

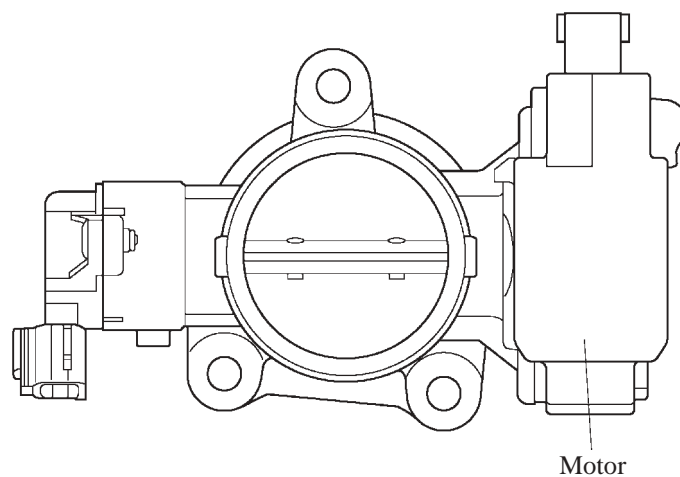
## 6. Intake and Exhaust System

### General

- The motor of the diesel throttle valve has been changed from a step motor type to a rotary solenoid type in order to attain quick reponse and to suppress smoke emissions.
- The EGR valve has been changed from the previous step motor type to a linear solenoid type in order to attain quick response and to suppress smoke emissions.
- A catalyst has been added in front of the EGR cooler.
- To enable the addition of fuel into the exhaust system, the sealing performance of the gasket between the turbocharger and the exhaust manifold has been improved.
- Along with the adoption of the D-CAT, the exhaust pipe routing, muffler capacity, muffler construction, and the catalyst size have been optimized.
- In D-CAT, the exhaust gas pressure increases when fuel is added into the exhaust manifold. Therefore, the sealing performance of various areas and the reliability of the bearings for the turbocharger have been ensured.

### Diesel Throttle Valve

A rotary solenoid type motor has been adopted in the diesel throttle valve. This makes the throttle valve respond quickly.



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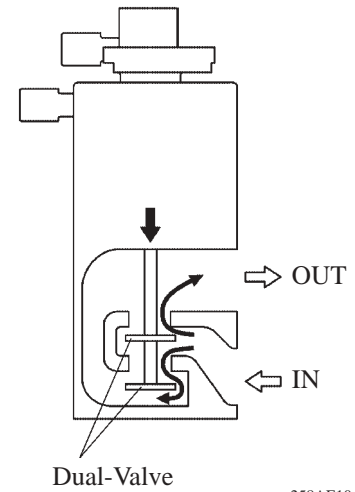
## EGR System

### 1) EGR Valve

- A linear solenoid type of EGR valve has been adopted. Also, a dual-valve mechanism has been adopted to enable the valve to respond quickly.

In particular, this achieves the following:

- Decreases the oxygen concentration level in the intake air.
- Allows a large volume of EGR gas to flow by increasing the EGR flow rate.
- Richens the air-fuel ratio in the exhaust gas.
- Increases the catalyst temperature, which decreases the amount of smoke during acceleration.
- The dual-valve construction cancels the effects of the exhaust pressure during actuation, in order to realize quick response.
- An EGR valve position sensor has been newly provided. This sensor enables EGR valve control at a higher level of precision by detecting the amount of lift of the EGR valve.



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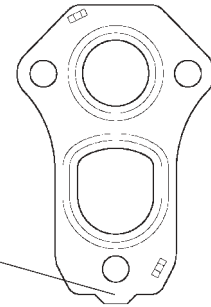
### 2) EGR Inlet Gasket

The gasket has been changed to accommodate the newly installed EGR valve.

#### Service Tip

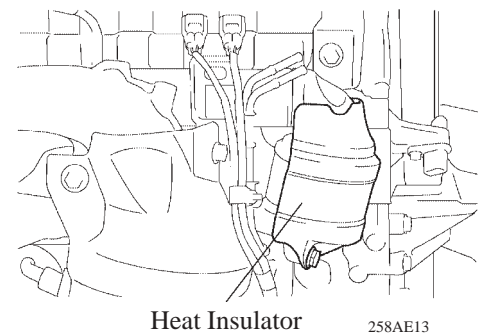
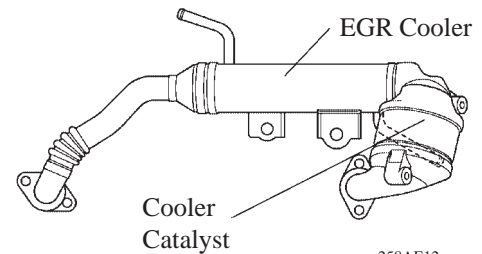
An overhang has been provided on the gasket for the 1CD-FTV engine with D-CAT in order to distinguish it from the 1CD-FTV engine without D-CAT. This prevents the wrong gasket from being installed.

Overhang added  
for distinguishing



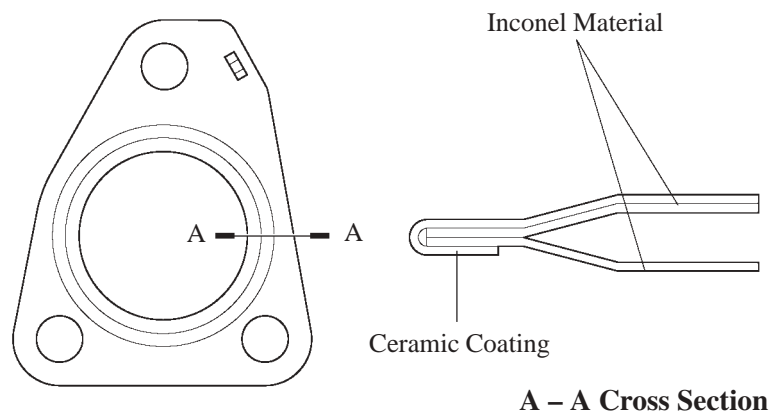
### 3) EGR Cooler & Cooler Catalyst

- A catalyst has been added in front of the EGR cooler.
- The passage diameter at the EGR cooler outlet has been increased in order to increase the flow rate of the EGR gas.
- A heat insulator has been provided at the catalyst area of the EGR cooler in order to prevent heat damage to the surrounding parts.



### Turbocharger to Exhaust Manifold Gasket

- The sealing performance of the gasket between the turbocharger and the exhaust manifold has been improved.



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