance between the VSV connector terminals using a circuit tester.
Cold Resistance: 37 — 44 (Ω) (for 12 volt)
Connect battery voltage between VSV connector terminals and make sure of the continuity between the ports.



Legend

- 1. 2 pin
- 2. Port

EGR Valve

With negative pressure applied to the diaphragm chamber, make sure that the valve is smoothly actuated to make the area between (1) and (2) ventilated.
Startup: About — 18.66±2.67 Kpa (-140±20 mmHg)
Check to see if EGR valve is normally actuated under the following conditions:
QWS off (After warming up)
Engine coolant temp: 80°C or higher

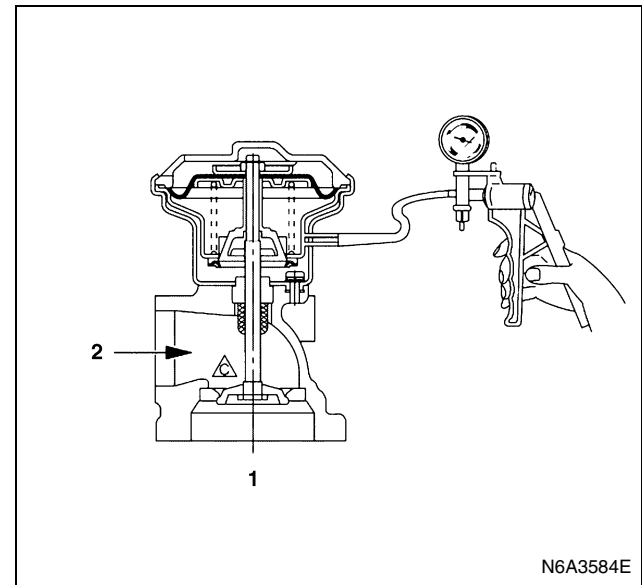
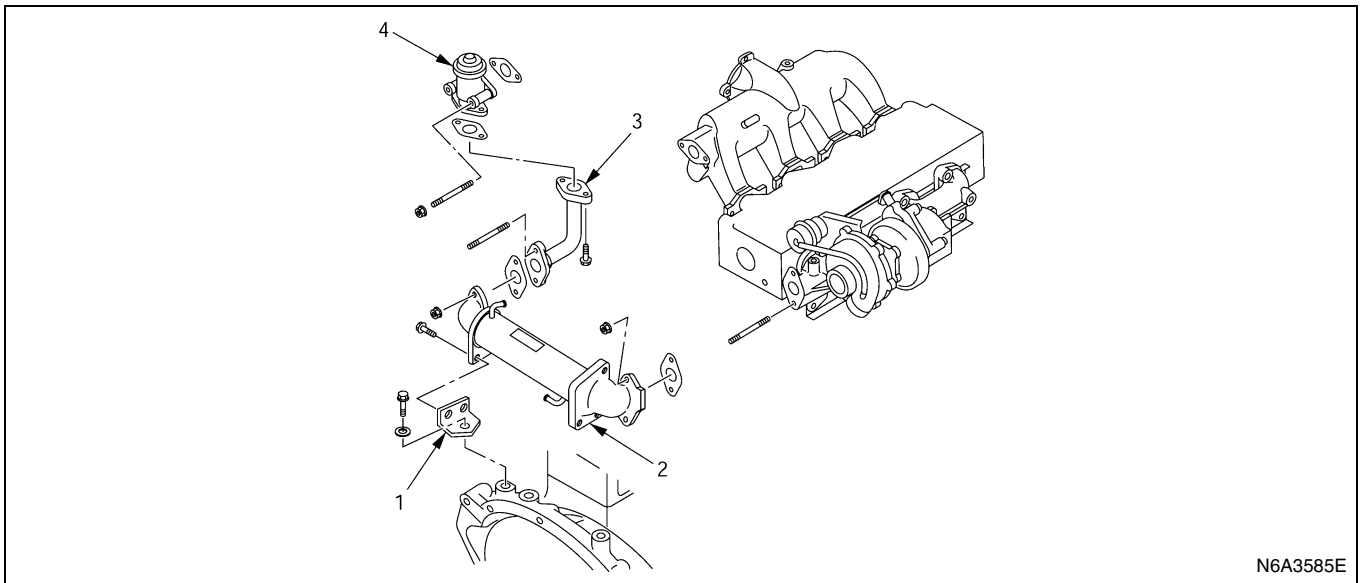


Illustration	Tool Number / Description / Remarks
 5884003660	5-8840-0366-0 / High Impedance Multimeter (Digital Voltmeter-DVM)
 5884002790	5-8840-0279-0 / Vacuum Pump with Gauge

EGR COOLER

Component



Legend

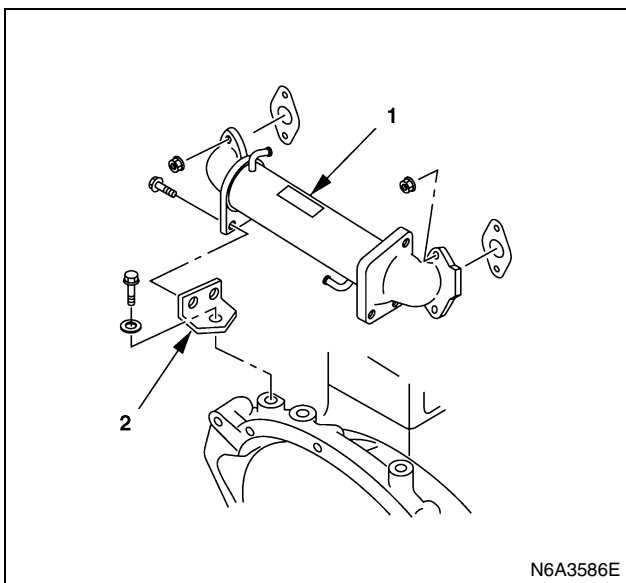
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|-----------------------|--------------|
| 1. EGR cooler bracket | 3. EGR pipe |
| 2. EGR cooler | 4. EGR valve |

Removal

Preparation

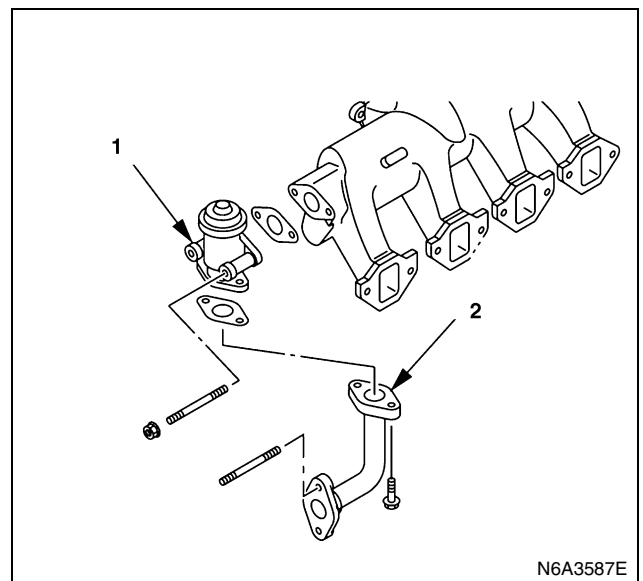
- Disconnect the battery ground cable.
- Drain the coolant.
- Remove the water hose.

1. EGR Cooler Bracket
Remove the bracket from the flywheel housing.
2. EGR Cooler
Remove the EGR fixing nuts. Remove the cooler together with the gasket.



Legend

- | |
|-----------------------|
| 1. EGR cooler |
| 2. EGR cooler bracket |
| 3. EGR Pipe |
| 4. EGR Valve |



Legend

- | |
|--------------|
| 1. EGR valve |
| 2. EGR pipe |

6E-8 EXHAUST GAS RECIRCULATION (EGR) SYSTEM

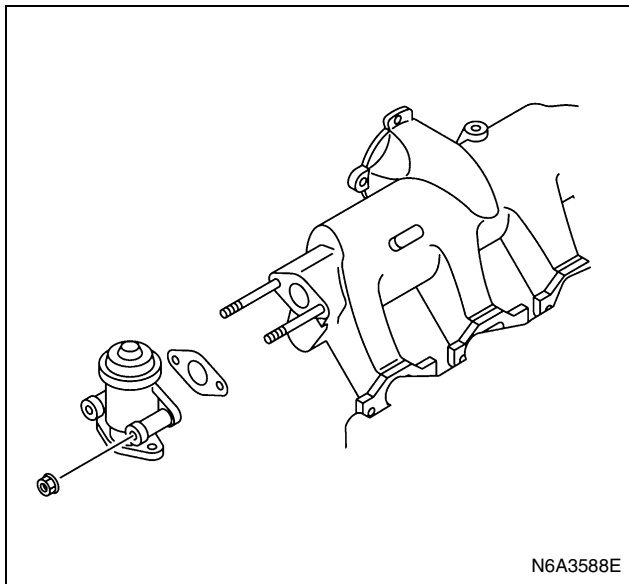
Installation

1. EGR Valve

- Install the gasket to the intake manifold.
- Install the EGR valve and tighten the nuts to the specified torque.

Tighten:

- Nut to 24 N·m (2.4 kg·m / 17 lb·ft)



2. EGR Pipe

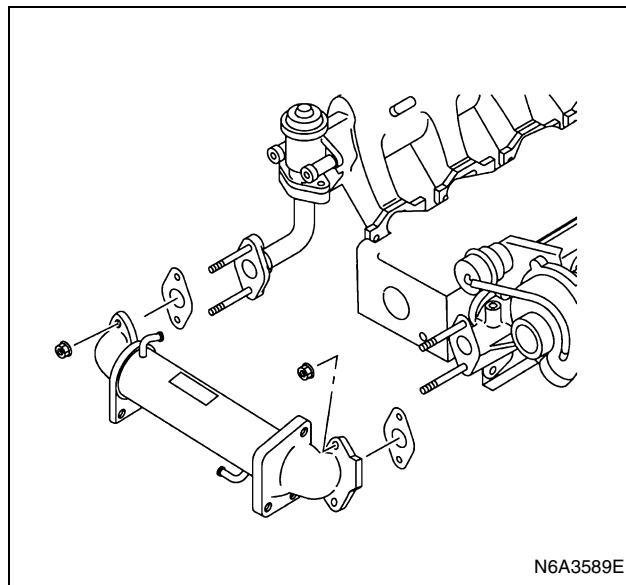
- Install the gasket to the EGR valve.
- Install the EGR pipe and tighten the bolts to the specified torque.

Tighten:

- Bolt to 19 N·m (1.9 kg·m / 14 lb·ft)

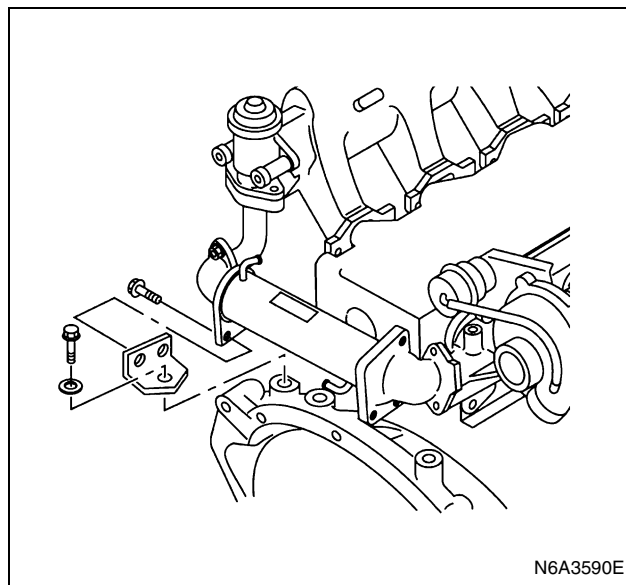
3. EGR Cooler

- Install the gaskets to the EGR pipe and the exhaust manifold.
- Install the EGR cooler.
- Tighten the nuts until they seat (do not final tighten).



4. EGR Cooler Bracket

- Install the bracket to the EGR cooler.
- Install the washer to the flywheel housing side.
- Tighten the bolts until they seat (do not final tighten).



Tighten the nuts and bolts to the specified torque in the order shown in the illustration.

Tighten:

- Nuts to 24 N·m (2.4 kg·m / 17 lb·ft)
- Bolts to 19 N·m (1.9 kg·m / 14 lb·ft)

