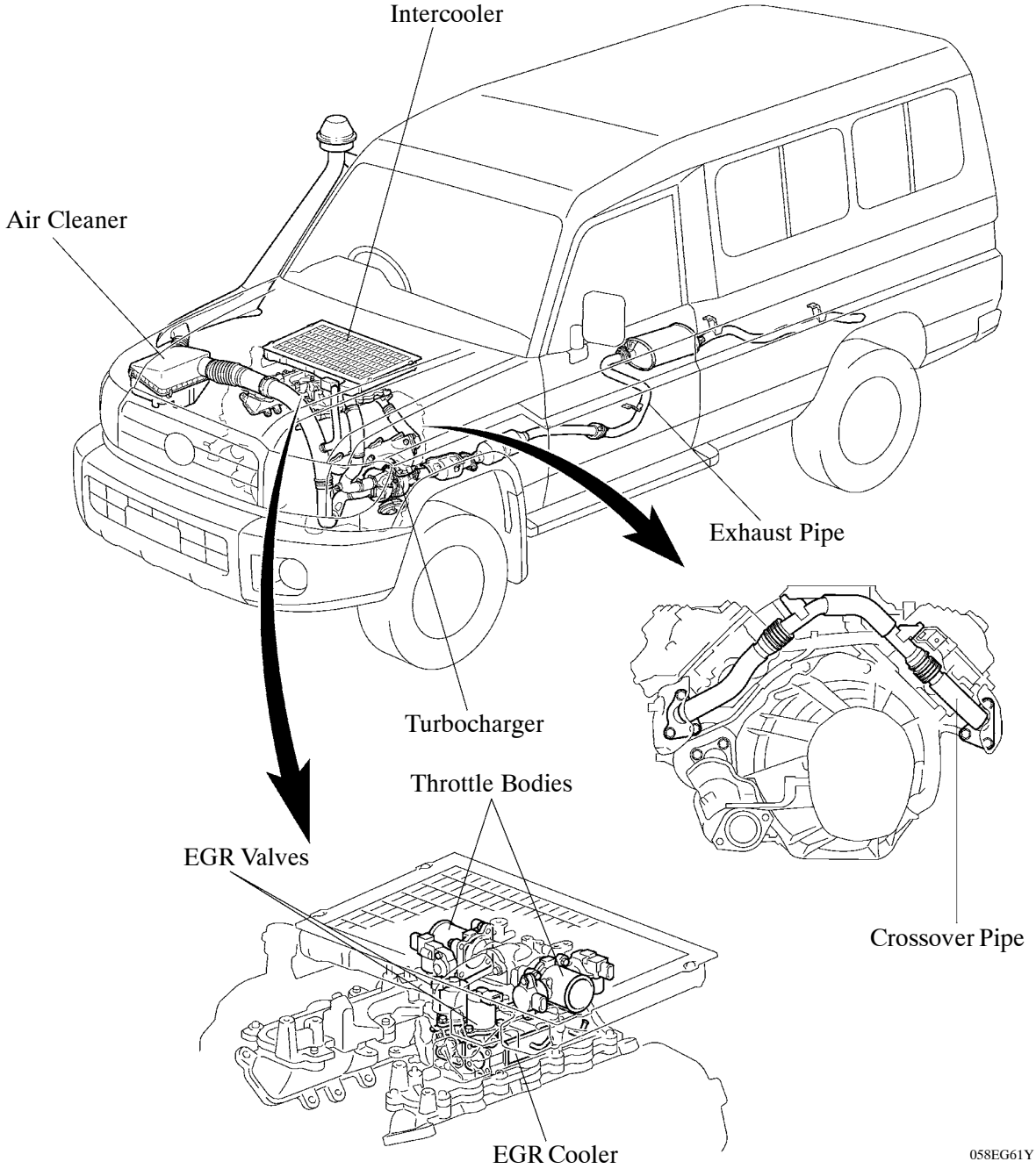
■INTAKE AND EXHAUST SYSTEM

1. General

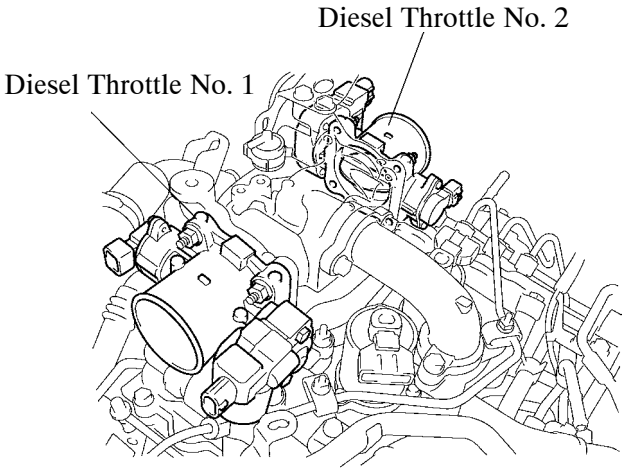
- A throttle body equipped with a rotary solenoid type throttle control motor is used.
- An air-cooled intercooler is used.
- An EGR system is used. This system is designed to reduce and control NOx formation through a slight reduction of peak temperature in the engine combustion chamber, which is accomplished by introducing a small amount of inert gas into the intake manifold. For details of EGR control, see page 76.
- A variable nozzle vane type turbocharger is used.
- A stainless steel exhaust pipe is used for weight reduction and improved rust resistance.
- Because a single turbocharger is used on a V type engine, a crossover pipe is used to merge the exhaust gas from the right bank to the left bank.
- An oxidation catalytic converter is used in the front pipe to comply with the EURO IV emission regulation.



2. Throttle Body

Two link-less type throttle bodies in which the diesel throttle control motor and the throttle position sensor are integrated are used.

- In the diesel throttle control motor, a rotary solenoid motor is used to control intake throttle.
- A non-contact type throttle position sensor is used in the throttle body. For details, see page EG-68.



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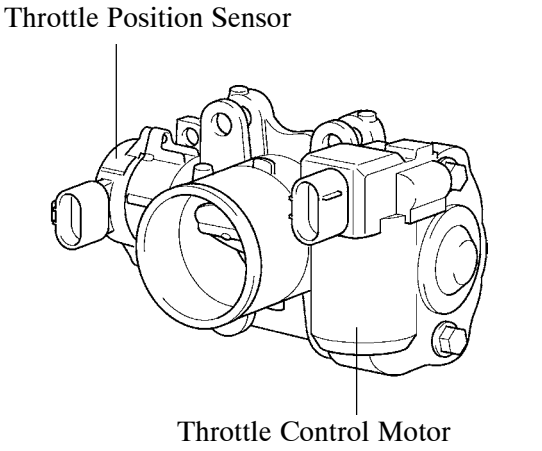

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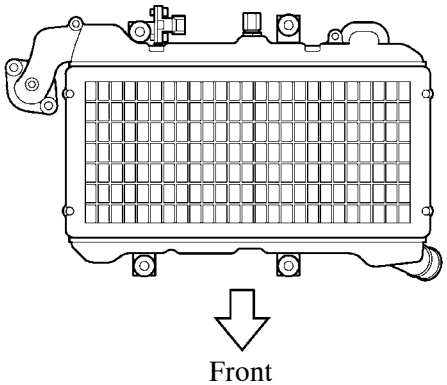
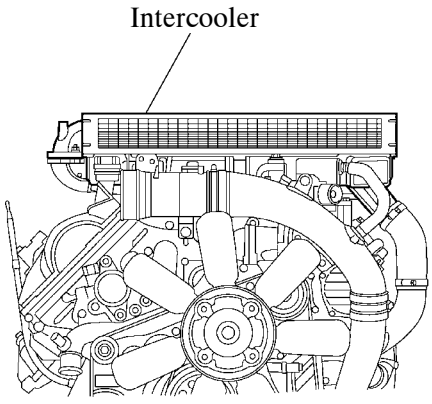
3. Intercooler

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





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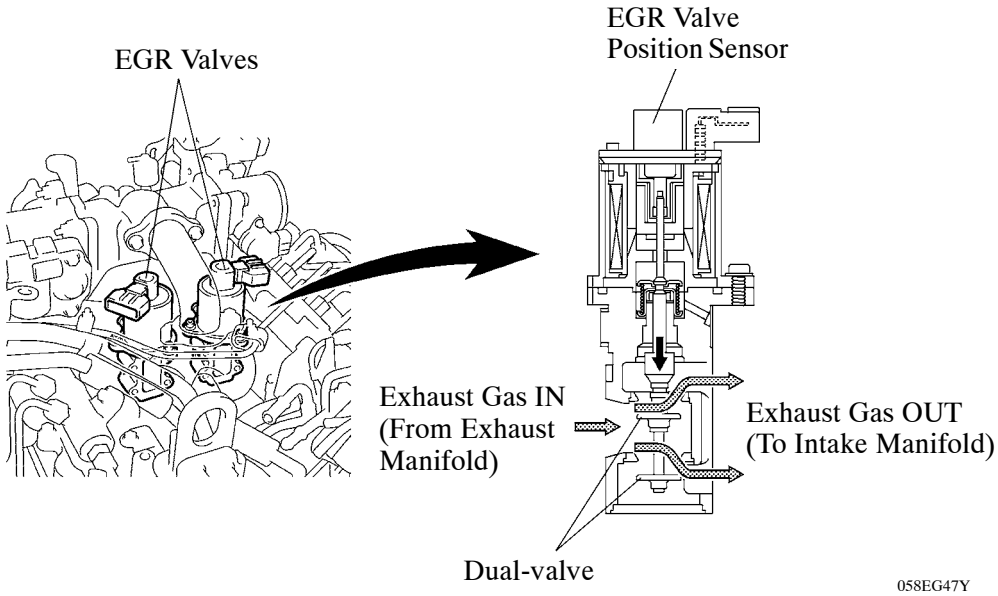
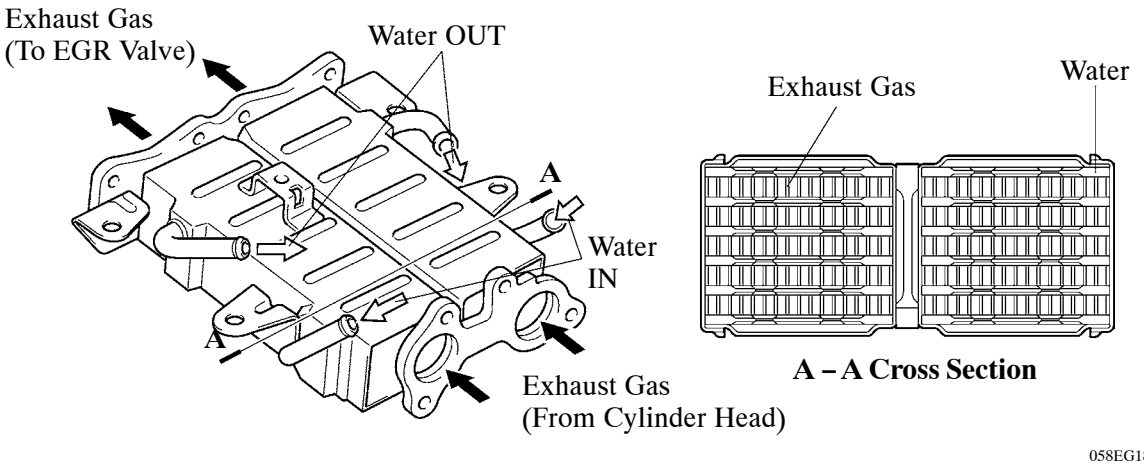
4. EGR Valve

- Two linear solenoid type EGR valves are used. Also, a dual-valve mechanism is used to cancel the effects of the exhaust pressure during actuation, in order to realize quick response.
- An EGR valve position sensor is provided in the EGR valve. This sensor enables EGR valve control at a higher level of precision by detecting the amount of lift of the EGR valve.



5. EGR Cooler

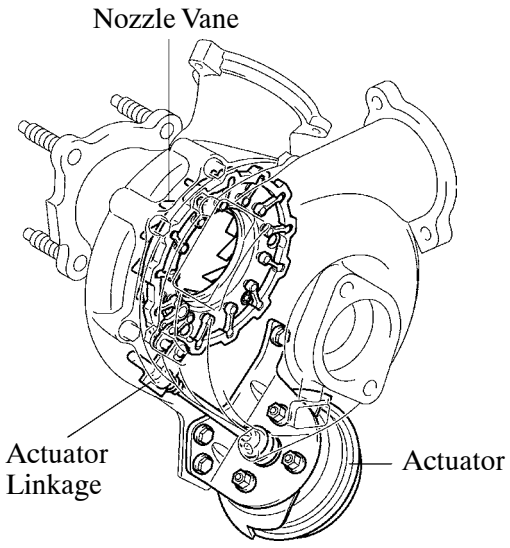
- A water-cooled type EGR cooler is used. That lowers the exhaust gas temperature to recirculate the great amount of exhaust gas, realizing the reduction of NOx.
- In the water-cooled type EGR cooler, water flows the five-layered gas passage to cool down.



6. Turbocharger

General

- The variable nozzle vane type turbocharger drives the vacuum type actuator according to engine condition, and controls the nozzle vane in order to realize high engine output, low fuel consumption and low emissions.
- The turbocharger is cooled by the engine oil.



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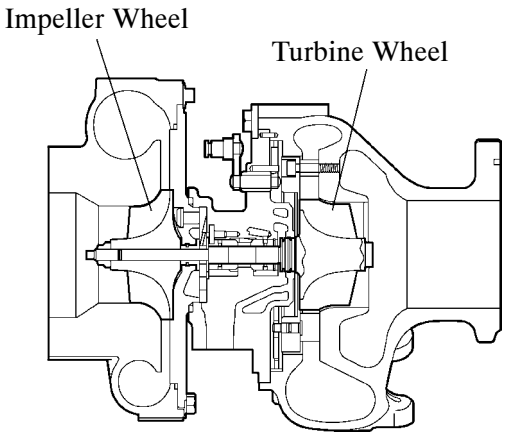

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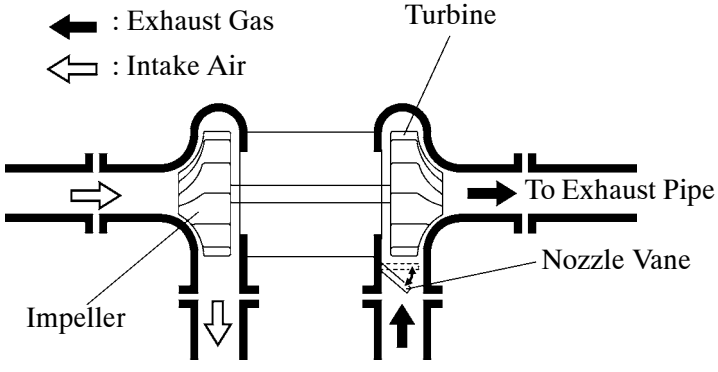
- The exhaust gas from the exhaust manifold goes through the nozzle vane inside the turbocharger housing, and flows to the exhaust pipe through the turbine. The speed of the turbine (supercharging pressure) differs depending on the flow velocity of the exhaust gas going through the turbine and the flow velocity of the exhaust gas is controlled by the opening. When idling, the exhaust gas is less and the nozzle vane is fully closed, but as there is a slight clearance between the vanes, the exhaust gas flows through this clearance to the exhaust pipe. As this type of turbocharger has the nozzle vane operating in these ways, there is no bypass.



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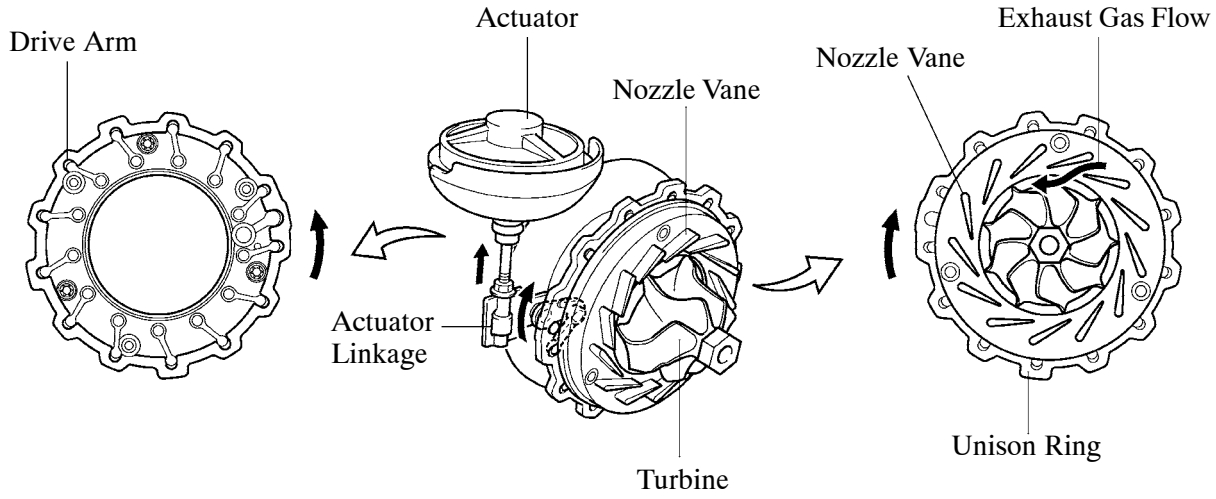
Operation

1) At Low Load Range or Low Speed Range

When the engine is running in a low load range or a low speed range, the actuator pulls up the actuator linkage. The actuator linkage is connected to the unison ring. At the same time, the drive arms installed in the unison ring move to change the nozzle vane angle toward closing direction. As a result, the exhaust gas speed to the turbine increases, and the engine torque will be improved.



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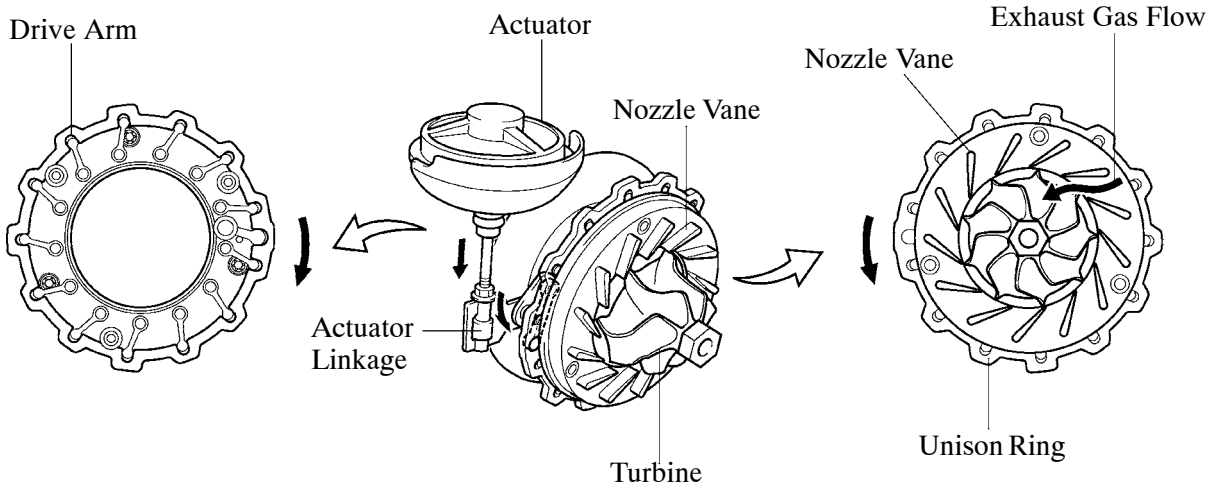
2) At High Load Range or High Speed Range

When the engine is running in a high load range or a high speed range, the actuator pulls down the actuator linkage. With this, the drive arm moves and this opens the nozzle vane and holds the specified supercharging pressure. Thus, the exhaust gas back pressure is lowered, and the output and fuel consumption and improved.



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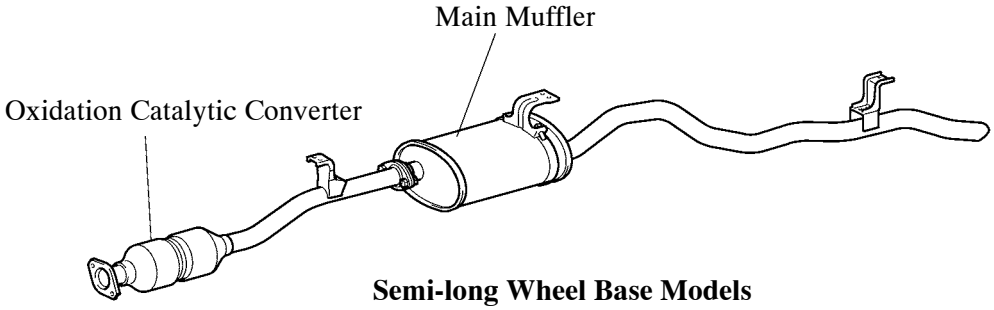
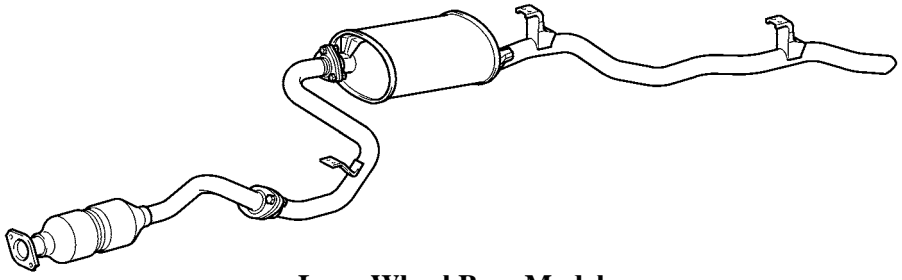
7. Exhaust Pipe

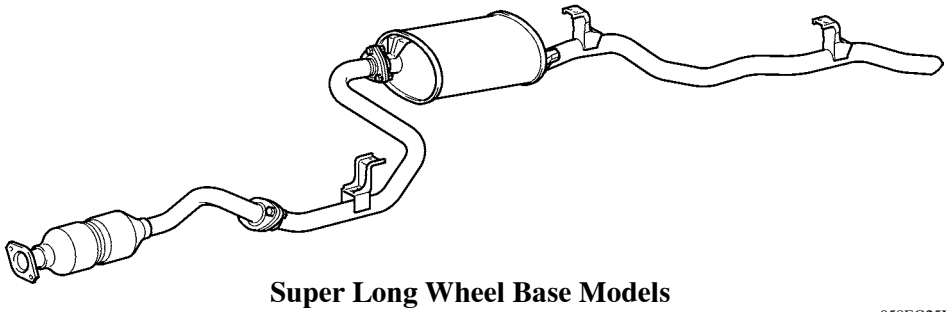
- A stainless steel exhaust pipe is used for weight reduction and rust resistance.
- The oxidation catalytic converter is used to clean the exhaust gas particulates, HC, and CO.



Semi-long Wheel Base Models



Long Wheel Base Models



Super Long Wheel Base Models

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