■ EMISSION CONTROL

1. Function of Main Components

The main components of the emission control system are as follows:

Component	Function
ECM	Controls the emission control system based on signals from each sensor.
Electric EGR Control Valve Assembly	Actuated by the ECM, this valve controls the flow rate of EGR gas.
EGR Valve Position Sensor (Built into Electric EGR Control Valve Assembly)	Detects the EGR valve position.
Diesel Throttle Valve	Actuated by the ECM, this valve controls the flow rate of intake air.
No. 1 EGR Cooler	Cools EGR gas.
No. 2 EGR Valve Assembly	Switches the flow passage of EGR gas in 2 stages.
Urea Pump Control ECU	Controls the UREA SCR system based on signals from each sensor.
Exhaust Gas Temperature Sensor	Detects the exhaust gas temperature.
No. 2 Exhaust Gas Temperature Sensor	
No. 3 Exhaust Gas Temperature Sensor	
No. 4 Exhaust Gas Temperature Sensor	
Differential Pressure Sensor	Monitors the differential pressure before and after the DPF to detect whether the DPF is clogged.
Exhaust Fuel Addition Injector Assembly	Injects fuel into the exhaust manifold according to signals from the ECM.
Air Fuel Ratio Sensor	Detects the oxygen concentration in exhaust gas.
NOx Sensor (Nitrogen Oxides Sensor)	Detects the concentration of NOx in the exhaust gas.

2. Function

1) EGR System

This system is designed to help reduce and control NOx formation due to a reduction of peak temperature in the engine combustion chamber, which is accomplished by the introduction of an amount of inert gas into the intake manifold.

2) Catalyst Support Control

Determines the DPF catalyst conditions based on various signals, controls the injector assembly and exhaust fuel addition injector assembly, and controls the DPF catalyst conditions.

3) UREA SCR System

Urea solution is injected by the urea injector set to purify NOx in the exhaust gas.

■ EGR CONTROL

1. System Control

The EGR system carries out the following controls:

- The ECM actuates the electric EGR control valve assembly, which regulates the volume of EGR gas recirculation, in accordance with the engine condition.
- The ECM switches the bypass passage of the No. 1 EGR Cooler via the No. 2 EGR valve assembly in 2 stages in order to optimize the temperature of the EGR gas and clean exhaust gases.

■ CATALYST SUPPORT CONTROL

1. System Control

- If the DPF temperature is high under normal driving conditions, PM captured by the DPF is oxidized by the temperature of the DPF and is emitted as CO_2 and H_2O.
- If the DPF temperature becomes low, catalyst performance decreases, resulting in an increase of the amount of PM stuck in the filter substrate. The ECM detects that the filter substrate is clogged by calculating the accumulated volume of the PM discharged by the engine. To reduce PM, the ECM controls the injection timing and the injection frequency of the injectors, and activates the exhaust fuel addition injector. At the same time, ECM controls the engine speed and glow plug assembly temperature via the glow plug controller. As a result, filter substrate temperature becomes high and PM reacts with active oxygen and changes into CO_2 for purification. This is known as catalyst support control.
- When PM has accumulated in the DPF while driving normally, the ECM automatically performs catalyst support control.
- However, sufficient purification of the PM by the catalyst support control may not be possible when driving repeatedly over short distances. As a result, the PM accumulation limit may be surpassed. If a predetermined level of PM accumulation has been surpassed, the DPF indicator light in the combination meter assembly is illuminated. This prompts the driver to drive at a constant speed (approx. 65 km/h) for automatic catalyst support control to be carried out.
- In addition, if the driver keeps driving without driving at a constant speed (approx. 65 km/h), the DPF indicator light illuminates or blinks when a predetermined level of PM accumulation is surpassed. This prompts the driver to bring the vehicle to a dealer for manual catalyst support control to be carried out.
- Moreover, if the driver keeps driving without bringing the vehicle to a dealer, PM accumulates further. In this situation, if the catalyst support control is conducted, the DPF could be destroyed. To prevent