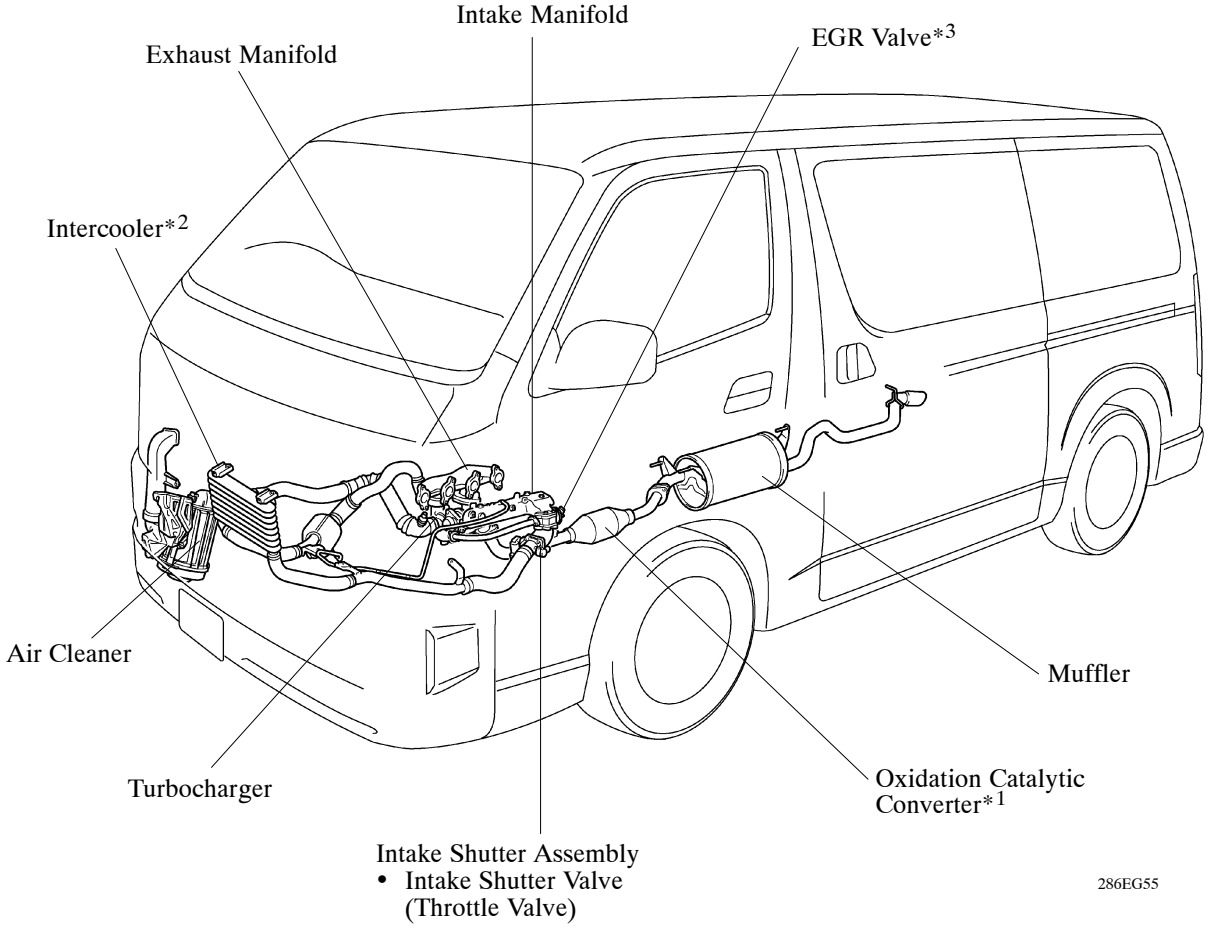
■ INTAKE AND EXHAUST SYSTEM

1. General

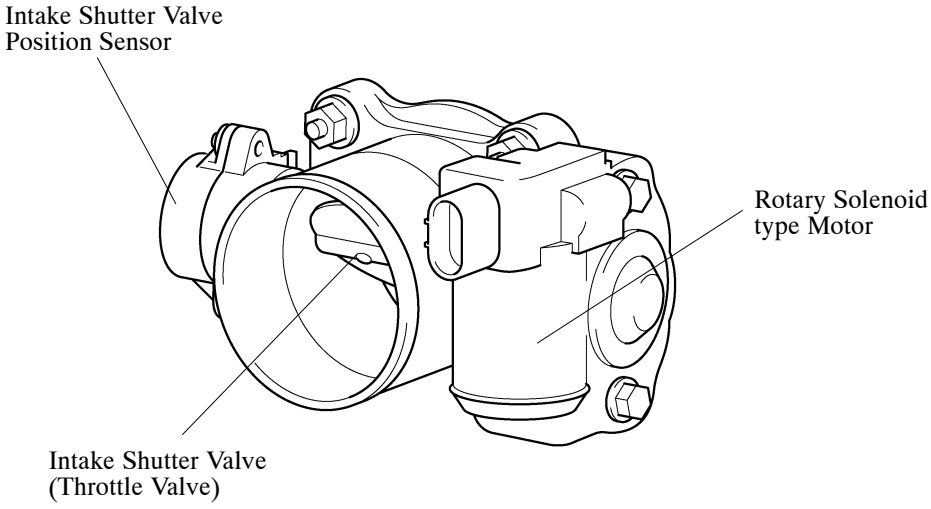
- An intake shutter valve (throttle valve) equipped with a torque motor (rotary solenoid type) is used.
- An EGR control system is used on the models complying with the Euro III and Euro II emission regulation. This system is designed to reduce and control NOx formation due to a slight reduction of peak temperature in the engine combustion chamber, which is accomplished by introducing a small amount of inert gas into intake manifold. For details of EGR control, see page EG-115.
- An air-cooled intercooler is provided for high roof, wide body, RHD models.
- On models without an intercooler, a water-cooled type turbocharger is used.
- An oxidation catalytic converter is provided on the models complying with the EURO III emission regulation.



*1: for Models Complying with the EURO III Emission Regulation
*2: for Models with Intercooler
*3: for Models with EGR control system

2. Intake Shutter Assembly

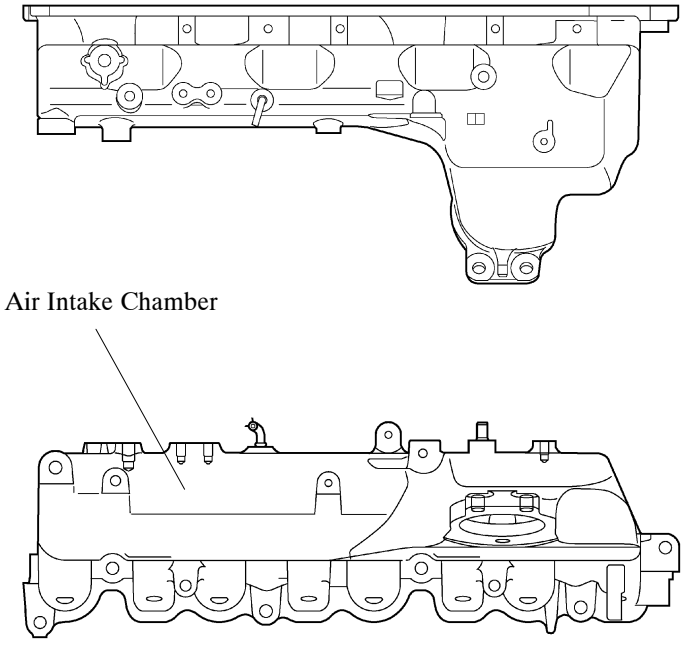
The intake shutter valve (throttle valve) equipped with a torque motor (rotary solenoid type) is used to reduce the vibration and noise when the engine is stopped. The torque motor (rotary solenoid type) makes the intake shutter valve (throttle valve) respond quickly.



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3. Intake Manifold

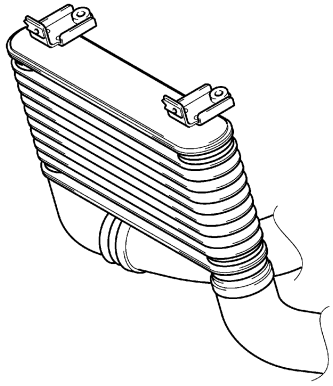
In conjunction with the adoption of the direct injection system, an intake manifold provided with an air intake chamber is used in order to reduce the swirl variances between the cylinders.



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4. Intercooler

An air-cooled intercooler is used in order to lower the intake air temperature, improve engine performance, and realize cleaner exhaust gas emissions.



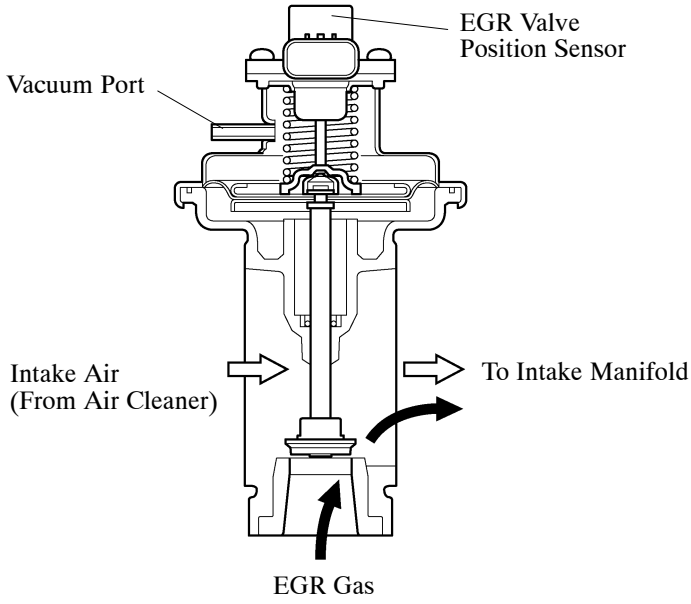
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▶ Specification ◀

Type		Drawn Cup
Core Size	Height	187.6 mm (7.39 in.)
	Width	250.0 mm (9.84 in.)
	Thickness	65.0 mm (2.56 in.)
Material		Aluminum

5. EGR Valve

- The EGR valve is provided in the intake air passage. By cooling the EGR valve in this manner, a greater volume of exhaust gas can be processed.
- The EGR valve position sensor has been provided in the EGR valve in order to directly measure the actual amount of the valve opening. This measurement is then input into the engine ECU in order to improve the precision of EGR control. For details of EGR control, see page EG-115.

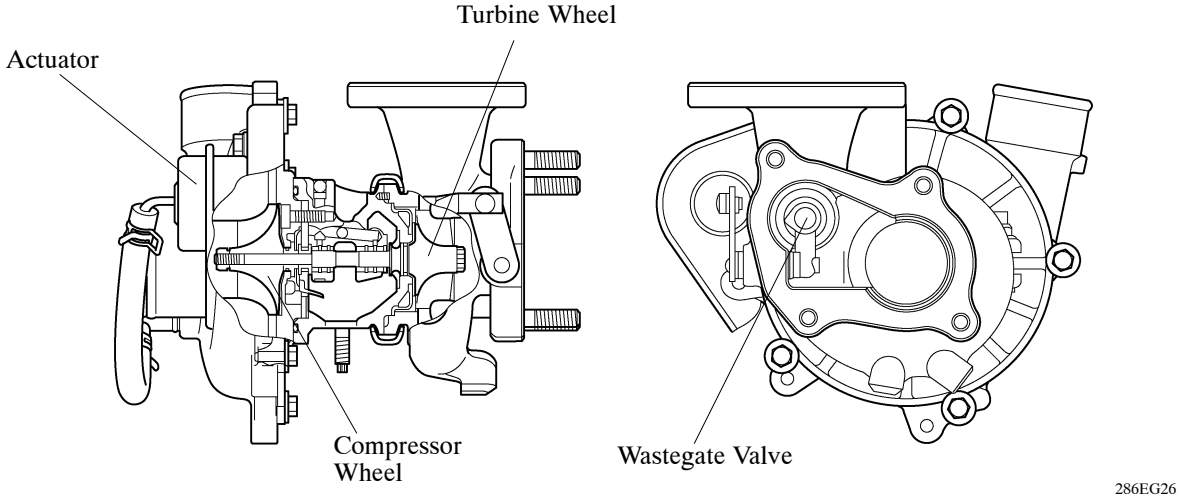


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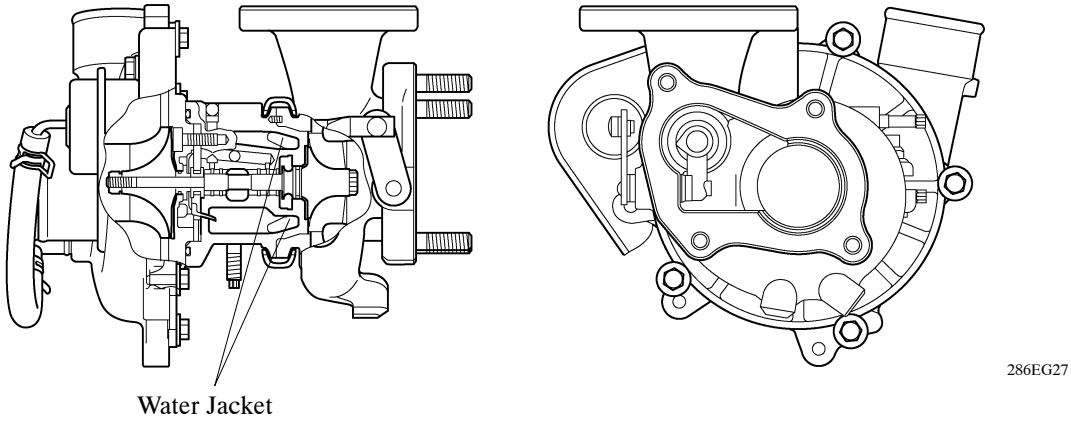
6. Turbocharger

- On models with an intercooler, a lightweight, compact air-cooled type turbocharger is used. On models without an intercooler, a water-cooled type turbocharger in which a water jacket is installed in the bearing housing is used.
- To control the turbo pressure, this turbocharger is provided with a wastegate valve and an actuator that operates mechanically in accordance with the turbo pressure.

▶ with Intercooler ◀



▶ without Intercooler ◀



Service Tip

The engine ECU determines altitude using the atmospheric pressure sensor. If the sensor indication value is approx. 85 kPa or less (Altitude: Higher than approx. 1,500 m), the engine ECU lowers the preset maximum engine speed*, in order to prevent the turbine wheel from racing when the vehicle is driven in high altitude areas (where the atmospheric pressure is low). Therefore, the preset maximum engine speed is lower than standard. However, this is not an engine malfunction. For details, see the Hiace Repair Manual (Pub. No. RM1171E).

*: Varies in accordance with altitude. As the altitude increases (the atmospheric pressure sensor indication value decreases), the preset maximum engine speed decreases.

EG

7. Exhaust Pipe

- The exhaust pipe for standard wheel base models is comprised of the front pipe and the tail pipe.
- The exhaust pipe for super-long wheel base models is comprised of the front pipe, the center pipe and the tail pipe.
- A ball joint is used to join the exhaust front pipe and exhaust manifold. As a result, a simple and reliable construction for reducing vibration has been realized.
- The oxidation catalytic converter is used, in order to clean the exhaust gas particulates, HC, and CO, on the models complying with the EURO III emission regulation.

▶ for Models Complying with the EURO III Emission Regulation ◀

